



INNOVATION IN MOTION

THE DELAWARE LONG RANGE TRANSPORTATION PLAN



Delaware Department
of Transportation

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PRODUCED BY:



THE DELAWARE DEPARTMENT OF TRANSPORTATION
DIVISION OF PLANNING
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REMLINE MARKETING SERVICES

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EXECUTIVE SUMMARY

Delaware's transportation system must continue to evolve over the next 20 years to support a growing economy, diverse communities and advancing technology. Increasing vehicle miles traveled (VMT), funding constraints and aging infrastructure are challenges that will require DelDOT to develop and implement innovative solutions.

Innovation in Motion outlines DelDOT's long range plan to embrace new technologies and strategies that enhance the transportation system and adapt to the ever-changing needs of our customers. This plan will define the statewide transportation goals, strategies, actions and performance measures to make our economy more competitive, our communities more vibrant, and our environment more sustainable for future generations.

VISION STATEMENT

Innovation in Motion will guide DelDOT in developing a **safe, reliable and efficient** transportation system that will support a **diverse economy, vibrant communities and viable transportation options** for Delaware's citizens, visitors and customers.

TRANSPORTATION IN DELAWARE BY 2040

Delaware's transportation system in 2040 will have some significant differences compared to today, including:

- An enhanced and connected multimodal system, including bicycle, pedestrian and transit networks
- New technologies in vehicles, infrastructure and system management
- Innovative tools for customer service and communication with the public



INNOVATION IN MOTION

CHALLENGES

Innovation in Motion examines the following statewide challenges and seeks opportunities to adapt the transportation system to overcome these challenges:

- Aging infrastructure requiring more maintenance
- Increasing population and Vehicle Miles Traveled (VMT)
- Decreasing public transit ridership
- Sprawling growth patterns resulting in longer commuting times to work and commercial centers
- Increasing aging population in need of costly specialized transportation services and facilities
- Changing economic conditions
- Impacts of extreme weather events and sea level rise
- Ensuring safe and efficient emergency evacuation routes
- Providing and maintaining safe and accessible routes for pedestrians and bicyclists
- Managing increasing traffic generated by special events and seasonal fluctuations
- Funding constraints

VALUE & OPPORTUNITIES

EXISTING PLANS & POLICIES

DelDOT's existing plans and policies set standards that ensure the agency is implementing programs effectively, efficiently and in the best interest of our customers. By connecting this plan to existing policies and plans, DelDOT will be able to work collaboratively across departments striving towards the same goals such as planned growth and strategic infrastructure spending.

POPULATION DEMOGRAPHICS & TRANSPORTATION HABITS

The two largest population demographics by age are persons aged 65+ and millennials (persons born between 1981—2000). Each of these population demographics provides an opportunity for increased public transportation ridership with millennials often opting for alternative transportation rather than single occupancy vehicles, and the 65+ population increasingly becoming more reliant on public transportation as driving becomes less desirable. The growing 65+ population is likely to also promote growth for area job markets, particularly retail, hospitality, healthcare and services for the aging population.

ECONOMIC GROWTH

Delaware's economy is dependent on a safe, efficient and reliable transportation network. Access to job opportunities and freight mobility are key factors in economic growth. Also, tourism serves as a major economic driver for Delaware economies. Although the majority of visitors travel to Delaware by motor vehicle, bicycling, walking and public transit are becoming more attractive transportation to visitors once they arrive at their destination.

NEW TECHNOLOGIES

DelDOT is working on several policies embracing a variety of new technologies that could improve transportation, economic growth and quality of life. Among these new technologies are:

- Intelligent Transportation Systems (ITS) Upgrades
- Drone Aircraft
- Mobile Travel Applications
- Real-Time Travel Updates
- Connected and Automated Vehicles

LONG RANGE GOALS

DelDOT will implement **Innovation in Motion** by aligning plans, policies, activities, and measuring progress towards the following long range goals:

Safety and Security - Ensure the safe and secure movement of people and goods while limiting the potential for incidents that may cause harm or disrupt the network operations.

Economic Vitality - Promote and strengthen the economic vitality of Delaware with an excellent transportation network that meets the needs of a diverse and growing economy.

Connectivity - Improve accessibility, mobility and increase options for the movement of people and freight; enhance the integration of a multi-modal transportation system throughout the state; provide people with a choice of safe, attractive and reliable options.

Quality of Life - Maintain and enhance vibrant and appealing communities and support planned growth and development through a transportation network that serves the mobility needs of all Delawareans.

System Preservation - Preserve the transportation network to support travelers and commerce, while adapting to the future's changing needs.

System Management and Operations - Enhance system management and operations through innovative strategies and technology that increase the efficiency of the transportation system.

Resiliency and Reliability - Provide resilient and reliable transportation system that offers predictable travel times under normal conditions as well as efficient and safe use during emergency situations.

Environmental Stewardship - Protect and enhance the environment through sustainable best practices, integration of environmental considerations into planning and design, and responsible energy consumption.

Travel and Tourism - Facilitate efficient mobility options for tourist destinations that support Delaware residents, businesses, and visitors.

Customer Service and Communication - Conduct the highest level of customer service possible to proactively provide information and to learn from and address our customers' needs.



PLAN COMPONENTS

PART 1

Part I – Introduction & Vision, explores questions such as “Where have we been?”, “Where are we now?”, “Where are trends heading?”, and most importantly, “Where do we want to go?” Based on historical knowledge, existing data and future projections, Part I has determined the value, opportunities and challenges of Delaware’s transportation network and has defined the vision and goals as we move into the future.

PART 2

Part II – Implementation Strategies, establishes our strategic approach to achieve our vision. Detailed strategies, categorized under larger **Transportation Elements**, will be implemented over time as transportation needs evolve. Performance measures and targets are included to keep us accountable in reaching our goals and to help us monitor and adjust our strategies to stay on track.

PART 3

Part III – New Innovations, looks at the advancing technologies to improve mobility options and transportation management and operations. As DelDOT looks towards the future, there are many anticipated and unknown possibilities and potential consequences with advancing technologies. DelDOT is ready and staying ahead of the curve by leading efforts to develop and implement new innovations and best practices.

This plan will help DelDOT establish or revise policies and prioritize investments ensuring Delaware’s transportation network remains **safe, efficient, accessible and reliable**, while integrating the latest advancements in technology and providing our customers with excellent service.

DELDOT IN ACTION

Each of these transportation elements are addressed within this Strategic Implementation Plan. While each element is featured individually within its own chapter, we consider each element as an integral component of our transportation network. In the following chapters, the Strategic Implementation Plan for each Transportation Element are outlined as follows:

STRATEGIC IMPLEMENTATION PLANS FOR EACH TRANSPORTATION ELEMENT

- ✓ A unique vision for each component of the transportation network
- ✓ Funding Opportunities
- ✓ Challenges and Constraints
- ✓ Efficiencies and Innovations
- ✓ Assessment of Needs
- ✓ Implementation Partnerships
- ✓ Strategies and Action Items to Support the Long Range Goals
- ✓ Performance Measures, Baselines, and Targets
- ✓ A Plan for Monitoring Progress



TRANSPORTATION PLANNING TOPICS

The Transportation Elements are each components of a multi-modal transportation system working for all people and the movement of goods throughout Delaware. These elements include:

			
Planning & Land Use	Roads, Bridges & Other Assets	Traffic & System Management	Bicycle Transportation
Transportation and land use are intrinsically linked and need to be considered holistically. Planning is a process that considers a balance of potential opportunities, impacts and solutions across a wide spectrum of issues. Our collaborative planning process includes internal and external stakeholders. This partnership allows us to build support and prioritize transportation investments for the communities we serve.	Asset management is one of DeIDOT's core functions. Roadways, structures, drainage facilities and green infrastructure are the main assets that we are responsible for planning, constructing and maintaining.	Managing traffic movement across the state requires a significant effort. The Department is becoming increasingly reliant on advanced technologies. DeIDOT strives to remain a national leader in the testing, development and deployment of innovative traffic management technology, which will help us adapt to the evolving transportation environment.	Bicycling is supported by DeIDOT as a viable transportation mode. Delaware has recently been ranked the most bicycle-friendly state on the east coast. However, there are still improvements to be made to make bicycling a safe, reliable and accessible option.



Pedestrian Transportation

Pedestrian safety has been a challenge in Delaware, and DelDOT is committed to improving pedestrian safety and accessibility. Our priorities are maintaining and expanding a pedestrian network that minimizes barriers and hazards that may put people at risk.



Freight Movement

Delaware's freight network provides critical connections for the movement of goods across the Delmarva Peninsula and nationwide. Delaware's freight network consists of roads, rail lines, port facilities, intermodal transfer centers and air carrier service facilities. The movement of freight is a critical component of our region's economy, and DelDOT is committed to providing and enhancing freight-related transportation infrastructure.



Aeronautics

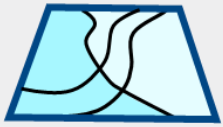
Aviation is a component of the transportation system that is used for personal travel, freight movement, tourism and contributes to economic growth. DelDOT is responsible for planning, coordination and implementation of improvements to the public-use airport system within the state.



Public Transit

Public transit is either the preferred or the only transportation option for many Delawareans. The Delaware Transit Corporation (DTC), part of DelDOT, manages and operates public transit statewide. DTC is continually seeking opportunities to increase transit ridership and accessibility.

DELAWARE'S TRANSPORTATION PRIORITIES FOR THE NEXT 20 YEARS



LAND USE AND TRANSPORTATION PLANNING

Collaborative planning between transportation and land use agencies is critical for sustainable patterns of development. DeIDOT's Transportation Improvement District Program (TID) focuses transportation investments in high-priority growth areas as identified as appropriate for development in local comprehensive plans.



TRANSPORTATION CORRIDOR STRATEGIES

DeIDOT is developing a set of strategies to address the existing and future needs of transportation corridors throughout the state. These strategies will result in a comprehensive vision in the areas of safety, access and multimodal mobility for each corridor. Plans developed through this new approach will prioritize investments and phasing of projects over time. The plans will support statewide economic growth objectives and will streamline project development and environmental review processes. Partnerships with local land use agencies and stakeholder input will be valuable components in this effort.



CRITICAL FREIGHT NETWORK INVESTMENTS

Delaware's economic growth is dependent on a reliable freight network, which includes roads, railroads, ports, waterways and airports. DeIDOT will continue to support operational efficiencies, investments in designated growth areas and infrastructure improvements that promote freight-related business growth. Maintaining reliable roadway connections to freight facilities and mitigating hazard impacts, such as increased roadway flooding, are important parts of DeIDOT's asset management program.



TECHNOLOGY INTEGRATION

DeIDOT is continually looking for new ways to support and integrate new technology to improve our transportation system. Freight trucking and transit are ideal modes for testing and expanding new systems, such as autonomous vehicle technology that can improve the efficiency of moving goods and people. In anticipation of this new technology, innovative travel forecasting methods and traffic management techniques are being developed.



PUBLIC EDUCATION AND SAFETY CAMPAIGNS

To improve driver, bicyclist and pedestrian understanding of safety, DeIDOT will continue to provide comprehensive education and outreach programs at the statewide and local levels.



ADVANCED STREETSCAPE DESIGN

Ongoing changes in technology and DelDOT's priorities in the areas of pedestrian and bicycle safety may change how we interact with our streetscape environment and may necessitate new roadway design guides. Connected Vehicle (CV) technology, for example, allows vehicles to communicate with other vehicles, connected devices and the world around them. This technology may require reallocation of space within the existing right-of-way to accommodate related infrastructure. The testing of new street designs, infrastructure elements and programs in a Living Laboratory Research Program will enable DelDOT to balance advancing technology with the needs of all transportation modes.



PEDESTRIAN NETWORK PLAN AND PRIORITY AREA PROGRAM

Pedestrian safety improvements are a critical need in Delaware, and DelDOT is working towards a more comprehensive assessment of pedestrian routes, missing connections, barriers and priority connections. The goal of the Network Plan is to utilize existing and new facilities to improve network connectivity, enhance recreation, economic development and pedestrian safety. In support of Delaware's Complete Communities Initiative, DelDOT is establishing a Priority Area Program that will designate targeted areas where pedestrian safety and accessibility improvements are prioritized. Targeted areas would include those with high pedestrian activity, high accident locations and low income/at-risk neighborhoods.



BICYCLE NETWORK OF STATEWIDE IMPORTANCE AND BICYCLE DESIGN GUIDE

A comprehensive plan for bicycle transportation would designate major bicycling corridors and connections. This plan would identify preferred routes and prioritize improvements for a regional, well-connected and low-stress bicycle network. Designated routes are typically at a regional scale and span multiple jurisdictions, and they may include trails as well as on-street facilities. A return-on-investment analysis will help to gauge the effectiveness of bicycle network funding in the areas of bicycle ridership, economic development and other public benefits. A bicycle design guide will provide guidance and recommendations using best practices for integrating bicycle facilities into the road network. The guide will include recommendations for various facility types, lighting, wayfinding and maintenance of traffic flow during construction.



IMPROVED TRANSIT SERVICE

A multifaceted approach to improving transit service and access will include providing additional transit centers and routes/express service, expanded service areas and increasing use of dedicated transit lanes. Geolocation technology in transit vehicles will improve the reliability of arrival times and other information for our customers. Automation technology will increase the efficiency of boarding and fare collection processes.

	HOMELAND SECURITY Some cargo moving through Delaware originates from international sources, and our freight network has nationally important connections. Interagency coordination is important for managing border security, cargo screening and tracking, protecting assets and developing contingency plans. Partnerships are needed to anticipate, screen, monitor and track movement of hazardous materials, and to have contingency plans in place for addressing emergency situations.
	IMPROVED PUBLIC INPUT SYSTEM The public has a number of mechanisms to provide DelDOT input for project ideas, maintenance needs and general inquiries or requests. To improve our interaction with the public, DelDOT is exploring new outreach methods, including crowdsourcing technology and other communication techniques.
	HAZARD MITIGATION AND FLOOD RESILIENCY PREPARATION DelDOT has developed a <i>Strategic Implementation Plan for Climate Change, Sustainability, and Resilience for Transportation</i> to help prepare for emerging climate impacts and coordinate efforts across various state agencies. Further planning is needed to identify community-specific threats and a ranking program to identify which of DelDOT's assets are most at-risk. These at-risk assets must either be upgraded to maintain transportation connectivity, relocated outside of flood prone areas, left in place with anticipated periodic closures and detours, or abandoned.
	CONNECTED DATABASE MANAGEMENT SYSTEMS DelDOT has a variety of systems to assess and manage the state's transportation network. DelDOT is integrating many of the databases that support these systems in a connected manner that will increase efficiency in decision-making and project design. Continued investments in database technology will enhance our ability to leverage information for the benefit of our customers.



PART I

BACKGROUND & VISION



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SECTION A - INTRODUCTION & PLAN OVERVIEW



INNOVATION IN MOTION

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INTRODUCTION

WHY DO WE PUBLISH A LONG RANGE TRANSPORTATION PLAN?

A statewide Long Range Transportation Plan (LRTP) identifies broad goals, policies and priorities to meet transportation needs over a 20-year period. The Plan is a federal requirement and is updated every five years. Each new Plan does not negate the previous Plan but rather provides new guidance to address changing conditions, trends and policies.

Delaware's transportation network supports the economy through the movement of people, goods and services, and it continues to evolve with changing land use, demographics, travel patterns, preferences and technological innovations. The Delaware Department of Transportation (DelDOT), in collaboration with communities, businesses and partners across the state, is working to identify future transportation needs and develop effective solutions to anticipated challenges.

The vision and goals for this Plan have been developed through stakeholder input and a thorough assessment of current performance, travel trends and technological innovations.



INNOVATION IN MOTION

WHY DO WE PUBLISH A LONG RANGE TRANSPORTATION PLAN?

DELDOT'S MISSION

DelDOT's mission is ***"Excellence in Transportation for Every Trip, Every Mode, Every Dollar and Everyone."***

To help accomplish this mission, DelDOT has developed ***INNOVATION IN MOTION***. This Plan will help guide DelDOT's strategic investments and provide an internal and public resource showcasing the many technological innovations, policies and efficiency improvements DelDOT is undertaking to address various current and future challenges.



PART I

INNOVATION IN MOTION is structured in three parts: *Part I - Background & Vision*, *Part II - Implementation Strategies* and *Part III - New Innovations*.

Part I - Background & Vision examines how transportation has evolved and defines DelDOT's overall vision and goals, including:

- **WHERE HAVE WE BEEN?**

HOW HAS OUR TRANSPORTATION SYSTEM CHANGED IN THE PAST CENTURY?

- **WHERE ARE WE NOW?**

WHAT DOES OUR TRANSPORTATION SYSTEM LOOK LIKE TODAY?

- **WHERE ARE TRENDS HEADING?**

WHAT FACTORS WILL SHAPE OUR TRANSPORTATION SYSTEM IN THE FUTURE?

- **WHERE DO WE WANT TO GO?**

WHAT DO WE WANT THE FUTURE TRANSPORTATION SYSTEM TO BE?

Part I builds upon historical knowledge, existing data and future projections to determine the value, opportunities and challenges of the transportation network in Delaware.



PART II - IMPLEMENTATION STRATEGIES

Part II – Implementation Strategies will provide detailed strategies about how the vision established in Part I will be implemented across eight transportation topics. Each topic's implementation strategy is paired with performance measures and targets to monitor progress toward our goals.

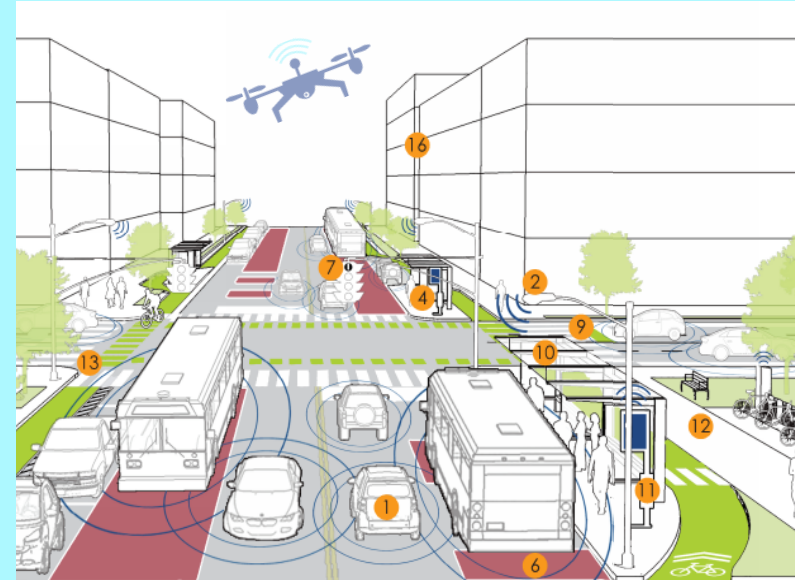
These measures and targets will be reviewed and reported annually, providing transparency as DelDOT assesses performance and strategizes future actions. New performance measures and targets can be added as technologies advance and processes evolve. DelDOT will continue to engage with its partners and stakeholders across the state to ensure we are employing the best strategies and setting the right benchmarks.



PART III - NEW INNOVATIONS

Part III – New Innovations highlights advancing technologies aimed at improving mobility options, transportation management and operations. Although the evolution of technology presents some unknown challenges, DeIDOT is positioned to adapt to this changing environment by developing and implementing new innovations and best practices, which include:

- Utilizing online and mobile communication tools to engage with stakeholders and collect valuable feedback.
- Expanding telecommunication systems and digital infrastructure to provide routing and infrastructure condition information for autonomous vehicles.
- Improving and interconnecting spatial data systems to more efficiently manage and operate the transportation system.
- Drafting innovative policies to address potential changing mobility habits resulting from advances in transportation technology.



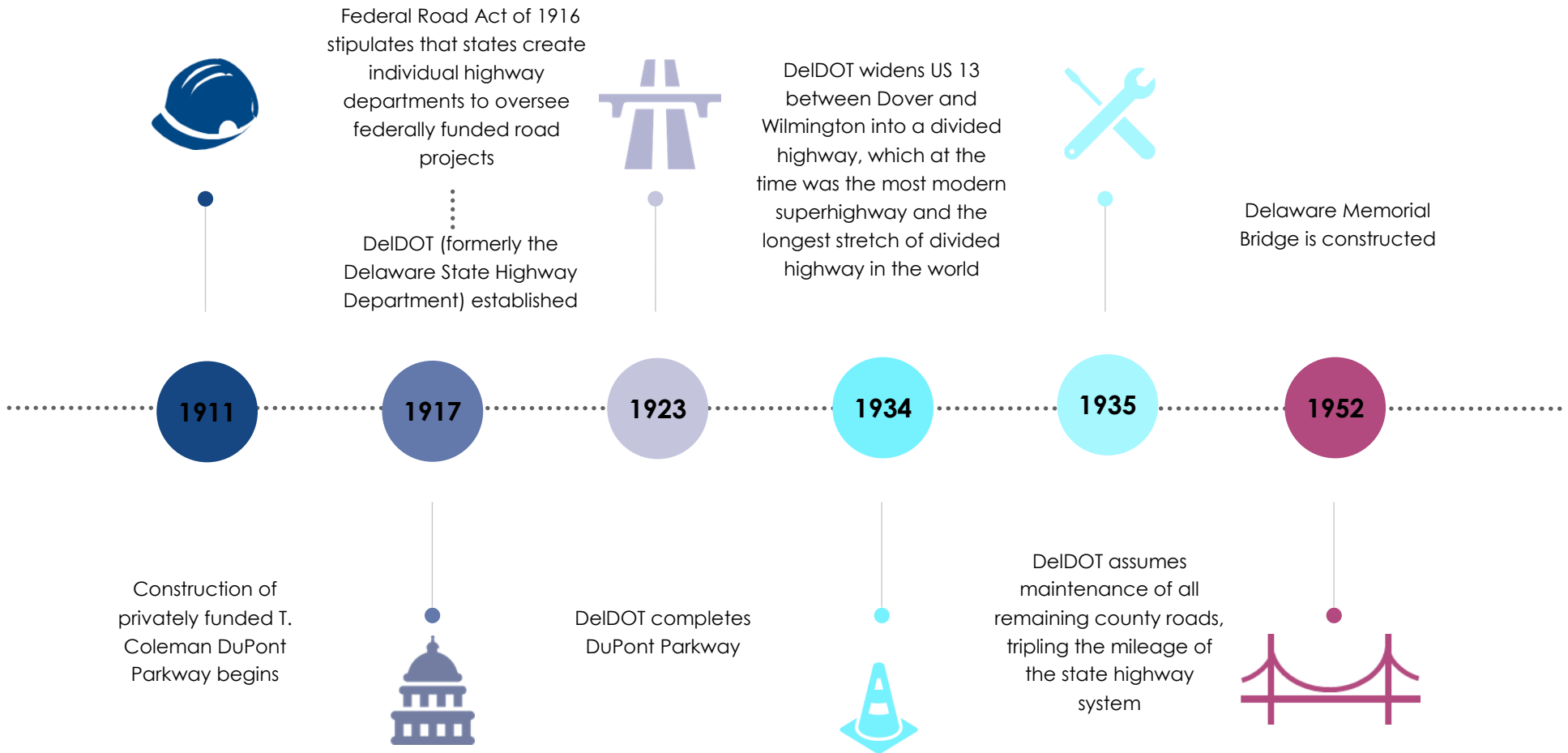
A SHORT HISTORY OF DELDOT

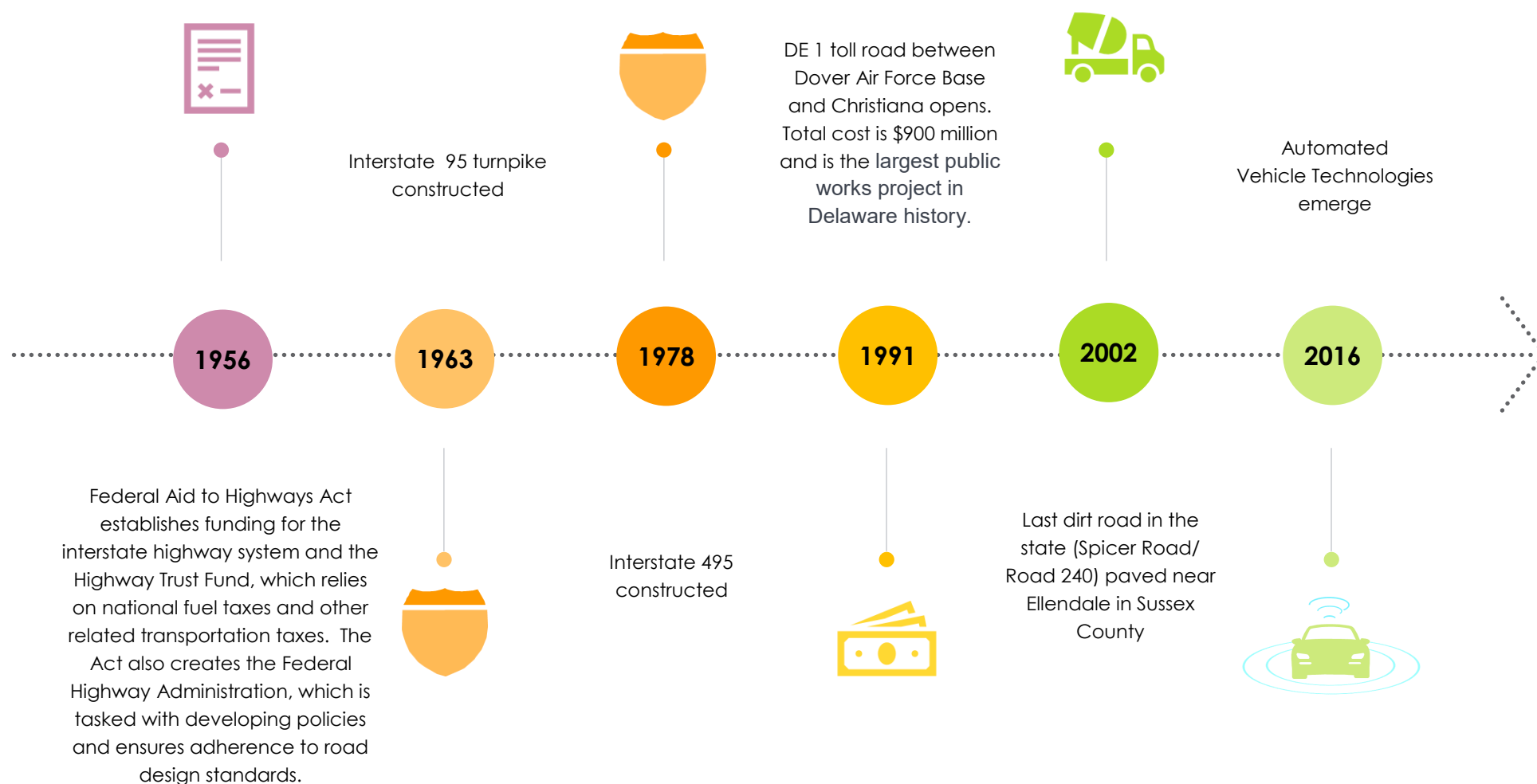
The Delaware Department of Transportation, formerly known as the Delaware State Highway Department, was created in 1917. With the advent of the automobile, states across the country found their road networks inadequate for the increasing demands of new drivers. The *Federal Road Act* of 1916 stipulated that each state create individual highway departments to oversee federally funded road projects. A truly notable pioneer in the history of Delaware Transportation during this time was T. Coleman DuPont who built and privately funded the DuPont Parkway, which runs the length of Delaware. The DuPont Parkway, completed in 1923, has the distinction of being the nation's first modern super highway.

In the past hundred years, DelDOT has seen a lot of changes. Originally an agency focused on highways, DelDOT now considers all transportation modes including marine, aeronautics, rail, transit, bicycle and pedestrians. DelDOT is also actively integrating and preparing for new innovations, including autonomous vehicles, aerial drones and transportation-sharing services.



A SHORT HISTORY OF DELDOT



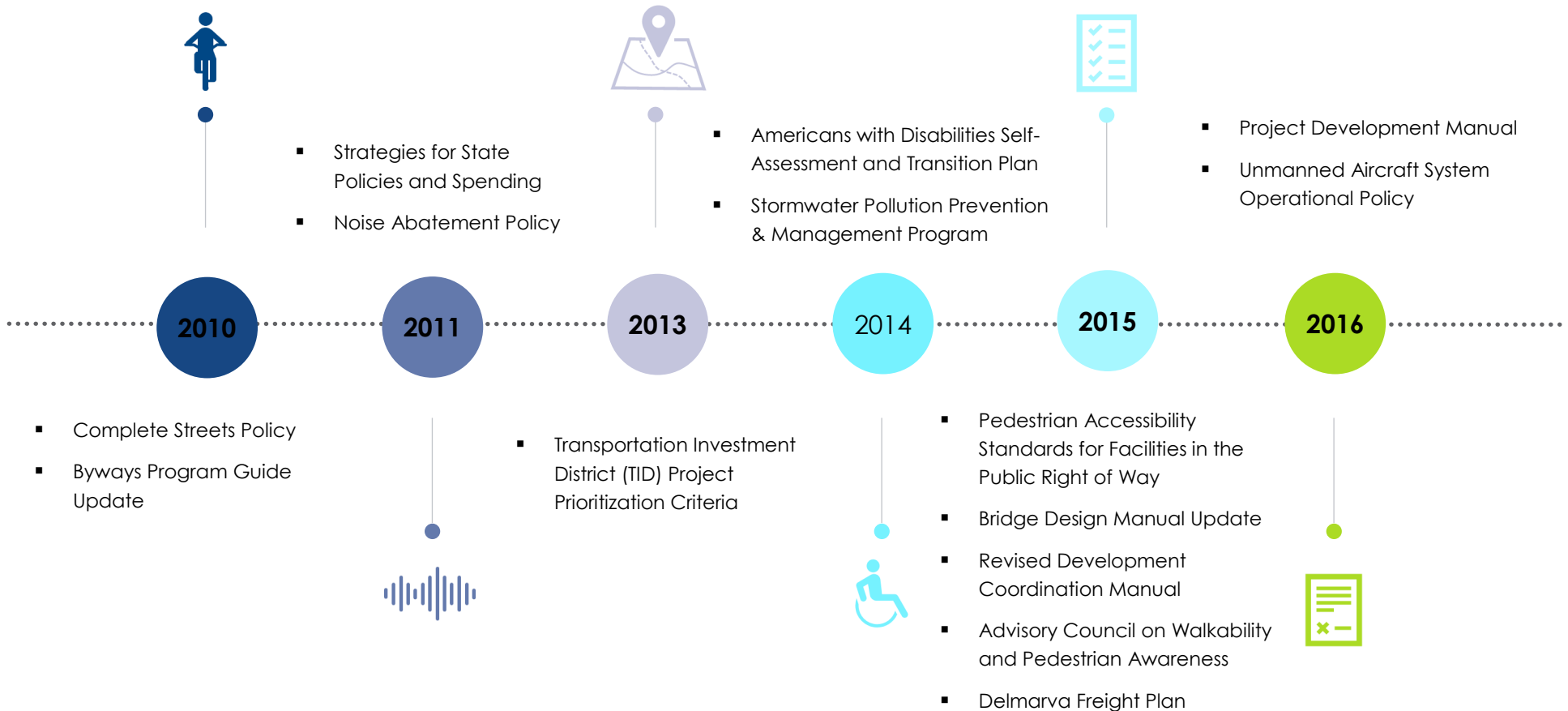


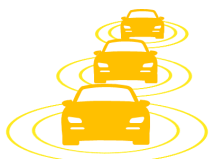
ACCOMPLISHMENTS SINCE PREVIOUS PLAN

The most recent DelDOT Long Range Transportation Plan, *Moving the First State Forward Policy Plan*, was drafted in 2010 and adopted in 2011. The previous Plan incorporated new Delaware policies and guiding principles from the US DOT. One of the key state policies was the update of the *Strategies for State Policies and Spending*. This policy was developed collaboratively with the Office of State Planning Coordination and introduced a tiered structure for state policies and investments based on land use. The strategies help coordinate investment decisions at all levels of government within Delaware, including transportation decisions.

The updated plan, *Innovation In Motion*, builds upon the success of the previous plan and incorporates new policies, programs and strategic recommendations. The following timeline shows several new important policies and programs that have gone into effect since 2010.

DELDOT POLICIES & PROGRAMS SINCE THE PREVIOUS PLAN





2017

- Strategic Implementation Plan for Climate Change, Sustainability & Resilience for Transportation
- Integrated Transportation Management Strategic Plan Update
- Connected and Autonomous Vehicles Strategic Plan

- Pavement and Bridge Deficiency Rating System Update
- Blueprint for a Bicycle-Friendly Delaware - A Statewide Policy Plan
- Delaware State Aviation System Plan Update

2018



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SECTION B - BACKGROUND

WHERE IS DELAWARE NOW

&

WHERE ARE WE GOING?



INNOVATION IN MOTION

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POPULATION

SUMMARY

According to the 2016 Delaware Population Consortium, the state's population is projected to increase by roughly 119,000 to a total of 1,065,168 between 2015 and 2040. The location of future population growth will influence DelDOT's operations and needs for infrastructure improvements.

The increasing population of residents age 65 and over highlights the need for quality transit connections to medical and other services throughout the state. Of the three counties, Sussex County is experiencing the largest increase in this age group.

One related demographic trend is the decreasing average household size throughout Delaware and the resulting decreased need for traditional larger single family homes.



INNOVATION IN MOTION

WHERE IS DELAWARE NOW?

8 Out of 10

DELAWAREANS live in



As of 2015, the population of Delaware was estimated at 945,937, with the highest concentration of residents living in New Castle County. The percentage of Delaware residents living within urban areas is increasing each year, creating denser urban populations.

The millennial generation (persons ages 15 - 34 in 2015) now represents the largest population group in Delaware. Millennials drive less compared to previous generations, more often opting to use alternative modes of transportation.¹ It is uncertain whether this pattern will continue as this group reaches life milestones such as having families of their own.

12.1%

Of Delaware's population has a some form of



DISABILITY

Source: 2015 American Community Survey - 5 year Estimates (S1810)

63% of adults living in Delaware are overweight;

28% are considered obese.

16% of adolescents are overweight;

14% are considered obese.

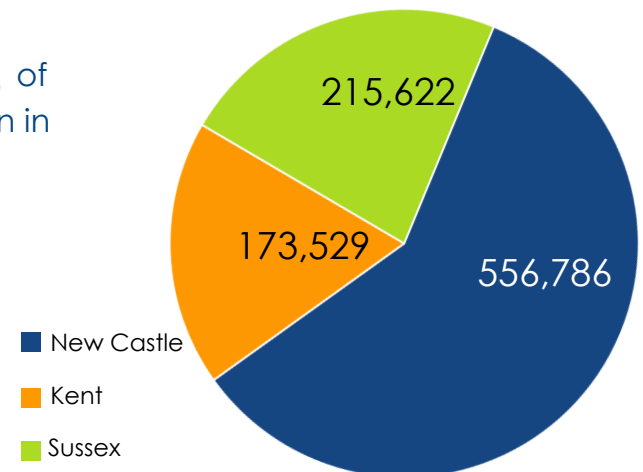


Source: CDC - 2012 Delaware State Nutrition, Physical Activity, and Obesity Profile

MILLENNIALS

Accounted for 26% of Delaware's Population in 2015, becoming the majority generation.

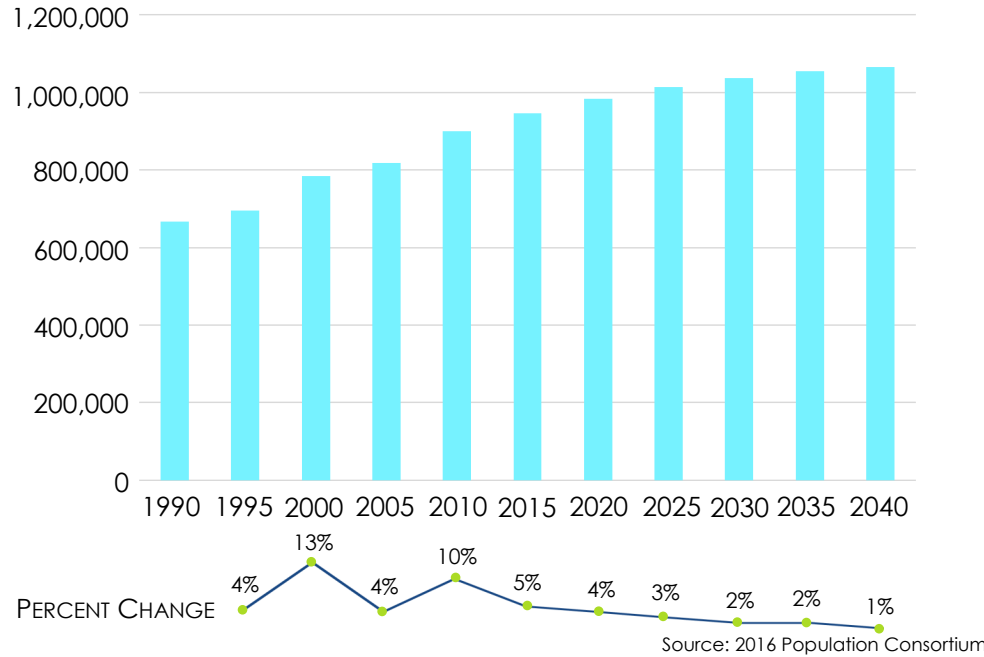
2015 POPULATION BY COUNTY



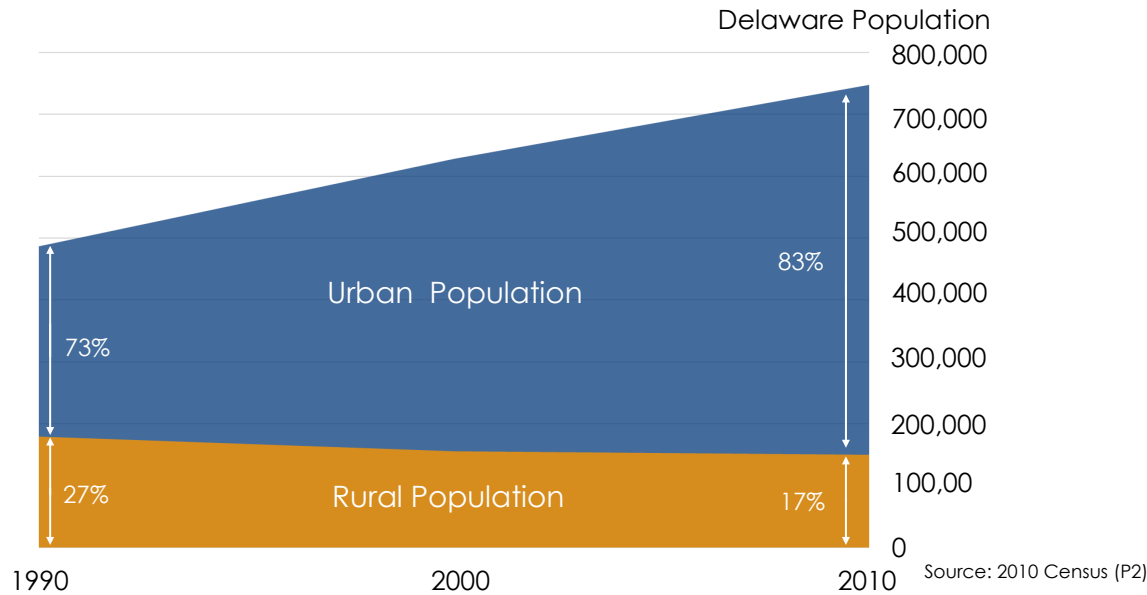
¹ U.S. Department of Transportation Beyond Traffic 2045

WHERE IS DELAWARE GOING?

STATEWIDE POPULATION GROWTH



URBAN AND RURAL POPULATION CHANGE



POPULATION GROWTH RATE DECLINE

Delaware's population is expected to grow through 2040. However, the Delaware Population Consortium predicts that the overall rate of population growth will decline during the same period.

URBAN POPULATION GROWTH

The number of people living in urbanized areas is anticipated to grow as urban development expands into previously rural areas.

GROWTH BY COUNTY

While more than half of all Delawareans are still expected to reside in New Castle County in 2040, the Delaware Population Consortium anticipates that Kent and Sussex Counties will see the most population growth, at 16.8% and 20% respectively.



INNOVATION IN MOTION

WHERE IS DELAWARE GOING?

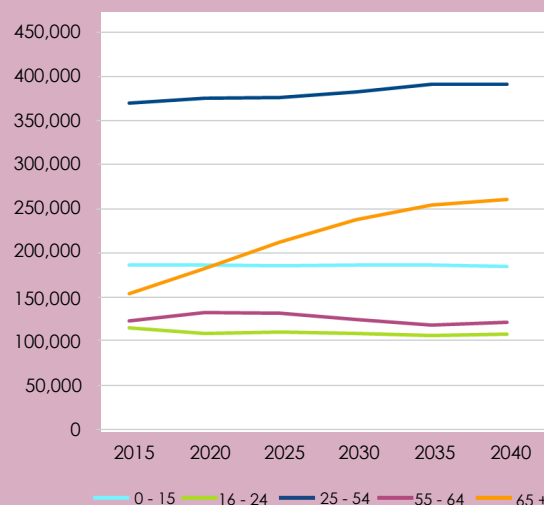
THE POPULATION IS GETTING OLDER.

24% of the population will be 65 or older in 2040.



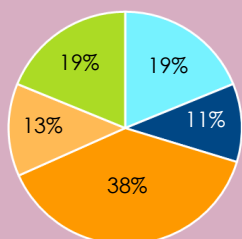
The **POPULATION** of Delaware is expected to grow by **12.6%** by 2040.

CHANGE IN POPULATION BY AGE



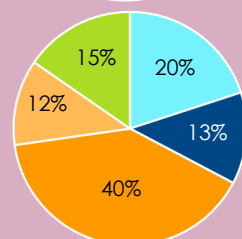
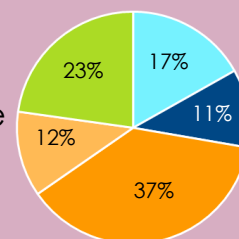
AGE	2015 - 2040 % CHANGE
0-15	-0.7%
16-24	-5.7%
25-54	5.8%
55-64	-0.9%
65+	69.3%
Total	12.60%

2025

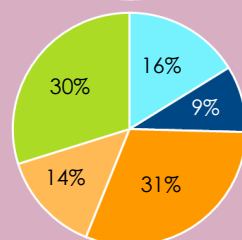
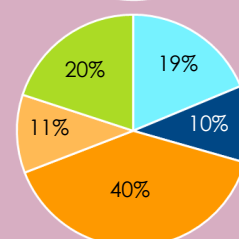


New Castle

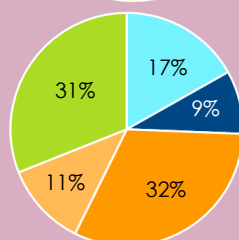
2040



Kent

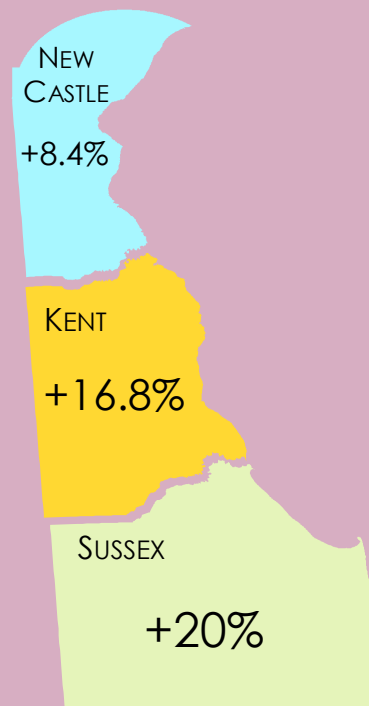


Sussex



CHANGE IN **65+** POPULATION BY COUNTY

PROJECTED CHANGE IN TOTAL POPULATION GROWTH BY COUNTY 2015 - 2040



Source: 2016 Population Consortium

VALUE & OPPORTUNITIES



AUTOMOBILES VS ALTERNATIVES

The continued use of automobiles by a growing population is likely to perpetuate existing congestion and air pollution challenges. Long range planning and policy should promote sustainable travel options to encourage all age groups to adopt a lifestyle that embraces multi-modal transportation travel options.



AGING POPULATION

Sussex County is the fastest growing county in Delaware, expected to grow by 20% by 2040. A large portion of Sussex County's growth is in the 65+ age group, which has caused increases in medical and other related services. To access these services, many in the senior population with limited mobility options depend on transit and paratransit.

A related issue is that workers holding jobs in aging-support services are increasingly unable to afford housing near their work. Therefore, many of these workers are forced to commute much longer distances than in the past.



INNOVATION IN MOTION

CHALLENGES

Delaware's growing population and urbanization will increase demand for jobs, housing, transportation infrastructure and social services.

The population aged 65 and older will increase the demand for transit and paratransit services throughout the state. Millennials may seek multimodal or alternative transportation options without reliance on a personal vehicle. This may cause an increase in demand for non-motorized transportation facilities for bicycling or walking, as well as on-demand services such as Uber, Lyft and automated vehicles.

Delaware faces the challenge to continually adapt the transportation system to accommodate the diverse needs of residents throughout the state and prepare for the changing needs of future residents.

A comprehensive understanding of future trends will enhance DelDOT's ability to make sound infrastructure investments and deliver a transportation system that will meet the needs of future generations.

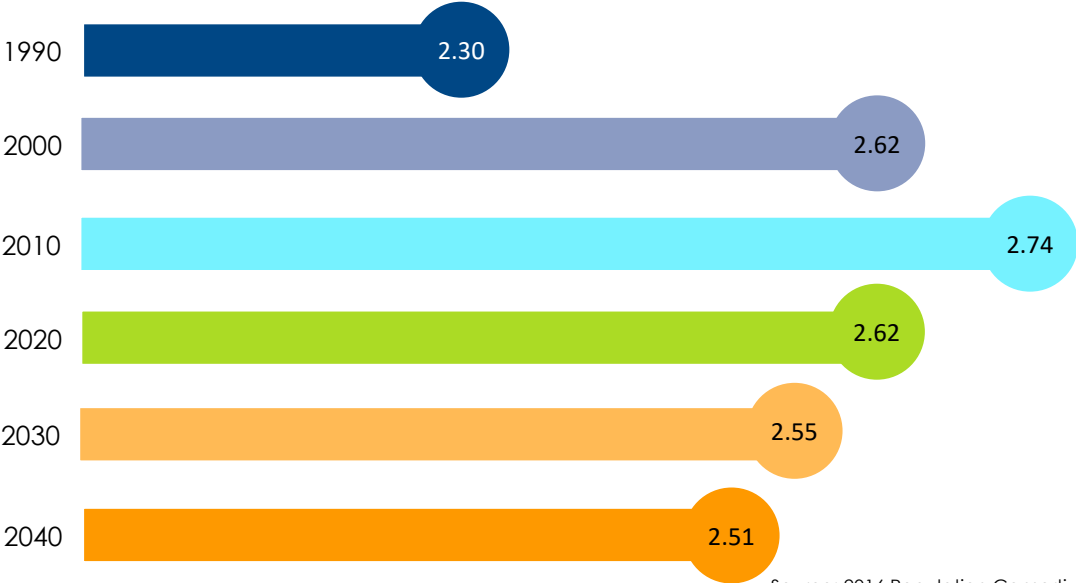
INCREASING 65+ POPULATION

Accommodating the travel and transportation needs of a growing population of people 65 years and older could put further strain on the transportation system that is already facing other challenges.

Older Americans are more likely to have a physical limitation that will affect their ability to drive. Almost 32% of people aged 65 or older in Delaware have a disability. Many disabilities that limit one's ability to drive also limit the ability to travel on other modes of transportation, such as traditional fixed-route transit.

Paratransit services are individualized door-to-door transportation services that offer a solution for people with physical limitations or disabilities. However, these services are more than three times as expensive to provide compared to traditional transit services. Providing quality services for our aging population while controlling costs will continue to be a challenge for DelDOT.

POPULATION PER HOUSEHOLD



Source: 2016 Population Consortium

CHALLENGES

CHANGING TRANSPORTATION HABITS

While Americans are driving less than they did a decade ago, younger adults are driving much less.¹ Millennials are more likely to use technology to find new ways to travel or avoid traveling altogether. While many millennials do not drive much now, it is possible that as they age they may choose to drive more. Either way, people choose where they live and how they get around based on their budget and lifestyle. DelDOT is continually seeking new ways to meet the multimodal needs of our diverse population.



INFRASTRUCTURE CAPACITY

Delaware's transportation infrastructure will need to accommodate the increased demand expected to accompany the statewide population growth. Expanding or building new roads and bridges, while maintaining and using existing infrastructure more efficiently, should be considered in addressing these challenges.



SHRINKING HOUSEHOLD SIZE

From 2010 to 2040, the overall population of Delaware is expected to increase. However, household size is expected to decrease by 8%. As a result, approximately a 29% increase in housing will be needed to accommodate the population by 2040. Increased housing and smaller household size could result in more personal vehicles traveling the roads.

¹ U.S. Department of Transportation Beyond Traffic 2045



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ECONOMY

SUMMARY

Transportation is the backbone of Delaware's economy. While many Delaware residents depend on roads and public transit to travel between home and work, businesses require well-maintained roads, railroads, airports, and ports to distribute raw materials and parts among manufacturers, and deliver finished products to consumers.

Key economic indicators include workforce profiles, business and industry trends, and gross domestic product data for the State of Delaware and each county.

TRANSPORTATION IS CRITICAL
TO DELAWARE'S ECONOMY



INNOVATION IN MOTION

WHERE IS DELAWARE NOW?



43% OF ALL JOBS IN DELAWARE RELY HEAVILY ON **TRANSPORTATION INFRASTRUCTURE**

TRANSPORTATION DEPENDENT INDUSTRIES:

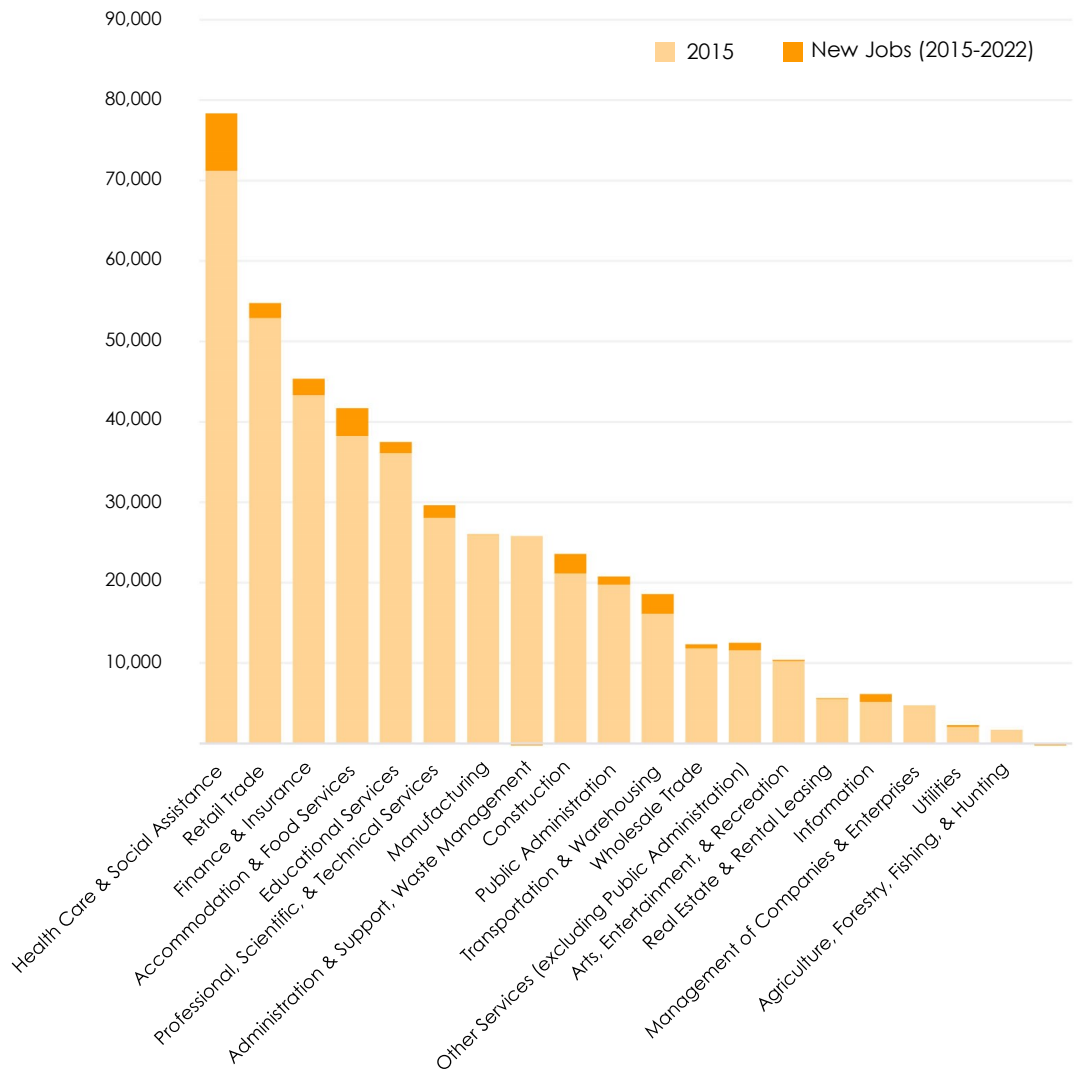
- RETAIL AND WHOLESALE
- MANUFACTURING
- TRANSPORTATION
- WAREHOUSING
- CONSTRUCTION
- UTILITIES
- TOURISM-RELATED INDUSTRIES
- AGRICULTURE

IN 2016 THESE INDUSTRIES PRODUCED APPROXIMATELY \$16 BILLION IN TOTAL GOODS AND SERVICES IN DELAWARE

23% of Delaware GDP

THE CONDITION OF DELAWARE'S **TRANSPORTATION INFRASTRUCTURE** IS **CRITICAL** FOR THE STATE'S ECONOMY TO **FUNCTION, GROW** AND REMAIN **COMPETITIVE**.

DELAWARE EMPLOYMENT GROWTH IN TRANSPORTATION DEPENDENT INDUSTRIES



Source: Delaware Office of Occupational and Labor Market Information



WHERE IS DELAWARE NOW?



EMPLOYMENT IN TRANSPORTATION DEPENDENT INDUSTRIES BY COUNTY (2015)

	NEW CASTLE COUNTY	KENT COUNTY	SUSSEX COUNTY	DELAWARE
Retail Trade	32,307	8,970	11,646	52,923
Accommodation and Food Services	21,997	5,452	10,802	38,251
Manufacturing	13,468	4,664	7,855	25,987
Construction	14,116	2,605	4,426	21,147
Transportation and Warehousing	12,558	2,137	1,460	16,155
Wholesale Trade	8,789	1,192	1,835	11,816
Arts, Entertainment, and Recreation	5,958	3,018	1,282	10,258
Real Estate and Rental and Leasing	3,705	510	1,325	5,540
Utilities	1,545	240	297	2,082
Agriculture, Forestry, Fishing and Hunting	209	490	1,015	1,714
Subtotal	114,652	29,278	41,943	185,873
Share of Total	39%	45%	59%	43%

Source: U.S. Census Bureau, Center for Economic Studies, LEHD



INNOVATION IN MOTION

WHERE IS DELAWARE NOW?

UNEMPLOYMENT RATE

Delaware's unemployment rate of 5.1% in 2016 is higher than the national rate of 4.9%, but lower than it was during the peak of the 2007-2009 recession (reaching as high as 9.3% in 2010).

Average unemployment rates in Delaware have been declining since 2010, but they remain higher than pre-recession levels. The current level of unemployment likely does not factor in working-age persons who have voluntarily left the workforce due to a lack of suitable employment options or those who have taken part-time jobs, but would prefer full-time employment (involuntary part-time workers).

NEW CASTLE COUNTY

HAS THE **LOWEST UNEMPLOYMENT RATE, 4.8%**

KENT COUNTY

EXHIBITED AN **UNEMPLOYMENT RATE OF 5.3%**

SUSSEX COUNTY

EXHIBITED AN **UNEMPLOYMENT RATE OF 5.7%**

5.1%

DELAWARE
UNEMPLOYMENT RATE

4.9%

NATIONAL
UNEMPLOYMENT RATE

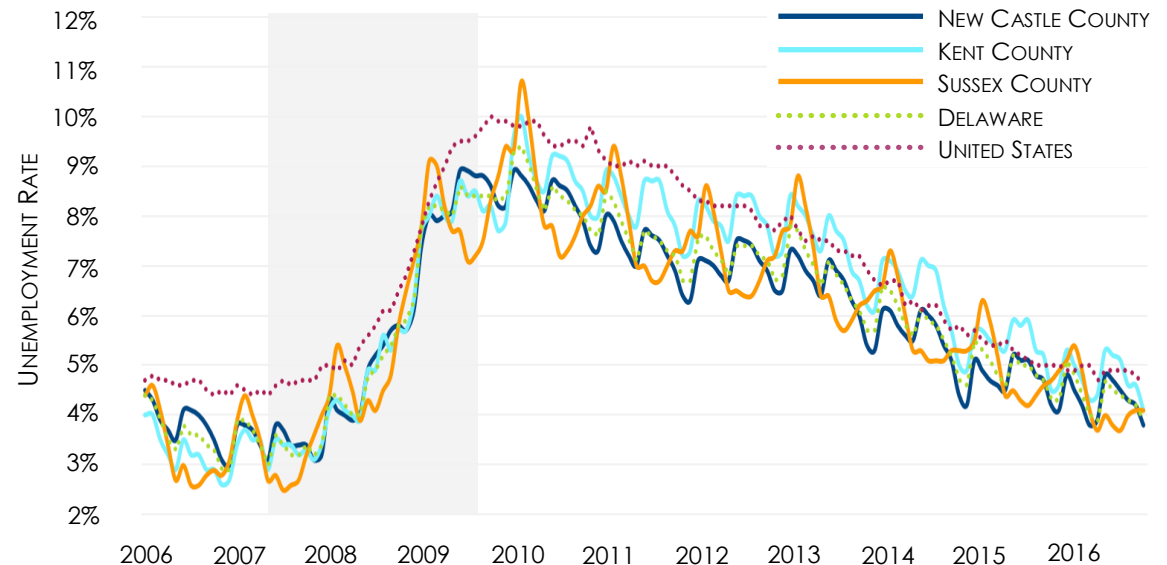
2016 Unemployment Rates

UNEMPLOYMENT PERCENTAGES

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
New Castle County	4.5%	3.8%	4.3%	7.4%	8.9%	8.0%	7.1%	7.3%	6.1%	5.1%	4.8%
Kent County	4.0%	3.4%	4.1%	7.7%	9.6%	8.9%	8.3%	8.4%	7.1%	5.7%	5.3%
Sussex County	4.8%	4.3%	5.0%	9.0%	10.5%	9.7%	8.7%	8.9%	7.5%	6.4%	5.7%
Delaware	4.4%	3.9%	4.4%	7.8%	9.3%	8.5%	7.6%	7.8%	6.6%	5.5%	5.1%
United States	4.7%	4.6%	5.0%	7.8%	9.8%	9.1%	8.3%	8.0%	6.6%	5.7%	4.9%

Source: U.S. Bureau of Labor Statistics Nov 2016

UNEMPLOYMENT PERCENTAGE TRENDS



Note: Shaded area indicates U.S. recession, which lasted from the fourth quarter of 2007 to third quarter of 2009.

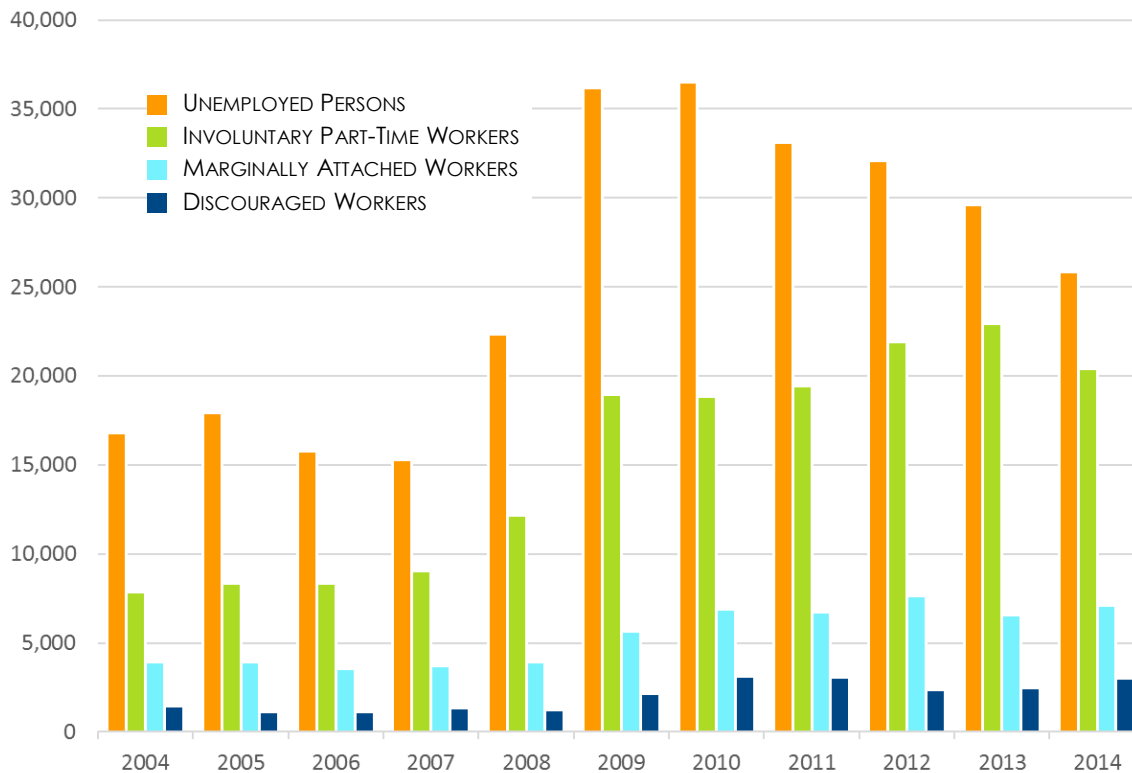
Source: U.S. Bureau of Labor Statistics

WHERE IS DELAWARE NOW?

INVOLUNTARY PART-TIME WORKERS

Although the average number of involuntary part-time workers has declined since 2013, the number has more than doubled since 2004. Involuntary part-time workers represent persons who are employed part-time (less than 35 hours per week) who want to work full time, are available to do so, and gave an economic reason for working part time (e.g. their hours were cut back or they were unable to find a full time job). This increase may in part be attributed to the Affordable Care Act and the resulting effect of employers having to maintain part-time workers to less than 30 hours per week to avoid health care costs.

UNEMPLOYMENT AND LABOR FORCE PARTICIPATION

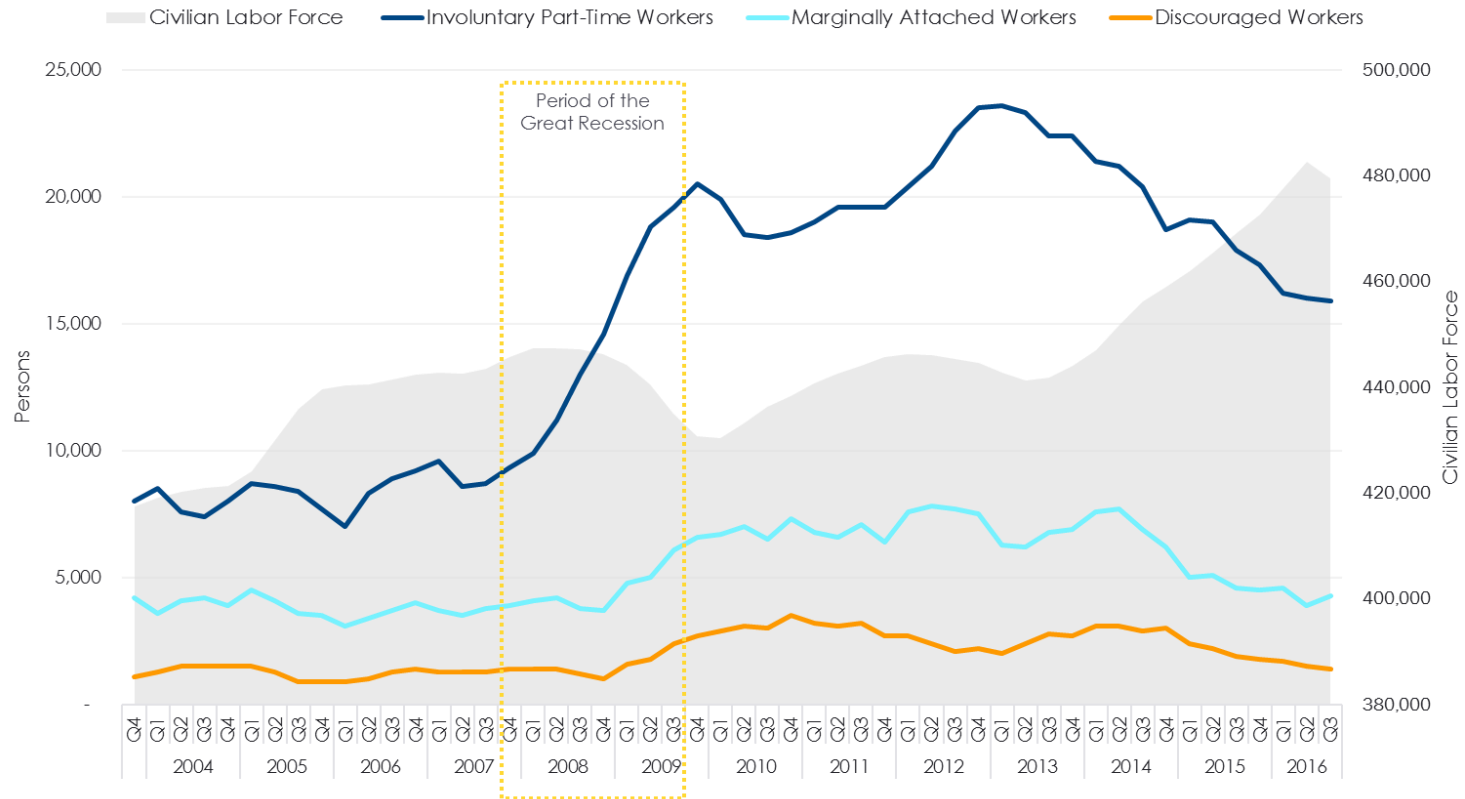


Note: U.S. recession spanned from fourth quarter of 2007 to third quarter of 2009.
Source: U.S. Bureau of Labor Statistics retrieved from FRED®, Federal Reserve Bank of St. Louis

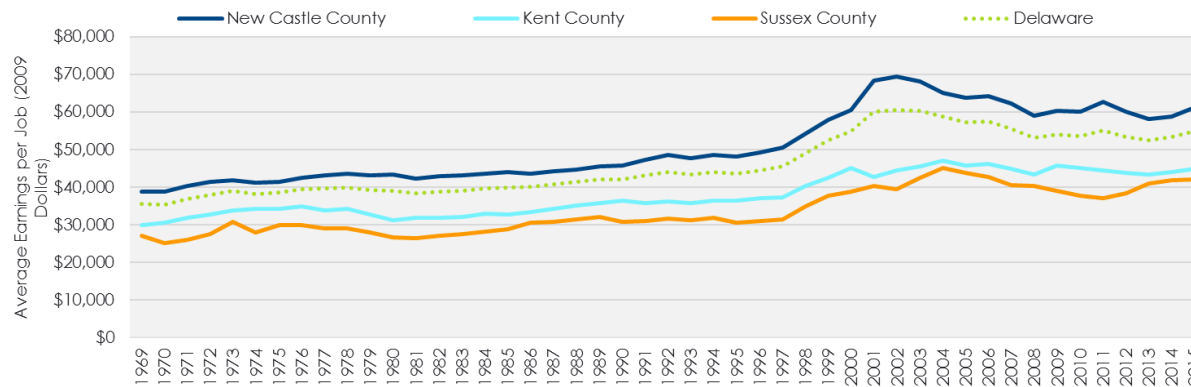


WHERE IS DELAWARE NOW?

UNEMPLOYMENT AND LABOR FORCE PARTICIPATION



AVERAGE EARNINGS PER JOB



Source: U.S. Bureau of Labor Statistics

WHERE IS DELAWARE NOW?

EMPLOYMENT BY AGE

According to fourth quarter 2015 data provided by the U.S. Census, approximately 6% of all workers in Delaware are age 65 or older. The share of workers age 65 or older ranges by county, as low as 5.5% in New Castle County and as high as 7.9% in Sussex County.

From 2011 to 2015, the number of workers age 65 or older in all geographies grew at the fastest rate across all age cohorts (ranging from 6.7% per year in New Castle to 8.0% per year in Sussex County).

AVERAGE EARNINGS

According to U.S. Bureau of Economic Analysis data, after adjusting for inflation, average earnings per job in Delaware declined by approximately \$5,620 from 2002 to 2015. Although average adjusted earnings per job declined in New Castle County, average earnings per job increased in both Sussex and Kent counties over the same period.

FROM 2011 - 2015

THE NUMBER OF WORKERS

AGE **65 OR OLDER**

GREW AT THE FASTEST RATE

ACROSS ALL **AGE COHORTS**

AND **GEOGRAPHIES.**

EMPLOYMENT SHARE BY AGE COHORT (2015 Q4)

AGE	NEW CASTLE COUNTY	KENT COUNTY	SUSSEX COUNTY	DELAWARE
14-18	1.8%	2.2%	3.0%	2.1%
19-21	4.4%	4.8%	4.8%	4.5%
22-24	6.2%	5.8%	6.0%	6.1%
25-34	21.4%	20.7%	21.0%	21.2%
35-44	20.7%	20.0%	18.8%	20.3%
45-54	22.9%	22.9%	21.1%	22.6%
55-64	17.2%	17.3%	17.4%	17.2%
65-99	5.5%	6.2%	7.9%	6.0%

AVERAGE ANNUAL EMPLOYMENT GROWTH BY AGE COHORT (2011- 2015)

AGE	NEW CASTLE COUNTY	KENT COUNTY	SUSSEX COUNTY	DELAWARE
14-18	4.4%	2.7%	6.0%	4.5%
19-21	0.2%	-0.1%	1.0%	0.3%
22-24	4.3%	0.1%	3.3%	3.5%
25-34	2.5%	1.8%	3.5%	2.5%
35-44	0.1%	0.7%	1.7%	0.4%
45-54	0.2%	0.7%	0.8%	0.4%
55-64	3.9%	4.7%	4.4%	4.1%
65-99	6.7%	7.2%	8.0%	7.0%

AVERAGE EARNINGS PER JOB (2009 DOLLARS)

	2002	2015	CHANGE
NEW CASTLE COUNTY	\$69,427	\$61,130	-\$8,297
KENT COUNTY	\$44,546	\$44,804	\$258
SUSSEX COUNTY	\$39,433	\$42,057	\$2,624
DELAWARE	\$60,592	\$54,967	-\$5,624

Note: Per capita personal income is divided by the national PCE price index. The result is a chained dollar (using 2009 as the base year). Source: U.S. Bureau of Economic Analysis

WHERE IS DELAWARE NOW?

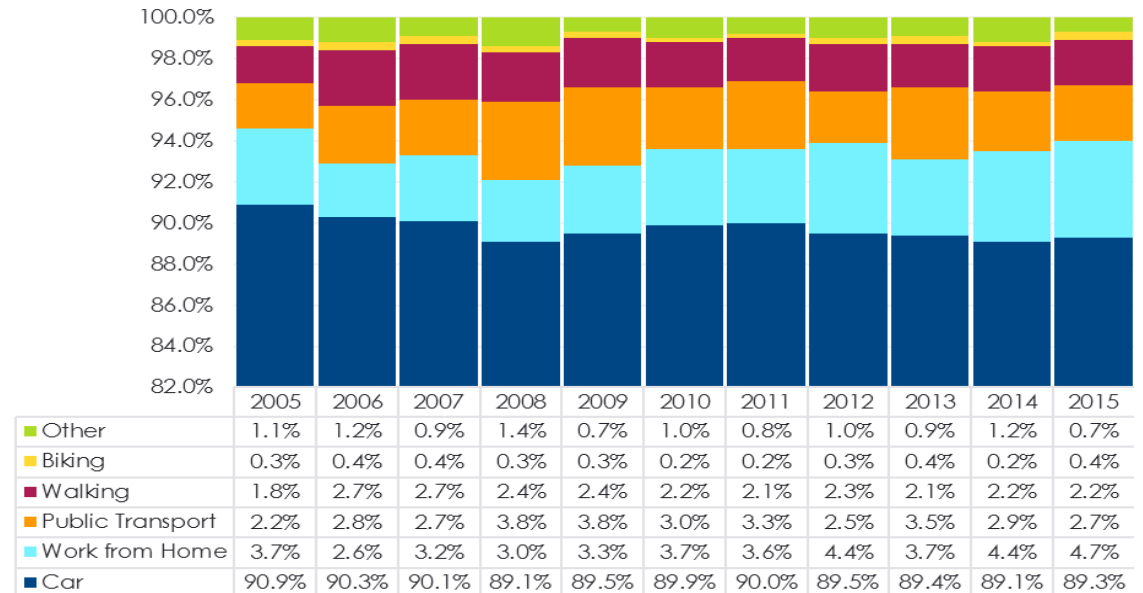
DELAWARE COMMUTER HABITS

According to American Community Survey estimates, in 2015, the share of Delaware workers age 16 years or older commuting to work in a car (89.3%) was 1.6% less than it was in 2005 (90.9%). In contrast, from 2005 to 2015, the share of adults in Delaware working from home increased by 1% (from 3.7 in 2005 to 4.7% in 2015). This may be attributed to many things, including changing technologies, personal preferences, and business trends.

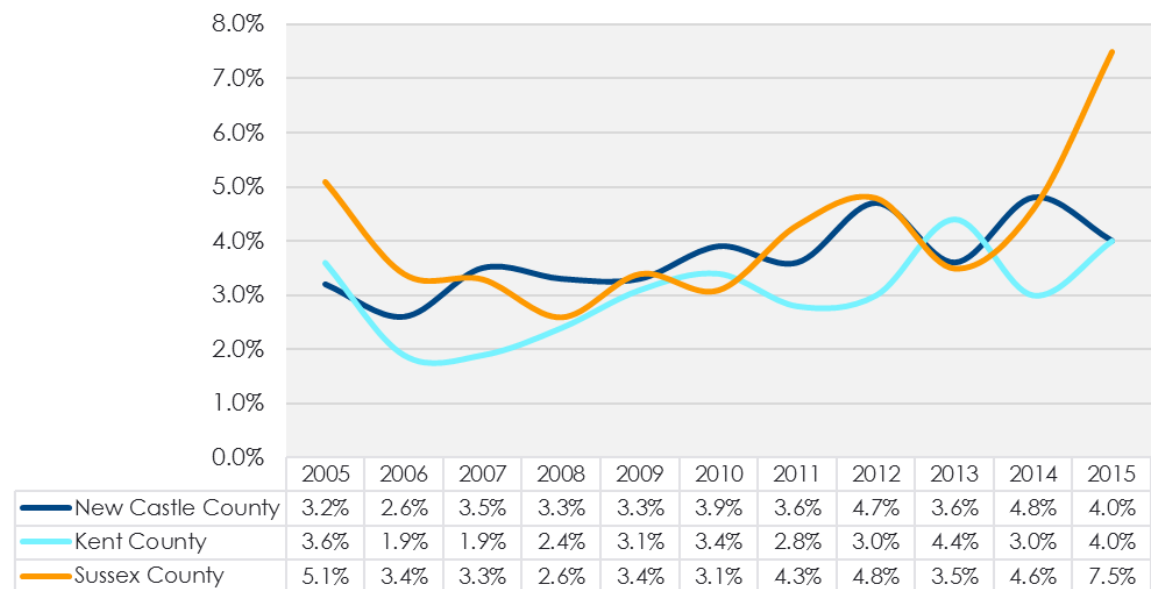
DELAWARE WORKERS WHO TELECOMMUTE FROM HOME

In 2015, the share of adults working from home was highest in Sussex County (7.5%) and lowest in New Castle and Kent counties (4.0%, respectively). The rapid increase in Sussex may be attributed to better communication technologies helping people to work remotely allowing individuals attracted to a more rural lifestyle to maintain access to jobs previously unattainable in a rural setting. This may also be attributed to a growing workforce of 55+ individuals relocating to Sussex County for retirement while maintaining their employment with improved telecommuting technologies.

COMMUTER MODE FOR WORKERS 16+



WORKERS AGE 16+ THAT WORK FROM HOME

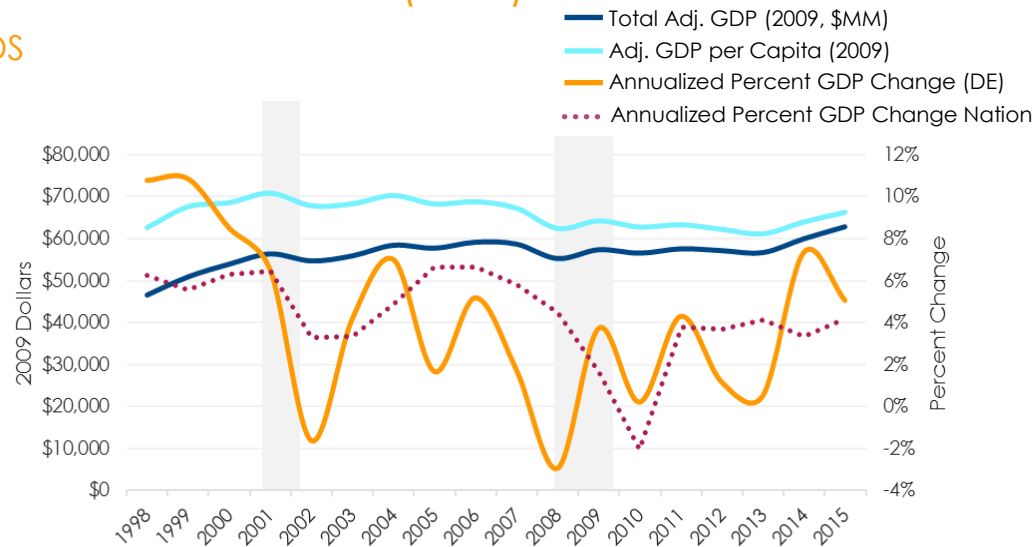


Source: U.S. Census Bureau, American Community Survey 1-Year Estimates

WHERE IS DELAWARE NOW?

GROSS DOMESTIC PRODUCT (GDP)

TRENDS



Note: GDP estimates are divided by the national PCE price index. The result is a chained dollar (using 2009 as the base year). Highlighted area indicates U.S. recession. Not Seasonally Adjusted.

GROSS DOMESTIC PRODUCT (GDP) BY TRANSPORTATION DEPENDENT INDUSTRIES (MILLIONS OF CURRENT DOLLARS)

	2006		2016		GDP Change, 2006-2016	
	GDP (\$MM)	Percent of Total	GDP (\$MM)	Percent of Total	\$MM	Percent Change
Manufacturing	\$4,779	8.5%	\$4,139	5.9%	-\$640	-13.4%
Retail trade	\$2,554	4.6%	\$3,047	4.4%	\$493	19.3%
Construction	\$2,504	4.5%	\$2,730	3.9%	\$226	9.0%
Wholesale trade	\$2,338	4.2%	\$2,215	3.2%	-\$123	-5.3%
Accommodation and food services	\$1,134	2.0%	\$1,568	2.2%	\$434	38.3%
Transportation and warehousing	\$770	1.4%	\$1,087	1.6%	\$317	41.2%
Utilities	\$809	1.4%	\$793	1.1%	-\$16	-2.0%
Arts, entertainment, and recreation	\$405	0.7%	\$469	0.7%	\$64	15.8%
Subtotal	\$15,293	27.3%	\$16,048	23.0%	\$755	4.9%

In 2016, transportation dependent industries in Delaware produced approximately \$16.0 billion in total goods and services, (approximately 23% of the state's GDP). From 2006 to 2016, total GDP produced by transportation dependent industries increased by \$754 million.

Source: U.S. Bureau of Economic Analysis, Total Gross Domestic Product for Delaware [DENGSP], retrieved from FRED, Federal Reserve Bank of St. Louis, January 4, 2017.

GROSS DOMESTIC PRODUCT (GDP)

Gross domestic product (GDP) is the featured measure of output representing the market value of the goods and services produced by labor and property located in the United States. According to historic data provided by the U.S. Bureau of Economic Analysis, both total and per capita GDP in Delaware have increased significantly over the past two decades. After adjusting for inflation, between 1998 and 2015, total GDP for Delaware increased from \$62.7 billion to \$66.3 billion, while per capita GDP increased from approximately \$46,660 to \$62,740.

Although the rate of GDP growth in Delaware has fluctuated widely since 1998 (partly responding to two recessions), total GDP in Delaware has increased at an average of 4.1% per year since 1998 (compared to 4.4% within the nation overall). While annualized percent GDP growth in Delaware has increased since the 2008-2009 recession, overall, the rate of growth has slowed in recent years.

According to GDP data provided by the U.S. Bureau of Economic Analysis, as of the second quarter of 2016, Delaware's economy produced approximately \$69.8 billion in goods and services. From 2006 to 2016, total GDP produced by all Delaware industries increased by over \$13.8 billion.



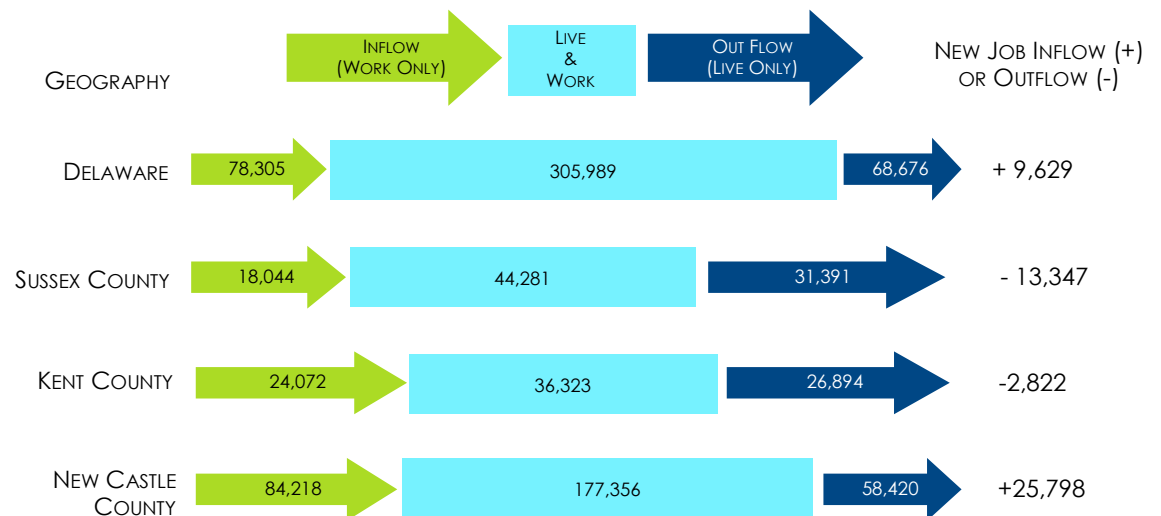
INNOVATION IN MOTION

WHERE IS DELAWARE NOW?

WORKER INFLOW / OUTFLOW

Some workers cross state lines or county lines for employment. Delaware has a net inflow of workers, as does New Castle County. This means more people enter for jobs than leave for jobs. In 2014, approximately 78,305 persons lived outside Delaware but commuted into the state to work, 68,676 persons lived in the state but commuted outside the state to work, and 305,989 persons both lived and worked in the state – resulting in a net inflow of 9,629 jobs within the state. While New Castle County specifically experienced a net inflow of 25,798 jobs in 2014, both Sussex and Kent counties experienced a net outflow of jobs (13,347 and 2,822 jobs, respectively).

WORKER INFLOW / OUTFLOW MODEL BASED ON 2014 DATA



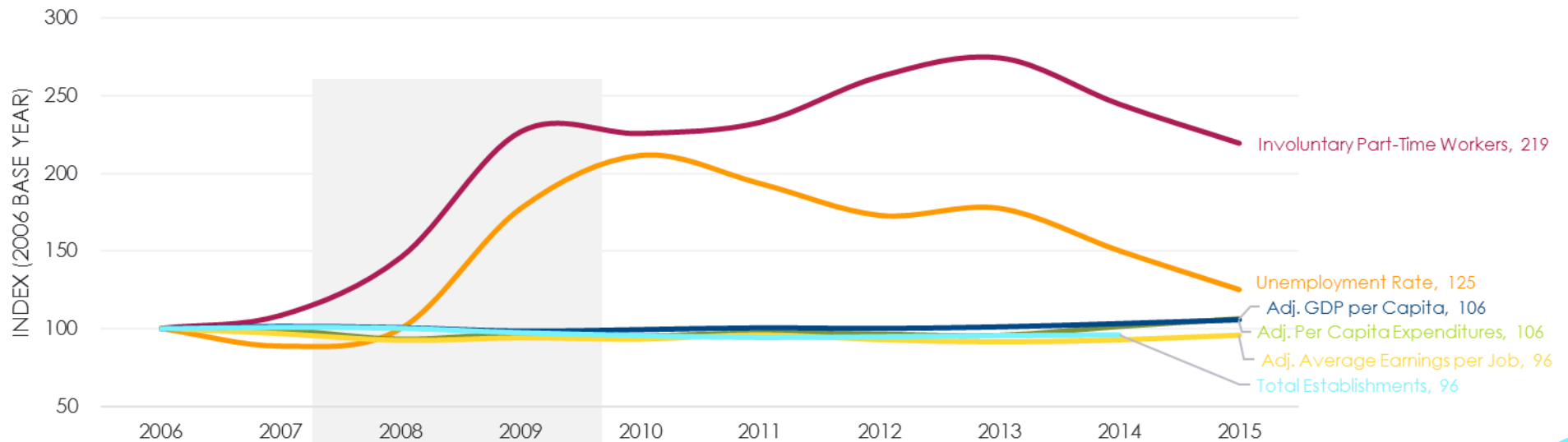
Source: Delaware Office of Occupational and Labor Market Information

WHERE IS DELAWARE NOW?

DELAWARE'S KEY ECONOMIC HEALTH METRICS (INDEX 2006 BASE YEAR)

Although the state's unemployment rate has declined significantly since the recession of 2007-2009, the number of involuntary part-time workers in Delaware has more than doubled. After adjusting for inflation, average per capita earnings remain lower than they were in 2006, while GDP per capita and consumer expenditure growth have remained relatively flat. Overall, many Delaware residents are working and earning less than previous years, while economic growth has remained relatively flat. Transportation investments have the potential to stimulate and diversify economic growth within the state.

Investment in public transit and bike/pedestrian networks, in particular, can result in direct travel cost savings for businesses and households, increase the pool of workers and consumers for companies, and support public policies regarding public health, energy use, air quality and carbon emissions. With the average cost of owning a car approximately \$9,500 per year, switching from automobile travel to public transportation can result in significant cost savings for Delaware residents, further stimulating consumer spending and business growth.



Note: Shaded area indicates U.S. recession, which lasted from the fourth quarter of 2007 to third quarter of 2009.

Sources: U.S. Bureau of Labor Statistics, U.S. Census Bureau, U.S. Bureau of Economic Analysis, U.S. Census Business Dynamics Statistics



INNOVATION IN MOTION

WHERE IS DELAWARE GOING?



TRANSPORTATION OPTIONS MUST EVOLVE WITH A CHANGING ECONOMY

As the economy evolves, so must the transportation network in order to ensure strong economic growth opportunities.

Transportation dependent industries are growing, especially in New Castle County. Based on employment data provided by the U.S. Census Bureau, from 2011 to 2015, the Health Care and Social Assistance sector added 7,935 new jobs within the state (60% within New Castle County).

From 2011 to 2015, 4,655 new jobs (15% of all new jobs) were added within Delaware's Transportation and Warehousing sector (94% within New Castle County).

FROM **2015 TO 2022**, APPROXIMATELY **25,570** NEW JOBS ARE EXPECTED TO BE **CREATED** WITHIN DELAWARE.

1 OUT OF 3 OF THESE JOBS ARE EXPECTED TO BE CREATED WITHIN **TRANSPORTATION-DEPENDENT INDUSTRIES**.

EMPLOYMENT CHANGE BY INDUSTRY (2011 - 2015)

	New Castle County	Kent County	Sussex County	Delaware
Health Care & Social Assistance	4,748	1,728	1,460	7,936
Finance & Insurance	5,722	64	98	5,884
Transportation & Warehousing	4,366	255	35	4,656
Administration & Support, Waste Management & Accommodation & Food Services	3,832	(464)	866	4,234
Retail Trade	1,746	86	1,922	3,754
Arts, Entertainment, & Recreation	2,152	284	1,208	3,644
Educational Services	1,402	(84)	275	1,593
Manufacturing	838	175	410	1,423
Construction	1,477	377	(695)	1,159
Public Administration	(78)	548	657	1,127
Professional, Scientific, & Technical Services	(163)	909	84	830
Utilities	(246)	474	483	711
Agriculture, Forestry, Fishing & Hunting	174	29	(55)	148
Mining, Quarrying, & Oil & Gas Extraction	6	12	81	99
Real Estate & Rental and Leasing	-	-	-	-
Information	(24)	62	(278)	(240)
Wholesale Trade	(876)	(45)	(7)	(928)
Other Services (except Public Administration)	(1,282)	(46)	369	(959)
Management of Companies & Enterprises	(1,637)	(130)	299	(1,468)
	(2,193)	47	56	(2,090)
Total	19,964	4,281	7,268	31,513

Source: U.S. Census Bureau, Center for Economic Studies, LEHD

WHERE IS DELAWARE GOING?

ANNUAL EMPLOYMENT GROWTH RATE

Industry	2012-2022			2014-2024
	New Castle County	Kent County	Sussex County	Delaware State
Construction	2.5%	2.4%	2.9%	1.6%
Health Care & Social Assistance	1.6%	1.3%	1.6%	1.5%
Finance & Insurance	1.2%	1.4%	1.2%	1.2%
Transportation & Warehousing	1.0%	0.4%	0.8%	0.9%
Accommodation & Food Services	0.8%	0.8%	1.3%	0.9%
Administration & Support, Waste Management & Remediation	1.0%	1.1%	1.3%	0.9%
Arts, Entertainment & Recreation	0.9%	0.4%	1.1%	0.7%
Educational Services	0.6%	0.6%	0.6%	0.7%
Other Services, Ex. Public Admin	0.0%	0.0%	0.0%	0.0%
Professional, Scientific, & Technical Services	1.2%	2.3%	2.4%	0.6%
Retail Trade	0.6%	0.4%	0.8%	0.5%
Information	0.5%	0.4%	1.0%	0.5%
Government	0.4%	0.5%	0.5%	0.4%
Real Estate & Rental & Leasing	0.6%	1.7%	1.5%	0.2%
Utilities	-0.6%	-1.5%	-0.6%	0.2%
Wholesale Trade	0.6%	1.0%	2.0%	0.1%
Manufacturing	0.1%	4.0%	-0.7%	-0.2%
Management of Companies & Enterprises	-3.3%	-4.5%	-3.4%	-3.4%
Total Primary Jobs	0.9%	1.0%	0.9%	0.8%

Source: Delaware Office of Occupational and Labor Market Information

Although Delaware has emerged from the recession of 2007-2009, many residents are working, earning, and spending less than a decade ago, as business creation and economic growth has remained relatively flat. Over the next six years, the construction and health care and social assistance sectors - sectors providing mid-wage job opportunities - are projected to be the state's top sectors by annual employment growth (increasing by 1.6 and 1.5% per year, respectively). Over the same period, other sectors traditionally providing higher-wage job opportunities - including finance and insurance, and professional, scientific and technical services - are expected to experience relatively flat employment growth (1.2 and 0.6% per year, respectively), while the management of companies and enterprise sector is expected to experience relatively strong employment decline (-3.4% per year).

STRONGEST EMPLOYMENT DECLINE

In contrast to employment changes in the last several years, the Management of Companies and Enterprises sector is expected to experience the strongest employment decline within the state (-3.4%), overall within the next ten years.

CONSTRUCTION INDUSTRY GROWTH

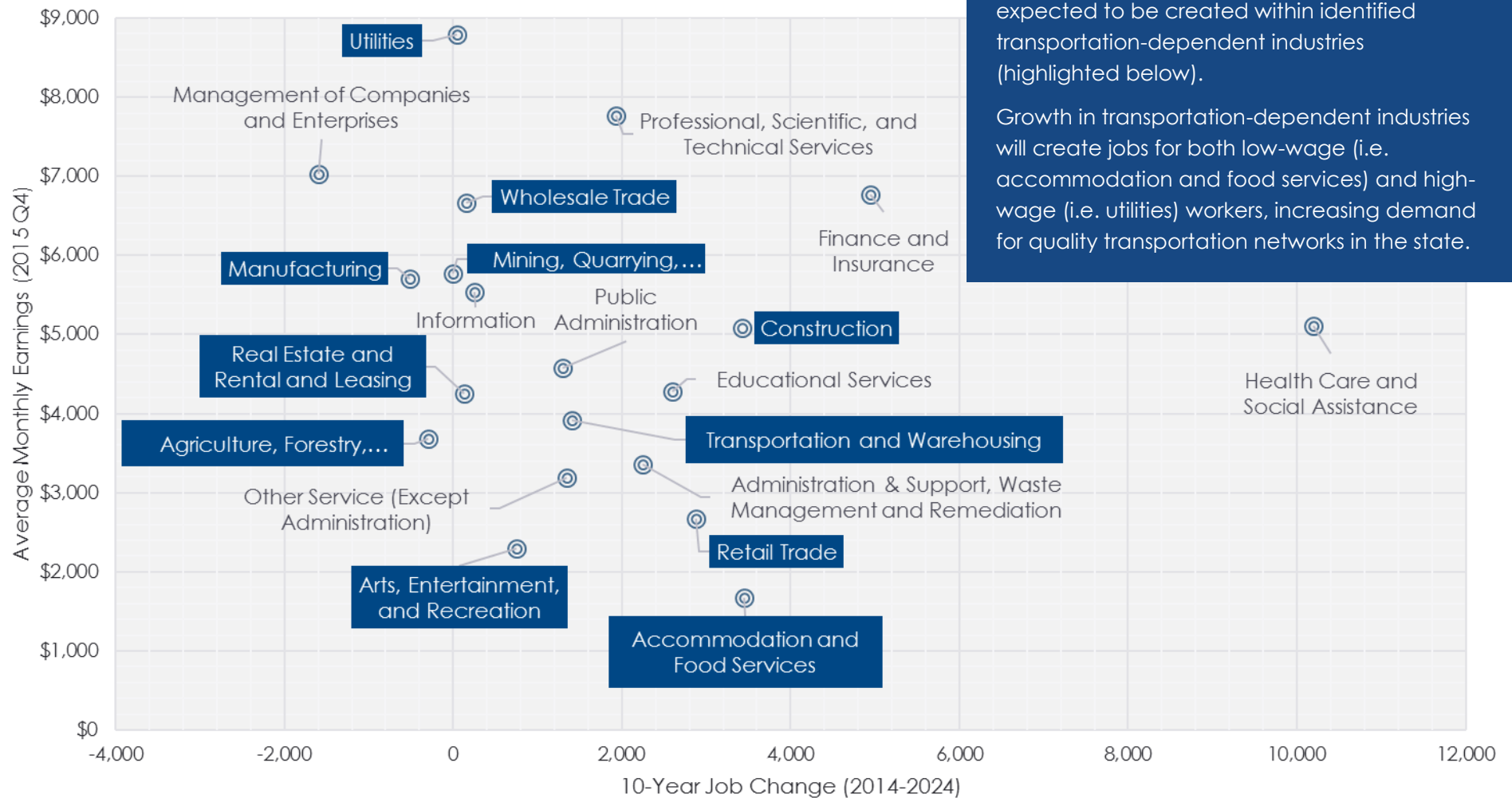
Based on annual growth rate projections provided by the Delaware Office of Occupational and Labor Market Information, through 2022, the construction sector is projected to grow the fastest within the state (1.6%), overall, with relatively even growth across the state.



INNOVATION IN MOTION

WHERE IS DELAWARE GOING?

EMPLOYMENT PROJECTIONS BY EARNINGS



From 2014 to 2024, approximately 34,640 net new jobs are projected to be created within Delaware. 33% of these net new jobs are expected to be created within identified transportation-dependent industries (highlighted below).

Growth in transportation-dependent industries will create jobs for both low-wage (i.e. accommodation and food services) and high-wage (i.e. utilities) workers, increasing demand for quality transportation networks in the state.

WHERE IS DELAWARE GOING?

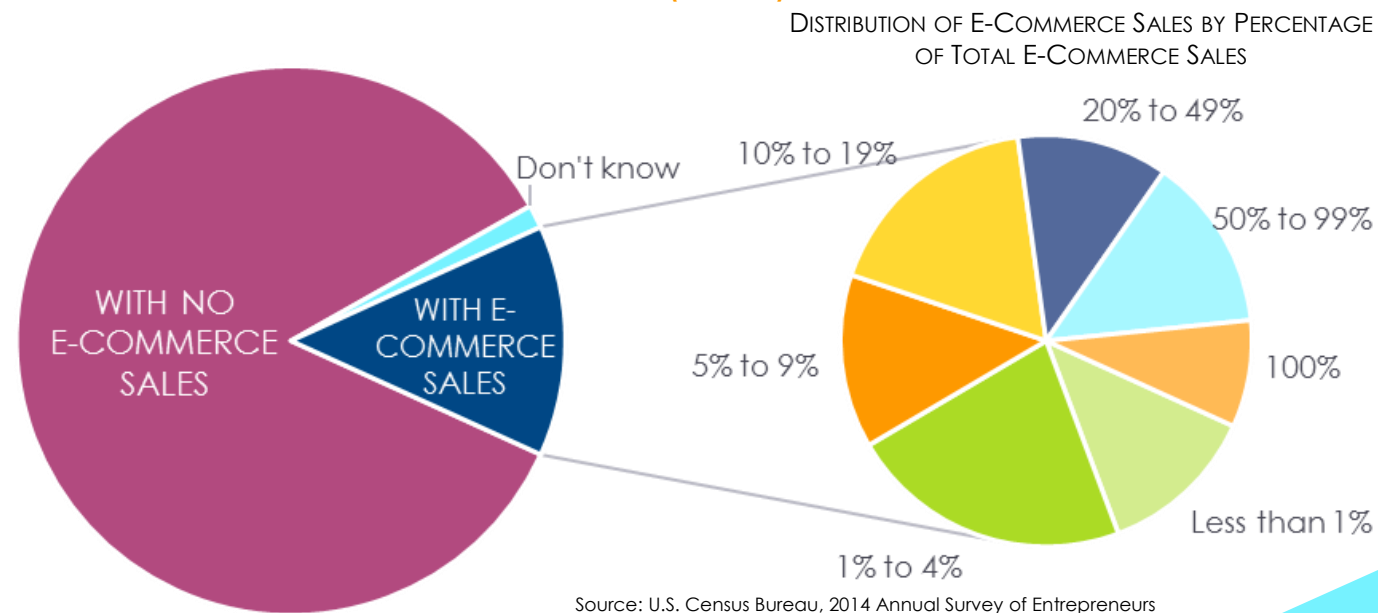
E-COMMERCE SALES

E-commerce is online transactions to buy or sell goods and services. While e-commerce has potential to change transportation patterns with fewer personal trips, it may increase the volume of delivery trucks or support opportunities for new delivery methods, such as autonomous drones.

According to the 2014 Annual Survey of Entrepreneurs, there are 17,977 firms with paid employees in Delaware. Approximately 85% of the firms participating in the survey did not have any e-commerce sales while 13.6% reported some e-commerce sales.



DELAWARE FIRMS WITH REPORTED E-COMMERCE SALES (2014)



CHALLENGES

DELAWARE MUST CONTINUE TO INVEST IN **HIGH QUALITY** TRANSPORTATION

Transportation infrastructure is the backbone of the Delaware economy. Currently, 89% of Delaware workers commute to work by car and 43% of total jobs in Delaware are in trade, manufacturing, transportation and warehousing, construction, utilities and tourism-related industries, which typically rely heavily on transportation infrastructure. As a result, many Delaware residents and businesses require well-maintained roads, railroads, airports, and ports to distribute raw materials and parts among manufacturers, and deliver finished products to consumers. With a third of the new jobs expected to be created in Delaware, from 2015 to 2022, occurring within transportation-dependent industries, the condition of Delaware's transportation infrastructure will remain critical to the health of the state's economy.



OPPORTUNITIES

DELAWARE'S WORKFORCE IS AGING.
BUSINESSES WILL NEED TO FILL JOBS AS
WORKERS RETIRE OVER THE NEXT DECADE.

While the state has experienced some growth in the age groups representing the Millennial generation (ages 20 to 36 years in 2017), Delaware's workforce population has seen the greatest growth among older age groups representing the Baby Boomer generation (ages 53 to 71 years). In a small state with an aging population, attracting and retaining a younger workforce may prove critical for existing businesses looking to replace the large number of workers approaching retirement over the next decade. Furthermore, since younger generations, like the Millennials, are more likely to have an undergraduate or postsecondary degree than adults from earlier generations, this younger workforce may also help attract business in higher-wage industries looking for a highly educated workforce.



INVESTING IN MORE PEDESTRIAN, BIKE, AND PUBLIC TRANSIT
CAN HELP ATTRACT AND RETAIN A STRONGER WORKFORCE.

Approximately five% of workers in Delaware commute on foot, bike, or public transportation. An aging workforce combined with relatively flat earnings growth should increase demand for accessible, convenient and affordable transportation options, especially among workers looking to reduce commuting costs or older residents looking for alternatives to driving. Furthermore, younger generations, like the Millennials, are walking, biking and taking public transportation significantly more than previous generations. Since urban young adults without children often prefer to live in mixed-use communities (containing a variety of businesses, entertainment and public transit options), investing in pedestrian, biking and public transportation infrastructure in Delaware's urban areas can also help attract and retain a younger workforce.



INNOVATION IN MOTION

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FREIGHT

SUMMARY

The entire state of Delaware is considered part of the Delmarva Peninsula, also encompassing nine counties on Maryland's Eastern Shore and two counties in Virginia. The Delmarva Peninsula is a growing region with well-established industries and developed infrastructure. As part of the Peninsula's freight network, Delaware's multimodal freight network contributes 240 miles of rail lines, 10 rail freight facilities, 13 port facilities, 11 intermodal transfer centers, 1 air carrier service airport, and 365 miles of roadway.

The main challenges facing the freight industry in Delaware are aging infrastructure, maintenance and capacity concerns. In response to the challenges facing the freight industry, DelDOT adopted the Delmarva Freight Plan in 2015 to address the freight network of the entire Delmarva Peninsula. The plan contains the following strategic goals:

- ECONOMIC VITALITY
- FREIGHT CONNECTIVITY, MOBILITY & ACCESSIBILITY
- SAFETY & SECURITY
- SYSTEM MANAGEMENT, OPERATIONS & MAINTENANCE
- SUSTAINABILITY & ENVIRONMENTAL STEWARDSHIP



WHERE IS DELAWARE NOW?

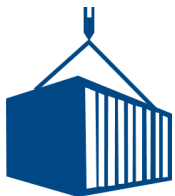


DELAWARE'S FREIGHT RAIL SYSTEM

RAILROAD NAME	MILES OPERATED IN DE
NORFOLK SOUTHERN	158
CSX TRANSPORTATION	23
MARYLAND & DELAWARE RAILROAD	16
WILMINGTON & WESTERN RAILROAD	10
EAST PENN RAILROAD	10
DELAWARE COASTLINE RAILROAD	23
TOTAL MILES	240

Source: Delaware State Rail Plan 2011

THE PORT OF WILMINGTON ACCOUNTED FOR
OVER

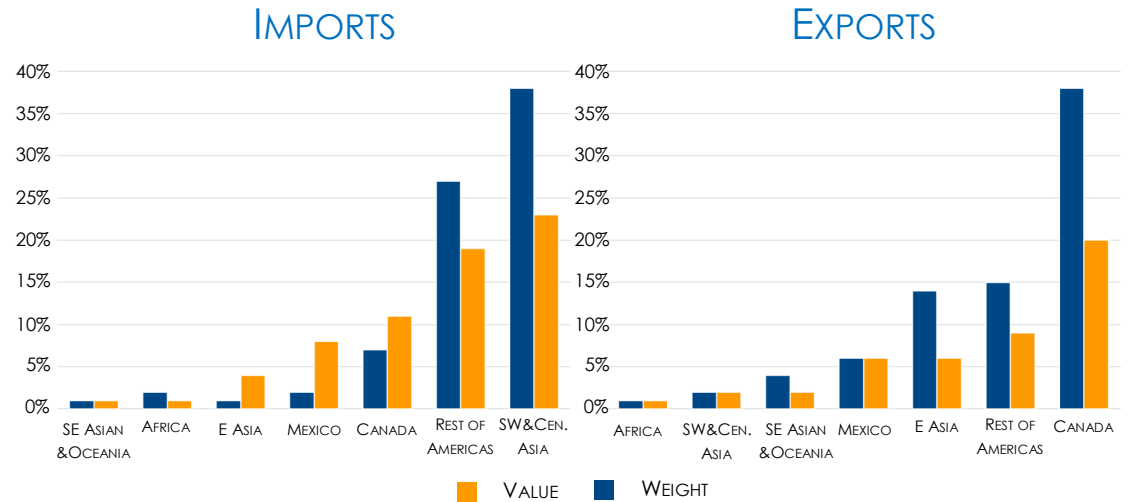


7.5 MILLION TONS OF CARGO

In 2016.

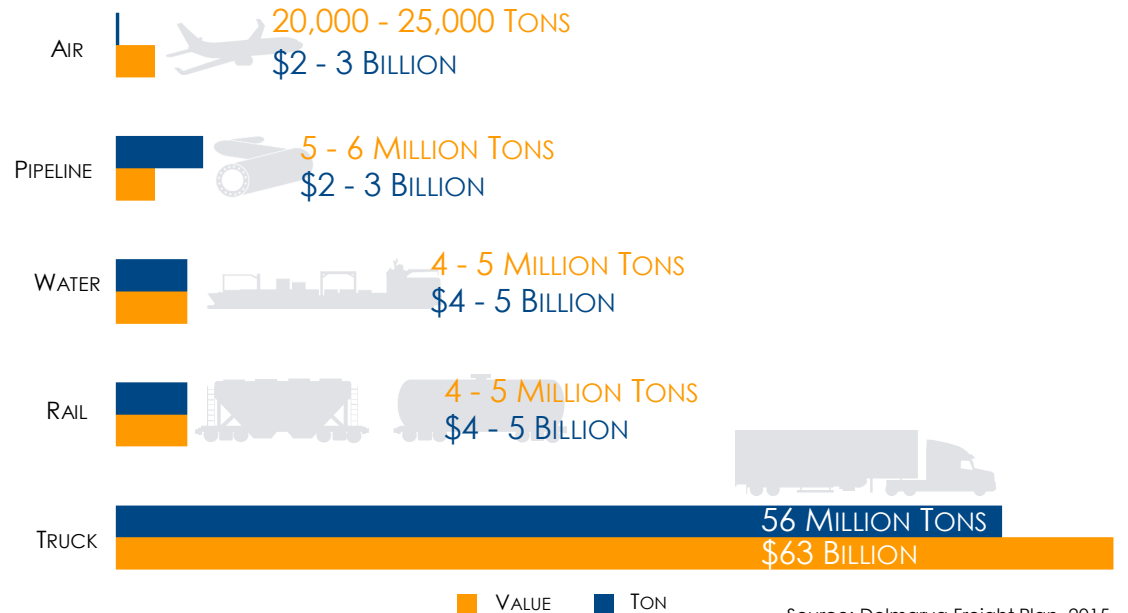
Source: Delmarva Freight Plan, 2015

2015 DELMARVA INTERNATIONAL FREIGHT



Source: Delmarva Freight Plan, 2015

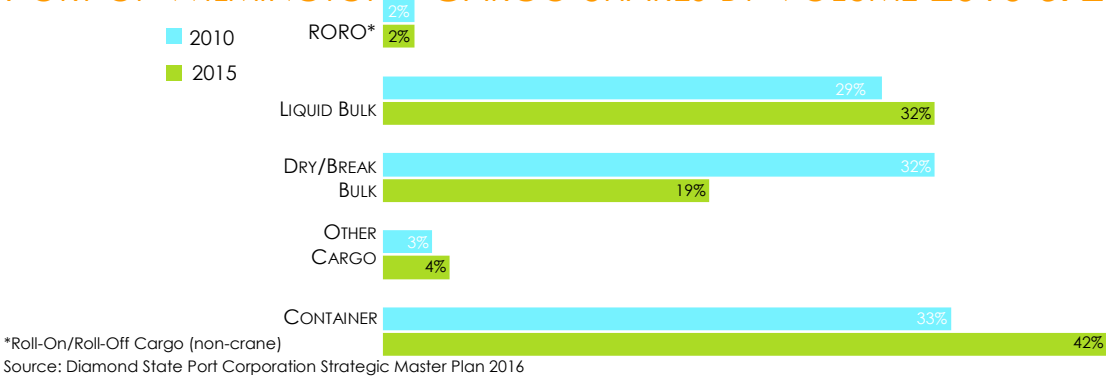
2015 DELMARVA FREIGHT BY VOLUME & VALUE



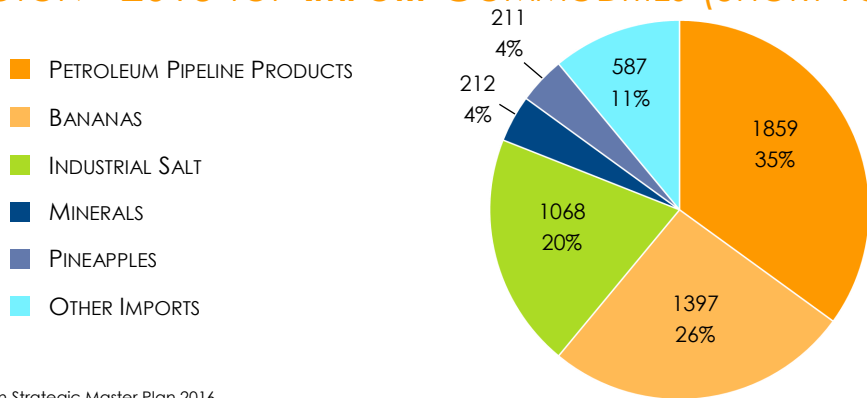
Source: Delmarva Freight Plan, 2015

WHERE IS DELAWARE NOW?

PORT OF WILMINGTON - CARGO SHARES BY VOLUME 2010 & 2015

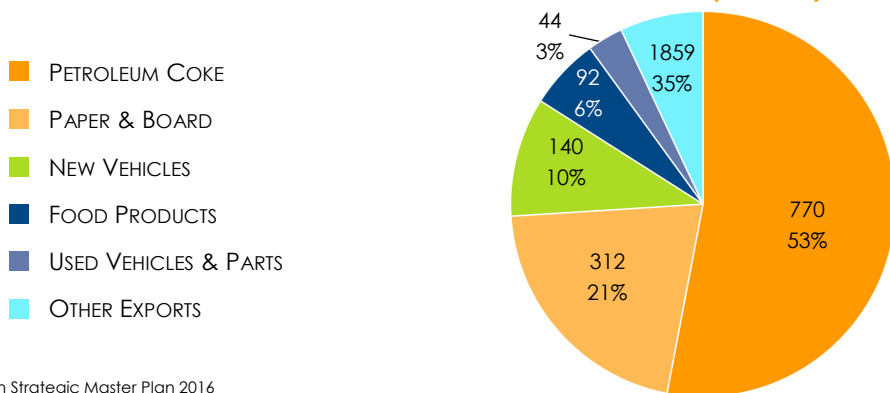


PORT OF WILMINGTON - 2015 TOP IMPORT COMMODITIES (SHORT TONS)



Source: Diamond State Port Corporation Strategic Master Plan 2016

PORT OF WILMINGTON - 2015 TOP EXPORT COMMODITIES (TONS)



Source: Diamond State Port Corporation Strategic Master Plan 2016

PORT OF WILMINGTON - QUICK FACTS

- 400 vessels are processed each year
- Annual import/export cargo tonnage of over **4 million tons**
- East Coast's **largest exporter** of live cattle to foreign markets
- Largest importer** in North America for **bananas** and other fresh fruit and juice concentrates
- North America's **largest** dock-side cold storage, the Port handles approximately **1.5 million tons** of imported containerized fruit annually. Approximately **40 %** is transported by rail, remainder by truck

Source: Delaware State Rail Plan 2011



INNOVATION IN MOTION

WHERE IS DELAWARE GOING?

TRUCKS ARE AND WILL REMAIN THE PRIMARY MODE OF FREIGHT TRANSPORTATION ACROSS THE U.S. AND IN THE DELMARVA REGION.



Source: Delmarva Freight Plan 2015

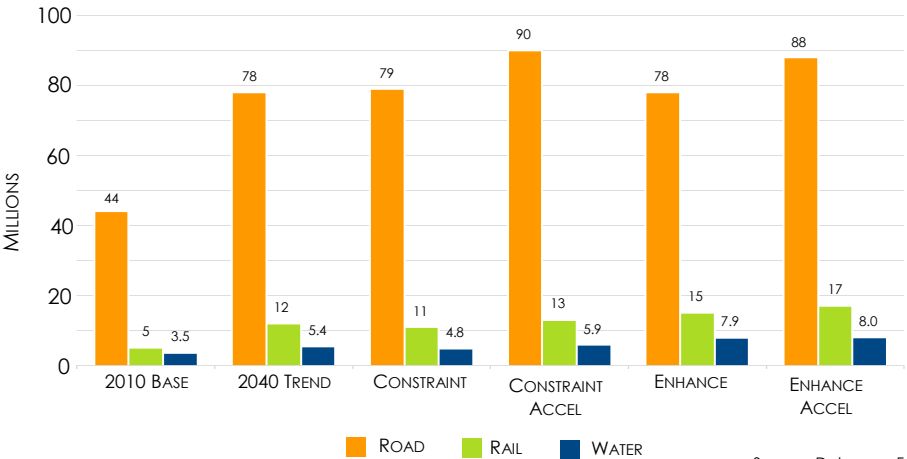
FREIGHT TONNAGE TRANSPORTED BY TRUCKS

THE PROPORTION OF TOTAL FREIGHT TONNAGE TRANSPORTED BY TRUCK WILL RISE FROM 67.0% IN 2011, TO 68.9% IN 2017, TO 69.63% BY 2023.



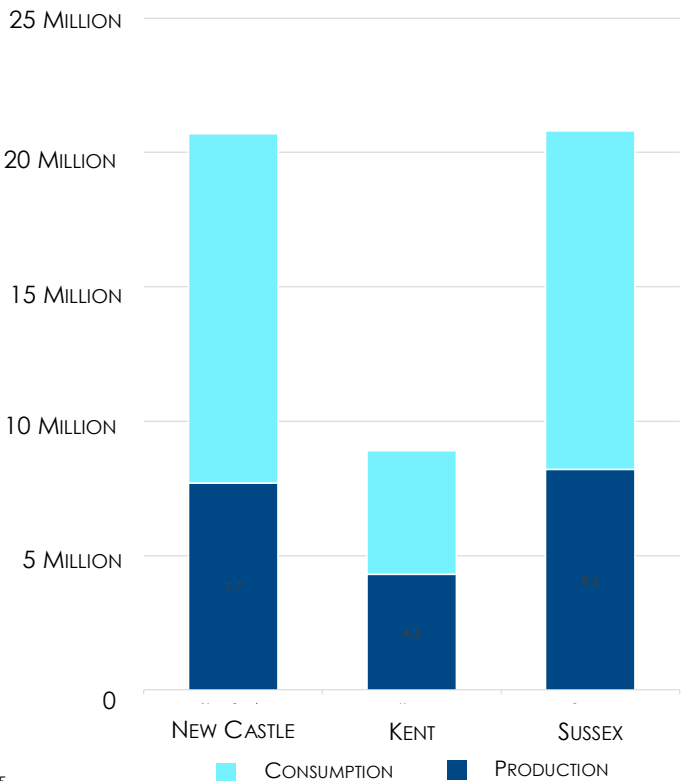
TONS BY MODE

DELMARVA FREIGHT PLAN SCENARIO ANALYSIS



Source: Delmarva Freight Plan 2015

2040 DELMARVA FREIGHT PLAN TRENDLINE ANNUAL FREIGHT PRODUCTION/CONSUMPTION (MILLIONS OF TONS)



VALUE & OPPORTUNITIES



RURAL ECONOMIES

Providing a well-planned multimodal freight system with efficient and reliable connections to major markets creates an opportunity for companies to locate and grow in the rural regions of Delaware, stimulating local and regional economies. Rurally located intermodal facilities and logistics centers can additionally benefit from lower costs than urban areas.

RAIL FREIGHT

Delaware's freight rail system is considered a "green" mode of transportation as it reduces highway congestion, improves safety and uses less energy per ton-mile than other modes of transportation. Rail corridors have historically been economic drivers for communities large and small throughout the state. Revitalizing our rail network should provide new opportunities for industrial and agricultural market growth.

INNOVATION

The freight industry is transforming how information and communication technologies are applied to optimize global supply chains, placing a premium on the reliability of transportation services. Emerging technological advances in data analysis systems, automatic vehicle and container identification systems, and satellite navigational systems will improve the efficiency of freight movement. Freight automation will have the potential to revolutionize the freight industry and improve the safety and efficiency of freight. In turn, this will increase demand for advanced mechanical and data analysis employees, demanding higher skills and higher pay than traditional freight work.

Source: DelDOT State Rail Plan 2011

Source: USDOT - Beyond Traffic 2045



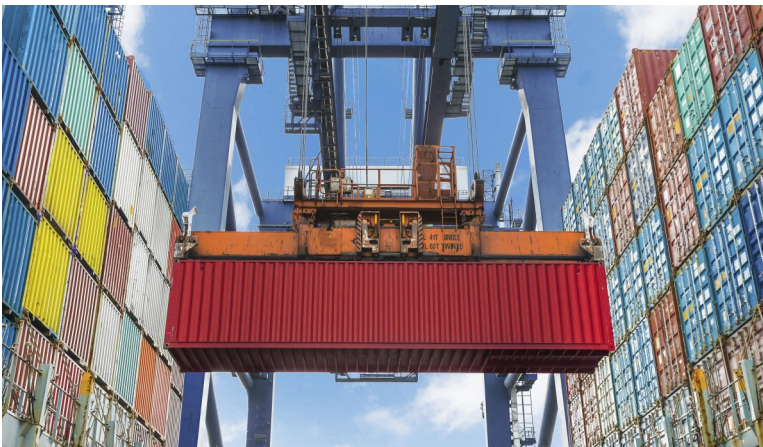
INNOVATION IN MOTION

CHALLENGES

As the economy becomes increasingly globalized with cargo moving between modes, Delaware will face the challenge of how to most appropriately invest limited public resources in supporting freight operations, including infrastructure and capacity improvements.

As consumer demand increases, truck transportation will continue to grow as the primary mode of freight travel. Coupled with anticipated growth in the tourism industry and related peak seasonal congestion traveling to southern Delaware, these increases will exacerbate any existing concerns or conflicts between passenger vehicles and freight trucks sharing road space.

The growth of urban populations, along with increases in online shopping and related freight deliveries, may result in greater delays and congestion and could intensify debates over land use and pollution.



ENVIRONMENTAL IMPACTS

“Trucking is the single largest contributor to freight-related **AIR POLLUTION** nationally.”

Source: USDOT - Beyond Traffic 2045



FIRST/LAST MILE CONFLICTS

Necessary for local business and industry to survive, but often puts **heavy trucks** on collector and local roads creating **SAFETY CONCERNS** for local traffic and people walking and biking.

Source: Delmarva Freight Plan 2015

PARTNERSHIPS

It is critical for the State to **PARTNER** with stakeholders and others to advance the rail improvements necessary to maintain and improve the State's **multimodal freight system**.



Source: Delaware State Rail Plan 2011

CHALLENGES

POULTRY AND AGRIBUSINESS

A significant portion of the poultry, agriculture, and food products in the Delmarva Peninsula are dependent on efficient motor freight. Excessive congestion is an exceptional concern when it affects freight delivery of time-sensitive or perishable commodities. Another challenge is the need to import grain into southern Delaware to support the needs of the poultry farmers. This makes reliable high quantity freight movement vital to the industry operations.

Source: Delmarva Freight Plan, 2015



WATER NETWORK MAINTENANCE

The inland waterways face ongoing concerns regarding inadequate dredge funding, shortage of dredge material storage sites, and delayed channel maintenance. Maintaining efficient access to key ports such as Wilmington and preparing for new import/export market opportunities and related effects on overall freight traffic is vital to maintaining a successful freight network.

Source: Delmarva Freight Plan, 2015



AGING INFRASTRUCTURE & MAINTENANCE NEEDS

The aging infrastructure and maintenance needs of the freight system in Delaware could create negative implications on the area's broader economic prospects. Failures or shortcomings in the existing rail or water networks could reduce or eliminate rail or barge travel, resulting in immediate impacts to local businesses and supply chain. Short-term increases in truck traffic and related conflicts would be inevitable, long-term impacts of reduced or relocated economic opportunities would be likely.

Source: Delmarva Freight Plan, 2015



INNOVATION IN MOTION

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TOURISM

SUMMARY

Delaware's coastal towns, pristine beaches, tax-free shopping and outdoor recreation attract 8.5 million regional visitors to the state every year. In 2015, tourism generated \$3 billion in economic revenue (5% of the state GDP).

While tourism is a critical component of Delaware's economy, visitors also create significant demands on our existing transportation services and infrastructure.

DeIDOT will continue to find **INNOVATIVE APPROACHES** to **manage traffic congestion** produced by visitors and seasonal workers in support of our growing tourism industry.

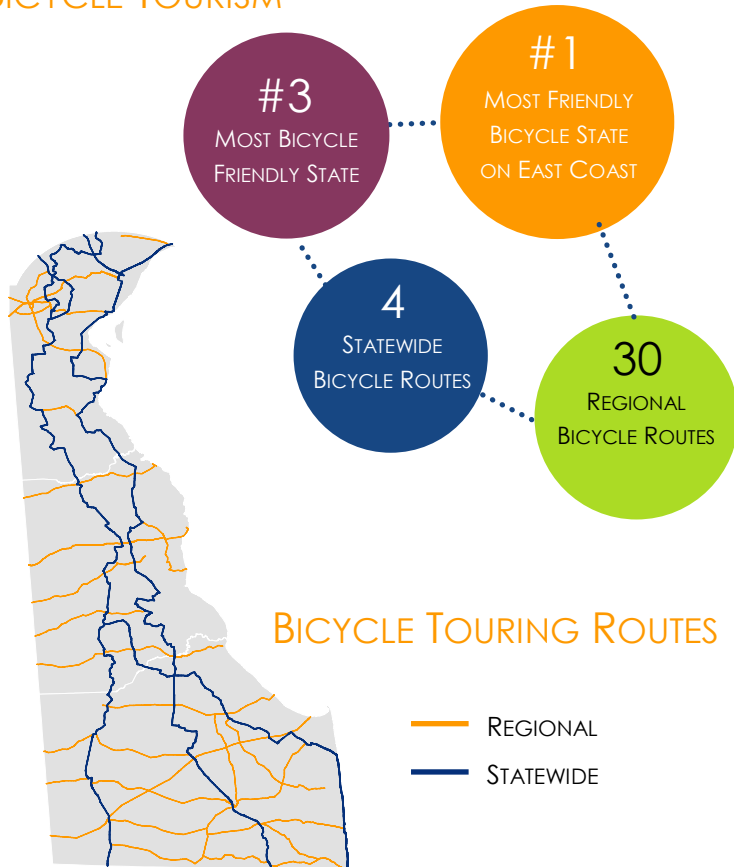


INNOVATION IN MOTION

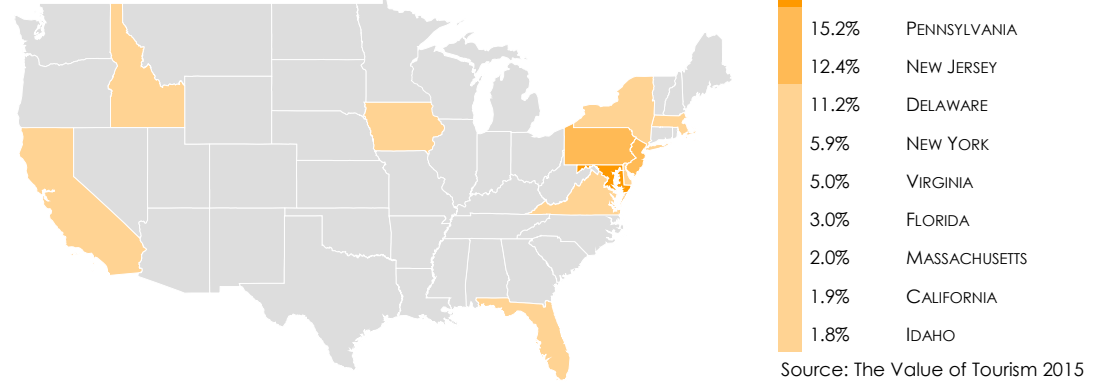
WHERE IS DELAWARE NOW?



BICYCLE TOURISM



MOST VISITOR STATES OF ORIGIN



DELAWARE IS A "DRIVE-TO" STATE

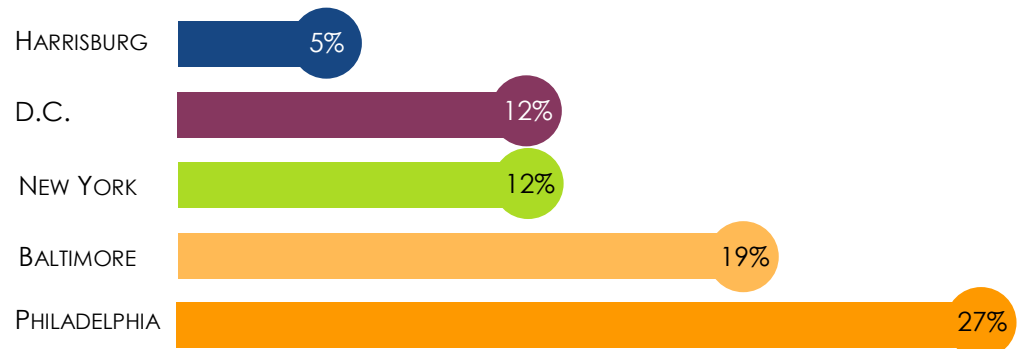
97% OF VISITORS USED A CAR TO GET TO THE STATE



75% OF VISITORS TRAVELED 200 MILES OR LESS

Source: The Value of Tourism 2015

TOP MARKETS OF ORIGIN - PERCENTAGE OF VISITORS



Source: The Value of Tourism 2015

WHERE IS DELAWARE NOW?

WATER-BASED TRANSPORTATION

There are two ferry services in Delaware that provide important links that connect the communities they serve. The Cape May-Lewes Ferry, operated by the Delaware River and Bay Authority, connects Lewes, DE to Cape May, NJ, crossing a 17-mile section of the Delaware Bay. The ferry serves as a tourist attraction and an alternative crossing to the Delaware Memorial Bridge on I-295 in northern Delaware.

The Woodland Ferry, operated by DeIDOT, crosses the Nanticoke River, west of Seaford, DE. The ferry transports vehicle and foot passengers between Seaford and Laurel, DE during daylight hours. The Woodland Ferry carries approximately 225 vehicles daily on a typical summer day, with annual estimates of approximately 45,000 trips per year.

CAPE MAY-LEWES FERRY ANNUAL RIDERSHIP

	PASSENGERS	CHANGE	VEHICLES	CHANGE
2011	779,451	-	268,605	-
2012	795,541	2%	272,358	1%
2013	743,151	-7%	256,326	-6%
2014	767,209	3%	262,010	2%
2015	782,241	2%	266,149	2%
2016	711,233	-9%	257,648	-3%
2017	731,262	3%	267,174	4%

Source: Delaware River & Bay Authority

DAY TRIP TRAVELERS



4.63 MILLION VISITORS



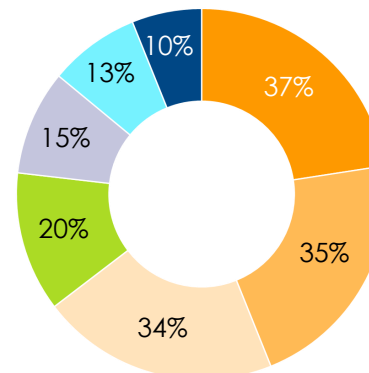
OVERNIGHT TRAVELERS

3.87 MILLION VISITORS

Source: The Value of Tourism 2015

VISITOR ACTIVITIES

BEACH
DINING
SHOPPING
NIGHTLIFE
GAMING
TOURING
HISTORY



Source: The Value of Tourism 2015



BUSINESS TRAVELERS ACCOUNTED FOR

1.69 MILLION VISITORS



LEISURE TRAVELERS ACCOUNTED FOR

6.81 MILLION VISITORS

Source: The Value of Tourism 2015

TOURISM QUICK FACTS

- Most visitors originate from the **northeastern region** of the U.S.
- The Philadelphia area accounts for **27%** of visitors
- Tourism accounted for **7.3%** of jobs
- Beaches, dining and shopping** are the main tourist activities
- Food, transportation and lodging** are the main things visitors spend their money on in Delaware

Source: The Value of Tourism 2015
Delaware Tourism Office



INNOVATION IN MOTION

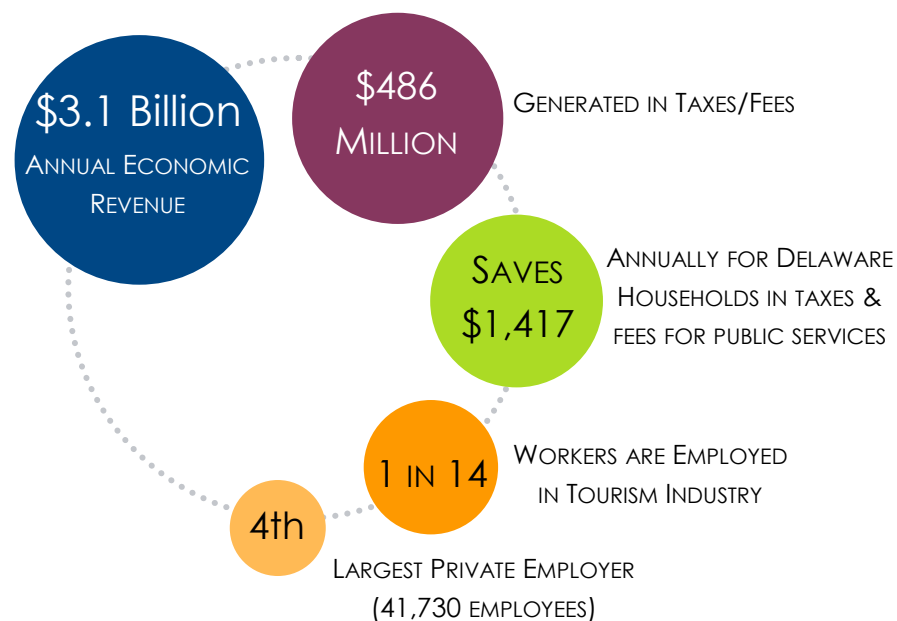
VALUE & OPPORTUNITIES

THE AVERAGE DELAWARE VISITOR SPENDS \$105 DAILY PER PERSON,

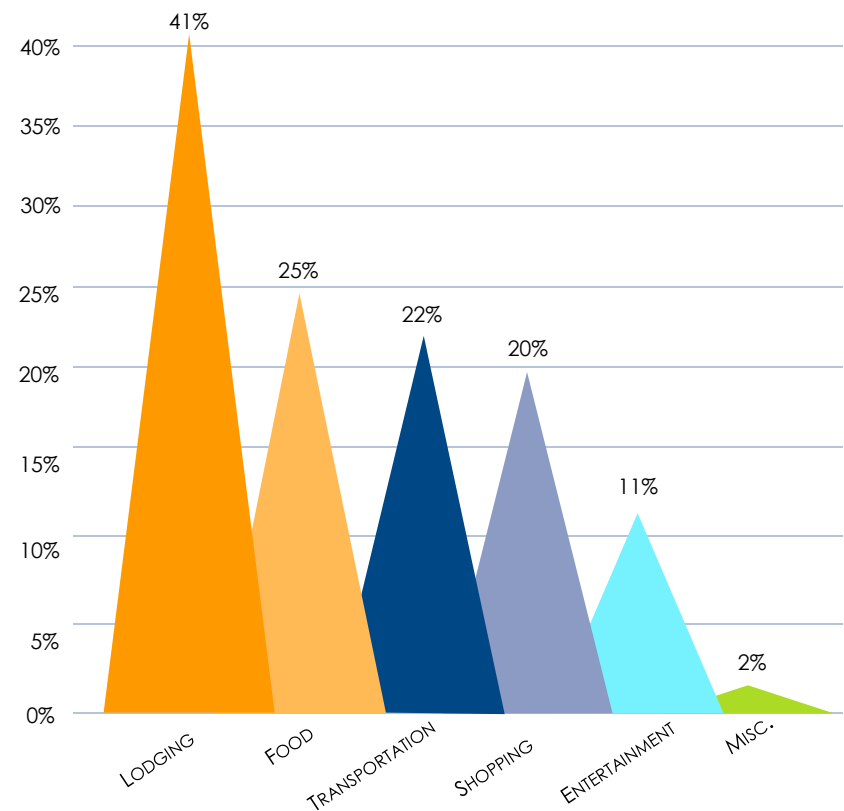
\$566 PER TRIP

Source: The Value of Tourism 2015

VALUE OF TOURISM



VISITOR SPENDING



Source: The Value of Tourism 2014 Delaware Tourism Office

VALUE & OPPORTUNITIES



BYWAYS & BIKEWAYS

The Delaware Byways Program meshes the intrinsic value of the transportation system and its surroundings with the promotion of tourism and recreational resources. These corridors offer alternative travel routes to the major highways, while telling a story about Delaware's heritage, recreational activities or beauty.

Delaware's mostly flat terrain and charming small towns create an attractive market for bicycle tourism. Bicycle touring can range from one-day trips to more than a week-long adventure.

Scenic byways and bicycle tourism bring travelers to communities that may not otherwise experience the economic benefits of traditional tourism.

FESTIVALS

Delaware hosts a variety of annual festivals that bring benefits to both local and regional economies. Festivals contribute to the growth of tourism and other businesses throughout the state.

The Firefly Music Festival in Dover attracts 80,000 attendees and contributes more than \$68 million to the regional economy. In 2014, the festival created the equivalent of 579 full-time jobs with \$23 million in wages.¹

BEACHES

Delaware's beaches add to our quality of life and offer value to both residents and visitors.

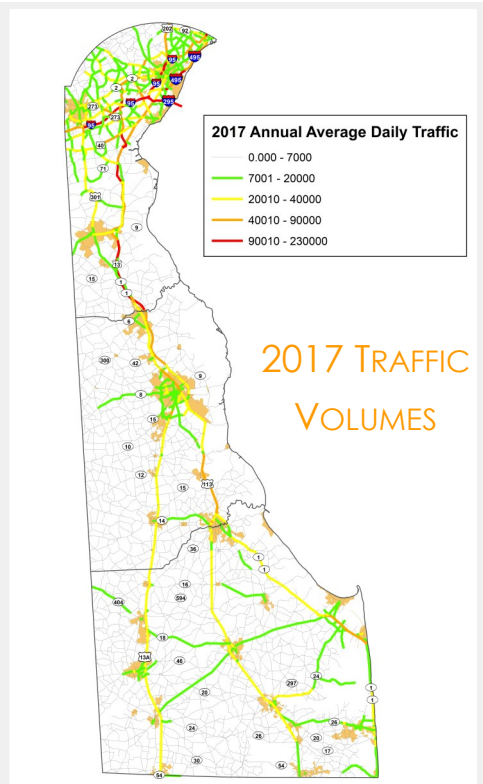
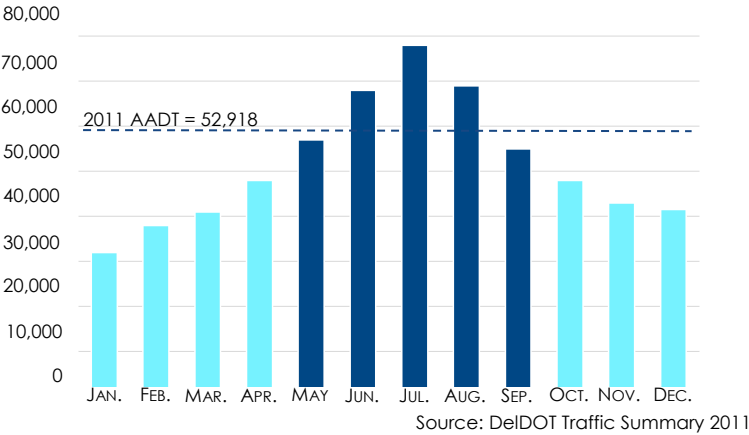
The majority of the state's tourism economy is associated with the beaches and resort communities in the southern part of the state. The continuing and future success of the beach resort tourism industry will require investments in improving travel route efficiency and effective traffic management.

¹ University of Delaware

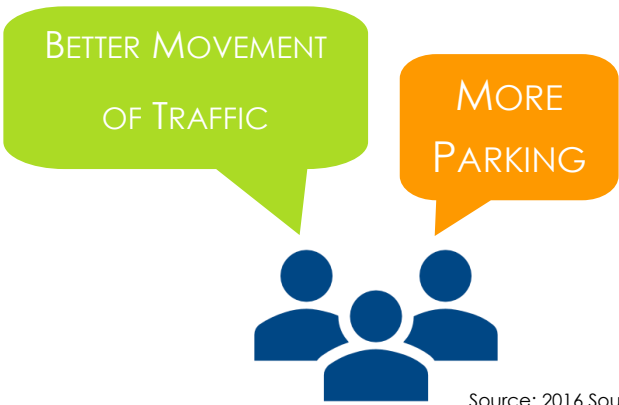


CHALLENGES

SAMPLE PEAK SEASON TRAFFIC VARIATION ALONG STATE ROUTE 1

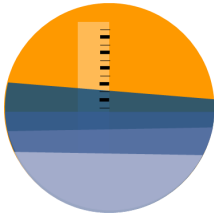


WHAT DO VISITORS WANT?



Source: 2016 Southern Delaware Visitor Survey

CLIMATE CHANGE & SEA LEVEL RISE



STATEWIDE BETWEEN 8% AND 11%

OF THE STATE'S LAND COULD BE **INUNDATED BY SEA LEVEL RISE** BY THE
YEAR 2100

Source: Preparing for Tomorrow's High Tide Sea Level Rise Vulnerability Assessment for the State of Delaware - DNREC

PREDICTED CLIMATE TRENDS COULD POSE CHALLENGES FOR
OUR **TOURISM ECONOMY**.



Source: 2015 Delaware Strategies for State Policies and Spending - Delaware OSPC

CHALLENGES

REGIONAL TRANSPORTATION CHALLENGES

Delaware is a drive-to destination, with many travelers originating from the north. These travelers put pressure on Route 1, the north-south connection through the state, as well as Interstate 95, which crosses New Castle County in Northern Delaware as the northeast corridor link between Philadelphia and the Baltimore/Washington Region. The traffic volumes of these routes peak during the busy summer tourism months. Traffic congestion is predicted to grow as Delaware tourism increases.



LOCAL TRANSPORTATION CHALLENGES

The influx of visitors also creates congestion in the local communities and resort towns. The limited parking in resort towns causes visitors to circulate local streets searching for available parking, increasing congestion and creating an uninviting biking and walking environment.

DeIDOT works with local communities to build transportation networks that encourage visitors to access local amenities without reliance on personal vehicles. DeIDOT works to achieve this goal by strategically locating:

- Park & Ride Facilities
- Public Transit Routes
- Comfortable and Convenient Biking and Walking Infrastructure



INNOVATION IN MOTION

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SAFETY

SAFETY is a primary concern and **core value** at DelDOT, and the Department is constantly working towards **REDUCING** serious injuries and fatalities on Delaware's roads.

Since the publication of the previous Long Range Transportation Plan in 2011, the number of persons killed and injured on Delaware roads has increased.

In response to these ongoing safety concerns and statistics, Delaware's Office of Highway Safety has developed the *Delaware Strategic Highway Safety Plan: Toward Zero Deaths*. The following pages provide an overview of the Plan, including specific areas of emphasis for improving safety throughout the state.



WHERE IS DELAWARE NOW?

LEADING CONTRIBUTING FACTORS OF CRASHES IN 2015

FATAL

PEDESTRIAN ERROR: 27

DRIVING UNDER THE INFLUENCE: 20

FAILED TO YIELD ROW: 14

INJURED

DRIVER INATTENTION, DISTRACTION, FATIGUE: 1,239

OTHER/UNKNOWN: 725

FAILED TO YIELD ROW: 694

PROPERTY DAMAGE

DRIVER INATTENTION, DISTRACTION, FATIGUE: 4,267

DRIVING UNDER THE INFLUENCE: 3,245

FAILED TO YIELD ROW: 2,269

CONTRIBUTING CIRCUMSTANCES	FATAL	INJURY	DAMAGE	TOTAL
DRIVING AGGRESSIVELY	5	16	64	85
PEDESTRIAN ERROR	27	27	31	85
WRONG SIDE OR WRONG WAY	8	42	48	98
SPEEDING	9	82	152	243
PASSED STOP SIGN	7	120	198	325
MADE IMPROPER TURN	1	100	292	393
OTHER IMPROPER DRIVING	1	76	498	575
DISREGARD TRAFFIC SIGNAL	1	317	391	709
ENVIRONMENTAL - DEBRIS, WEATHER, GLARE, ETC.	0	147	750	897
DRIVING UNDER INFLUENCE	20	316	586	922
IMPROPER PASSING OR LANE CHANGE	3	184	1,176	1,363
ANIMAL IN ROADWAY	2	85	1,449	1,536
FAILED TO YIELD ROW	14	694	1,364	2,072
DRIVING CARELESSLY / RECKLESSLY	5	586	1,904	2,495
FOLLOWED TOO CLOSE	0	497	2,269	2,766
OTHER / UNKNOWN	21	725	3,245	3,991
DRIVER INATTENTION, DISTRACTION, OR FATIGUE	5	1,239	4,267	5,511
TOTALS	129	5,253	18,684	24,066

Source: Delaware's Annual Traffic Statistical Report, 2015

WHERE IS DELAWARE NOW?

VEHICLE CRASHES IN DELAWARE BY TYPE OF VEHICLE 2015

TYPE OF VEHICLE	FATAL	INJURY	DAMAGE	TOTAL
PASSENGER CAR	105	5,714	18,668	24,487
PICKUP TRUCK	20	916	3,487	4,423
TRUCK TRACTOR & SEMI	7	112	504	623
OTHER TRUCK COMBO, OR COMMERCIAL VAN	7	168	828	1,003
MOTORCYCLE	21	215	90	326
BUS	2	48	114	164
SCHOOL BUS	3	50	148	201
FARM TRACTOR &/OR FARM EQUIPMENT	1	2	9	12
SPORT UTILITY VEHICLE	29	1,966	6,792	8,787
MINIVAN / PASSENGER VAN	6	550	1,614	2,170
OTHER TRUCK COMBO, OR COMMERCIAL VAN	6	58	99	163
NOT STATED	0	194	1,814	2,008
TOTALS	207	9,993	34,167	44,367

Source: Delaware's Annual Traffic Statistical Report, 2015

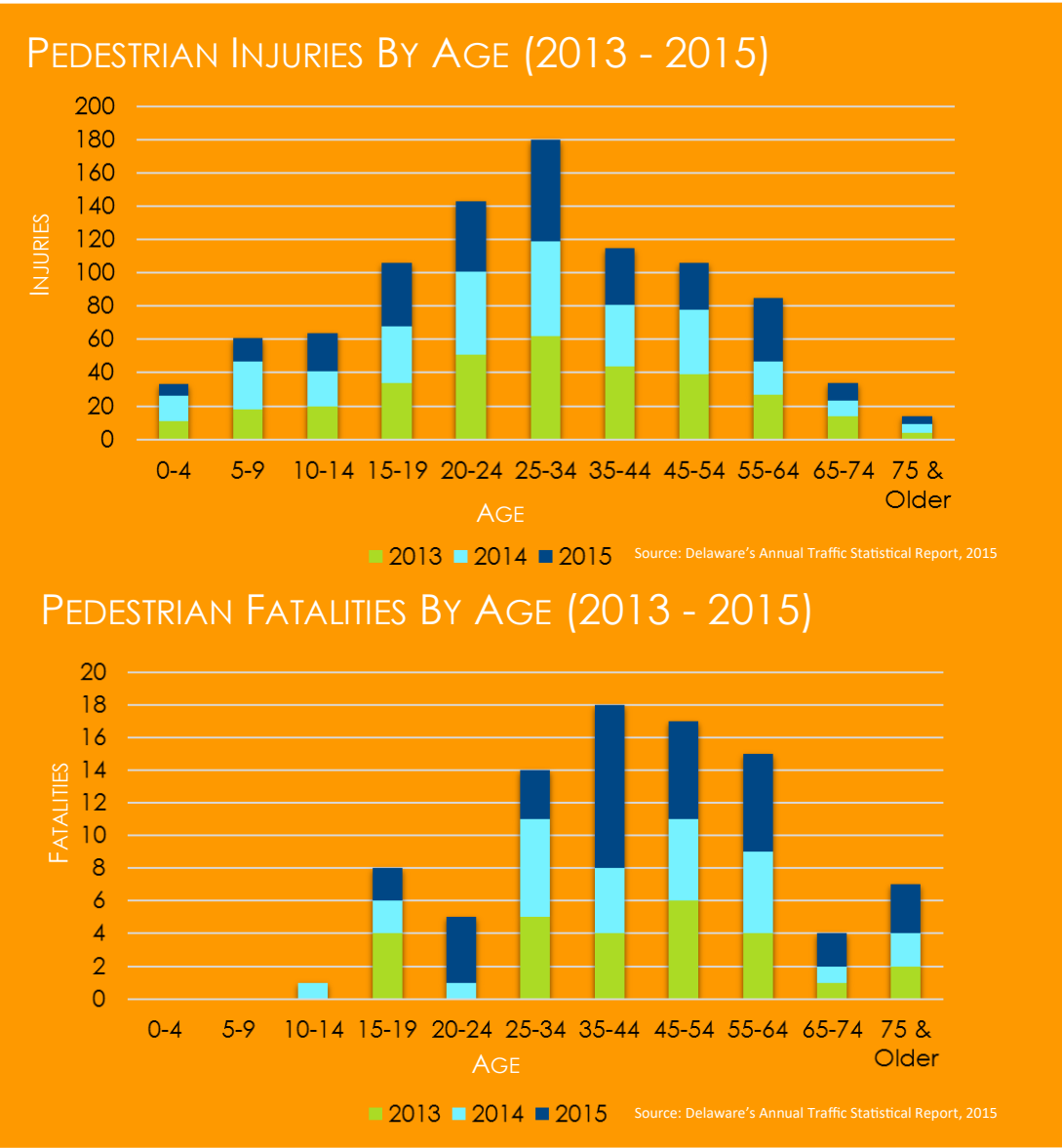
VEHICLE CRASHES IN DELAWARE

- 1 person is killed **every 3 days**
- More than 2 people are killed or seriously injured every day
- Every week 15 people are killed or seriously injured
- 1,900 people have died on Delaware's roads between 2000 - 2015



INNOVATION IN MOTION

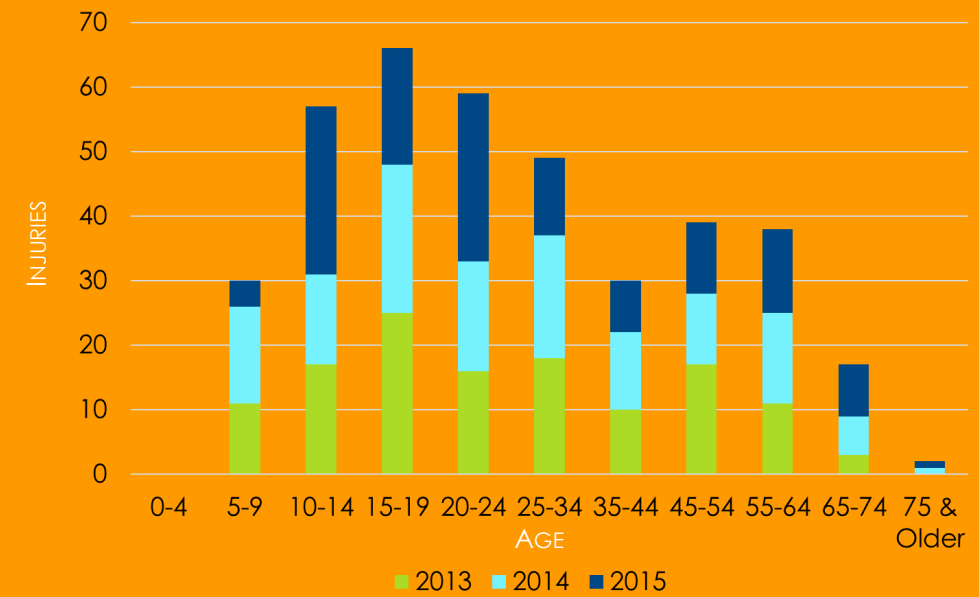
WHERE IS DELAWARE NOW?



WHERE IS DELAWARE NOW?

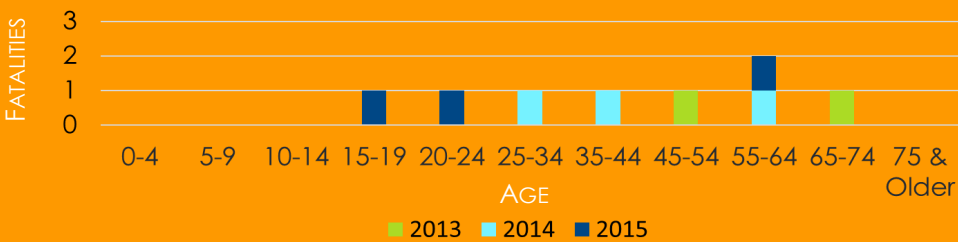


BICYCLIST INJURIES BY AGE (2013 - 2015)



Source: Delaware's Annual Traffic Statistical Report, 2015

BICYCLIST FATALITIES BY AGE (2013 - 2015)



Source: Delaware's Annual Traffic Statistical Report, 2015

2015 DELAWARE STRATEGIC HIGHWAY SAFETY PLAN: TOWARD ZERO DEATHS

MISSION STATEMENT

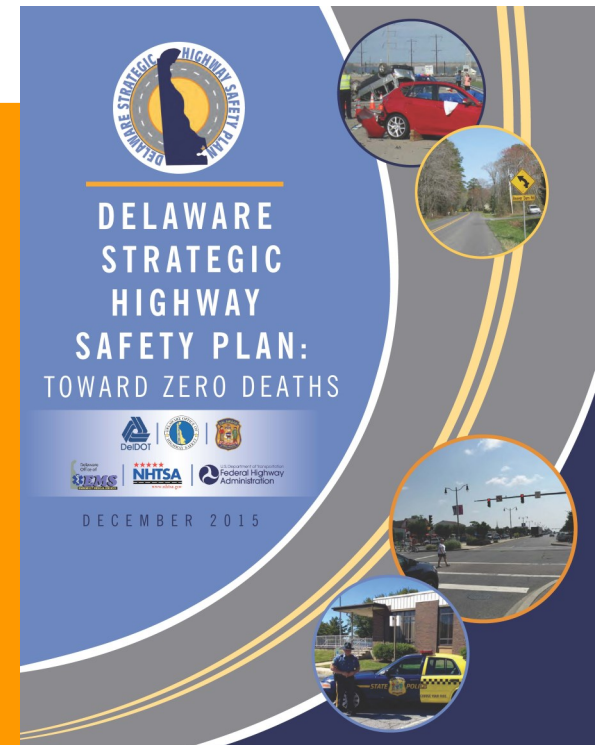
"The *Delaware Strategic Highway Safety Plan: Toward Zero Deaths* aims to eliminate fatalities and serious injuries on Delaware's roadways through a multi-agency approach that utilizes education, enforcement, engineering and emergency medical service strategies."

OVERALL PLAN GOAL

The goal of the *Delaware Strategic Highway Safety Plan: Toward Zero Deaths* is to achieve a reduction of at least 3 fatalities and 15 serious injuries annually and continue to reduce the total number of fatalities and serious injuries to achieve at least a 50 percent reduction by 2035.

2015 STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREAS

- | | |
|---------------------------|--------------------|
| 1. Intersections | 5. Motorcycles |
| 2. Roadway Departure | 6. Speeding |
| 3. Impaired Driving | 7. Pedestrians |
| 4. Unrestrained Motorists | 8. Traffic Records |



EVERY **3** YEARS, DELAWARE'S OFFICE OF HIGHWAY SAFETY REVIEWS CRASH DATA AND BEST PRACTICES FOR SAFETY IMPROVEMENTS TO UPDATE THE

STRATEGIC HIGHWAY SAFETY PLAN.

TO MAKE DELAWARE'S TRANSPORTATION NETWORK MORE SAFE, THE PLAN SETS FORTH:

- **GOALS**
- **POLICIES**
- **PERFORMANCE MEASURES**

2015 STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREAS



IMPROVING THE DESIGN AND OPERATION OF HIGHWAY INTERSECTIONS

In Delaware, intersection crashes represent the largest percentage of serious injuries (38 percent) and represent 23 percent of fatalities based on 2007 through 2014 crash data. Intersections introduce complex traffic maneuvers between different traffic movements, pedestrian crossings, and bicycle routes. Vehicles turning and crossing lanes create potential conflict points, and many intersections across Delaware are included among the state's highest accident rate locations. DeIDOT is actively working to improve intersections with high-accident rates and develop engineering solutions to improve intersection design. Because many incidents occur at night, improved lighting and night-time visibility is one of the strategies we implement.

REDUCING THE FREQUENCY AND SEVERITY OF ROADWAY DEPARTURE CRASHES

A roadway departure crash is a non-intersection crash which occurs after a vehicle crosses an edge line, a center line or otherwise leaves the traveled way. These crashes frequently result in an injury or fatality when the departing vehicle strikes another vehicle or one or multiple fixed objects located outside the travel way such as trees, utility poles, ditches and bridge abutments after the initial roadway departure. DeIDOT is working to keep vehicles on the roadway as the first priority, and second to address the consequences of leaving the roadway. These strategies include keeping roadside edges smooth, keeping the roadsides clear or protected with barriers, and adding rumble strips to alert drivers that they have veered outside the travel lane.



INNOVATION IN MOTION

2015 STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREAS

DATA TRENDS : 2007 TO 2014 IMPAIRED DRIVING FATALITIES & SERIOUS INJURIES

- 72% were male
- 59% occurred on a Friday, Saturday, or Sunday
- 51% were in roadway departure crashes
- 47% occurred during dark (unlit) conditions
- 45% occurred in New Castle County
- 38% were 20 to 29 years old
- 29% were unrestrained motorists
- 28% occurred between 12 AM and 3 AM
- 25% occurred on principal arterials
- 15% involved speeding

Source: 2015 Delaware Strategic Highway Plan

DATA TRENDS : 2007 TO 2014 UNRESTRAINED MOTORIST FATALITIES & SERIOUS INJURIES

- 68% were male
- 67% were drivers
- 56% of all fatalities in Sussex County were unrestrained motorists
- 49% were in roadway departure crashes
- 47% were in impaired driving crashes
- 41% occurred on a Saturday or Sunday
- 34% were 20 to 29 years old
- 31% were impaired drivers
- 24% occurred between 12 AM and 3 AM
- 19% involved speeding

Source: 2015 Delaware Strategic Highway Plan

PREVENTING IMPAIRED DRIVING

In Delaware, a driver is considered legally impaired if their blood alcohol limit is 0.08% or higher, and that level drops to 0.02% for drivers under the age of 21. Delaware is implementing a comprehensive public education campaign along with enforcement operations to keep drunk drivers off the road. Drivers charged with a DUI face strict penalties, including the loss of a driver's license for at least 12 months, installation of ignition interlocking devices that over-ride manual ignition if the driver's breathalyzer detects impairment, and mandatory participation in an alcohol abuse education and treatment program.

INCREASING SEAT BELT USAGE

Seat belts are one of the best defenses against serious injury during a crash, and wearing a seat belt is required by law in Delaware. Seat belt usage in Delaware has generally increased since establishing the primary seat belt law and reached 92% in 2014. However, 43% of vehicle occupant fatalities and 13% of vehicle occupant serious injuries from 2007 through 2014 were unrestrained motorists. Delaware is striving to achieve 100 % compliance with the seat belt law through a comprehensive public education campaign, targeted enforcement campaigns, and supporting legislative enhancements to strengthen the law.

2015 STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREAS

IMPROVING MOTORCYCLE SAFETY

Motorcyclists are more at risk of serious injury or fatality and represent a disproportionately high number of serious crashes in Delaware. In 2014, the death rate for motorcyclists was 6.6 per 10,000 registrations, whereas the death rate for all registered vehicles was 1.4. In Delaware, motorcyclists account for 14% of all fatalities and 11% of all serious injuries from 2007 through 2014.

Delaware law requires a motorcycle education course and special license to operate a motorcycle, and riders under the age of 19 are required to wear a helmet. Riders over the age of 18 are required to own a helmet, but are not required to wear one. An education campaign is active throughout the state, and DelDOT is supporting legislative efforts to strengthen safety laws and enforcement efforts. DelDOT is also improving advanced warning signage for motorcycle safety.

SPEEDING

Speeding, aggressive driving, and driving too fast for roadway conditions are behaviors that present a danger to other drivers. Speeding is often a contributing cause of serious accidents that also involve other dangerous behaviors, such as impaired driving or not wearing seat belts. Inclement weather, poor visibility, heavy traffic or work zones may require motorists to drive slower than posted limits to remain safe. DelDOT is conducting a public safety campaign to educate drivers about safe driving and is working to provide consistent engineering design and speed limit signage to meet driver expectations. DelDOT is also supporting enforcement efforts and strengthening legislation to decrease speeding.

DATA TRENDS : 2007 TO 2014 MOTORCYCLE

FATALITIES & SERIOUS INJURIES

- 88% were male
- 54% occurred on a Friday, Saturday or Sunday
- 47% occurred in June, July, or August
- 45% were not wearing a helmet
- 34% were in single-vehicle crashes
- 34% occurred at an intersection
- 32% occurred between 3 PM and 7 PM
- 28% occurred within a horizontal curve
- 26% occurred on principal arterial roadways
- 24% were 40 to 49 years old
- 24% were in roadway departure crashes
- 17% were impaired drivers (or riding with an impaired driver)

Source: 2015 Delaware Strategic Highway Plan



INNOVATION IN MOTION

2015 STRATEGIC HIGHWAY SAFETY PLAN

EMPHASIS AREAS

PEDESTRIAN SAFETY

In Delaware, a large portion of pedestrian crashes occur on high-speed, multi-lane suburban corridors that have significant transit usage and are adjacent to commercial and residential land uses. Pedestrian fatalities accounted for 20% of all fatalities and 8% of all serious injuries from 2007 through 2014. From 2015 to 2016, Delaware improved from highest to fifth highest pedestrian fatality rate per 100,000 population of all states.

DelDOT is conducting pedestrian safety audits in high-accident locations and implementing safety improvements where possible. These include strategies such as increasing lighting, adding new crosswalks and refreshing crosswalk paint, and extending sidewalks. Pedestrian needs are also a primary consideration in the design of new roadway projects. DelDOT is also proactively making improvements to problem areas outside of high-accident locations and conducting follow-up safety assessments after improvements are installed.



DELAWARE HAD THE **5TH HIGHEST PEDESTRIAN FATALITY RATE** IN THE UNITED STATES IN 2016



2016 DELAWARE AVERAGE - 2.83 FATALITIES PER 100K POPULATION

2016 U.S. AVERAGE - 1.92 PER 100K POPULATION

Source: Pedestrian Traffic Fatalities by State (GHSA)

2015 STRATEGIC HIGHWAY SAFETY PLAN

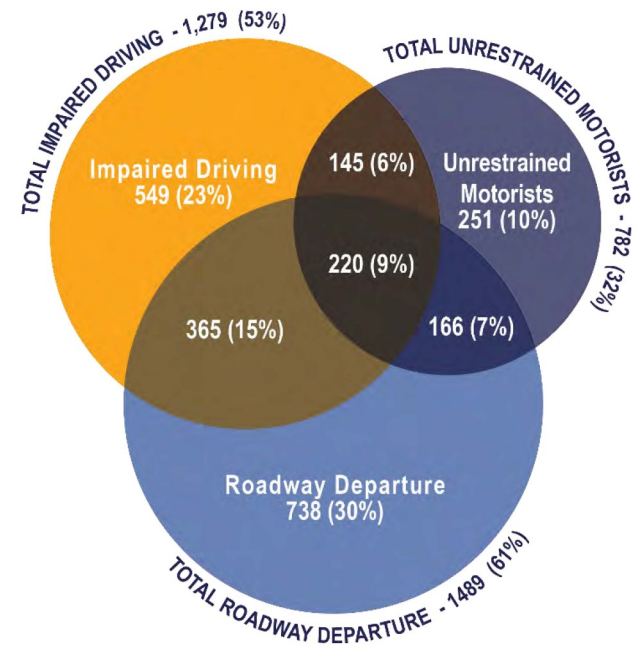
EMPHASIS AREAS

OVERLAPPING EMPHASIS AREAS

A single crash is frequently the result of multiple behavioral, environmental and infrastructure related factors working together. Understanding how emphasis areas overlap is important to identifying the most effective strategies to reduce fatalities and serious injuries, since a strategy for one emphasis area could contribute to improvements in another emphasis area.

For example, strategies to reduce roadway departure crashes (e.g., rumble strips and high friction surface treatments) could contribute to reductions in impaired driving crashes. Fatality and serious injury data was reviewed to determine which emphasis areas most frequently overlap. The three most common overlapping emphasis areas in Delaware are roadway departure, impaired driving and unrestrained motorists. Nearly 40% of all fatalities and serious injuries since 2007 in Delaware involved at least one of these three factors.

OVERLAPPING EMPHASIS AREAS



Percentages shown above represent the portion of the total fatalities and serious injuries (2,434 total) of the three emphasis areas.

39% of **ALL** fatalities and serious injuries between 2007 and 2014 (6,171 total) involved at least one of these three emphasis areas.



INNOVATION IN MOTION

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TRANSPORTATION SYSTEM

SUMMARY

The Delaware Department of Transportation (DelDOT) is responsible for planning, designing, building, maintaining and managing the transportation system throughout the state. The transportation system is made up of all modes and includes pedestrian, bicycle, motor vehicle, rail, transit, freight, marine, and aeronautic facilities. The system also includes utilities, environmental features, and maintenance facilities. Overall, DelDOT is responsible for:

- 13,954 lane miles of highways
- 1,722 bridges and one ferry
- Over 1,100 signals
- Over 300,000 signs
- Over 300 miles of fiber optic cable, over 700 Intelligent Transportation System devices which include 153 cameras
- 2,900 pedestrian signal push buttons
- 54 toll lanes
- 130 buildings
- 4,814 miles of ditches
- 1,790 miles of storm drains
- 129,030 drainage structures (inlets and manholes)
- 560 stormwater management facilities
- Average of 9,796 vehicles inspected each week
- 41 SEPTA weekday trips in Delaware
- 247 Fixed Route buses
- 297 Paratransit buses



WHERE IS DELAWARE NOW?

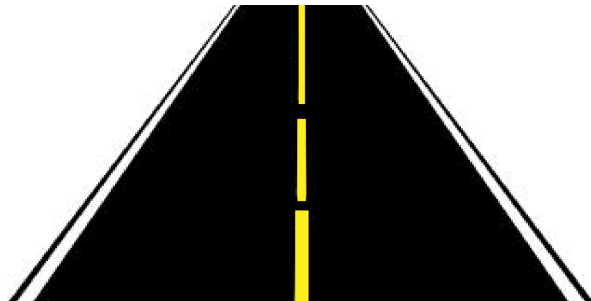
TRANSPORTATION ASSETS

STATE MAINTAINED ROADWAYS (2017)

ROADWAY TYPE	MILES
INTERSTATE	40.6
PRINCIPAL ARTERIAL - OTHER FREEWAYS & EXPRESSWAYS	56.2
PRINCIPAL ARTERIAL - OTHER	313.9
MINOR ARTERIAL	310.3
MAJOR COLLECTOR	796.2
MINOR COLLECTOR	325.5
LOCAL	2,055.5
SUBDIVISION	1,526.3
SUBTOTAL	5,424.5
NON-STATE MAINTAINED	1,027.9
TOTAL	6,452.4

Source: DelDOT, 2018

84% OF THE ROADS IN DELAWARE ARE **OWNED**
AND **MAINTAINED** BY DELDOT.



DART FIRST STATE RIDERSHIP

DART FIRST STATE BUS AND SEPTA RIDERSHIP, FY 2015 - 2017



	FIXED ROUTES	PARATransIT	SEPTA	SYSTEMWIDE
2015	9,258,207	998,920	1,273,950	11,531,077
2016	8,401,294	981,677	1,240,830	10,623,801
2017	7,512,218	953,234	1,128,094	9,593,546

Source: DelDOT Delaware Transit Corporation

TRANSIT RIDERSHIP HAS **DECLINED**
BY **17%** SINCE 2015



WHERE IS DELAWARE GOING?

VEHICLE MILES TRAVELED (VMT) IN DELAWARE

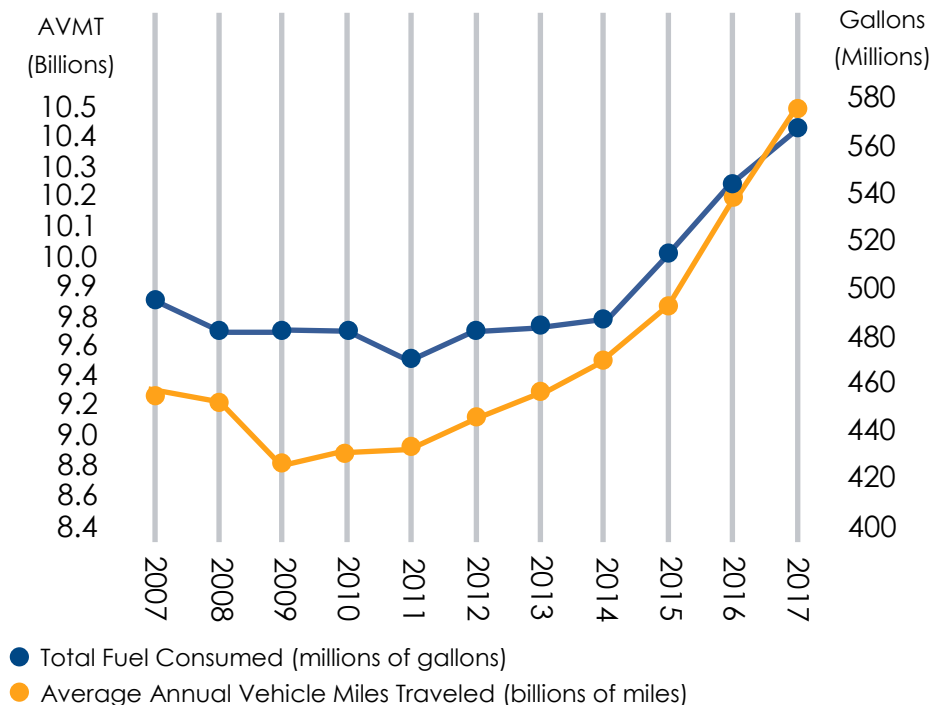
VMT IS PROJECTED TO **INCREASE 22%** BY 2040

AVERAGE ANNUAL VEHICLE MILES TRAVEL, 2015 - 2017



Source: DelDOT Planning

FUEL CONSUMED VS. AVERAGE VEHICLE MILES TRAVELED, 2007 - 2017



The term "vehicle miles traveled" is often used to measure the total amount of travel in a given area, such as a county or state. The amount of travel is an important indicator for transportation, economic and social analyses. VMT is usually measured according to a 24-hour "typical day" or over the course of an entire year. For example, the odometer of a car could be used to measure the "total travel" of a specific vehicle for a one-year period.

VMT is affected by several factors, including:

- The number and types of trips people make in a typical day or week
- Overall trip lengths of various trip purposes
- Mode choice decisions to use cars, buses, bikes or walking
- Number of vehicles available, or owned, in a household
- Annual trends in population, housing units and job growth

In future years, annual VMT is anticipated to grow faster than fuel consumption (see graph at left). VMT will continue to grow from people continuing to drive vehicles slightly more each year and from the continued growth of new residents coming to Delaware. While total fuel consumption for the state will grow, it will be at a slower rate due to continued increases in fuel efficiency of engines, trends toward smaller engines, additional transit, bike and pedestrian trip patterns, increased shared mobility, and increasing use of electric or alternative fueled vehicles.

WHERE IS DELAWARE GOING?

AIR QUALITY

The Federal Clean Air Act created new requirements on state and regional transportation agencies linking project funding, environmental approvals, and the project implementation phasing process (such as right-of-way, preliminary design, and construction steps) to achieving national air quality goals.

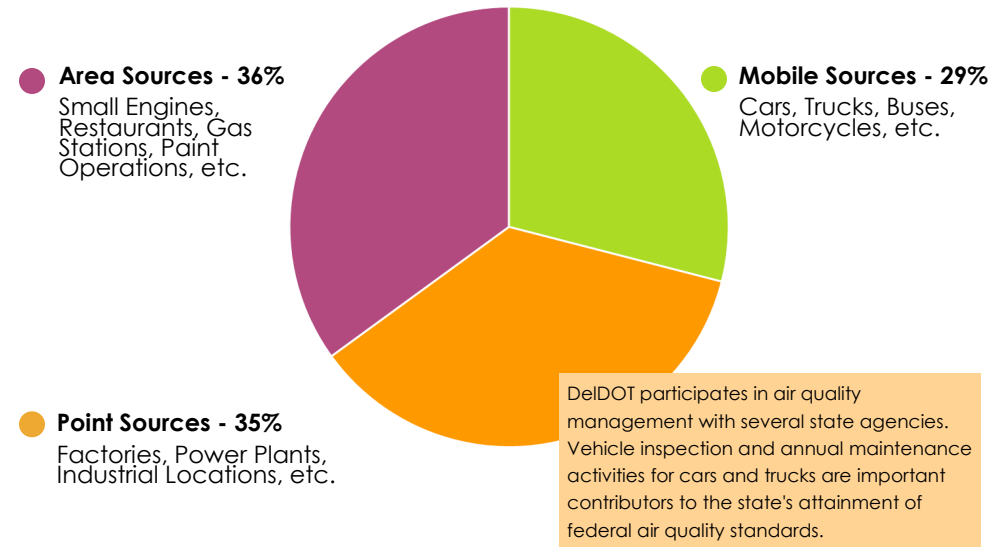
Transportation-related emissions come mostly from internal combustion engine exhaust gases and from evaporative gases during refueling. Transportation emissions are called “mobile sources” and are about one-third of total emissions in a given state. Area sources (generally “smaller” sources like lawn mowers) and point sources (usually “large sources” like industrial plants) contribute about one-third, each, as well.

Delaware has managed its transportation emissions by improving transit and ridesharing services, as well as implementing effective statewide annual vehicle inspection programs. Drivers are encouraged to maintain vehicles in peak condition to minimize engine-related emissions. These activities ensure Delaware remains in compliance with Federal regulations.

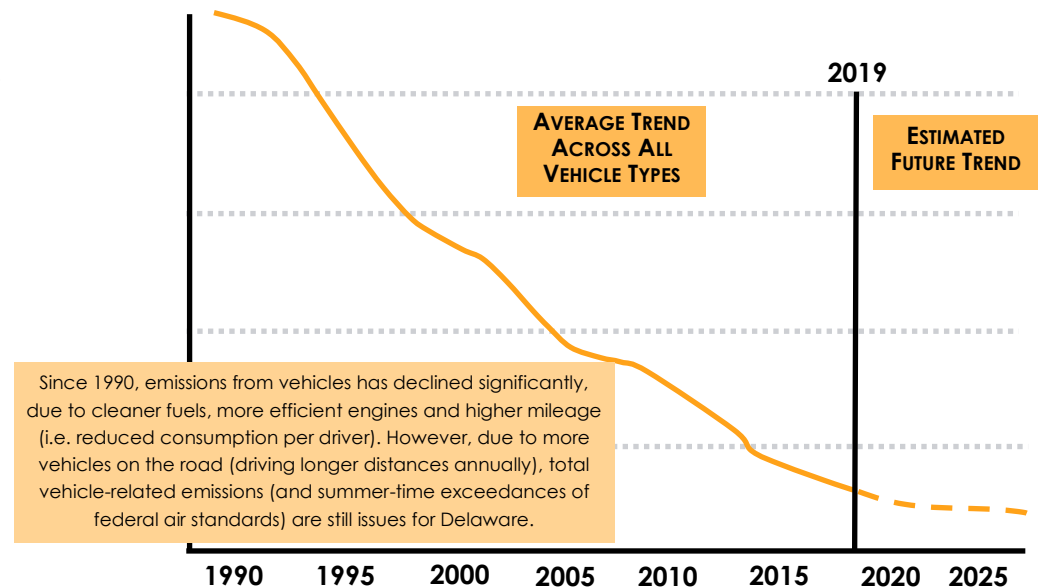
Delaware is one of about 40 states with overall air pollution levels higher than those allowed by federal standards. A challenge for Delaware is that a major portion of our air pollution originates outside the state.

The so-called “transportation conformity process” connects the approval of Federal transportation funds, planned or proposed projects, and national air quality goals. Through conformity, transportation projects are examined to estimate their relative impacts on increasing or decreasing overall vehicle-related emissions. Individual projects must not exceed designated targets or “budgets” for emissions or funding and construction activities can be affected.

WHERE DO AIR EMISSION POLLUTANTS COME FROM IN DELAWARE?



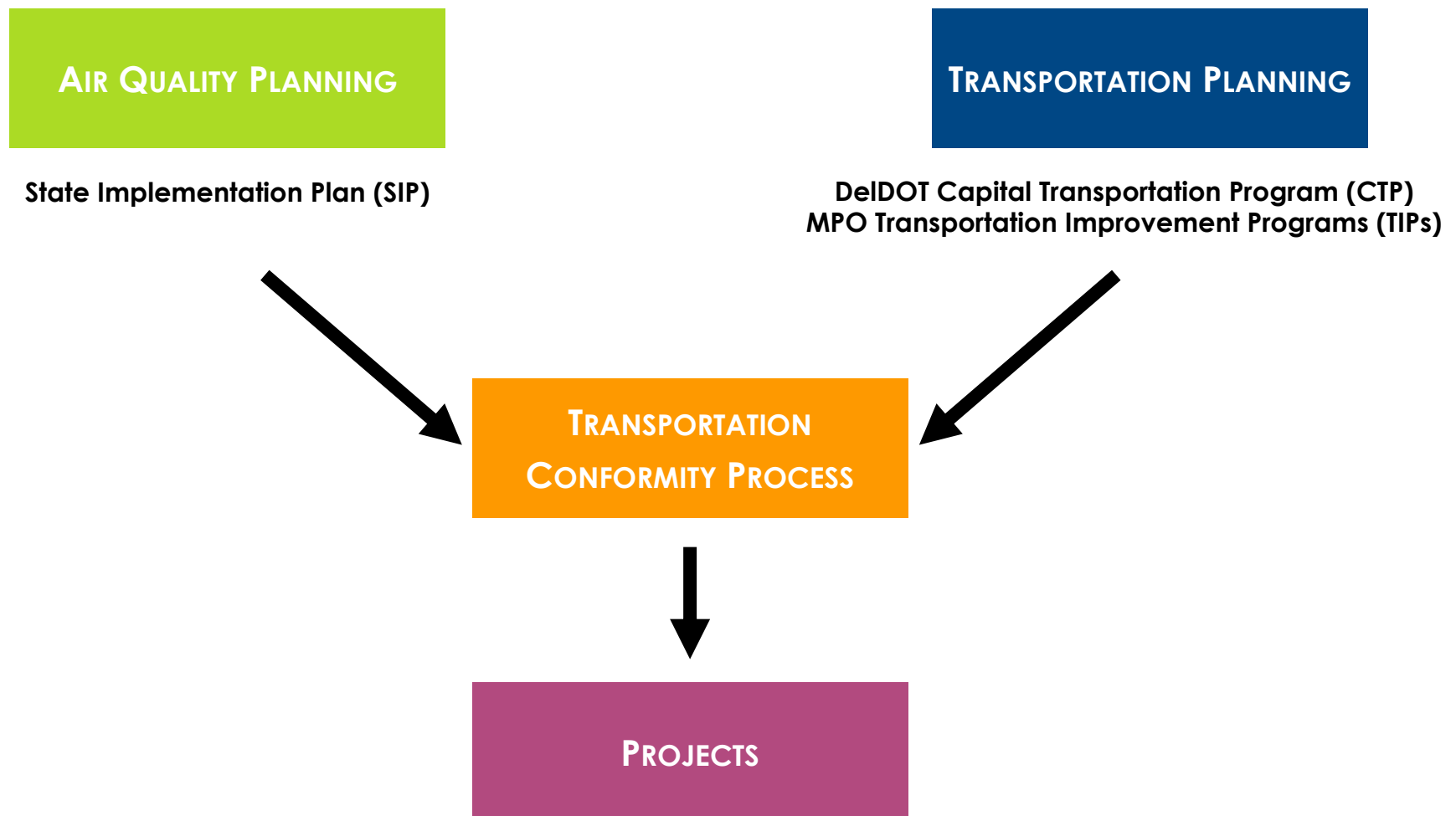
AVERAGE DELAWARE MOBILE SOURCE EMISSION RATE (GRAMS EMITTED PER MILE) 1990 - 2025



WHERE IS DELAWARE GOING?

AIR QUALITY AND PLANNING

The so-called "transportation conformity process" connects the approval of Federal transportation funds, planned or proposed projects, and national air quality goals. Through conformity, transportation projects are examined to estimate their relative impacts on increasing or decreasing overall vehicle-related emissions. Individual projects must not exceed designated targets or "budgets" for emissions or funding and construction activities can be affected.



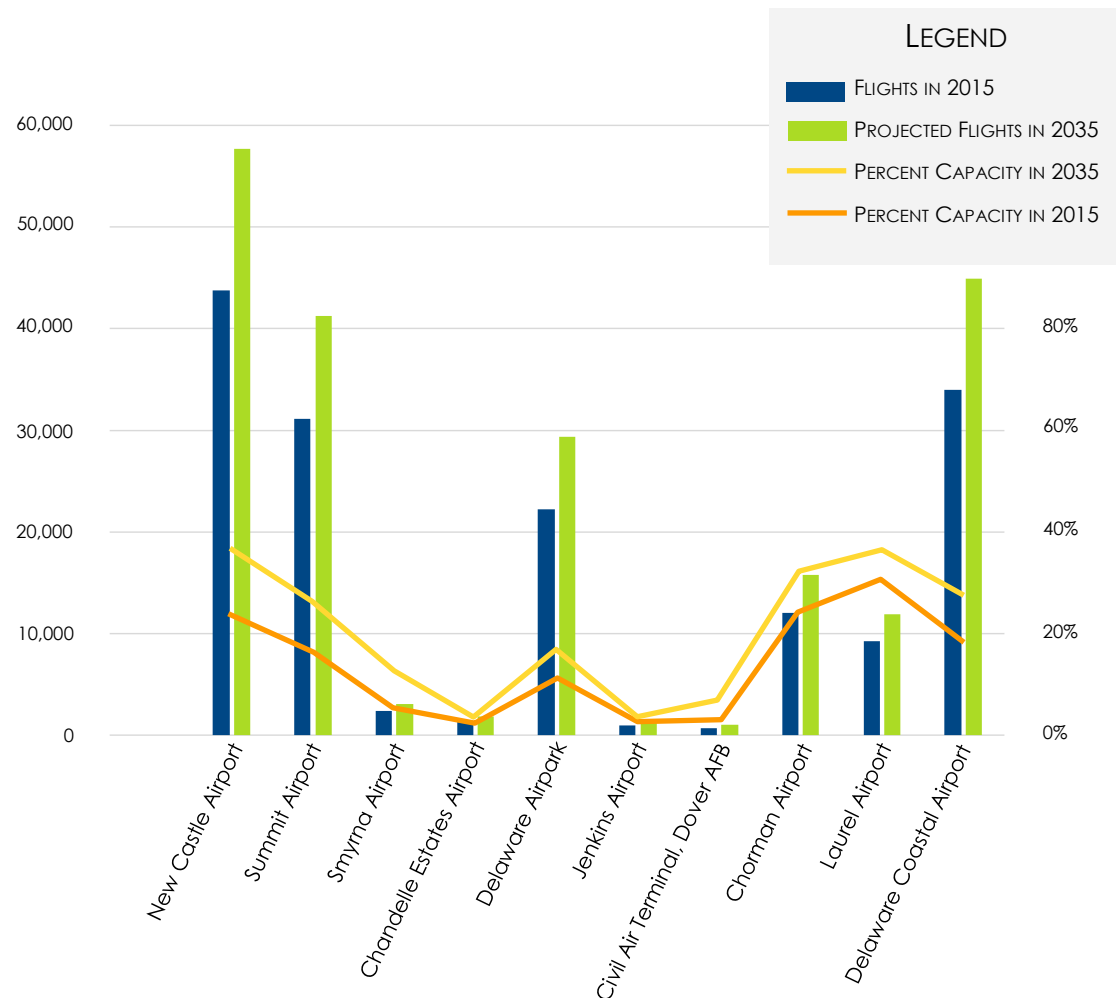
WHERE IS DELAWARE GOING?

AERONAUTICS

PUBLIC AIRPORTS ARE PROJECTED TO AVERAGE
19% CAPACITY IN 2035, UP FROM 14% IN 2015.



TOTAL PUBLIC AIRPORT FLIGHTS 2015 - 2035 (PROJECTED)



DRONE AIRCRAFT

Drones are remotely operated aircraft or unmanned aerial vehicles (UAVs) with many potential uses. DelDOT is already starting to use drones for **aerial photography** and **inspections**. The public is also starting to use drones for **surveillance**, **monitoring**, **cinematography** and **recreational racing**. Drones may become important tools to **deliver emergency medical supplies** and **consumer goods** and could be used as a means of **personal transportation** in the future.

DelDOT participated in a one-year Unmanned Aircraft Systems (UAS) Task Force in 2015 that was tasked with encouraging the development of the UAS industry in Delaware, public education and advocating for training programs at the state's colleges and universities.



INNOVATION IN MOTION

WHERE IS DELAWARE NOW?

TRANSPORTATION PLANNING

The federal government's Surface Transportation Laws and Regulations require metropolitan urbanized areas with populations of 50,000 or more to organize metropolitan planning organizations (MPOs). Delaware's MPOs work with DelDOT to develop region-wide coordinated programs, projects and long range plans. The MPOs develop a Transportation Improvement Plan (TIP) that aligns with the first three years of Delaware's CTP. MPOs monitor efforts on all projects within their region that use federal funding. Each MPO has a Technical Advisory Committee made up of civic, business, environmental and private transportation provider interest groups. Portions of Delaware are part of three different MPO regions, as shown on the map on this page.

DELDOT'S STATEWIDE PLANNING EFFORTS INCLUDE:

LONG RANGE TRANSPORTATION PLAN

- Plans for a twenty year outlook; last updated in 2011
- Defines statewide policies and principles
- Identifies primary goals and priorities
- Establishes performance measures and targets

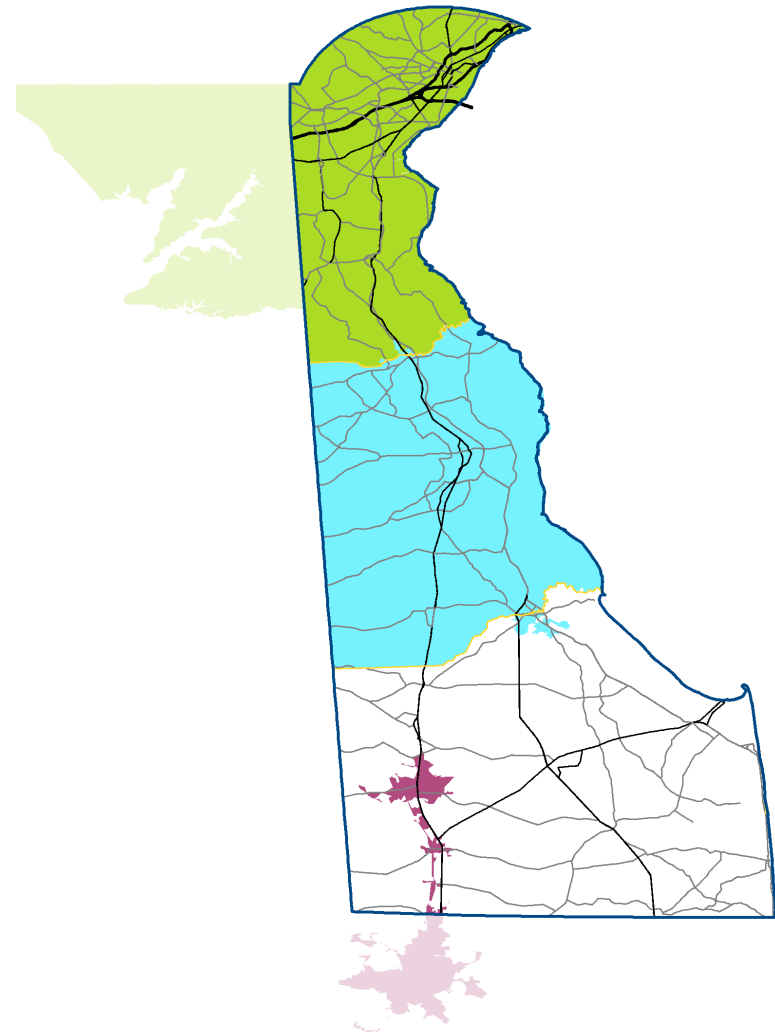
CAPITAL TRANSPORTATION PROGRAM (CTP)

- Updated annually to identify specific projects for a six year horizon
- Determines time frame and costs for upcoming projects

OTHER RECENT STATEWIDE PLANS

- DelDOT Project Prioritization Criteria (2013)
- Americans with Disabilities Transition Plan (2014)
- Delmarva Freight Plan (2015)
- Delaware Strategic Highway Safety Plan (2015)
- Unmanned Aircraft System Operational Policy (2016)
- Initial Transportation Asset Management Plan (2018)

MPO BOUNDARIES



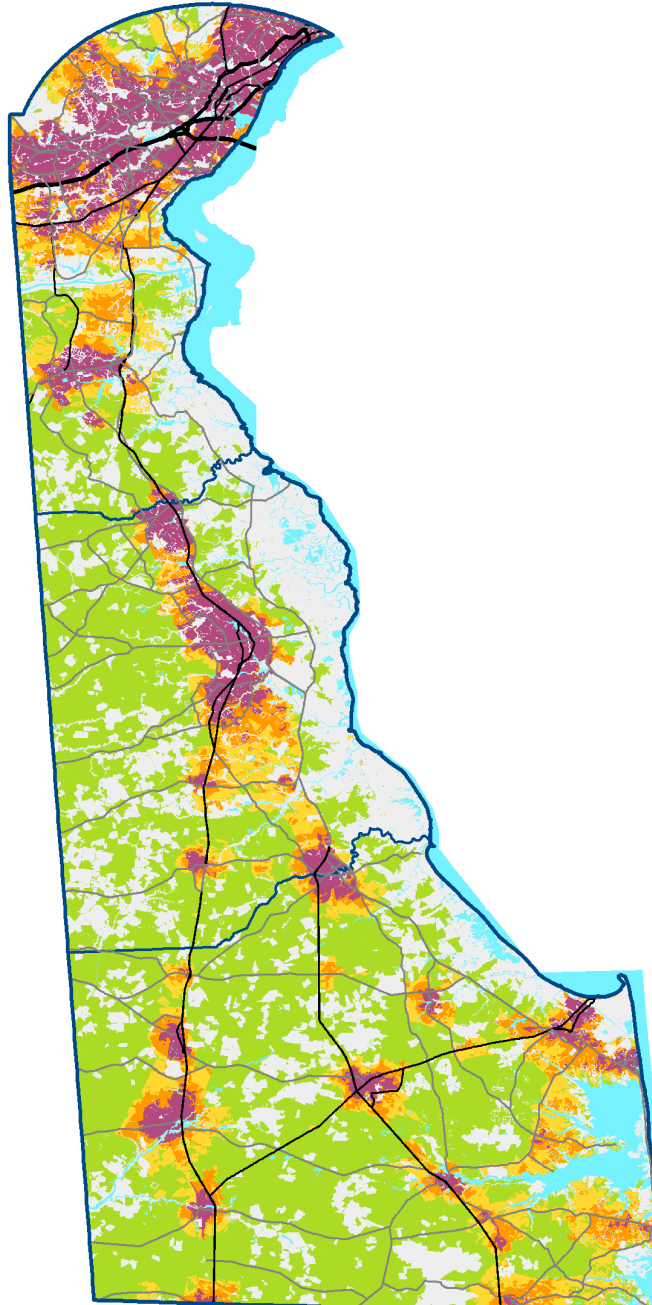
WHERE IS DELAWARE GOING?

LEVELS OF STATE INVESTMENT

Land use decisions in Delaware are made at the local level. However, the State provides infrastructure and many services to support development growth and is directly affected by land development patterns. Sprawling development is more costly to taxpayers and creates greater impacts on the environment.

Intergovernmental collaboration is important in cases where one agency's decision affects the responsibility of other agencies. DelDOT's transportation network is directly affected by land use decisions. Unlike most other states, Delaware operates and maintains about 84 percent of the roads as compared to a national average of 20 percent. Development patterns have a direct affect on traffic and the overall operation of the transportation network.

The *Delaware Strategies for State Policies and Spending* sets guidelines for land use decisions that direct development to areas where the state can prioritize infrastructure and support growth. The state will invest in infrastructure that supports the appropriate development patterns for each level.



INVESTMENT LEVELS

LEVEL 1

Higher-density urbanized areas where multimodal transportation options and community enhancements are prioritized.

LEVEL 2

Growing suburban areas that prioritizes mixed land uses and multimodal transportation options.

LEVEL 3

Outlying suburban areas designated for long-term growth.

LEVEL 4

Rural areas where preservation of agriculture and open space is prioritized.

OUT OF PLAY

Protected land not available for private development.



INNOVATION IN MOTION

WHERE IS DELAWARE GOING?

THE TRANSPORTATION AND LAND USE CHARACTER TRANSECT



WHILE DELAWARE **GROWS INTO THE FUTURE**, STATE POLICIES WILL CONTINUE TO SUPPORT **HIGHER DENSITIES IN URBANIZED AREAS** AND **PRESERVATION OF OPEN SPACE IN RURAL AREAS**. TRANSPORTATION INVESTMENTS WILL REFLECT THESE PRIORITIES. GROWTH-RELATED INFRASTRUCTURE WILL BE DIRECTED TOWARDS LEVEL 1 AND 2 AREAS, WHILE INVESTMENT IN LEVEL 3 AND 4 AREAS WILL FOCUS ON PRESERVING AND PROTECTING OPEN SPACE, AGRICULTURE AND A RURAL LEGACY. OUT OF PLAY AREAS WILL BE FOCUSED ON **ENVIRONMENTAL CONSERVATION EFFORTS**.

APPROPRIATE TRANSPORTATION INVESTMENT FOR EACH LEVEL

LEVEL 1

The transportation investment priorities are to preserve and enhance existing transportation infrastructure to improve mobility, connectivity and quality of life. Complete Street design and multi-modal investments, including pedestrian, bicycle and transit infrastructure, are important to provide efficient and effective mobility options for people of diverse needs.

LEVEL 2

These are rapidly growing areas, and the priority is to build, enhance and maintain a transportation network that provides safe and accessible connections across all modes. Capacity improvements should be balanced with creation and enhancement of multi-modal infrastructure.

LEVEL 3

Transportation investments within this level should focus on regional movement of goods and people between towns and other population centers and industrial districts. Lower priority is given to capacity improvements.

LEVEL 4

The priority within these rural areas is to preserve and maintain facilities in good working order. This priority supports the agriculture industry and helps to ensure the industry's ability to thrive into the future with minimized development pressure.

OUT OF PLAY

These areas are protected from development and include sensitive environmental resources. Transportation investments in these areas are restricted but may be developed to improve recreational access to state parks or other valuable environmental areas.



FINANCING

SUMMARY

The State Transportation Trust Fund accounts for about two thirds of the DelDOT budget, with Federal funding accounting for about one third and a small amount coming from other sources, such as local impact fees. While the state may face budget constraints overall, the Transportation Trust Fund is typically separated from other state spending programs, which helps to keep DelDOT's budget solvent and reliable. However, there are constant pressures to operate a first class transportation system, build new infrastructure, and maintain the infrastructure already in place. DelDOT therefore has to make difficult decisions when prioritizing which projects and programs will best serve the transportation needs of Delawareans.



INNOVATION IN MOTION

WHERE IS DELAWARE NOW?

DELDOT'S FISCAL YEAR **2018** FUNDING WAS
\$908.6M (INCLUDING FEDERAL DOLLARS).

STATE TRANSPORTATION FUNDING

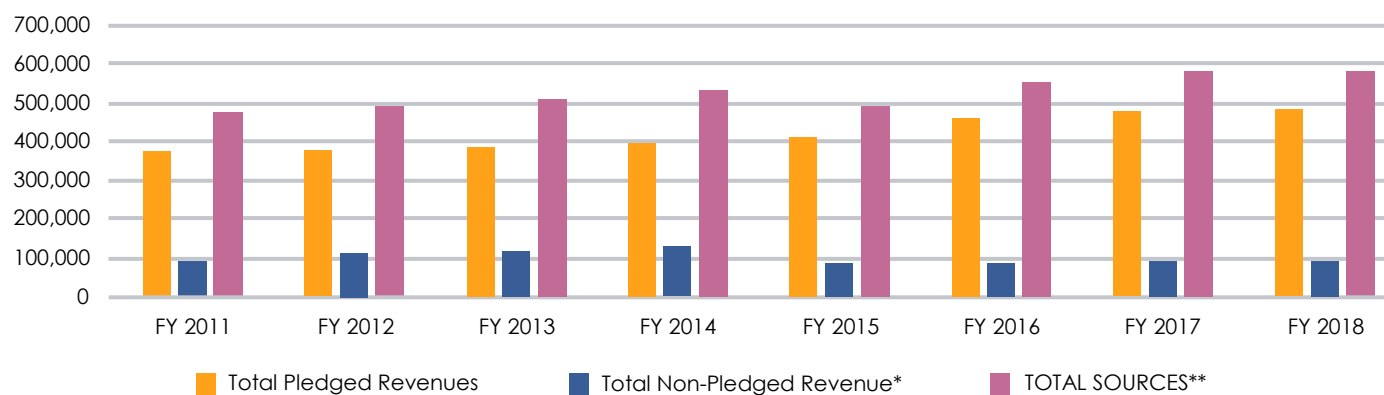
SOURCE OF STATE FUNDS (Dollars in thousands)								
Source of Funds	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Pledged Revenues								
I-95 Tolls & Concessions	115,895	117,133	120,089	122,404	120,364	132,517	136,159	135,048
Motor Fuel Tax Administration	116,612	115,877	115,008	116,928	119,663	126,521	129,645	132,894
DMV Fees	140,106	142,790	150,601	160,333	170,978	198,131	213,473	211,135
Interest Income	3,573	3,160	2,220	2,257	1,845	5,036	285	6,784
Total Pledged Revenues	376,186	378,960	387,918	401,922	412,850	462,205	479,562	485,861
Total Non-Pledged Revenue*	98,725	117,554	119,037	131,678	87,252	89,382	101,414	96,109
TOTAL SOURCES**	474,911	496,514	506,955	533,600	500,102	551,587	580,976	581,970

* Non-pledged revenues include SR1 Tolls, Transit Fares and other miscellaneous revenues.

** Does not include borrowing reported in FY2011 and FY2017

Source: DelDOT CTP FY18-23

SOURCES OF STATE FUNDS



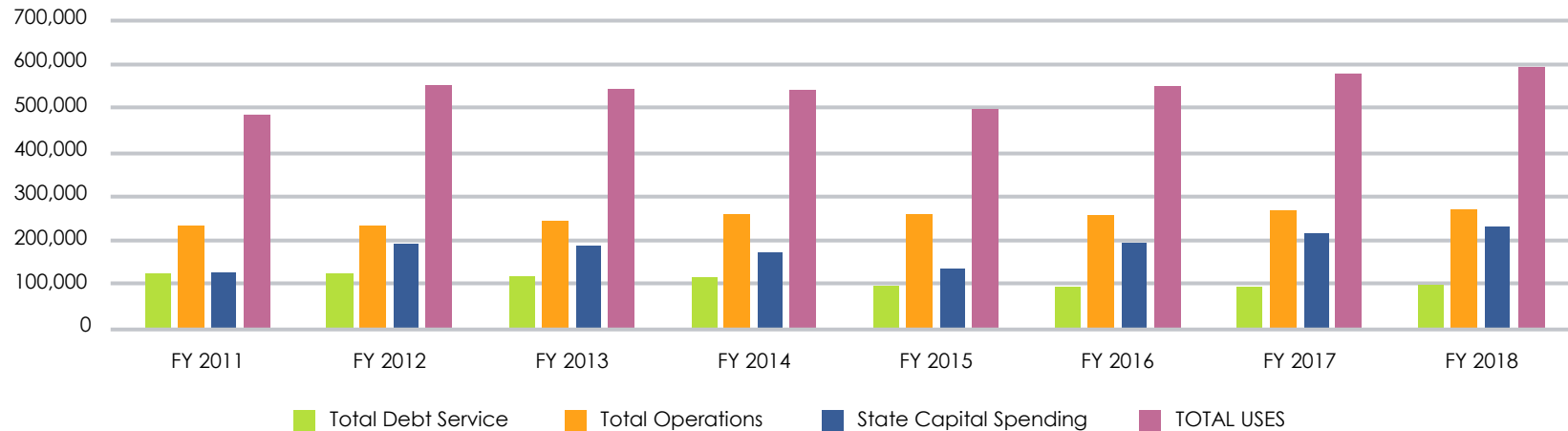
WHERE IS DELAWARE NOW?

TRANSPORTATION SPENDING

USE OF STATE FUNDS (Dollars in thousands)								
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Total Debt Service	123,823	123,743	116,410	110,328	103,776	96,126	91,760	96,795
Total Operations	232,217	237,021	241,914	260,299	262,563	257,649	267,967	272,300
State Capital Spending	127,486	191,479	188,000	171,144	136,624	196,844	217,435	233,936
TOTAL USES	483,526	552,243	546,324	541,771	502,963	550,619	577,162	603,031

Source: DelDOT CTP FY18-23

USE OF STATE FUNDS



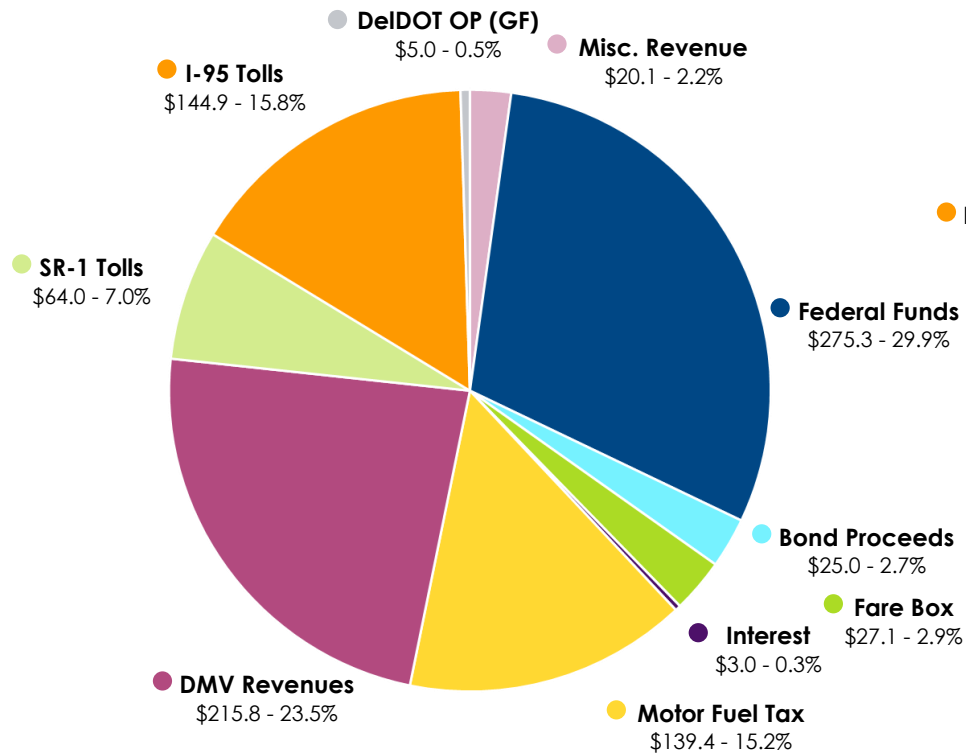
WHERE IS DELAWARE NOW?

PROJECTED REVENUE SOURCES AND USES OF DELDOT FUNDING IN FISCAL YEAR 2019

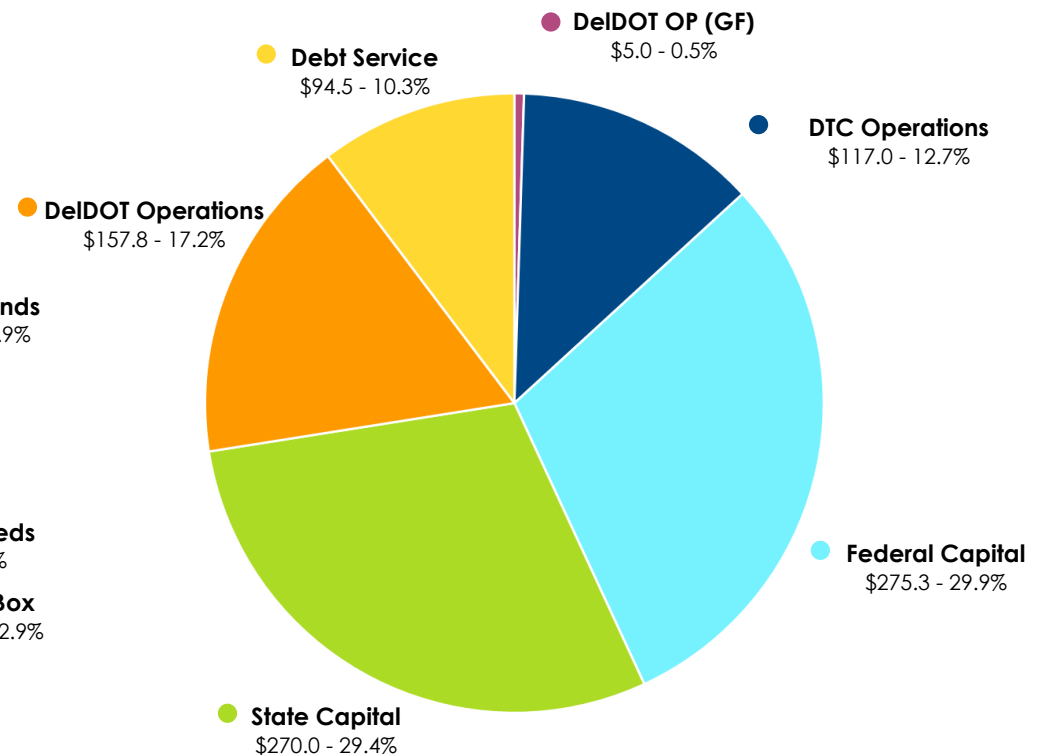
DELDOT'S PROJECTED FISCAL YEAR **2019** FUNDING
IS **\$919.6M** INCLUDING FEDERAL DOLLARS.



FY2019 SOURCES OF FUNDS - \$919.6M
(Millions of dollars)



FY2019 USES OF FUNDS - \$919.6M
(Millions of dollars)

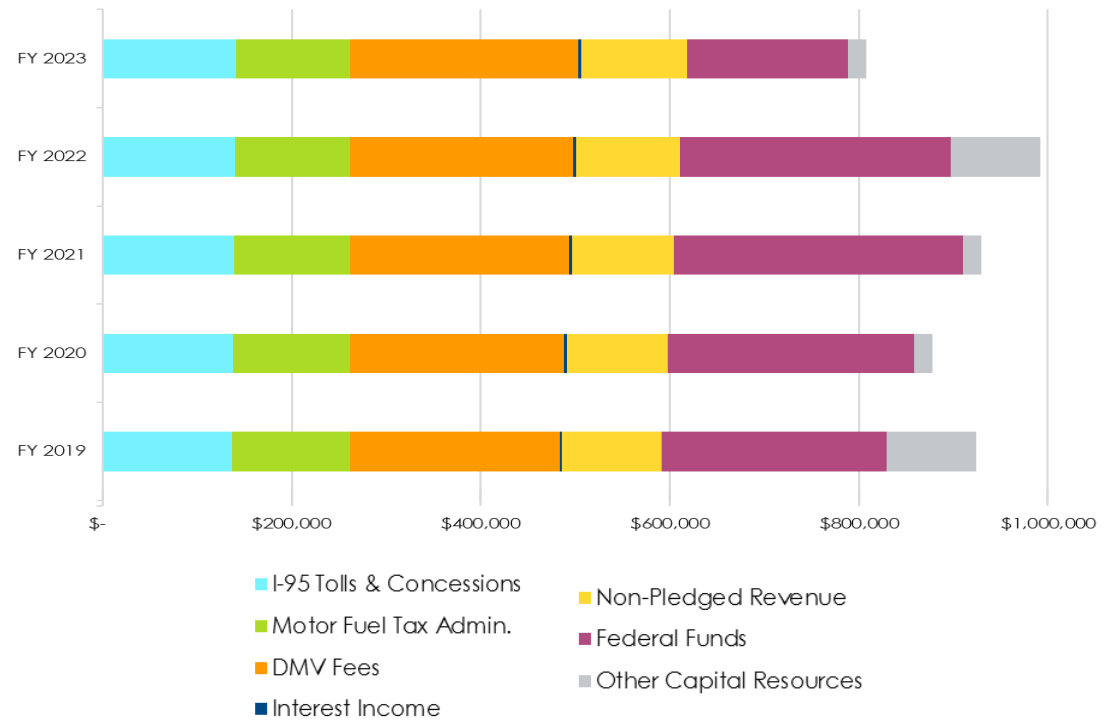


REVENUE PROJECTIONS*

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	% Change
Pledged State Revenues						
I-95 Tolls & Concessions	137,200	138,200	139,100	140,200	141,200	6%
Motor Fuel Tax Admin.	124,500	123,500	122,500	121,500	120,500	-5%
DMV Fees	221,400	226,100	231,200	236,200	241,300	14%
Interest Income	3,000	3,500	3,500	3,500	3,500	17%
Total Pledged Revenue	486,100	491,300	496,300	501,400	506,500	7%
Total Non-Pledged Revenue	104,975	106,548	108,095	109,546	111,385	10%
Total State Revenues	591,075	597,848	604,395	610,946	617,885	7%
Anticipated Additional Capital Resources						
Federal Funds	238,238	260,383	305,441	285,944	170,000	
Other Capital Resources	95,000	20,000	20,000	95,000	20,000	
Total Capital Resources	587,490	538,286	559,319	590,288	444,600	
Total Revenue	924,313	878,231	929,836	991,890	807,885	

* Dollars in Millions

DELDOT's **MOTOR FUEL TAX** REVENUES ARE EXPECTED TO **DECREASE** BY **5%** OVER THE NEXT SEVERAL YEARS, WHILE **TOLL COLLECTION** AND **DMV REVENUES** ARE EXPECTED TO **INCREASE** BY **6%** AND **14%** RESPECTIVELY.



CHALLENGES

DOWNWARD PRESSURE ON REVENUE SOURCES

Delawareans enjoy a **high-quality transportation network**, which has traditionally been well-funded and well-maintained. DeIDOT prides itself on good customer service, safety, operations, system preservation and innovation. These values will continue to be important as the transportation network evolves in the future.

It is not anticipated that many new major roads will be built, so the **existing transportation network must adapt to meet changing needs**. More investment will be required to maintain and upgrade aging infrastructure. Population growth and resulting increases in traffic will put pressure on the capacity of existing roads that have limited potential for right-of-way expansion.

Funding today comes from a variety of sources at the local, state and Federal levels. Most of DeIDOT's funding is at the state level with DMV fees, tolls, bonds, state gas taxes and fare box recovery making up the majority of revenues. The revenue from each of these sources is expected to increase in the future, except for the gas tax. The State Motor Fuel Tax funded about 13% of total DeIDOT revenues in fiscal year 2017. The Delaware legislature has set this tax at 23 cents per gallon, which is not expected to be increased for some time or to increase with inflation.

Increasing vehicle fuel-efficiency is good for the economy and the environment. However, reducing fuel consumption also reduces gas tax revenues, which may prompt DeIDOT to consider alternative revenue sources in the future.



The Federal Transportation Trust Fund accounts for about one third of DeIDOT's revenues. This source is primarily funded by the Federal Fuel Tax revenues, and the tax is currently 18.4 cents per gallon on gasoline and 24.4 cents per gallon of diesel fuel. Although support for transportation funding is typically a non-partisan issue, finding new revenue sources to make up the gap of a declining revenue source can be challenging. Furthermore,

Delaware must compete with other states for limited federal transportation funding. It is important for Delaware to attract targeted federal funding by showing a strong commitment to economic growth, environmental stewardship and fiscal responsibility.



CHALLENGES

AGING INFRASTRUCTURE

As DelDOT's infrastructure continues to age, costs for maintenance will continue to rise. DelDOT has historically prioritized maintenance and repair, and as a result, the state's transportation network remains in very good condition. However, additional revenues may be needed in the future to keep up with current standards, or new standards may be needed to more efficiently maintain the transportation network at a lower cost.



CLIMATE CHANGE

A changing climate may introduce higher risks for major storm events that can impact the transportation network and increase costs for emergency preparedness and maintenance. Storm surges, rising sea-levels and heavy rains and snow can all have an effect on DelDOT's ability to provide a high-quality and reliable transportation network. Funding for emergency preparedness will always be a DelDOT budget priority and may need to increase over time. Infrastructure in high-risk areas may need more investment for protection and to ensure public safety in case of an evacuation.



FEDERAL SHORTFALLS

According to the Pew Charitable Trust, revenue for the federal Highway Trust Fund has fallen short of expenditures for more than 10 years. This is the main source of Federal funding for transportation, and these gaps are expected to continue to grow. The Trust Fund has been drawing down since 2008, and this trend may continue without any significant new revenue in place to make up the difference.



INNOVATION IN MOTION

VALUE & OPPORTUNITIES

ARE THERE **NEW WAYS** TO INCREASE REVENUE?

How else can DelDOT get the necessary funding to build and maintain a safe and reliable transportation network that meets our changing transportation needs? There are several options that may be explored, including:

GRANTS

Transportation grants are available from the Federal government to help fund transportation infrastructure, such as Transportation Alternatives (TA) grants and Transportation Investment Generating Economic Recovery (TIGER) Grants. DelDOT will continue to pursue these grants to the maximum extent.

DEBT FINANCING

Transportation financing assistance can be used to fund large projects or initiatives

- Bonds, which can be issued at the state level through voter referendums or by the federal government. An example is the Grant Anticipation Revenue Vehicle (GARVEE) Bond that allows a state highway agency to borrow against future federal transportation investments.
- Federal Credit Loans, such as Transportation Infrastructure Finance and Assistance (TIFIA) Loans have specific criteria to meet loan requirements, but can be used to help fund major projects
- Infrastructure Banks are revolving investment funds that are established and administered by states and offer a range of loans for transportation projects or mitigation bank opportunities. Such funds give states the capacity to more efficiently use transportation funds and leverage Federal resources by attracting other public and private investment.

USER FEES (TOLLS)

User fees are a direct charge by transportation network users, such as:

- Tolls can be increased at existing locations or expanded into new locations on the roadway network.
- Congestion pricing is a toll mechanism that prices a toll based on demand, with higher prices charged at peak times.
- Cordon Pricing is a vehicle toll for entering areas of high congestion, such as a downtown area.

GAS TAX INFLATION

Gas tax increases are often static and do not change with inflation over time. Linking a tax to the Consumer Price Index (CPI) can help keep the gas tax in line with inflation in the long term.

MITIGATION BANKING

Environmental mitigation can be a costly addition to infrastructure projects. Privately held environmental restoration sites can efficiently address mitigation needs and sell credits more cost-effectively than if DelDOT were to construct them independently.

PUBLIC PRIVATE PARTNERSHIPS (P3)

The private sector, in cooperation with a public agency under a contractual agreement, can invest in transportation infrastructure and provide management of construction, operations and maintenance. These partnerships often include a revenue mechanism, such as tolls, to finance the P3.

VALUE & OPPORTUNITIES



MULTI-MODAL INVESTMENTS

Infrastructure for multi-modal transportation, such as walking, biking and transit, can be more cost-effective than investing in single-occupancy vehicle infrastructure because these modes require less space and can accommodate higher trip densities.

New development and redevelopment should promote pedestrian-friendly environments that integrate multi-modal choices. Directing growth into urban areas further promotes various mode options by reducing the need for long trips to and from outlying areas.

TRANSPORTATION IMPROVEMENT DISTRICTS (TIDs)

The TID program defines geographic areas for the purpose of securing required improvements to transportation facilities, as described in DelDOT's Development Coordination Manual.

TID impact fees are used to efficiently and equitably finance transportation infrastructure to meet the demands of communities where new and infill development are occurring.

The TID program is explained in detail in the Planning & Land Use section of Part II in this Plan.

INNOVATIVE TECHNOLOGIES

New transportation technologies have the potential to dramatically change travel behavior in the next 20 years.

Autonomous vehicles have the potential to increase vehicle miles travelled resulting in increased fuel tax revenues. Societal economic benefits will also be realized through enhanced safety, such as reduced collisions. However, it is expected that traffic congestion and air pollution could become worse as autonomous vehicle technologies become more prevalent.



INNOVATION IN MOTION

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SECTION C - VISION

WHERE DOES
DELAWARE WANT
TO GO?



INNOVATION IN MOTION

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WHERE DOES DELAWARE WANT TO GO?

CHALLENGES, VALUE & OPPORTUNITIES

DelDOT offers value to its customers across all modes of transportation. DelDOT is also well positioned to benefit from a variety of opportunities from existing state policies and lead the state in innovative technologies and programs.

DelDOT is also anticipating and strategizing for challenges facing Delaware. Understanding projections and trends allows DelDOT to allocate resources and priorities to address the ever changing needs of its customers.

The following pages consolidate the values, opportunities and challenges presented in this document, which DelDOT will use to inform the development of implementation strategies described in the second part of this plan.



INNOVATION IN MOTION

CHALLENGES

INCREASING VMT

Vehicle Miles Traveled (VMT) is a measurement of miles traveled by vehicles within a specified region for a specified time period. VMT in Delaware is expected to increase for the following reasons:

- Increasing truck traffic
- Seasonal tourism traffic
- Population growth
- Sprawling development

Increasing VMT will lead to increased congestion, emissions and decreasing travel time reliability.

FINANCING

Funding for Delaware's transportation system comes from a variety of sources at the local, state, and federal level, with most coming from the state level. A major component of this funding comes from the gas tax which is increasingly becoming a less reliable funding source due to inflation, fuel-efficient vehicles and alternative modes of transportation becoming more popular.

The Federal Highway Trust Fund, the main source of federal funding for transportation, has also fallen short of expenditures for more than 10 years with shortfalls anticipated to grow.



AGING POPULATION

According to the Delaware Population Consortium, 24% of Delaware's population will be 65 or older in 2040, which highlights the need for enhanced accessibility and quality transit systems to better serve older Americans that may have physical limitations affecting their ability to drive.

In eastern Sussex County, lower-wage workers employed in age- and tourism-related services are increasingly unable to afford housing near their places of employment. This trend contributes to traffic congestion challenges.

AGING INFRASTRUCTURE

Aging infrastructure is a challenge facing the transportation system everywhere, including Delaware. Deficiencies or failures in the existing freight rail or water networks could reduce or eliminate rail or barge travel, resulting in impacts to local businesses and supply chains. The aging of roadways and bridges throughout the state also creates ongoing maintenance concerns.

CHALLENGES



PEDESTRIAN SAFETY

Delaware's per capita pedestrian fatality rate is one of the highest in the nation. This highlights the need for enhanced pedestrian safety throughout the state. A large portion of pedestrian crashes occur on high-speed multi-lane suburban corridors that are surrounded by commercial and residential land uses.

DelDOT is proactively addressing pedestrian safety by identifying the causes of crashes and developing a variety of safety enhancement projects.

TRANSIT RIDERSHIP

Declining transit ridership is a challenge facing the state of Delaware. Ridership has declined 17% between 2015 and 2017. This decline could be due to a combination of reasons including:

- Convenience
- Reliability
- Decreasing gas prices
- Weather

Addressing the causes of decreasing ridership is crucial to reducing VMT, emissions and traffic congestion.

CLIMATE CHANGE

The changing climate may introduce risks for major storm events that can have an impact on the transportation network and increase costs for emergency preparedness and maintenance repairs. DelDOT is currently undertaking an evaluation of Infrastructure located in high-risk areas is to determine appropriate levels of future investment.



INNOVATION IN MOTION

VALUE & OPPORTUNITIES



EXISTING PLANS & POLICIES

DelDOT's existing plans and policies ensure that our programs are implemented effectively, efficiently and in the best interest of DelDOT's customers. **Innovation in Motion** will compile the main components of these policies and plans, which will allow DelDOT to enhance coordination both internally and with our transportation partners.

The goals presented in this Plan will help to guide the agency in updating our plans and policies to keep pace with transportation trends and challenges.

MILLENNIAL TRANSPORTATION HABITS

Millennials (persons born between 1981 - 2000) are the largest population segment in Delaware. Millennials drive less compared to previous generations and often opt to use alternative modes of transportation.

DelDOT will strive to offer alternative mode choices that accommodate the changing transportation preferences of the Millennial population. By responding to these trends, DelDOT may be able to reduce Vehicle Miles Traveled (VMT), which will positively impact all generations.

65+ POPULATION

Delaware's growing 65+ population is likely to cause job growth in the retail, hospitality and health care sectors that provide services for senior citizens.

As resulting demographic and employment changes occur, the transportation system will need to address the needs of both the elderly and workers employed in senior-related services.



VALUE & OPPORTUNITIES



TOURISM

Delaware's coastal towns, beaches, outdoor recreation and tax-free shopping attract visitors from outside the state bringing a boost to local businesses. In 2015, tourism generated \$3 billion in economic revenue statewide.

Although the majority of tourists arrive to the state by motor vehicle, bicycling and walking are becoming a more attractive means of transportation for visitors once they arrive. Enhancing walkability and bikability as well as transit access in resort communities and other popular destinations can help to remove some of the pressure put on local roadways by offering alternative modes of transportation.

NEW TECHNOLOGIES

DelDOT is currently working on several policies and plans to embrace a variety of new technologies that could enhance the transportation system, generate economic growth and improve quality of life. Among these new technologies are:

- Intelligent Transportation Systems (ITS)
- Unmanned Aerial Vehicles (drones)
- Automated and Connected Vehicles
- Mobile applications

PLANNED GROWTH

Delaware is actively planning for growth across the state. The *2015 Delaware Strategies for State Policies and Spending* sets guidelines for land use decisions to direct development to areas where the state can prioritize infrastructure to support growth, including transportation investments.

Encouraging higher densities in urban areas and preserving open space in rural areas will also continue to be important goals.



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WHERE DOES DELAWARE WANT TO GO?

VISION STATEMENT:

INNOVATION IN MOTION reflects DelDOT's belief and vision that embracing new technologies and efficiencies will help us find the right solutions to meet future challenges while providing the highest level of customer service possible.

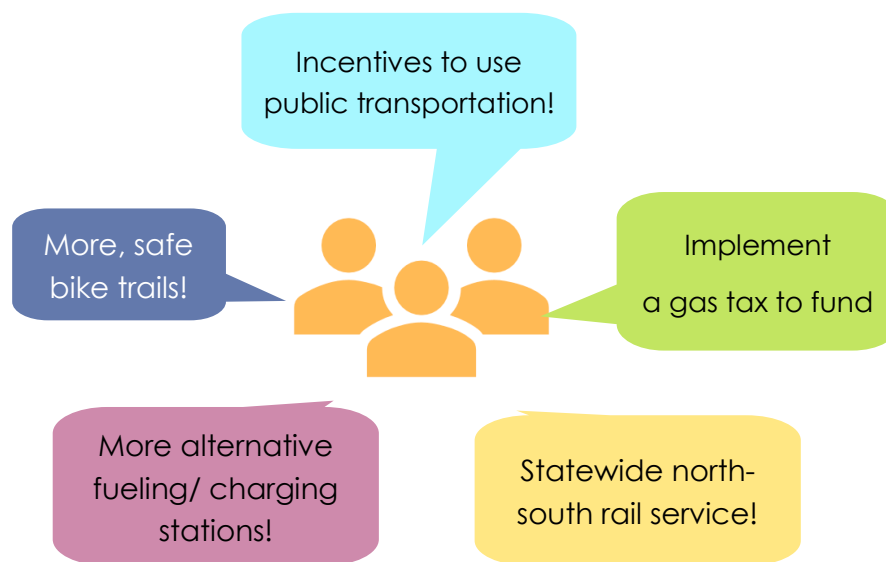


INNOVATION IN MOTION

WE ASKED OUR STAKEHOLDERS WHAT THEY WANTED – THIS IS WHAT WE HEARD:

DeIDOT asked Delaware residents and visitors to participate in a public survey to share their opinions about the current transportation services in DE and future transportation challenges. The survey was available online and in-person at several public events including the Delaware State Fair, and several other regional festivals and events throughout the state. DeIDOT received over **1,000 survey responses** from the public.

Survey participants were asked a variety of questions ranging from where they live, commuting habits, level of satisfaction with transportation services and facilities, and their opinions on the most important challenges facing the transportation system in Delaware. This section includes the summary of information gathered from the survey respondents .



SURVEY RESULTS:



Over **50%** of respondents say
DeIDOT's facilities are in **GOOD**
TO EXCELLENT condition.

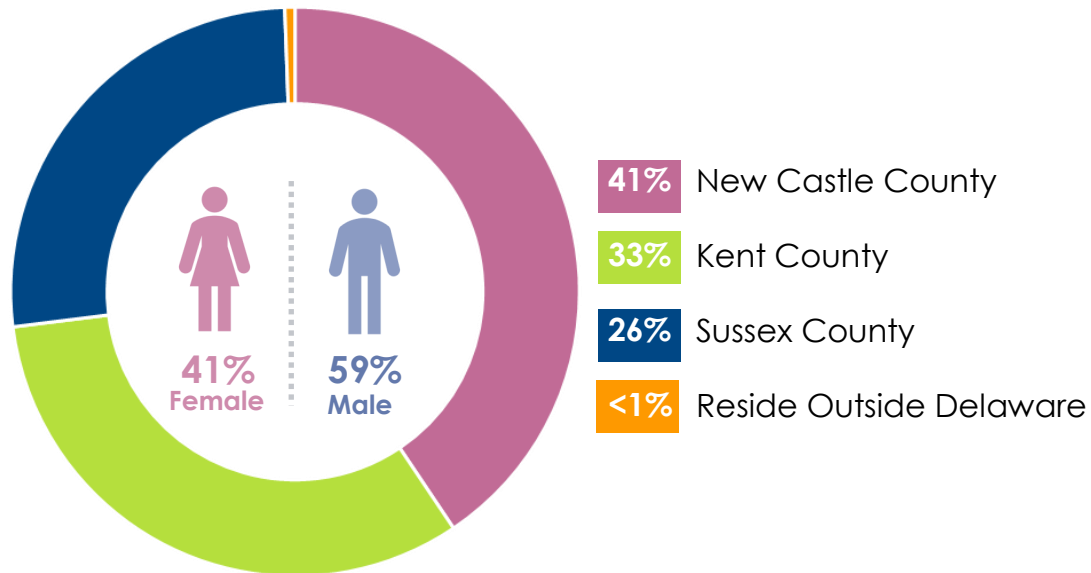


Respondents were **most**
satisfied with **SNOW REMOVAL**
and **least satisfied** with **TRAFFIC**
CONGESTION.

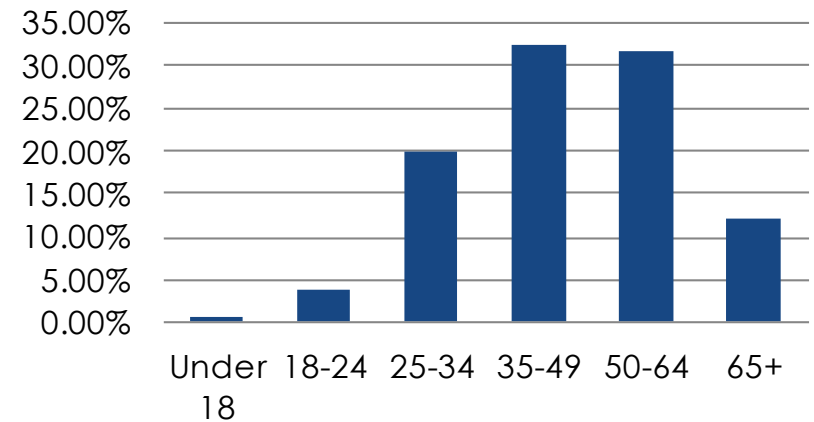
Over **43%** of respondents
agree that the transportation
network provides users with
MORE THAN ONE VIABLE
TRANSPORTATION CHOICE.



SURVEY RESULTS:



AGE RANGE



POPULAR COMMENTS



Preparation needed to begin integrating CAVs into the roadway network

Concerns about growing congestion and safety



More frequent and direct routes desired for both rail and bus services

More sidewalk connections and better crosswalks needed, especially at bus stops and major roads like Route 1

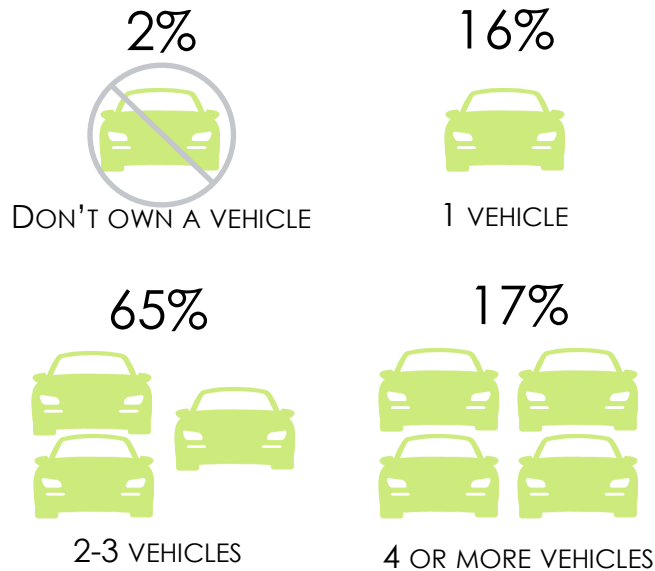


Updating infrastructure to alleviate "beach traffic"

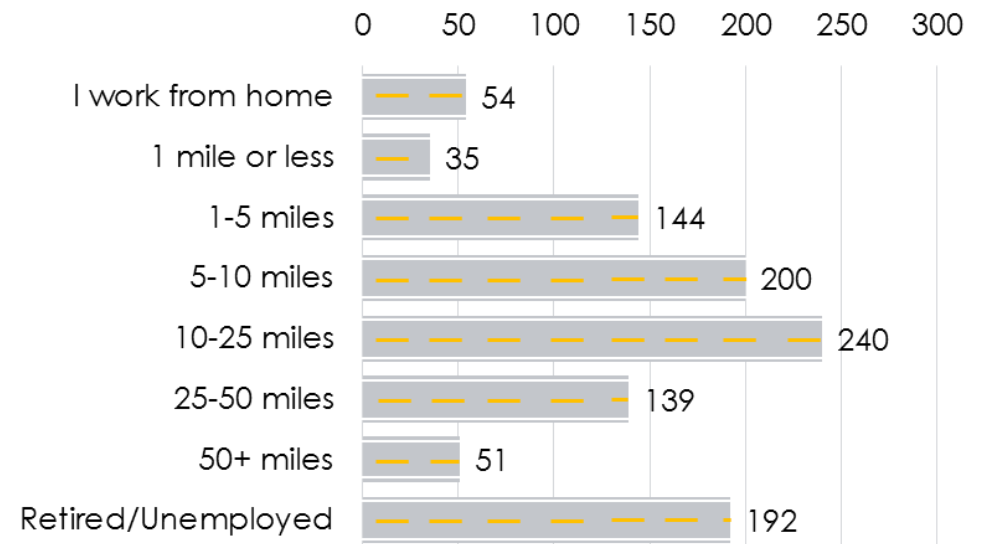
Expand system to accommodate growing population



HOW MANY VEHICLES ARE OWNED BY YOUR HOUSEHOLD?



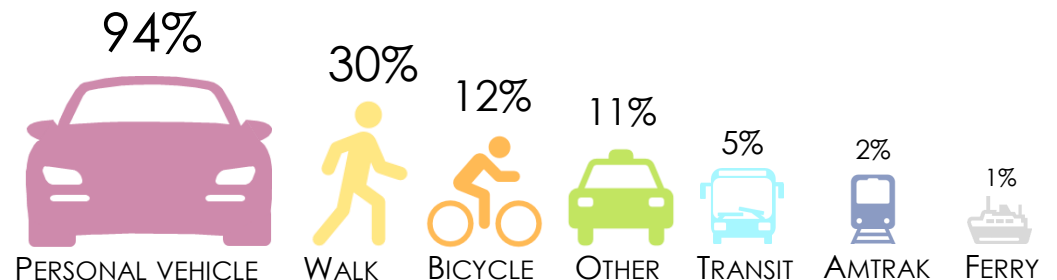
HOW MANY MILES DO YOU COMMUTE TO WORK DAILY (ONE DIRECTION)?



WHAT SHOULD BE DELDOT'S HIGHEST PRIORITIES?

- #1 SAFETY
- #2 INFRASTRUCTURE MAINTENANCE
- #3 REDUCING CONGESTION
- #4 PUBLIC TRANSIT
- #5 PEDESTRIAN & BICYCLE FACILITIES
- #6 ADVANCING NEW TECHNOLOGIES AND ALTERNATIVE FUEL

MOST FREQUENTLY USED TRANSPORTATION MODES



*Other includes: Car pool, taxi, shared vehicle service

GOALS

These Long Range Goals were developed using stakeholder input and form the basis for strategies and decision-making for DelDOT initiatives moving forward to support the future of Delaware's transportation network.



SAFETY & SECURITY

Ensure the safe and secure movement of people and goods by reducing injuries and deaths on the transportation network.



ECONOMIC VITALITY

Promote and strengthen the economic vitality of Delaware with an excellent transportation network that meets the needs of a diverse and growing economy.



QUALITY OF LIFE

Maintain and enhance vibrant and appealing communities and support planned growth and development through a transportation network that serves the mobility needs of all Delawareans.



GOALS (CONT'D.)



CONNECTIVITY

Enhance the integration and connectivity of the transportation system across and between modes throughout the state. Provide people with a choice of safe, attractive, and reliable options.



SYSTEM PRESERVATION

Preserve the transportation network to support travelers and commerce, while adapting to the future's changing needs.



SYSTEM MANAGEMENT & OPERATIONS

Enhance system management and operations through innovative strategies and technology that increase the efficiency of the transportation system.



INNOVATION IN MOTION

GOALS (CONT'D.)



RESILIENCY & RELIABILITY

Provide resilient and reliable transportation system that offers predictable travel times under normal conditions as well as efficient and safe use during emergency situations.



ENVIRONMENTAL STEWARDSHIP

Protect and enhance the environment through sustainable best practices, integration of environmental considerations into planning and design, and responsible energy consumption.



TRAVEL & TOURISM

Facilitate efficient mobility options for the state's major tourist destinations that support Delaware residents, businesses and visitors.



CUSTOMER SERVICE & COMMUNICATION

Conduct the highest level of customer service possible to proactively provide information and to learn from and address our customers' needs.



STRATEGIC PLANNING

TOPIC AREAS

The Vision and Goals represent core values and form the foundation of **INNOVATION IN MOTION**. Part II of the Plan will focus on specific strategies to achieve these goals.

Eight topics have been identified as areas for strategic planning. A set of specific strategies will support the goals under each topic. Performance measures, targets, time frames and responsible parties will be identified.

Consideration of every user in Delaware's transportation network is important. Stakeholder participation will continue to be a key factor in developing **INNOVATION IN MOTION's** policies and strategies.

DELDOT'S TOPIC AREAS FOR STRATEGIC PLANNING INCLUDE:

- PLANNING & LAND USE
- ROADS, BRIDGES & OTHER ASSETS
- TRAFFIC MANAGEMENT
- BICYCLING
- PEDESTRIAN TRAVEL
- FREIGHT MOVEMENT
- AERONAUTICS
- PUBLIC TRANSIT



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PART II

IMPLEMENTATION STRATEGIES



INNOVATION IN MOTION

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INTRODUCTION

INNOVATION IN MOTION is helping guide DelDOT's strategic investments as our transportation network evolves to meet future needs. Part I of this plan answered many questions such as "Where have we been?", "Where are we now?", "Where are trends heading?", and most importantly, "Where do we want to go?" Based on historical knowledge, existing data and future projections, Part I has determined the value, opportunities and challenges of Delaware's transportation network and defined the vision and goals as we move into the future.

In **Part II – Implementation Strategies**, the Plan establishes our strategic approach to achieve our vision. Detailed strategies, categorized under eight **Transportation Elements**, will be implemented over time as transportation needs evolve. Performance measures and targets are included to keep us accountable in reaching our goals and to help us monitor and adjust our strategies as needed.

This plan will help DelDOT establish or revise policies and prioritize investments ensuring Delaware's transportation network remains **safe, efficient, accessible and reliable**, while integrating the latest advancements in technology and providing our customers with excellent service.



OUR VISION FOR THE FUTURE:

Innovation in Motion will guide DelDOT in developing a **safe, reliable and efficient** transportation system that will support a diverse economy, vibrant communities and viable transportation options for **Delaware's** citizens, visitors and customers.



INNOVATION IN MOTION

LONG RANGE GOALS

DelDOT will implement **Innovation in Motion** by aligning policies and strategies in support of the guiding principles from the following long range goals:

SAFETY AND SECURITY - Ensure the safe and secure movement of people and goods limiting the potential for incidents that may cause harm or disrupt the network operations.

ECONOMIC VITALITY - Promote and strengthen the economic vitality of Delaware with an excellent transportation network that meets the needs of a diverse and growing economy.

CONNECTIVITY - Improve accessibility and mobility and increase options for the movement of people and freight. Enhance the integration of a multi-modal transportation system throughout the state. Provide people with a choice of safe, attractive and reliable options.

SYSTEM PRESERVATION - Preserve the transportation network to support travelers and commerce, while adapting to the future's changing needs.

QUALITY OF LIFE - Maintain and enhance vibrant and appealing communities and support planned growth and development through a transportation network that serves the mobility needs of all Delawareans.

SYSTEM MANAGEMENT AND OPERATIONS - Enhance system management and operations through innovative strategies and technology that increase the efficiency of the transportation system.

RESILIENCY AND RELIABILITY - Provide a resilient and reliable transportation system that offers predictable travel times under normal conditions as well as efficient and safe use during emergency situations.

ENVIRONMENTAL STEWARDSHIP - Protect and enhance the environment through sustainable best practices, integration of environmental considerations and responsible energy consumption.

TRAVEL AND TOURISM - Facilitate efficient mobility options for tourist destinations that support Delaware residents, businesses and visitors.

CUSTOMER SERVICE AND COMMUNICATION - Provide the highest level of customer service possible as to proactively provide information and to learn from and address our customer's needs.

DELDOT IN ACTION

Each transportation element is addressed within the Strategic Implementation Plan section. While each element is featured individually within its own chapter, we consider each element as an integral component of our transportation network.

STRATEGIC IMPLEMENTATION PLANS FOR EACH TRANSPORTATION ELEMENT INCLUDE:

- ✓ A unique vision for each component of the transportation network
- ✓ Funding Opportunities
- ✓ Challenges and Constraints
- ✓ Efficiencies and Innovations
- ✓ Assessment of Needs
- ✓ Implementation Partnerships
- ✓ Strategies and Action Items to Support the Long Range Goals
- ✓ Performance Measures, Baselines and Targets
- ✓ A Plan for Monitoring Progress



TRANSPORTATION ELEMENTS

The Transportation Elements are each components of a multi-modal transportation system working for the movement of people and goods throughout Delaware. These elements include:

			
Planning & Land Use	Roads, Bridges & Other Assets	Traffic & System Management	Bicycle Transportation
Transportation and land use are intrinsically linked and need to be considered holistically. Planning is a process that considers a balance of potential opportunities, impacts and solutions across a wide spectrum of issues. Our collaborative planning process includes internal and external stakeholders. This partnership allows us to build support and prioritize transportation investments for the communities we serve.	Asset management is one of DeIDOT's core functions. Roadways, structures, drainage facilities and green infrastructure are the main assets that we are responsible for planning, constructing and maintaining.	Managing traffic movement across the state requires a significant effort. The Department is becoming increasingly reliant on advanced technologies. DeIDOT strives to remain a national leader in the testing, development and deployment of innovative traffic management technology, which will help us adapt to the evolving transportation environment.	Bicycling is supported by DeIDOT as a viable transportation mode. Delaware has recently been ranked the most bicycle-friendly state on the east coast. However, there are still improvements to be made to make bicycling a safe, reliable and accessible option.

			
Pedestrian Transportation	Freight Movement	Aeronautics	Public Transit
Pedestrian safety has been a challenge in Delaware, and DeIDOT is committed to improving pedestrian safety and accessibility. Our priorities are maintaining and expanding a pedestrian network that minimizes barriers and hazards that may put people at risk.	Delaware's freight network provides critical connections for the movement of goods across the Delmarva Peninsula and nationwide. Delaware's freight network consists of roads, rail lines, port facilities, intermodal transfer centers and air carrier service facilities. The movement of freight is a critical component of our region's economy, and DeIDOT is committed to providing and enhancing freight-related transportation infrastructure.	Aviation is a component of the transportation system that is used for personal travel, freight movement, tourism and contributes to economic growth. DeIDOT is responsible for planning, coordination and implementation of improvements to the public-use airport system within the state.	Public transit is either the preferred or the only transportation option for many Delawareans. The Delaware Transit Corporation (DTC), part of DeIDOT, manages and operates public transit statewide. DTC is continually seeking opportunities to increase transit ridership and accessibility.

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PLANNING & LAND USE

In Delaware, land use decisions are a local responsibility, and providing and maintaining infrastructure and services is a state responsibility. Intergovernmental collaboration is vital for optimizing resources and efficiency, as one agency's decision typically affects responsibilities of other agencies.

DelDOT works as a planning and land use partner across the state, providing technical expertise, tools and project funding to Metropolitan Planning Organizations (MPOs) and local municipalities. DelDOT works collaboratively with the Office of State Planning Coordination (OSPC) to connect transportation services with growing regions across the state aligning with the State Investment Levels established in the *2015 Delaware Strategies for State Policies and Spending*.

DelDOT is responsible for prioritizing transportation projects in the Capital Transportation Program (CTP). One of the functions of the CTP is to support the state's economy through strategic transportation improvements. One of the mechanisms for supporting this goal is the Transportation Improvement District (TID) program, which encourages smart growth in rapidly developing areas.

VISION

*"Coordination and cooperation with Delaware local governments is vital to DelDOT's ability to achieve our mission of Excellence in Transportation. Through **comprehensive** and **coordinated** land use and transportation planning and public engagement, Transportation Improvement Districts increase our ability to collaborate effectively with residents and employers to achieve our vision of Every Trip, Every Mode, Every Dollar, Everyone."*

- Jennifer Cohan, Secretary of Transportation

PLANNING & LAND USE HIERARCHY

LOCAL MUNICIPALITIES

Plan and manage land use by instituting zoning and other regulatory land use controls.

METROPOLITAN PLANNING ORGANIZATIONS

Plan and coordinate how Federal transportation funds are invested in a region.

DELDOT

Provides the infrastructure and services to support growth and development, including most of the state's public transit service and approximately 84% of Delaware's roadways.

OFFICE OF STATE PLANNING COORDINATION

Coordinates land use decision-making with the provision of infrastructure and services in a manner that makes the best use of our natural and fiscal resources.



INNOVATION IN MOTION

FUNDING SOURCES

Planning and land use projects are funded and implemented through a variety of sources at the federal and state levels. These sources include:

- ✓ DELDOT CAPITAL TRANSPORTATION PROGRAM (CTP)
- ✓ DELDOT TRANSPORTATION ALTERNATIVES PROGRAM
- ✓ DNREC RESILIENT COMMUNITY PARTNERSHIP
- ✓ DNREC GRANT PROGRAMS
- ✓ OSPC/DSHA DOWNTOWN DEVELOPMENT DISTRICTS PROGRAM
- ✓ FEDERAL EMERGENCY MANAGEMENT AGENCY PROGRAMS (FEMA)
- ✓ NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) RESILIENCY GRANTS

CURRENT CHALLENGES & CONSTRAINTS

HOME RULE STATE

In Delaware, the state has no control over how municipalities and counties govern land use. This can make regional land use planning challenging if local jurisdictions have conflicting priorities.

SUBURBAN SPRAWL



Changing population patterns from urban centers into rural areas results in suburban sprawl, which is typically highly dependent on automobiles.

SEASONAL TOURISM

Delaware is home to many seasonal attractions that create wide fluctuations in population and traffic volumes at different times of the year.

PREDICTIVE MODELING

Land use and growth forecasts need to be more comprehensively integrated into the transportation planning process. New predictive modeling methodologies are being developed to achieve more comprehensive transportation solutions.

CURRENT EFFICIENCIES & INNOVATIONS

OPEN SOURCE SPATIAL DATA



DeIDOT's Gateway platform provides a variety of publicly available GIS data and maps used to coordinate local and state planning activities and increase efficiency.

SMART GROWTH



TIDs and the Complete Communities Toolbox provide innovative growth plans and strategies helping municipalities to create attractive, multimodal, healthy and resilient places.

PLANNING & ENVIRONMENTAL LINKAGES



DeIDOT uses this flexible Federal approach to cohesively integrate planning and environmental review, offering cost and time savings. The PEL Process facilitates better documentation and decision making through the NEPA Process and subsequent stages of a project.

PUBLIC ENGAGEMENT

DeIDOT is employing new and more proactive public engagement tools online and through mobile apps to reach broader audiences.

LOCAL COLLABORATION & PLANNING SUPPORT

DelDOT provides full-time community planners responsible for coordinating comprehensive planning initiatives with local jurisdictions, promoting smart growth, mobility, sustainability and complete community innovations. DelDOT provides planning and land use tools and support to foster resilient communities.

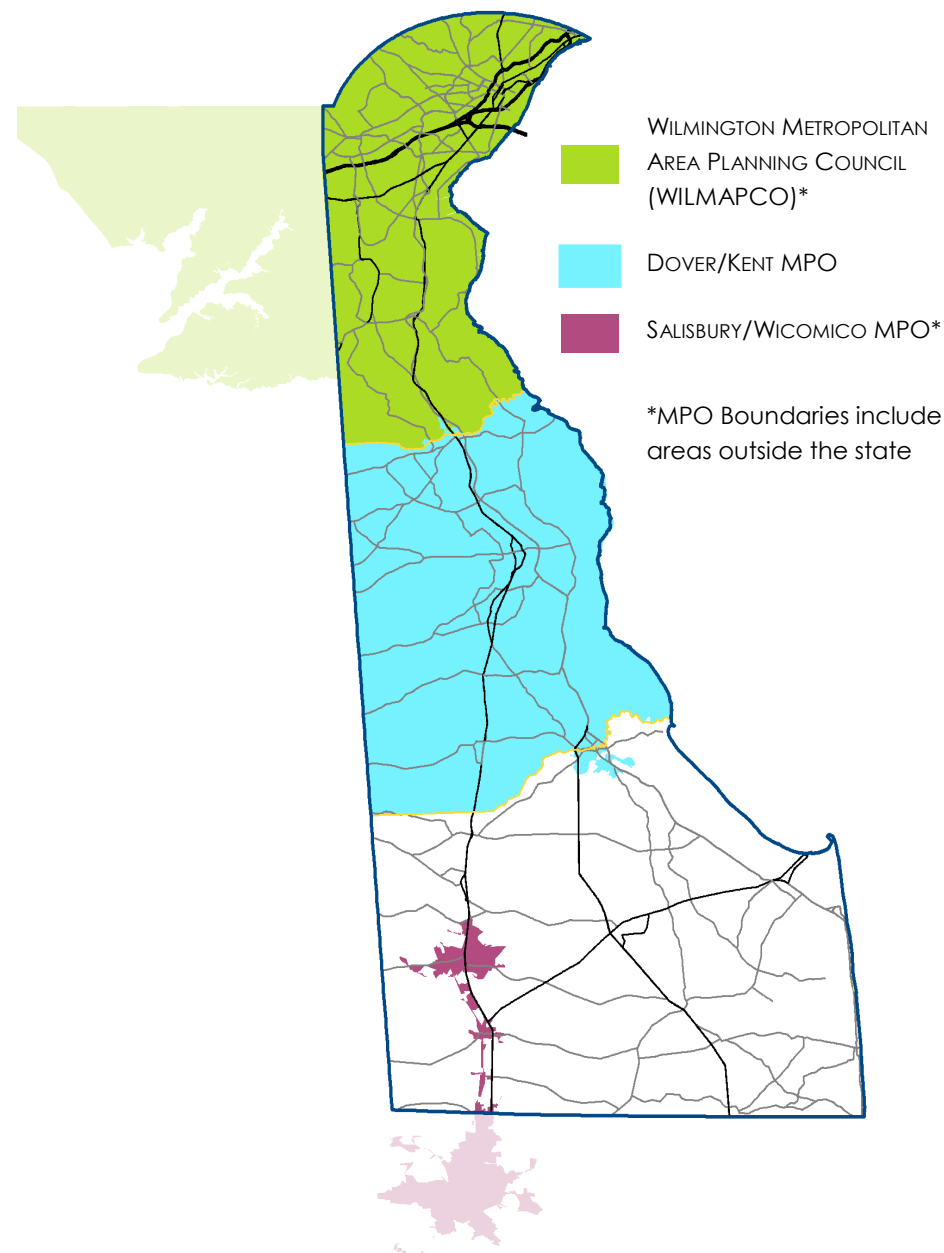
Complete Communities is a planning framework in that recognizes the impact transportation investments have on efficient land use, community form, economic development and quality of life. DelDOT, in partnership with the University of Delaware, has created the Complete Communities Toolbox, which provides local municipalities with innovative ideas and strategies to promote more livable communities.

METROPOLITAN PLANNING ORGANIZATION (MPO) COORDINATION

The federal government's surface transportation laws and regulations require metropolitan urbanized areas with populations of 50,000 or more to organize MPOs. Delaware's MPOs work with DelDOT to develop region-wide coordinated programs, projects and long range plans. The MPOs develop a Transportation Improvement Plan (TIP) that aligns with the first three years of Delaware's Capital Transportation Program (CTP). There are three MPO regions in Delaware, as shown on the Delaware MPO Boundaries map.



DELAWARE MPO BOUNDARIES



STATE INVESTMENT LEVELS

LEVEL 1

Higher density urbanized areas where multi-modal complete streets transportation options and community enhancements are prioritized.

LEVEL 2

Growing suburban areas that prioritize mixed land uses and multi-modal transportation options.

LEVEL 3

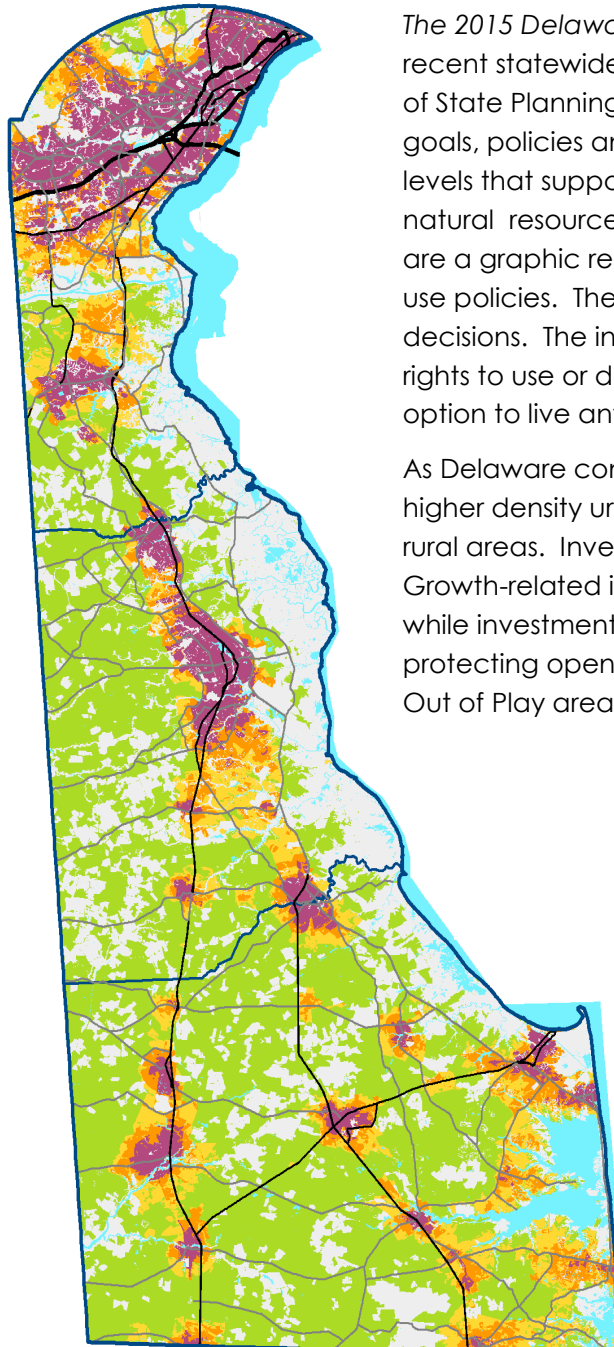
Outlying suburban areas designated for long term growth.

LEVEL 4

Rural areas where preservation of agriculture and open space is prioritized.

OUT OF PLAY

Protected land not available for private development.

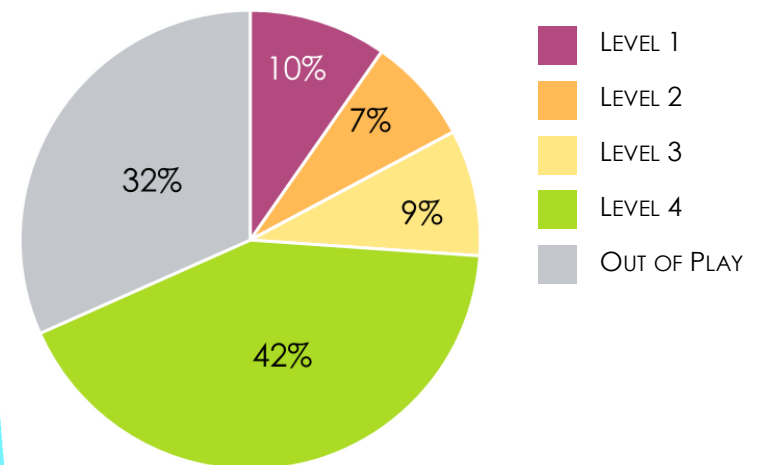


STATE INVESTMENT LEVELS

The 2015 Delaware Strategies for State Policies and Spending is the most recent statewide land use policy guide prepared by the Delaware Office of State Planning Coordination. The plan summarizes the state's land use goals, policies and strategies and directs state spending into investment levels that support the most efficient use of state physical, fiscal and natural resources. The investment levels, illustrated in the map to the left, are a graphic representation of a combination of state and local land-use policies. They are intended to guide state agencies' investment decisions. The investment level designations do not restrict landowners' rights to use or develop their property, nor do they restrict a purchaser's option to live anywhere desired.

As Delaware continues to grow, the state will prioritize its investments in higher density urbanized areas and attempt to preserve open space in rural areas. Investments in transportation will reflect the same priorities. Growth-related infrastructure will be directed towards level 1 and 2 areas, while investment in level 3 and 4 areas will be geared for preserving and protecting open space, agriculture and a rural legacy. Investments in Out of Play areas focus on environmental conservation efforts.

STATE INVESTMENT LEVELS BY
TOTAL LAND AREA



THE TRANSPORTATION AND LAND USE CHARACTER TRANSECT



WHAT ARE THE APPROPRIATE TRANSPORTATION INVESTMENTS FOR EACH LEVEL?

LEVEL 1 - The highest priorities in these areas are preserving existing facilities and making safety improvements. Other priorities include Complete Street design and multi-modal investments, including pedestrian, bicycle and transit infrastructure, provide mobility options for people of diverse needs.

LEVEL 2 - The priorities in these areas are similar to those in Level 1 but include other priorities, such as corridor capacity preservation, interconnectivity of neighborhoods and public facilities and signal system enhancements. Capacity improvements are balanced with context-sensitive design goals and policies.

LEVEL 3 - Transportation investments focus on regional movement of goods and people between towns, population centers and industrial districts. Lower priority is given to capacity improvements and transit system enhancements.

LEVEL 4 - These areas are rural, where transportation investments focus on preserving and maintaining facilities in safe working order and supporting agriculture needs to transport materials and products. This approach aims to ensure that rural industries remain viable.

OUT OF PLAY - These areas are protected from development and include sensitive environmental resources. Transportation investments are restricted, but may be developed to improve recreational access to state parks or other valuable environmental areas.

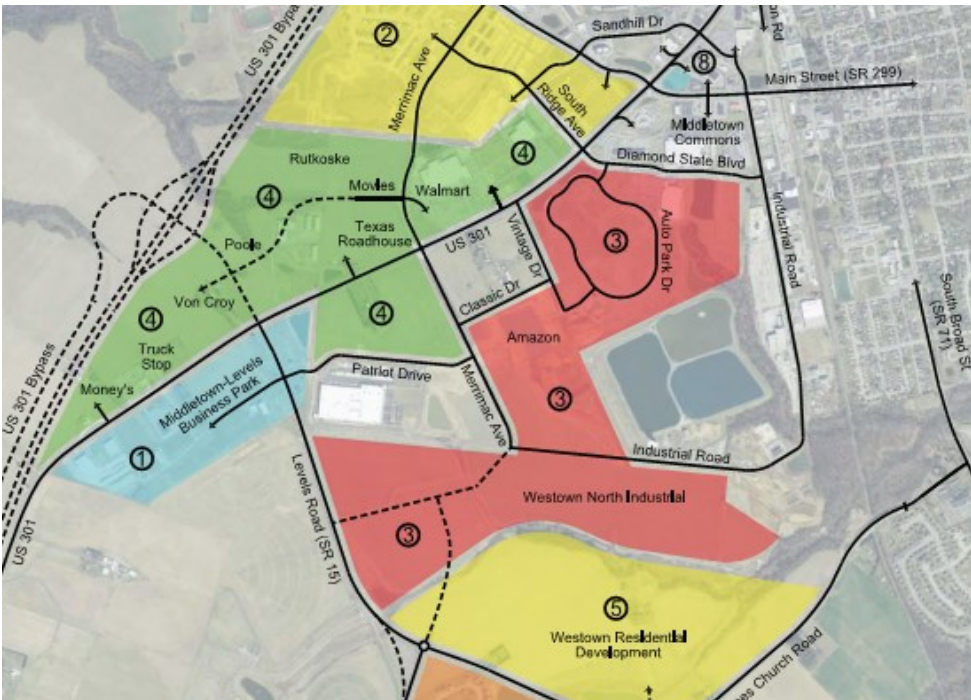
TRANSPORTATION IMPROVEMENT DISTRICTS (TIDs)

DEFINITION

A TID is a geographic area defined for the purpose of securing required improvements to transportation facilities in the area.

PURPOSE & NEED

Transportation Improvement Districts (TIDs) can foster sustainable development by providing transportation improvements needed to support land development in locations identified as appropriate for development in local Comprehensive Plans. Coordinating land use and transportation can lower infrastructure costs and foster planning for market-ready development or redevelopment opportunities. TIDs utilize private-sector impact fees to equitably distribute the cost of growth-related transportation improvements.



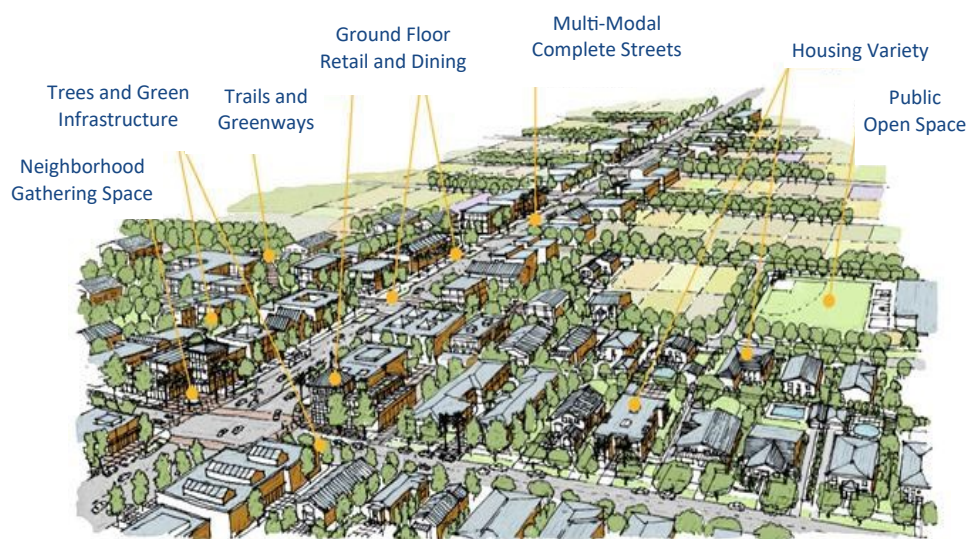
WESTOWN TID DEVELOPMENT AREAS (TOWN OF MIDDLETOWN)

WHAT IS THE PROCESS TO CREATE A TID?

- 1** Review state and local plans and policies to determine if proposed TID is within a planned growth and state Investment Level 1, 2 or 3 area.
- 2** Collaborate with local, state, regional planning officials.
- 3** Determine whether a TID should be created as part of a Master Plan or Land Use and Transportation Plan.
- 4** Amend or update the Comprehensive Plan to incorporate planning for TIDs.
- 5** Complete TID Requirements:
 - Written TID agreement with DeIDOT
 - Set boundaries of the TID
 - Establish target horizon year (generally 20 years from the creation of TID)
 - Establish parcel-level land use forecast
 - Establish service standards to determine the necessary transportation improvements and investments required for the TID
 - Include TID in local government's Comprehensive Plan
 - Establish Infrastructure Fee Program
- 6** *TID Recommended Elements being considered:*
 - Requirement of Master Plans prior to TID agreement
 - Inclusion of local MPO in TID agreement
 - Monitoring program
- 7** Implement and monitor the TID.

COMPLETE COMMUNITIES PROGRAM

DelDOT is supporting the University of Delaware's Complete Communities program to help local communities to better plan for and build attractive, inclusive, efficient, healthy and resilient places. Together, DelDOT, the University of Delaware and OSPC developed an online Toolbox at www.CompleteCommunitiesDE.org with helpful information to define and promote best practices that support "Complete Communities." Featured topics include multi-modal transportation, land use, urban design, recreation, inclusivity for a broad range of demographic groups, economic development, environmental sustainability, energy efficiency, and climate change



Complete Communities
attractive, inclusive, efficient, healthy & resilient places

DATA-DRIVEN DECISION MAKING

DelDOT is increasingly relying on verifiable data to make planning decisions. Data-driven decision-making provides more equitable, efficient and reliable results to effectively address issues and challenges that DelDOT faces. The Department is actively building, expanding and utilizing comprehensive datasets to inform policies, programs and project development. These include:

PROJECT PRIORITIZATION TECHNICAL SCORING

DelDOT uses a value-driven process to prioritize capital projects based on uniform criteria and a technical scoring system. Efforts are underway to add a spatial component to the current system that will link to other Department spatial databases.

TRANSPORTATION SYSTEM DATA MANAGEMENT (TSDM)

Recently, DelDOT developed a spatial database of asset inventories based on LIDAR data. This system is regularly updated and is expanding with new datasets to become a central repository for all of DelDOT's spatial data.

FIRSTMAP

State agencies in Delaware, including DelDOT, support and utilize a shared enterprise GIS database, which improves coordination and provides the public with up-to-date information such as property lines, environmental resources, transportation facilities and land use.

GATEWAY

DelDOT maintains a GIS portal that leverages the FirstMap enterprise system. Both public information and internal data can be displayed through an online viewer or downloaded into GIS.

CAPITAL TRANSPORTATION PROGRAM (CTP)

Per federal regulation 23 CFR 450.216 (a)-(o), each state must develop a Statewide Transportation Improvement Program (STIP). DeIDOT refers to the STIP as the Capital Transportation Program (CTP). The CTP is a six-year project program. The Council on Transportation (COT) is an advisory panel, appointed by the Governor, that serves as oversight to DeIDOT for developing the CTP. The CTP is established based on the following:

PROJECT TECHNICAL SCORE

Evaluates and scores individual projects based on weighted criteria.

PROJECT READINESS

Assesses current phases and when the next phase of a project can begin from concept design to construction.

PROJECT FUNDING ELIGIBILITY

Determines types of Federal or State funding each project is eligible to use.

The CTP is developed annually using software that ranks and evaluates individual projects based on ranking criteria. The CTP prioritization process is a flexible method, which is continually refined.



CTP PROJECT PRIORITIZATION PROCESS

- 1 DRAFT CTP**
 DeIDOT receives project ideas from MPOs, local governments, the public, and projects identified in:
 - Long Range Transportation Plans & TIDs
 - Management Systems
 - Economic Development Initiatives
 Projects are evaluated and prioritized using the criteria shown in the table on the following page.
- 2 PUBLIC INPUT**
 Public notice of meetings is posted statewide. Meetings are held in each county during September. Written comments are taken for ten days after each meeting.
- 3 REVIEW AND REVISION**
 DeIDOT reviews comments and updates project budgets and schedules to coordinate projects and priorities to match the updated CTP.
- 4 MPO PRIORITIES**
 MPOs finalize their Transportation Improvement Programs (TIPs) which must be included into the CTP.
- 5 COT APPROVAL**
 The final CTP, including the TIPs, must be approved by the COT before March 1.
- 6 FINAL APPROVAL, FUNDING, & IMPLEMENTATION**
 The Governor and the General Assembly approve CTP by March 15 and fund the first year of the CTP. DeIDOT implements individual projects beginning in July.
- 7 PROJECT DEVELOPMENT**
 Depending on size and complexity, projects may take months to years to design. Property, environmental, access, cost and social impacts, and public meetings/hearings are considered as needed.
- 8 CONSTRUCTION**
 Contractors or DeIDOT construct the projects or implement the service.
- 9 MAINTENANCE**
 DeIDOT ensures maintenance and system preservation is continually prioritized for state funded infrastructure.

CTP PROJECT EVALUATION AND PRIORITIZATION TECHNICAL SCORE

WEIGHT	CRITERIA	RATING SCALE					
33.0%	✔ Safety						
80%	Identified in Safety Program	No = 0%		Yes = 100%			
20%	Addresses strategies in the State Highway Safety Plan (SHSP)	No = 0%		Yes = 100%			
24.8%	📊 System Operating Effectiveness						
50%	Existing Level of Service (LOS)	LOS A or B = 0%	LOS C = 25%	LOS D = 50%	LOS E = 75%	LOS F = 100%	
50%	Identified as a congested corridor in the MPO Congestion and Management Analysis	No = 0%		Yes = 100%			
15.6%	♿ Multi-Modal Mobility/Flexibility/Access						
100%	Ability to provide efficient movement of people and goods by motor vehicle, pedestrian, bicycle and transit modes.	None or Detrimental Effects = 0%	Moderate Improvement = 50%		Significant Improvement = 100%		
7.9%	📈 Revenue Generation/Economic Development/Jobs & Commerce						
33%	Located in a Transportation Improvement District	No = 0%		Yes = 100%			
33%	Degree of Non-State/Non-Federal Contribution	No = 0%		Yes = 100%			
33%	Located in a Designated Freight Corridor	No = 0%		Yes = 100%			
7.2%	🏠 Impact on the Public/Social Disruption/Economic Justice						
100%	Ability of a project to support and enhance existing communities	Negative Community Impact = 0%	No Community Impact = 25%		Positive Community Impact = 100%		
6.5%	🌿 Environmental Impact/Stewardship						
100%	The extent in which the project mitigates threat or damage to the environment, including air quality.	Major Negative Impact = 0%	Minor Negative Impact = 20%		No Impact = 50%	Positive Impact = 100%	
5.0%	🏗️ System Preservation						
100%	The project contributes towards system preservation and is addressed through an existing preservation program.	No = 0%		Yes = 100%			

TRANSPORTATION CORRIDOR STRATEGIES

CORRIDOR STRATEGIES AND PLANNING

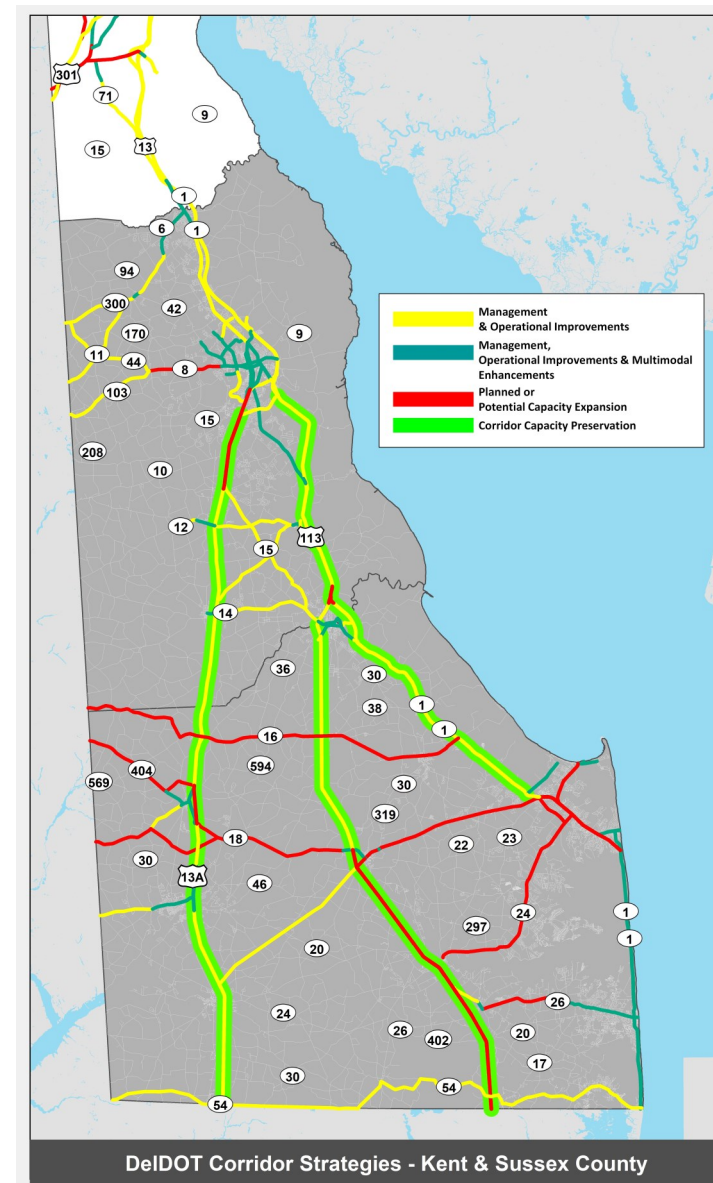
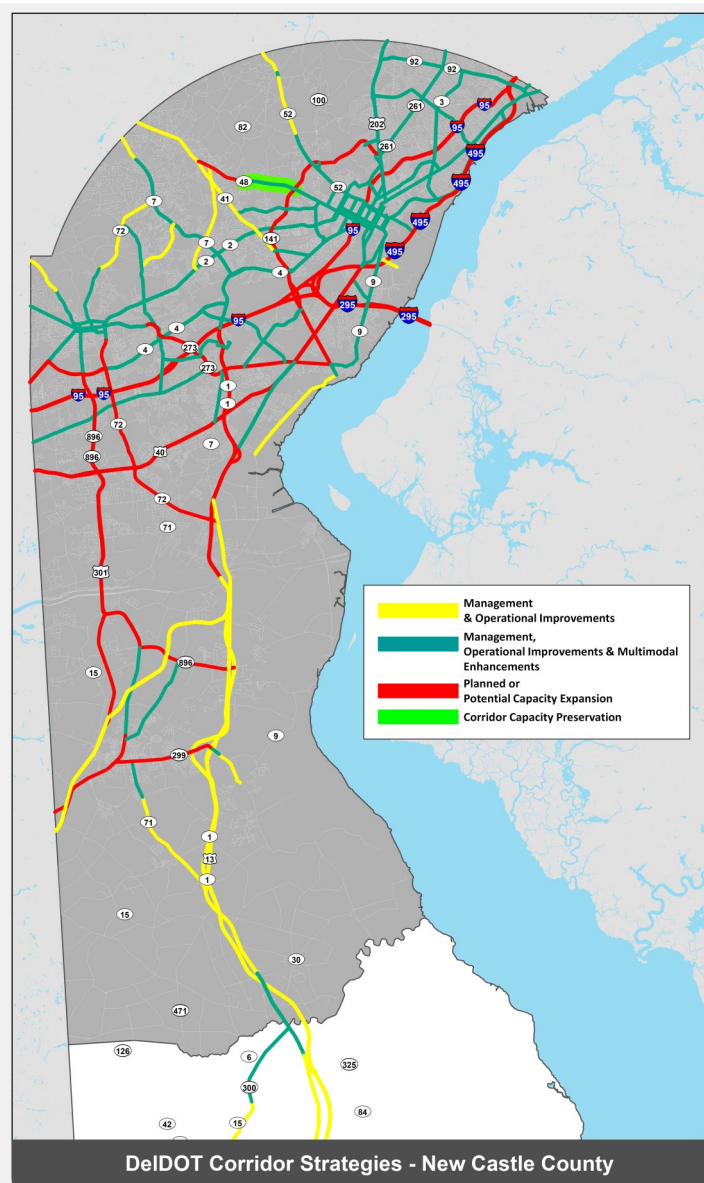
DelDOT continues to be focused on the development of strategies and planning for our major transportation corridors throughout the state. Corridor strategies have already been established in several locations including: US 113, SR 1, US 13 (south of Wilmington), and SR 2 (through Marshallton).

As part of the Long Range Transportation Plan update, DelDOT has expanded upon this ongoing success through the development and adoption of additional corridor strategies. The overall purposes of this effort are to aid the Department with long-term capital investment decisions and to provide greater transparency and predictability to our numerous and valuable stakeholders.

APPROACH AND METHODOLOGY

The first step in developing the Corridor Strategies was to determine which types of roads would be eligible. The Federal Highway Administration (FHWA) Functional Classification system was utilized to identify roadways with a minimum functional classification of Arterial or higher. Selected Major Collector roads were also added to the list where DelDOT is anticipating possible future expansion and/or where there is significant community interest in modifying the character of a particular roadway. DelDOT's existing Corridor Capacity Preservation Program locations were also included in the maps to provide additional context. The three-tiered Corridor Strategy approach is outlined below.

STRATEGY 1 MANAGEMENT & OPERATIONAL IMPROVEMENTS	STRATEGY 2 MANAGEMENT, OPERATIONAL AND MULTIMODAL ENHANCEMENTS	STRATEGY 3 PLANNED OR POTENTIAL CAPACITY EXPANSION
Strategy Tools • ADA • Controlled Access Conversion • Corridor Capacity Preservation • HOV Lanes • Intelligent Transportation Systems (ITS) • Modify or Add Intersection • Road Diet • Safety Enhancement • Traffic Incident Management • Traffic Calming • Travel Information • Traffic Signal Timing/Optimization	Strategy Tools • Bicycle • Complete Streets • Modify or Add Intersection • Off-Alignment Multi-Use Paths • Pedestrian • Public Transportation • Selected Tools from Strategy 1 • Shoulders	Strategy Tools • Additional Transit Capacity • Additional Travel Lanes • Intersection Capacity Improvements • New Highways or Arterials



PLANNING & LAND USE STAKEHOLDERS

DELDOT DIVISIONS



OFFICE OF THE SECRETARY

- Policy and Legislation
- Leadership and Prioritization



PLANNING

- Planning Coordination
- Data Collection & Analysis
- Manage CTP Process
- Manage TID Program
- NEPA Documentation
- Corridor Master Planning
- Public Involvement



TECHNOLOGY & INNOVATION

- Maintain GIS Databases & Inventories



COMMUNITY RELATIONS

- Public Education and Outreach



FINANCE

- Funding Sources & Budgeting



MAINTENANCE & OPERATIONS

- Transportation Corridor Preservation



TRANSPORTATION SOLUTIONS

- Project Management



DELAWARE TRANSIT CORPORATION (DTC)

- Coordinate Transit Services
- Support Transit Oriented Development Policies



PERFORMANCE MANAGEMENT

- Establishing Metrics & Targets
- Tracking Progress



ADVISORY COUNCIL ON CAVs

- Integration of New Technologies with Land Use Planning

ADDITIONAL PARTNERSHIPS

OFFICE OF STATE PLANNING COORDINATION (OSPC)

- Planning Coordination
- Certify Local Land Use Plans
- Public Education
- Data Collection

DELAWARE DEPT. OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

- Recreation, Open Space & Conservation Planning

MPOS

- Planning and Land Use Coordination
- CTP Project Identification & Prioritization

COUNTY AND MUNICIPAL GOVERNMENTS

- Local Land Use Planning
- Land Use Zoning & Development Coordination

PLANNING & LAND USE - STRATEGIES & ACTION ITEMS

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

STRATEGIES AND ACTION ITEMS	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
Continue evaluating and planning network connections that facilitate economic growth and increase efficiency of goods movement.	✓			
Work with local municipalities to review and update land use and zoning ensuring growth is targeted in appropriate areas with adequate transportation connections.	✓			
Continue planning and designing for multimodal network connectivity throughout the state.	✓			
Integrate and document components of the NEPA Process and Planning and Environmental Linkages (PEL) into corridor planning, TIDs and preliminary planning studies to address environmental review requirements.	✓			
Incorporate a spatial component into the Capital Transportation Program (CTP) Prioritization Process.		✓		
Establish a formal strategic corridor planning process.		✓		
Develop an online public feedback mechanism to categorize comments ensuring they are forwarded to the appropriate Department. This type system will also inventory comments and retain them for input on future projects.		✓		
Improve stakeholder/public awareness of the impact that land use decisions have on transportation through targeted outreach and education campaigns.		✓		
Establish integrated database management system that ensures the most up-to-date information is available.			✓	

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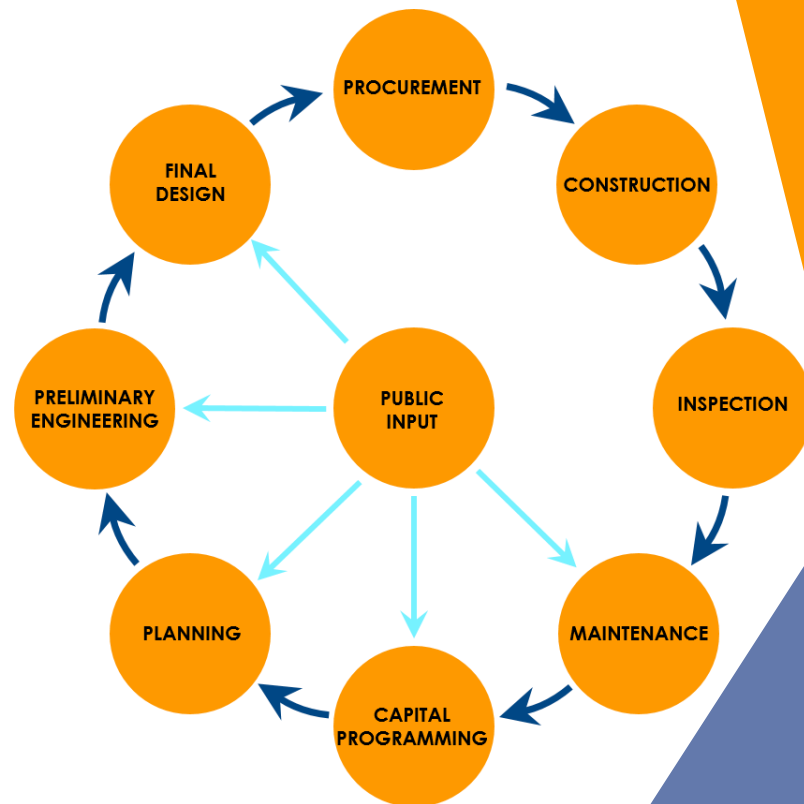
ROADS, BRIDGES & OTHER ASSETS

DeIDOT is responsible for building, operating, managing and maintaining the vast majority of transportation assets across the state. These assets include roads and bridges, as well as supporting infrastructure, such as drainage systems, signage and traffic signals, maintenance facilities and environmental features within the right-of-way.

"Transportation asset management is a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well defined objectives."

- American Association of State Highway and Transportation Officials, 2006

DeIDOT strives to provide excellence in transportation by developing, constructing and maintaining the state's infrastructure in a manner that results in a safe, cost-effective and efficient multi-modal transportation network that enhances mobility commerce and livability.



INNOVATION IN MOTION

FUNDING SOURCES

Funding for DelDOT's Asset Management Programs come from federal, state and local funding sources. About 36% of the state transportation budget is dedicated to capital spending, and 46% is dedicated to operations. The remaining 18% is spent on debt service.

STATE TRANSPORTATION FUNDS

- ✓ TOLL REVENUES
- ✓ GAS TAX
- ✓ DMV FEES
- ✓ TRANSIT FARES
- ✓ BOND PROCEEDS
- ✓ GENERAL FUND
- ✓ REST AREA CONCESSIONS
- ✓ DEVELOPER IMPACT FEES
- ✓ SUPPLEMENTAL MUNICIPAL PARTICIPATION AND FUNDING

SUPPLEMENTAL FEDERAL FUNDS

- ✓ DISCRETIONARY FUNDS
- ✓ TRUST FUNDS
- ✓ GRANTS
- ✓ LOANS

CURRENT CHALLENGES & CONSTRAINTS

AGING INFRASTRUCTURE



Delaware's roadways and bridges have historically been well-maintained. However, trends project a decline in the conditions of these assets, particularly drainage systems, in the future if spending remains at current levels. Increases in maintenance funding and capital investments will be needed to continue to meet our current standards and the public's expectations.



ADA COMPLIANCE

Many sidewalks across the state were built before the Americans with Disabilities Act (ADA) and predate the latest accessibility standards. Pavement retrofit projects are requiring more investment and expanded footprints to upgrade access for pedestrians as well as addressing pavement, drainage and other project needs.

SURPLUS PROPERTY

DelDOT assumes liability and maintenance responsibility for excess property that is sometimes a byproduct of the right-of-way (ROW) acquisition process.

UTILITIES



Increasing demand for space within the ROW for utilities and telecommunication infrastructure presents challenges for DelDOT when planning future roadway projects.

CLIMATE CHANGE



Delaware's lowland topography and coastal geography leaves much of the state at risk for flooding with more frequent and intense storms and potential for impacts due to sea-level rise.



CURRENT EFFICIENCIES & INNOVATIONS

MAXIMO

Maximo is DeIDOT's enterprise-based asset management system used to manage physical infrastructure. This system includes roadway and facility assets and tracks work orders, incidents, management and operational activities. Currently, the system does not have a spatial component, but plans are underway to integrate Maximo with other DeIDOT spatial datasets.

ROUTABLE CENTERLINE DATA

DeIDOT's roadway centerline data now includes routable connectivity capabilities that help identify gaps and barriers in the transportation network. Routability is particularly helpful for analyzing connectivity for different modes, such as freight, transit, bicycle and pedestrian.

STRATEGIC PLANNING FOR CLIMATE CHANGE

DeIDOT has developed a *Strategic Implementation Plan for Climate Change, Sustainability, and Resilience for Transportation* to help prepare for emerging climate impacts and coordinate efforts across various state agencies.

TRANSPORTATION SYSTEM DATA MANAGEMENT (TSDM)

Using advanced Light Detection and Ranging (LiDAR) technology, DeIDOT is expanding and modernizing its asset inventory system. TSDM is a system that collects and compiles asset data and detailed inspection information into a comprehensive spatial record of DeIDOT's infrastructure. The improved accuracy of asset data enables more efficient management and technical analysis.

COMPLETE STREETS

DeIDOT adopted a Complete Streets Policy in 2010. The policy focuses on implementation during the development or scoping phase of a transportation project to ensure that all users are considered in planning, designing, building, operating and maintaining Delaware roadways. This policy expands the scope of standard roadway improvements and new project development to require provisions for multi-modal accommodations. The Complete Streets policy also defines the applicability, roles and responsibilities, and an exemption and waiver process to be administered by DeIDOT.

TRANSPORTATION ASSET MANAGEMENT PLAN (TAMP)

DeIDOT has developed an initial TAMP for its roads and bridges which outlines a planned investment strategy for the next 10 years. This will allow the Department to set funding levels for roads and bridges using data-driven decision-making processes based on projections of condition of the infrastructure. Future updates of the LRTP will incorporate the analyses conducted in the TAMP.

ROADWAY CONDITION RATING SYSTEM

DeIDOT has updated methods to collect and analyze roadway distress data with more detailed calibrations for different facilities, pavement types and distress conditions. Custom software is employed to provide a digitized record of roadway conditions, thereby creating a more accurate and reliable rating system.

WETLAND MITIGATION BANKING

Wetland mitigation banking is the process of creating or enhancing wetlands to compensate for the loss of similar ecosystems adversely affected by transportation projects. DeIDOT has used this process in highway construction and in flood-prone areas, such as Glenville, where flooding caused an unsustainable road maintenance situation.

PROJECT PRIORITIZATION PROCESS

PAVEMENT CONDITIONS

DelDOT's Pavement and Rehabilitation program strives to maintain the condition of Delaware's roadways by systematically identifying candidates for rehabilitation and determining the most cost effective treatment. The program provides rehabilitation in the form of pavement preservation, replacement and reconstruction, as well as guardrail upgrades. In keeping with DelDOT's Accessibility Standards, ADA compliance and pedestrian access considerations are also incorporated in pavement rehabilitation projects.

A condition survey of every state-maintained road segment is performed biennially, although those state-maintained roads that are part of the National Highway System (NHS) are surveyed every year. This survey is a combination of various automated collection techniques and some visual inspection to determine the severity and extent of the pavement distresses present in the roadway. An Overall Pavement Condition (OPC) is calculated based on the severity and extent of distresses present in the roadway. The lower the OPC value is, the poorer the roadway condition is. Acceptable OPC Values differ depending on the roadway's functional classification.

- **Interstates and Arterials:** OPC greater than 70
- **Collectors:** OPC greater than 60
- **Local Roadways:** OPC greater than 50

A follow-up visual survey is performed by DelDOT's Pavement Management Team (PMT) on low-rating roadway sections to rank pavement rehabilitation priorities. A more detailed technical analysis takes into consideration road condition, traffic volume, functional class, special conditions, transportation needs and other discretionary input from the PMT to account for safety issues and project continuity. Road segments with a higher score are given higher priority.

During this second review, the PMT may also identify segments that would be good candidates for more economical maintenance or preservation treatments, such as patching or microsurfacing.

DelDOT's maintenance districts also nominate roads within their jurisdiction for preservation treatments each year. Once the prioritization is complete, the appropriate rehabilitation or preservation treatment is identified, a rough cost estimate is generated, and a determination is made of how many segments can be completed within the assumed budget. The roadway segments are packaged into contracts for construction, and a refined cost estimate is performed. The contracts that will be advertised in the upcoming fiscal year are presented to the Delaware State Legislature Bond Bill Committee for approval.

- **30% Overall Pavement Condition (OPC)** – This criterion is based solely on the physical distresses found in the roadway. Points are given to roadways based on the severity of distresses.
- **30% Traffic Volume** – For each Functional Classification of road, we have set ranges of daily traffic volume that correlate to the points given to this category. More points are given to roadways with higher the traffic volumes.
- **25% Special Conditions** – This category takes into account the land use accessed by the road. For instance, a road would receive more points based on the proximity of a school, firehouse or daycare center compared a sparsely developed rural road.
- **10% Pavement Management Team Input** – This category allows the pavement management team to give points to a roadway for other considerations, such as a specific safety concern, being part of detour route, or for project continuity.
- **5% Functional Classification** – This criterion is based purely on the functional classification of the roadways (either Interstate/Arterial, Collector or Local). Interstate/Arterial roads are given the highest number of points, while the Local roads given the lowest.

PROJECT PRIORITIZATION PROCESS

BRIDGE CONDITIONS

DelDOT's Bridge Deficiency Formula has been developed to manage bridge preservation efforts based on the lowest long-term costs to maintain the state's structural assets. A Bridge Management System stores inspection data and assesses the condition, maintenance requirements, costs and associated benefits for a bridge as a whole and each of its structural components. The structure is assigned a Deficiency rating based on the following weighted criteria:

- **25% Health Index** – The Health Index for a bridge is the sum of the quantity of each element multiplied by the condition state percentage multiplied by the element cost and relative weight, divided by the total sum of the element costs and relative weights. The Health Index is representative of the amount of work required for a bridge.
- **20% Condition Rating** – This factor assigns deficiency points to bridges that are in "Fair" condition or have been identified as Structurally Deficient. A bridge is considered to be in Fair condition if the lowest Condition Rating is a "5". The term "Structurally Deficient" is related to the National Bridge Inspection Standards (NBIS). A bridge is Structurally Deficient if the condition of the deck, superstructure, substructure or culvert is in poor condition as defined by NBIS inspection guidelines. A bridge may also be Structurally Deficient based on load capacity or waterway adequacy. DelDOT has performance goals to maintain the bridge inventory with 5% or less Structurally Deficient bridges and more than 75% of bridges in Good condition. Good condition is defined as NBI Condition Rating greater than 6.
- **10% Highway Functional Class** – Functional Classification groups streets and highways according to the character of service they are intended to provide. The functional classification also gives an indication of importance of the road.
- **10% Load Capacity** – All bridges have load rating calculations performed in order to determine their structural load carrying capacity. Any bridge that is not capable of carrying any of the Delaware Legal Loads, Specialized Hauling Vehicles (SHVs) and Emergency Vehicles (EVs) legal load configurations must be posted for allowable load limits.
- **10% Detour Length** – The detour length is the additional travel for a vehicle, which would result from the closing of a bridge.
- **10% Truck ADT** – The amount of truck traffic for a bridge gives an indication of the importance to commerce that a bridge may have.
- **5% Scour Critical Bridges** – A bridge is Scour Critical if the bridge foundation is determined to be unstable for an assessed or calculated scour event.
- **5% Benefit to Cost Ratio** – Each preservation action has an associated cost. The benefit from performing preservation work is determined by calculating the projected increase in Health Index for the bridge multiplied by the replacement cost of the bridge. The calculated benefit is divided by the cost to determine the Benefit-to-Cost Ratio.
- **5% Fracture Critical and/or Historic Significance** – Fracture Critical Bridges are bridges with non-redundant members that may have more severe consequences if failure occurs. The historic significance is determined by listing or eligibility for listing in the National Register for Historic Places. DelDOT has committed to the State Historic Preservation Office to implement a historic bridge inspection/maintenance program.

IMPLEMENTATION: DELAWARE'S NEEDS

SPATIAL ASSET MANAGEMENT DATABASE

DelDOT will continue to make the necessary investments required for complete, accurate and continually updated databases of all DelDOT assets and resources. Improvements associated with this effort include operations management and project coordination. The ability to group projects that may have different purposes together geographically can improve efficiency and reduce costs and redundancies.

PUBLIC RELATIONS DATABASE

The public has a number of mechanisms to provide DelDOT input for project ideas, maintenance needs and general inquiries or requests. However, there is no standardized process or tracking mechanism to compile and manage public input and DelDOT responses. DelDOT is currently undertaking the development of a project "Pipeline" process/application that will allow the public and other stakeholders to submit and track project ideas and requests. An agency-wide database that is inclusive of all of our interactions with the public can help DelDOT to more comprehensively document public needs and more efficiently coordinate and track DelDOT responses.

PAPERLESS PROJECT DELIVERY

Technology is advancing to the point where paper documents could become obsolete in the future. While DelDOT still issues full size plan sets in hard copy format, the Department also archives plans and specifications in digital format through the DelDOT OnBase Data Management System. A project is underway to link the OnBase system to an online mapping application to provide more efficient access for employees.

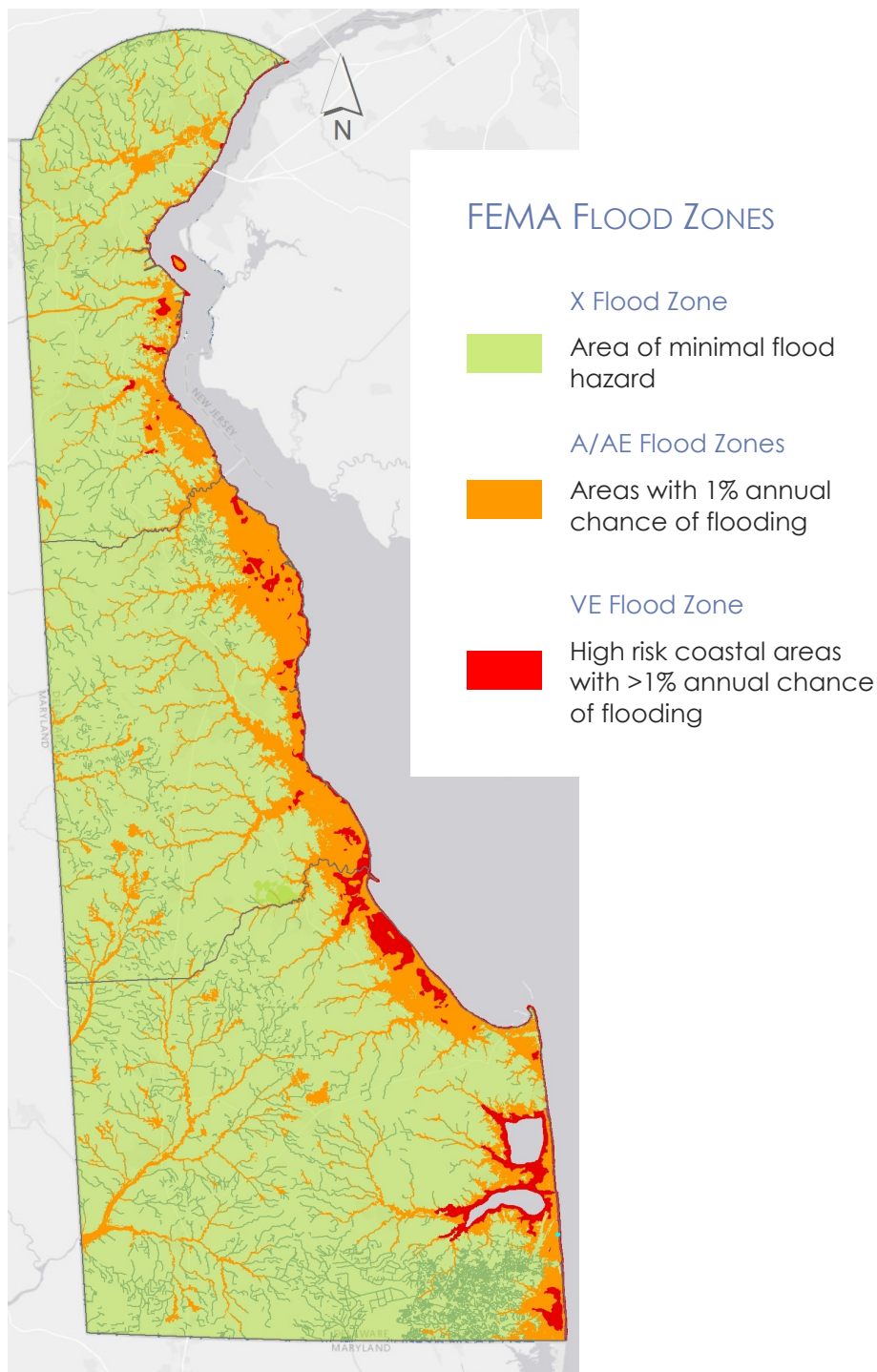
WHAT SHOULD BE INCLUDED IN A SPATIAL DATABASE?

CURRENT DATABASES:

- LiDAR Topography
- Roadway Centerlines & Footprints
- Bridge & Pavement Conditions
- Traffic Volumes & Level of Service
- Crash Data
- Bicycle Route & Trail Centerlines
- Transit Routes & Stops
- Freight Corridors
- Drainage Inlets & Outfalls
- Stormwater Management Facility Locations
- Project Locations
- Right-of-Way & Property Lines
- Property Ownership
- Flood Risk Areas & Projected Sea-Level Rise Inundation Areas
- Watersheds, Floodplains & Wetlands
- Mitigation Banks
- Historic & Cultural Resources
- Jurisdictional Boundaries
- Land Use & Zoning
- Sidewalks, Crosswalks & ADA
- Traffic Signals & Intelligent Transportation System (ITS) Devices
- Subsurface Drainage Pipes
- Guardrails

ANTICIPATED DATABASES:

- Active & Planned Detours
- As-Built Drawings
- Asset Inspection Results
- Traffic Signage
- Pavement Striping
- Lighting & Conduit
- Stormwater Drainage Areas
- Above & Underground Utilities
- Soil Conditions & Geotechnical Data
- Vegetation & Green Assets
- Surplus Right-of-Way



THREAT AND HAZARD RISK ASSESSMENT

Executive Order 41 requires state agencies to plan and design projects for flooding and sea level rise (SLR). DelDOT has responded by revising language in the Bridge Design and Project Development Manuals. DelDOT has also partnered with the University of Delaware to undertake a comprehensive assessment of the worst-case effects of hurricanes, flooding, high tides, and sea level rise on DelDOT assets. Recommendations include additional revisions to road design and bridge design manuals to strengthen hydraulic design criteria, a systematic review of protocols to enlarge and/or replace bridges and culverts as per recommended criteria, and a strategic review of the highway system to determine vulnerable sections from which to allocate capital mitigation funding.

GREEN INFRASTRUCTURE FOR FLOOD MITIGATION

Green infrastructure can help reduce flood risk by absorbing, holding or diverting runoff and flood waters in a natural landscape to help protect the built environment from flood damage. A comprehensive approach incorporating best practices on and off DelDOT right-of-way can reduce flood risk. New partnerships, design standards and processes are needed to allow DelDOT the flexibility to protect our assets and public safety using green infrastructure best practices.

RISK MITIGATION FUNDING

Expanding DelDOT's risk management and hazard mitigation efforts without compromising other DelDOT responsibilities will require new investments, which requires new funding sources or a reallocation of existing funds from other programs.

MITIGATION BANKING

High-risk and flood-prone locations are ideal candidate sites to expand mitigation banking opportunities. Conversion to natural ecosystems provides flooding protection, and can provide credits for mitigation needs associated with other DelDOT projects.

ASSET MANAGEMENT STAKEHOLDERS

DELDOT DIVISIONS



OFFICE OF THE SECRETARY

- Policy and Legislation



PLANNING

- Interagency Coordination
- Data Development



TECHNOLOGY & INNOVATION

- Database Management and Maintenance



COMMUNITY RELATIONS

- Public Education and Outreach



FINANCE

- Funding Sources
- Budgeting



TRANSPORTATION SOLUTIONS

- Project Development
- Updating Design Manuals and Standards
- Maintenance and operation of the TMC and traffic control/ITS devices



MAINTENANCE & OPERATIONS

- Infrastructure and System Maintenance
- Infrastructure Inspections
- Emergency Management



PERFORMANCE MANAGEMENT

- Establishing Metrics and Targets
- Monitoring Progress

ADDITIONAL PARTNERSHIPS

MPOs

- Planning Coordination
- Project and Program Identification

LOCAL JURISDICTIONS

- Local Risk Assessment and Hazard Mitigation Planning
- Project and Program Identification

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC)

- Flood Protection Planning
- Erosion and Sediment Control and Stormwater Management Regulations
- Environmental Asset Data Support

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

- Floodplain Delineation
- Risk Assessment and Hazard Mitigation Assistance
- Hazard Mitigation Grant Funding

ROADS, BRIDGES & OTHER ASSETS - STRATEGIES & ACTION ITEMS

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Develop a comprehensive Transportation Asset Management Plan for all roads and bridges.	✓			
Review progress on the Strategic Implementation Plan annually and update as necessary.	✓			
Identify and assess existing chronic flooding and erosion problems caused by sea-level rise, frequent storms, tidal forces, subsidence and aging infrastructure.	✓			
Increase life cycle of materials with efforts to reuse and recycle materials during construction.	✓			
Evaluate materials used to reduce impacts of stormwater runoff and reevaluate stormwater management best practices.	✓			
Coordinate with the Federal Emergency Management Agency (FEMA) to utilize assessment tools, identify community-specific hazards and assets at risk, and develop and update preparedness plans.	✓			
Evaluate and adjust worker safety guidelines, and provide training to improve worker knowledge.	✓			
Support local governments with Land Use Assessment tools.		✓		
Expand upon existing geospatial datasets, and link spatial data to other tabular datasets to create a comprehensive and interconnected data management system.		✓		
Continue development of geospatial data sets that can help identify vulnerable areas and help estimate the impact of reasonably anticipated events.		✓		
Conduct a comprehensive assessment of state infrastructure asset needs and risks, and develop a tracking and reporting mechanism to monitor progress.		✓		
Incorporate potential climate impact considerations into cost-effective investments in infrastructure.		✓		
Integrate Climate Resiliency considerations into Project Development, Traffic, Bridge and Highway Design manuals.		✓		
Evaluate obtaining insurance to assist in recovery of catastrophic events.		✓		

ROADS, BRIDGES & OTHER ASSETS - STRATEGIES & ACTION ITEMS (CONT'D.)

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Explore new pavement technologies to reduce long term maintenance and urban heat island affects.		✓		
Develop revised maintenance schedules in response to air quality.		✓		
Evaluate continuing deployment of low-emission vehicles in DeIDOT fleet.		✓		
Evaluate alternative energy technology for DeIDOT Facilities.		✓		
Establish a formal DeIDOT Mitigation Banking policy and program.		✓		
Establish a public relations database to document public input and track agency responses.		✓		
Invest in environmental restoration sites as Mitigation Banks to accommodate impact mitigation needs.			✓	
Enhance design and construction of transportation projects (pathways, trails, streetscapes, etc.) to accommodate impacts of climate change.			✓	
Establish a paperless project delivery system to design and procure projects using only digital files.			✓	
Conduct a full inventory of excess DeIDOT-owned land and develop a utilization or disposal plan.			✓	

PERFORMANCE MONITORING

DeIDOT has an active performance management system to collect and analyze information and promote data-driven decision making.

DeIDOT's newly established

Office of Performance

Management provides added emphasis on promoting effective, responsible and collaborative results agency-wide. New software applications and tracking tools are being explored and employed to improve this initiative and strengthen the agency as a whole. Performance monitoring is the responsibility of senior managers across the Department and a primary topic of Director Staff Meetings each quarter.

DATA SOURCES

- ✓ MAXIMO
- ✓ CONTRACT PROCUREMENT
- ✓ PURCHASE ORDERS
- ✓ WORK ORDERS
- ✓ INCIDENT REPORTS
- ✓ PUBLIC INQUIRIES
- ✓ PERMITS APPROVED
- ✓ INSPECTION RESULTS

PERFORMANCE MEASURES & TARGETS

The National Highway System (NHS) is the network of roadways that are critically important to national security, defense and the economy. These facilities include interstate highways, principal arterials, major strategic connectors and intermodal connectors. Delaware's transportation network includes 1688 lane miles and 301 bridge structures on the NHS system. Maintaining pavement and bridges on the NHS system in a state of good repair is critically important to national and state interests. DeIDOT monitors pavement and bridge conditions as part of the asset management program and to prioritize investments in critically important infrastructure. Currently, DeIDOT is exceeding established performance targets.



CURRENT NHS BRIDGE CONDITIONS (2017)

Metropolitan Planning Area	Bridge Count	Good	Fair	Poor
Wilmington Area Planning Council	232	17%	82%	1%
Dover/Kent County MPO	41	20%	80%	0%
Salisbury/Wicomico MPO	7	0%	100%	0%
Sussex County Outside MPO	21	14%	81%	5%
Total	301	17%	82%	1%

Annual Target: <5% Poor Rating

CURRENT NHS PAVEMENT CONDITIONS (2017)

Metropolitan Planning Area	Lane Miles	Good	Fair	Poor
Wilmington Area Planning Council	910	50%	48%	2%
Dover/Kent County MPO	289	71%	29%	0%
Salisbury/Wicomico MPO	39	46%	54%	0%
Sussex County Outside MPO	450	72%	28%	0%
Total	1688	58.9%	39.8%	1.1%

Annual Target: <15% Poor Rating

ADDITIONAL PERFORMANCE MEASURES & TARGETS

Pavement Conditions

PERFORMANCE MEASURE	BASELINE	ANNUAL TARGET
Pavement Conditions for all State Roadways based on DeIDOT's Rating System	Currently (2017) rated as 84.4% Good, 9.6% Fair, and 6.0% Poor	At least 85% of roadways rating as Fair or better; no more than 10% rating as Poor.
Interstate System Pavement Condition		At least 50% in Good condition; no more than 2% in Poor condition
Non-Interstate System Pavement Condition		At least 55% in Good condition; no more than 2% in Poor condition

Bridge Conditions

National Highway System Bridges	Currently (2017) rated at 4.6% Poor	No more than 10% of bridge deck area in Poor condition
All Bridges	Currently (2017) rated at 4.1% Poor and 73.7% in Good condition. Good condition = 6-9 of the lowest condition ratings.	Less than 5% of total number of bridges in Poor condition; greater than 75% of total number of bridges in Good condition

Design, Construction & Maintenance of DeIDOT Assets

PERFORMANCE MEASURE	DESCRIPTION	BASELINE	ANNUAL TARGET
Community Transportation Fund (CTF) Estimated Response Time	Responding to stakeholder work requests for maintenance needs	Completion within 20 business days: FY 2018: 94.9%	Meet or exceed 85% completion within 20 business days
Snow Storm Response Time	Clearing roads to passable conditions within 24 hours for 4" or less snow; within 48 hours for 4" to 8" snow; and within 72 hours for snow greater than 8"	100% in FY 2018	100% on-time completion for every snow storm event
Employee Work-Related Injury Rates	Ensuring worker safety for DeIDOT employees and contractors	148 personal injuries in 2017	10% reduction annually until zero

ADDITIONAL PERFORMANCE MEASURES & TARGETS (CONT'D.)

Design, Construction & Maintenance of DelDOT Assets (cont'd.)			
PERFORMANCE MEASURE	DESCRIPTION	BASELINE	ANNUAL TARGET
Equipment Readiness	Availability of equipment for maintenance needs based on the number of open work orders	86% availability in FY 2018	90% availability (annual average)
Equipment Preventive Maintenance	Completion of scheduled preventive maintenance to keep equipment in good working conditions	92% completion in FY 2018	90% completion (annual average)
Equipment Age	Age of equipment within the estimated functional age parameters	92% compliance in FY 2018	>90% compliance (annual average)
Equipment Usage	Equipment is within usage parameters (based on AASHTO specifications)	82% compliance in FY 2018	85% compliance (annual average)
Sweeping Mileage	Sweep 100% of designated roadway miles as defined in the Sweeping Program	9,484 road miles—varies	100%
Sweeping Waste Collected	Tons of waste collected from roadway Sweeping Program	2,711 tons in CY 2017	none
Permit Process Time	Track number of business days to issue permit or response following receipt of a complete application package, including: - Residential and commercial entrance permits for access to state-maintained roads - Utility permits for private utility work in the state right-of-way	95% processed on time in CY 2017	Issue 90% of permits or responses within 15 calendar days

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TRAFFIC & SYSTEM MANAGEMENT

The goal of the DelDOT Traffic Section is to maintain efficient, safe and reliable traffic operations, which are necessary to connect people with goods, services, employment and recreation.

The DelDOT Traffic Section is responsible for the following functions:

- Administer statewide traffic safety programs
- Perform traffic engineering analyses and traffic calming studies
- Prepare designs and implement traffic safety, operational and accessibility improvements
- Direct DelDOT's Integrated Transportation Management Program
- Monitor Delaware's transportation systems
- Disseminate information between various agencies and the public
- Maintain and operate DelDOT's traffic control devices and electronic field systems such as traffic signals, closed-circuit cameras and Intelligent Transportation System (ITS) devices
- Administer special events and oversized/overweight permit programs
- Serve as liaison for the Department on Homeland Security matters

DelDOT is recognized as a national leader in Transportation Management.

Modern telecommunications and smart operations are integral parts of our business.

DelDOT has been advancing the **latest technologies** in our Transportation Management program. Connected devices are already a part of our transportation network to help keep people and goods moving safely on Delaware's roads.

The next major infrastructure investment will be **telecommunication superhighways**, which will support DelDOT's operations and the private sector's growing telecommunication needs.



INNOVATION IN MOTION

DeIDOT's Traffic Section is part of the Division of Transportation Solutions (DOTS).

THE TRAFFIC SECTION INCLUDES:

- ✓ TRAFFIC STUDIES
- ✓ TRAFFIC SYSTEMS DESIGN
- ✓ TRAFFIC FIELD OPERATIONS
- ✓ TRANSPORTATION MANAGEMENT
- ✓ TRAFFIC SAFETY
- ✓ TRAFFIC FINANCE

FUNDING SOURCES

- APPROXIMATELY \$30 MILLION FROM ANNUAL CAPITAL PROJECT BUDGET
- \$3.4 MILLION PER YEAR (NOT INCLUDING SALARIES)

CURRENT CHALLENGES & CONSTRAINTS



COMMUNICATING WITH THE PUBLIC

Rapid changes in technology require new and innovative ways of communicating with the public.

RAPIDLY ADVANCING TECHNOLOGY

Evolving technologies require new skills and recruitment of a qualified workforce to manage new programs and systems.



HUMAN FACTORS

Distracted driving, impaired driving and irresponsible mistakes can lead to major safety problems.



SUBURBAN SPRAWL

Traffic congestion increases when development becomes more dispersed and relies on automobile access.

CURRENT EFFICIENCIES & INNOVATIONS

INTEGRATED TRANSPORTATION MANAGEMENT SYSTEM (ITMS)

Cutting edge technologies are being utilized to provide smart transportation management for current operations and in preparation for connected and autonomous vehicles in the future.

THE DELDOT MOBILE APP

Mobile applications provide a source for up-to-date traffic conditions and alerts, which help improve driver expectations and system reliability.

TELECOMMUNICATION SYSTEMS

Fiber optic lines and wireless telecommunication systems are increasingly being integrated in new infrastructure projects.

NEW TECHNOLOGIES AND IMPROVED TRAFFIC DEVICES

Intersection conflict warnings, rectangular rapid flashing beacons, LED lighting and wireless traffic signal detection are being used to improve safety and traffic flow.

ROADWAY RETROFITS

Multi-modal access is being enhanced by the addition of separated bike lanes, dedicated transit lanes, road diets and traffic calming measures to improve pedestrian and bicyclist safety.

OVERSIZE/OVERWEIGHT VEHICLE PERMITTING

Systems are being developed to provide automated routing for vehicles requiring hauling permits.

DELAWARE'S NEEDS

IMPROVING SAFETY

DelDOT has a goal to achieve zero fatalities and serious injuries statewide on the transportation network. We will continue to monitor and improve our safety programs until we consistently reach this goal. The *Delaware Strategic Highway Safety Plan* (SHSP) is updated every five years to address safety needs and implement best practices that can save lives.

PUBLIC COMMUNICATION

Communicating with our stakeholders helps to increase public awareness and improve driver expectations. DelDOT's mobile app provides the public with useful information about traffic and road conditions, policies and programs, and a mechanism to allow for feedback from the public so we have a better understanding of their needs.

INTELLIGENT TRANSPORTATION MANAGEMENT SYSTEMS

DelDOT is a national leader in utilizing ITMS technology. As new ITMS technology is developed, DelDOT will continue to test and implement systems that improve traffic operations and safety.

ADVANCED TECHNOLOGY PREPAREDNESS

DelDOT is increasingly relying on advanced connected technologies to manage traffic operations. Keeping pace with rapidly evolving technologies requires maintaining staff expertise through new training programs and strategic hiring practices.



TRAFFIC & SYSTEM MANAGEMENT – STRATEGIES & ACTION ITEMS

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Upgrade roadway lighting with LED fixtures to improve nighttime visibility and save energy.	✓			
Conduct before-and-after studies at targeted safety improvement locations to assess level of success and best practices that can be employed elsewhere.	✓			
Partner with Office of Highway Safety and police to increase enforcement in areas prone to high crash rates.	✓			
Continue support of the Office of Highway Safety and the State Police in efforts to conduct targeted enforcement campaigns to reduce impaired driving, reduce speeding, increase seat belt usage, and to reduce other aggressive or risky driving behaviors.	✓			
Conduct pedestrian safety audits and implement targeted safety improvement projects in high-accident locations.	✓			
Update policy and program descriptions on the DeIDOT website to better communicate technical information to the public.	✓			
Increase risk perception by publicizing information about enforcement initiatives for impaired driving, distracted driving and wearing seat belts.	✓			
Update the DeIDOT mobile app with technology advances to better communicate conditions and news with the public.	✓			
Develop a cooperative workforce development program with educational institutions to train students and staff for new jobs related to CAV operations and management at DeIDOT and within the private sector.		✓		
Identify targeted corridors and areas to partner with private sector investors to advance CAV technology.		✓		
Prioritize and implement system improvements (e.g., rumble strips, median barriers, high-friction surface treatment) along high-risk locations for roadway departure crashes.		✓		
Identify high risk intersections and prioritize safety improvements, such as traffic calming, lighting, left-turn phasing, roundabouts, back plates and other innovations.		✓		

TRAFFIC & SYSTEM MANAGEMENT - STRATEGIES & ACTION ITEMS (CONT'D.)

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

STRATEGIES & ACTION ITEMS	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
Update design standards to integrate new best practices for traffic safety, such as speed reduction warnings and intersection narrowing.		✓		
Identify more opportunities to integrate intelligent transportation systems and connected/autonomous vehicles into the Strategic Highway Safety Plan.		✓		
Publish "Traffic Studies Guidebook" to advance the state of the practice and improve consistency.		✓		
Provide hand-held devices for all field staff to streamline and improve asset management efforts.		✓		
Standardize autorouting for hauling permits.		✓		
Increase and advance automated technology for flood hazard warning detectors and alert systems.		✓		
Improve reporting on traffic control device conditions (signing, striping, signals).		✓		
Advance the state of the practice in asset management and preventive maintenance.		✓		
Develop and distribute consistent public information messages to educate the public on traffic laws, new traffic control devices and high-crash locations.		✓		
Coordinate with utility companies to delineate, shield or redesign poles as part of the permit process or at locations with a history of crashes involving utility poles.			✓	

PERFORMANCE MONITORING

DelDOT has been tracking traffic safety data for several decades. The data is closely **monitored and reported** and is publicly available through the **DelDOT Dashboard** at www.deldot.gov.

PERFORMANCE MEASURES & TARGETS

DelDOT's primary traffic performance measures are related to **Safety** and **Travel Time Reliability**. The safety measures are derived from the **Delaware Strategic Highway Safety Plan: Toward Zero Deaths**. This statewide plan, which is updated every five years, includes goals, strategies and performance measures aimed at eliminating fatalities and serious injuries on Delaware's roadways. Travel time reliability is measured by the frequency and degree that actual travel time exceeds the expected time based on posted speed limits.

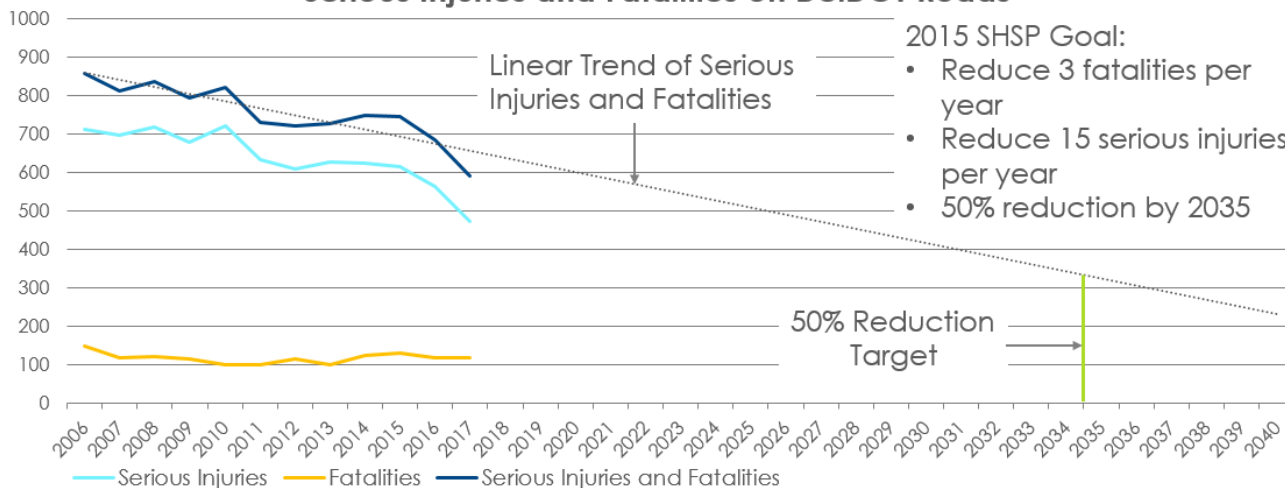
FATALITIES AND SERIOUS INJURIES

- This measure tracks the number of fatalities and serious injuries on the state transportation system.
- DelDOT is actively addressing safety improvements as part of our core mission. The goal of the 2015 Strategic Highway Safety Plan is to achieve a 50% reduction in fatalities and serious injuries by the year 2035. The overall goal, however, is to **eliminate fatalities and serious injuries** on Delaware roadways through a multi-agency approach that utilizes education, enforcement, engineering and emergency medical services strategies.

TRAVEL TIME RELIABILITY

- DelDOT currently tracks the Reliability Index on Interstates (I-95, I-295 and I-495).
- Reliability data is reported through the DelDOT Dashboard, which provides real-time updates to determine needs for incident management and to provide travel conditions information. Data is reviewed monthly to assess patterns or issues to be addressed.
- The Reliability Index will be expanded to include the freeway portions of SR 1 and major arterial roadways such as Kirkwood Highway, US 13 through Dover and US 113.

Serious Injuries and Fatalities on DelDOT Roads



Following the overall trend, the 2015 SHSP goal is to achieve a 50% reduction in fatalities and serious injuries by 2035. DelDOT is **continually aiming to prevent all serious injuries and fatalities** on Delaware roadways to achieve significant reductions sooner.



BICYCLE TRANSPORTATION

A well-connected and safe bicycle system is a vital component of every transportation network. In addition to health and environmental benefits, biking is a viable form of transportation. DelDOT encourages cycling as a mode of transportation for both commuting and recreational purposes for residents and visitors.

In efforts to continue our success as one of the nation's most bike-friendly states, DelDOT has implemented a statewide policy plan, *Blueprint for a Bicycle-Friendly Delaware*. The plan identifies specific goals, performance measures, adopts new best practices, creates a focused implementation strategy amongst stakeholders, leverages resources, and communicates the value of bicycling.

DelDOT has recently adopted a Level of Traffic Stress (LTS) approach for evaluating bikeable roads in our state. LTS uses a stress level scale (1-4) to rate each roadway based on its design, traffic volumes and speed limits and how these factors affect a bicyclist's perception of safety and choice of route.

DelDOT's Bicycling Goals:

1. **Develop a Complete, Comfortable, Connected Bicycle Network**
2. **Improve Bicyclist Safety and Confidence**
3. **Foster a Culture of Bicycling that Benefits all Delawareans**

DELDOT IS COMMITTED TO SUPPORTING A **STRONG BICYCLE CULTURE** IN OUR STATE, AND AS A RESULT, DELAWARE HAS CONSISTENTLY BEEN RANKED AS **ONE OF THE NATION'S MOST BICYCLE-FRIENDLY STATES** BY THE LEAGUE OF AMERICAN BICYCLISTS. WE ARE COMMITTED TO **IMPROVING AND INVESTING** IN BICYCLE INFRASTRUCTURE AND ADOPTING POLICIES, PROGRAMS AND CAMPAIGNS THAT PROMOTE **SAFETY, ACCESSIBILITY AND COMFORT** FOR BICYCLISTS.



INNOVATION IN MOTION

FUNDING SOURCES:

DelDOT aims to increase funding options and strategic partnerships for bicycle network investment. It is vital to establish a clear project prioritization process to identify and prioritize the projects that will expand the low-stress bicycle network. This prioritization process will help to ensure that the limited funding available for construction and maintenance of bicycle infrastructure is leveraged to provide maximum public benefit. There are several mechanisms by which bicycle infrastructure projects are funded:

- ✓ STATEWIDE BICYCLE AND PEDESTRIAN FUNDING PROGRAM
- ✓ TRANSPORTATION ALTERNATIVES PROGRAM
- ✓ FEDERAL AND STATE SURFACE TRANSPORTATION FUNDS AND SAFETY FUNDS
- ✓ OUTDOOR RECREATION, PARKS AND TRAILS PROGRAM
- ✓ DELAWARE BICYCLE COUNCIL CYCLING INFRASTRUCTURE INNOVATION GRANT PROGRAMS
- ✓ LOCAL OR PRIVATE FUNDING

CURRENT CHALLENGES & CONSTRAINTS

CONNECTIVITY OBSTACLES



Railroads, highways, waterways and other infrastructure create gaps that present challenges when planning a continuous bike network.

PUBLIC EDUCATION



The public and local authorities are often uninformed about the planning processes in which projects are funded.

MOTOR VEHICLE-CENTRIC PLANNING

Roads built for high-speed or high-volume automobile traffic segregate communities into isolated areas inaccessible by bikes.



UNCONNECTED LOW-STRESS NETWORKS

Gaps between low-stress networks can deter biking because of a perception of danger or difficulty on certain routes.



CURRENT EFFICIENCIES & INNOVATIONS

BICYCLE FRIENDLY DELAWARE ACT (2017)

Motorists are required to change lanes when passing bicycles if travel lanes are too narrow for side-by-side sharing; motorists are prohibited from honking at cyclists when passing.



DELAWARE'S COMPLETE STREETS POLICY

The policy identifies the benefits of a multi-modal system and ensures that any modifications are done in a way that provides safe and efficient access for all users.



DELAWARE ROAD DESIGN MANUAL (2004)

The Manual provides guidance for all DelDOT design projects and stresses bicycle safety in design standards and controls.



KEY PRINCIPLES OF THE *BLUEPRINT FOR A BICYCLE-FRIENDLY DELAWARE*

The *Blueprint for a Bicycle-Friendly Delaware* contains a series of innovative strategies and tools for the planning, design and coordination of Delaware's bicycle infrastructure investments. Specific goals and best practices are identified that support Delaware's commitment to being a bicycle-friendly state.

SAFETY



Bicycling in Delaware should be safe and perceived as safe by all. Citizens should not let fear keep them from riding a bicycle.

NETWORK



A high-quality bicycle network that is approachable and comfortable for all types of bicyclists should be provided. The utilization of low-speed local roads, off-street trails and on-street bicycle facilities in a connected manner ensures that riders at every skill and age level will feel safe and comfortable.

EQUITY



Expanding the safe and comfortable bicycling network has the potential to expand access to people with limited transportation options with affordable, environmentally sustainable and healthier mobility options.

CULTURE



Delaware should promote bicycling as an enjoyable and widely accepted form of transportation and recreation. This can be achieved through partnerships with agencies, organizations and officials and through public education and awareness campaigns.

COORDINATION



Bicycle transportation policies and standards require coordination and communication within DelDOT and with other agencies.

TRANSPARENCY



Public stakeholders and state and regional agencies should understand bicycling-related planning, funding, building and maintenance processes.

PRIORITIZATION AND IMPLEMENTATION PROCESS

The prioritization process is a vital tool that DelDOT uses to identify local priorities and select feasible and implementable projects.

BICYCLE NETWORK PLANNING HEIRARCHY

LOCAL PLANNING: At the local level, project ideas are generated and needs are identified.



REGIONAL PLANNING: WILMAPCO, Dover/Kent MPO and Sussex County submit three to five priority projects each to DelDOT. If more than five are submitted, they must be either prioritized into tiers or bundled.



DeIDOT PLANNING: DelDOT conducts an initial feasibility screening for projects and screens out projects that are not feasible due to right-of-way acquisition, utilities, environmental conditions and other issues that may lead to excessive expense or approval challenges.



DeIDOT updates Projects of Statewide Significance, announces funded projects, releases GIS data and statewide map of all planned projects, and evaluates projects and audits process for future refinement.

PROJECT BUNDLING & SCORING

Project Bundling:

Creating effective connected networks requires a combination of projects. Therefore, regional agencies are invited to submit bundled projects that are then treated as one project throughout the feasibility and scoring process.

Project Scoring

Level of Traffic Stress (LTS) Analysis is used to measure the impact of a project. Each project is scored based on the increase in the number of destinations that can be reached comfortably.

A project will score well if it:



- ✓ Connects people to destinations
- ✓ Provides separation from traffic
- ✓ Turns a stressful route into a comfortable one

Destinations to be considered:



- ✓ Public Transportation & Transit Centers
- ✓ Schools
- ✓ Employment Centers
- ✓ Community Centers
- ✓ Existing Parks and Trails

STRATEGIC IMPLEMENTATION PLAN FRAMEWORK & NEEDS

To achieve our vision for bicycling in Delaware, it is necessary to provide a secure and connected bicycle network and support facilities. The following recommended policies, priorities and strategies aim to continually improve safety and increase bicycle use.

FRAMEWORK PRIORITIES

NETWORK DEVELOPMENT



Develop a statewide, locally-driven bicycle network planning process supported by state resources.

PROJECT DEVELOPMENT & DESIGN GUIDANCE



- Update the project development process to ensure the most bicycle-friendly designs
- Create simple and clear guidance for bicycle facility designers
- Adopt Complete Streets Implementation Strategy

PROJECT PRIORITIZATION AND FUNDING



Establish a uniform and clear bicycle facility project prioritization process.

RECOMMENDATIONS

DESIGN GUIDE: A design guide is necessary to provide guidance and recommendations using best practices for bike facility integration into the road network. The guide will include recommendations for different facility types as well as lighting, wayfinding and maintenance of traffic during construction.

BICYCLE NETWORK OF STATEWIDE IMPORTANCE: Projects having this designation will be part of the low-stress bicycle network process, will be large in scale/scope and may span multiple jurisdictions. These projects will typically be trail projects but may include on-street facilities.

LIVING LABORATORY RESEARCH PROGRAM: A Living Laboratory Research Program will enable the testing of street designs and programs that help DelDOT achieve its goals. The program will test new ideas and assess results to guide new design standards and policies.

EDUCATION: Comprehensive education and outreach strategies are needed to improve public awareness of bicycle safety-related issues. Local jurisdictions should be educated about funding and support opportunities that are available from the state.

RETURN ON INVESTMENT (ROI) REPORT: An assessment is needed to gauge the effectiveness of bicycle network investments in the areas of ridership, economic development and other public benefits.

BICYCLE TRANSPORTATION STAKEHOLDER ROLES & RESPONSIBILITIES

DELDOT DIVISIONS

PLANNING



- Policy & Design Guidance
- Integration of Multi-Modal Networks
- Data Collection
- Designate Routes of Statewide Importance
- Identify Priority Projects

TECHNOLOGY & INNOVATION



- Maintain GIS Database

COMMUNITY RELATIONS



- Public Education & Outreach

FINANCE



- Funding Sources & Budgeting

MAINTENANCE & OPERATIONS



- Bicycle Facility Upkeep

TRANSPORTATION SOLUTIONS



- Project Implementation



DELAWARE TRANSIT CORPORATION (DTC)

- Coordination of Bicycle Network Development with Transit Planning



PERFORMANCE MANAGEMENT

- Establishing Metrics & Targets
- Tracking Progress



ADVISORY COUNCIL ON CAVs

- Integration of New Technologies with Bicycle Goals



SAFETY/TRAFFIC

- Safety Audits
- Signage Coordination



DIVISION OF MOTOR VEHICLES

- Driver Training & Licensing

ADDITIONAL PARTNERSHIPS

OFFICE OF HIGHWAY SAFETY

- Public Education
- Data Collection

DELAWARE STATE POLICE

- Training & Enforcement

DELAWARE DEPT. OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL

- Trail Management Programs
- Funding

METROPOLITAN PLANNING ORGANIZATIONS

- Planning Coordination
- Identify & Prioritize Projects

COUNTY & MUNICIPAL GOVERNMENTS

- Local Master Plans

LOCAL ADVISORY GROUPS & COMMUNITY BASED ORGANIZATIONS

- Bicycle Advocacy
- Events

BICYCLE TRANSPORTATION - STRATEGIES & ACTION ITEMS

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Conduct an annual comprehensive Return on Investment (ROI) report to assess a correlation of bicycle network investments with increases in ridership, local economic development trends and other public benefits.	✓			
Review and analyze crash data involving bicyclists to assess trends, identify areas with recurring problems, and prioritize safety improvements.	✓			
Require before-and-after bicycle counts as part of standard traffic analysis and project development processes.	✓			
Review and update police training and enforcement statewide and across local jurisdictions to improve bicycle safety.	✓			
Support efforts to ensure that bicycles and other non-connected road users and road features are detected by automated, driverless vehicles.	✓			
Encourage and provide technical support to local planning agencies that develop bicycle master plans or invest in bicycle network improvements.	✓			
Encourage local jurisdictions and universities to regularly collect and share data about bicycle route users.	✓			
Appoint members to Delaware Bicycle Council to represent a broad range of Delaware citizens, and coordinate with the group to identify and address local issues and concerns.	✓			
Develop targeted outreach safety campaigns for at-risk demographic groups or communities.	✓			
Establish a Living Laboratory Program to assess the level of success of improvements to the bicycle network to quantify any changes in ridership and safety.		✓		
Include bicycle safety considerations in the state drivers' license test.		✓		
Recognize bicycling as an emphasis area within the next updates of the Delaware Strategic Highway Safety Plan.		✓		
Establish a certification process for Bicycle-Friendly Businesses at the state level, and publicize a list of certified businesses.		✓		
Designate a network of Bicycle Routes of Statewide Importance.		✓		

BICYCLE TRANSPORTATION - STRATEGIES & ACTION ITEMS (CONT'D.)

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Identify gaps, priority locations and project bundling opportunities within the Bicycle Network of Statewide Importance.		✓		
Compile a list of priority projects to connect and expand the Bicycle Network of Statewide Importance.		✓		
Assess potential off-road corridors for greenway expansion, such as utility lines, railroads, parks and waterways.		✓		
Establish a Bicycle and Pedestrian Priority Area (BPPA) Program in partnership with the Office of State Planning Coordination, MPOs and local jurisdictions.		✓		
Develop a standard bicycle route maintenance agreement that can be used with local jurisdictions, property owners and community groups. Flexibility regarding facility condition requirements may be allowed on a case by case basis.		✓		
Develop a Statewide Bicycle Network Maintenance Plan including budget, schedule of seasonal maintenance activities, schedule of inspection frequency, and responsible parties.		✓		
Develop a standard bicycle route conditions and inspection checklist to assess when repairs or improvements are needed.		✓		
Establish an "Adopt-a-Trail" program for local groups to clean up litter along trails.		✓		
Establish guidance to address design requirements, lighting, signage and wayfinding, maintenance of traffic, and other best practices.		✓		
Refine the state's Complete Streets Policy to include design requirements, implementation guidance and defined processes for project development.		✓		
Incorporate hazard signage for flood-prone bicycle routes.		✓		
Include bicycle routes on DelDOT's automated flood gauge tracking system.		✓		
Use bicycle trip count data to estimate annual reductions of air pollutants and gasoline consumption.		✓		

BICYCLE TRANSPORTATION - STRATEGIES & ACTION ITEMS (CONT'D.)

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Increase use of interpretive signage along trails and routes to educate and promote environmentally-friendly initiatives.		✓		
Enhance the DelDOT App to include bicycle route navigation, anticipated travel times and trip planning guidance.		✓		
Provide maps, safety guides and promotional materials to local bike shops and bike rental businesses.		✓		
Develop a comprehensive and branded education campaign to promote bicycle safety laws and tips using a variety of outlets, including the DelDOT website, mobile app, social media, signage, public service announcements, radio ads, transit ads and press releases.		✓		
Develop and provide bicycle safety educational resources for professional drivers and driver training programs.		✓		
Incorporate bike racks on all public buses to enhance bicycle-to-transit connectivity.			✓	
Incorporate bicycle amenities at all transit stations and transit centers, including bike parking, drinking water fountains, tire repair stations and public restrooms.			✓	
Establish incentive programs for businesses that provide bicycle amenities, such as bike racks, tire repair stations, drinking water fountains and employee showering facilities.			✓	
Develop comprehensive Level of Stress ratings and map data for all roadways and trails statewide, and publish LTS map information online.			✓	
Expand the automated bicycle trip count program to more locations including segments of all Bicycle Routes of Statewide Importance, and publish trip count data online through the DelDOT Gateway mapping portal.			✓	
Publish real-time traffic and flood conditions for Bicycle Routes of Statewide Importance online through the DelDOT App.			✓	
Develop a publicity campaign to promote bicycling for transportation and recreation.			✓	

SOURCES OF DATA

DelDOT uses a variety of data sources to maintain and track performance measures and targets. This helps us to evaluate the Bicycle Program's success and tailor the program to meet evolving needs.

Existing data sources include:

- ✓ FATALITY ANALYSIS REPORTING SYSTEM DATABASE
- ✓ STATEWIDE COMPREHENSIVE OUTDOOR RECREATION PLAN SURVEY
- ✓ DELAWARE TRIP MONITORING SYSTEM
- ✓ AMERICAN COMMUNITY SURVEY
- ✓ TRAIL COUNTERS
- ✓ DELJIS: DELAWARE CRIMINAL JUSTICE INFORMATION SYSTEM

PERFORMANCE MEASURES & TARGETS

To measure yearly progress, DelDOT currently uses **miles of bike lanes and trails added per year** as it's primary benchmark. However, this figure only tracks the **amount and rate at which bike facilities are being added per year** and therefore is not representative of all the goals and objectives that have been outlined in the *Blueprint for a Bicycle-Friendly Delaware* or this Long Range Transportation Plan. The *Blueprint* identifies additional measures to evaluate a broader range of outcomes,

NUMBER OF FATALITIES AND SERIOUS INJURIES

A bicycle-related fatality and injury measure will be used in conjunction with the *Delaware Strategic Highway Safety Plan: Towards Zero Deaths*. This Plan is a statewide coordinated plan working towards eliminating fatalities and serious injuries through a multi-agency approach targeting educational, enforcement, engineering and emergency medical services.

MODE SHARE

Measuring mode share statistics is helpful in understanding the impact that bicycle facilities have on vehicular usage and to support bicycle-friendly communities.

TRAIL USER VOLUMES

This measure is averaged annually using permanent counters at the Castle, Capital City and Junction & Breakwater Trails. These statistics are vital to understand where the greatest volume of usage is concentrated and is helpful to effectively plan additional projects.

PERCENT OF POPULATION OR HOUSEHOLDS PARTICIPATING IN BIKING

The Statewide Comprehensive Outdoor Recreation Plan and Survey identifies bicycling as an important recreational activity. This Plan also provides guidance for where and how trails and pathways can be expanded to maximize availability of these facilities to increase the percentage of the population that participates in biking.

PERFORMANCE MEASURE SUMMARY

				DATA COLLECTION		
MEASURE	SOURCE(S) OF DATA	DATA MANAGER	DATA CONSISTENTLY/ REGULARLY COLLECTED?	BASELINE MEASURE	BASELINE YEAR	BASELINE SOURCE
Fatalities	DeIJIS, CARS, FARS databases	DeIDOT Safety, OHS	Yes	3 People	2016	DPS 2016 Traffic Statistical Report
Personal Injuries	DEIJIS - CARS database	DeIDOT Safety, OHS	Yes	108 People	2016	DPS 2016 Traffic Statistical Report
Percent of population or households participating in bicycling of all types	Statewide Comprehensive Outdoor Recreation Plan (SCORP) Survey (may also consider BRFS)	DNREC State Parks	Yes	53% of households	2016	DNREC State Parks
Mode share	DTMS, American Community Survey	DeIDOT, OSPC	Yes	1.2% of commuters	2016	ACS, 2012-2016 (5 year estimates), Table B08134
Trail user volumes (average annual weekly) at specified locations	Permanent counters; Castle Trail (Lift Bridge); Capital City (Archives Building); J & B Trail (Shofield Development)	DeIDOT	Yes	4,924 trail users per week	2016	Eco-Visio data site

Source: *Blueprint for a Bicycle-Friendly Delaware*

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PEDESTRIAN TRANSPORTATION

Safety, accessibility and proximity are all deciding factors when it comes to people choosing to walk or opt for a different transportation mode. As part of the Complete Communities Initiative, DelDOT strives to promote **walkable communities** providing safe and convenient transportation choices for all citizens.

DelDOT is responsible for the **planning, design, construction and maintenance** of pedestrian facilities located within state-owned public right-of-way. DelDOT analyzes a variety of factors and adjoining land uses to design pedestrian facilities that are appropriate for all users. In doing so, DelDOT has emerged as a **leader in Americans with Disabilities Act (ADA) pedestrian accessibility**. DelDOT's design guide, *Pedestrian Accessibility Standards for Facilities in the Public Right-of-Way*, provides criteria for the design of Pedestrian Accessible Routes (PAR) elements and ensures that pedestrian facilities are being consistently installed and updated to current ADA requirements. DelDOT also inventories pedestrian facilities and ADA accessibility using an innovative Geographic Information System (GIS) web application that helps DelDOT monitor progress toward the goal of statewide ADA compliance.

Through coordination with the Office of Highway Safety and the Delaware State Police, DelDOT works to **improve pedestrian safety and accessibility** on our roadways, creating an environment that supports **walking as a viable transportation option**.

Complete Communities

"Complete Communities are attractive, inclusive, efficient, healthy and resilient places."

-DelDOT



The Five Elements of Complete Communities are:

- Complete Streets
- Efficient Land Use
- Healthy and Livable Communities
- Inclusive and Active Places
- Sustainable and Resilient Infrastructure



INNOVATION IN MOTION

FUNDING SOURCES

Construction and reconstruction of sidewalks are funded through a variety of programs. These sources include:

- ✓ ROAD SYSTEMS
- ✓ BRIDGE PRESERVATION
- ✓ INTERSECTION IMPROVEMENTS
- ✓ SAFE ROUTES TO SCHOOL
- ✓ BICYCLE & PEDESTRIAN IMPROVEMENTS
- ✓ TRANSPORTATION ALTERNATIVES PROGRAM (TAP)
- ✓ FIRST STATE TRAILS & PATHWAYS
- ✓ RECREATIONAL TRAILS PROGRAM
- ✓ RAIL CROSSING SAFETY
- ✓ PEDESTRIAN ADA ACCESSIBILITY
- ✓ PAVING & REHABILITATION
- ✓ MATERIALS & MINOR CONTRACTS
- ✓ TRAFFIC SAFETY
- ✓ TRAFFIC CALMING
- ✓ MUNICIPAL STREET AID
- ✓ COMMUNITY TRANSPORTATION FUND
- ✓ BUS STOP IMPROVEMENT PROGRAM

CURRENT CHALLENGES & CONSTRAINTS

Delaware land use patterns include clusters of urbanized development separated by high-speed, multi-lane roadways that have limited opportunities for safe pedestrian crossing between destinations. As a result, Delaware has one of the highest per-capita pedestrian fatality rates in the nation. DelDOT is actively working to reduce pedestrian injuries and fatalities by **improving roadway design with pedestrian safety in mind**. Several factors that affect pedestrian safety are described below.

VEHICULAR-ORIENTED INFRASTRUCTURE

Many of Delaware's roads were built for high vehicular capacity and lack pedestrian-oriented infrastructure that provides safe walking routes or access to transit service.



GAPS IN THE PEDESTRIAN NETWORK

Substandard Pedestrian Accessibility Routes and missing sidewalks, crosswalks and ramps create connectivity issues and gaps in the pedestrian network.



LIGHTING

Poor lighting conditions along highways create unsafe environments for pedestrians trying to cross the road.



PEDESTRIAN BEHAVIOR

Crash data shows that a high percentage of pedestrian fatalities involves pedestrians under the influence. Other pedestrian distractions, such as headphones and cell phones, can divert attention away from the road and surroundings.



DISTRACTED DRIVERS

Cell phone usage and impaired driving are major factors in vehicle-pedestrian collisions.



AGGRESSIVE DRIVERS

Speeding, failing to signal or yield the right of way, tailgating, disregard of traffic controls, and sudden lane changes are driving behaviors that endanger pedestrians and other road users.



CURRENT EFFICIENCIES & INNOVATIONS

Delaware is committed to developing and implementing a comprehensive strategy to save lives and prevent pedestrian injuries on our roadways. There are currently numerous innovations and efforts aimed at promoting and enhancing pedestrian safety.

PEDESTRIAN COUNCIL

The Advisory Council on Walkability and Pedestrian Awareness ("Pedestrian Council") was reestablished in 2015 to address concerns related to the high number of pedestrian fatalities, lack of awareness about pedestrian laws, and a desire to improve the walkability of the state. The Pedestrian Council was charged with advising DelDOT on making walking a safe, convenient and comfortable means of transportation.

PUBLIC EDUCATION

Upon Recommendations of the Pedestrian Council, Governor Carney declared October 2017 as Pedestrian Safety Awareness Month. DelDOT and the Office of Highway Safety (OHS) spearheaded activities to educate the public on ways to make walking safer for everyone. Their message to the public included: use of crosswalks and sidewalks, wearing of light-colored clothing or use of flashlights/reflective items when walking at night, walking facing traffic, and always keeping an eye out for pedestrians if you are a motorist.



PEDESTRIAN SAFETY AUDITS

One of the strategies in Delaware's Strategic Highway Safety Plan to reduce pedestrian fatalities and serious injuries includes conducting pedestrian safety audits at high-crash locations and implementing the resulting recommendations.



HAWK PEDESTRIAN SIGNAL COMPLIANCE REVIEW

Pedestrian Hybrid Beacons, or HAWK (High Intensity Activated Cross Walk) signals have been installed in select locations across the state to reduce pedestrian exposure to traffic and increase visibility when crossing roadways. Reviews have been conducted to determine the level of motorists' compliance with this relatively new form of traffic control in Delaware and to assess the feasibility of installing such devices elsewhere.



PEDESTRIAN ACCESSIBILITY STANDARDS FOR FACILITIES IN THE PUBLIC RIGHT-OF-WAY

DelDOT published a design guide that provides standards and criteria to formalize a consistent approach to planning, design, construction and maintenance of Pedestrian Accessible Routes (PAR) in the public right-of-way.



ADA INVENTORY & INSPECTIONS

A mobile and interactive app has been developed that tracks pedestrian facility inventory and inspection data across the state.



COORDINATION WITH PAVEMENT REHABILITATION

DelDOT's Pavement Rehabilitation projects now include a requirement to bring all adjoining pedestrian ramps up to current ADA Standards, which increases accessible routes statewide.

PEDESTRIAN TRANSPORTATION STAKEHOLDER ROLES & RESPONSIBILITIES

DELDOT DIVISIONS



OFFICE OF THE SECRETARY

- ADA Coordination



PLANNING

- Policy & Design Guidance
- Data Collection
- Community-based Projects



COMMUNITY RELATIONS

- Public Education Outreach



PERFORMANCE MANAGEMENT

- Metrics & Targets
- Progress Tracking
- Pedestrian Accessibility Standards



TECHNOLOGY & INNOVATION

- GIS Database Maintenance



SAFETY/TRAFFIC

- Safety Audits



TRANSPORTATION SOLUTIONS

- Project Implementation



FINANCE

- Funding Sources & Budgeting



DIVISION OF MOTOR VEHICLES

- Driver Training



MAINTENANCE & OPERATIONS

- Maintenance Agreements
- Construction

ADDITIONAL PARTNERSHIPS

FEDERAL HIGHWAY ADMINISTRATION

- Research & Resource Publication
- Federal Funding

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

- Data Collection

OFFICE OF HIGHWAY SAFETY

- Educational Outreach & Funding

STATE COUNCIL FOR PERSONS WITH DISABILITIES

- Policy, Plan and Program Review

DELAWARE STATE POLICE

- Enforcement
- Data Collection
- Job Site Safety

PEDESTRIAN SAFETY COUNCIL

- Pedestrian Safety Strategy Development
- Infrastructure Gap Identification

OFFICE OF STATE PLANNING COORDINATION

- Coordination of state, county and local planning efforts

IMPLEMENTATION: DELAWARE'S NEEDS

Pedestrian facility standards and design guidelines have been developed and continue to be refined as new infrastructure is put in place. Additional programs and outreach techniques have been identified that will further enhance DelDOT's efforts to provide a safe and accessible pedestrian network.

LIVING LABORATORY RESEARCH PROGRAM

A Living Laboratory Research Program will enable the testing of street designs, infrastructure elements and programs that help DelDOT achieve its goals and keep pedestrians safe. Testing new ideas and assessing results could lead to new design standards and policies.

PEDESTRIAN NETWORK PLAN

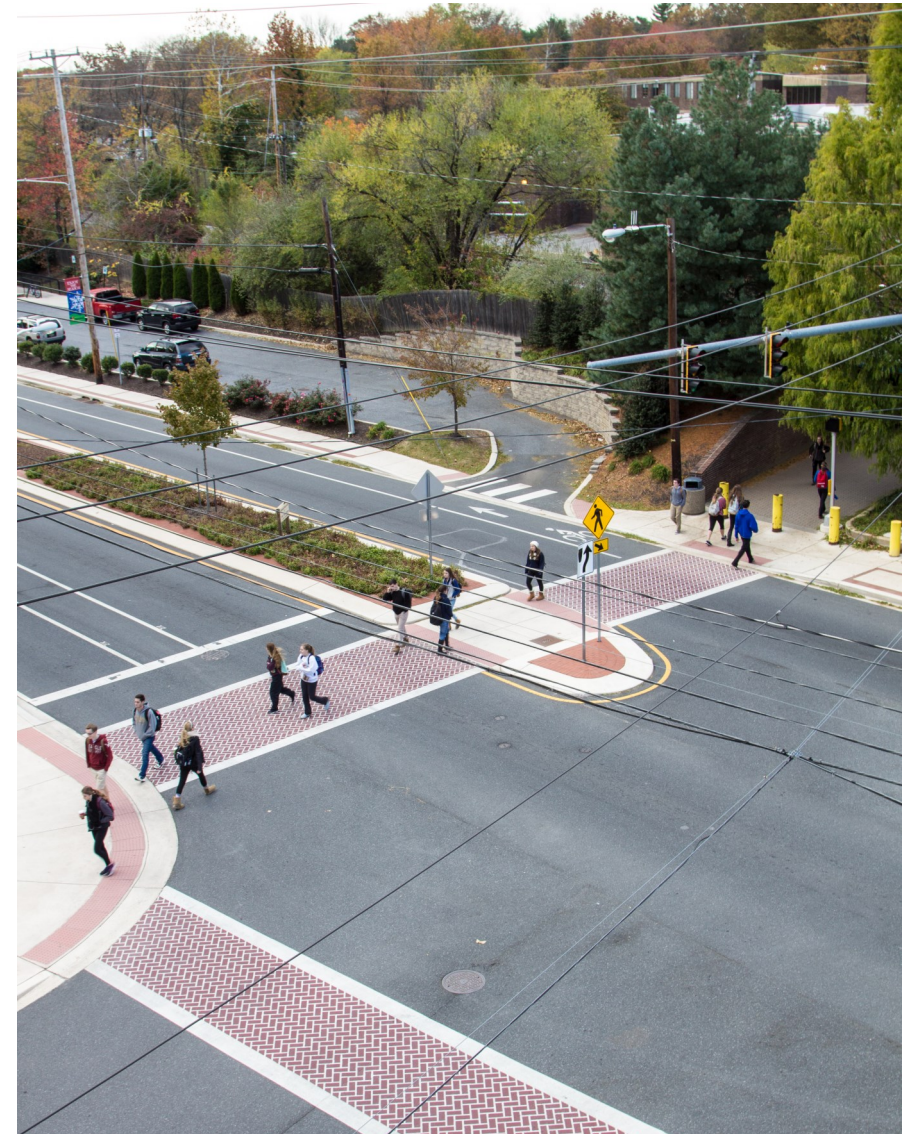
A comprehensive assessment of pedestrian routes, missing connections and barriers will lead to improved network connectivity, which will enhance recreation, economic development and pedestrian safety. This program can be used to help DelDOT prioritize its pedestrian project investments.

PEDESTRIAN PRIORITY AREA PROGRAM

A program could be implemented that supports Complete Communities by designating targeted areas where pedestrian safety and accessibility improvements are prioritized. These areas would include those with high pedestrian activity, high accident locations, and low income/at-risk neighborhoods.

EDUCATION

Additional comprehensive education and outreach campaigns will help drivers and pedestrians understand highway safety issues.



PEDESTRIAN TRANSPORTATION - STRATEGIES & ACTION ITEMS

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Conduct an annual comprehensive Return on Investment (ROI) report to assess a correlation of pedestrian facility investments in business districts with increases in foot traffic, local economic development trends, and other public benefits.	✓			
Conduct pedestrian safety audits at high-crash locations and install effective countermeasures to improve safety.	✓			
Establish a Living Laboratory program to perform before-and-after studies to evaluate and identify the most effective pedestrian safety treatments, incorporating the results of these studies into the pedestrian design guide.	✓			
Support legislative action to strengthen pedestrian safety laws and enforcement measures.	✓			
Update accessibility of at least 100 curb ramps within the scope of pavement and rehabilitation projects constructed per calendar year, until all state-owned curb ramps are designed and constructed to meet accessibility requirements.	✓			
Evaluate opportunities to plan and implement capital projects that improve existing routes and strategically expand the pedestrian network. These long-term projects will be listed in the 6-year CTP.	✓			
Provide assistance to local jurisdictions to develop and implement pedestrian plans and projects linking local and state owned pedestrian facilities that expand the overall network.	✓			
Continue full maintenance of "primary" sidewalks in DelDOT's Sidewalk Snow Removal Program.	✓			
Establish a Pedestrian Priority Area Program promoting walkability, and prioritize pedestrian improvement projects in low income/at-risk neighborhoods to foster economic growth and revitalize communities.		✓		
Partner with regional organizations and employers to encourage and provide incentives for active lifestyles that include regular walking.		✓		
Create a pedestrian design guide that includes design requirements, implementation guidance and defined processes for project development.		✓		

PEDESTRIAN TRANSPORTATION - STRATEGIES & ACTION ITEMS (CONT'D.)

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

STRATEGIES & ACTION ITEMS	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
Identify new trail expansion opportunities to increase recreational walking activity and create links between existing sidewalks and trails.		✓		
Update the DelDOT Sidewalk Maintenance Policy by developing an annual review and repair program.		✓		
Establish a Living Laboratory Program to evaluate improvements to the network and to quantify any changes in pedestrian patterns and behavior.		✓		
Develop a mobile application using e-Construction technology to enable construction inspection staff to make real-time sidewalk inventory updates and provide more timely reporting to the public and FHWA.		✓		
Provide public education and awareness campaigns focused on pedestrian safety, rights and responsibilities, and link these campaigns with other activities that encourage walking.		✓		
Continue annual ADA self-evaluation Transition Plan review (w/ required formal review every 5 years). Progress reports will include maps depicting locations that have been remediated in the past year.		✓		
Update DelDOT pedestrian facility design standards to refine pedestrian accessibility requirements and best practices for DelDOT projects based on new innovations, targeted network expansions and Living Laboratory Program assessments.			✓	
Establish a process that incorporates PAR Program retrofit improvements into the Paving Program.			✓	
Create an inventory of abandoned or underutilized infrastructure that can be repurposed for recreational trails. These assets may include railroads, bridges, utility corridors, levees, "paper" streets and roadways.			✓	

SOURCES OF DATA

Reporting measures of pedestrian accessibility and safety is a collaborative process that involves state and federal offices. Success is measured through the collection and analysis of data from a variety of sources each year, including:

- ✓ DELDOT
- ✓ OFFICE OF HIGHWAY SAFETY
- ✓ DELAWARE STATE POLICE
- ✓ NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
- ✓ UNIVERSITY OF DELAWARE

PERFORMANCE MEASURES & TARGETS

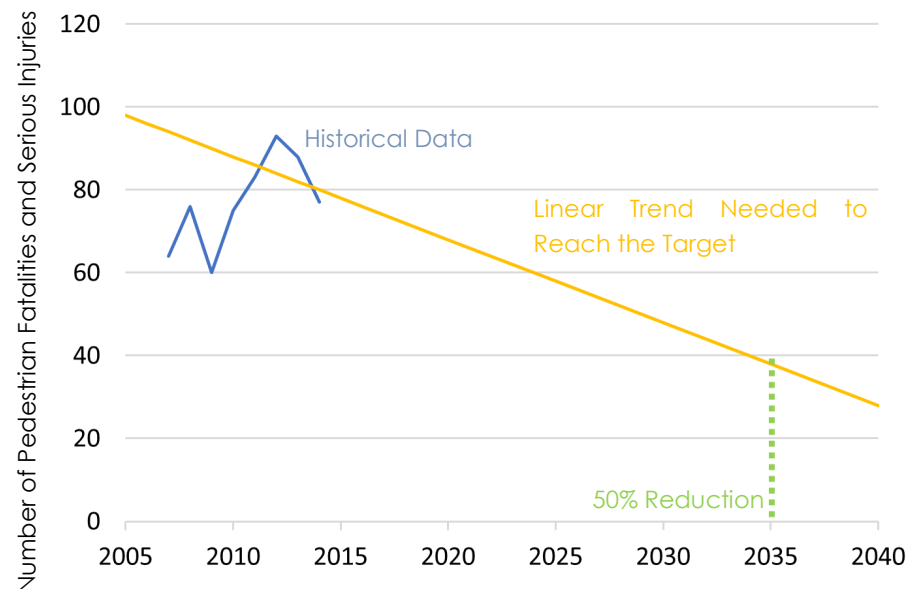
In Delaware, pedestrian fatality and serious injury data is annually reviewed and reported in DelDOT's Highway Safety Improvement Plan (HSIP) Annual Report, the Office of Highway Safety's Annual Highway Safety Report and the Delaware State Police's Annual Traffic Statistical Report. Trends in the data are monitored throughout the year to target engineering, enforcement, education and emergency service efforts. The following performance measures have been developed to monitor progress in attaining Delaware's goal of **reducing the combined number of pedestrian fatalities and serious injuries by at least 10 incidents every 5 years**, and an overall target of **reducing fatalities and serious injuries by at least 50% by 2035**.

TOTAL NUMBER OF FATALITIES

- This measure tracks the number of pedestrian fatalities on the state transportation system
- Delaware recognizes that the use of education and enforcement techniques may have the greatest potential for reductions in the total number of fatalities.

TOTAL NUMBER OF SERIOUS INJURIES

- This measure tracks the number of serious injuries that have occurred as the result of an incident on the state transportation system.



DelDOT is striving for at least a **50% reduction in pedestrian fatalities and serious injuries** by 2035. **DelDOT is continually aiming to prevent all serious pedestrian injuries and fatalities** on Delaware roadways to achieve significant reductions sooner.

PERFORMANCE MEASURES & TARGETS

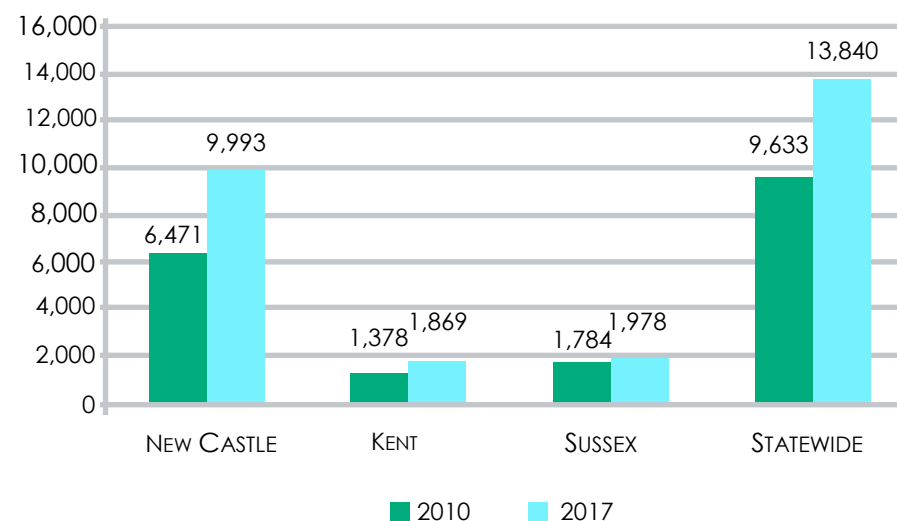
PERFORMANCE MEASURE	2014	2015	2016	2017	TARGET
Pedestrian Safety					
Number of Pedestrian Fatalities	27	36	28	34	50% reduction by 2035 from 2015
Number of Serious Injuries	50	48	45	33	50% reduction by 2035 from 2015



CONNECTING SIDEWALKS remains a focus for DelDOT as **increasing numbers** of Delawareans **consider walking** as their **primary** means of **transportation**.

Walking as a Primary Way to Commute: 2010 vs 2017				
2010	New Castle	Kent	Sussex	Statewide
Total workers	258,255	71,865	83,865	413,985
Number walking	6,471	1,378	1,784	9,633
2017	New Castle	Kent	Sussex	Statewide
Total workers	293,925	93,439	98,842	486,206
Number walking	9,993	1,869	1,978	13,840
% change 2010-17	54.4	35.6	10.9	43.7

Source: University of Delaware, Delaware Trip Monitoring Survey; numbers shown are survey results weighted to the total population.



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FREIGHT MOVEMENT

Reliable and efficient movement of freight is critical to Delaware's economy. DelDOT monitors and manages freight movement in coordination with partners across the Delmarva Peninsula, a region occupied by most of Delaware, as well as the eastern shores of Maryland and Virginia. In 2015, DelDOT adopted the "Delmarva Freight Plan". The plan was developed based on regional focus and collaboration with various freight partners across the Delmarva Peninsula. The plan provides information that assists the state DOTs, area MPOs and other stakeholders in making well-informed decisions on freight infrastructure investments and policies.

This plan was updated in November, 2017 to bring the plan into compliance with the federal Fixing America's Surface Transportation (FAST) Act, which includes requirements for performance measures and development of a Freight Investment Plan.

As freight activity continues to increase, it is important to consider the role of all modes of transport, including roads, rail lines, navigable waterways, and airports. Future investments will be prioritized across all modes to make the system more efficient.

VISION

Coordinating with freight partners across the Delmarva Peninsula, Delaware can achieve a safer, more efficient multimodal freight system that will strengthen the regional economy and create new jobs.



NATIONAL FREIGHT POLICY GOALS

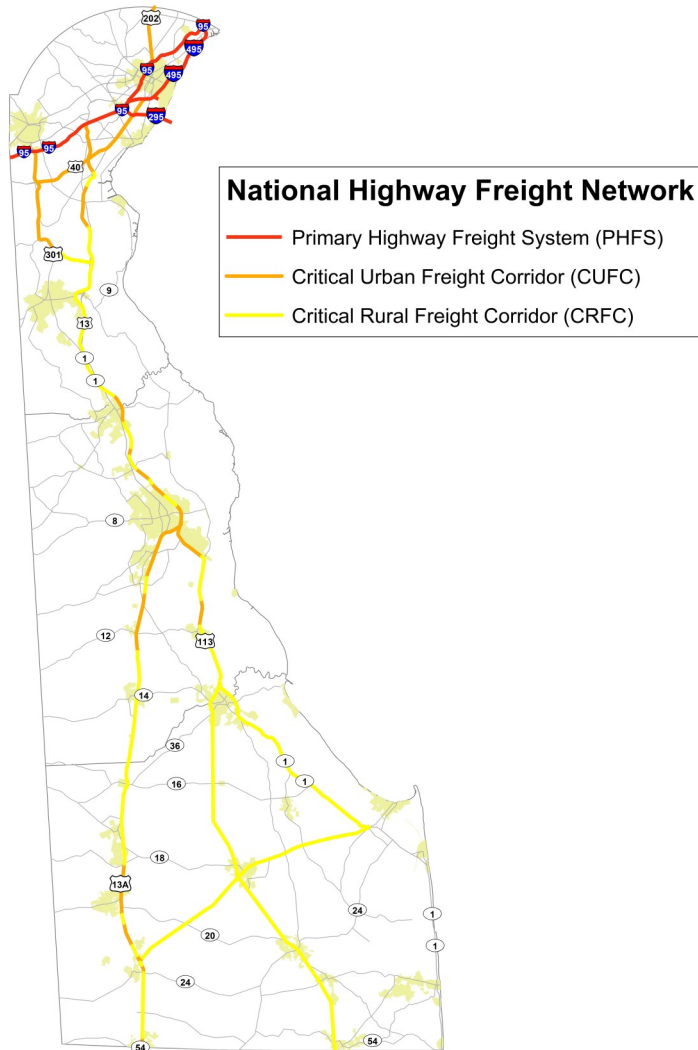
- Improve the freight transportation system's contribution to **economic efficiency**, **productivity** and **competitiveness**.
- Reduce **congestion** on the freight transportation system.
- Improve the **safety**, **security** and **resilience** of the freight transportation system.
- Improve the state of **good repair** of the freight transportation system.
- Use advanced technology, performance management, **innovation**, competition and **accountability** in operating and maintaining the freight transportation system.
- Reduce adverse **environmental** and **community** impacts of the freight transportation system.



INNOVATION IN MOTION

NATIONAL HIGHWAY FREIGHT NETWORK

Trucking, by way of the highway network, is the dominant means of freight transportation across the Delmarva Peninsula. According to the 2015 *Delmarva Freight Plan*, trucks carry approximately 80% of the Delmarva Peninsula's overall goods by tonnage and 82% of the overall freight value. Trucks transport freight using Delaware's interstate, U.S. highway, state and secondary route networks. The first and last mile connections are typically along smaller, local roadways or subdivision roads that are not always owned or maintained by DelDOT. **Reliable connections at each level are important in order to move goods from their sources to their final destinations.**



Under the FAST Act, the National Highway Freight Program (NHFP) was established to improve the efficient movement of freight on the National Highway Freight Network (NHFN) in support of national freight goals. The NHFN consists of the following federally-required components:

- **Primary Highway Freight System (PHFS) - designated by FHWA**
- **Critical Urban Freight Corridors (CUFC) - designated by the state**
- **Critical Rural Freight Corridors (CRFC) - designated by the state**

The NHFP provides a targeted source of federal funding for a wide range of activities along freight corridors including, but not limited to the following:

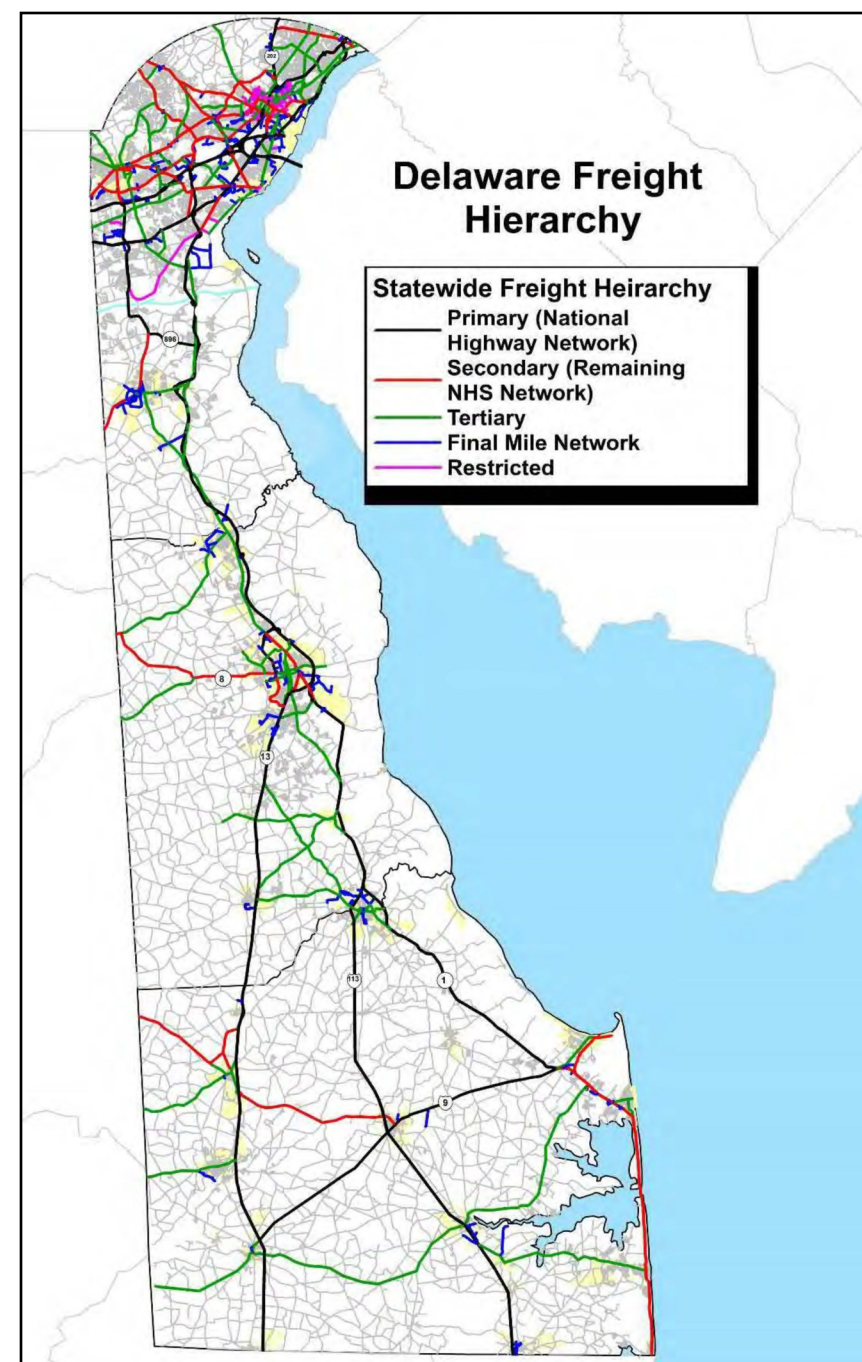
- Planning, feasibility analysis, revenue forecasting, environmental review, preliminary engineering and design work, and other preconstruction activities
- Construction, reconstruction, rehabilitation, acquisition of real property (including land relating to the project and improvements to land), construction contingencies, acquisition of equipment, and operational improvements directly relating to improving system performance
- Intelligent transportation systems and other technology to improve the flow of freight
- Environmental and community mitigation for freight movement
- Geometric roadway improvements
- Electronic screening and credentialing systems for vehicles, including weigh-in-motion truck inspection technology
- Traffic signal optimization, including synchronized and adaptive signals
- Work zone management and information systems
- Electronic cargo and border security technology that improve truck freight movement.

Projects eligible for NHFP funds are contained in the state's Freight Investment Plan.

FREIGHT NETWORK HIERARCHY IN DELAWARE

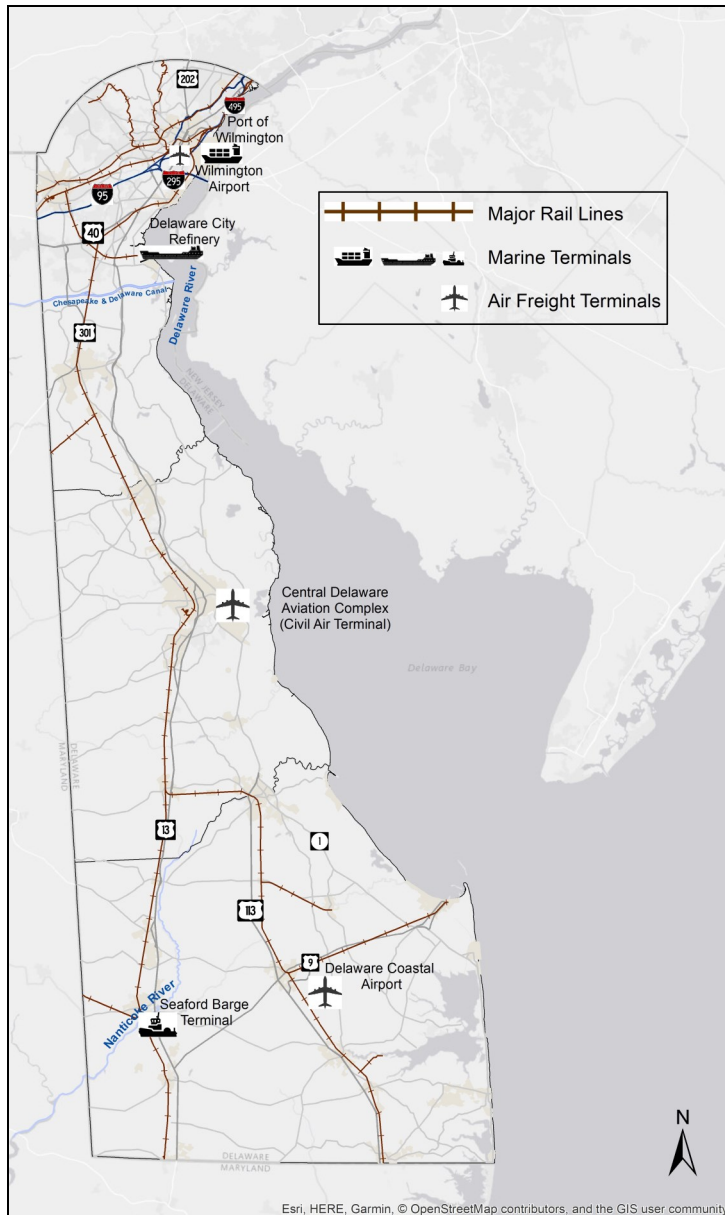
As a complement to the federally-designated and multimodal freight networks, DelDOT and the MPOs have been developing a **Delaware Freight Hierarchy** that identifies additional categories of freight transportation routes. These categories include Secondary Routes, which are remaining segments of the National Highway System not designated in the federal networks, Tertiary, Final Mile and Restricted route segments. Proposed Final Mile segments were designated based on a draft rating system that incorporated the Delaware State Spending Strategies, truck trip generation, truck traffic volumes and percentages and pavement conditions.

Examples of potential applications of the Delaware Freight Hierarchy include supporting corridor-specific strategies or supplemental performance monitoring details, broader freight program emphasis, final mile freight details and mitigation of related roadway deterioration, or potential roles directly related to project prioritization.



MULTIMODAL FREIGHT NETWORK

In addition to the highway networks, freight transportation in Delaware occurs through a variety of other modes. Connectivity between the highway system and rail, waterborne and air freight routes and facilities is vital for the movement of goods and services throughout Delaware and the surrounding region.



Rail Freight

Railroads on the Delmarva Peninsula provide a critical transportation system for supplying and distributing raw materials and other goods for major sectors of the region's economy. The energy, agricultural, chemical and construction industries all rely heavily on rail-based supply chains, as do a variety of large and small manufacturing and processing industries. Project-specific commodity flow data indicates that railroads carry approximately 6% of the peninsula's overall goods movement tonnage or value.

Rail freight carriers that serve the peninsula include Norfolk Southern, CSX, Delmarva Central, Maryland & Delaware Railroad, Delaware Coastline Railroad and Bay Coast Railroad.

Waterborne Freight

Waterborne freight is a crucial component of the Delmarva Peninsula's economy and freight network, given the geographical location on the Atlantic coast and connections to the Delaware Bay, Chesapeake Bay and numerous inland waterway systems. International shipping activity occurs by way of the Delaware Bay and River and the Chesapeake and Delaware Canal, accessing facilities at the Port of Wilmington and nearby in New Castle and Delaware City. The region's river systems provide access to ports at Salisbury, Seaford and Pocomoke City. Various raw materials and manufactured products carried on the Peninsula's waterways include crude oil and petroleum products, chemicals, grains, fertilizers, vehicles, livestock, fresh fruit and fabricated metal products.

Airborne Freight

Airborne freight activity on the Delmarva Peninsula is generally limited to the smaller business and corporate levels. Although less than 1% of the Peninsula's overall goods movement tonnage and 3% of the overall goods value move by air, the highway transportation network provides efficient access to several major airborne freight hubs in the surrounding region. The significant freight-related airports in Delaware include the Dover Air Force Base and the developing Central Delaware Aviation Complex (Civil Air Terminal), the Wilmington Airport and Delaware Coastal Airport.

See the [Delmarva Freight Plan](#) for more information about freight transportation modes.

FUNDING SOURCES

Delaware uses a variety of available resources including:

- ✓ NATIONAL HIGHWAY PERFORMANCE PROGRAM (NHPP)
- ✓ SURFACE TRANSPORTATION PROGRAM (STP)
- ✓ NATIONAL HIGHWAY FREIGHT PROGRAM (NHFP)
- ✓ TRANSPORTATION INFRASTRUCTURE FINANCE AND INNOVATION ACT (TIFIA)
- ✓ TRANSPORTATION INVESTMENT GENERATING ECONOMIC RECOVERY (TIGER)
- ✓ PROJECTS OF NATIONAL & REGIONAL SIGNIFICANCE (PNRS)
- ✓ FEDERAL RAILROAD ADMINISTRATION (FRA)
- ✓ FAA AIRPORT IMPROVEMENT PROGRAM (AIP)
- ✓ DELAWARE TRANSPORTATION TRUST FUND
- ✓ PUBLIC PRIVATE PARTNERSHIPS (P3)

CURRENT CHALLENGES & CONSTRAINTS

HIGHWAY CONGESTION

Increasing congestions reduces delivery reliability and increases costs and potential conflicts, particularly with seasonal peak traffic.



GEOGRAPHY

The geography of the Delmarva peninsula affects how Delaware is able to link to the regional movement of goods along the East Coast.

DETERIORATING INFRASTRUCTURE

Aging infrastructure requires more investment to maintain good conditions of the first and last mile connections, especially on secondary roads and bridges.



MARINE ACCESS

There are limited sites and capacity for dredge material disposal.



LOCAL CONNECTIONS

The network must keep pace with freight facility development occurring in the region.



LOCAL CONFLICTS

Residents do not want truck traffic in their neighborhoods.

INTERMODAL CONNECTIONS

Adequate capacity must be maintained to enable efficient transfers between highway, rail, air and marine modes.

ONLINE SHOPPING

Local package delivery trips are increasing.



CURRENT EFFICIENCIES & INNOVATIONS

DELMARVA FREIGHT PLAN

The Plan coordinates freight goals and strategies across the 3-state region, and identifies priority investments for Delaware.

ELECTRONIC TRUCK REGISTRATION

Streamlined credentialing and interagency record-sharing leads to trucks making fewer stops for roadside inspections.

PAVEMENT MANAGEMENT PROGRAM

Pavement rehabilitation projects are prioritized based on local and regional freight routes and use treatments and materials suitable for heavy vehicles.



REGIONAL COORDINATION

DelDOT proactively partners with regional stakeholders, through the Delmarva Freight Working Group, and provides leadership for planning activities, identification of priority projects, and freight security and enforcement initiatives.



PERMITTING EFFICIENCIES

New systems are being developed that will provide auto-routing for hauling permits.



FREIGHT MOVEMENT STAKEHOLDERS

DELDOT DIVISIONS



OFFICE OF THE SECRETARY

- Policy and Legislation



PLANNING

- Freight Planning and Project Prioritization
- Intermodal Planning (Including Aeronautics, Rail and Marine)
- Interagency Coordination
- National Performance Management
- Regional Data



TECHNOLOGY & INNOVATION

- Data Maintenance



COMMUNITY RELATIONS

- Public Education and Outreach



FINANCE

- Administers Delaware's Transportation Trust Fund
- Funding Sources
- Budgeting



PERFORMANCE MANAGEMENT

- Tracking Progress
- Establishing Metrics and Targets



TRANSPORTATION SOLUTIONS

- Project Development and Construction



MAINTENANCE & OPERATIONS

- Infrastructure and System Maintenance
- Toll Facility Operation



DELAWARE TRANSIT CORPORATION (DTC)

- Rail Facility Oversight
- Passenger Rail Coordination



MOTOR VEHICLES

- Commercial Licensing
- Toll Operations

ADDITIONAL PARTNERSHIPS

DELAWARE RIVER & BAY AUTHORITY (DRBA)

- Economic Development Opportunities through Key Transportation Links
- Delaware Memorial Bridge Operation

GT USA WILMINGTON LLC

- Port of Wilmington Operation

DELAWARE STATE POLICE

- Weigh Station Operation
- Commercial Vehicle Inspections
- Enforcement Activities

MPOS

- Planning Coordination
- Project and Program Identification

OTHER PARTNERS

- Delmarva Water Transport Committee
- Delaware Motor Transport Association
- Class I and Short-Line Rail Operators

DELAWARE'S NEEDS

The **2015 Delmarva Freight Plan** and its **2017 Delaware Statewide Freight Plan Addendum** have identified some long-term needs and strategies with a coordinated, regional perspective, as described below.

MANAGE FREIGHT ROUTE CONGESTION

A key performance indicator is truck travel time reliability, and highway congestion causes delay that adds time and costs, compromises safety and degrades the transportation infrastructure.

MAINTAIN FREIGHT INFRASTRUCTURE

Roadway and bridge conditions throughout the overall freight network are important factors to keep freight movement operations reliable and efficient. Degraded conditions can result in longer detours on community streets or a relocation of freight-dependent businesses.

IMPROVE MULTI-MODAL CONNECTIVITY

The freight system needs a designated network of routes for each mode (truck, rail, marine and air) as well as key gateways and modal transfer locations. These critical components of system operations must be significantly weighted in project screening and prioritization.

PROMOTE REGIONAL SUPPLY CHAIN POSITIONING

Since a strong freight network is a significant factor in Delaware's economic vitality, continued emphasis must be placed on implementing system efficiencies, streamlining system operations, identifying and investing in targeted growth areas and promoting freight-related business growth statewide.

IMPROVE AIR QUALITY

Freight movement is a contributor to mobile source air pollution. Air quality can be improved by reducing roadway congestion, integrating more fuel efficient technology, and using cleaner fuels.

MANAGE FLOOD RISK AND SEA-LEVEL RISE

Portions of the freight network are vulnerable to flooding and sea-level rise. DeIDOT's overall asset management and hazard mitigation planning must include considerations for freight accommodation and resiliency.



LAND USE PLANNING INTEGRATION

Locating freight-related businesses in appropriate, highly accessible sites is a key economic development strategy. County and local land use plans must ensure that Delaware's key agricultural, industrial, poultry and chemical supply chains continue to have sites offering sustainable, efficient access to mid-Atlantic population centers from Norfolk to Boston.

DREDGED MATERIAL MANAGEMENT

Additional capacity and new, beneficial and innovative use opportunities must be sought for dredged material disposal to ensure Delaware's ports and waterways remain open and secure.

HOMELAND SECURITY

Some cargo moving through Delaware originates from international sources, and our freight network has nationally important connections. Interagency coordination is important for managing border security, cargo screening and tracking, protecting assets and developing contingency plans.

SAFETY AND SECURITY FOR TRANSPORTING HAZARDOUS MATERIALS

Partnerships are needed to anticipate, screen, monitor and track movement of hazardous materials, and to have contingency plans in place for addressing emergency situations.

EXPAND THE USE OF ADVANCED TECHNOLOGY

The trucking industry is already testing connected and autonomous vehicle technology to increase the efficiency of moving goods. Delaware will continue to monitor these advancements and will implement new technology when and where applicable.



FREIGHT MOVEMENT - STRATEGIES & ACTION ITEMS

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

STRATEGIES & ACTION ITEMS	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
Establish and update agency tracking systems, environmental protections and contingency plans to address potential hazardous material spills.	✓			
Establish and update agency Homeland Security policies to maintain a secure border and screen and monitor cargo to identify any illicit or harmful agents.	✓			
Monitor safety records and accident statistics to identify locations with safety concerns within the freight network, and prioritize traffic safety improvements.	✓			
Create and maintain a designated freight network to prioritize locations for freight-related infrastructure investments.	✓			
Prioritize improvements on the freight network within DelDOT right-of-way, including critical routes as well as secondary roads and bridges critical to motor freight access throughout the Delmarva Peninsula.	✓			
Coordinate with and educate local planning officials on importance of balancing land use and community interests with preserving critical infrastructure and freight-oriented land uses in freight corridors.	✓			
Coordinate inter-agency meetings, training and mock exercises to optimize communications and data-sharing between jurisdictions within the Delmarva Peninsula.	✓			
Track the Truck Travel Time Reliability Index and prioritize congestion relief strategies for high-congestion areas within the freight network.	✓			
Inventory vulnerable freight infrastructure that may be impacted by flooding and sea-level rise, and prioritize these locations for flood-protection and abatement measures.	✓			
Study and promote fuel-efficiency technology, idling restrictions and alternative fuels for freight vehicles that reduce air pollutant emissions.	✓			
Ensure that freight is a “good neighbor” to communities by continuous education and public outreach.	✓			
Invest in Intelligent Transportation System improvements such as traffic signal optimization, All Electronic Tolling (AET) and real-time traffic and construction reporting systems.	✓			
Identify and promote the use of overnight truck parking facilities and invest in enhancements to accommodate drivers.	✓			

FREIGHT MOVEMENT - STRATEGIES & ACTION ITEMS (CONT'D.)

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Conduct a full review of agency regulations and identify opportunities to streamline those that hinder freight business operations without increasing risks to public health and safety and environmental sustainability.		✓		
Create and maintain an assets data inventory including road widths, bridge loads, weight limits, and height/operating restrictions for all freight routes.		✓		
Develop guidance and policy to balance the needs of freight-dependent businesses and communities.		✓		
Establish a standardized method to track truck-related crash data to efficiently compile and compare crash datasets from Delaware, Maryland and Virginia.			✓	
Identify alternative dredged material disposal opportunities including new placement sites and new beneficial and innovative use opportunities.			✓	
Create a system to monitor and inventory changes in heavy vehicle traffic patterns to inform pavement design and maintenance programs/projects.			✓	
Implement pilot studies to test connected and autonomous vehicles for freight operations on Delaware roads.			✓	

FEDERAL PERFORMANCE MEASURES

FHWA requires reporting on the following freight movement performance measure:

- Freight movement on the Interstate System; Freight Reliability Measure—Truck Travel Time Reliability (TTTR) Index

The FHWA requires DOTs to submit freight targets in a baseline report at the beginning of each performance period and report progress in achieving targets at the midpoint and end of the performance period. State DOTs are allowed to adjust their 4-year target at the midpoint of the performance period. MPOs are not required to provide separate reporting to FHWA. State DOTs and MPOs need to agree on a reporting process as part of their Metropolitan Planning Agreements.

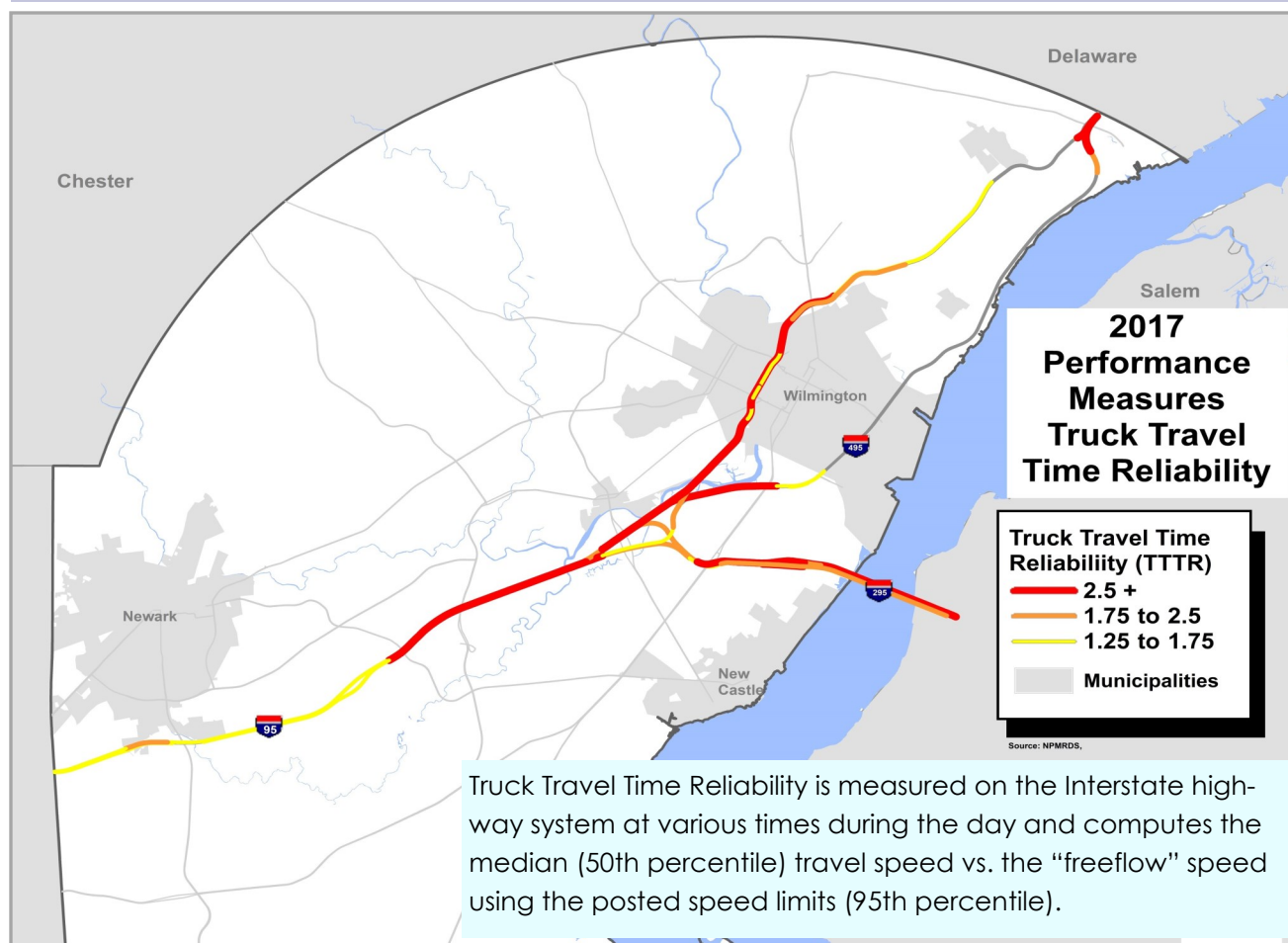
DATA SOURCES

- ✓ FREIGHT ANALYSIS FRAMEWORK (FAF) DATA SUMMARIES
- ✓ USACE NAVIGATION DATA CENTER
- ✓ GT USA WILMINGTON LLC
- ✓ DELMARVA WATER TRANSPORT COMMITTEE
- ✓ NHTSA FATALITY ANALYSIS REPORTING SYSTEM (FARS)

PERFORMANCE MEASURES & TARGETS

An initial set of performance measures for monitoring freight on the Delmarva Peninsula was compiled as part of the **2015 Delmarva Freight Plan**. A total of 36 tentative measures were identified, including the freight movement performance measure required by FHWA, the Truck Travel Time Reliability Index, which is described and depicted in the map below. The 36 performance measures included baseline 2010 data using available data sources. There are many additional non-federal performance measures listed in the 2015 Plan that did not identify any baseline data and are listed in the Freight Plan as TBD (to-be-determined). Moving forward, DelDOT is working to finalize the list of performance measures and identify targets for each measure.

TRUCK TRAVEL TIME RELIABILITY



PERFORMANCE MEASURES & TARGETS

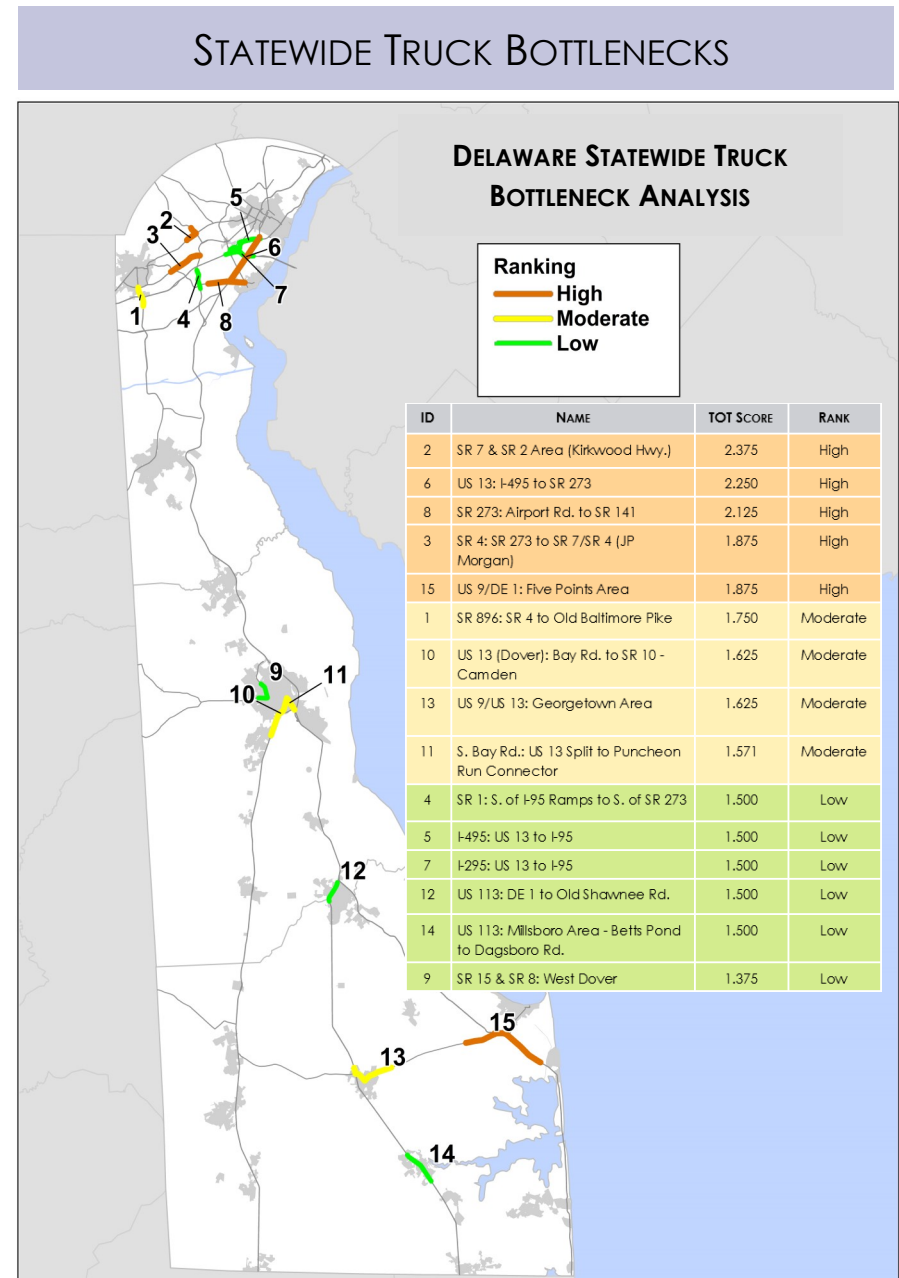
Increasing freight traffic throughout the United States presents challenges for efficient movement of goods and concerns about safety, infrastructure condition and reliability of travel. Federal performance management requirements focus on these issues by creating national goals and by requiring the Federal Highway Administration (FHWA) to establish performance measures for which states and MPOs must set targets.

State DOTs must also submit performance reports to FHWA, and as part of this reporting, states must identify and describe the ways that they are addressing congestion at freight bottlenecks. The performance management regulations define a Truck Freight Bottleneck as “a segment of roadway identified by the state DOT as having constraints that cause a significant impact on freight mobility and reliability.” (23 CFR 490.101)

FHWA publishes a Truck Freight Bottleneck Reporting Guidebook to support compliance by states with reporting requirements. Although states have flexibility to select methods to comply with the reporting requirements, the guidebook encourages states and their partners to build a foundation for bottleneck reporting that combines data analysis, qualitative information, professional expertise and stakeholder engagement.

Source: Truck Freight Bottleneck Reporting Guidebook, FHWA-HOP-18-070, July 2018

The Delaware Statewide Truck Bottleneck Analysis map depicts the top 15 highest-scoring corridors based on a technical scoring system that incorporates factors such as AM, PM and Summer peak truck totals, overall truck volumes, truck percentages, route types and crash rates.





AERONAUTICS

The DelDOT Office of Aeronautics is responsible for planning and investing in Delaware's public-use aviation system, which consists of airports open to any aircraft without prior permission. In Delaware, the primary use of airports is general aviation (GA), defined as any use other than commercial air services and air transport for hire. Typical GA uses include aviation training, agricultural flights and corporate aviation, which are all significant economic drivers in the state.

DelDOT has a *State Aviation System Plan* that was completed in 2011. The primary purpose of the plan is to determine the type, location and cost of development needed to support a viable system of airports. The Office of Aeronautics will be developing a 2020 State Aviation System Plan using a coordinated process, with federal, state and local stakeholder engagement. **The Delaware Aviation Advisory Council (DAAC)** will play an active role in advising DelDOT during the development and implementation of the System Plan.

AERONAUTICS MISSION

To promote a safe and efficient aviation system for people and commerce and to communicate the value of airports to surrounding communities.



DeIDOT
AERONAUTICS

Economy • Safety • Community

DELDOT AERONAUTICS HAS ESTABLISHED THE FOLLOWING OBJECTIVES:

- Maintain an Aviation System Plan to guide policy and investment decisions
- Participate in economic development initiatives
- Promote aviation safety through outreach and education
- Provide limited capital funding for improvements to public-use airports
- Reduce the impacts of encroaching development
- Provide the public with accurate information about the aviation system
- Engage local communities in airport-related communication and events
- Maintain the safe operation of the DelDOT Helipad



INNOVATION IN MOTION

ECONOMIC IMPACTS

EXISTING FACILITIES

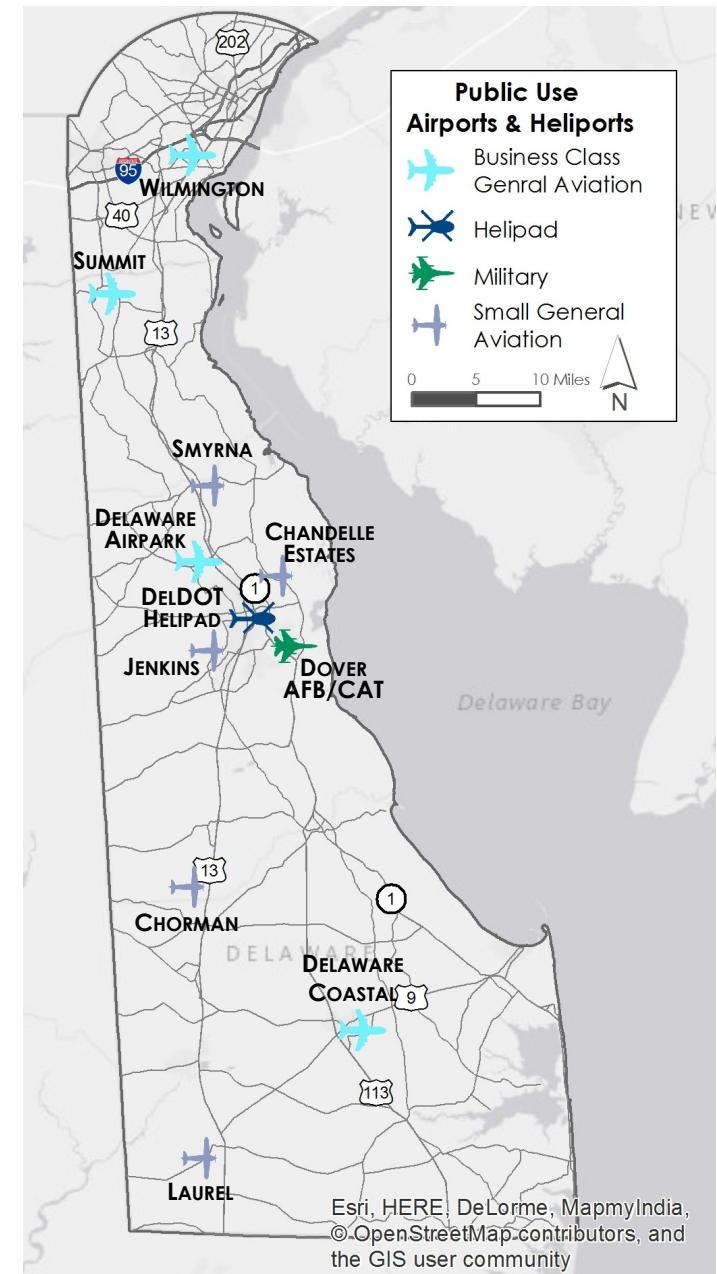
There are currently nine public-use airports and one joint military/civilian use airport in Delaware, along with a public-use helipad located at DeIDOT in Dover. Six of the eleven aviation facilities are privately-owned, and five are publicly-owned. Three of the public facilities are managed by DeIDOT's aviation partner, the Delaware River and Bay Authority (DRBA). Sussex County owns and manages Delaware Coastal Airport, and DeIDOT manages its helipad.

Every five years, DeIDOT conducts an economic assessment of Delaware's aviation system. According to the *2013 Economic Impact Assessment of Delaware Airports*, the aviation system is anticipated to sustain approximately 12,300 jobs, \$598.4 million in income, and \$1.07 billion in annual economic output. This report also estimates that the Delaware aviation system contributes roughly \$43.4 million in state and local taxes annually.

The 2013 Study demonstrated a slight increase in overall dollar output (+8%) from the 2007 Study, but a decrease in the number of aviation related jobs (-21%). The most significant drop in the number of jobs involved the Dover Air Force Base, which reported a decline of 1,407 direct and 1,629 indirect jobs.



PUBLIC USE AIRPORTS & HELIPORTS



AIRPORTS HAVE THE CAPACITY TO GROW

Airports in Delaware are primarily focused on private business, recreational flights and cargo movement. General Aviation (GA) maintenance, repair and overhaul are also provided at many airports. Delaware's airports offer ample capacity for expanded passenger and freight movement in the near future (See the "Flight Activity" chart to the right). Airport improvements must be carefully coordinated with ground transportation planning and local land use objectives to ensure compatibility and efficiency of the overall transportation system.

UNMANNED AIRCRAFT

An Unmanned Aerial Vehicle (UAV), commonly known as a drone, is a remotely operated aircraft that can be used for a variety of purposes. An Unmanned Aircraft System (UAS) refers to the total system needed to operate a UAV, consisting of the following three elements:

- UAV
- Control Station
- Data Link

Originally used for military and security purposes, UAVs are now beginning to penetrate the commercial and private realms serving the purposes of law enforcement surveillance, search and rescue operations, infrastructure inspection, aerial photography, property inspections, surveying and GIS mapping. DelDOT primarily uses drones for situational awareness, debris assessments, traffic mitigation, bridge inspection, aerial photography and archeological investigations.

The Delaware UAS Task Force was created in 2015 in partnership with the Delaware River and Bay Authority (DRBA) and was led by DelDOT. The Task Force was created to serve for one year and was tasked with:

- Encouraging the UAS industry to come to Delaware.
- Creating an outreach program to educate the public on safety.
- Advocating for the state's colleges and universities to develop operator training programs, which could include training mechanics to repair drones.

FLIGHT ACTIVITY OF PUBLIC AIRPORTS - 2016 vs. 2036

AIRPORT	2016			2036	
	CAPACITY	FLIGHTS	PERCENT OF CAPACITY	PROJECTED FLIGHTS	PERCENT OF CAPACITY
WILMINGTON	194,000	45,780	24%	45,590	24%
SUMMIT	170,800	31,040	18%	41,610	24%
SMYRNA	30,000	1,660	6%	2,740	9%
CHANDELLE ESTATES	46,400	1,100	2%	1,700	4%
DELAWARE AIRPARK	171,300	16,500	10%	35,860	21%
JENKINS	24,800	550	2%	900	4%
CIVIL AIR TERMINAL, DOVER AFB	13,500	600	5%	1,030	8%
CHORMAN	53,100	11,700	22%	15,390	29%
LAUREL	32,200	10,900	34%	12,640	39%
DELAWARE COASTAL	174,500	33,500	19%	46,250	27%
TOTAL		153,910		203,710	

Source: DelDOT Planning, Office of Aeronautics

The UAS Task Force provided outreach and education regarding safe use of UAVs. Due to time and resource constraints, the Task Force did not accomplish everything it set out to do. Some of the remaining issues that require follow-up to accomplish the goals of the Task Force include:

- Coordination with the Delaware Prosperity Partnership to develop tangible Incentives to attract UAS Manufacturing to Delaware
- Enabling Legislation for the attraction of UAS industries to Delaware
- University Operator Training Programs and UAS Maintenance Technician training in the state
- "Centers for Excellence" to attract UAS companies
- Drone Racing Venues and use of state parks for drone flying
- UAS website on DelDOT's Aeronautics website

FUNDING SOURCES

- ✓ STATE TRANSPORTATION TRUST FUND
- ✓ AVIATION GAS (AVGAS) TAX REVENUE
- ✓ FAA AIRPORT IMPROVEMENT PROGRAM (AIP) GRANTS

AVGAS TAX REVENUE

Avgas, or Aviation Gasoline, is the gasoline sold at airports for use by aircraft. DeIDOT licenses all retail gasoline sale locations in Delaware, including locations that sell avgas. This license requires retailers to sell gas with a tax of 23 cents per gallon, with the proceeds going to the state Transportation Trust Fund.

Though all gasoline retailers must charge the gasoline tax, vehicles and machinery which do not operate on the state's highways are entitled to a refund of the tax. This includes tractors, boats, lawnmowers and aircraft. Therefore, the purchasers of avgas can submit receipts to DeIDOT for a reimbursement within 12 months of purchase. As not all of this tax is refunded, any remaining proceeds are provided to DeIDOT's Aeronautics Program. These funds are critical for supporting Delaware's smaller airports.

CURRENT CHALLENGES & CONSTRAINTS

FUNDING SHORTFALLS



A lack of permanent federal funding and state revenue for aviation has created uncertainty.

ENCROACHMENT OF DEVELOPMENT



Encroaching residential development can restrict airport growth and increase the number of aircraft noise complaints. Runway Protection Zones (RPZs) are often located off airport property and therefore are subject to development.

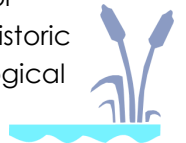
AGING INFRASTRUCTURE & DEFERRED MAINTENANCE



Aging pavement and lighting systems create ongoing challenges for maintenance.

ENVIRONMENTAL CONSIDERATIONS

Wetlands exist around and near airports making expansion difficult. Airports also contribute to habitat degradation for wildlife and waterfowl. Impacts to historic buildings, landscape and archaeological sites must be mitigated.



CURRENT EFFICIENCIES & INNOVATIONS

UAS COORDINATION



DeIDOT is participating in multiple initiatives to advance the use of UAS/UAV technology in Delaware. These efforts will yield new efficiencies for state business.

DELDOT PROGRAM TEAM



The Office of Aeronautics, located in the Division of Planning, is expanding the depth of its workforce by engaging additional DeIDOT staff willing to cross-train and support its efforts.

UNIVERSITY PARTNERSHIPS



DeIDOT currently partners with Delaware State University to provide employment opportunities for Aviation Program students. There is potential to expand this partnership and open additional opportunities to other colleges/universities.

UAS OBSTRUCTION MAPPING



Using UAS, DeIDOT is able to identify airspace obstructions such as trees, towers and utility poles. This mapping process, previously conducted using manned aircraft, has become more affordable and efficient and produces visualizations for airport managers.

IMPLEMENTATION: DELAWARE'S NEEDS

ESTABLISH AVIATION SYSTEM GIS DATABASE

DeIDOT maintains a Geographic Information System (GIS) web portal known as Gateway. Steps should be taken to update the current data and develop new datasets to track assets and manage the aviation system. This effort could be a part of an update to DeIDOT's Aeronautics website.

UAS TASK FORCE - NEXT STEPS

The Task Force successfully completed some objectives, but many remain uncompleted. The Task Force should have some transition or hand-off to another group or groups which can carry on the work. Some groups that could carry forward the goals of the Task Force are the Division of Small Business or the Delaware Aviation Advisory Council (DAAC).

RELIABLE AIRPORT OPERATIONS COUNTS

Reliable operations counts are needed to develop forecasts, noise studies, compatible land use plans and financial plans for Delaware airports. Accurate airport operations counts are difficult to obtain at non-towered airports without the use of aircraft counting devices that are used to sample operational activity. In the absence of accurate operation counts, the impacts of airports are represented subjectively.

DeIDOT has been collecting data through noise-activated counters. This program needs to be re-energized and more formalized to record operational activity. The program and methods for accurately estimating operational activity can then be included in the State Aviation System Plan.



AERONAUTICS STAKEHOLDER ROLES & RESPONSIBILITIES

DelDOT DIVISIONS



OFFICE OF THE SECRETARY

- Policy and Legislation
- Leadership and Prioritization



PLANNING

- Data Collection
- Manage CTP Programs
- Planning Coordination with Local Municipalities and Aviation Stakeholders
- Management of DelDOT's Helipad (0N5)



TECHNOLOGY & INNOVATION

- Maintain GIS Databases



MAINTENANCE & OPERATIONS

- Assistance with aviation system maintenance



PERFORMANCE MANAGEMENT

- Establishing Metrics and Targets
- Tracking Progress



COMMUNITY RELATIONS

- Public Outreach



FINANCE

- Funding Sources and Budgeting



ADDITIONAL PARTNERSHIPS

DELAWARE RIVER AND BAY AUTHORITY

- Operate Wilmington, Delaware Airpark, and Civil Air Terminal

AIRPORT OWNERS AND/OR OPERATORS

- Aviation System Operations
- Technology Advancement and Project Implementation

DELAWARE AVIATION ADVISORY COUNCIL (DAAC)

- Advise DelDOT on Aviation Matters
- Public Education and Outreach

DELAWARE STATE UNIVERSITY

- Student Employment Opportunities

FEDERAL AVIATION ADMINISTRATION (FAA)

- Regulations and Guidance

GENERAL AVIATION PILOTS

- End-User Expertise and Input

LOCAL GOVERNMENTS

- Regulate land use around airports
- Develop aviation-related economic development initiatives

AERONAUTICS - STRATEGIES & ACTION ITEMS

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Continue to invest in the growth of the Civil Air Terminal (CAT) at the Dover Air Force Base (DAFB) due to the increased flexibility of the Joint Use Agreement.	✓			
Continue to provide capital funds to assist with 10% sponsor match requirements of FAA Airport Improvement Program (AIP) grants at federally-eligible airports in the National Plan for Integrated Airport Systems (NPIAS).	✓			
Continue periodic safety inspections to update the master records (FAA Form 5010) for Delaware's public-use airports, and improve data collection procedures through staff training and new technology.	✓			
Coordinate with local government agencies to ensure that current zoning and future land use plans consider the impacts of development to the operations at airports.	✓			
Coordinate with airport management, private businesses and government officials to identify opportunities to integrate Unmanned Aircraft Systems (UAS) technology into airport operations.	✓			
Continue collecting sample data of the number of take-offs and landings at non-towered airports and develop more efficient and precise sampling techniques.	✓			
Continue to engage the Delaware Aviation Advisory Council (DAAC) to advise staff on the development and prioritization of strategies for the Aeronautics Program.	✓			
Coordinate with the Delaware Prosperity Partnership (DPP) to identify future economic development opportunities and identify specific resources that can be provided.		✓		
Update and maintain an Economic Impact Assessment of Aviation in Delaware, and provide the output data to aviation stakeholders and policy makers for use in decision-making.		✓		
Develop a program to provide limited capital funds for airport improvements at public-use airports that are not classified as NPIAS airports and therefore ineligible for federal AIP grant funds.		✓		
Improve the airspace obstruction review process by evaluating current regulations, technical criteria and the application process to develop new efficiencies and technological advancements.		✓		

AERONAUTICS - STRATEGIES & ACTION ITEMS (CONT'D.)

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Develop outreach materials to increase public awareness about agricultural spraying flights and related safety tips.		✓		
Identify methods to educate local community members about the value and potential of Delaware's airports, such as events, publications and contests.		✓		
Reach out to local community groups and Homeowners Associations (HOAs) to find opportunities to spread awareness.		✓		
Update the current Aviation System Plan (Phases I and II) to establish statewide goals, forecast aviation demand and recommend future capital funding priorities.		✓		
Evaluate the current state licensing procedures for public-use airports and determine if changes are necessary.		✓		
Improve the partnership with Delaware State University (DSU) to expand opportunities to support the Aeronautics Program through staffing and research.		✓		
Evaluate the current DelDOT Helipad lighting system and determine if upgrades or a full replacement is needed.		✓		
Rebuild the Aeronautics Program website to promote Delaware aviation to new audiences.		✓		
Improve and update GIS data and develop interactive web maps for Gateway.		✓		
Identify potential airspace obstruction mitigation projects to preserve the safe operation of the aviation system.			✓	
Partner with the Division of Small Business, Development & Tourism to identify current programs and/or develop new programs to promote General Aviation (GA).			✓	



PUBLIC TRANSIT

DART First State, operated by the Delaware Transit Corporation (DTC), a DelDOT Division, offers a statewide network of public transportation options. Public transit services provided by DART include:

- Fixed route, intercounty & seasonal bus routes
- Paratransit for people with disabilities
- Regional rail service contracted through SEPTA & Amtrak
- RideShare program
- Revenue generating parking at Biden Amtrak Station
- Regional transit centers (Lewes, Newark, Claymont & Wilmington)
- Transit hubs for bus routes, operations and maintenance
- Park & Ride/Park & Pool lots

DART MISSION

"The mission of DART First State and the Delaware Transit Corporation, an operating division of the Delaware Department of Transportation, is to design and provide the highest quality public transportation services that satisfy the needs of the customer and the community."

DART VISION

"We aspire to be a premier transportation organization with accessible facilities and interconnected services incorporating state-of-the-art technologies. Our well-trained workforce, using clear communications and beneficial working partnerships, will enable us to connect people to their destinations in an affordable, safe and efficient manner."

DART OPERATES

63 bus routes
 Over **500** buses
 Over **2,500** bus stops
38 Park & Rides & **12** Park & Pools

IN FISCAL YEAR 2018,

RIDERSHIP INCLUDED:

9.26 million trips systemwide
7.17 million fixed route bus trips
 Over **926,000** Paratransit trips
1.16 million SEPTA train trips
 (in Delaware)



INNOVATION IN MOTION

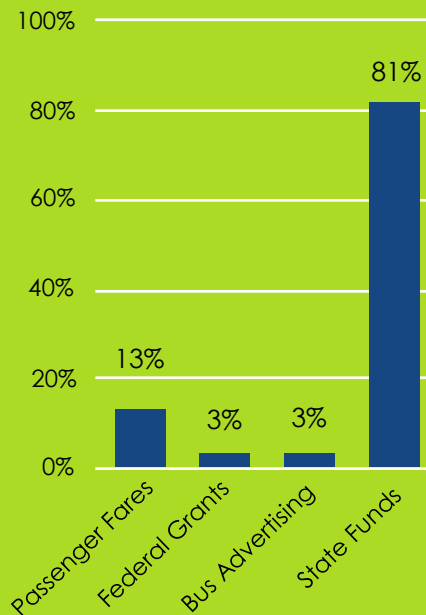
RELEVANT DELDOT DIVISIONS

- ✓ DELAWARE TRANSIT CORPORATION
- ✓ DIVISION OF PLANNING
- ✓ DIVISION OF TRANSPORTATION SOLUTIONS
- ✓ DIVISION OF PERFORMANCE MANAGEMENT

TRANSIT STAKEHOLDERS

- ✓ TRANSIT CUSTOMERS
- ✓ VISITORS
- ✓ EMPLOYERS
- ✓ LOCAL GOVERNMENTS
- ✓ OTHER TRANSIT PROVIDERS

TRANSIT FUNDING SOURCES



CURRENT CHALLENGES & CONSTRAINTS

SUBURBAN SPRAWL



Transit efficiencies are difficult to maintain as development expands into rural areas.

SYSTEM INTEGRATION WITH OTHER MODES



Connectivity to and from the transit system can be difficult in some locations.

PUBLIC PERCEPTION



Public perceptions of transit may not always reflect actual user experience.



NON-TRADITIONAL WORK SCHEDULES

Flexible work schedules among transit users place additional demands on services that have limited resources.



PARATRANSIT DEMAND AND COSTS

Increasing numbers of paratransit-eligible customers can divert investments away from fixed-route services.



REGIONAL RAIL SERVICE

Regional commuter train services do not connect between Newark, DE and Perryville, MD.

CURRENT EFFICIENCIES & INNOVATIONS

REAL-TIME ARRIVAL INFORMATION



IMPROVED FARE COLLECTION SYSTEM

- Reduces boarding times
- Improves reliability



UNIVERSITY OF DELAWARE AUTONOMOUS BUS PILOT



DART TRANSIT APP

- Bus schedules
- Real-time travel information
- Fares
- Communication with DTC



NEW TRANSIT CENTERS

- Wilmington
- Newark
- Lewes
- Claymont
- Christiana



PUBLIC TRANSIT - STRATEGIES & ACTION ITEMS

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Support "Complete Communities" and transit-oriented development around hubs and train stations.	✓			
Support access to job opportunities by serving low-income or working class communities and employment centers.	✓			
Utilize on-board cameras to investigate and reduce preventable crashes.	✓			
Expand partnerships with police and Wilmington's Downtown Visions to maintain a safe customer environment.	✓			
Streamline and improve the eligibility process for Paratransit.	✓			
Coordinate with human service agencies that receive FTA 5310 funds for improved mobility.	✓			
Expand intercounty commuter routes to better connect counties.	✓			
Improve the efficiency of selected corridors by consolidating and upgrading bus stops and creating convenient and logical transfer points.	✓			
Improve sidewalk, crosswalk and handicapped access to train stations, hubs and bus stops.	✓			
Improve bicycle access to and bicycle rack parking at train stations, hubs and bus stops.	✓			
Work with municipalities to close gaps in pedestrian network to improve access to fixed routes.	✓			
Update fare collection system for flexible options and to speed up boarding.	✓			
Utilize best practices to extend the useful life of buses without compromising scheduled service or on-time performance.	✓			
Incorporate dedicated transit lanes on major DelDOT roadway projects.	✓			
Purchase vehicles with sustainable and environmentally-friendly methods of propulsion and increased fuel efficiency.	✓			
Improve lighting at passenger facilities.		✓		
Equip fleet with systems that identify poor driving techniques and assist with the avoidance of crashes.		✓		
Increase park-and-ride parking capacity and locations along Route 301.		✓		

PUBLIC TRANSIT - STRATEGIES & ACTION ITEMS (CONT'D.)

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Complete construction of Newark Regional Transportation Center.		✓		
Construct the Regional Transit Center in Wilmington through a public-private partnership.		✓		
Construct the New Castle County Regional Transit Center in Christiana.		✓		
Add weekend service and increase weekday frequency of trains operating to Fairplay and Newark stations.		✓		
Work with MARC/MTA to close the commuter rail gap between Perryville and Newark.		✓		
Integrate GPS and CAV technology for automated paratransit routing using real-time data.		✓		
Extend fixed route service times and streamline routes to better access employment, shopping, medical, government, educational and entertainment centers.		✓		
Expand the use of Flex services to provide more mobility options in smaller cities and towns.		✓		
Increase number of express trains servicing Delaware.		✓		
Partner with University of Delaware to Initiate autonomous bus service on and near campus.		✓		
Construct the Regional Transportation Center in Claymont.		✓		
Construct new maintenance facility in Lewes to support increased service in eastern Sussex County.		✓		
Continue consolidation of Wilmington paratransit operations to Beech Street facility to relieve overcrowding at Monroe Street complex.		✓		
Construct new travel training center at DTC's Administrative Offices in Wilmington and plan additional facilities for Kent and Sussex counties.		✓		
Provide real-time transit information via digital displays at major bus stops and hubs.		✓		
Utilize GPS and real-time traffic information to update arrival predictions and reroute if necessary.		✓		
Increase frequency of resort area transit services.		✓		

PUBLIC TRANSIT - STRATEGIES & ACTION ITEMS (CONT'D.)

The strategies and action items below include strategic investments and policies that align with related goals of the Long Range Transportation Plan.

	TIMEFRAME			
	ONGOING	WITHIN 5 YEARS	WITHIN 10 YEARS	WITHIN 20 YEARS
STRATEGIES & ACTION ITEMS				
Create a mobile app connecting customers to bus schedules, real-time travel information, fares and to communicate directly with DTC.		✓		
Promote ride hailing services to better connect riders to transit.		✓		
Partner with employers and organizations to provide better service and promote more ridership.		✓		
Simplify printed pocket schedules and system maps.		✓		
Expand public outreach efforts and emphasize bilingual competency to provide additional forums for public comments and input.		✓		
Increase social media presence to promote DART's services and to give urgent transit service updates.		✓		
Improve bus stop and way-finding signs for commuter bus routes at park and rides and rail stations.		✓		
Increase presence of service supervisors, safety officers and customer service staff throughout the system.		✓		
Connect passenger rail line through southern portion of state.				✓

FEDERAL TRANSIT ADMINISTRATION (FTA) REQUIREMENTS

Transit Asset Management (TAM) Required Performance Measures:

- ✓ Rolling Stock - The percentage of revenue vehicles (by type) that exceed the useful life benchmark (ULB).
- ✓ Equipment - The percentage of non-revenue service vehicles (by type) that 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.

DTC PERFORMANCE MONITORING

DTC closely monitors progress through regular performance tracking and reporting to ensure that targets are met and adjustments are made to address changing needs.

PERFORMANCE MEASURES & TARGETS

PERFORMANCE MEASURE	FY2015	FY2016	FY2017	FY2018	ANNUAL TARGET
Transit Operations					
Fixed Route On-time Performance	91%	69%	70%	71%	92%
Total Fixed Route Transit Ridership per Year	8,775,735	7,784,229	7,389,093	7,170,059	7,300,000
Average Boardings per Hour on Fixed Routes Statewide	27	24	21	13	25
Collisions per 100,000 Miles of Service for all Transit Modes Statewide	2.76	2.85	2.86	3.02	2.25 or less
Preventable Collisions	50%	52%	49%	50%	33% or less
Farebox Recovery on Fixed Route Service	\$8.83M 16%	\$8.91M 16%	\$8.52M 15%	\$8.36M 14%	20%
Farebox Recovery on Rail Service	\$4.45M 40%	\$4.38M 47%	\$3.83M 44%	\$4.16M 45%	50%
Average Weekday Riders per Revenue Mile - Total/Fixed Route*	1.12/1.43	0.99/1.27	0.85/1.38	0.51/0.87	1 to 1.5
Average Saturday Riders per Revenue Mile - Total/Fixed Route*	1.49/1.61	1.30/2.91	1.14/2.61	0.62/1.14	1.5 to 2.75
Average Sunday Riders per Revenue Mile - Total/Fixed Route*	1.66/1.73	1.57/2.59	1.35/2.50	0.89/1.09	1.5 to 2.75
Customer Service					
Number of Customer Complaints	1,181	1,142	835	873	0
Time on hold	3.2 mins	3 mins.	3 mins.	0.25 min.	Less than 5 mins.
Lost Calls	10.25%	2.58%	1.95%	3.26%	Less than 3%

*Total Services includes Paratransit Ridership and Fixed Route Ridership



PART III

NEW INNOVATIONS



INNOVATION IN MOTION

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TECHNOLOGY & DATA MANAGEMENT

SUMMARY

The future of transportation is built upon a strong foundation of technology that leverages ongoing improvements to collecting and accessing data. DelDOT's data management is becoming just as important as physical infrastructure when it comes to enhancing efficiencies in transportation planning, management, operations and decision-making.

DelDOT currently collects real-time data including roadway and weather conditions, traffic speeds, volumes, travel patterns and transit use. Data derived from new technology will provide additional information for operations management and help to prioritize future investments. Such advanced data could also be provided to connected vehicles and travelers.

While new technology is expected to yield many benefits, DelDOT is fully aware of its responsibilities to use the data in a secure manner and to safeguard the privacy of the traveling public.



INNOVATION IN MOTION

EXAMPLES OF DELDOT'S ADVANCED TECHNOLOGY

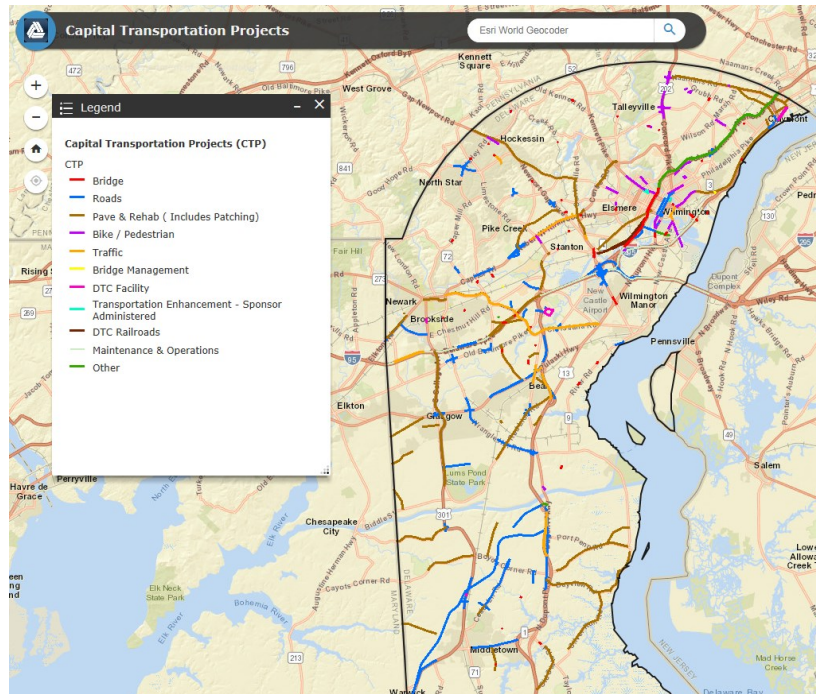


ITMS

For over 20 years, DelDOT has been implementing and improving relatively low-cost transportation management systems and solutions. The system, known as the **INTEGRATED TRANSPORTATION MANAGEMENT SYSTEM (ITMS)**, is used to collect and analyze real-time information to manage mobility and respond to incidents throughout our transportation network. ITMS is a 24/7 coordinated system that helps us monitor operations, track travel patterns and control our traffic signal system.

GATEWAY

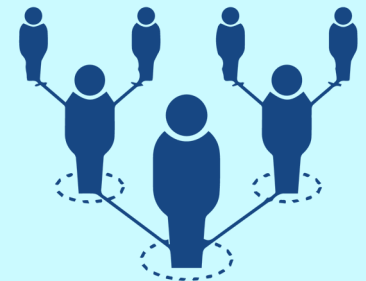
DelDOT is becoming increasingly reliant on the use of spatial data to fulfill our mission and to provide optimal customer service. DelDOT's **GATEWAY web mapping application** is an online mapping portal providing information that can be used within the Department and by the public. Gateway enhances transparency with shared access to the most up-to-date information regarding the transportation system, operations and planned improvements.



IMPROVING COMMUNICATION TO THE PUBLIC

Technology is a key element in managing and operating a successful transportation network. Using technology to communicate information to the public is also a priority at DelDOT.

We are continuously developing new methods and technology to provide transparency and responsiveness to our customers' needs. The development of mobile apps allows us to convey large amounts of useful transportation-related information to the traveling public.



WHAT ARE MOBILE APPS?

Mobile apps are software applications developed specifically for small, wireless computing devices, such as smartphones and tablets. Apps **ALLOW PEOPLE TO ACCESS INFORMATION** while on the move.



HOW DO MOBILE APPS AFFECT TRANSPORTATION TODAY?

TRANSPORTATION DATA COLLECTION

GPS and BLUETOOTH technology can collect data about vehicle location, speed and traffic congestion. Mobile apps use this information to determine peak traffic hours and real-time congestion conditions for use in route-planning.



TRAVEL INFORMATION

Mobile apps can calculate how weather conditions may affect travel time. Apps also provide **REAL-TIME** traffic information, such as accidents, ongoing and planned roadwork, average travel speed and average travel time. Access to travel information can reduce travel time and overall congestion.



THE DELDOT APP

The DeIDOT App includes a comprehensive suite of transportation resources to help the traveling public. Services in the app provide up-to-the-minute, reliable traffic data that comes directly from DeIDOT's 24/7 Transportation Management Center. The app has 11 components, each providing users with specific transportation information.



TRAFFIC RADIO
A live stream of DeIDOT's traveler advisory radio, WTMC 1380AM.



PROJECTS
Project information near an app user's location.



TRAVEL MAP
Real-time travel time, traffic cameras, speed limits, snow plows and Waze mapping.



DART
Real-time bus information, including arrival times, bus locations and fixed routes.



ADVISORIES
Real-time travel advisory notices.



REPORT AN ISSUE
Reporting of non-emergency roadway issues (photos, descriptions, location, and contact information).



EVENTS
Travel information about road closures and detours due to special events.



WORKSHOPS
Dates and calendar invitations for DeIDOT Workshop events.



NEWS
News coverage and project-related traffic alerts.



SOCIAL MEDIA
Access to DeIDOT's social media: Twitter, Facebook, YouTube, Flickr and the DeIDOT Blog.

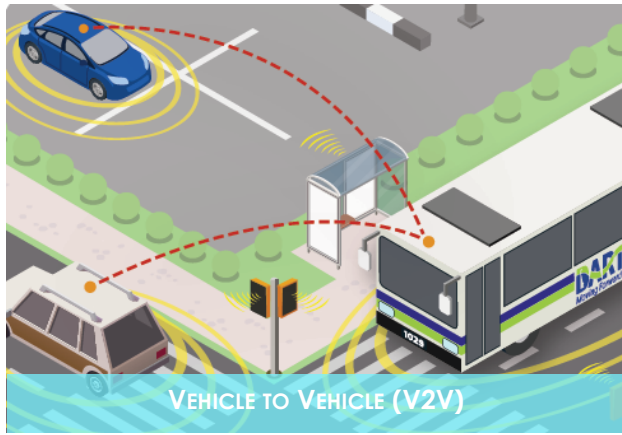


DMV
DMV wait times, sample driving test and office branches.



INNOVATION IN MOTION

WHAT ARE CONNECTED VEHICLES?



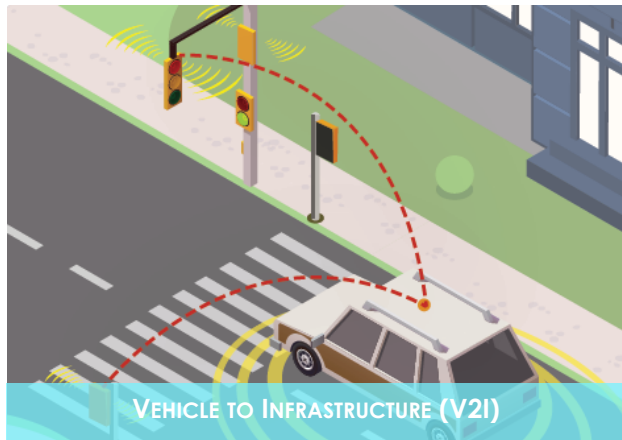
Connected Vehicle (CV) technology allows vehicles to communicate with other vehicles, connected devices and the world around them. This technology has the potential to revolutionize how the public uses and interacts with our transportation system. The three forms of communication technology used by connected vehicles are:

Vehicle to Vehicle (V2V)

V2V communications allow vehicles to communicate through wireless connections to share information such as speed, distance and braking.

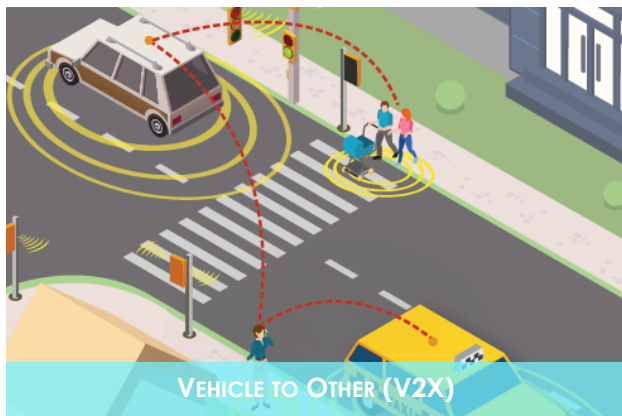
Vehicle to Infrastructure (V2I)

V2I communications allow infrastructure, such as traffic signals, to communicate with vehicles. V2I systems could warn drivers about weather conditions, traffic, work zones and potholes. V2I technology could allow for coordinated signal timing and improved parking information systems, improving traffic flow in urban areas.



Vehicle to "Other" (V2X)

V2X communications enable vehicles to directly communicate with any other connected devices, such as smart phones.



WHAT ARE AUTOMATED VEHICLES?

Automated Vehicle (AV) technology resides within the vehicle itself and assists with or fully takes over driving tasks. AVs are classified by the following six Levels of Automation as defined by the Society of Automotive Engineers (SAE) and the National Highway Traffic Safety Administration (NHTSA):

LEVELS OF AUTOMATION

LEVEL 0

NO AUTOMATION

Driver is in full control of all driving functions.

LEVEL 3

FUNCTION-SPECIFIC FULL AWARENESS AUTOMATION

Automated system, vehicle can conduct some parts of the driving task and monitor the driving environment, but driver must be ready to take control of vehicle when system requests.

LEVEL 1

FUNCTION-SPECIFIC PARTIAL AUTOMATION

Automated system, vehicle can sometimes assist the human driver and conduct some parts of the driving task.

LEVEL 4

ENVIRONMENT-SPECIFIC FULL AUTOMATION

Automated system, vehicle can conduct the driving task and monitor the driving environment, with no human inputs, but only in certain environments and under certain conditions.

LEVEL 2

FUNCTION-SPECIFIC FULL AUTOMATION

Automated system, vehicle can conduct some parts of the driving task, while the human continues to monitor the driving environment and performs the rest of the driving task.

LEVEL 5

FULL AUTOMATION

Automated system, vehicle can perform all driving tasks, under all conditions that a human driver could perform them.

ADVANCED VEHICLE TECHNOLOGY

CONNECTED VEHICLES (CV)

Vehicles that are able to communicate with other vehicles, the surrounding infrastructure and the other connected devices in the surrounding environment.

AUTOMATED VEHICLES (AV)

Vehicles that use technology that allows a vehicle to perform critical thinking and drive itself independent of human action.

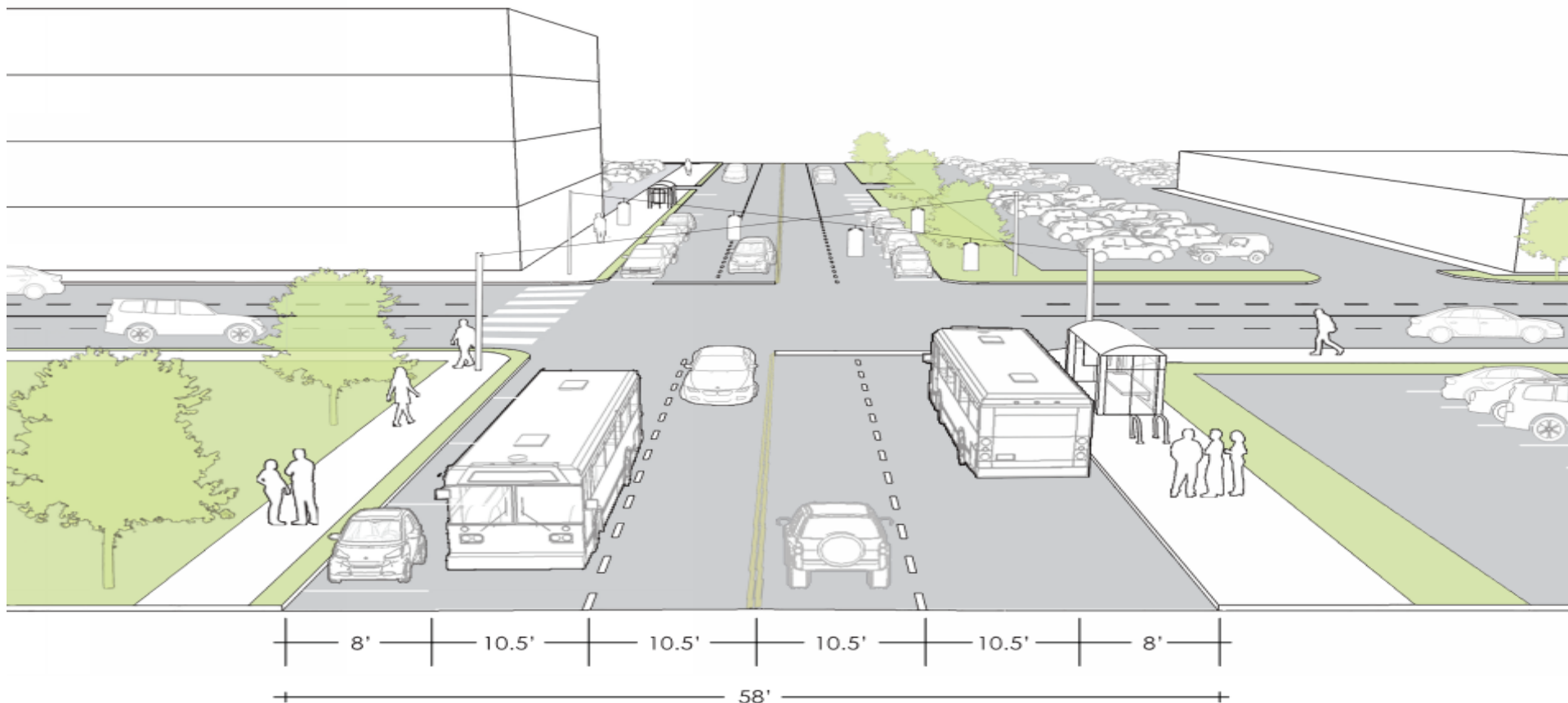
CONNECTED & AUTOMATED VEHICLES (CAV)

Vehicles that combine the use of connected and automated vehicle technology.



INNOVATION IN MOTION

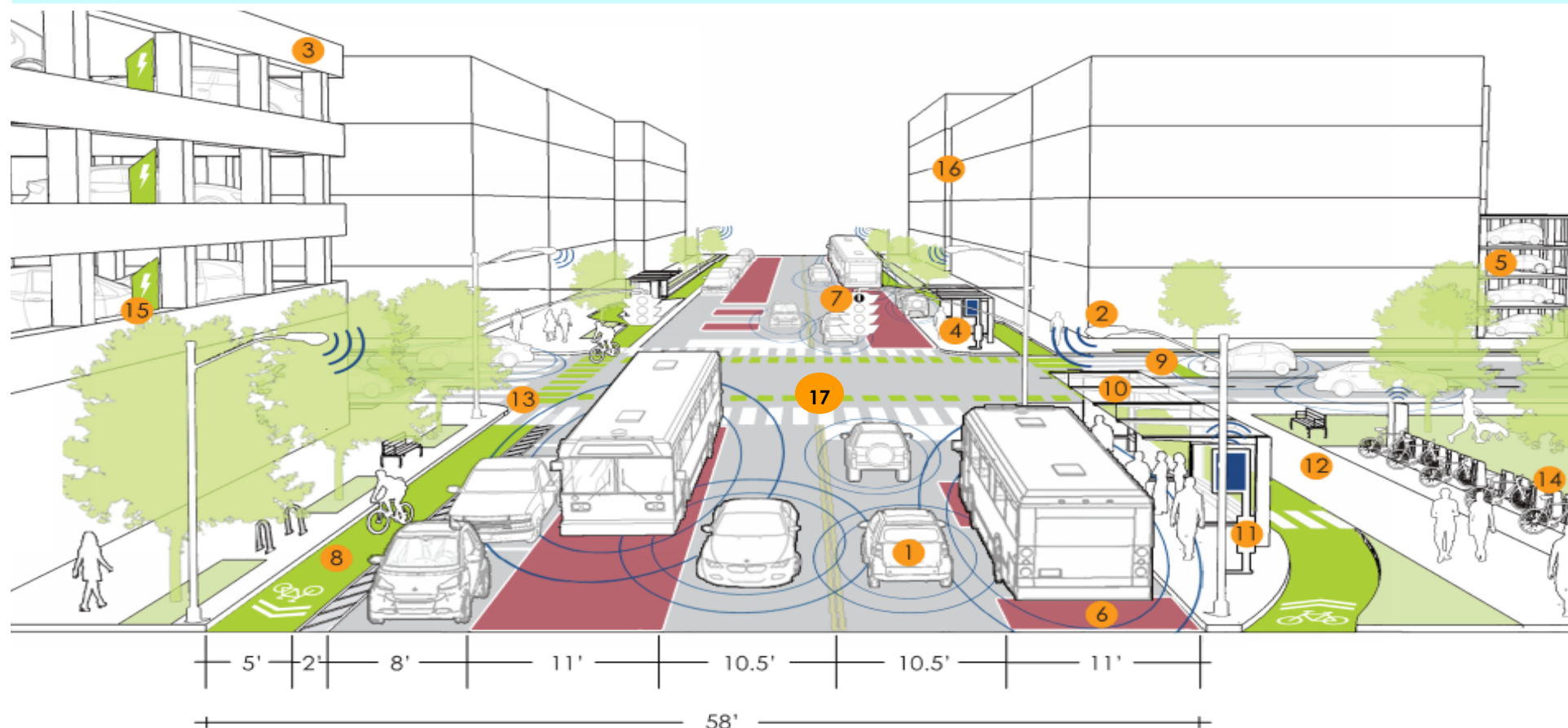
TYPICAL URBAN STREET - TODAY



Our current transportation network has a strong focus on automobiles. Roadway corridors have traditionally been designed to accommodate automobile traffic and not other modes. Expanding roadway capacity does not always result in reduced congestion and may not be a sustainable strategy in the future. To mitigate congestion, DelDOT has invested in alternative modes, such as transit, bicycle and pedestrian infrastructure. However, gaps in accessibility to these modes remain, including missing sidewalks, crosswalks, bike lanes, transit lines or transit structures.

Complete Streets is a DelDOT policy that promotes safe mobility for all transportation modes. While retaining many of today's characteristics, **the transportation network in 2040 will need to adapt to changes in land use patterns, transportation efficiencies, technological advancements and changing preferences.** Widening existing roadways to address growing populations and congestion will be more difficult due to right-of-way restrictions and costs. Encouraging people to use new modes and more efficient use of space and resources will be an important aspect of our transportation network in 2040. Current trends show an increase in shared-vehicle use, and it's anticipated that many more people will be sharing vehicles with the advancement of ride-sharing and CAV technology. These trends may dramatically change how our streets are designed as we anticipate future travel needs.

TYPICAL URBAN STREET - 2040



What Features will Complete Streets have by 2040?

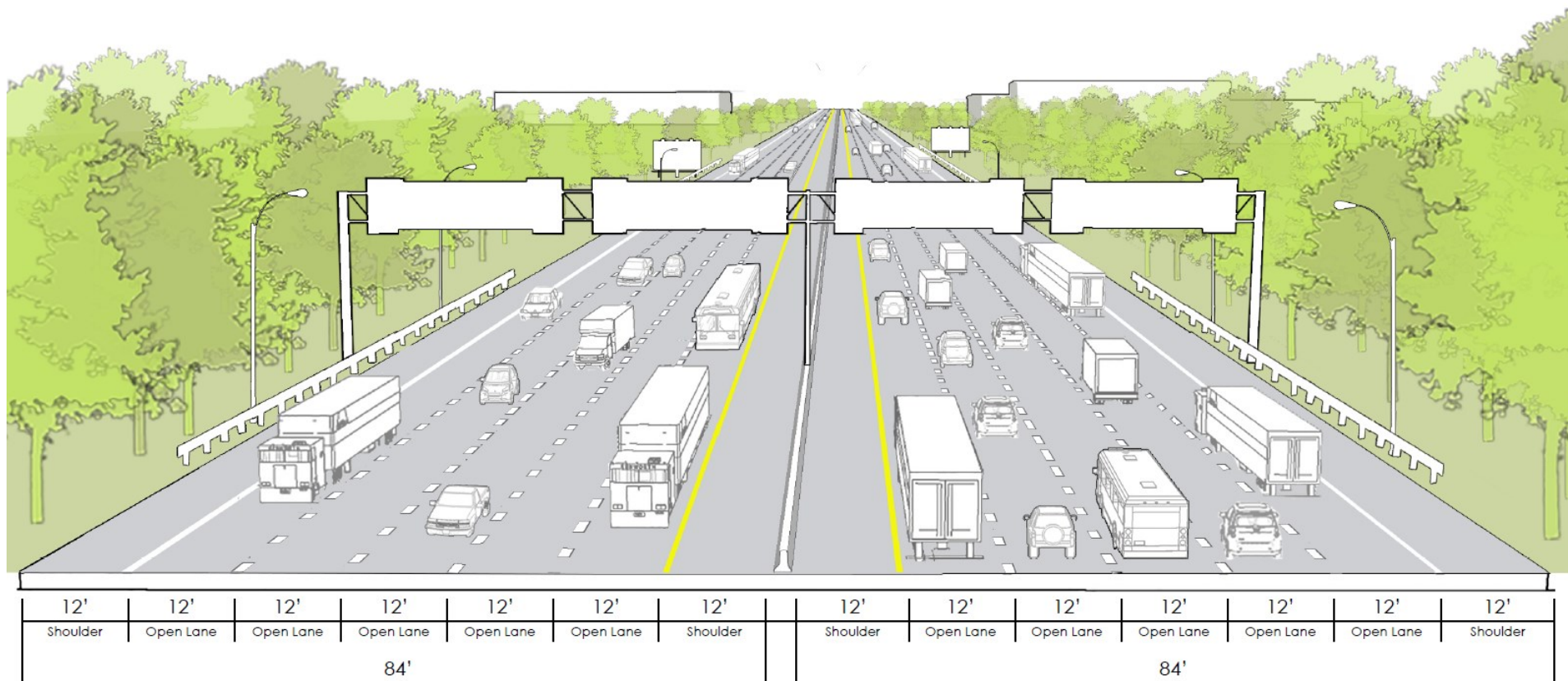
1	Connected and Autonomous Vehicles (CAVs)	7	Priority Transit Signals	13	Pedestrian and Bicycle Crossings
2	CAV Transponders (Smart Telecommunication Infrastructure)	8	Protected Bike Lanes	14	Bike Share Stations
3	Parking Reconfiguration	9	Bike Box	15	Electric Vehicle Sharing Stations
4	Passenger Pick-Up and Drop-Off	10	Floating Bus Stop Islands	16	Infill Development
5	Shared-Vehicle Storage	11	Real-Time Arrival and Departure Displays	17	Smart Striping
6	Dedicated Transit Lanes	12	Continuous Walkways		

See the next page for detailed item descriptions.

2040 ADVANCED MULTI-MODAL TRANSPORTATION INFRASTRUCTURE

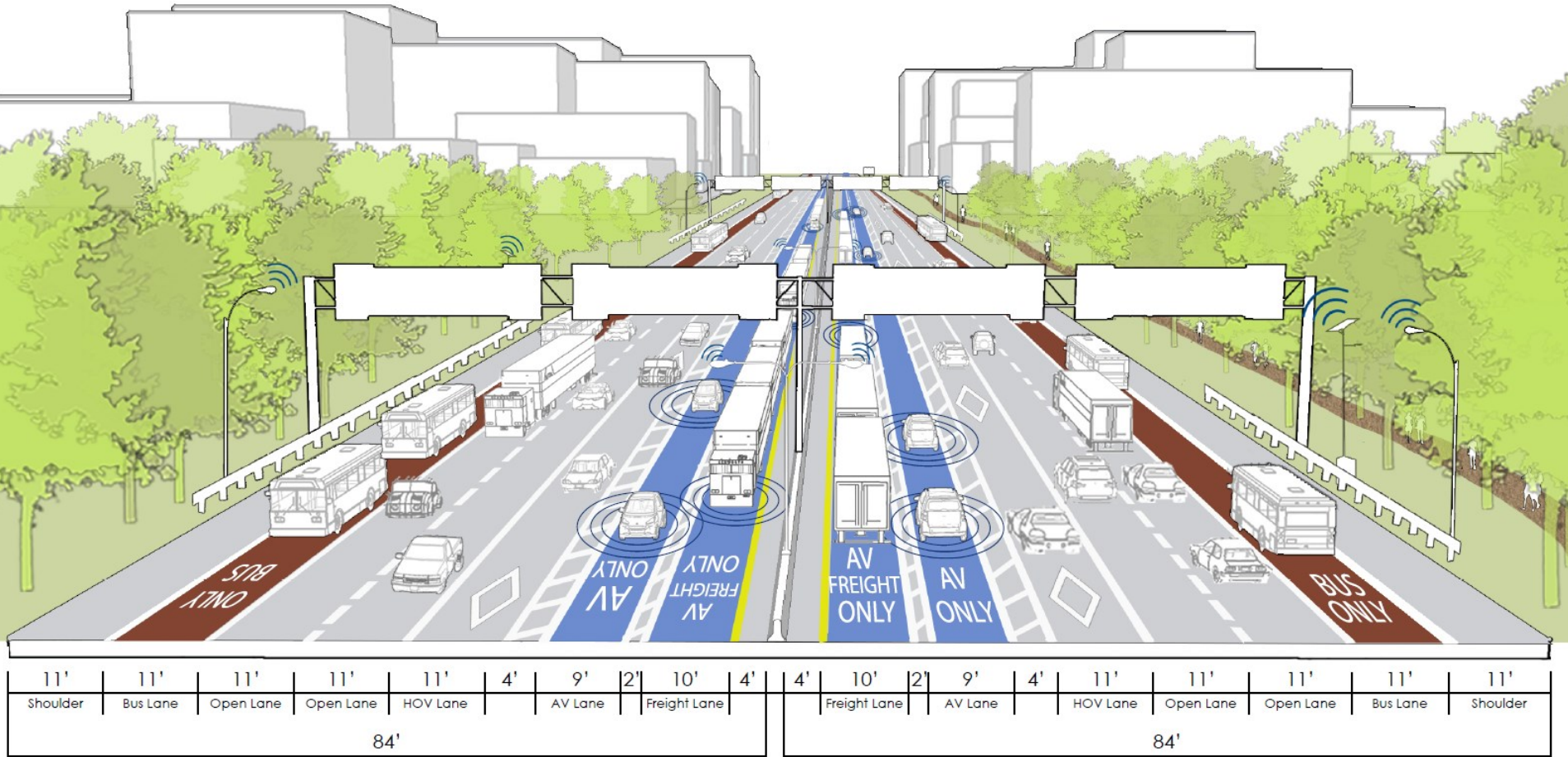
1	CAV	CAVs are expected to become increasingly common by 2040, which may require dedicated CAV lanes.
2	CAV TRANSPONDER	CAV transponders will be needed to support communication between CAVs, relay important information about roadway conditions, and transmit traffic information to CAVs.
3	PARKING RECONFIGURATION	Increases in shared-vehicle use could reduce the demand for parking space. Parking areas could be rededicated to other transportation uses, such as bike lanes or transit lanes, converted into green space, or redeveloped.
4	PASSENGER PICK-UP AND DROP-OFF	Similar to a bus stop, a dedicated shared-vehicle space will accommodate passenger pick-up and drop-off activity. These facilities also help to minimize traffic flow disruptions such as sudden stopping and weaving.
5	SHARED VEHICLE STORAGE	Stacked parking facilities for shared vehicles will be a more efficient use of space than traditional parking facilities.
6	DEDICATED TRANSIT LANE	Dedicated transit lanes can increase efficiency by separating transit from other traffic.
7	PRIORITY TRANSIT SIGNAL	Priority transit signals use connected vehicle technology to allow transit vehicles additional time to proceed through an intersection.
8	PROTECTED BIKE LANE	Bike lanes physically separate bicyclists from vehicle traffic, thereby making bicycling safer and less stressful.
9	BIKE BOX	The Bike Box is a forward-placed stop bar that allows left-turning cyclists to move ahead of vehicles queued at an intersection. Bike Boxes can also be used with dedicated bike signals.
10	FLOATING BUS STOP ISLAND	Floating bus stop islands are dedicated waiting and boarding areas and are separated from the sidewalk by bike lanes, thereby eliminating conflicts between buses and bikes.
11	REAL-TIME INFORMATION	Real-time arrival information displays at bus stops provides riders with more accurate wait time information.
12	SIDEWALK CONNECTIVITY	Sidewalk connectivity provides greater access to a variety of land uses.
13	PEDESTRIAN & BICYCLE CROSSINGS	Marked and lighted crossings with dedicated space for pedestrians and bicyclists help to improve safety and make walking and biking attractive transportation choices.
14	BIKE SHARE STATIONS	Bike share stations store bicycles that are used in bike share services, which allow individuals to share bicycles on a short term basis either with or without a fee.
15	EV CHARGING	The demand for Electric Vehicles (EVs) will require more charging stations at a variety of locations.
16	INFILL & REDEVELOPMENT	Redeveloping vacant or underutilized properties into higher density, mixed-use developments promotes efficient land use and can provide more transportation options.
17	SMART STRIPING	"Smart" striping includes sensors that enable autonomous vehicles to detect the edges of lanes and the locations of stop bars, crosswalks and other roadway features.

TYPICAL HIGHWAY - TODAY



Today's highways are high-speed, high-volume corridors that carry thousands of cars, trucks and buses. Highways are typically designed for automobiles with no separation for other modes, and **each vehicle is driven by an individual person**. Pedestrian and bicycle access is usually prohibited.

TYPICAL HIGHWAY - 2040



The highways of the future will integrate connected and autonomous vehicle technology, leading to more efficient traffic flow and increased driver safety. **Highways will need to accommodate different levels of autonomy** as technology transitions toward a connected and autonomous system. Dedicated autonomous vehicle-only lanes may be necessary, allowing for narrower lane widths, shorter following distances and faster speeds. Dedicated transit lanes and high occupancy vehicle (HOV) lanes may also increase multi-modal efficiency when mixed with traditional open travel lanes.

ADVISORY COUNCIL ON CONNECTED AND AUTONOMOUS VEHICLES

EXECUTIVE SUMMARY:

Under the leadership of Governor Carney, the Advisory Council on Connected and Autonomous Vehicles, established through Executive Order 14, met and discussed the varying aspects regarding the deployment of this emerging technology and its potential impacts on our transportation system, economy and citizens. The Advisory Council heard from subject matter experts from across the industry on the opportunities, challenges and best practices to encourage the safe manufacturing, development, testing and deployment of connected and automated technology.

The following is a summary of the Council's actions and recommendations:

- The Council focused on the following areas: 1) Promoting Economic Development, 2) Technology, Security and Privacy, 3) Transportation Network Infrastructure, and 4) Impacts on Public and Highway Safety. In addition, the Council and the Department of Insurance reviewed the potential impacts that connected and autonomous vehicles will have on the insurance industry.
- The Council developed a number of recommendations that cross all of the above focus areas. The group identified some recommendations for immediate implementation and acknowledged that other recommendations will require further research.
- The state should focus on investing in CAV-related education and workforce training, providing financial incentives for companies to test technology, preparing existing infrastructure, and securing data.
- Delaware should continue to have a presence at a national level on CAV-related topics and should develop relationships with industry leaders and manufacturers.
- The Council will continue to meet on a regular basis and provide updates on its progress.



SELECTED CAV ADVISORY COUNCIL RECOMMENDATIONS AND FINDINGS

GENERAL RECOMMENDATIONS

- Include the topic of CAV in the next version of the Delaware Strategic Highway Safety Plan.
- Continue Advisory Council and the various subcommittee meetings on a regular basis.

DATA COLLECTION, PRIVACY AND OWNERSHIP

- Monitor discussion, activities of standards organizations (SAE, ISO, etc.), and court decisions around data ownership.
- Define clear-use cases for collecting Personally Identifiable Information (PII) and collect the least amount of PII necessary to accomplish the goals of the use case.
- Encrypt (or apply current best practices for anonymization) PII and non-public data collected during vehicle use and non-use.

INFRASTRUCTURE AND TECHNOLOGY

- Establish additional resources through the Capital Transportation Program to continue and enhance CAV-related efforts.
- Create a technology oversight board.
- Coordinate with surrounding states on CAV technology.
- Consider partnering with public transit providers to leverage CAV technology.
- Continue the expansion and improvement of the ITMS.
- Support the emergence of 5G and/or other similar communication technology.
- Incorporate CAV technology and devices into DeIDOT's project development process.



CURRENT EFFICIENCIES & INNOVATIONS: CONNECTED AND AUTONOMOUS VEHICLES

WHAT IS DELAWARE CURRENTLY DOING?

- Integrating CAV technology into DelDOT's short-term and long-term planning efforts.
- Actively participating in national and regional organizations of transportation officials that develop transportation policy and conduct research.
- Maintaining relationships with product manufacturers.
- Coordinating with neighboring states of Maryland and Pennsylvania to share data over dedicated fiber optic networks.
- Continuing to expand the fiber optic and telecommunications network throughout Delaware.
- Developing ITMS statewide: traffic signals, variable message signs, roadside detectors, weather stations and other assets, which are controlled from the TMC in Smyrna.
- Monitoring and maintaining traffic signs, roadway and bridge surfaces, and roadway striping in a state-of-good-repair using in-house and contracted resources.
- Increasing connectivity between databases to improve cross-departmental decision making and project design.
- Exploring the viability of pilot projects, which may include the installation of CAV infrastructure at high-crash locations or high-risk areas such as work zones.





INNOVATION IN MOTION

PRODUCED BY:



THE DELAWARE DEPARTMENT OF TRANSPORTATION
DIVISION OF PLANNING
REGIONAL SYSTEMS PLANNING SECTION

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