



Delaware Carbon Reduction Strategy

November 15, 2023



Executive Summary

The Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL), was signed into law in November 2021. The IIJA provides funding for highway, transit, and other multimodal transportation projects throughout Federal Fiscal Years (FFY) 2022-2026, continuing the legacy of many existing transportation funding programs while creating three new formula-funded programs. One of the new formula-funded programs is the Carbon Reduction Program (CRP) which requires each state department of transportation to develop a Carbon Reduction Strategy (CRS) that will support the reduction of emissions from the transportation sector. The CRS must be submitted to the Federal Highway Administration (FHWA) by November 15, 2023, and updated every four years.

Delaware Department of Transportation's (DelDOT) CRS outlines the agency's overall intended approach to addressing Greenhouse Gas (GHG) emissions and identifies policies, plans, and strategies to achieve existing statewide emission reduction goals. DelDOT has long-standing relationships with stakeholders and partners including sister state agencies and metropolitan planning organizations (MPO's). These existing partnerships will allow the strategies within this document to align with existing state plans and processes designed to lower carbon emissions. Though this CRS focuses on strategies that will improve GHG emissions from the transportation sector, DelDOT prepared this CRS with the intention that this effort will contribute to statewide emissions reduction goals across all sectors.

According to the latest inventory of GHG emissions conducted by the Division of Air Quality within the Delaware Department of Natural Resources and Environmental Control (DNREC), the transportation sector is the leading source of GHG emissions in Delaware, contributing to 30 percent of the total emissions. This trend has steadily increased since 2011 with internal combustion engine passenger vehicles accounting for 97 percent of GHG emissions in the transportation sector.

Delaware has long been at the forefront of carbon reduction policies and sees the CRS as an important piece in achieving statewide goals. In 2023 the Delaware state legislature passed a package of laws aimed at reducing GHG emissions and supporting Delaware's transition to electric vehicles and renewable energy. The package of laws included the Delaware Climate Change Solutions Act and set new targets for GHG emissions of 50 percent by 2030, and net zero by 2050.

Given this context, DelDOT developed the CRS to build a framework that will embed carbon reduction considerations in project planning and development, project prioritization, and life cycle planning. The CRS is structured into four comprehensive sections, each dedicated to different elements critical for its successful implementation.

DelDOT intends to follow the requirements outlined in the Carbon Reduction Program as well as FHWA Carbon Reduction Program guidance published in 2022. This comprehensive understanding of the federal landscape provides a solid foundation for a well-informed and compliant approach.

The CRS offers a high-level overview of the transportation system managed by DelDOT including an inventory of assets and a description of the strategic plans and priorities of the DelDOT Division of Transportation Resilience and Sustainability. The CRS also outlines existing planning documents that articulate DelDOT's intent to align the CRS with other existing plans and processes. Also discussed is Delaware's method of tracking, inventorying, and reporting in-state greenhouse gas emissions, showcasing a commitment to addressing environmental concerns and staying in line with recent state legislative activities.

The CRS provides insight into DelDOT's project prioritization methodology, crucial for identifying state and regional priorities eligible for CRP funding. It also outlines the incorporation of equity into the prioritization process using Delaware's Equity Analysis tool, aligning with Justice40 provisions and goals. A review of ongoing CRP-funded projects and an introduction to the DelDOT Climate Challenge Grant Program is also provided. This research initiative focuses on DelDOT's research of Environmental Product Declarations and Life Cycle Assessments and demonstrates DelDOT's commitment to sustainability and a forward-looking perspective. By examining how these projects support the CRS, DelDOT demonstrates a holistic approach to climate resilience and sustainability.

The document also details DelDOT's plan to monitor CRS implementation and integrate it into the Delaware Climate Action Plan and other long-term planning activities. The CRS clearly outlines DelDOT's next steps and the process for updating the document every four years, as mandated by IJJA. The identified process will ensure a transparent and adaptive approach to lowering carbon emissions through the implementation of the CRS.

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Abbreviations and Acronyms

ADA	Americans with Disabilities Act
CMAQ	Congestion Mitigation and Air Quality
CRP	Carbon Reduction Program
CRS	Carbon Reduction Strategy
CTP	Capital Transportation Program
DelDOT	Delaware Department of Transportation
DNREC	Delaware Department of Natural Resources and Environmental Control
DRIP	Delaware Resilience Improvement Plan
DTC	Delaware Transit Corporation
EPD	Environmental Product Declaration
EV	Electric Vehicle
FY	Fiscal Year
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
GHG	Greenhouse Gas
I-95	Interstate 95
I-295	Interstate 295
I-495	Interstate 495
IIJA	Infrastructure Investment and Jobs Act
ITS	Intelligent Transportation System
LRTP	Statewide Long-Range Transportation Plan
MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act
NEVI	National Electric Vehicle Infrastructure

PROTECT	Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation
SIP	Strategic Implementation Plan for Climate Change, Sustainability, and Resilience for Transportation
TAMP	Transportation Asset Management Plan
VMT	Vehicle Mile(s) Traveled
WILMAPCO	Wilmington Area Planning Council

1. Introduction

In November 2021, the Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law, was signed by President Biden. The IIJA provides funding for highway, transit, and other multimodal transportation projects throughout Federal Fiscal Years 2022 through 2026 and continues the legacy of many existing transportation funding programs while creating three new formula funding programs. One of the new formula funding programs is the Carbon Reduction Program (CRP). The CRP requires each state's department of transportation to develop a Carbon Reduction Strategy (CRS) to identify approaches that will support the reduction of emissions from the transportation sector. The CRS must be submitted to the Federal Highway Administration by November 15, 2023, and updated every 4 years.

Delaware Department of Transportation's (DelDOT's) CRS outlines DelDOT's intended approach to collaborate with key stakeholders and partners, sister state agencies, and metropolitan planning organizations. DelDOT will work with these partners to develop a process that allows for the strategies within the CRS to align with existing state plans and processes to achieve Delaware's goals in reducing emissions across all sectors. Though this CRS focuses on plans, processes, and projects that will improve greenhouse gas (GHG) emissions from the transportation sector, DelDOT understands that this effort will contribute to overall Delaware emissions reductions goals.

The DelDOT CRS is divided into four sections that focus on the following elements:

1. **Federal Context:** This section describes the IIJA, CRP, and associated requirements. Additional details are provided about other related federal policies, regulations, and legislation that DelDOT will consult throughout the implementation of the CRP and the CRS.
2. **Delaware Context:** This section presents an overview of the transportation system DelDOT manages, including a high-level inventory of assets and a description of the DelDOT Division of Transportation Resilience and Sustainability. This section discusses existing planning documents that explain DelDOT's intent of aligning the CRS with these plans. It also provides an explanation of Delaware's method of tracking, inventorying, and reporting in-state GHG emissions. The State of Delaware recognizes the importance of reducing carbon emissions, as reflected in the recent Delaware state legislative activity and policy updates that are discussed herein.
3. **Framework for Action:** This section details DelDOT's project prioritization method for identifying state and regional priorities that are eligible for funding under CRP and explains how DelDOT intends to track CRP funding allocations. It also outlines

DelDOT's planned approach to incorporate equity into the prioritization process using Delaware's Equity Analysis Tool that was developed for the state, which also aligns with Justice40 provisions and goals. DelDOT's plan to monitor CRS implementation and embed the CRS into the Delaware Climate Action Plan, as well as other long-term planning activities, is also discussed. Part of the framework for action includes next steps and the process for updating the CRS every 4 years, as required under the IIJA.

4. **Taking Action:** This section reviews current CRP-funded projects and describes the ongoing Delaware Climate Change Solutions Act, designed to examine the use of Environmental Product Declarations and Life Cycle Assessments, and how this project will support the CRS.

2. Federal Context

The Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law, was signed by President Biden on November 15, 2021. The IIJA provides federal funding for highway, transit, and other multimodal transportation projects and covers Federal Fiscal Years (FFYs) 2022 through 2026. The IIJA created three new formula funding programs related to climate:

- The Carbon Reduction Program (CRP)
- The Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) Formula Program
- The National Electric Vehicle Infrastructure (NEVI) Formula Program

This formula funding approach represents a change in how the authorization bill has traditionally been funded. Formula funding is allocated to state departments of transportation using a formula calculation based on census population data and the state's total highway lane miles of federal-aid highways. These programs provide funding for state department of transportation projects designed to accomplish the following:

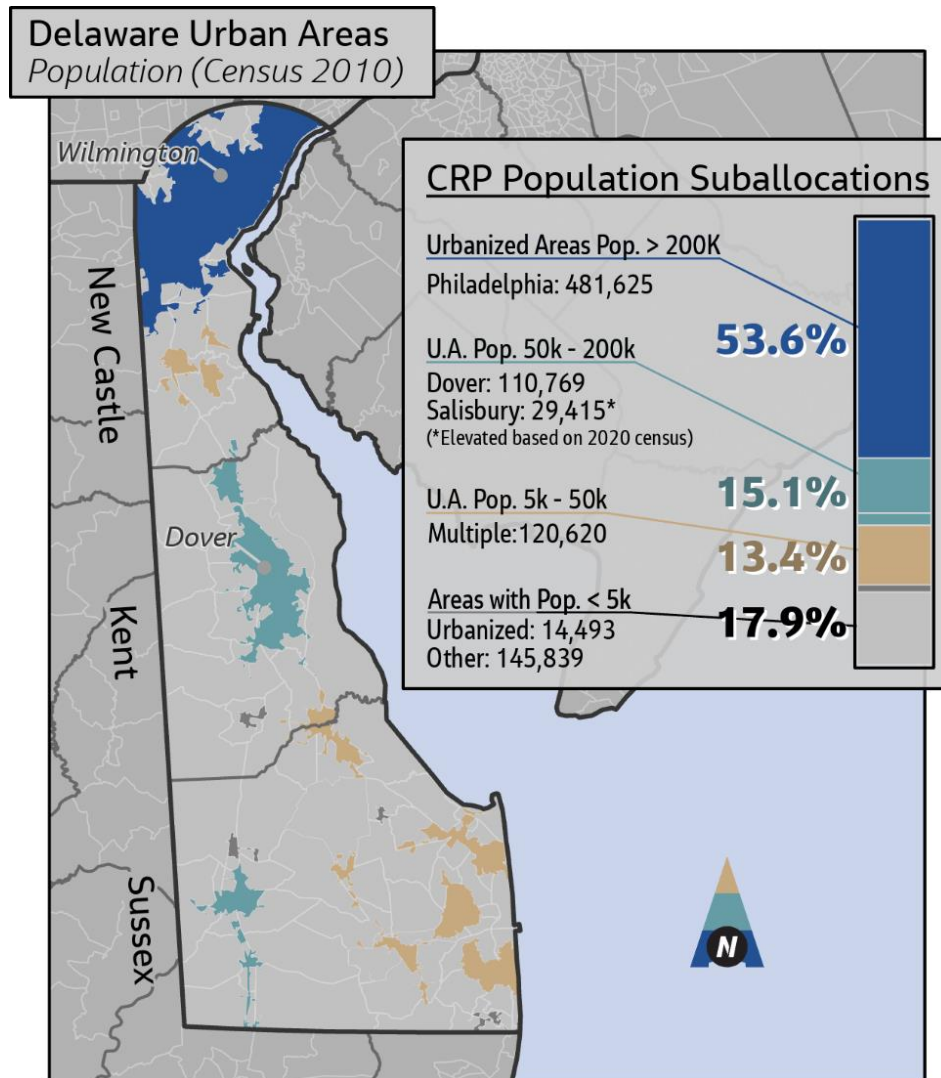
- Lower greenhouse gas (GHG) emissions.
- Build a nationwide electric vehicle (EV) charging network.
- Focus on climate adaptation and mitigation efforts.

The CRP, administered by the Federal Highway Administration (FHWA), includes over \$27 million in formula funds for eligible Delaware Department of Transportation (DelDOT) transportation projects for FFYs 2022 through 2026. The apportionment of these funds (65%) must be distributed among U.S. census-defined urbanized areas relative to population size, with populations ranging from over 200,000 to less than 5,000. The population groups established for distribution of CRP funds are shown in Table 1. The remaining 35% of DelDOT's allotment is assigned to the Carbon Flexible program group and may be spent in any location. The extent of each program group is shown on Table 1 and **Figure 1**.

Table 1. Programming Groups for CRP – Percent of State Population

Program Group	Percent of State Population
Carbon Reduction Flexible	100%
CRP – Urbanized Areas with Population over 200,000	53.6%
CRP – Urbanized Areas with Population over 50,000 to 200,000	15.1%
CRP – Urbanized Areas with Population over 5,000 to 49,999	13.4%
CRP – Areas with Population less than 5,000	17.9%

Figure 1. Delaware's Carbon Reduction Program Area Map



k = thousand(s)
pop. = population
U.A. = urbanized area

The *Carbon Reduction Program Implementation Guidance* (FHWA 2022) outlines federal priorities on funding, eligible activities, and other program requirements. Equity is one of the priorities and is included to ensure that the CRP advances a transportation network that effectively serves all community members while aligning with GHG reduction. The safety and accessibility of a multimodal transportation network is another key federal priority, as it references FHWA's Complete Streets, the Americans with Disabilities Act (ADA), and Transit Flex guidance.

The CRP also aims to support national performance goals related to improving infrastructure condition, safety, congestion reduction, system reliability, and freight movement on the National Highway System.

In addition to the efficiency of freight travel, the FHWA (2022) CRP guidance notes the need to address the shortage of long-term parking for commercial motor vehicles. Another important priority outlined in the CRP guidance is creating labor and workforce opportunities to advance high-quality job creation while improving the transportation system. The consideration of climate change and sustainability in project planning and development is another priority listed in the CRP guidance. Additionally, the guidance includes a discussion about ways the IIJA created additional opportunities to couple or stack CRP and other federal funds to maximize carbon reduction benefits.

The CRP requires each state's department of transportation to prepare and submit for approval to FHWA, a Carbon Reduction Strategy (CRS). DelDOT's CRS was prepared in alignment with federal requirements and guidelines established in the *Carbon Reduction Program Implementation Guidance* released by the FHWA (2022) and considers other relevant federal policies, regulations, and legislation, such as the following:

- **National Blueprint for Transportation Decarbonization** (DOE n.d.): This blueprint establishes a landmark whole-of-government approach for addressing the climate crisis by cutting all GHG emissions from the transportation sector by 2050.
- **FHWA NEVI Formula Program:** This program provides funding to states to strategically deploy EV charging stations and establish a nationwide interconnected network to facilitate data collection, access, and reliability.
- **Alternative Fuel Corridors:** This national network of alternative fueling and charging infrastructure along National Highway System corridors was established by FHWA as part of the Fixing America's Surface Transportation Act of 2015 and used as the backbone for the NEVI Program.
- **Congestion Relief Program:** This new program established under the IIJA provides grants to advance innovative, integrated, and multimodal solutions to reduce road congestion and the related economic and environmental costs in the most congested metropolitan regions with an urbanized area having a population of at least one million.
- **Reduction of Truck Emissions at Port Facilities Program:** This newly established competitive grant program provides funding for projects that reduce idling at port facilities, including port electrification and efficiency improvements, particularly for heavy-duty vehicles.
- **Transportation Alternatives Set-Aside from the Surface Transportation Block Grant Program:** This grant program seeks to reduce emissions and energy use by providing and encouraging nonmotorized travel.

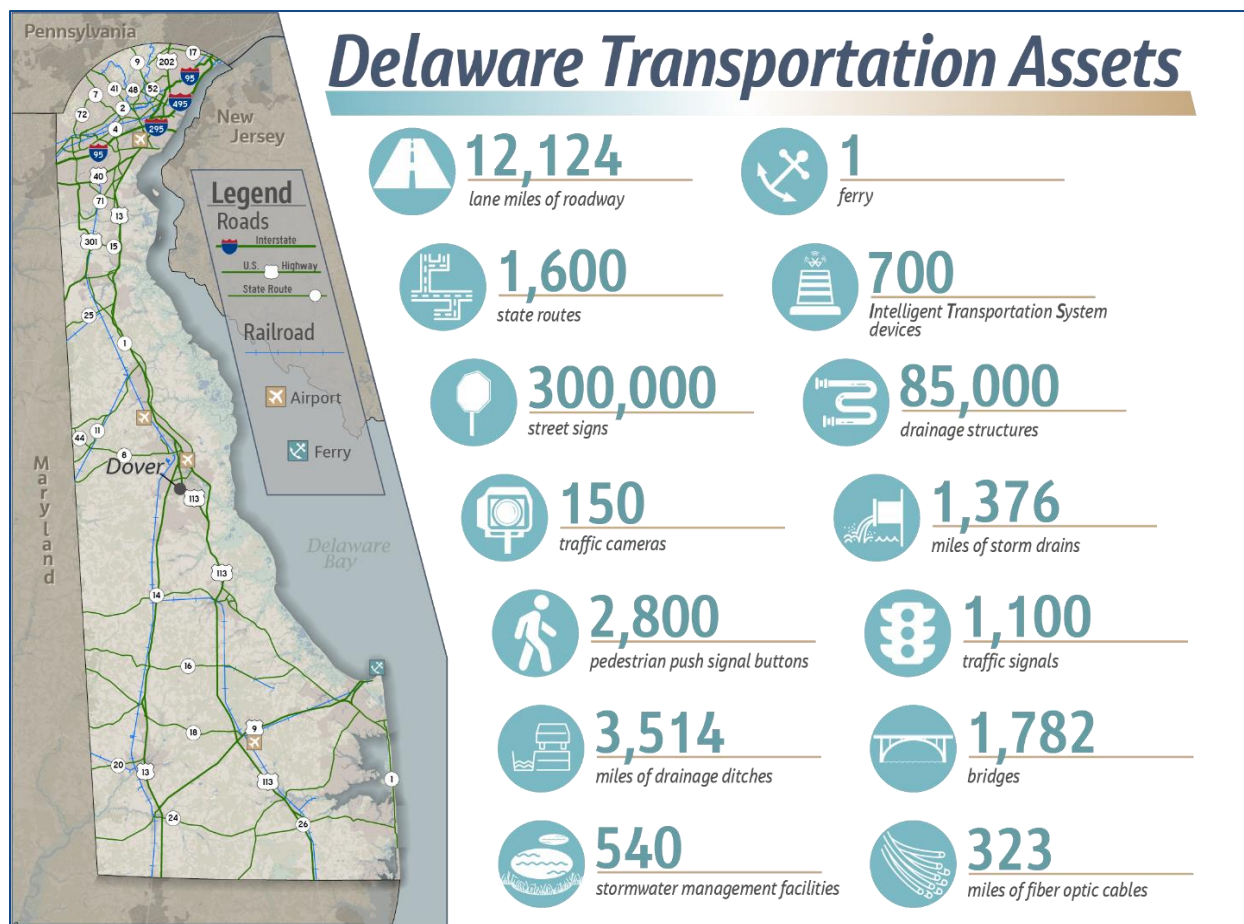
- **Congestion Mitigation and Air Quality Improvement (CMAQ) Program:** This program's main goal is funding transportation projects that reduce regulated emissions associated with carbon monoxide, ozone, and particulate matter pollution in nonattainment and maintenance areas, often through congestion mitigation techniques.
- **Buses and Bus Facilities Program:** This Federal Transit Administration program provides federal resources to states and direct recipients to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities, including technological changes or innovations to modify low- or no-emission vehicles or facilities.
- **Low- or No-Emission Vehicle Program:** This program provides funding to state and local governmental authorities for the purchase or lease of zero-emission and low-emission transit buses, as well as acquisition, construction, and leasing of required supporting facilities.
- **Energy Efficiency and Conservation Block Grant Program:** Administered by the Department of Energy, this \$550 million program provides financing for energy efficiency, renewable energy, and zero-emission transportation capital investments, projects, and programs.
- **Inflation Reduction Act:** This act provides \$5 billion in grants administered by the U.S. Environmental Protection Agency to support states, municipalities, air pollution control agencies, tribes, and territories to develop and implement GHG reduction strategies through the **Climate Pollution Reduction Grants Program**.
- **Justice40 Initiative:** This historic federal initiative emphasizes a commitment to equity and addressing climate change. The Justice40 Initiative is an opportunity to address gaps in transportation infrastructure and public services by working toward the goal that at least 40% of the overall benefits from federally funded projects flow to disadvantaged communities.
- **Buy Clean Policy:** This procurement policy promotes the purchase of construction materials and products with lower embodied GHG emissions, considering the life-cycle emissions associated with the production of those materials.

3. Delaware Context

3.1 Overview of Delaware and DelDOT's Transportation System

DelDOT operates and/or maintains approximately 90% of all roadway mileage in Delaware, the highest percentage among all state departments of transportation in the United States. DelDOT's jurisdiction is so extensive because few of the state's counties, towns, or municipalities own or operate transportation infrastructure (DelDOT 2022). As DelDOT continues to develop and maintain its transportation infrastructure, specific lane and mileage details may vary over time. As of 2022, DelDOT's jurisdiction contained the transportation assets detailed on **Figure 2**.

Figure 2. Delaware Department of Transportation Assets Map



This inventory includes Delaware's three interstate highways—Interstate 95 (I-95), Interstate 295 (I-295), and Interstate 495 (I-495). I-95 runs southwest to northeast from Elkton, Maryland; through Newark and Wilmington, Delaware; to Pennsylvania, just south of Philadelphia. I-495 serves as a bypass around Wilmington and I-295, connecting from I-95 North to the Delaware Memorial Bridge to the New Jersey Turnpike. Roadways maintained by DelDOT include not only the system of state routes that provide regional

connectivity, but also the local roads and subdivision streets that provide mobility and access at the community level.

DelDOT's most recent Statewide [Long-Range Transportation Plan](#) (LRTP) (DelDOT 2019) serves as a comprehensive guide for the future development of Delaware's transportation system. The LRTP is currently being updated, with an expected 2024 publication date, and will further integrate sustainability and resilience considerations into transportation planning processes. This integration will, in part, be driven by a focus on creating a well-connected, multimodal transportation network that enhances safety, addresses extreme weather impacts, and promotes environmentally responsible transportation choices. The plan will be titled "Connecting Everyone Everywhere" and will be policy-based, focusing on how each division connects to [DelDOT's Framework of Excellence](#) (DelDOT n.d.a) (Figure 3), which focuses on nine elements:

- Safety
- Congestion management
- State of good repair
- Economic development
- Equity in transportation
- Resiliency, sustainability, and environmental stewardship
- Transportation innovation
- Customer service/engagement
- Employee engagement

Figure 3. DelDOT's Framework of Excellence

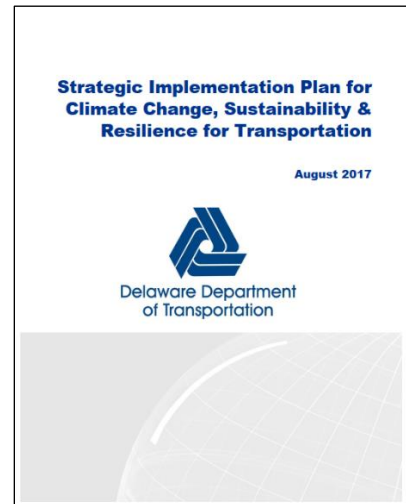


Source: DelDOT, n.d.a.

3.3 Carbon Reduction Activities for the State of Delaware

For more than a decade, the State of Delaware has established laws and policies and has conducted planning efforts to support resilience, sustainability, and reduced GHG emissions. Delaware was one of the first states to develop a strategic and cohesive plan to promote a more resilient and sustainable transportation system with [DeIDOT's Strategic Implementation Plan for Climate Change, Sustainability, and Resilience for Transportation](#) (SIP; Figure 4) (DeIDOT 2017). The SIP was developed in response to Executive Order 41, issued by Governor Markell in 2013, which required all state agencies to incorporate measures for adapting to increased flooding and sea-level rise in the siting and design of state-funded projects for new construction and reconstruction of substantially damaged buildings and infrastructure. The SIP recognized the need to mitigate GHG emissions, adapt to changing climatic conditions, and provide a reliable and efficient transportation system (DeIDOT 2017).

Figure 4: Strategic Implementation Plan Cover



Source: DeIDOT, 2017

DeIDOT and the State of Delaware have also demonstrated environmental stewardship through key initiatives that integrate resiliency and sustainability into planning and operations to combat climate change. In addition to this CRS, these initiatives include the following:

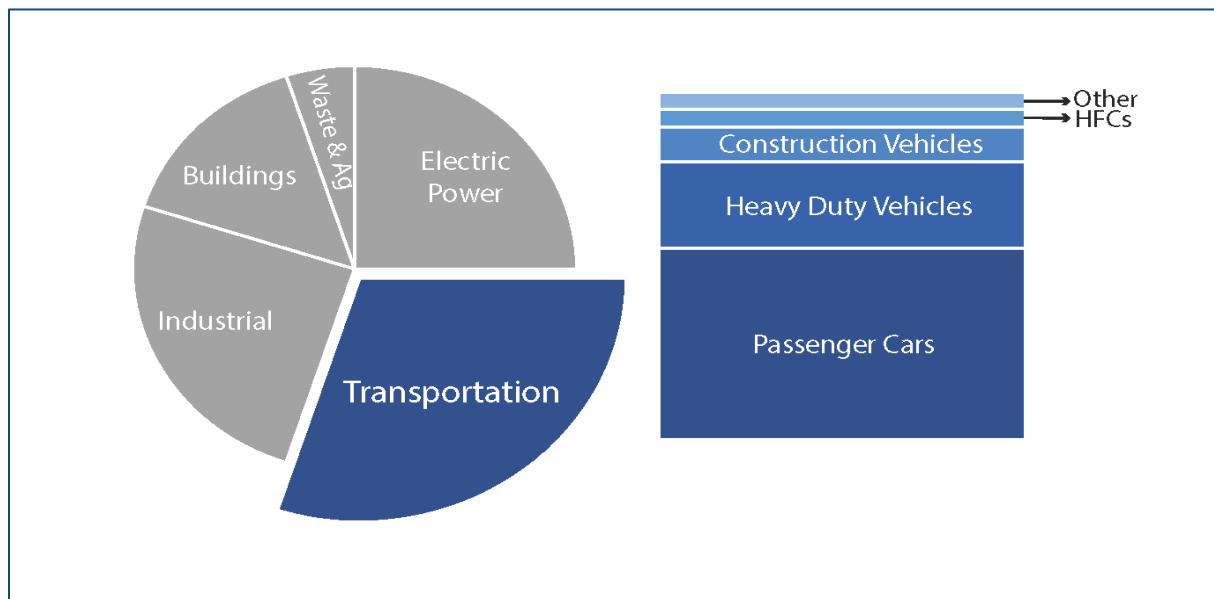
- [Statewide Long-Range Transportation Plan](#) (DeIDOT 2019)
- [Delaware Department of Natural Resources and Environmental Control \(DNREC\) Climate Action Plan](#) (DNREC 2021b)
- [NEVI and State EV Plan](#) (DeIDOT and DNREC 2022)
- [Delaware Transit Corporation \(DTC\) Climate Action Plan](#) (DTC 2022)
- [Transportation Asset Management Plan](#) (TAMP) (DeIDOT 2022)
- Delaware Resilience Improvement Plan (DRIP) (approved September 2023)
- CMAQ Program state initiatives (ongoing); include target setting, emission calculations, and FHWA reporting

To further support these efforts, in 2021, DeIDOT created the **Division of Transportation Resilience and Sustainability** to promote the incorporation of resilience and sustainability into statewide infrastructure projects. This division plays a crucial role in engaging with DeIDOT's Cabinet Secretary and collaborating with other divisions within

the agency. Outside of DeIDOT, the division works with other state agencies and interested stakeholders to integrate resilience and sustainability considerations throughout the transportation planning, design, construction, maintenance, and operation processes.

An important example of DeIDOT's ongoing interagency coordination is its work with DNREC to monitor and manage air quality issues. DNREC's Division of Air Quality annually tracks and inventories in-state GHG emissions. The [latest inventory report](#) (DNREC 2021a), which covers GHG emissions estimates between 1990 and 2018, shows that the transportation, industrial, and electric power sectors represent the leading sources of emissions in Delaware. Combined, these three sectors account for at least 75% of Delaware's GHG emissions since 1990. Of these three sectors, the transportation sector was the leading source of GHG emissions in Delaware, contributing 30% of the total GHG emissions. DNREC noted in the report that GHG emissions from the transportation sector have been trending upwards since 2011 and that the 2018 inventory represented the highest level since 2008. Internal combustion engines accounted for 97% of all GHG emissions in the transportation sector. Of those, passenger vehicles, including light-duty trucks and motorcycles, represent the largest source of GHGs in the transportation sector, with heavy-duty vehicles representing the next highest. Construction vehicles have been identified as another constant source of GHG.

Figure 5. Gross GHG Emissions in Delaware (2018) by Sector and End Use (When Applicable)
Source: DNREC, 2021a.



Ag = agriculture
HFC = hydrofluorocarbons

In November 2021, DNREC, in partnership with DeIDOT and other state agencies, released the Delaware Climate Action Plan (DNREC 2021b). The plan serves as a

roadmap for the State of Delaware as it addresses and prepares for climate change now and into the future. Strategies to minimize GHG emissions in the transportation sector include the following:

- Transitioning to zero-emission vehicles.
- Encouraging EV purchases.
- Improving access to public EV charging infrastructure.
- Decreasing vehicle miles traveled (VMT) by 10% by 2030.
- Identifying methods to create more efficient transportation systems.

DelDOT also worked closely with DNREC to develop the State of Delaware's NEVI Plan and Statewide Electric Vehicle Plan to further reduce vehicle emissions in Delaware.

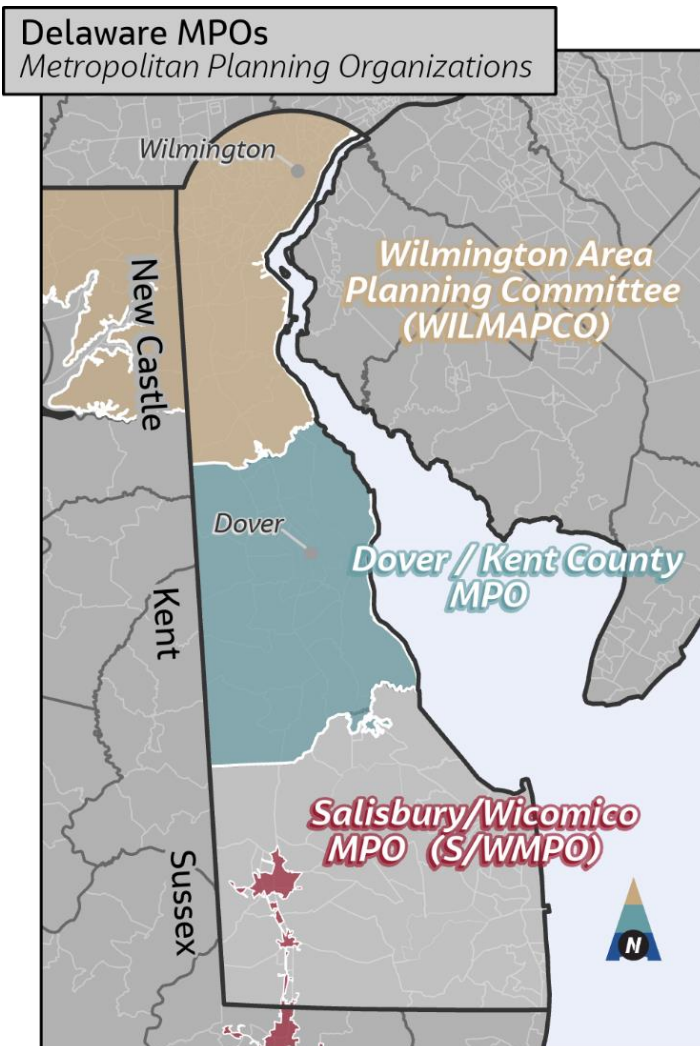
3.4 Recent Delaware Legislation and Policy Updates

Building on the [Delaware Climate Action Plan](#) (DNREC 2021b), the Delaware legislature passed a package of laws during the 2023 legislative session aimed at reducing GHG emissions and supporting Delaware's transition to EVs and renewable energy. The Delaware Climate Change Solutions Act of 2023 sets new targets for GHG emissions reductions of 50% by 2030 and net-zero GHG emissions by 2050. In addition, it also codifies a planning process to support the State of Delaware in achieving these goals by requiring the State to prepare and implement a Climate Action Plan every 5 years. The package of bills also created the following requirements:

- All State-owned passenger and light-duty vehicles must be zero emission by 2040. Interim targets include 15% zero-emission vehicles by 2026, 25% zero-emission vehicles by 2029, and 50% zero-emission vehicles by 2032.
- Beginning in July 2025, State agencies must develop clean construction preferences that allow sustainability and carbon impact data to be considered in awarding public works contracts.
- The package codifies the Clean Vehicle Rebate program offered through DNREC since 2014. It incentivizes the purchase of electric and hybrid vehicles (a \$2,500 rebate for EVs and a maximum \$1,000 rebate for hybrids).
- DNREC and DelDOT will assess the availability of residential charging stations for EVs and create strategies on addressing demand in "high-need areas."
- DNREC will develop a residential incentive program to improve EV charging infrastructure in Delaware.

Given this context, and support of the Carbon Reduction Formula Program, the intent of the DelDOT CRS is to create a framework to embed carbon reduction considerations in project planning and development, prioritization, and life-cycle planning to confirm the sustainable financing of infrastructure assets.

Figure 6. Delaware Metropolitan Planning Organizations



To support incorporating carbon reduction considerations in project planning and development, prioritization, and life-cycle planning, DelDOT is continually working to integrate and coordinate planning efforts within the agency and across the state, as well as with federal partners and metropolitan planning organizations (MPOs) (see Figure 6). DelDOT actively works with the MPOs in the state—the Wilmington Area Planning Council (WILMAPCO), Dover/Kent County MPO, Salisbury/Wicomico MPO and Sussex County Planning Administration—to collaborate and coordinate planning activities to verify that the carbon reduction strategies identified in this CRS support planning activities within the three planning areas. Currently, DelDOT makes it a priority to meet on a regular basis to discuss the latest initiatives.

The DelDOT CRP will support this integration and collaboration and

will confirm that carbon reduction considerations and project prioritization are included in planning processes and documents, including the following:

- 2024 Updated LRTP “Connecting Everyone Everywhere” (in progress)
- CMAQ Assessments and Reporting (ongoing)
- [Capital Transportation Program](#) (CTP)
- [TAMP](#) (DelDOT 2022)
- [Transportation Operations Management Plan](#) (DelDOT n.d.d)
- [Statewide Climate Action Plan](#) (DNREC 2021b)
- [Climate Action Plan](#) (DTC 2022)
- DRIP (approved September 2023)
- [NEVI Plan](#) (DelDOT and DNREC 2022)
- MPOs’ Transportation Improvement Plans/Long-Range Plans

- [Statewide Hazard Mitigation Plan](#) (DEMA 2019)

In addition to supporting integration of the CRS into these planning documents, DelDOT will also incorporate the requirements of Executive Order 14008, implementing Justice40 goals and the findings and recommendations from Delaware's 151st General Assembly House Concurrent Resolution 40, which created an oversight committee to study environmental justice in Delaware.

DelDOT is excited about creating the statewide CRS, which will help serve as a guide for responsible investment in the State of Delaware's CRP. DelDOT understands that, just like other inaugural documents, including the federally approved DRIP, the CRS will serve as a ladder step for future endeavors, building on the initial strategies or pivoting based on lessons learned.

4. Framework for Action

The CRP requires each state to identify projects and strategies that back efforts that will support a reduction in transportation emissions through safe, reliable, and cost-effective options, including the following:

- Reducing traffic congestion and VMT by facilitating the use of alternatives to single-occupant vehicle trips, including public transportation facilities, pedestrian facilities, bicycle facilities, and shared or carpoled trips.
- Facilitating the use of other types of vehicles or modes of travel that result in lower transportation emissions per person-mile traveled compared to existing vehicles and modes.
- Facilitating approaches to the material use and construction of transportation infrastructure that result in reduced transportation-related emissions compared to existing approaches.

Projects that reduce GHG emissions, improve efficiencies in moving people and goods, and reducing congestion, may involve:

- Increased use of zero- or low-emission vehicles.
- Active transportation facilities.
- Mode shifts to rail and transit.
- Intelligent Transportation System (ITS) - related solutions.

DeIDOT will receive \$27 million total in CRP funding between FFY 2022 and FFY 2026. The funds will be split, with 65% apportioned to different parts of the state based on population and 35% to be spent anywhere in the state. Prioritizing projects and ensuring those projects align with and support other efforts underway throughout Delaware is critical. Currently, statewide planning documents and state initiatives work together to guide DeIDOT's priorities and investments. As described in the previous section, during this funding period, DeIDOT will integrate strategies incorporated in the CRS with other planning documents and processes to comprehensively approach lowering carbon emissions and project prioritization and selection. DeIDOT, MPOs, and community stakeholders will continue coordinating throughout the program implementation to identify CRP-eligible projects to prioritize for funding.

4.1 Project Prioritization

DeIDOT's strategy for prioritizing the expenditure of CRP funding begins with identifying state and regional priorities that are eligible for funding. Examples of eligible project types include the following:

- Active transportation facilities
- EV infrastructure
- Heavy truck emission controls
- ITS and Transportation Systems Management and Operation solutions
- Mass transit
- Roadway improvements that address recurring congestion without adding additional capacity

State-level priorities will be identified by reviewing the LRTP goals, [CTP](#) (DeIDOT n.d.b), [Strategic Highway Safety Plan](#) (DeIDOT et al. 2020), and similar planning documents and identifying regional and local priorities by working with MPOs, local governments, and community partners to review and update the list of eligible projects on an annual basis. As discussed in Section 2, DeIDOT will continue to maintain existing coordination with MPOs and other partners to review and update the list of eligible projects on an annual basis. Currently, the State of Delaware, and in particular the Division of Transportation Resilience and Sustainability, meets with these partners at least once per month to keep the lines of communication open and to discuss recent initiatives.

As eligible projects are identified, DeIDOT will sort them into categories based on location and the type of improvement being proposed. Sorting projects based on their location helps confirm that DeIDOT's program reflects FHWA's population-based suballocation requirements (refer to Section 4.2). Sorting projects based on their improvement type helps confirm that DeIDOT is investing in a range of solutions that reflect Delaware's transportation needs and priorities. The list of eligible projects provided previously in this section identifies some of the improvement categories likely to be used. Once projects have been sorted, each will be scored using a series of quantitative and qualitative factors. This prioritization process will allow DeIDOT to optimize investments in suballocation areas, align with state and regional equity goals, and enable the transportation system to serve all communities within Delaware efficiently and effectively. Additional factors may include the following:

- Estimated carbon reduction benefit and return on investment.
- Ability to achieve Justice40 initiatives and regional equity goals.
- Compatibility with goals in the Statewide Climate Action Plan.
- Status of project funding for obligation and inclusion in the CTP.

- Readiness for implementation.
- Expected asset life-cycle.
- Community/stakeholder support.
- Alignment with future land uses and ability to achieve co-benefits.
- Enhancement of the health and safety of rural or urban communities (public health).
- National Environmental Policy Act (NEPA) status.
- Implementation timeline.
- Feasibility, including cost and maintenance considerations.

Further refinement of the prioritization process, including the consideration of weighting these factors, will continue during future funding years, in coordination with DeIDOT, the MPOs and other local stakeholders. **The goal of this ongoing refinement of the prioritization process will be to achieve quantifiable metrics, including anticipated emissions reductions and project cost.** These quantifiable metrics could allow DeIDOT to show anticipated project cost per metric ton of carbon reduced. DeIDOT will leverage existing tools to develop carbon reduction estimates at the project level and can be visually displayed to show investments made with CRP funding, as well as other metrics, such as progress toward Justice40 goals.

4.2 Tracking Carbon Reduction Program Funding Allocations

DeIDOT will provide a summary of projects and efforts that use CRP funding per fiscal year in future CRS updates to demonstrate that funding allocation requirements are being met. **Figure 7** and **Table 2** show the funding allocation requirements for Delaware. In addition, future updates to other relevant planning documents will include details about projects supported using CRP funding. Additional sources of federal funding used per project will also be outlined to aid in future funding strategies and decision-making. DeIDOT will leverage current funding allocation tracking methodologies as part of routine fiscal record keeping processes and will also incorporate prioritization strategies developed throughout the department.

Figure 7. Delaware Urban Areas for Carbon Reduction Program Funding Allocation (FFY 2023)

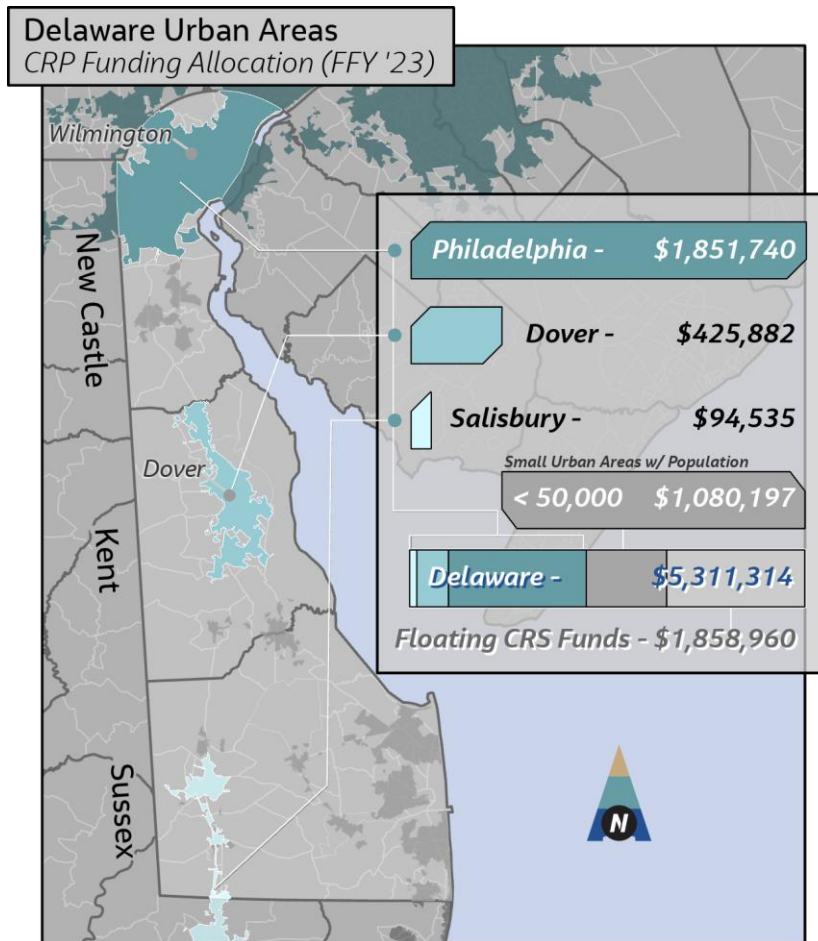


Table 2. Programming Groups for CRP – Funding Allocation

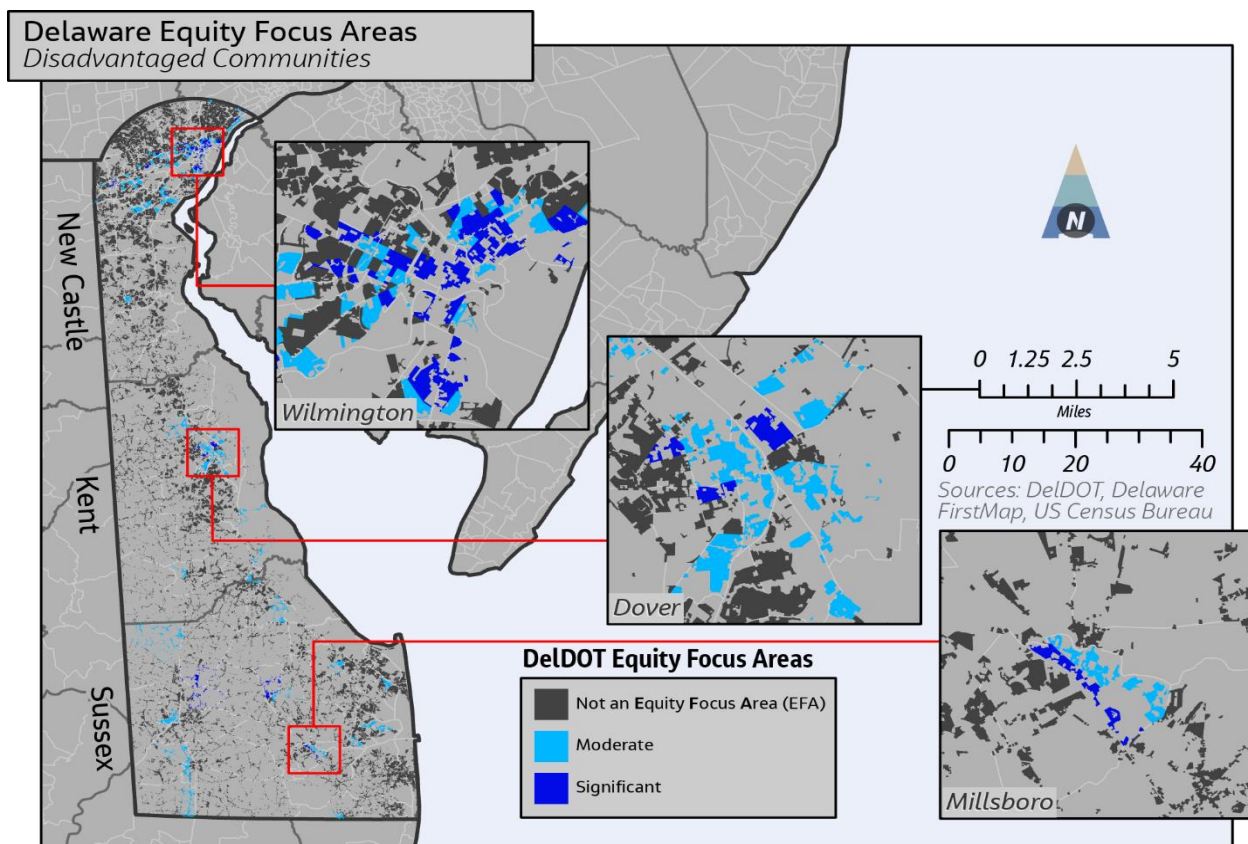
Program Group	Funding Allocation
Carbon Reduction Flexible	35%
CRP – Urbanized Areas with Population over 200,000	34.9%
CRP – Urbanized Areas with Population over 50,000 to 200,000	9.8%
CRP – Urbanized Areas with Population over 5,000 to 49,999	8.7%
CRP – Areas with Population less than 5,000	11.6%

4.3 Incorporating Equity

As discussed in the previous section, DeIDOT has developed an [Equity Analysis Tool](#) (DeIDOT n.d.c) that incorporates census and residential land use data to identify neighborhood block groups where the department should more keenly focus its attention to confirm the equitable distribution of funding and appropriate public outreach. The identification of the “Equity Focus Areas” will help DeIDOT make data-driven investment

decisions, provide data for public outreach and engagement, and establish a standardized tool to be used throughout the department. Methodologies from [WILMAPCO's Transportation Justice Analysis](#) (WILMAPCO 2019) and [Massachusetts' Energy and Environmental Affairs Environmental Justice Criteria](#) (Commonwealth of Massachusetts n.d.) were used to create DelDOT's Equity Analysis Tool. The tool offers a step above what many other state agencies have done to define vulnerabilities and disadvantaged and/or underserved communities, as DelDOT's tool is much more granular and able to focus on the specific locations of these communities. **Figure 8** depicts equity focus areas in Delaware.

Figure 8. Delaware Equity Focus Areas



It is worth noting that many of the underserved areas of Delaware are along local roads that do not qualify for federal funding investments. The Equity Analysis Tool will allow DelDOT to identify what other benefits can be experienced through federal funding investments in adjacent projects (such as multimodal infrastructure and EV charging). Benefits from those investments include the following:

- Better air quality, as EV chargers make EV use more accessible, thereby reducing GHG emissions.
- Workforce development in and near disadvantaged communities from investment programs and projects.

- Emissions reductions.

At implementation, DelDOT plans to incorporate the data resulting from this analysis into the capital project prioritization process and for all other sections of the department to use the data for strategic decision-making, such as outreach, investments, and other analyses.

DelDOT plans to use the Equity Analysis Tool to meet federal Justice40 provisions and goals, which state that “40 percent of the overall benefits of federal investments from covered programs, including CRP, should flow to disadvantaged communities.” The granularity achieved by using the Equity Analysis Tool will allow DelDOT to confirm the communities identified through this analysis will experience the benefits of the CRP-funded projects.

Furthermore, DelDOT will consider the context of the communities when identifying and funding carbon reduction projects. Distributing CRP funding consistent with Justice40 goals is an integral component of the DelDOT project prioritization process, as described previously. This includes working with MPOs and communities and engaging with the public in the planning process. DelDOT is invested in workforce development and coordinates on a regular basis with Department of Energy, Department of Labor, and DNREC to ensure equitable investment and collaboration.

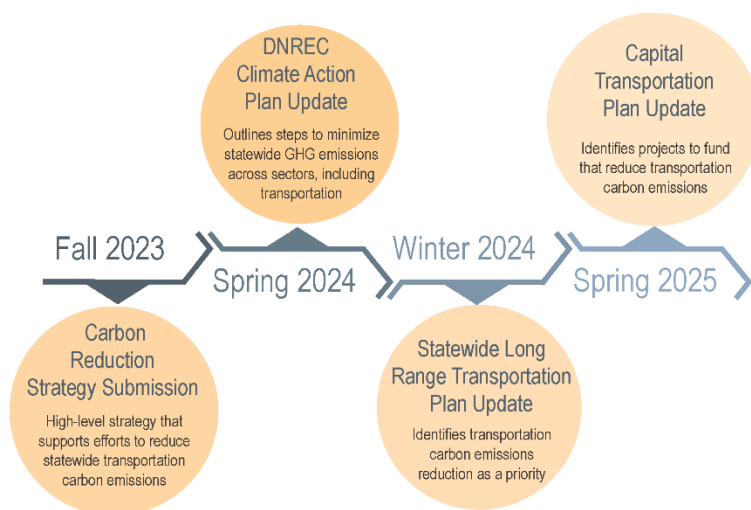
4.4 Ongoing DelDOT Carbon Reduction Strategy Evaluation

This CRS was developed in partnership with DNREC, MPOs, and other critical partners at the local and community level. This ongoing coordination allows DelDOT the opportunity to take a holistic approach in prioritizing projects and reviewing the methods used to prepare the CRS. According to the FHWA *Carbon Reduction Program Implementation Guidance* (FHWA 2022), evaluation costs are allowable unless prohibited by statute or regulation. DelDOT will monitor and track a range of associated metrics, including transportation-related emissions, number of registered EVs, transit ridership and access, and estimated VMT reductions. DelDOT will continue to monitor and report these performance measures, including equitable distribution of program benefits. In addition, EV usage information will be collected and could contribute to the ongoing evaluation. This analysis will help determine the success of CRP investments and allow DelDOT to refine or adjust the project prioritization process, as needed.

4.5 Embedding the CRS in DeIDOT's Climate Action Plan and Long-Range Planning

As described in previous sections, coordination between DeIDOT, MPOs, and communities is a continual integrative and collaborative process. DeIDOT will leverage these relationships to confirm strategies described in the CRS will be embedded in statewide plans and processes. This coordination will continue as DeIDOT works with MPOs to incorporate the CRS strategies in upcoming planning cycles, such as long-range plans and capital transportation plans. DeIDOT will also work closely with other state agencies to confirm strategies included in the CRS are incorporated into planning efforts and initiatives, such as the Statewide Climate Action Plan. **Figure 9** shows how the CRS could inform other Delaware planning documents on the horizon. Given the link between carbon emissions and extreme weather and climate stressors that impact transportation system resilience, DeIDOT's goal is to identify tools and resources to address both sets of challenges and incorporate proven strategies in statewide planning efforts.

Figure 9. Delaware Planning Documents Timeline



DeIDOT understands the benefits of having statewide planning documents work together and will continue this approach to guide decision-making regarding priorities and investments, with the eventual goal of integrating the CRS into other DeIDOT strategic plans. DeIDOT recognizes the benefits of connecting all planning efforts and including strategies contained within the CRS.

4.6 Next Steps and Carbon Reduction Strategy Updates

DelDOT will update the CRS at least once every 4 years, as required in the FHWA CRP guidance (FHWA 2022). More frequent updates to the CRS might be necessary as DelDOT continues to refine their process through continued analysis and subsequent results. DelDOT is also working with its partners at the local level to identify carbon-producing hot spots around Delaware that may be targeted for specific project development and investments. Using data sources such as Traffic Incident Management data and statewide operational performance maps, DelDOT will work with MPOs, other partners, and stakeholders in future years to identify and analyze such locations for improvement in operational conditions to reduce carbon emissions. Based on this regular analysis, DelDOT will make updates to the CRS on a continual basis, as needed.

DelDOT is conducting assessments of connectivity for alternative transportation systems, such as bicycle and pedestrian facilities, that may benefit from investments to help complete the “last mile” to connect origin-destination pairs with high-commuter trips or school-based trips using nonmotorized means of transportation. DelDOT will work with its facilities staff to identify means to reduce carbon emissions through the installation of low-energy use lighting equipment, improved energy efficiency windows and doors, electric fleet purchases, and the use of noncarbon-fuel tools such as lawnmowers, blowers, chainsaws, and trimming equipment.

Finally, DelDOT is seeking methods to reduce carbon emissions associated with construction operations, including materials acquisition, transport, and production, through the development of an Environmental Product Declaration (EPD) program. Efforts are being made to identify sources of lower carbon-emitting products, such as low-carbon or carbon-negative concrete and warm-mix asphalt, in addition to reviewing mix designs to efficiently use materials to minimize construction operations’ global warming potential. Analyzing materials in this way can support the reduction of carbon emissions associated with DelDOT construction and maintenance efforts and the incorporation of carbon reduction planning in project design and decision-making. As these innovations are emerging, the potential carbon benefit and timeframe are currently to be determined.

5. Taking Action

As described in Section 2, there are several statewide efforts underway in Delaware to address climate change, sustainability, and resilience. These initiatives include plans and processes that can be leveraged to quantify GHG emissions from the transportation sector and identify ways to reduce these emissions. DelDOT will continue to work hand-in-hand with stakeholders like DNREC and MPOs to support and align with these efforts and provide a holistic approach to reducing emissions throughout Delaware, specifically in the transportation sector. As this CRS illustrates, DelDOT has made commitments to improve sustainability and resilience outcomes related to the transportation system it manages and operates. DelDOT is positioned to supplement action and steps already in progress, as well as begin to identify other projects and programs that would benefit from CRP funding.

This section provides a review of current DelDOT CRP-funded projects, an overview and status of the FHWA-funded DelDOT Climate Challenge Grant program, and a summary of CRP requirements for the CRS, including details about how DelDOT will meet each requirement through this CRS (as detailed in Appendix A).

5.1 Current CRP-funded Projects

DelDOT has identified and obligated funding for specific projects for FFY 2023 and FFY 2024, as shown in Table 3. At a high level, DelDOT has identified four pedestrian and bicycle projects in Kent and Sussex counties to improve safety, connectivity, and mobility options. These projects are designed to close gaps for alternative transportation facilities and improve existing facilities to meet ADA compliance. The goal of these projects is to provide improved access to destinations within these areas through safe and connected multimodal transportation options for travelers. Many of these projects promote mode shift and decrease vehicular traffic and the associated carbon emissions.

One pedestrian project in New Castle County will include multimodal path and curb ramp improvements, bringing the multimodal network into ADA compliance and increased connectivity, improving intersection crosswalks, upgrading the curb ramp system, and providing minor landscaping enhancements. Similar to the projects in Kent and Sussex counties, the goal of these improvements in New Castle County is to provide safe and connected multimodal transportation options for travel that will increase the use of alternative transportation modes and reduce carbon emissions.

Another project on the list includes commercial vehicle parking improvements. Providing adequate commercial vehicle parking is a critical factor in the safe and efficient movement of goods throughout Delaware by providing safe locations for drivers to take federally required service breaks and wait for staging appointments, as needed. This project will identify and analyze various sites throughout the state for potential use as commercial

vehicle parking facilities. Adequate commercial vehicle parking reduces the need for trucks to idle while waiting for parking to become available, thereby lowering carbon emissions.

Table 3. Programming Groups for CRP – Estimates and Phase

Program Group	Project Name	Estimate (\$)	Phase	FFY
Y600	DelDOT Carbon Reduction Plan	300,000	Planning	2023
Y600	Commercial Vehicle Parking Site Identification & Evaluation Statewide	300,000	Project Development	2023
Y600	IDIQ Pedestrian Bicycle Facility Development, Kent/Sussex FY24–27, Flex	483,500	Construction	2023
Y601	Adams Street Sidewalk	600,000	Preliminary Engineering	2024
Y606	IDIQ Pedestrian Bicycle Facility Development, Kent/Sussex FY24–27, 50k–200k	1,012,500	Construction	2024
Y607	Flood Warning Signals & Signage, Odessa	291,000	Traffic	2024
Y607	IDIQ Pedestrian Bicycle Facility Development, Kent/Sussex FY24–27, 5k–49k	1,552,500	Construction	2024
Y608	IDIQ Pedestrian Bicycle Facility Development, Kent/Sussex FY24–27, Rural	331,500	Construction	2024
Y601	School Lane Pathway	533,000	Construction	2023

FY = fiscal year

IDIQ = Indefinite Delivery Indefinite Quantity

Efficient movement of traffic is another proven way to lower carbon emissions. One way Delaware has invested in this is through advanced warning signage and signaling system improvements in Odessa. Improvements to the signaling and signage systems will provide travelers with sufficient warning and notification of roadway flooding, which will allow travelers to make informed decisions and adjust plans based on road closures. Having the ability to make informed travel decisions can improve efficiencies of traffic movement and lower the likelihood of having to sit in traffic idling, which will help lower emissions as well.

5.2 DeIDOT Climate Challenge Grant Program

In July 2022, DeIDOT applied for and received a grant from the FHWA under the Climate Challenge Program. DeIDOT plans to leverage this funding to support initiatives and efforts described in the Delaware Climate Action Plan (DNREC 2021b). As described in Section 2 of this CRS, the Delaware Climate Action Plan identifies areas of focus, including minimizing GHG emissions and maximizing resilience to climate change impacts across Delaware.

Although emissions information has been tracked and estimated for various industries across Delaware, there has never been specific in-depth capture, study, or analysis of the highway construction industry and its carbon footprint. To better understand current emissions status and establish future targets, DeIDOT will use this funding to create a process to track GHG emissions associated with pavement construction and learn from others how to establish future reduction targets and thresholds to minimize the carbon footprint and overall environmental impacts related to roadway construction.

An important outcome of the project will be the creation of environmental and materials training, including how to evaluate EPDs and Life Cycle Assessments for those involved in infrastructure planning, design, construction, and maintenance. Once the training has been developed, DeIDOT plans to work with material suppliers and the construction industry to capture and share existing environmental data, baseline the State of Delaware's status, and work together with subject matter experts to develop realistic and achievable targets that will help the State reduce their materials- and construction-generated GHG emissions and help meet the goals set in the Delaware Climate Action Plan (DNREC 2021b).

This project will also allow DeIDOT to review and quantify the current state of practice in material use and identify improvements that can be made to the sustainability of the pavement life cycle from procurement to construction, as well as operations and maintenance and ultimately to the end of pavement life. DeIDOT will continue encouraging and championing the use of recycled and beneficial use materials while initiating the process of quantifying these beneficial uses to help support setting GHG emissions reduction goals that consider these factors.

As with the CRS, DeIDOT will collaborate with key partners and stakeholders across Delaware to develop a program to measure and track GHG emissions associated with the pavement life cycle. As DeIDOT owns, operates, and maintains approximately 90% of Delaware's infrastructure, this program will provide a realistic and quantifiable measure of the emissions associated with various pavement operations across the state. Ultimately, this project will support DeIDOT in the implementation of the CRS and achieving goals intended to lower GHG emissions within their purview.

5.3 Conclusion

This DeIDOT CRS provides a summary of current statewide climate and sustainability efforts and identifies strategies DeIDOT will employ to reduce GHG emissions. DeIDOT will continue to take a collaborative approach with key stakeholders, including MPOs and other key partners, such as DNREC, to comprehensively approach identifying projects and programs that help DeIDOT achieve GHG reduction targets while simultaneously supporting the goals set in the Delaware Climate Action Plan (DNREC 2021b). The CRS outlines a process DeIDOT will employ to identify and prioritize projects for CRP funding and provides details about projects underway using current CRP funding (FFY 2023 to FFY 2024). The strategies included in this document will support DeIDOT in achieving a sustainable and resilient transportation system and aid in reducing GHG emissions from the transportation system.

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Appendix A

Carbon Reduction Strategy

Requirements



A.1 Carbon Reduction Strategy Requirements

CRS Requirement	DeIDOT Progress	DeIDOT CRS Reference
Support efforts to reduce transportation emissions.	CRS provides a description of the framework and development of a project prioritization method.	Section 3, Framework for Action
<p>Identify projects and strategies to reduce transportation emissions, which may include projects and strategies for safe, reliable, and cost-effective options that accomplish the following:</p> <ul style="list-style-type: none"> Reduce traffic congestion by facilitating the use of alternatives to single-occupant vehicle trips, including public transportation facilities, pedestrian facilities, bicycle facilities, and shared or pooled vehicle trips within Delaware or an area served by the appropriate MPO, if applicable. Facilitate the use of vehicles or modes of travel that result in lower transportation emissions per person-mile traveled compared to existing vehicles and modes. Facilitate approaches to the construction of transportation assets that result in reduced transportation emissions compared to existing approaches. 	<p>CRS outlines ongoing strategies and example projects to reduce transportation emissions, including those that accomplish the following:</p> <ul style="list-style-type: none"> Reduce traffic congestion by facilitating the use of alternatives to single-occupant vehicle trips. Facilitate the use of vehicles or modes of travel that result in lower transportation emissions per person-mile traveled compared to existing vehicles and modes. Facilitate approaches to the construction of transportation assets that result in lower transportation emissions compared to existing approaches. <p>CRS outlines an approach to prioritizing projects to receive funding.</p>	Section 3, Framework for Action
Support the reduction of Delaware's statewide transportation emissions.	The CRS outlines planned funding allocations across geographic regions of Delaware.	Section 3, Framework for Action; Subsection 3.2, Tracking Carbon Reduction Program Funding Allocations

CRS Requirement	DeIDOT Progress	DeIDOT CRS Reference
At the discretion of the State, quantify the total carbon emissions from the production, transport, and use of materials used in the construction of transportation facilities within Delaware.	The Delaware Department of Natural Resources and Environmental Control's Division of Air Quality conducts annual inventories and tracking of in-state greenhouse gas emissions.	Section 2, Delaware Context; Subsection 2.2, Carbon Reduction Activities for the State of Delaware
Be appropriate to the population density and context of Delaware, including any metropolitan planning organization designated within the state.	The CRS outlines planned funding allocations to urbanized areas, consistent with CRP requirements.	Subsection 3.1, Project Prioritization; Subsection 3.2, Tracking CRP Funding Allocations
Prepare the CRS in consultation with MPOs.	The CRS outlines ongoing DeIDOT coordination and collaboration with MPOs.	Subsection 2.3, Recent Delaware Legislation and Policy Updates
Develop the CRS no later than 2 years after enactment of the Infrastructure Investment and Jobs Act.	The draft CRS is under development and to be submitted to the Federal Highway Administration by November 15, 2023.	Not applicable
Update the CRS a minimum of once every 4 years.	Next proposed update is to occur no later than November 15, 2027.	Subsection 3.6, Next Steps and Carbon Reduction Strategy Updates

CRS = Carbon Reduction Strategy

DeIDOT = Delaware Department of Transportation

MPO = Metropolitan Planning Organization

State = State of Delaware