

MaineDOT Carbon Reduction Strategy



November 2023



MaineDOT

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Executive Summary

The Carbon Reduction Strategy (CRS), a requirement of the 2021 federal Bipartisan Infrastructure Law (BIL), serves as a guide for MaineDOT to reduce carbon emissions from Maine's transportation system. The CRS serves two primary purposes:

1. Identifying goals and supporting strategies to reduce transportation emissions, appropriate to the population density and context of the state (including Metropolitan Planning Organizations (MPO)), while fulfilling the requirements of §11403; 23 United States Code 175 in developing a Carbon Reduction Strategy that will guide MaineDOT's investment of Carbon Reduction Program (CRP) funding.
2. Highlighting how the CRS aligns with existing statewide climate initiatives, MaineDOT's Family of Plans, and other MaineDOT climate efforts, including some that go beyond emissions reduction to include resilience and adaptation to climate change.

Rather than lay out a new set of goals, the CRS builds on and supports existing statewide climate initiatives, such as the State's climate action plan ([Maine Won't Wait](#)) and the [Clean Transportation Roadmap](#). The CRS also supports the vision and goals laid out in MaineDOT's Family of Plans, especially MaineDOT's Long-Range Transportation Plan. MaineDOT is dedicated to the development of an environmentally sustainable transportation system and will use the CRS as one tool to continue investing in practical transportation solutions that mitigate impacts on the natural world and prepare for the realities of climate change. In implementing the CRS, MaineDOT will uphold the commitments listed in the MaineDOT Statement on Equity, which reiterates MaineDOT's commitment to ensuring that all Maine people have access to safe and reliable transportation options that support economic opportunity and quality of life regardless of a person's economic, social, ethnic, racial, age, sexual orientation, physical, mental, or geographic circumstance. Implementation of the CRS, along with other elements of MaineDOT's Climate Initiative (which are described in the CRS) will help to support achievement of the Maine's climate goals: a 45% reduction in carbon emissions by 2030, an 80% reduction by 2050, and carbon neutrality by 2045.

The strategies identified in the CRS will guide MaineDOT's use of approximately \$27.5 million in federal CRP funding, which will be allocated to Maine over the span of five years (FY22-FY26). In accordance with the requirements of BIL, 65% of these funds will be allocated to certain areas of the state based on their share of the population, while MaineDOT will be able to allocate the remaining 35% anywhere in the state. The CRS provides guidance about what types of projects should be prioritized for CRP funding, rather than a list of specific projects. This provides MaineDOT with the flexibility to respond to opportunities as they arise and enables us to continue coordinating with Maine's MPOs and consulting with Maine's Regional Planning Organizations (RPOs) in the coming years to identify the most beneficial projects to support their regions and reduce emissions.

After discussions with our MPO and RPO partners, and an extensive public outreach process that provided important insights into the priorities of partners and citizens from across the state, MaineDOT has identified the following core strategies for the CRS to guide the investment of MaineDOT's CRP funds:

- **Strategy 1: Enhance Active Transportation Options**
 - Strategy 1-A: Prioritize first- and last-mile infrastructure and support local, non-motorized trips
 - Strategy 1-B: Fill gaps in the Active Transportation network
 - Strategy 1-C: Invest in equipment to support demonstration and pilot programs
- **Strategy 2: Reduce Vehicle Miles Traveled (VMT) Through Improved Transit Options**
 - Strategy 2-A: Improve transit service and accessibility- through small, cost-effective projects
- **Strategy 3: Support Existing Electrification Priorities and Programs**
 - Strategy 3-A: Lead by example by increasing access to public electric vehicle chargers

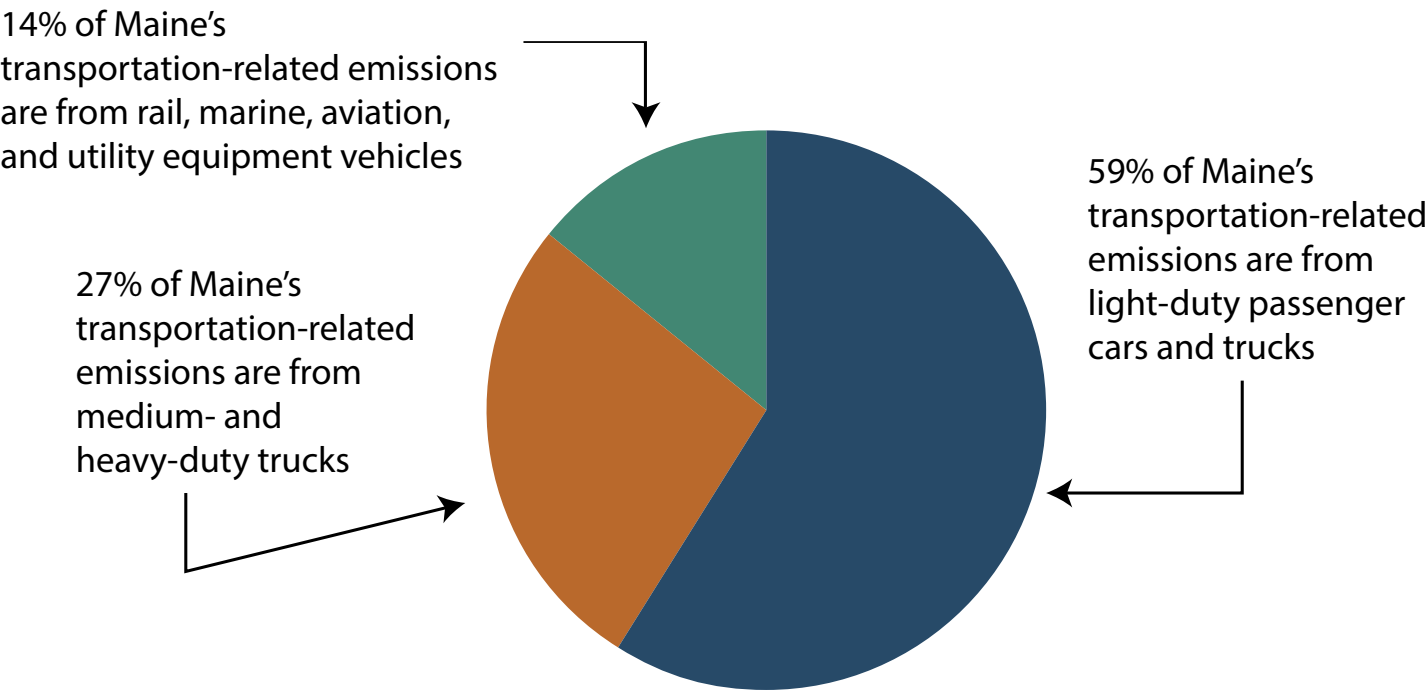
This strategy was approved by the Federal Highway Administration (FHWA) in February 2024. Going forward, MaineDOT will implement these strategies by prioritizing eligible projects for CRP funding through our Work Plan process. MaineDOT will continue to coordinate with our MPO partners in urban areas, and consult with our RPO partners in rural areas, when selecting projects in their regions. By implementing the CRS, MaineDOT and our partners will continue to make good on our commitment to support Maine’s climate goals and to deliver a safe, multimodal, and efficient transportation network that leads to carbon reductions across Maine’s transportation system.

Introduction

On November 15, 2021, President Biden signed the Infrastructure Investment and Jobs Act (IIJA) (Public Law 117-58, also known as the “Bipartisan Infrastructure Law”) (BIL) into law. The BIL authorizes a new Carbon Reduction Program (CRP) codified at 23 United States Code (U.S.C.) 175 to reduce transportation emissions, defined as carbon dioxide (CO2) emissions from on-road highway sources. This Carbon Reduction Strategy (CRS) will guide the Maine Department of Transportation’s (MaineDOT) use of federal CRP funds.

MaineDOT developed this Strategy to support ongoing and future efforts to reduce CO2 emissions from the transportation sector in Maine, consistent with BIL and CRP requirements, in alignment with current State of Maine policies, statutes, and existing MaineDOT initiatives, and in coordination with our Metropolitan Planning Organization (MPO) partners around the state.

Transportation is responsible for 49% of Maine’s annual greenhouse gas emissions. Maine’s rural character and relatively low emissions from other sectors—like electricity generation—make our transportation emissions disproportionately high compared to other states. When emissions are analyzed by vehicle type, 59% of Maine’s transportation-related emissions are from light-duty passenger cars and trucks; 27% are from medium- and heavy-duty trucks; and the remaining 14% come from rail, marine, aviation, and utility equipment vehicles. The most significant reductions of greenhouse gas emissions in Maine’s transportation sector will come through the long-term and large-scale electrification of our transportation systems, reduction of the number of miles Maine People drive through expanded options and funding for public transportation and ride-sharing (including through GO MAINE, the statewide travel resource program), increased broadband deployment across the state, and support for human-scaled downtowns and villages.



Funding

Carbon Reduction Program

Maine expects to receive approximately \$27.5 million in federal CRP funding from FY22-FY26. While Maine was originally allocated \$29.9 million, the Federal Highway Administration (FHWA) retained some CRP funds from each state in FY22 to stand up the program, reducing the total available to MaineDOT. Federal CRP funds may only cover up to 80% of the total cost of any project. The remaining 20% must be made up of state and/or local matching funds.

The annual breakdown of funds is illustrated below. These numbers are approximate and based on a 90% obligation authority, as is standard assumption with federal funds. These figures do not include state or local matching funds.

Fiscal Year (FY	Available federal funds
FY22	\$3.3 million
FY23	\$5.2 million
FY24	\$5.3 million
FY25	\$5.4 million
FY26	\$5.4 million

BIL requires that CRP funds be obligated in different areas of the state based on their population. The breakdown is as follows:

- 65% of Maine’s CRP funds must be obligated in different areas of the state. The proportion of these funds obligated in each area must be based on each area’s share of the state’s total population:
 - Urbanized areas with a population over 200,000
 - Urbanized areas with a population between 50,000-200,000
 - Urban areas with a population between 5,000-49,999
 - Areas with a population below 5,000
- MaineDOT retains the ability to obligate 35% of Maine’s CRP funds anywhere in the state, regardless of population.

For instance, in FY24, MaineDOT would allocate approximately \$3.45 million to parts of the state based on their share of the population, leaving approximately \$1.85 million to allocate anywhere in the state.

MaineDOT will coordinate with the MPOs to program CRP funds in Maine’s urban areas and consult with our Regional Planning Organizations (RPOs) to program CRP funds in rural areas. MaineDOT is currently working with our MPO partners to confirm the final borders for Maine’s urban areas based on the 2020 Census, which will determine which municipalities are included in which urban area classifications.

Other MaineDOT Investments

MaineDOT funding for projects that support Maine’s climate goals are not limited to what is available through the CRP. In addition to the CRP funding commitments, MaineDOT’s Three-Year Work Plan for 2023-2025 provides nearly \$68 million for active transportation capital projects, including \$46.5 million in funding for 82 stand-alone active transportation projects, encompassing nearly 42 miles in 45 different communities across Maine. This is in addition to other projects funded as a part of highway, bridge, or other capital projects that also may integrate active transportation improvements. This Work Plan also provides more than \$100.4 million in transit capital funding investments. This total includes federal, state, and local funds. These investments provide support to Maine’s 20 regional and local transit providers.

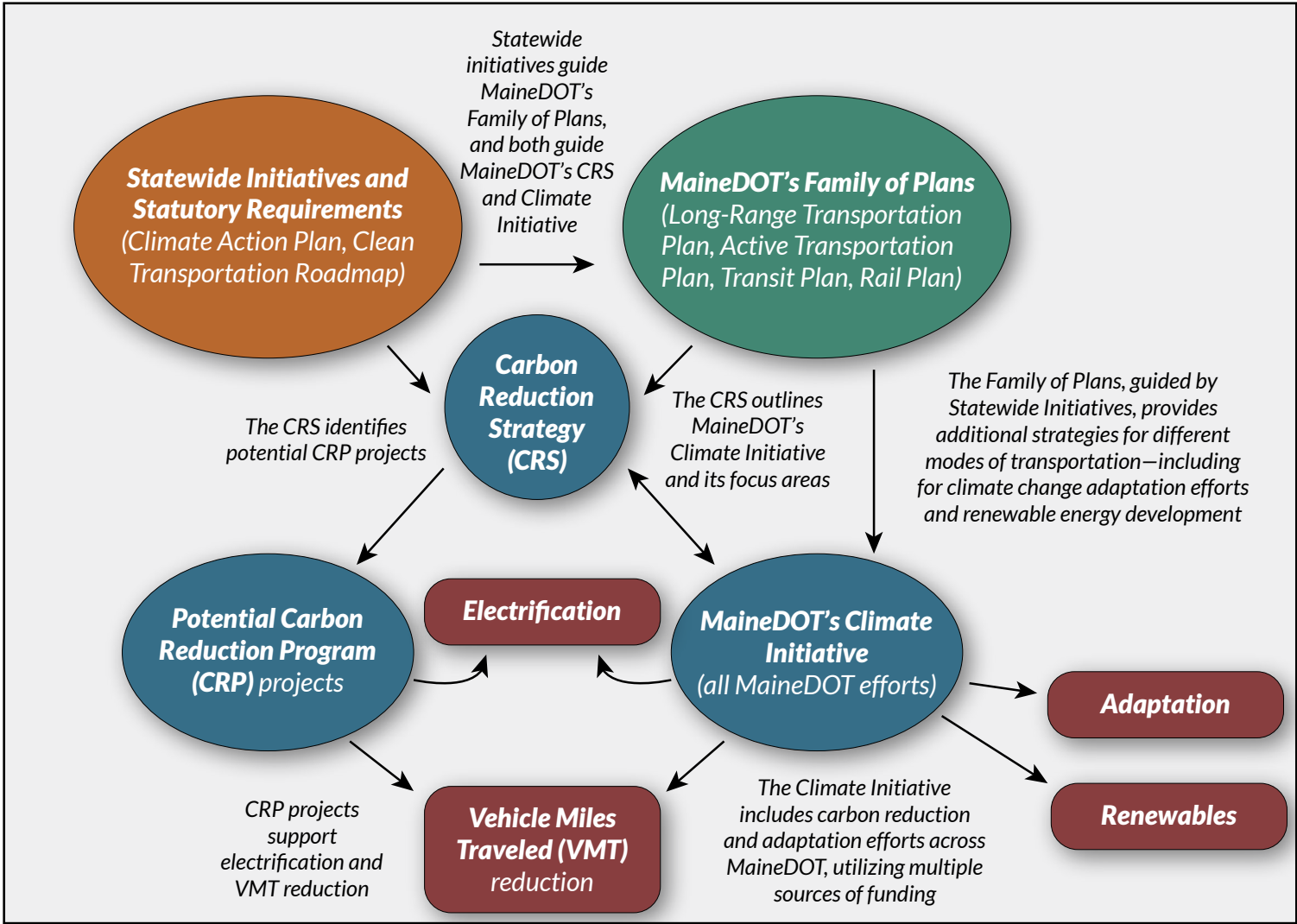
Carbon Reduction Strategy Alignment with Existing Plans

MaineDOT developed this Carbon Reduction Strategy with input from numerous existing and ongoing State of Maine and MaineDOT planning documents and initiatives. The CRS is only one component of MaineDOT’s Climate Initiative, focused on how to use CRP funding to support emissions reduction through electrification and vehicle miles travelled (VMT) reduction.

This section provides important context about the statewide goals guiding MaineDOT’s climate efforts and MaineDOT’s goals for the transportation system as they relate to climate change and the environment. It also describes MaineDOT’s overarching Climate Initiative, which is centered around four major focus areas: electrification, VMT reduction, adaptation, and renewables. The CRS will be an important component of these efforts, guiding CRP investments to support electrification and VMT reduction.

The illustration below lays out how these different efforts are interconnected and mutually supportive.

Illustration: The CRS’ Place in MaineDOT’s Climate Efforts



Climate Action Plan, Maine Won't Wait

In June 2019, Governor Janet Mills signed An Act to Promote Clean Energy Jobs and to Establish the Maine Climate Council into law. The Maine Climate Council, an assembly of scientists, industry leaders, bipartisan local and state officials, and engaged citizens was charged with developing a four-year Climate Action Plan (Plan) to achieve the ambitious emissions reductions goals laid out in law: 45% by 2030 and 80% by 2050 and carbon neutrality by 2045.

The Climate Action Plan, *Maine Won't Wait*, identified four key strategies to reduce carbon emissions in Maine. Strategy A focuses on the future of transportation in the state, which is responsible for 49% of Maine's annual greenhouse gas emissions. To meet emissions reductions goals identified in statute, Maine must pivot to the future by pursuing aggressive transition strategies and innovative solutions within this important sector.

Strategy A includes three sub-strategies to accomplish the goals of the Plan:

Accelerate Maine's Transition to Electric Vehicles

- Achieve emissions-reduction goals by putting 41,000 light-duty electric vehicles (EVs) on the road in Maine by 2025 and 219,000 by 2030.
- By 2022, develop a statewide EV Roadmap to identify necessary policies, programs, and regulatory changes needed to meet the state's EV and transportation emissions-reduction goals.
- By 2022, create policies, incentives, and pilot programs to encourage the adoption of electric, hybrid, and alternative-fuel medium- and heavy-duty vehicles, public transportation, school buses, and ferries.

Increase Fuel Efficiency and Alternative Fuels

- Continue to support increased federal fuel-efficiency standards.
- Significantly increase, by 2024, freight industry participation in EPA's SmartWay program.
- Increase, by 2024, local biofuel and biodiesel production and use in Maine transportation sectors, especially heavy-duty vehicles (assuming Maine biofuels production becomes viable).
- Establish a time-limited incentive program, targeted to low- and moderate-income drivers, to encourage drivers to upgrade to higher-efficiency vehicles in the near term.

Reduce Vehicle Miles Traveled

- Reduce light-duty VMT over time, achieving 10% reductions by 2025 and 20% by 2030.
- Reduce heavy-duty VMT by 4% by 2030.
- Deploy high-speed broadband to 95% of Maine homes by 2025 and 99% by 2030.
- By 2024, establish state coordination, strengthen land-use policies, and use state grant programs to encourage development that supports the reduction of VMT.
- Increase public transportation funding to the national median of \$5 per capita by 2024. (Note: the original figure referenced in *Maine Won't Wait* did not include all public transportation services. With all sources of state funding included, Maine's per capita state funding for transit was \$10.81 in 2020 and \$15.03 in 2021).
- Relaunch GO MAINE to significantly increase shared public commuting options by 2022.

The most recent [Maine Won't Wait Progress Report](#) was released in 2022. It identified several transportation successes, including a doubling of registered electric vehicles in Maine since 2020, the installation of 169 additional charging stations, the relaunch of GO MAINE, procurement of electric vehicles for the state fleet, and investments in broadband and multimodal transportation infrastructure.

Maine Won't Wait is a four-year plan, and the Maine Climate Council has begun the process of developing the next iteration of the State's Climate Action Plan. The updated plan is scheduled to be presented to the Legislature in December 2024. MainedOT will review the updated Climate Action Plan and ensure our climate efforts align with its goals and strategies.

Maine Clean Transportation Roadmap

The [Maine Clean Transportation Roadmap](#) (Roadmap)—a specific action of Maine Won't Wait and supported by an Executive Order by Governor Janet Mills—identifies the policies, programs, and regulatory changes needed to continue decarbonizing Maine's transportation sector in coming years. The Roadmap integrates modeling of the transportation sector through 2050 and explores the relative contributions of electrification, vehicle miles traveled (VMT) management, and system efficiencies in achieving the desired greenhouse (GHG) emission reductions.

The Roadmap also provides a set of recommendations that will catalyze Maine's clean transportation sector.

Note: Only the recommendations related to MainedOT's Carbon Reduction Strategy are listed.

State Run Programs	Goal	Rationale
Public DC Fast Charging (DCFC) Incentive and/or Ownership	Expand Charging Network	Academic literature clearly demonstrates positive relationship between DCFC access and EV sales.
Multi-Unit Dwelling (MUD) L2 Charger Incentive Program	Expand Charging Network	Analysis shows that enabling access to charging at MUDs has more impact on EV sales than providing charging for single-family homes.
Medium- and Heavy-Duty EV Incentive	Incentivize Clean Vehicles	Electrifying MHDVs is critical for meeting Maine's 2030 and 2050 GHG goals.
Marketing and Awareness Campaign	Education & Awareness	Ensures public has concise, accurate information on clean transportation modes, incentives, and technologies.
Local Programs	Goal	Rationale
Transit Village to Encourage Transit Oriented Development (TOD)	VMT Reduction & Mode Shift	Reduces VMT, boosts transit ridership, and reduces need for traditional road infrastructure.
Bicycle & Pedestrian Investment	VMT Reduction & Mode Shift	Ensures prioritization of nonmotorized modes and facilitates support of emerging micro-mobility technologies, such as e-bikes and e-scooters.

MaineDOT's Family of Plans

MaineDOT's Family of Plans is a set of multimodal and modal transportation planning documents that lay out the department's vision for Maine's transportation system, present recommendations for how to achieve the vision, and lay out the path to implementing them.

Long-Range Transportation Plan

The [Long-Range Transportation Plan](#) (LRTP) is MaineDOT's overarching plan to communicate the vision for the transportation system and the strategies that MaineDOT and our partners plan to implement throughout the next 20+ years.

One of the LRTP's five core goals is the development of an environmentally sustainable transportation system by investing in practical transportation solutions that mitigate impacts on the natural world and prepare for the realities of climate change. MaineDOT's objectives for this goal are to reduce greenhouse gas emissions from the use, maintenance, operation, and construction of the transportation system; mitigate the transportation system's environmental footprint; and reduce transportation disruptions due to climate change. The LRTP also identifies several strategies to help MaineDOT achieve these objectives, including positioning for an electric vehicle future, preparing for climate change, and leading by example.

Maine State Active Transportation Plan

The first-ever [Maine State Active Transportation Plan](#) (AT Plan) assesses the current state of active transportation (AT) in Maine, identifies and evaluates the state's goals, and proposes an implementation plan to achieve those goals. The plan will enable MaineDOT to enhance safety and accessibility throughout the state. The AT Plan states MaineDOT's belief that "a robust AT system statewide will support the Maine Climate Action Plan and the Maine Economic Development Strategy 2020-2029 and enhance the vibrancy of Maine's cities, quintessential villages, and rural areas."

The AT Plan calls for prioritized, cost-effective improvements to the on-road AT network that will improve active transportation in villages and downtowns, and enhancement of multimodal connections for all Maine people by increasing access to multimodal connections and providing additional consideration for underserved communities.

Maine State Transit Plan

The [Maine State Transit Plan](#) (Transit Plan) is an update to the 2015 Statewide Strategic Transit Plan. The Transit Plan reviews existing conditions and needs to help identify potential system efficiencies, practices, and alternatives appropriate for Maine, and new modes and approaches for providing needed public transportation in rural Maine. The plan focuses on over-the-road public transportation, addressing passenger rail and ferry service at a high level.

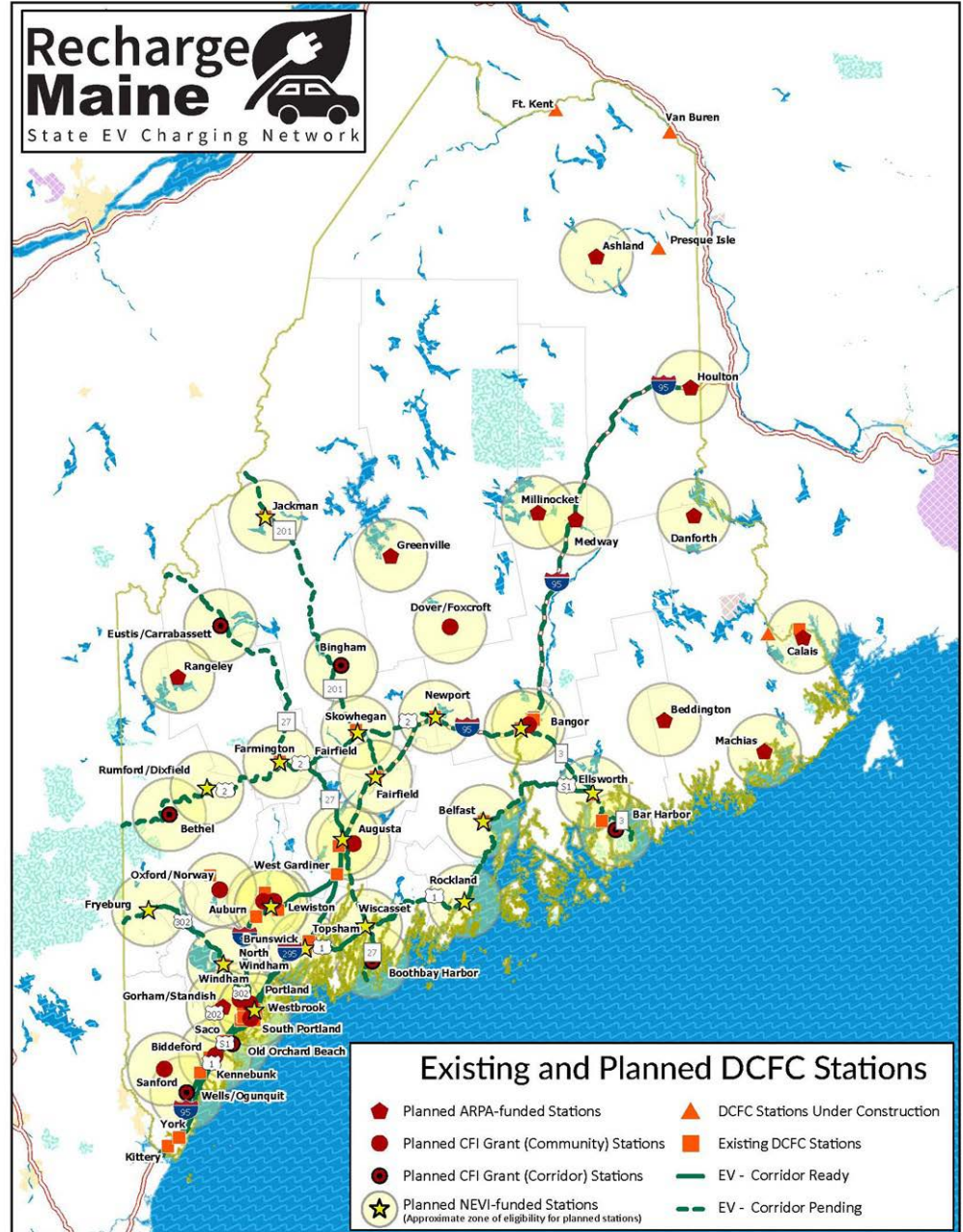
The Transit Plan's needs assessment identified climate change as one of its key themes, with specific needs including the continued implementation of hybrid, electric, and other low- and zero-emission transit vehicles, as well as the continued development of a robust transit system. The Transit Plan presented 11 strategies for achieving Maine's public transit vision, including improving transit customer facilities statewide by improving amenities such as bus stops, shelters, signage, stations, transfer points, customer information and related amenities. The Transit Plan also calls for removing barriers to riding transit and making transit easier through modernizing payment systems and improving connections between transit agencies.

Plan for Electric Vehicle Infrastructure Deployment (Recharge Maine Plan)

The Bipartisan Infrastructure Law established a National Electric Vehicle Infrastructure Formula Program (NEVI) to provide funding to states to strategically deploy electric vehicle (EV) charging infrastructure and to establish an interconnected network to facilitate data collection, access, and reliability.

MaineDOT worked with Efficiency Maine Trust and other state agencies (including the Governor's Office of Policy Innovation and the Future, the Governor's Energy Office, and the Maine Department of Environmental Protection) to develop a [Plan for Electric Vehicle Infrastructure Deployment](#) describing how the NEVI funds would be used to expand the electric vehicle charging network across the state. This plan was approved for implementation by the FHWA in September 2022. An updated plan was submitted to FHWA on July 31st, 2023 and that plan will be posted on MaineDOT's Climate Initiative webpage once it is approved.

The 2023 NEVI Plan focuses on implementation of the \$19M of NEVI funding available but also incorporates the overall Recharge Maine plan, including Maine Jobs and Recovery Plan (MJRP) funding and discretionary CFI funding. The Recharge Maine strategy (as seen in the below map) has been thoughtfully developed to utilize available funding sources concurrently while meeting the varying requirements of the funding sources. While the NEVI funding is required to be spent on designated alternative fuel corridors, MJRP funds and CFI community grants can support infrastructure in other locations across the state.



In 2023, Recharge Maine announced 7 new DC fast charger sites awarded with NEVI funds in Bangor, Augusta, and along Route 1 between Freeport and Ellsworth, as well as 5 new DC fast charger sites awarded with MJRP funds along the most traveled routes to the Crown of Maine and to the eastern border with New Brunswick.

Maine State Rail Plan

The Maine State Rail Plan (Rail Plan) is a multi-year guide for focusing federal, state, and local investments on a rail system that supports MaineDOT's vision, goals, and objectives for rail. One of the Rail Plan's six goals is to "Improve Maine's quality of life and economic competitiveness through transportation investments that promote energy efficiency, environmental sustainability, and equity." Some of the key objectives that support emissions reduction include encouraging greater use of freight and passenger rail, and investing in rail infrastructure and equipment that will reduce energy use and emissions.

MaineDOT's Climate Initiative

MaineDOT has been an active member in the Maine Climate Council (MCC) and the State's Lead by Example efforts. Since the release of Maine Won't Wait in 2020, MaineDOT has been actively working to reduce emissions and increase resiliency of infrastructure and has emerged as a leading state agency. These efforts will continue, with CRP funding providing additional resources for emissions reduction efforts. More information about MaineDOT's Climate Initiative can be found on our [website](#).

Electrification

Charging Infrastructure

MaineDOT has been working with Efficiency Maine Trust (EMT) to expand electric vehicle charging infrastructure across the state since the VW settlement funds became available in 2018. Between 2018 and 2023, MaineDOT and EMT administered over \$7 million in funds to install more than 50 DC fast charger ports and more than 200 Level 2 ports across the state. The state has received \$8 million for public EV charging infrastructure through the Maine Jobs and Recovery Plan (MJRP), \$18 million in funds from the National Electric Vehicle Infrastructure (NEVI) program to build a national network of EV chargers through the Bipartisan Infrastructure Law (BIL), and the state will also compete for additional funding through the BIL's



Discretionary Program, Charging and Fueling Infrastructure (CFI) program. The CFI Program is a 5-year, \$2.5 billion competitive grant program; MaineDOT submitted an application in June 2023 requesting over \$15M in funding to support Recharge Maine, the statewide initiative to expand public level 2 and DC fast chargers in Maine.

Transit Electrification

In addition to public charging infrastructure, MaineDOT provided financial support for the first four battery electric buses and associated charging infrastructure for Greater Portland Metro and Biddeford-Saco-OOB Transit. The buses are now in operation and the charging infrastructure has been installed.

In addition, MaineDOT hired a consultant (HATCH LTK) to develop a [best practices summary](#) for transit vehicle electrification and, in collaboration with eight transit providers, complete individual fleet transition analyses and develop plans for transitioning select transit bus fleets to electric or hybrid vehicles. Details such as bus replacement schedules and recommended facility upgrades will position Maine's transit agencies for discretionary grant funding and ultimately more successful adoption of battery electric buses. The plans for each transit agency are available at the links below.:

- [Bangor Community Connector \(PDF\)](#)
- [BSOOB \(PDF\)](#)
- [CityLink \(PDF\)](#)
- [Downeast \(PDF\)](#)
- [Metro \(PDF\)](#)
- [RTP \(PDF\)](#)
- [SPBS \(PDF\)](#)
- [YCCAC \(PDF\)](#)

Hatch has begun working on transition plans for Kennebec Valley Community Action Program, Waldo Community Action Partners, and Western Maine Transportation Services. Hatch will resume work on these plans and begin work on a transition plan for Aroostook Regional Transportation System pending finalization of the contract extension.

MaineDOT worked with Hatch to apply on behalf of seven transit agencies for FTA's Low or No Emission Vehicle grant in April but was not successful in this round of Low No grants.

Electric ferry technology is improving but, like transit technology, the available models may not suit the needs of all trip types and routes. Hybrid ferries can reduce emissions compared to conventional diesel-only vessels. MaineDOT is committed to considering hybrid ferry options for all future ferry replacements. The following Maine State Ferry Service (MSRF) ferries have planned hybrid diesel-electric replacements scheduled:

- The M/V Almer Dinsmore is currently under construction at Senesco Marine and is scheduled for completion in late 2023. It will be the first ocean going hybrid-electric RoPax ferry in service in the United States and will serve Vinalhaven. The ferry will be based out of Rockland.
- The replacement for Margaret Chase Smith (Lincolntonville and Islesboro) is currently in design. MaineDOT recently received a \$28M grant for low emissions ferries. This ferry will be a double ended electric ferry powered by 2MW of onboard stored power and can operate in all-electric mode, with diesel generators onboard capable of providing additional power if needed.

Reducing Vehicle Miles Traveled (VMT)

Reducing the number of vehicle miles traveled is another key strategy to reducing emissions in the transportation sector, identified in the state's climate action plan. Although MaineDOT can't ask drivers to use their vehicles less, the Department can provide drivers with the choice of alternative modes of transportation. There are a number of projects underway which have goals of increasing mobility options and increasing active transportation safety, both of which may influence a driver's decision to drive their vehicle.

GO MAINE

MaineDOT, in partnership with the Maine Turnpike Authority, administers the state's ridesharing and trip planning program, [GO MAINE](#), which was relaunched in early 2022. GO MAINE provides ride matching for

carpoolers, rewards people for taking green commutes and offers the Emergency Ride Home Benefit for members. GO MAINE serves the entire state of Maine, and services are free.



Workforce Transportation Pilot

The [Workforce Transportation Pilot](#) program is an initiative of Governor Mills' Maine Jobs & Recovery Plan to pursue and develop transportation solutions that connect workers with employers across Maine. This \$5 million program provides competitive grants of up to \$750,000 to local and regional partnerships to pilot innovative ways to connect workers and employers through ridesharing, vanpools, and other subsidized transit options. Many grants have already been awarded to projects across Maine, including projects with Sunday River, Timber HP/GO Lab, and Gagne Foods that involve the purchase of electric vans, vehicles, and bicycles. Other projects include development of a new transit service between Biddeford, Sanford, and Kennebunk; connecting students in Oxford County with training, work, skill-building, and mentorship opportunities; and the extension of existing transit service hours in the Lewiston-Auburn region. It is anticipated that all Workforce Transportation Pilot funds will be committed by the end of 2023.

E-Bikes

MaineDOT has supported the increasing use of electric bicycles (e-bikes) across Maine. MaineDOT has provided financial support to a bikeshare program in Portland since 2022, which includes both conventional and electric bicycles. In partnership with Bicycle Coalition of Maine, MaineDOT is operating a small fleet of e-bikes that are available for e-bike demonstrations at public or corporate events to promote bicycle commuting, safety, and the use of e-bikes as a transportation alternative. MaineDOT is also pursuing other e-bike initiatives with other state agencies around workforce transportation utilizing e-bikes.

Complete Streets

It is the policy of MaineDOT to carefully consider the needs of all users in the earliest stages of infrastructure project design. MaineDOT has delivered projects to improve pedestrian and vulnerable user safety which include new sidewalks, as well as the addition of shoulders, bike lanes, transit stops, freight unloading zones and accommodations for people with disabilities. Under [Complete Streets](#), recent projects in urban or village areas, such as in Belgrade, Ogunquit, Thomaston, Yarmouth, Bar Harbor and Hallowell, have focused on safety for all users of the roadway, and resulted in streetscapes that are much safer and friendlier to pedestrians and other non-motorized users of the road network. In accordance with the Maine State Active Transportation Plan, MaineDOT is currently reviewing the state's Complete Streets Policy and plans to update the policy by early 2024.

Gateway Treatments

Some funding within MaineDOT's Village Partnership Initiative will be used to install roadway features that signal to drivers when they are entering downtown areas that they need to drive carefully. The goal of these gateway features is to improve safety for pedestrians and access to businesses. MaineDOT has identified the roadway features that are most effective in the state, which are outlined in [this list of gateway treatment options](#).

Reducing Emissions Through Renewables

MaineDOT has identified and pursued ways to decrease emissions using alternative fuels and by generating renewable energy. MaineDOT recognizes that electrification is not a one-size-fits-all solution and continues to evaluate other techniques for reducing the agency's building, on-road, and fleet emissions.

MaineDOT completed the installation of solar arrays on I-95 Exits 109 and 112 in Augusta, utilizing degraded land that could serve few other purposes. These renewable roadsides have been explored by [many state transportation agencies](#) to reduce electricity costs, among other benefits. The cost to the state of Maine is nominal. MaineDOT's developer is covering the cost of development, construction, operation, maintenance, and the 20-year land lease. Additionally, MaineDOT will be planting pollinator-friendly plant species around the panels; many of these plant species are native to Maine.

MaineDOT continues to use locally produced biofuel to heat 11 facilities, and uses biodiesel in vehicles, which reduces carbon emissions compared to petroleum-based alternatives. In Q4 2022, MaineDOT reduced CO2 emissions by 43,662 lbs. and 142,906 lbs. by using biofuel and biodiesel, respectively. This pilot program supports the State's Lead by Example efforts and has given other municipalities and agencies to experiment with the biodiesel and biofuels.

Adaptation to Climate Change

Maine is experiencing the effects of climate change first-hand. In 2022 and 2023, a number of large storm events resulted in infrastructure failure, causing impassable roads, extended detours, and millions of dollars in damage. The Maine Climate Council's report notes that many culverts across the state have a greater than 66% chance of overtopping within the next 30 years and also recommends a commitment to manage 1.5 feet of relative sea level rise by 2050 and 3.9 feet of sea level rise by 2100. To lower the risk of future damage to infrastructure, MaineDOT has taken a number of steps to reduce vulnerability to climate change for transportation assets and other infrastructure.

MaineDOT has hired Climate Advisory LLC to conduct a Statewide Vulnerability Assessment of all assets within the State transportation infrastructure. The Assessment will consider the sensitivity and adaptive capacity of the infrastructure to climate hazards, identify which infrastructure is the most vulnerable, and finally determine the probability and consequence of failure, which will be used to recommend actions and focus areas for the Department. This effort will consider the other initiatives pursued by the state, federal, and municipal levels. The Assessment results and methods will be made publicly available so that others can utilize and replicate the work. The Assessment will support the State's climate action plan and Lead by Example efforts, in addition to saving money on future disaster events.

The *Bridge Design Guidance* was revised to require assessment of 4 feet of sea level rise per 100 years for new bridge designs. The change was based on the National Oceanic and Atmospheric Administration's (NOAA) historical data for the Maine coast and a range of predictions for future sea level rise, and is consistent with the current recommendations of the Maine Climate Council. Further, DOT culverts are now designed for 100-year flow rates; prior design guidance was for the 25-year storm event.

Additionally, MaineDOT is developing a high-resolution, dynamic, and probabilistic model of flood risk along the Maine coast from storm events and projected sea level rise – the Maine Coastal Flood Risk Model (ME-CFRM). The Model will take advantage of a new NOAA LiDAR dataset that will provide consistent, high-quality topographic and bathymetric data covering nearly the entire coast of Maine.

Carbon Reduction Strategy Coordination, Consultation, and Public Involvement

Like MaineDOT's Family of Plans, the development of the Carbon Reduction Strategy included a comprehensive public engagement process. MaineDOT coordinated with Maine's four MPOs, nine RPOs, and reached key stakeholders and members of the public through an on-demand virtual public meeting, in accordance with MaineDOT's Public Involvement Plan.

Urban and Rural Planning Organizations

Coordination in Urbanized Areas

The BIL requires that a state agency shall coordinate with any MPO that represents the urban area before obligating CRP funds for an eligible project in an urbanized area that is not a transportation management area. It also requires that the state agency consult with MPOs to develop and update the CRS.

MaineDOT conducted two in-person meetings with Maine's four MPOs:

- May 15, 2023 to introduce the Program and MaineDOT's initial approach to the Carbon Reduction Strategy
- September 12, 2023 to communicate how the Carbon Reduction Strategy had been influenced by stakeholder and public input.

MaineDOT also conducted individual, virtual meetings with each MPO throughout the month of June.

Consultation in Rural Areas

The BIL also requires that a state agency shall consult with any planning organization that represents a rural area prior to determining which activities should be carried out under the project before obligating CRP funds for an eligible project.

MaineDOT conducted a collective, virtual meeting with all RPOs on June 21, 2023. Eight of Maine's engaged RPOs attended.

Key Stakeholder Meeting Takeaways

- Most of the MPOs' priority projects align with MaineDOT's selected strategies, specifically transit and active transportation projects.
- Active transportation and transit enhancements were identified as stronger needs in the MPO regions than electrification.
- Unfunded needs for transit stop improvements and amenities, including connectivity to other modes and destinations, were identified.
- There are also unmet funding needs for demonstration projects and pilot programs, including microtransit options.
- Challenging and deficient sidewalk networks exist throughout the state and create unsafe conditions that could be targeted with CRS.

Virtual Public Engagement

MaineDOT elected to host one virtual public meeting to gather public feedback during the development of the Carbon Reduction Strategy. This meeting was publicized on social media, was featured in the press, and was included in the Maine Won't Wait newsletter (with approximately 5,000 subscribers—including the members of the Maine Climate Council). Seventy-nine unique comments were received during the public comment period between June 28 and August 7, with 46 unique communities represented. An on-demand public meeting using the MaineDOT-developed PIMA site allowed MaineDOT to hear from the widest range of engaged public members and gauge support for various carbon emissions reducing strategies.

Key Virtual Public Engagement Takeaways

Common themes among all comments received through the virtual public meeting included strong support for active transportation facilities statewide, some support for improvements to transit facilities (and an emphasis on improved service), and an overall neutral position on whether electrification was the key to carbon emissions reduction in Maine. In general, there was a desire to see significantly more emphasis placed on the reduction of VMT, rather than just electrification of the vehicle fleet.

The bullets below summarize some of the major themes and recurring comments received from the public during the virtual public meeting.

Active Transportation

- Policies and projects that make communities more walkable and bikeable, such as implementing Complete Streets principles and building separated active transportation facilities, received strong support.
- Active transportation strategies and projects should be implemented in rural communities as well as urban areas.
- MaineDOT should focus on creating a network of safe active transportation arterials, such as the proposed AT arterials network referenced in the Maine State Active Transportation Plan.
- Transit Improvements
- Support for improved transit in rural areas and between towns where travel distances make active transportation challenging.
- Transit needs to be prioritized, and enhanced with improved transit hubs and stops, and smart technology like real time bus location.
- Vehicle Electrification
- There are identified needs for electric vehicle charging beyond the Alternative Fuel Corridors identified in other programs.

- While there is general support for EVs, the electrification of the current private vehicle fleet will not be sufficient to address climate change and VMT reduction should be prioritized.

Results of the Coordination, Consultation, and Public Engagement Process

After reviewing the feedback received from stakeholders and members of the public, MaineDOT staff made several revisions to the draft CRS strategies. The most significant changes included:

- Removing the rural/urban distinction for transit projects. While the original draft was only focused on transit projects in urban areas, the revised CRS includes transit projects in rural areas that are likely to result in a reduction in emissions.
- Adding active transportation projects as one of the core goals. While some active transportation projects were included in the original draft (especially first- and last-mile connections to transit stops), the revised CRS includes active transportation as one of the three core components of MaineDOT's CRS.
- Focusing the EV charging component on easily implementable projects that fill gaps in the Recharge Maine network, as it develops.

Carbon Reduction Strategies and Implementation

MaineDOT developed three categories of strategies with aligned projects that will support Maine's carbon emissions reduction goals. These strategies are meant to provide MaineDOT with a pragmatic and implementable framework to meet the requirements of the Carbon Reduction Program and support MaineDOT's Climate Initiative by guiding the prudent investment of CRP funds. Implementing will require dedication on the part of MaineDOT and cooperation with numerous stakeholders throughout the state.

Goal 1	Goal 2	Goal 3
<i>Enhance Active Transportation Options</i>	<i>Reduce VMT Through Improved Transit Options</i>	<i>Support Existing Electrification Priorities and Programs</i>

Strategy 1: Enhance Active Transportation Options

In accordance with the Maine State Active Transportation Plan, create active transportation systems with connectivity to origins and destinations that are compatible with human-powered or micro-mobility mode choices and enable transportation system users to feel safe leaving their personal vehicle behind. By enabling and encouraging Maine people and visitors to drive less, while offering more alternative transportation options, we can reduce our greenhouse gas emissions.

Strategy 1-A: Prioritize first- and last-mile infrastructure and support local, non-motorized trips

Selecting projects that are centered around origins such as built neighborhoods or multi-unit housing developments and destinations such as municipal or civic facilities including schools, retail and other commercial locations, and transit facilities will encourage local, non-motorized trips and modal choice. Example project types include, but are not limited to, sidewalks, bike lanes (including protected lanes), side-paths, multi-use paths, and crosswalk improvements.

Active Transportation Project Example

The recently completed Brewer Riverwalk represents the third and final phase of a pathway that starts near the Joshua Chamberlain Bridge and continues for about 3,700 feet along the Penobscot River. The pathway connects riverfront homes and businesses to sidewalks on each end, providing connectivity for pedestrians, cyclists, and users of non-motorized transportation.



Strategy 1-B: Fill gaps in the Active Transportation network

Developing infrastructure that closes gaps in existing human-scale facilities, such as adding crosswalks with pedestrian lighting, signage, or other intelligent transportation technology; or adding sidewalks between two existing facilities; will encourage using active transportation modes over greater distances. Where feasible given the limits of CRP funding, connecting longer gaps between towns or villages via facilities such as multi-use paths could also help to reduce VMT, especially through the use of e-bikes and similar mobility technology.

Strategy 1-C: Invest in equipment to support demonstration and pilot programs

Develop a structured program to support demonstration projects for first-/last-mile connections and at gaps in the existing network before constructing a final solution; and support pilot programs, such as shared mobility programs with e-bikes.

Strategy 2: Reduce Vehicle Miles Traveled (VMT) Through Improved Transit Options

In accordance with the Maine State Transit Plan, invest in public transit in order to make it a more competitive alternative to single-occupancy vehicle trips in some settings. By encouraging greater utilization of Maine's various public transit systems, MaineDOT can reduce VMT and emissions from personal vehicle use. Expanding transit service, where feasible, is also a critical element of increasing transit use. However, CRP funds are for capital expenses and cannot be used to fund ongoing transit operational costs. Although transit investments are important in both rural and urban areas, expanded urban transit will have a greater impact on carbon emissions. This does not rule out potential transit investments with CRP funds in rural areas, but only if there is likely to be a significant impact on emissions reduction. MaineDOT has access to other sources of rural transit funding.

Strategy 2-A: Improve transit service and accessibility through small, cost-effective projects

Make targeted and cost-effective investments that have a high potential to improve the accessibility, utility, and attractiveness of public transit options. The total amount of CRP funds available to Maine, coupled with the need to spread them out across the state's urban and rural areas, means that they are generally insufficient for large-scale transit capital projects. Alternative sources of funding would need to be identified for any large-scale expansions. To maximize the utility of CRP funds, projects such as bus stop improvements (shelters, bike parking, lighting, sidewalks, displays, etc.), updated payment and real-time bus tracking technology, and transit signal priority—among others—can have a measurable impact on the accessibility, comfort, and utility of public transit at a reasonable cost. Innovative projects such as microtransit may also have some start-up capital expenses that may be considered for CRP funding, if there is a reasonable expectation that the service will lead to a reduction in emissions

Transit Stop Project Example

To encourage multimodal connections and provide safe access to park and ride facilities, transit facilities, and active transportation facilities, MaineDOT and the Town of Brunswick constructed the Brunswick Cedar Street Park and Ride. This facility connects commuters, neighborhoods, and business districts in Brunswick with transit options on the Downeaster and Portland Metro BREEZ. The transit stop pictured serves the BREEZ and provides a comfortable shelter, lighting, and accessibility for transit riders.



Strategy 3: Support Existing Electrification Priorities and Programs

MaineDOT has already made significant advancements in access to electric vehicle charging throughout Maine, utilizing more than \$8 million of ARPA funding and \$18 million of NEVI formula funds, as well as applying for discretionary grants through BIL's Charging and Infrastructure Discretionary Grant Program. MaineDOT's Carbon Reduction Strategy will support these efforts by identifying gaps in the existing programs and areas of Maine that are less likely to receive priority funding, which could benefit from investments of CRP funds. MaineDOT will continue to seek all available funding outside

of the CRP program to install and maintain chargers as a part of our overarching Climate Initiative.

Strategy 3-A: Lead by example by increasing access to public electric vehicle chargers

MaineDOT and other state agencies have an opportunity to lead by example through the electrification of publicly owned fleets and incentivizing employees to own alternative fuel vehicles. MaineDOT will work within the Department and across departments in state government to identify opportunities to locate EV charging infrastructure at large facilities or in areas where multiple facilities are able to access the infrastructure. These facilities will be publicly accessible, supporting the electrification of both the state fleet and private vehicles. Identification and construction of these charging facilities will be carried out in conjunction with the Recharge Maine Plan and will prioritize locations that fill gaps in the existing and planned charging network.

Electrification Project Example

MaineDOT has installed publicly accessible electric vehicle charging equipment at all regional offices and at several camps across the state. The use of electric vehicles and installation of the charging equipment works towards reducing emissions in support of the State Climate Action Plan, as well as the State's Lead by Example efforts.



CRP Funding Flexibility

While these three strategies represent the core components of MaineDOT's Carbon Reduction Strategy, there may be other CRP-eligible projects that fall outside of these three categories that have potential for significant transportation emissions reduction. MaineDOT will evaluate these alternative opportunities for CRP funding as appropriate.

Implementation and Project Selection

Implementation of the CRS will be carried out in alignment with all other MaineDOT policies and plans, including the Long-Range Transportation Plan and the Family of Plans. As with all MaineDOT projects, the Department will uphold the commitments listed in the MaineDOT Statement on Equity, which reiterates MaineDOT's commitment to ensuring that all Maine people have access to safe and reliable transportation options that support economic opportunity and quality of life regardless of a person's economic, social, ethnic, racial, age, sexual orientation, physical, mental, or geographic circumstance. A key component of equity is acknowledgement that transportation needs and solutions differ depending on geography, demographics, and individual circumstances. MaineDOT is committed to equitable delivery of our programs and services to meet the mobility equity needs of all Maine people in both rural and urban areas—including through the implementation of the CRS.

Implementation of the CRS will also be carried out in accordance with MaineDOT's Complete Streets Policy. It is MaineDOT's policy to consider the needs of all users in the planning and development of its projects, in order to provide safe and efficient access to the transportation system. Complete Streets is an important tool in promoting safety, livability, and equity and should be considered in every step of the complete project lifecycle. MaineDOT is in the process of updating its Complete Streets Policy, and future CRP-funded projects will be delivered in accordance with the updated policy once it is finalized.

Engagement

To effectively achieve the goals and priorities of the CRS, MaineDOT will continue to coordinate with our MPO partners in the selection and programming of CRP projects within Maine's urban areas. In rural areas of the state, MaineDOT will continue to consult with the RPOs when programming CRP projects. MaineDOT will also maintain and enhance regular outreach with advocates, stakeholders, and underserved communities. MaineDOT will continue coordination between MaineDOT bureaus and other state agencies to track existing MaineDOT performance measures related to carbon

reduction, especially with the Governor's Office of Policy, Innovation, and the Future.

Funding Ready Projects

In order to take full advantage of the CRP funds available throughout the state, MaineDOT will prioritize projects for capital investments that can be rapidly implemented and have the largest likely carbon reduction impacts of appropriately scaled projects. While planning is critical for developing construction-ready projects, there are other mechanisms available to support these efforts and planning studies will not be prioritized for CRP funding.

Three-Year Work Plan

MaineDOT will use its existing project selection process to choose projects for CRP funding. This approach will reduce the administrative burden of deploying these funds effectively and allow MaineDOT to expend funds more easily in accordance with the complex division of funds among different areas of the state.

MaineDOT's project selection process determines project funding by considering several factors, including long-term and program-specific planning such as the Long-Range Transportation Plan, the Family of Plans, the CRS, and data-driven technical asset management principles; resource allocation principles arising from funding eligibility and system priorities, asset management studies, community outreach, partnership initiatives; and project selection input from experts on various MaineDOT committees as well as our MPO and RPO partners.

This approach to funding CRS projects will also allow MaineDOT to retain flexibility to support new opportunities as they arise during the latter years of the Carbon Reduction Program. Although the Three-Year Work Plan is developed annually, MaineDOT will accept project nominations throughout the year and fund appropriate projects as responsively and dynamically as possible.

The annual Statewide Transportation Improvement Program (STIP) features a detailed assessment of how Maine's federal transportation funding is being spent. This will include information about which projects have been selected to receive CRP funds, and how much they are programmed to receive. The STIP is available to the public on MaineDOT's website.

Conclusion

MaineDOT is committed to supporting identified state and local goals to achieve a 45% reduction in carbon emissions by 2030 and 80% by 2050 and achieve carbon neutrality by 2045. MaineDOT is embracing this challenge, focusing on leveraging technological advances and deepening partnerships with MPOs, RPOs, transit agencies, and other key stakeholders to deliver a safe, multimodal, and efficient transportation network that leads to carbon reductions across Maine's transportation system. MaineDOT will monitor and evaluate implementation of the CRS as outlined, and may periodically update the CRS, as needed, in advance of the next update in four years as required.