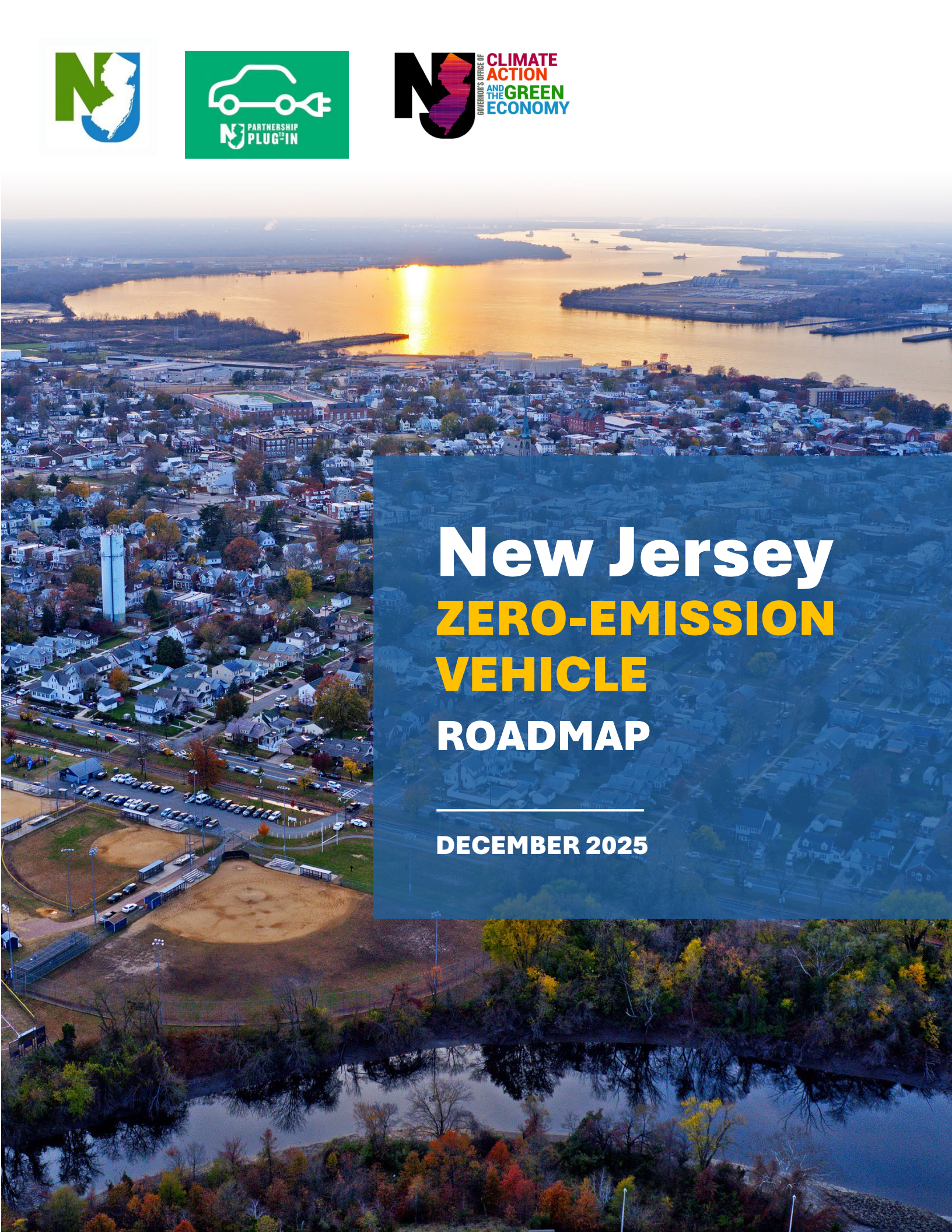

New Jersey ZERO-EMISSION VEHICLE ROADMAP

DECEMBER 2025

Acknowledgements

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Special thanks to the New Jersey's Partnership to Plug In state leaders and representatives:

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Letter from New Jersey Governor Phil Murphy

Dear New Jersey,

Since day one, we've followed the science. The evidence is clear: climate change is the defining challenge of our time. But in meeting our obligation to combat climate change, we've turned this challenge into an opportunity to create jobs and lower costs.

Over the years, we have worked to realize our vision for a stronger, fairer, and greener New Jersey by embracing an evidence-based approach. We set bold targets to reduce emissions 80 percent by 2050 and achieve 100 percent clean electricity in New Jersey by 2035.

An affordable and responsible transition to New Jersey's clean energy future will, first and foremost, rest on the success of our residents, businesses, and local governments. Over the last eight years, we've accelerated an economic transformation that will make our transportation system more resilient and make our roads cleaner and safer for every one of our residents.

We've collaborated with New Jerseyans to create a zero-emission ecosystem and get us closer to our 2035 and 2050 goals. We've reinvested in communities bearing the brunt of pollution. And we've taken historic steps that will protect generations yet to come.

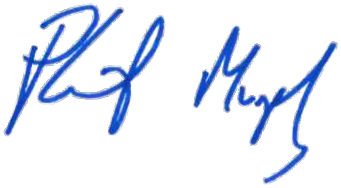
We now have robust programming from the State, utilities, and the federal government to lower the upfront cost of zero emission vehicles and expand charging infrastructure. We've also built strong market signals and relationships with manufacturers, labor, dealers, and advocates to develop and sustain the best marketplace for consumers and compete in a growing global market.

Together, we are not only ensuring our residents can get from Point A to Point B safely and reliably, but we are also protecting our people by advancing cost-effective emissions reduction. At a time when families are reeling after years of inflation, embracing a strategy that will lower costs while making our state more sustainable is absolutely essential. Now, New Jersey must continue making progress in reducing transportation emissions, from increasing ridership on NJ TRANSIT to creating more passenger and commercial zero-emission vehicle options.

Just consider how far we have come in ten years. In 2016, there were fewer than 11,000 electric vehicles registered in New Jersey. Today, we have more than 250,000. That is an over 2,000 percent increase in a decade. EVs now constitute over 14% of new vehicle sales, with much of New Jersey's success being driven by my Administration's policies.

But we're just getting started. Together, we are going to continue building a cleaner, healthier, more prosperous future for all. And in the process, we will continue building a zero-emission ecosystem that is the envy of the nation.

Sincerely,



Executive Summary

This report serves as a comprehensive roadmap for New Jersey's transition to zero-emission vehicles (ZEVs) as part of the State's broader efforts to reduce greenhouse gas (GHG) emissions and meet its 80x50 climate targets. By assessing the current state of electrification in the transportation sector and the ambitious goals already set by the State, the report outlines the progress achieved, the challenges ahead, and strategies to encourage market transformation and accelerate the adoption of ZEVs, including electric vehicles (EVs) and fuel cell electric vehicles (FCEVs), which operate using hydrogen fuel. The widespread adoption of ZEVs will help advance progress toward New Jersey's clean energy, clean transportation, and grid modernization goals.

New Jersey has made significant progress in electrifying light-duty (LD) vehicles, primarily through programs like Charge Up New Jersey (Charge Up) and It Pay$ to Plug In, which have successfully driven ZEV purchases among early adopters. The next phase, Charge Up+, expands this success across a broader population, ensuring that more people, particularly those in low- and moderate-income households and underserved communities, can afford and access ZEVs. Similarly advancing the electrification of medium- and heavy-duty (MHD) vehicles is a critical priority that will need support to grow rapidly but will benefit from programs like the New Jersey Zero-Emission Incentive Program (NJ ZIP), New Jersey Zero-Emission Vehicle (NJ ZEV) Financing Program, and the Advanced Clean Trucks (ACT) regulation.

To continue building momentum, the roadmap outlines strategic recommendations that focus on expanding financial incentives for ZEV adoption, developing a robust and accessible network of charging infrastructure and enhancing stakeholder collaboration. For LD vehicles, expanding and scaling current programs will help ensure that ZEVs become accessible to a broader range of consumers, including underserved populations. These strategies also consider market conditions and recommend adjustments in incentive focus to align with the changing market. For MHD vehicles, the roadmap emphasizes the importance of establishing dedicated funding to support the electrification of larger vehicles like buses and trucks, ensuring they play a key role in reducing emissions across sectors such as public transit and freight and that the State works with the industry to identify projected demand for energy capacity and infrastructure investments.

Infrastructure remains a key area of focus. New Jersey must continue to incentivize more chargers for LD vehicles, particularly in underserved areas, and prioritize the development of high-capacity charging stations and grid upgrades in key locations for MHD vehicles, such as freight corridors and logistics hubs. Incentives will remain critical to support the development of a sustainable market for LD and MHD ZEVs, as well as to encourage investment by infrastructure developers and operators. LD vehicle markets have already expanded in response to supportive incentives, but ultimately the State's ZEV market must reach sufficient maturity to sustain growth on its own. Targeted regulations will help sustain a new State clean transportation technology market without relying heavily on incentives, providing economies of scale and enabling a full technological transition that will make ZEVs common across the State.

Equity and accessibility are central to the State's vision. All communities, especially those disproportionately affected by harmful air quality pollutants and tailpipe emissions, must benefit from the transition to ZEVs. Prioritizing equity outcomes at the outset of programs and including dedicated equity-focused stakeholder engagement and feedback loops are paramount in meeting New Jersey's clean energy goals and emission reduction targets in a sustainable and just manner. Targeted equity efforts highlighted in this report include greater access to clean, safe, and affordable mobility options, as well as workforce development opportunities, which will help reduce the harmful environmental and economic impacts of the current transportation system.

Contents

List of Abbreviations

ACC II - Advanced Clean Cars II

ACT - Advanced Clean Trucks

AV - Autonomous vehicle

BEV - Battery electric vehicle

Charge Up - Charge Up New Jersey

CPRG - Climate Pollution Reduction Grant

DCFC - Direct current fast charging

EEANJ - Energy Efficiency Alliance of New Jersey

EMP - New Jersey Energy Master Plan

EPA - United States Environmental Protection Agency

EV - Electric vehicle

eVMT - Electric vehicle miles traveled

EVSE - Electric vehicle supply equipment

FCEV - Fuel cell electric vehicle

FTA - Federal Transit Administration

GHG - Greenhouse gas

GVWR - Gross vehicle weight rating

GWRA - Global Warming Response Act

HEV – Hybrid electric vehicle

ICCT - International Council on Clean Transportation

ICE - Internal combustion engine

ICEV – Internal combustion engine vehicle

IIJA - Infrastructure Investment and Jobs Act

IRA - Inflation Reduction Act

kW - Kilowatt

kWh - Kilowatt-hour

L1 - Level 1

L2 - Level 2

LD - Light-duty

LMI - Low- and moderate-income

MHD - Medium- and heavy-duty

MUD - Multi-unit dwelling

MW - Megawatt

MWh - Megawatt-hour

NEV - Neighborhood electric vehicle

NEVI - National Electric Vehicle Infrastructure (Formula Program)

NJBPU - New Jersey Board of Public Utilities

NJ CAR - New Jersey Coalition of Automotive Retailers

NJDCA – New Jersey Department of Community Affairs

NJDEP - New Jersey Department of Environmental Protection

NJDOT - New Jersey Department of Transportation

NJEDA - New Jersey Economic Development Authority

NJ EVA - New Jersey Electric Vehicle Association

NJ LCV - New Jersey League of Conservation Voters

NJMVC - New Jersey Motor Vehicle Commission

NJ ZIP - New Jersey Zero-Emission Incentive Program

NJ ZEV - New Jersey Zero Emission Vehicle Financing Program

NREL - National Renewable Energy Laboratory

PANYNJ - Port Authority of New York and New Jersey

PHEV - Plug-in hybrid electric vehicle

RGGI - Regional Greenhouse Gas Initiative

TCO - Total cost of ownership

TNC - Transportation network company

VIUS – Vehicle Inventory and Use Survey

VMT - Vehicle miles traveled

ZEV - Zero-emission vehicle

ZEV SEED - Zero-Emission Vehicle Sustainable Equitable Employment Destination

Introduction

In response to the growing climate crisis, reducing emissions from the transportation sector, which accounts for 37% of New Jersey's total greenhouse gas (GHG) emissions, is critical.[i] The urgency is underscored in the United Nations Emissions Gap Report 2023, which stresses the need for global GHG emissions to drop by 28% to 42% to keep global warming well below the critical 2.0°C threshold—and ideally below 1.5°C.[ii] Given on-road transportation's contribution to GHG emissions, electric vehicles (EVs) are central to emission reduction strategies.

New Jersey is committed to transitioning to a decarbonized future with clear goals for reducing GHG emissions. Central to this effort is New Jersey's 80x50 target, established through the 2020 Global Warming Response Act (GWRA), which requires reducing GHG emissions to 80% below 2006 levels by 2050. The GWRA directs the New Jersey Department of Environmental Protection (NJDEP) to assess the State's GHG emissions and develop strategies with other State agencies to reduce emissions across sectors. The 2020 GWRA 80x50 Report[iii] provided a "business-as-usual" scenario that indicated New Jersey's continued policies and trends would reduce the State's GHG emissions 12% below 2006 levels by 2050; this roadmap identifies strategies to build a self-sustaining clean transportation market in the future, which will significantly reduce GHG emissions in the largest emission-producing sector.

New Jersey's 2019 Energy Master Plan (EMP)[iv] and GWRA 80x50 Report emphasized a comprehensive approach to decarbonizing the transportation sector, including accelerating EV adoption, expanding charging infrastructure availability, increasing public transit options, and reducing vehicle miles traveled (VMT).

Current efforts to reduce emissions and accelerate EV adoption in New Jersey rely on leveraging State and regional policy initiatives, Memorandums of Understanding, and additional federal support. State agencies have coordinated with regional stakeholders over many years to design and refine multiple vehicle and infrastructure incentive programs, grid development regulations, and utility transportation electrification policies. New Jersey has adopted the Advanced Clean Cars II (ACC II)[v] regulation, which requires that 100% of new light-duty (LD) vehicle sales be zero-emission by 2035, and the Advanced Clean Trucks (ACT) rule,[vi] which requires manufacturers to increase sales of medium- and heavy-duty (MHD) zero-emission vehicles (ZEVs) through 2035.

Rapid and sustained decarbonization of New Jersey's transportation sector will also require continued collaboration among State and local governments, the private sector, and communities to address barriers to EV adoption and deployment of necessary charging infrastructure.

This roadmap examines the current state of EV adoption in New Jersey, assesses progress toward emissions reductions in the transportation sector, and recommends the steps necessary to ensure market transformation. Issues considered include the evolving EV technology ecosystem, specifically the advancement of battery technologies, the development of charging infrastructure, and the

integration of renewable energy into electric mobility. Insights from various stakeholders are highlighted—including government agencies, utilities, environmental groups, environmental justice groups, and industry representatives.

Finally, the roadmap offers strategic recommendations to support New Jersey's evolving EV landscape. Throughout the report, key time periods—near-term (2027), medium-term (2030), and long-term (2035)—provide milestones to guide our analysis and shape policy recommendations that facilitate the ongoing adoption of EVs. In addition to moving the State toward its clean transportation goals, these recommendations will also solidify New Jersey as an innovation leader in transportation electrification by engaging various EV stakeholders, attracting new businesses, and developing a skilled workforce to support innovation, manufacturing, and infrastructure investment.

Policies, Progress, and Projections

The combined efforts of the Legislature and the Murphy Administration have helped New Jersey advance its efforts toward transportation electrification. In the 2019 Energy Master Plan (EMP), Transportation Electrification was the first strategy named to combat the impacts of climate change, as transportation accounts for nearly 40% of all greenhouse gas (GHG) emissions in the State.

New Jersey has established several incentive and grant programs to support electric vehicle (EV) adoption.[vii] Since 2019, the State has awarded over $800 million to support the deployment of over 58,000 light-duty (LD) EVs, 1,425 electric trucks and cargo vans, 500 electric buses, and 328 vehicles and equipment at ports, airports, and other facilities.[viii] In addition to Charge Up New Jersey (Charge Up)—the cash-on-the-hood incentive for EVs—programs from the New Jersey Board of Public Utilities (NJBPU), the New Jersey Economic Development Agency (NJEDA), and the New Jersey Department of Environmental Protection (NJDEP) have focused on growing a robust charging infrastructure network that is available and accessible to all residents.

The State has also been awarded federal funding for EV adoption and EV infrastructure programs to reduce GHG emissions and benefit State residents, though the statuses of some current and projected programs are uncertain. These efforts have led to a nearly 700% growth in EV registration since 2020 and a robust public charging network in much of the State.

This roadmap is built upon the successful planning and outreach efforts that State agencies have incorporated into their EV programs and regulations. Since 2018, New Jersey agencies have conducted public hearings and received written comments for the following plans and programs (the dates in parentheses indicate when feedback was received):

- New Jersey 2019 EMP (2018)
- Annual NJBPU Clean Energy Programs and Budget Reviews (2018 – 2024)
- Advanced Clean Trucks (ACT) Regulation (2020 – 2021)
- Medium- and Heavy-Duty (MHD) Charging Infrastructure Straw Proposal (2021 – 2024)
- Regional Greenhouse Gas Initiative (RGGI) Strategic Funding Plan (2022 – 2023)
- Advanced Clean Cars II (ACC II) Regulation (2023)
- New Jersey 2024 EMP (2024)

For a more thorough timeline of stakeholder engagement efforts, see the Appendix – Stakeholder Outreach Timelines for Major Policies. The following section reflects the various topics that stakeholders emphasized across program engagements.

Light-Duty Electric Vehicles

LD EV Policies and Programs

New Jersey has made significant progress in LD EV adoption. EVs constitute over 14% of new vehicle sales in New Jersey, with over 237,000 EVs on the road as of June 2025. As Figure 1 illustrates, rapid growth in EV registration began climbing after 2021 when the Murphy Administration incentive programs began.

Together, battery electric vehicles (BEVs) and plug-in hybrid electric vehicle (PHEVs) account for 3.1% of LD vehicles on the road in New Jersey, a significantly higher share than the 1.7% national average at the end of 2023. This progress has been driven through a combination of legislation, regulations, administrative initiatives, and incentive programs, including over $160 million in incentives through the State's Charge Up program, which has incentivized over 60,000 EVs.

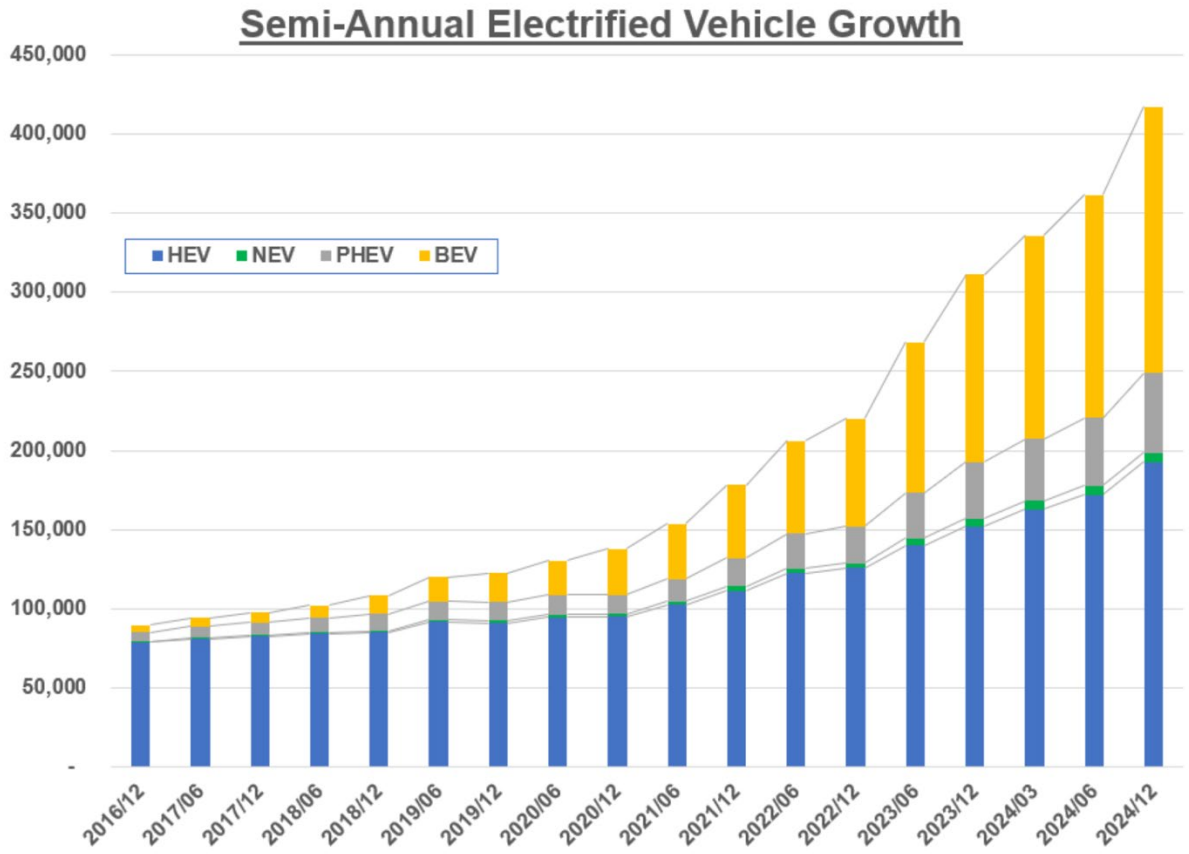


Figure 1. Cumulative electrified vehicle registrations in New Jersey from December 2016 through December 2024.

New Jersey's landmark EV Law (P.L. 2019, c. 362) contained several goals to promote the widespread deployment of EVs (Table 1), including the deployment of 330,000 LD EVs in New Jersey by December

31, 2025, and 2 million LD EVs by December 31, 2035. Projections from the Caret® EV Planner (Caret®-EV),[ix] a data-based forecasting tool developed by the Center for Sustainable Energy (CSE), indicate that New Jersey is on track to meet the 2035 goal.

Table 1. Electric Vehicle Goals.

2024	2025	2026	2032	2035	2040
10% New Transit Bus Purchases are Zero Emission Buses	**330,000** Registered Light-Duty Electric Vehicles **25%** State-Owned, Non-Emergency Light-Duty Vehicles are Electric Vehicles	**50%** New Transit Bus Purchases are Zero Emission Buses	**100%** New Transit Bus Purchases are Zero Emission Buses	**2,000,000** Registered Light-Duty Electric Vehicles **100%** State-Owned, Non-Emergency Light-Duty Vehicles are Electric Vehicles **100%** New Light-Duty Vehicle Sales are Zero Emission Vehicles **Zero Emission Trucks** constitute 55% of Class 2b-3 truck sales, 75% of Class 4-8 truck sales, and 40% of Class 7-8 truck tractor sales	**85%** New Light-Duty Vehicle Sales/Leases are Electric Vehicles

In December 2023, NJDEP adopted the ACC II package of regulations, which requires auto makers to produce increasing numbers of EVs for sale for model years 2027-2035. Specifically, the ACC II regulation requires vehicle manufacturers to steadily increase the percentage of zero-emission vehicles (ZEVs), culminating in 100% ZEVs by 2035. Assuming State policies remain in effect, the ACC II rule is expected to significantly boost EV adoption by ensuring a growing supply of EVs and associated charging infrastructure and by responding to consumer preferences. The program correlates strong EV growth in other states that have adopted the ACC II regulation (Figure 2). New Jersey is the 7th largest state market with EVs accounting for 14.4% of new vehicle registrations (Figure 2).

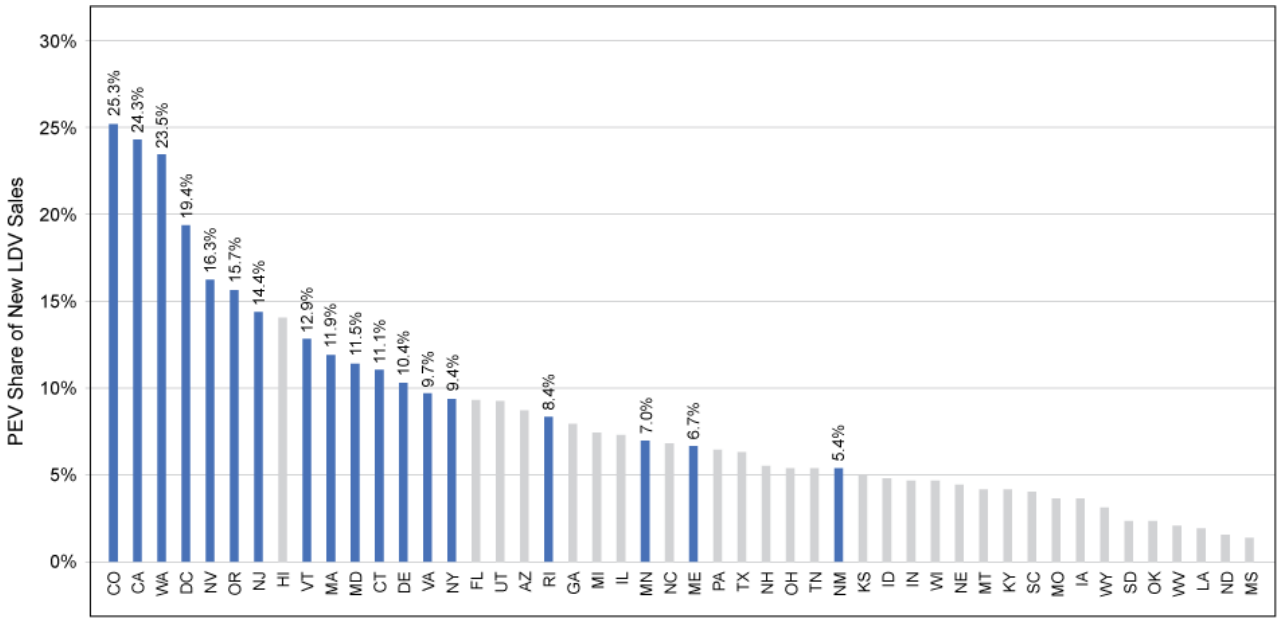


Figure 2: New Jersey joins other Advanced Clean Cars II states as an electric vehicle sales leader.

Notes: Section 177 ZEV States include: CO, CT, DC, DE, MA, MD, ME, MN, NJ, NM, NV, NY, OR, RI, VA, VT, WA
Source: NESCAUM, using data from Experian via Atlas Public Policy's EV Hub

Projected LD EV Trends

Projections from Caret®-EV consider the impacts of federal EV tax credits, State EV incentive programs, and the ACC II regulation. These projections indicate that EV registrations will accelerate significantly into the 2030s, driven by two key factors: an increase in new EV sales and the relatively low retirement rate of EVs on the road in New Jersey due to the young age of these vehicles (Figure 3).

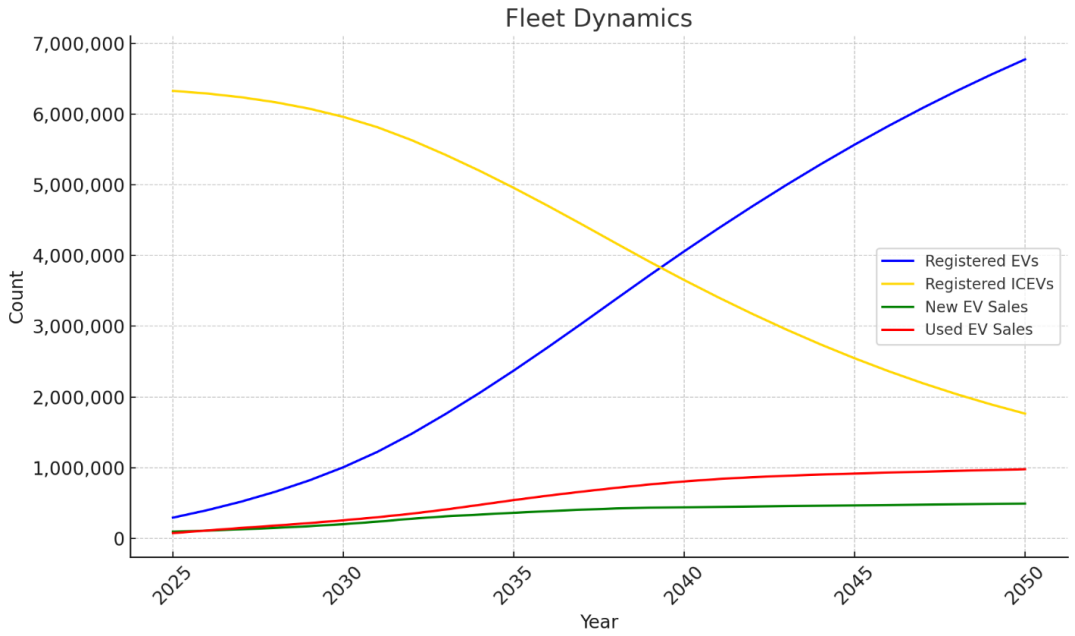


Figure 3. Projections of the number of light-duty vehicles on the road in New Jersey for 2025-2050.

The rise in EV adoption is expected to primarily occur in large metropolitan areas (Figure 4). The projections also indicate a rapidly increasing used EV market through 2035, reflecting the initial wave of EVs entering the secondary market. For additional information on assumptions and methodology that Caret®-EV uses, see the Appendix – Methodology for Electric Vehicle Projections.

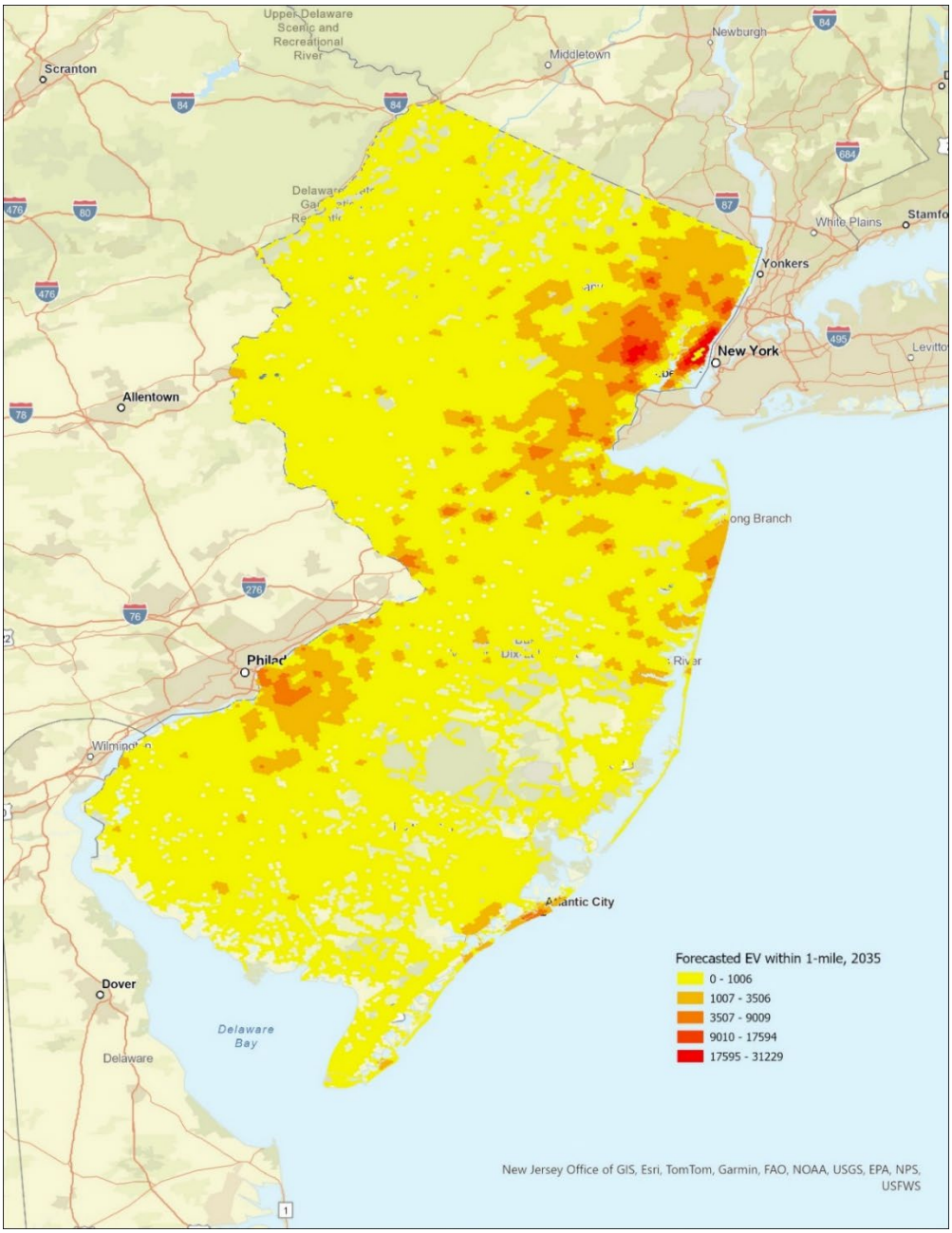


Figure 4. The projected domicile distribution of light-duty electric vehicles across New Jersey in 2035.

In a scenario where New Jersey continues State incentives and identifies ways to supplement the loss of federal tax credits, the State could surpass its 2035 goals, with EV registrations expected to exceed 2.3 million and market share expected to approach 70% (Table 2a). Without supplementing the recently eliminated federal EV tax credits, the number of EVs is projected to be 5.8% lower in 2027 and 40% lower in 2035 (Table 2b), compared to the scenario in which the tax credits were supplemented.

Table 2a. Baseline and projected cumulative fleet status for light-duty vehicles if federal tax credits had stayed in effect.

Time Period	Number of Electric Vehicles on the Road	ICE Fleet Size	New EV Sales	Used EV Sales	Market Share (%)
Baseline (2024)	224,705	6,584,199	50,050	Not Available	13
Short (2027)	517,180	6,242,517	125,270	145,377	24
Medium (2030)	1,004,573	5,964,513	198,890	253,561	39
Long (2035)	2,373,196	4,959,482	359,829	539,648	69

Table 2b. Baseline and projected cumulative fleet status for light-duty vehicles with federal tax credit eliminated.

Time Period	Number of Electric Vehicles on the Road	ICE Fleet Size	New EV Sales	Used EV Sales	Market Share (%)
Baseline (2024)	224,705	6,584,199	50,050	Not Available	13
Short (2027)	487,323	6,272,374	102,340	142,596	20
Medium (2030)	782,536	6,186,549	110,677	198,672	22
Long (2035)	1,425,514	5,907,163	195,662	273,643	38

Light-Duty Charging Infrastructure

Charging Infrastructure and Grid Modernization Policies and Programs

New Jersey has also set ambitious goals for charging to support its transition to electric transportation, establishing specific targets for EV charging infrastructure deployment (Table 3). Currently, two types of charging stations are publicly accessible. Direct current fast charging (DCFC) ports provide high-power charging capable of replenishing most of an EV's battery in 20-45 minutes. Level 2 (L2) charging ports use alternating current to deliver a slower charge, making them more ideal for areas where people spend long periods of time, such as workplaces, certain public parking areas, and residential zones.

The State has made strong progress, even surpassing some charging infrastructure goals. Notably, New Jersey has exceeded its 2025 targets for both L2 and DCFC installations.

Table 3. Public Electric Vehicle infrastructure goals – numerical targets.

2025			
400 **Direct Current Fast Chargers** At no fewer than 200 charging locations	**75** **Travel Corridor Locations** At least 2 Direct Current Fast Chargers per location; Each charger capable of 50+ kW; 150+ kW where feasible	**100** **Community Locations** At least 2 Direct Current Fast Chargers per location; Each charger capable of 50+ kW; 150+ kW where feasible	**1,000** **Level 2 Chargers** Available for public use across the State; May be upgraded to higher power or Direct Current Fast Chargers after initial installation

New Jersey has also developed goals to deploy LD EV charging infrastructure at private locations, including multi-family residential properties and franchised overnight lodging establishments. By December 31, 2025, at least 15% of all multi-family residential properties must have parking spaces equipped with Level 1 (L1) electric vehicle supply equipment (EVSE), L2 EVSE, or make-ready equipment. By December 31, 2030, this requirement increases to 30%. These properties must serve a percentage of resident parking spaces equal to the percentage of LD EVs registered in the State at the end of the preceding calendar year, or the percentage of LD EVs owned by residents, whichever is higher. By December 31, 2025, 20% of all franchised overnight lodging establishments must be equipped with L2 EVSE to provide charging for guests. By December 31, 2030, this requirement increases to 50%. These properties must serve a percentage of guest parking spaces equal to the percentage of LD EVs registered in the State at the end of the preceding calendar year.

In the last few years, New Jersey has successfully leveraged grant and incentive programs to facilitate the deployment of EV charging infrastructure:

- NJBPU and NJDEP offer incentives for charging infrastructure at individual residences, multi-unit dwellings (MUDs), hotels, public fleets, and public charging locations, which is a critical solution for supporting residents of overburdened municipalities and expanding EV access. These and other incentives have helped deploy over 12,400 charging ports.
- In 2021, the New Jersey Department of Community Affairs (NJDCA) published the Model Statewide Municipal EV Ordinance, which provided a consistent permitting structure for EV infrastructure and established make-ready parking space requirements to provide adequate charging opportunities to EV drivers.
- In September 2020, NJBPU directed State utilities to develop EV programs that incentivize make-ready EV charging infrastructure. Pursuant to this direction, State utilities Atlantic City Electric Company, Jersey Central Power and Light, Public Service Electric and Gas Company, and Rockland Electric Company have implemented EV infrastructure programs, establishing over $200 million in incentives.
- In April 2024, the NJBPU announced the approval of a series of grid modernization steps developed in NJBPU's 2022 Grid Modernization Study. NJBPU will work to implement short-term goals, such as streamlining utility interconnection application processes, providing more transparent information, and improving assessments of feasibility and costs. The medium- and long-term recommendations will be planned in a series of expert working groups.
- In 2018, Governor Phil Murphy signed into law P.L. 2018, c. 17 ("2018 Clean Energy Act"), which codified the goal of installing 2,000 megawatt (MW) of battery storage by 2030. Enhanced storage capacity will help shave peak load from increased EV charging and support vehicle-to-grid capacities. In November 2024, NJBPU released its Garden State Energy Storage Program Straw Proposal.[x] In June 2025, NJBPU approved Phase 1 of the Garden State Energy Storage Program.[xi] In August 2025, Governor Murphy signed legislation to establish an energy storage incentive program to achieve the goal of installing 2,000 MW of energy storage.[xii] These actions help build a foundation for energy storage planning and management.
- The 2018 Clean Energy Act also established an ambitious Renewable Portfolio Standard that requires at least 35% of energy sold in New Jersey to come from renewable resources by 2025, rising to 50% by 2030. New Jersey's grid mix is already less carbon intensive than the national average, and a lower-carbon grid will further enhance the GHG reduction benefits of vehicle electrification.[xiii]
- New Jersey was allocated funding through the National Electric Vehicle Infrastructure Formula (NEVI) program for charging projects along federally identified Alternative Fuel Corridors.
- The NJEDA Board approved the $50 million Take Charge Program, which will provide funding for charging infrastructure projects for private commercial fleets, helping to cover hardware and related installation costs.

New Jersey has been successful in deploying publicly accessible EV charging infrastructure. As of July 2025, the State has over 1,700 DCFC ports (Figure 5),[xiv] increasing at a rate of 540 per year, and over

3,300 L2 charging ports, increasing at a rate of 682 per year. It should be noted that these numbers only include publicly accessible charging infrastructure and do not include home and private workplace charging infrastructure where the majority of charging is expected to occur. The recent increase in charging station availability across the State has helped to increase the ratio of EVs to charging locations. Since 2021, New Jersey has had robust incentive programs for both residential charging and charging at multi-unit dwellings. Those chargers are pivotal to providing equitable access to charging infrastructure and are not included in the public numbers.

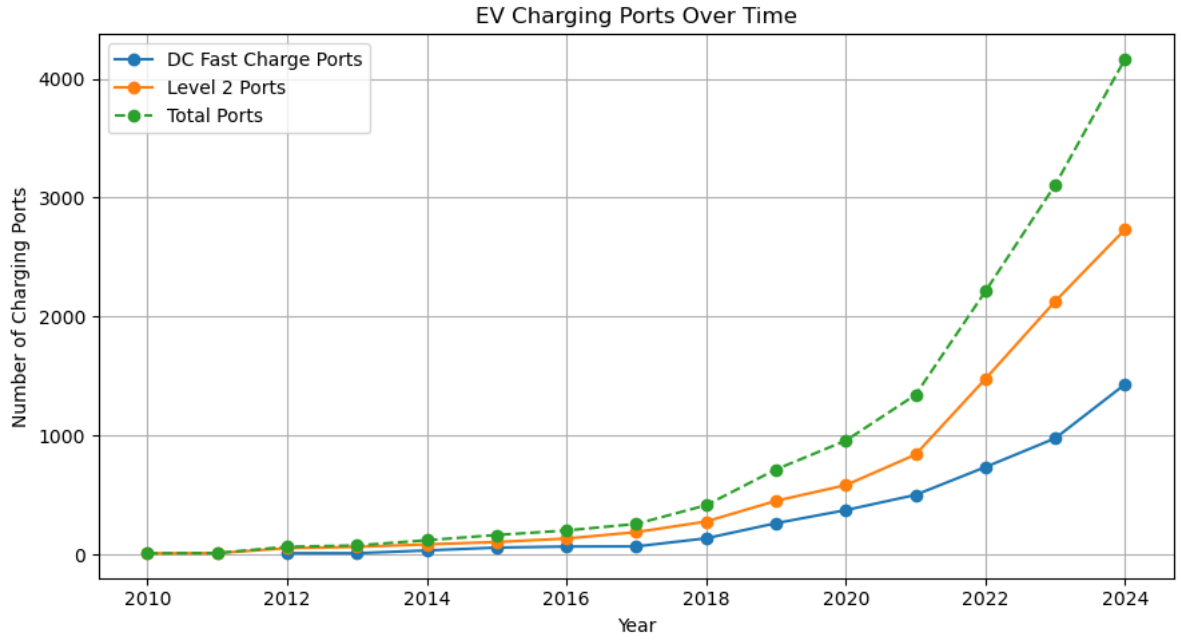


Figure 5. Historical counts of publicly available direct current fast charger and Level 2 charging ports across New Jersey from 2010-2024.[xv]

Projected LD EV Charging Needs

Projections for LD vehicle charging indicate that New Jersey will need to significantly increase the deployment of L2 and DCFC charging infrastructure over the near-, medium-, and long-term (Table 4) (see the Appendix – Methodology for Projecting LD EV Chargers for a description of the approach used to generate these estimates). While New Jersey has met the legislative goals for L2 chargers and DCFC in 2025, the State will need to increase charger deployment in future years to meet future targets, and goals may need to be revised based on changing market needs. In 2027, the projected number of L2 charging ports needed in New Jersey is nearly quadruple the number deployed to date, though projected DCFC charging needs have already been met. In 2035, the projected number of L2 charging ports needed is fifteenfold the number deployed to date and the projected number of DCFC charging ports needed is threefold the number deployed to date. These projections indicate the need

for significant investment and planning in New Jersey's charging infrastructure to keep pace with the anticipated increase in EV adoption. These estimates should be regularly reviewed and updated based on the latest data and trends in EV adoption and charging behavior.

Table 4. Estimated charging needs for light-duty vehicles across New Jersey (2027-2035).

Time Period	Public Level 2 Charging Ports	Public Direct Current Fast Charging Ports	Workplace Level 2 Charging Ports	Multi-Unit Dwelling Level 2 Charging Ports	Single-Family Level 2 Charging Ports
Current (2025)	3,715	1,532	Not Available	Not Available	Not Available
Short (2027)	13,713	1,251	5,907	13,438	290,699
Medium (2030)	24,075	2,157	11,426	21,701	543,854
Long (2035)	57,553	5,097	26,992	58,039	1,247,611

Projected LD EV Charging Energy Demand

Projecting energy demand from various charging sources is important for planning grid capacity and development. The energy dispensed by EV chargers is expected to increase significantly across home, workplace, and public charging (Table 5).

Table 5. Average daily weekday and weekend charging loads and energy demands (2027-2035).

Time Period	Peak Weekend Charging Load (MW)	Single-Day Weekend Energy Demand (MWh)	Peak Weekday Charging Load (MW)	Single-Day Weekday Energy Demand (MWh)
Short (2027)	556	6,561	629	7,485
Medium (2030)	1,079	12,840	1,221	14,530
Long (2035)	2,550	30,345	2,885	34,332

Each charging type has unique usage patterns, which influence the overall daily energy demand and peak load on the grid. Home L2 chargers are projected to account for a majority of the energy demand, especially in the early evening when many drivers return from work (Figure 6). In 2027, the peak weekend load is estimated at 556 MW, with weekday peaks at 629 MW. By 2035, these numbers are expected to increase approximately fivefold, with weekend peaks reaching 2,550 MW and weekday peaks 2,885 MW. Adoption of smart charging strategies, including vehicle-to-grid technologies, supporting policies, and time-of-use rates, could help shift this load to off-peak hours, reducing the peak power demand and grid strain. Studies of real-world managed charging programs in California have found that proactive planning and corresponding policies are able to lower costs for drivers and utilities, reduce GHG emissions, and decrease the collective power demand of EVs on the electric grid.[xvi] New Jersey has begun much of this work by establishing residential time-of-use rates, working with utilities to create fleet charging rates, and requiring all incentivized chargers and make-ready installations to be networked in order to allow for future managed charging.

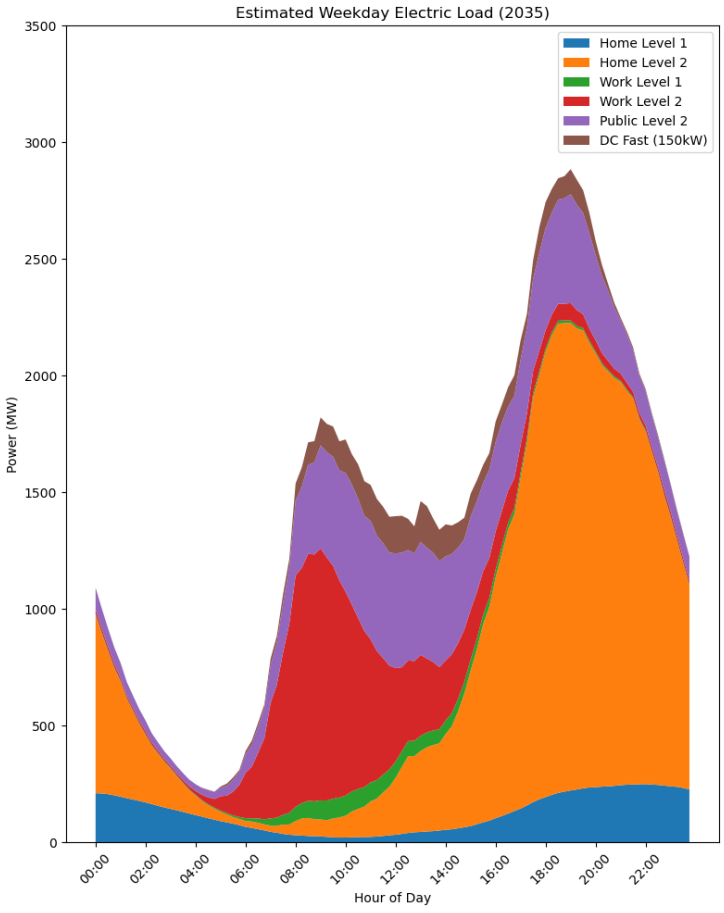


Figure 6. Weekday charging load profiles for light-duty vehicles for New Jersey in the long-term (2035). This assumes that the charging behavior is consistent with current charging behavior.

Medium- and Heavy-Duty Electric Vehicles

MHD EV Policies and Programs

Although the MHD EV sector is still nascent, New Jersey has already established clear policy drivers to advance the electrification of this sector. The EV Law established goals for NJ Transit to purchase increasing percentages of zero-emission buses over time and required NJDEP to establish MHD EV goals, which are outlined in NJDEP's MHD roadmap report. Specifically, the EV Law established a requirement for 10% of new bus purchases by NJ Transit to be zero-emission by December 31, 2024. The purchasing target increases to 50% by December 31, 2026, and 100% by December 31, 2032.[xvii] In April 2025, the NJ Transit Board of Directors authorized the purchase of 20 electric buses.[xviii]

Additionally, NJDEP adopted the ACT regulation in December 2021, which requires manufacturers of MHD vehicles to provide increasing numbers of MHD EVs for model years 2025-2035. The ACT regulation also establishes fleet reporting requirements for specified fleets. Separately, the Port Authority of New York and New Jersey (PANYNJ) adopted the Clean Truck requirements, which require any drayage truck weighing 33,001 pounds or more that moves shipping containers to their final destination to meet certain model year requirements.

In addition to these policy signals, New Jersey has implemented programs and provided significant grant funding to help electrify the MHD vehicle sector:

- New Jersey offers several incentive programs for MHD EVs and infrastructure, including NJEDA's New Jersey Zero-Emission Vehicle Financing Program (NJ ZEV), NJEDA's New Jersey Zero-Emission Vehicle Incentive Program (NJ ZIP), NJBPU's Clean Fleet EV Incentive program, NJDEP's MHD Electrification Grants program, NJDEP's Electric School Bus Program, and NJBPU's MHD EV Charging Program.
- As mentioned on page 11, the State has awarded nearly $800 million to support the deployment of over 58,000 EVs, 1,425 electric trucks and cargo vans, 500 electric buses, and 328 vehicles and equipment at ports, airports, and other facilities in the last six years, including through the MHD EV incentive programs described in this report.[xix]
- In July 2024, NJ Transit was awarded nearly $100 million through the Federal Transit Administration's (FTA) Low or No Emission Grant Program. These funds will help NJ Transit construct an outdoor charging facility with a solar canopy at its Meadowlands Bus Garage. This project will allow NJ Transit to shelter, charge, and maintain its battery-electric bus fleet.
- In October 2024, PANYNJ was awarded $151 million through the Environmental Protection Agency's (EPA) Clean Ports Program. These funds will help deploy electric drayage trucks with accompanying charging infrastructure, as well as electric cargo handling equipment. PANYNJ also plans to scrap existing vehicles to reduce emissions.
- In October 2024, NJDEP announced the award of $15 million in grants for purchases of 48 electric school buses, marking the State's first comprehensive commitment of funding for zero-emission buses that will better protect the health of schoolchildren and communities.

The Electric School Bus Grant Program was authorized by legislation in 2022 and signed by Governor Phil Murphy to fund battery-electric school buses and installation of charging infrastructure. An additional round of funding was opened in August 2025.

- In July 2024, New Jersey was awarded $249 million through the Climate Pollution Reduction Grant (CPRG) implementation program to implement the Clean Corridor Coalition, an initiative to deploy MHD EV charging infrastructure along Interstate-95 and adjacent freight corridors in New Jersey, Delaware, Connecticut, and Maryland.
- In October 2024, NJDEP launched the New Jersey Fleet Advisor Program to provide technical assistance to fleets.
- In October 2024, NJBPU announced the adoption of minimum filing requirements for investor-owned utilities to propose make-ready programs for MHD EV charging. Under this requirement, the utilities must propose incentives for public-serving fleets and certain private fleets located in or serving overburdened municipalities and communities adjacent to EV freight corridors. Utilities will also be expected to create managed charging programs to smooth out load over the course of the day.
- In February 2025, NJEDA approved NJ ZEV, a financing assistance program that provides low-interest loans to support MHD EV purchases by commercial businesses.
- As mentioned on pages 17-19, NJBPU announced a series of grid modernization steps and energy storage goals, and the 2018 Clean Energy Act established an ambitious Renewable Portfolio Standard.
- In October 2025, as directed by Governor Murphy, NJ Transit and NJEDA entered into a Memorandum of Understanding to support the purchase of electric buses and the expansion of charging infrastructure for NJ Transit. This collaboration is part of a larger State initiative to transition NJ Transit's fleet to 100% zero-emission vehicles by 2040.

The MHD EV sector is still in the early stages of electrification. However, electric medium-duty trucks are becoming more common, with over 1% of the current fleet composed of BEVs. School buses are also beginning to electrify, with approximately 0.3% of the fleet consisting of BEVs. Heavy-duty trucks have been slower to electrify since they require larger battery packs to achieve comparable ranges to diesel-powered engines. Nevertheless, as of December 2024, more than 150 heavy-duty BEV trucks are on the road in New Jersey. In total, 7,839 of 522,154 MHD vehicles registered are EVs, with the majority in the lighter range.

Projected MHD EV Trends

In 2021, New Jersey adopted the ACT regulation, which requires increasing numbers of MHD EVs until model year 2035. The requirements specified by ACT are used to estimate EV growth in New Jersey's MHD vehicle sector, assuming the requirements remain in effect. Table 6 provides an estimate of the expected numbers of BEVs across different MHD vehicle classes over the next decade. A detailed description of the methodology is provided in the Appendix.

Table 6. Projected cumulative numbers of medium- and heavy-duty battery electric vehicles by vehicle class for short-, medium- and long-time periods. Note that Class 2b and Class 3 are included in the light-duty vehicle estimates above so they were not estimated in this section; and Class 8 vehicles include both tractors and straight trucks.

Year	Class 4	Class 5	Class 6	Class 7	Class 8	Total
2027	268	464	347	275	737	2,091
2030	1,875	3,082	2,391	1,798	5,088	14,234
2035	6,226	10,172	7,929	5,921	16,870	47,118

Projected MHD EV Charging Needs

The transition to MHD vehicle electrification will require a charging network that is sufficient to serve the anticipated fleet. Projections for charging needs are based on the number of estimated vehicles by class and suitable charger power mixes from previous studies (see Appendix for detailed methodology). Table 7 shows the estimated number of charging ports that will be required in 2027, 2030, and 2035 to serve the MHD vehicle fleet. It should be noted, however, that significant uncertainty exists around how MHD fleets will balance their charging between depot, on-site, and hub facilities, which could influence the total number and type of chargers required in the future. As such, it is important to regularly review and update estimates based on the latest data and trends in MHD vehicle adoption and charging behavior.

Table 7. Estimate for the number of charging ports that will be required to support the future medium- and heavy-duty vehicle fleet by charger power capacity.

Year	50 kW	100 kW	150 kW	350 kW	2 MW
2027	82	1174	72	12	6
2030	566	8075	495	87	43
2035	1,875	26,748	1,642	291	144

Projected MHD EV Charging Energy Demand

As the number of MHD EVs in New Jersey increases, the energy demand required to power this fleet may increase substantially (Table 8). Current estimates indicate that by 2030, the daily energy demand across all MHD vehicle classes will reach approximately 1,781 megawatt-hours (MWh). Assumptions for this calculation are listed in the Assumptions for MHD EV Energy Demand Projections section in the Appendix.

Table 8. Estimated average daily energy demand (in MWh) for medium- and heavy-duty vehicles by class and year.

Year	Class 4	Class 5	Class 6	Class 7	Class 8	Total
2027	10	14	26	30	179	259
2030	71	96	179	198	1,237	1,781
2035	235	317	594	651	4,102	5,899

Technological Trends

As the State continues the electrification of the transportation sector, there are additional technologies that will impact the market transformation, including the following:

- **Ultrafast Charging** – Significant progress has been made in ultrafast charging technologies with a power rating of 350 kilowatt (kW) or more. These systems aim to improve charging times, reducing wait times and improving turnaround times for fleet vehicles, particularly large trucks or buses with sizeable battery capacities. Industry stakeholders and researchers are working to develop a new, reliable, standardized charging system, and some are also developing chargers with a capacity of up to 3 MW.
- **Hydrogen Technology** – Fuel cell electric vehicles (FCEVs) operate using hydrogen fuel, which may offer several advantages over battery EVs including a longer range per refueling, lighter vehicle weight, and significantly faster refueling times. FCEVs are particularly well-suited for applications requiring long-range capabilities and quick turnaround times, such as commercial fleets or long-haul trucking that would otherwise need to wait for electric charging to refill large battery capacities.[xx] However, hydrogen infrastructure is still in its early stages, with few refueling stations available in the United States.[xxi] Making hydrogen a viable and sustainable alternative ZEV technology requires investment in efficient and cost-effective production, storage, and distribution infrastructure.

  The Rutgers University Center for Advanced Infrastructure and Transportation (CAIT) is preparing to deploy and demonstrate hydrogen fuel cell technology as part of an innovative pilot project funded by NJEDA. Project partners include Public Service Enterprise Group (PSEG), the Center for Transportation and the Environment (CTE), Hyundai Motor America, and PANYNJ. The trucks in the pilot will operate at Port Newark, a significant component of the Port of New York and New Jersey and the principal container ship facility for goods entering and leaving the Northeastern United States.
- **Autonomous Driving** – Autonomous vehicle (AV) driving technology enables vehicles to navigate and operate without human input by using a combination of technologies to perceive the environment and make driving decisions. The adoption of AVs could lead to an increase in vehicle miles traveled (VMT) because they may reduce the effort associated with driving,

thereby encouraging people to travel longer distances, take more frequent trips, and shift from other modes of transportation like public transit to personal vehicles.[xxii] This shift could potentially lead to greater energy consumption and increased emissions if AVs are not primarily electric. Conversely, vehicles equipped with advanced driver assistance systems can optimize driving patterns, such as maintaining steady speeds, reducing stop-and-go traffic, selecting the most efficient routes, and creating close platoon formations to reduce wind resistance.[xxiii] These optimizations could help reduce energy consumption per mile traveled, especially if AVs are electric. The efficiencies of autonomous driving would be most impactful on the emissions-intensive freight transport sector. By reducing traffic congestion on New Jersey's roads, autonomous technologies can reduce the amount of time freight transport vehicles spend idling and can thereby reducing emissions from the freight sector.[xxiv]

Strategic Recommendations for Advancing Market Transformation

This section identifies key challenges and recommended solutions to EV adoption. Recommendations are organized into categories focused on LD EV adoption, MHD EV adoption, and transportation system design. The overarching recommendations are informed by stakeholder feedback and are further detailed and categorized by timescale in the following section.

Increasing Light-Duty Electric Vehicle Adoption

New Jersey has made significant progress in LD EV adoption. As described in the previous section, there were over 237,000 EVs on the road by June 2025 and projections indicate that there will be over 1 million EVs on the road by the end of 2030. Despite growing and sustained market adoption, the high upfront cost of EVs compared to internal combustion engine (ICE) vehicles remains a primary consumer concern.[xxv] Additionally, a large majority of potential EV consumers have expressed concerns over insufficient charging infrastructure availability,[xxvi] despite the increase in charging ports over time. These concerns are exemplified by long queues at public charging stations and charger reliability issues, which generate dissatisfaction among current EV drivers.[xxvii] Limited consumer awareness can also hinder adoption, since some buyers are unfamiliar with EV technology or have uncertainty regarding the long-term reliability and resale value of EVs. Lastly, recent federal actions present additional uncertainty, since the removal of tax credits for new and used EVs significantly reduces the financial feasibility of purchasing or leasing EVs, particularly for low- and moderate-income (LMI) individuals.

To address these concerns, New Jersey will continue to employ a combination of policies, incentive programs, and consumer awareness initiatives that promote widespread EV adoption and ensure progress toward New Jersey's climate goals. Specifically, New Jersey can maintain and expand funding for incentive programs, prioritize underserved markets, enhance EV infrastructure reliability, modernize the grid, and promote consumer engagement.

Maintain and Consider Expanding LD EV Incentives

Dedicated and reliable State incentive funding is an important driver of long-term EV adoption, particularly given the elimination of the federal EV tax credits. As required under the EV Act, New Jersey will maintain the $30 million annual allocation for LD EV incentives that reduces incremental vehicle purchase costs. New Jersey may consider extending this annual allocation beyond the 10-year time frame specified in the EV Law to meet the State's EV adoption goals. Allocating additional funds in the near-term can lead to more rapid market adoption, reducing the need for future incentives. For example, in the last three fiscal years, Governor Murphy has allocated additional funds for the Charge Up program as well as EV charging programs and programs to electrify the State's vehicle fleet.

Associations, such as the New Jersey Coalition of Automotive Retailers (NJ CAR), New Jersey Electric Vehicle Association (NJ EVA), and New Jersey League of Conservation Voters (NJ LCV), strongly advocated for increasingly robust EV incentives rather than reducing levels or even maintaining $30 million annual funding. NJ CAR cautioned that lower incentives may not persuade hesitant buyers to choose EVs, especially given new EV registration fees and the potential removal of the EV sales tax exemption.[xxviii] NJ EVA echoed this concern, recommending a higher base incentive to effectively bridge the cost gap for potential EV buyers.[xxix]

The Division of Rate Counsel and others urged leveraging federal funding from the Infrastructure Investment and Jobs Act (IIJA) and Inflation Reduction Act (IRA) to support EV initiatives while minimizing ratepayer impacts, pointing to ratepayer cost equity concerns. NJ LCV commended the use of the General Fund for use in the Charge Up program but requested that NJBPU tap into the State Clean Energy Fund to supplement incentive amounts.[xxx]

ChargEVC emphasized the need for a consistently collaborative approach to Charge Up program design and management, emphasizing the need for additional time for stakeholder engagement.[xxxi] The Energy Efficiency Alliance of New Jersey (EEANJ) proposed a more direct engagement with local governments to provide greater visibility into incentives availability and processes.[xxxii]

Prioritize Underserved Market Segments

In order to continue the State's progress in expanding the consumer EV market, incentive funding for LD vehicle market segments that have received less financial support or otherwise experienced lower EV adoption should be prioritized, such as potential buyers of used vehicles, residents in overburdened or LMI communities, or users of specialized applications such as ride-hailing or car-sharing services.

For many consumers, used EVs are a more affordable option than new EVs. More than half of used EVs are currently priced below $30,000, and this average price is anticipated to decrease. This price reduction makes used EVs a viable option for a wider range of consumers and potentially accelerates the transition to electric mobility. Nationally, the used EV market is expected to see significant growth, with 2024 used EV sales exceeding 2023 sales by more than 50%.[xxxiii]

In New Jersey, recent growth in new EV sales, combined with a sharp uptick in the popularity of leasing, suggests that the State's used EV market will likely grow rapidly in the near-term. According to recent industry research, almost half of franchise EV sales in 2023 and 2024 came through lease agreements, which may result in tens of thousands of EV lease returns being available for resale between 2025 and 2027.[xxxiv] No incentive programs within the State currently focus on used EVs, even though used vehicle purchases constitute a significant portion of all vehicle purchases and are likely to be more common for LMI individuals. To better support the used EV market, the State should investigate how to design and initiate a used EV incentive program that increases adoption and

addresses equitable access to clean transportation over the next two years, and revisit funding allocations and levels across all LD EV incentive categories at the five-year mark.

Multiple stakeholders emphasized the importance of ensuring EV incentives are accessible to LMI residents. In its response to the 2025 State budget proposal, NJ EVA recommended revising income eligibility criteria for enhanced LMI incentives to better target assistance. They suggested aligning income thresholds with other State LMI programs to ensure the incentives reach those who need them most.[xxxv] NJ LCV and ChargEVC supported the need for equitable distribution of EV incentives. These organizations focused on setting appropriate designs based on income for the Charge Up program, as well as for other associated NJBPU energy efficiency and renewable energy programs."[xxxvi]

New Jersey continues to support LMI consumers and consumers in overburdened communities, who are less likely to purchase new EVs and are disproportionately impacted by vehicle pollution. In 2024, NJBPU established the Charge Up+ incentive, which allows income-qualifying customers to receive higher incentives for new EVs. Over the next two years, NJBPU should maintain this incentive and consider allocating additional funds or revising incentives, based on the level of EV adoption among LMI consumers. Over the next five years, New Jersey agencies may conduct an assessment to determine whether the EV adoption rate among LMI consumers has achieved parity with the general market. Based on the results of this assessment, NJBPU can consider whether to continue this incentive or to sunset the incentive over time.

Many LMI residents may not have access to personal vehicles. Investments in e-mobility programs, whether they are first and last mile shuttles, electric ride share, e-bikes, car shares, or other solutions are key to providing equitable access to clean transportation. New Jersey will also consider prioritizing LD EV adoption for specialized consumers such as drivers for ride-hailing fleets like Uber and Lyft and individuals who participate in car-sharing programs. New Jersey has incentivized similar projects under the NJDEP eMobility Grant Program. However, New Jersey may consider expanding these pilots into larger programs that provide sustained incentive support over a long period of time.

Over the next two years, NJDEP and NJBPU may consider establishing a fee and incentive structure to support ride-hailing drivers, as well as developing general EV adoption targets for ride-hailing fleets. To maximize EV exposure in new consumer segments, New Jersey may prioritize EV car-sharing services in areas with relatively lower EV adoption, including overburdened communities, rural regions, and MUDs, especially affordable housing developments. As further detailed, ride-hailing and car-sharing applications can be coupled with public transit and micromobility solutions to further reduce emissions while providing alternative transportation options.

Enhance EV Infrastructure Reliability

New Jersey has successfully deployed thousands of EV infrastructure ports over the last several years. However, the lack of reliable EV infrastructure continues to be a perceived barrier to widespread EV adoption,[xxxvii] particularly for drivers who may not have access to charging at home. To address this

challenge, New Jersey became one of the first states in the U.S. to enact legislation establishing standards for EV infrastructure reliability. P.L.2023, c.278 requires publicly funded EV infrastructure to meet or exceed federal standards, which currently require chargers to be operational at least 97% of the time. Over the next five years, the Department of Community Affairs (DCA) or the Legislature can assess whether the standards are working as intended and can adopt additional requirements or complementary measures, if necessary. Ideally, the reliability standards will be in effect for at least 10 years, at which point NJDCA or the Legislature can revisit the need for long-term EV infrastructure reliability solutions.

Beyond regulating uptime, New Jersey may consider incentivizing EV infrastructure reliability by requiring publicly funded projects to include operations and maintenance plans. Other states have established multi-year operations and maintenance requirements as a condition of receiving grant funding. New Jersey could also adopt performance-based incentive structures, wherein some portion of incentive funds are only awarded if an EV infrastructure project meets specified uptime thresholds. Lastly, New Jersey may develop programs to provide incentives for the timely operation and maintenance of EV infrastructure. These types of programs could be implemented in tandem with workforce development programs and could help develop career pathways for EV infrastructure technicians.

Develop Consumer Resources and Tools to Facilitate EV Adoption

To raise consumer awareness of EVs, New Jersey has published resources such as NJDEP's Drive Green website,[xxxviii] which highlights different EV incentive and grant programs; the New Jersey EV Savings Hub,[xxxix] which compares incentive values and eligibility guidelines; and the EValuateNJ dashboard,[xl] which publishes data on EV trends. New Jersey can expand on these resources to support prospective EV buyers and facilitate incentive application processes. Specifically, New Jersey could consider developing additional tools such as calculators to help applicants determine whether they qualify for income-qualified programs by simply typing in their income. New Jersey could also develop tools to help individuals determine what incentives are available based on their location, including incentives that may vary by city, county, air district, or utility service territory, and determine whether these incentives can be stacked. This information could enable incentive applicants to better understand what options are available for their future purchase.

Increasing Medium- and Heavy-Duty Electric Vehicle Adoption

Compared to the LD vehicle market, electrification of the MHD vehicle sector is more challenging due to higher upfront costs, more significant charging demands, and unique duty cycle requirements, as detailed:

- Fleet managers may struggle with the high upfront costs of MHD EVs, as well as infrastructure installation costs, higher maintenance costs, costs of procuring additional space to house

new buses and equipment, costs of hiring more drivers, and costs of training staff on the operations and maintenance of new technologies.

- For some fleet applications, additional MHD EVs may be needed to account for factors such as vehicle charging times or range limitations. This will vary by fleet type, route length, charging schedules, and other factors.
- There are over 200 MHD EV models available in the U.S.,[xli] though not all models are available in all markets and can be impacted by production delays.[xlii] While the ACT regulation can help address this challenge by compelling vehicle manufacturers to increase production of MHD EVs, those rules are subject to ongoing litigation that could complicate this transition. Additionally, federally funded bus purchases must comply with Buy America, Build America requirements. Currently, only two manufacturers have vehicles certified to meet these requirements, but other vehicles may become available in the future.
- While it is expected that the majority of MHD EVs will charge at private or shared-use depots, fleets that are unable to access depot charging must depend entirely on public charging infrastructure, and may experience issues with availability, scheduling, and downtime. While public, high-capacity MHD EV chargers can increase the robustness of the charging system by providing widely available opportunities for fast charging, these chargers are expensive to install and may require long lead time to develop.[xliii] Additionally, fleet managers may need additional space to house charging infrastructure and related equipment. However, alternative charging options including pantograph or wireless charging may become more prominent in the future.
- The infrastructure challenge is amplified by the likely need for significant grid upgrades to accommodate the high energy demands of MHD EVs. The U.S. Joint Office of Energy and Transportation has provided guidance for corridor charging investments across the country,[xliv] but significant challenges remain in developing this infrastructure at the scale needed to support widespread MHD EV adoption.

The variety of MHD vehicle fleets and the complexity of electrification will require a coordinated approach. However, the electrification of MHD vehicle fleets will result in substantial emissions reduction benefits. Currently, individuals using NJ Transit vehicles contribute 60% less emissions than individuals driving alone, when compared on a passenger-mile basis.[xlv] In the near-term, expanding access to public transportation will reduce emissions while NJ Transit works to electrify their fleet. These emissions reductions will increase once the transit buses are electrified, as required under the EV Law. Moreover, electric MHD vehicles present novel benefits, including the opportunity to provide grid services through participation in bidirectional charging programs, which can enable fleet operators to generate revenue and offset the higher costs of MHD vehicle electrification. To enhance the benefits of MHD EVs, New Jersey can leverage multiple incentive funding streams, coordinate the implementation of MHD EV programs, and develop fleet-focused tools and resources.

Continue to Leverage Multiple Programs to Support MHD EV Deployment

The MHD EV market will likely require significant and sustained incentive support, due to the higher upfront cost of MHD EVs as well as associated costs of charging infrastructure. New Jersey will continue to offer multiple vehicle incentive programs, including NJBPU's Clean Fleet EV Incentive program, NJDEP's MHD Electrification grants program, NJDEP's Electric School Bus Program, and NJEDA's NJZIP, as well as charging infrastructure incentive programs, including NJBPU's Clean Fleet EV Incentive Program and NJBPU's MHD EV Charging Program funded by RGGI funds. Over the next two years, NJBPU, NJDEP, and NJEDA can coordinate to ensure that MHD programs are adequately addressing the distinct elements of the MHD EV market, such as access to vehicles, access to charging, and operational challenges in MHD vehicle fleet applications. Over the next five years, State agencies may consider designing and launching additional MHD EV incentive programs or expanding existing programs based on market needs.

Coordinate the Implementation of MHD EV Programs to Identify Best Practices

New Jersey agencies that implement MHD vehicle programs will continue to examine the need for stacking incentives, aligning eligibility requirements and application processes, and standardizing reporting requirements. Incentive stacking allows MHD vehicle owners to take advantage of multiple funding streams, thereby maximizing savings. Similarly, aligning eligibility requirements and application processes would streamline the process of identifying and receiving incentives. Coordinating MHD EV program implementation will help prevent duplicative practices, such as deploying MHD EV infrastructure in adjacent or similar locations, and will highlight complementary strategies, such as utilizing distributed energy resources to help manage increased loads from MHD vehicle charging.

Over the next two years, NJBPU, NJDEP, and NJEDA can utilize the information on common challenges (including those collected through surveys) to highlight best practices and identify complementary strategies, such as pairing incentives for vehicles with incentives for charging. This standardization across programs will help maximize the impact of incentive funds while helping State agencies plan for the broader electrification of the MHD vehicle sector.

Develop Tools and Resources to Support Fleet Operators

As New Jersey collects information on common implementation challenges, NJBPU, NJDEP, NJEDA, and other State agencies can develop tools and resources to further support MHD vehicle electrification. For example, NJDEP operates the New Jersey Fleet Advisor resource[xlvi] that provides technical assistance for fleets. Additional resources could include information on utility interconnection and energization processes, expanded technical assistance resources for fleets, and strategies such as managed charging and the incorporation of distributed energy resources such as

solar PV systems or battery energy storage systems to reduce load. Within the same two-year time frame, State agencies may develop tools such as total cost of ownership (TCO) calculators using information unique to the State, including utility tariff options. These calculators can help MHD vehicle fleet operators develop plans for electrifying their vehicles.

Over the next five years, NJBPU, NJDEP, and the utilities can address longer-term challenges, such as deploying a network of public MHD EV infrastructure to support charging along key corridors, building out the distribution grid infrastructure necessary to support the increased loads from widespread MHD EV adoption, and identifying locations with sufficient grid capacity to support MHD EV charging. These strategies can expand upon existing regional initiatives, including the Clean Corridor Coalition,[xlvii] which will leverage $250 million to deploy MHD EV charging infrastructure throughout the mid-Atlantic region; the East Coast Commercial Zero-Emission Vehicle Corridor,[xlviii] which will develop a plan to identify community needs in commercial EV charging across the I-95 corridor; and the Northeast Freight Corridors Charging Plan,[xlix] which will identify charging needs for commercial fleets operating on highways throughout New Jersey, New York, Pennsylvania, and New England states.

Enhancing Transportation System Design

In addition to addressing individual market segments, New Jersey can enhance the overall design of its transportation system to provide a more cohesive and complementary environment for zero emissions. Specifically, New Jersey can prioritize equity across the transportation system, implement targeted outreach campaigns, develop the EV workforce, invest in grid infrastructure upgrades, and leverage urban planning to accommodate shared mobility. These strategies help ensure the transportation system works for all individuals and transportation modalities while reducing the State's GHG emissions.

Prioritize Equity

New Jersey can prioritize equity by addressing the unique transportation needs of LMI individuals and residents of overburdened communities, who are often disproportionately impacted by transportation pollution and face greater barriers in adopting EVs. New Jersey has already made significant progress in enhancing equitable EV adoption by offering increased income-based incentive levels for specified programs, including the Charge Up and MUD EV Charger incentive programs. However, these individuals will likely need additional and sustained support to ensure equitable access to clean transportation. This support may include additional investment for incentive programs, dedicated outreach efforts, and technical assistance services such as NJDEP's eMobility Planning Toolkit and the Community Transportation Needs Assessment grant. In some cases, innovative approaches, such as the GoTrenton! project funded by NJDEP through its ongoing e-mobility grant program, may be needed to address unique transportation challenges. For example, electric ride-sharing services can be used to transport individuals in rural areas to important services in urban and suburban areas.

Similarly, community car-sharing programs can be used to address EV demand in areas with limited charging infrastructure availability.

The transition to electrified transportation can result in additional economic opportunities for LMI individuals and residents of overburdened communities. For example, workforce development initiatives and job placement programs can generate employment opportunities for individuals, including new entrants to the workforce as well as individuals from other backgrounds who are being retrained. New Jersey may consider prioritizing LMI individuals or residents of overburdened communities for workforce development programs. Additionally, many drivers for ride-hailing companies like Uber and Lyft tend to be LMI individuals. These drivers can benefit from incentive programs aimed at electrifying the ride-hailing sector, as discussed later in this report. If New Jersey implements such incentive programs, higher incentives could be offered for LMI individuals or residents of overburdened communities.

Continue Outreach Campaigns Targeted at Key Stakeholders

New Jersey can expand upon successful consumer outreach campaigns, such as ride-and-drive events where individuals can test drive EVs, by developing targeted campaigns for priority stakeholders, including individuals in overburdened and LMI communities. New Jersey can also develop outreach campaigns focused on fleet operators, including those who operate MHD vehicles, as these individuals may face greater challenges in purchasing EVs. Additionally, New Jersey can raise awareness of local and regional workforce training programs, which will help cultivate in-state employment opportunities and develop the workforce needed to support the deployment of EVs and charging infrastructure. All outreach campaigns can highlight State, federal, and local incentives as well as other resources that can support EV adoption.

Develop the EV Workforce

New Jersey can implement workforce development initiatives to help recruit and train technicians needed to maintain EVs and charging infrastructure. NJDEP, NJEDA, NJBPU, New Jersey Department of Transportation (NJDOT), and the NJ Department of Labor and Workforce Development can work together with educational institutions, local community groups, and unions to develop training curricula and pilot programs that help develop the next generation of EV and infrastructure technicians.

NJ LCV supported efforts to create job training and career pathways in EV-related fields, stating, "As clean energy job opportunities continue to grow … job training and the creation of career pathways will be needed to move diverse and qualified members of the public into these fields."[l] EEANJ offered a similar perspective on investing in local workforces, stating "When trainees get into well-paying, family sustaining jobs, the local economies will grow."[li] NJ LCV supported increased funding for EV charging programs, particularly for MUDs and underserved communities.[lii]

Over the next two years, these agencies could develop a workforce development roadmap to outline key goals and identify strategies for achieving these goals, similar to the California Energy Commission's ZEV Workforce Training and Development Strategy that was released in June 2024.[liii] Over the next five years, these agencies could design and develop pilot programs that enable technicians to gain experience working on EVs and infrastructure, likely in partnership with colleges or other educational institutions that already offer similar programs. For example, Michigan developed the MI Auto Workforce Hub, which collects data on needed skills, develops the curricula needed to cultivate those skills, and coordinates between employers and training centers.[liv] Similarly, the California Energy Commission developed the Zero-Emission Vehicle Sustainable Equitable Employment Destination (ZEV SEED) Project, which provided targeted training programs focused on EV and infrastructure maintenance and sought to include job placement measures to provide full-time employment for trainees.[lv]

New Jersey could also expand on existing efforts, such as NJDOT's workforce development programs described in the State NEVI deployment plan and training programs conducted at the Bordentown Training Center, which specializes in transportation safety and first responder training.[lvi] In 2024, NJEDA launched a Green Workforce Training Grant Challenge to spur an equitable transition to meaningful green technology employment opportunities.[lvii] Additionally, workforce development efforts could leverage existing resources such as the Electric Vehicle Infrastructure Training Program.[lviii] These strategies can help generate in-state employment opportunities and position New Jersey as a leader in the burgeoning field of ZEV workforce development. The California and Michigan workforce development examples are pertinent because both states invested in EV technology testing centers that have made their states regional leaders in EV market and technology development, maintenance, and innovation. These investments also have led to workforce and economic development.[lix,lx] New Jersey may consider developing a Northeast and Mid-Atlantic regional testing center that would be a focal point for the EV industry and create local job opportunities.

Facilitate EV Infrastructure Installation

New Jersey has made strong progress in developing its EV charging ecosystem. However, New Jersey's ambitious zero-emission transportation goals will require a rapid acceleration in EV infrastructure deployment for LD vehicles and MHD vehicles over the next decade. CSE estimates that the State will need to install approximately 1.3 million L2 charging ports (though over 1 million of these stations will be at private residences) for LD vehicles and MHD vehicles, nearly 35,000 DCFC stations for LD vehicles and MHD vehicles, and several hundred 350kW and 1 MW ports.[lxi] Recent permitting estimates from across the U.S. are reported to average 65 days to approve MHD vehicle infrastructure projects.[lxii] These permitted projects must then manage utility interconnection with any needed upgrades, which could cause delays and added costs from utilities if major upgrades are needed, and deal with unpredictable installation time frames that depend on the promptness of hardware manufacturers, site installers, and software companies. Estimates for LD vehicle DCFC installations

can exceed 12 months in some cases[lxiii]—in the case of MHD programs in jurisdictions new to the process, it can take years. Additionally, utilities may need time to plan for and accommodate the additional load expected from MHD vehicle charging stations.

To address these challenges, New Jersey can continue to invest in EV infrastructure incentive programs and develop infrastructure outreach strategies and toolkits, which will facilitate infrastructure installations, particularly for those entities with limited EV experience. Additionally, New Jersey can prioritize the development of infrastructure operations and maintenance plans, which will help ensure that chargers are available and operational when needed. Agencies like NJBPU can leverage existing efforts, such as the development of commercial vehicle charging rates, to address challenges like demand charges that complicate the financial feasibility of EV ownership. The NJBPU can continue to encourage and prioritize infrastructure that will allow for managed charging for residential and fleet chargers to best utilize existing capacity and to create rates to encourage managed charging in the future. Lastly, New Jersey can map expected infrastructure needs throughout the State, with an emphasis on priority areas such as MHD freight transport corridors.

The Division of Rate Counsel commended NJBPU's work with a statewide evaluator for utility programs, as well as consultants and academic partners, to "ensure rigorous evaluation studies for both State and utility programs. Much of this work is long overdue and will add much-needed credibility to energy efficiency program process and impact studies."[lxiv] The same comments noted that greater consistency and efficiency would benefit ratepayers and the programs that are being administered.

Invest in Grid Upgrades

To achieve the State's clean energy goals, large-scale electrification of the transportation sector will require a reliable electric grid that can manage growing demand while also running on clean energy systems.

- According to CSE projections, New Jersey's electrical grid may need to take on as much as 40,000 MWh of new load within the next decade for LD EVs and be prepared to provide over 6,000 MW between LD EVs and MHD EVs. As new clean energy systems are installed to meet the State's Renewable Portfolio Standard commitments, regulators will need to ensure that capacity is balanced and available to match increased demand.
- Transportation electrification has the potential to impact reliability by introducing new electrical loads to the grid. In particular, unmanaged charging may create large demand spikes that strain specific grid locations. Managed charging can encourage charging to occur during periods of limited electrical demand, and bidirectional charging can increase resilience by leveraging EV batteries to provide grid services. Utilities can leverage managed and bidirectional charging to improve grid planning and improve and harden infrastructure to ensure reliable access to electricity.

- NJBPU and State utilities will need to update energy forecasting methods and develop systems for managing demand, which will help safeguard grid performance. Anticipating high volumes of charging and employing demand management programs, vehicle-to-grid technologies, or charging and discharging energy storage systems will be critical to managing costs and ensuring reliable grid performance.
- Utility investment will be necessary, and each electric utility within New Jersey must be prepared and actively engaged with industry partners to provide affordable access to power. NJBPU can authorize utilities to invest in grid upgrades, but the individual utilities must collectively act to develop the infrastructure needed to transition to a zero-emission grid. In doing so, the utilities must consider cost-effective investments that provide equitable outcomes for ratepayers and positive environmental outcomes for overburdened communities.

New Jersey can seek to expand grid capacity by projecting electric demand across all sectors and incorporating these forecasts into grid planning efforts. Ideally, this expansion of capacity will include investment in grid upgrades that is informed by and builds on existing efforts, such as NJBPU's Grid Modernization Rules. Where possible, New Jersey can encourage participation in managed charging programs, as required under NJBPU's MHD Order and the residential time-of-use rate.

Reduce VMT

New Jersey has undertaken several steps to reduce VMT, increase shared mobility options, and promote public safety. In November 2024, NJDOT updated its existing Complete Streets program to promote safety for all roadway users, including pedestrians and cyclists. In January 2025, Governor Murphy signed legislation to establish a Target Zero Commission that will develop an action plan to enhance road safety. Future roadway improvements will need to include design and engineering aspects for all roadway users, which will provide greater opportunities for New Jersey residents to switch away from motor vehicles entirely and reduce emissions. Additional information on zero-emission transportation legislation and programs is detailed in the Appendix and on NJDEP's Drive Green website.[lxv]

Electrifying transportation network companies (TNC) and taxi fleets presents a relatively new and immediate opportunity to reduce New Jersey's GHG emissions due to the high daily mileage of these vehicles. These commercial vehicles have been associated with increasing VMT in locations where residents would otherwise drive less, but also have the potential to reduce VMT in locations where final-mile TNC trips can connect residents to robust transit systems.[lxvi] TNCs have the added potential to increase GHG emissions as drivers circulate between passengers or as they idle waiting for new fares.[lxvii] Beyond the environmental benefits, electrified ride-sharing and taxi fleets serve as a high-visibility showcase of EV technology. As more people use or see EVs through ride-sharing services, public familiarity with and confidence in the technology grows, potentially accelerating the broader adoption of EVs across personal and commercial markets. To support the electrification of TNC and

taxi fleets, New Jersey could consider developing incentive programs that encourage TNC drivers to adopt EVs. These programs could prioritize incentives for LMI drivers or residents of overburdened communities. Additionally, New Jersey could leverage and expand upon partnerships between public transit agencies and TNCs or micromobility operators to reduce VMT by improving transit access for residents who might not otherwise drive.

The 2019 EMP encourages the development and integration of shared mobility solutions such as car-sharing and micromobility options like bike and scooter share programs, particularly around public transit hubs to maximize their usage and environmental benefits. NJDEP is supporting communities in developing appropriate mobility options through Community Transportation Needs Assessments,[lxviii] on-demand electric mobility pilots such as GoTrenton!,[lxix] and other programs designed to improve community clean transportation access. New Jersey can expand upon these programs and offer similar programs across the State. Additionally, New Jersey can complement these programs by supporting urban design approaches, such as the Complete Streets initiative or NJ Transit's Transit-Oriented Development: Vision & Goals,[lxx] to create more practical alternatives to current transportation systems that rely on passenger vehicle ownership.

Build on State Government Leadership

State agencies have continued to make progress toward the clean transportation goals required under the EV Law. For example, NJBPU's Clean Fleet Program and NJDEP's It Pay$ to Plug In program have helped to spur State and local government EV adoption. However, hurdles to adopting new technologies persist. To address these challenges, New Jersey could consider modernizing procurement strategies to identify and account for the benefits of EVs. For example, procurement strategies can incorporate the long-term cost savings of EVs from reduced operations and maintenance expenses or lower fuel costs. Similarly, New Jersey could consider opportunities to promote more effective charging models, including general-use motor pools, charging from home policies, and mixtures of fleet and workplace charging. New Jersey could also take advantage of new purchasing models, such as charging-as-a-service models in which vehicle owners can pay for charging services without having to install dedicated charging infrastructure.

State agencies can develop accountability measures to ensure adherence to clean transportation goals. Specifically, State agencies can prepare annual updates or assessments to demonstrate progress towards goals or identify barriers. Additionally, the Governor's Office and State agencies can leverage partnerships, such as the Partnership to Plug In, to identify lead agencies for key initiatives, track progress, and share data and recommendations on how to overcome barriers. Where possible, State agency initiatives can build on existing programs, as outlined in the recommendations tables in the following section.

Prioritizing Recommendations in the Near-, Medium-, and Long-Term

Each of the strategic recommendations described in the previous section are multifaceted and can be operationalized across different timescales. In order to continue the momentum that has been gained in the last five years, it is important to sequence future strategies and investments to ensure New Jersey is best positioned for growth at each stage of EV and charging market development. The following recommendations prioritize key strategies in the near-term (1-2 years) as well as medium- and long-term (5-10 years).

Near-Term Recommendations

Near-term policy recommendations for the next 1-2 years are detailed. Each policy recommendation is evaluated based on financial feasibility, implementation feasibility, emissions impact, and equity impact. Each of these evaluation criteria are color-coded, as described in the legend.

Legend

	High Feasibility/Impact
	Moderate Feasibility/Impact
	Low Feasibility/Impact

	Near-Term Recommendations	**Existing programs**	**Feasibility**		**Impact**	
			Financial	**Implementation**	**Emissions**	**Equity**
1	**Expand Funding for Vehicle Incentive Programs, such as NJ ZIP or Affiliated Financing Programs**: To project certainty and support fleet ZEV projects, establish minimum program funding levels for the next several years from RGGI, the State General Fund, and other funding sources. Additionally, engage the legislature to convey the need for an established funding source. Consider setting aside funding for diverse business enterprises or fleets operating in overburdened communities, and consider adding funding for the ZEV or other low-interest loan programs.	NJDEP funding, NJBPU MHD Order, NJ ZIP through NJEDA, Green Bank				

	Near-Term Recommendations	Existing programs	Feasibility		Impact	
			Financial	Implementation	Emissions	Equity
2	**Coordinate MHD EV Programs:** Promote interagency coordination and communication on lessons learned and implementation progress among the MHD EV programs. As programs grow or emerge to increase ZEV adoption and affordability, consider consolidating new and existing sector-specific incentive programs under a simplified umbrella program to provide centralized, consistent, and accessible incentives for consumers and businesses.	NJ ZIP, EV Fleet Grant Program				
3	**ZEV Workforce Development**: Promote participation in the Electric Vehicle Infrastructure Training Program and link eligible, licensed contractors through a new one-stop website. Develop case studies and best practices based on NJDOT's workforce development plan described in the State's NEVI plan, as well as training programs conducted at the Bordentown Training Center, community colleges, vocational schools, and other education providers. Prioritize outreach to overburdened or low-income communities to provide new economic opportunities.	NJDOT NEVI Plan, NJDEP Corridor Charging grant, Green Workforce Grant Challenge, Federal grant programs				
4	**Develop Multipurpose Corridor Charging Hubs**: Develop a needs assessment for projected LD and MHD charging demand along major travel corridors. This assessment should discuss related factors, including site-specific factors, such as peak loads, access to electricity and needed facility upgrades, and impacts on local communities, as well as potential funding sources and installation considerations. Engage with community stakeholders where possible to mitigate negative impacts on local communities.	NJDEP Corridor Charging Grant, NJDOT NEVI Plan				
5	**Support Incentives for Corridor, Community, Workplace, MUD, and Other Chargers:** Continue to support and monitor existing charger and make-ready incentive programs, adapt to market changes, and target efforts toward areas that need additional growth.	NJDEP, NJBPU, NJEDA, Utilities, NJDOT				
6	**Create One-Stop Shop Website for Public Education and Tool-Sharing:** Coordinate across all State agencies to collect information on infrastructure reliability, incentives for vehicles and infrastructure, and approved utility programs and technologies to manage charging costs and behaviors. Develop promotional campaigns to	DriveGreen website				

	expand consumer awareness. Provide tools to help residents and businesses easily navigate incentives and programs.					
7	**Maintain and Increase Vehicle Incentive Funding:** Continue to commit $30M in annual funding to maintain momentum and reliability of incentive funding to New Jersey EV buyers. Review program goals to adjust as needed, potentially identifying the need for additional funding to maintain progress. Engage with community organizations to ensure that equity goals are robust, inclusive, and current.	Charge Up				
8	**Develop Used EV Program:** Develop market assessment of current and projected EV sales and resale lifetimes to assess supply and anticipated demand for used EVs. Identify funding sources and begin program design to launch program as soon as funding is obtained.	Charge Up				
9	**Develop Incentives and Programs to Ensure Equitable Access to ZE Transportation, Particularly for the LMI Community**: Set adoption targets to convert TNC miles to zero-emissions and design statewide program to electrify TNCs, leveraging experiences with NJDEP eMobility Grant Program and the eMobility Planning Toolkit. Develop a funding mechanism (such as a per-ICE-ride fee) that will encourage drivers to adopt EVs.	Charge Up+, NJDEP eMobility Grant Program, the eMobility Planning Toolkit				
10	**Prioritize ZEV Incentives for LMI Customers**: Assess demand for new EVs among LMI customers, set aside a separate and distinct funding pool for LMI Charge Up+ customers and increase funding depending upon assessment.	Charge Up+				
11	**Requirements for All State Agencies to Prioritize ZEV Purchases:** Work with vehicle manufacturers to ensure adequate dealer supply to meet market needs. Engage State agencies on technical feasibility, impacts to contracts, real estate needs, and other considerations for large-scale ZEV adoption. Complement requirements with associated infrastructure investments to facilitate the purchase of only ZEVs, where feasible.	State Purchasing Contracts				

	Near-Term Recommendations	Existing programs	Feasibility		Impact	
			Financial	Implementation	Emissions	Equity
12	**Develop Testing Center for New ZEV and Charging Technologies**: Scope industry interest and need for a testing center to support and lead technological innovation in the Northeast and Mid-Atlantic. Determine costs, technologies, and impacts on workforce development. Identify potential outcomes from a new testing center.	NJEDA scoping project underway				
13	**Map Expected Infrastructure Demand:** Develop a detailed map and inventory of MHD vehicles and off-road vehicles and equipment within New Jersey to assess the full scope of charging and associated energy needs. Consider fleet needs, such as rate of charge, VMT, return-to-base operations, typical battery capacity, and other variables.	NJDEP MHD EV Roadmap				
14	**Leverage Auto Dealer Networks**: Expand existing efforts to train dealers, such as the New Jersey EV Sales Certification Course and the PlugStar online tool.	New Jersey EV Sales Certification Course				
15	**Create a Statewide Data Dictionary:** Coordinate across the Partnership to Plug In agencies to define and consolidate relevant data terms. Connect data dictionary with one-stop website to provide a simple understanding of New Jersey's terminologies to other agencies and investors. Connect map to one-stop website to provide clear understanding of which local, State, or federal agencies to contact for planned infrastructure investments. Consider linking contact information and basic instructions for undertaking infrastructure projects should be linked.	NJBPU/NJDEP EV Charging Data Requirements and Agreement				
16	**Expand and Shape Grid Capacity:** Combine projected electricity demand growth from the transportation sector with projected electric demand growth from all other sectors to define NJ's load profile over the next several years and through 2050. Coordinate forthcoming utility-managed charging programs to leverage demand response strategies, time-of-day charging, and bidirectional flows from LD and MHD vehicles to reduce the strain on the electric grid.	NJBPU Grid Modernization Rules and utility Integrated Distribution Plans, NJBPU MHD Order				

	Near-Term Recommendations	Existing programs	Feasibility		Impact	
			Financial	Implementation	Emissions	Equity
17	**Work With Cities to Develop Alternate Transportation Programs**: Develop case studies and toolkits to promote community e-mobility programs to empower communities and reduce costs to State agencies. Learn from successful projects under the NJDEP eMobility Grant Program such as GoTrenton! and utilize the eMobility Planning Toolkit to enable communities to lead and manage their transition to e-mobility.	NJDEP eMobility Planning Toolkit and Grant Program (e.g., GoTrenton!)				
18	**Create Incentives or Regulations to Target Specific Vehicle Applications**: Consider incentives or regulations that target near-term MHD ZEV use cases. Collaborate with community stakeholders to identify equity benefits for each proposed incentive or regulation.	Clean Fleet EV Incentives, Electric School Bus program				
19	**Consider Nonfinancial Incentives**: Engage industry and policy groups to develop a list of policies that would incentivize fleets to adopt ZEVs without direct financial payment—such as green loading zones, off-hour deliveries, or priority port access. Connect with municipalities, port and freight facility managers, and other entities that would hold authority to implement nonfinancial incentives, as well as fleets that would be impacted by such nonfinancial incentives. Estimate financial impacts to fleets and quality of life benefits or equity improvements to community residents for each program.	N/A				
20	**Research a Zero-Emission Freight Weight Exemption:** Engage regional experts to identify impacts of weight exemptions (up to 2,000 pounds) for zero-emission freight on targeted infrastructure, such as bridges and connector roads in New Jersey. Research model examples of zero-emission freight exemptions and evaluate existing legislation, such as enacted in California and the European Union. Engage neighboring states to consider potential for zero-emission freight weight exemption to create a connected corridor.	N/A				

	Near-Term Recommendations	Existing programs	Feasibility		Impact	
			Financial	Implementation	Emissions	Equity
21	**Promote Infrastructure Outreach Tools and Strategies:** Enable fleet ZEV transitions by providing clear, actionable toolkits and strategies that most fleet operators likely are not aware of in the relatively early market. Develop, refine, and distribute educational materials on financial and operational considerations for charging infrastructure to industry and equity groups and include on the one-stop shop website. Develop a working group for small fleet operators who may not be represented at working groups due to limited time, knowledge, or financial constraints.	Drive Green eMobility Planning Toolkits				
22	**Support Implementation of E-Bike Incentives**: Support the implementation of e-bike incentive programs and consider identifying funding sources to support e-bike incentives.	N/A				
23	**Require Infrastructure Operations and Maintenance Plan**: Ensure that applicants for public EV infrastructure incentive funds include operations and maintenance plans as part of the funding application.	NEVI				
24	**Develop Commercial Vehicle Charging Rates**: Coordinate with electric utilities to develop commercial vehicle charging rate parameters. NJBPU will consider several factors for differentiating rates between utilities but may seek to develop a consistent range for fleets operating across multiple utility service territories. Connect utilities with fleet managers to assess price sensitivities for charging rates. Explore innovative solutions, such as statewide demand charge subscription programs for fleet customers. Prioritize Open Charge Point Protocol and interoperability concerns when considering how common charging rates and technologies will apply across utility territories.	NJBPU MHD EV Order, utility general rate cases				

	Near-Term Recommendations	Existing programs	Feasibility		Impact	
			Financial	Implementation	Emissions	Equity
25	**Continue and Expand Complete Streets Program**: Whereas the Complete and Green Streets programs tend to highlight zero fatalities and livable communities, more of an emphasis could be placed on low-carbon enabling design. Review successful Complete Streets projects for efficacy of low-carbon enabling urban infrastructure, including safely and equitably designed EV charging and multimodal street design, as well as active transportation corridors and protected bike lanes.	NJ Complete Streets, NJDEP Community Mobility Study				
26	**Authorization to Monitor and Enforce Public Infrastructure Reporting and Uptime:** Implement the requirements of P.L.2023, c.278, which established a 97% uptime requirement for EV infrastructure installed using public incentive funds and directs agencies to convene stakeholder engagement processes to revisit uptime requirements at least every two years.	NJBPU/NJDEP EV Charging Data Requirements and Agreement				

Medium- and Long-Term Recommendations

Medium- and long-term policy recommendations for the next 5-10 years are detailed. Each policy recommendation is evaluated based on financial feasibility, implementation feasibility, emissions impact, and equity impact. Each of these evaluation criteria are color-coded, as described in the legend.

Legend

	High Feasibility/Impact
	Moderate Feasibility/Impact
	Low Feasibility/Impact

	Medium- and Long-Term Recommendations	**Existing programs**	**Feasibility**		**Impact**	
			Financial	**Implementation**	**Emissions**	**Equity**
1	**Expand and Shape Grid Capacity:** Support utilities to implement required managed charging programs, as directed by the NJBPU, and support State goals, including reliable and long-term renewable energy production.	NJBPU Grid Modernization Rules, NJBPU MHD EV Order				
2	**Maintain and Increase Vehicle Incentive Funding:** Review program progress to determine equity in new EV incentive distribution. Assess affordability of the new EV market to determine the need for and required level of continued incentives. If necessary, phase down programs to focus on LMI consumers and used EVs.	Charge Up				
3	**Expand Funding for NJ ZIP or Affiliated Financing Programs:** Increase funding to NJ ZIP and New Jersey Green Bank loan program to facilitate greater adoption and stretch available funding as loans rather than solely as rebates. Assess funding distribution to overburdened communities and small or minority- and women-owned businesses.	NJ ZIP, NJDEP funding, NJBPU MHD EV Order, New Jersey Green Bank				

	Medium- and Long-Term Recommendations	Existing programs	Feasibility		Impact	
			Financial	Implementation	Emissions	Equity
4	**Develop Multipurpose Corridor Charging Hubs**: Scale up charging hub investments over time to assess reliability and cost-effectiveness of providing power to large charging hubs. Connect charging hubs strategically across New Jersey, the Northeast, and the Mid-Atlantic to provide reliable, open access for freight and passenger vehicles.	NJDEP Corridor Charging Grant, NJDOT NEVI Plan				
5	**Develop Commercial Vehicle Charging Rates**: Adjust rates on regular intervals based on utilization, overall demand, energy prices, and other fluctuating variables. Incorporate bidirectional charging rates to incentivize managed charging and reduce grid impacts.	NJBPU MHD EV Order, utility general rate cases				
6	**Prioritize ZEV Incentives for LMI Customers**: Conduct ongoing assessments to determine demand for EVs among LMI customers and adjust funding allocations and incentive levels based on these assessments. Develop a timeline to sunset general market EV incentive programs and prioritize incentive funding for LMI customers going forward.	Charge Up+				
7	**Develop Used EV Program**: Ensure that the used EV program has been launched within five years and is accepted and recommended by State auto dealer networks. Implement feedback loops to determine if program meets State energy and equity goals.	Charge Up				
8	**Direct Utilities to Consider EV Infrastructure Investment Programs**: Determine the competitiveness and extent of the private EV charging market to assess the continued need for utility investments in charging infrastructure. Assess utility progress against equity goals, including representative investments across demographics, geographies, and income levels.	NJBPU EV Infrastructure Ecosystem Order, NJBPU MHD EV Order				

	Medium- and Long-Term Recommendations	Existing programs	Feasibility		Impact	
			Financial	Implementation	Emissions	Equity
9	**Coordinate MHD Vehicle Programs**: As MHD ZEV uptake expands, State agencies may consider limiting incentive layering to fleet projects that meet defined equity goals, such as small or minority- and women-owned businesses or serving overburdened communities.	NJ ZIP, EV Fleet Grant Program				
10	**ZEV Workforce Development**: With State agencies, develop pilot workforce training programs, which could include institutionalized apprenticeship and pre-apprenticeship training.	NJDOT NEVI Plan, NJDEP Corridor Charging grant				
11	**Map Expected Infrastructure Demand**: Determine progress toward meeting MHD vehicle fleet infrastructure needs by measuring utilization rates and engaging with industry. Reassess mapping efforts and deployment forecasts to adjust expected installations. Consider whether operators of charging stations with lower utilization could benefit from incentives or credit systems to create a more complete statewide charging network and thereby provide all fleets with equitable access to charging.	NJDEP MHD EV Roadmap				
12	**Identify Jurisdictions for Infrastructure Investments**: Develop and regularly update informational resources to support widespread charger deployment, including information on jurisdiction-specific requirements such as permitting or zoning rules; incentives that vary by jurisdiction, utility service territory, air quality district, etc.; contact information; and other relevant information.	DriveGreen website, NJBPU website				
13	**Develop Incentives and Programs to Ensure Equitable Access to ZE Transportation, Particularly for LMI Communities**: Assess progress on adoption rates and cost-effectiveness of funding mechanisms. Research and engage overburdened and LMI communities on environmental or economic benefits that have or will accrue resulting from this program.	N/A				

	Medium- and Long-Term Recommendations	Existing programs	Feasibility		Impact	
			Financial	Implementation	Emissions	Equity
14	**Work with Cities to Develop Alternate Transportation Programs**: Research how micro-transit programs can impact community VMT, including use of traditional transit resources and TNCs.	NJDEP eMobility Planning Toolkit and Grant Program				
15	**Invest In and Develop a Clean Vehicle Technology Accelerator**: Develop a Clean Vehicle Technology Accelerator, potentially in tandem with a testing center, to develop and test innovative ZEV and charging technologies. The accelerator could include workforce development and technician training programs that position New Jersey to be a leader in developing the ZEV workforce.	NJEDA scoping project				
16	**Requirements for All State Agencies to Prioritize ZEV Purchases**: Review the costs and technical feasibility of ZEV adoption for each agency on an ongoing basis for all vehicle types. Align statewide order with all new legislation, incentives, and regulations concerning ZEV adoption. Explore how large-scale State agency ZEV adoption can participate in or benefit the used EV market.	State purchasing contracts				
17	**Leverage Auto Dealer Networks**: Convert incentive for new EV sales to used EV sales based on a market assessment of new EV sales volumes and used EV inventory. Establish a market threshold for sunsetting the dealers' new EV sales incentive, potentially tied to the level of used EV sales or Advanced Clean Cars II sales requirements.	Charge Up				
18	**Continue and Expand Complete Streets Program**: NJDOT, Transportation Management Associations (TMAs), or third-party administrators may coordinate with New Jersey cities that have developed e-mobility programs, active transportation networks, transit operators, charging station installers, and TNC drivers to recommend additional low-carbon enabling infrastructure.	NJ Complete Streets, NJDEP Community Mobility Study				

	Medium- and Long-Term Recommendations	Existing programs	Feasibility		Impact	
			Financial	Implementation	Emissions	Equity
19	**Require Infrastructure Operations and Maintenance Plans:** Develop operations and maintenance programs to conduct EV infrastructure repairs and develop the workforce necessary to support infrastructure maintenance, which will position New Jersey as a leader in EV workforce development. Facilitate direct information sharing.	NEVI				
20	**Consider Standards for Public Infrastructure Reporting and Uptime:** Develop long-term strategies for maintaining EV uptime for all EV infrastructure, including publicly funded infrastructure. Consider complementary measures such as establishing networking requirements and developing tools and dashboards to highlight EV infrastructure availability, reliability, and utilization, including real-time status.	NJBPU and NJDEP EV Charging Data Requirements and Agreement				
21	**Create Incentives or Regulations to Target Specific Vehicle Applications:** Assess market progress of target MHD vehicle segments relative to ACT regulation targets and adjust incentives or timelines as needed. Estimate equity impacts of each program and targeted vehicle application to determine value added for all community stakeholders.	EV Incentives, Electric School Bus program				
22	**Consider Nonfinancial Incentives:** Assess the initial progress of incentives—such as green loading zones, off-hour deliveries, and priority port access—with a focus on equitable outcomes and scalability across municipalities. Connect municipalities, counties, or facilities that have adopted nonfinancial incentives to enhance their impact and create a regional network of aligned programs.	N/A				

	Medium- and Long-Term Recommendations	Existing programs	Feasibility		Impact	
			Financial	Implementation	Emissions	Equity
23	**Develop Infrastructure Outreach Tools and Strategies:** Work with fleet managers to monitor progress, expedite infrastructure installation timelines, and refine tools and strategies as needed. Engage with equity stakeholders and fleet operators to determine ideal tools and strategies to equitably benefit communities and fleets, including the New Jersey Fleet Advisor program. Convene a working group made up of fleet operators to share infrastructure plans or common investments.	Drive Green eMobility Planning Toolkits, New Jersey Fleet Advisor				
24	**Support Implementation of E-Bike Incentives:** Track demographic information for incentives to determine equitable distribution. Revise program definitions to create greater, more equitable access to low-carbon transportation alternatives outside of major cities.	N/A				
25	**Consider Developing a Zero-Emission Freight Weight Exemption:** Monitor potential impacts of weight exemptions on particulate matter output and develop any needed remediation plan. Coordinate with interstate freight companies to promote the need for a multistate exemption.	N/A				

Relevant Policies and Regulations in Other States

Other states have adopted a combination of policies and programs to facilitate transportation electrification. While New Jersey has enacted several similar initiatives, policies and programmatic pathways of other jurisdictions are highlighted here. Some of the initiatives listed in Table 9 are also included as recommendations.

Table 9: Examples of State programs or policies recommended for consideration by New Jersey.

Name	Description	Jurisdiction	Timeframe	Sector	Focus Area	Revenue Raising
Freight Weight Exemptions	Exemption for up to 2,000 pounds for MHD ZEVs	CA, OR, WA	Enacted	Freight	Cargo Volume and Road Access	No
Clean Miles Standard	Regulation for TNCs to increase percentage of electric vehicle miles traveled (eVMT) and decrease GHG emissions over time	CA	2023-2030	LD vehicles	TNC Mileage	Yes
Green Rides Initiatives	Regulation requiring TNCs to adopt ZEVs over time	NY	2024-2030	LD vehicles	TNC ZEVs	No
Drive Clean Assistance Program	Incentive program for new or used EVs	CA	Enacted	LD vehicles	Purchase Incentive	No
RideCleanMA	Incentive program for high-mileage TNC drivers to purchase EVs	MA	2024-2025	LD vehicles	Purchase Incentive	No
Advanced Clean Fleets	Regulation for State agencies to purchase MHD ZEVs	CA	2024-2035	Vehicles	Purchase Requirement	No

Other policies and regulations are either too new to be considered as models for New Jersey or are not relevant to the State (Table 10).

Table 10: Examples of State programs or policies not recommended for immediate consideration by New Jersey.

Name	Description	Jurisdiction	Timeframe	Sector	Focus Area	Revenue Raising
Low Carbon Fuel Standard	Program that caps carbon intensity of fuels, penalizing non-compliance and incentivizing low-carbon fuel production	CA, OR, WA	Current	Enacted	Cap and Trade for Fuel Sales	Yes
Retail Delivery Fee	Fee placed on every qualifying delivery to raise revenue for targeted programs	CO, MN	Current	Vehicles	Freight and Service Delivery	Yes
Utility Beneficial Electrification	Program for electric utilities to use rate-payer funds to fund residential, make-ready, and commercial fleet EV incentives	IL	2024-2025	Vehicles and EVSE	Purchase Incentive	Yes

Conclusion

This roadmap outlines New Jersey's ambitious goals for emissions reductions and vehicle electrification, driven by the State's Global Warming Response Act (GWRA) 80x50 target, the 2019 Energy Master Plan (EMP), and the 2024 EMP. New Jersey has made considerable progress toward its electrification goals, supported by a clear policy framework and a growing electric vehicle (EV) market. Despite challenges, the State's roadmap reflects a strong commitment to reducing emissions, with promising signs that the transformation of the transportation sector is well underway. Through a comprehensive analysis of the current landscape, targeted market opportunities, technological advancements, and regulatory frameworks, this report provides strategic recommendations that can accelerate the State toward a sustainable transportation future.

Light-duty (LD) EV adoption has recently accelerated with the support of numerous incentives and regulations. Medium- and heavy-duty (MHD) vehicle electrification presents a more complex challenge, as adoption in this sector lags far behind. Given their disproportionate share of transportation-related emissions, a focused strategy on MHD vehicle electrification is important for meeting overall climate targets.

The roadmap recommends a continued emphasis on equity and accessibility. Ensuring that low- and moderate-income communities can access both EVs and charging infrastructure is necessary for broadening the reach of New Jersey's electrification efforts. Expanding incentives for used EVs will help to ensure underrepresented populations benefit from the transition.

EV infrastructure for LD and MHD vehicles remains a key area of concern. Although New Jersey has made strides in deploying public chargers, especially in urban areas, the current rate of infrastructure development will need to scale significantly to meet growing demand. Grid upgrades will also be essential to support increased charging loads, especially for larger vehicles.

New Jersey's long-term success in electrifying transportation will also depend on the overall reliability and accessibility of its EV charging landscape. Beyond expanding the network, incentivizing the maintenance and operation of existing infrastructure and enhancing transparency through public dashboards that provide real-time data on charger reliability and usage will strengthen system performance. Such efforts will build public confidence and drive further EV adoption by reducing concerns over range anxiety and charging accessibility.

Coordination between State agencies, utilities, and private-sector stakeholders will be key to identifying best practices and avoiding redundancy in infrastructure planning. Encouraging fleet electrification with clear regulatory frameworks is vital for scaling EV adoption. By continuously engaging with utilities, local governments, automakers, community-based organizations, and environmental groups, New Jersey can adapt its policies to evolving market conditions and technological advancements. Ongoing dialogue will ensure the State remains flexible, inclusive, and focused on overcoming the remaining barriers to electrification.

New Jersey has an opportunity to build on its successes and lead in the transition to a sustainable, equitable, low-emission transportation future, achieving its long-term climate goals and setting a benchmark for other regions.

Appendix

Additional Legislation to Promote Electric Vehicle Adoption

In addition to the EV Law (P.L.2019, c.362), New Jersey has enacted several laws to support widespread EV adoption (Table A1).

Table A1: New Jersey Electric Vehicle Legislation.

Legislation	Description
P.L.2015, c.24	Enabled certain EV manufacturers to sell EVs directly to consumers under limited circumstances
P.L.2019, c.267	Directed municipalities to incorporate EV infrastructure sites into planning documents
P.L.2020, c.38	Established the New Jersey Fuel Cell Task Force to promote the use of fuel cell EVs in the State
P.L.2020, c.80	Directs developers of residential dwellings to offer installing EV infrastructure
P.L.2020, c.108	Established policies to promote EV infrastructure deployment in condominiums, including prohibiting homeowners' associations from restricting the installation of EV chargers
P.L.2020, c.362	Directed State agencies to develop a plan to establish an Essential Public Charging Network, which includes at least 600 public direct current fast chargers and at least 300 Level 2 charger locations
P.L.2021, c.168	Allowed certain publicly available EV infrastructure stations to be eligible for public funding
P.L. 2021, c. 171	Designated EV infrastructure and make-ready parking spaces as a permitted accessory use for zoning purposes and established requirements for developers to establish specified numbers of make-ready parking spaces at new developments, multi-family housing units, and existing buildings
P.L.2022, c.86	Directed the New Jersey Department of Environmental Protection to establish an electric school bus program

P.L.2023, c.222	Established requirements for producers of EV batteries to develop battery management plans
P.L.2023, c.278	Adopted requirements for publicly funded EV infrastructure to be operational for at least 97% of the time, consistent with the Federal requirement under the National Electric Vehicle Infrastructure Formula program
P.L.2023, c.316	Directed the New Jersey Board of Public Utilities to develop demonstration programs involving EV charging depots
P.L.2024, c.38	Established competitive contracting and other financing processes to promote the deployment of electric school buses.

Stakeholder Outreach Timelines for Major Policies

New Jersey agencies held a series of public comment engagements over the past several years to solicit stakeholder feedback on proposed policy changes. Stakeholders from vehicle manufacturer and dealer groups, clean energy, and EV advocates, community-based organizations, and more provided feedback recorded in conversation and through written submissions, which are all available on the host agency's websites. Their input spans diverse topics that demonstrate the importance of equitable and inclusive program design, the multiple perspectives and outcomes that inform and emerge from these programs, and the critical role that State agencies play in soliciting and absorbing stakeholder feedback.

Following are topics and timelines discussed that reflect the diverse opportunities and topics for stakeholder feedback on major policy considerations.

ACC II

The NJDEP has been advancing the ACC II Program to significantly reduce GHG emissions from the transportation sector. This initiative involves adopting California's vehicle emission standards which aim for an increased percentage of ZEVs in New Jersey's new LD vehicle sales.[lxxi] The NJDEP engaged in extensive stakeholder consultations, holding multiple meetings to discuss the proposed rulemaking and gather diverse perspectives.[lxxii] Following these discussions, the department used the formal stakeholder comments to make corresponding modifications to the proposed regulations. The culmination of this collaborative process was the adoption of the ACC II Program's regulations.[lxxiii]

ACT Program

The NJDEP proposed the ACT Program which would adopt California's zero-emission vehicle standards for MHD vehicles.[lxxiv] To ensure a collaborative approach, NJDEP conducted multiple stakeholder meetings to discuss the proposed rulemaking and gather feedback. The department used the stakeholder feedback to address concerns by adjusting the proposed rules. The culmination of this process was the finalization and adoption of the ACT Program's regulations.[lxxv]

MHD Charging Infrastructure

The NJBPU has been developing the MHD EV charging ecosystem to support the State's transition to cleaner transportation. In June 2021, NJBPU released a Straw Proposal outlining a framework for building a robust MHD EV charging infrastructure.[lxxvi] This proposal emphasized a shared-responsibility model, delineating roles for electric distribution companies and private investors in establishing charging networks. To receive stakeholder information, NJBPU conducted public meetings and solicited written comments, gathering perspectives from industry experts, environmental groups, and the public.[lxxvii], [lxxviii], [lxxix] The feedback received was important in refining the proposal, leading to the adoption of minimum filing requirements in October 2024. These requirements direct New Jersey's investor-owned electric distribution companies to propose programs aimed at expanding access to MHD vehicle charging.

RGGI Strategic Funding Plan

The RGGI Strategic Funding Plan outlines how New Jersey will invest proceeds from RGGI auctions to achieve the State's climate, clean energy, and environmental justice objectives. The NJDEP, NJEDA, and NJBPU conducted a series of public engagement activities to inform the 2023 RGGI Strategic Funding Plan, with significant focus on transportation initiatives. These engagement activities provided valuable insights into public priorities, particularly the emphasis on enhancing and electrifying public transportation. Following is a timeline summarizing these efforts.[lxxx]

New Jersey's 2019 EMP

New Jersey's 2019 EMP outlines a strategic vision for the State's energy future, aiming to achieve 100% clean energy by 2050. The plan emphasizes reducing greenhouse gas emissions, increasing renewable energy sources, and enhancing energy efficiency across various sectors. Key strategies include transitioning to clean transportation, modernizing the energy grid, and promoting sustainable and resilient infrastructure. The 2019 EMP serves as a comprehensive roadmap to guide New Jersey toward a sustainable and environmentally responsible energy system. The development of the 2019 EMP involved a comprehensive stakeholder engagement process.[lxxxi], [lxxxii]

New Jersey's 2024 EMP

New Jersey's 2024 EMP sets forth a plan for the production, distribution, consumption, and conservation of energy in the State and incorporates an accelerated target of 100% clean energy by 2035, defined as 100% of the electricity sold in the State to come from clean sources of electricity. The 2024 EMP builds on the 2019 EMP, incorporating the latest advancements in technology, policy, and programming to create an affordable and sustainable path and leverage the green economy. The core output of the 2024 EMP is a flexible, adaptive framework of "No Regrets" strategies and policies that can be pursued regardless of the changing energy landscape. This includes accelerating clean energy deployment, ensuring a reliable and modern grid, staying the course on transportation electrification, ensuring energy affordability and equity, ensuring environmental justice, enhancing regional coordination and advocacy, and driving innovation and workforce development.

Methodology for Electric Vehicle Projections

LD EV Projections

The Caret®-EV is a patent-pending EV incentive policy modeling and forecasting platform for the LD transportation sector developed by CSE. To forecast the LD vehicle market, Caret®-EV calculates EV market share growth as a function of both the available incentives and the resultant market share. The model is calibrated using data from the U.S. and around the world and can be refined over time as updated data sets become available. Caret®-EV models the total program cost, EV adoption, and other factors as far as 30 years into the future, based on a palette of incentive types, amounts, and schedules.

Modeling the long-term adoption of new technologies, such as EVs, is difficult since past data are not likely to reflect future market conditions as the technology becomes better known and accepted. Moreover, modeling may not reflect future changes in federal and state policy that impact incentives to purchase and invest in EVs. Common approaches rely on consumer choice models and estimates of price elasticities and cross-price elasticities of demand.[lxxxiii],[lxxxiv],[lxxxv],[lxxxvi] These models rely solely on historical data, assume that consumers are highly rational about vehicle adoption, and assume that adoption depends only on product attributes (e.g., cost). As such, these approaches are only useful for very near-term projections, when both the state of the technology and consumer acceptance will be similar to the recent past. To successfully model the adoption of a new technology spanning the entire market transformation (which typically lasts several decades) requires mathematical approaches that go beyond short-term consumer choice or price elasticity models.[lxxxvii],[lxxxviii],[lxxxix],[xc],[xci],[xcii],[xciii] The ideal approach to modeling EV adoption is grounded in data and accounts for the sociotechnical barriers to adoption, captures the dynamic forces inherent in

technology diffusion, and allows for modeling a variety of potential policy interventions directed at different stakeholders.

To model the EV market transformation, Caret®-EV implements a logistic growth function of adoption over time, as observed in a variety of other technologies,[xciv],[xcv] parameterized by a Bass diffusion model customized to the EV market. At its foundation, the model is calibrated using five years of data from sixteen EV incentive programs in the United States and other countries around the world, relating incentive dollars to the corresponding increase in EV sales. By using EV market data and regression techniques to model sales over time, this approach gives a more complete picture of the relationship between incentive levels, time, and EV adoption that could be provided using price elasticity or choice models over the same time frame. Finally, Caret®-EV incorporates a learning algorithm in which model predictions are replaced by data as they become available, which allows the projections to stay on track with reality and fine-tunes the model predictions over time.

Sociotechnical Transitions

A sociotechnical transition is a fundamental shift in the way society and technology interact, resulting in the adoption of new socio-economic systems and technologies, in this case electric vehicles. The science of sociotechnical transitions directs that each sociotechnical barrier should be addressed by a holistic and comprehensive market policy to accelerate the diffusion of a technology. The current EV market would be classified as a "sociotechnical niche"; that is, a new technology in its initial stage of transition to becoming the dominant actor in the market.[xcvi] In order to achieve the accelerated adoption of EVs required to meet GHG emissions reduction goals, stakeholder expectations must be aligned and the interconnected nexus of sociotechnical barriers inhibiting EV diffusion must be addressed in a comprehensive manner.[xcvii],[xcviii] While these interconnected barriers form a web, the primary barriers inhibiting EV diffusion are price, range, charging infrastructure, and consumer awareness and acceptance.[xcix],[c],[ci] To ensure that the EV market achieves the accelerated growth required to meet GHG emissions reduction goals, it is necessary to set complementary and clear policy signals that allow the market to overcome all the individual sociotechnical barriers. In the Caret®-EV model, the policy signals come in the form of incentives that are combined to target those barriers.[cii]

Diffusion of Innovations

The empirical concept of diffusion of innovations provides a framework for describing the characteristics of the adoption and spread of new technology (also see Figure 1).[ciii],[civ],[cv],[cvi],[cvii] The normal diffusion of a new technology is rooted in personality traits and other factors (such as level of knowledge or exposure to the new technology) that make each individual more or less likely to adopt it. It is driven by communication within social networks that acts to encourage adoption by more individuals over time. The overall distribution of these traits is determinant of the adoption rate in a population.

The rate at which a new technology moves up the sigmoidal (S-shaped) market share curve (i.e., the adoption rate) can be accelerated by encouraging (e.g., via incentives) the adoption of the technology among successive consumer groups (see Figure A1).

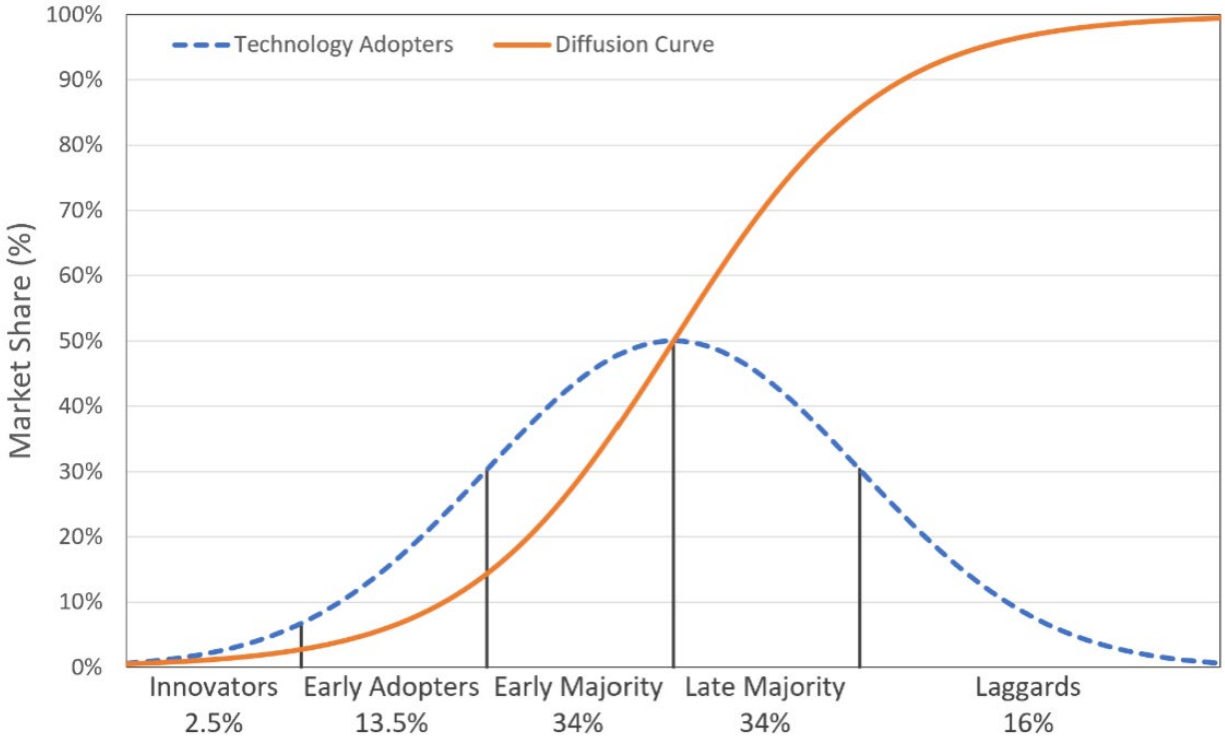


Figure A1: Curve for new technology consumer adoption.

Prioritizing resource expenditures to encourage adoption early in the diffusion process (on the lower, more linear branch of the S-curve) has the largest effect on accelerating the overall adoption rate by causing the growth in market share to reach the steep (exponential) central part of the S-curve faster. The most effective incentive policy acts to accelerate the EV adoption rate as rapidly as possible and as early as possible, to reach the steep part of the S-curve as soon as possible.

As successive groups of consumers adopt a new technology (dashed blue "bell-shaped" curve), its market share (solid orange "S-shaped" curve) grows and eventually reaches the saturation level. Categories of consumer groups are indicated (vertical lines) and labeled according to their willingness to adopt a new technology (high to low from left to right) and percentage of the total population represented by each group.

Some individuals in the final consumer group (the "laggards") might be especially reluctant to adopt the new technology on the same time scale as others; an "extra push" (e.g., legislative action such as a zero-emission vehicle requirement) might be required to convert them. The upper portion of the S-

curve gradually approaches 100% but will only reach it when the last laggard has adopted—this is why setting incentive policy goals based on reaching 100% market share can be unrealistic, especially when compared to more easily achievable goals such as 90% market share.

There are two primary considerations that Caret®-EV considers the relationship between policy levers and the development of the EV market.

1. All barriers to EV adoption are sociotechnical in nature (see above).
2. Price is the principal barrier to EV adoption, and the main policy influence that the government can address.

An accurate and reliable forecast of the optimal diffusion of EVs in the LD vehicle market requires a methodology that accounts for all the sociotechnical barriers with a balanced policy that combines incentives directed at each barrier.

LD Vehicle Scenarios Modeled in this Report

For this report, five scenarios were modeled to understand the impacts of changing various parameters for the Charge Up program. For each of these scenarios, models included projections with and without the IRA, so in total there are 10 scenarios modeled. It should also be noted that LD vehicles are defined as all class 1, 2 and 3 vehicles. The five modeled scenarios explore varying incentive structures: the Current Program Design maintains existing incentive levels, the Lowered Incentive Amounts scenario reduces incentives slightly below current values, the Raised Incentive Amounts scenario increases incentives above current levels, the Incentive Step-Downs scenario gradually decreases incentive values annually starting in FY 2028, and the Used EV Incentive Program introduces a targeted incentive for income-qualified applicants purchasing used EVs.

Projected EV adoption numbers show minimal variation (<1%) across all modeled scenarios, except for the used vehicle incentive scenario, which indicated slightly higher variation (1% more EVs projected). Given this negligible difference, the “Current Program Design” scenario is used for all EV and EV infrastructure projections presented in this report. Additionally, for IRA versus non-IRA modeling, EV projection results from the non-IRA scenario are included in the main report.

Methodology for Projecting LD EV Chargers

The Electric Vehicle Infrastructure Projection Tool Lite (EVI-Pro Lite) developed by the National Renewable Energy Laboratory (NREL) was used to project the future demand for LD vehicle charging infrastructure. EVI-Pro Lite is a publicly accessible, streamlined model designed to estimate charging needs based on anticipated EV adoption rates and vehicle travel behavior.

The EVI-Pro Lite methodology calculates required charging infrastructure by integrating projected EV populations, anticipated daily vehicle miles traveled (VMT), and typical charging patterns derived from empirical vehicle-use data. The tool accounts for charging behavior across different locations, including residential, workplace, and public charging scenarios, offering projections of Level 1 (L1), L2, and DCFC stations needed to adequately support future EV deployment.

Inputs to the EVI-Pro Lite tool include EV market share forecasts generated through our primary EV market modeling approach described earlier in this appendix (Caret®-EV model), as well as state-specific assumptions regarding travel behavior, such as daily driving distances and distributions of home charging access. For L2 charging infrastructure, default projections from EVI-Pro Lite were adopted. However, for the DCFC projection, the EVI-Pro Lite projected a 2027 number lower than the existing 2025 installations, suggesting an underestimated demand for public and non-home charging in New Jersey. To address this discrepancy, the assumption of EV users primarily charging at home was adjusted from 95% to 80%. This refined approach ensures that projected infrastructure numbers for both DCFC and L2 chargers more accurately reflect real-world usage patterns and anticipated growth, thereby providing robust and actionable guidance for infrastructure deployment planning.

Assumptions for MHD Vehicle Fleet Projections

This analysis estimates the future composition of the MHD vehicle fleet in New Jersey, incorporating historical vehicle registration data and projections from the ACT program. The methodology integrates multiple data sources, including New Jersey Motor Vehicle Commission (NJMVC) records (including data on model year, ownership type, Gross vehicle weight rating (GVWR), vehicle classification and zero-emission vehicle status), vehicle classification adjustments, and projected EV market shares to generate fleet forecasts through 2034. These data sources are used to establish the existing fleet composition and historical trends. Future EV adoption rates are based on the ACT requirements, assuming State policies remain in effect that specify the expected market penetration of zero-emission MHD vehicles by vehicle class and model year (Table A2).

Table A2. New Jersey Advanced Clean Trucks zero-emission vehicle market share targets by vehicle classification and year.

Year	Class 2b-3	Class 4-8	Class 4-8 Tractors
2027	15%	20%	15%
2028	20%	30%	20%
2029	25%	40%	25%
2030	30%	50%	30%
2031	35%	55%	35%
2032	40%	60%	40%
2033	45%	65%	40%
2034	50%	70%	40%
2035+	55%	75%	40%

Before generating forecasts, the data undergoes a preprocessing step to refine the raw NJMVC registration dataset. LD vehicles, motorcycles, and vehicles without a defined GVWR class are excluded. Registrations for vehicles first sold after December 31, 2023, as well as model years 2024 and later, are also removed to maintain a dataset representative of the active fleet at the end of 2023. To differentiate truck tractors from other Class 8 vehicles, the analysis applies an estimate based on 2019 federal data[cviii] and assumes that the proportion of truck tractors within Class 8 remains stable over time.

Fleet projections are conducted for each vehicle class by simulating fleet turnover and EV adoption. The number of new vehicles added each year is based on an estimate of the average number of new registrations for each class over the past five years (based on model year). For each year in the projection period, the model determines the total number of new vehicles entering the fleet and allocates these between EVs and non-EVs based on the projected market share from the ACT program, assuming State policies remain in effect. These projections assume that the fleet size remains constant over time, that only ICE vehicles are retired, and that only BEVs are adopted (no fuel cell electric vehicles).

Assumptions for MHD EV Energy Demand Projections

A simple approach is used to estimate future MHD EV energy demand using MHD EV fleet size projections and vehicle energy consumption assumptions by vehicle class (Table A3) and the annual fleet turnover (Table A4) to project load growth. The analysis begins with the EV adoption forecasts for

each vehicle class, as determined by the MHD EV fleet projection methodology (see above). These forecasts provide the number of EVs expected in 2027, 2030, and 2035. The total energy consumption for each class is then estimated by multiplying the projected EV population by class-specific daily VMT and energy efficiency values (kWh per mile). VMT estimates are sourced from the 2021 Vehicle Inventory and Use Survey (VIUS).[cix] The final energy demand projections are generated for each class and time period, with results expressed in MWh. The estimates exclude Class 2b and Class 3 vehicles since these are included in estimates of LD vehicles. The approach assumes that vehicle trips leaving New Jersey are offset by trips originating outside the State but traveling into New Jersey, resulting in a net balance of vehicle activity. However, this approach likely overestimates charging demand since many neighboring states have not adopted the ACT rule and will have lower rates of fleet electrification.

Table A3. Assumptions regarding vehicle miles traveled and kWh per mile for each medium- and heavy-duty vehicle class.

Class	Average Daily VMT[cx]	kWh per Mile[cxi]
Class 4	35	1
Class 5	31	1
Class 6	40	1
Class 7	52	2
Class 8	95	2

Table A4. Assumption for the number of vehicles that would be purchased each year (and subject to the Advanced Clean Trucks rule) based on the 2018-2023 fleet population by class.

Class	Annual Turnover Rate (# of new/retired vehicles)
Class 4	1,443
Class 5	2,209
Class 6	1,776
Class 7	1,289
Class 8	3,663

Assumptions for MHD Infrastructure Energy Demand Projections

The methodology used to project the required mix of MHD EV chargers in New Jersey is based on scaling the results from an existing study. Specifically, the approach relies on data from the International Council on Clean Transportation (ICCT), which provides a breakdown of charger types and their associated power demands for the year 2030. This dataset includes the number of chargers by power level, including 50 kW, 100 kW, 150 kW, 350 kW, and 2 MW, as well as key infrastructure capacity metrics such as peak load and installed nameplate capacity.

To adjust the ICCT charger projections for different years, a set of scaling factors is calculated based on the total energy demand estimates. In our analysis, statewide MHD vehicle energy demand was estimated for 2027, 2030, and 2035. The scaling factor for each year is determined as the ratio of the projected total energy demand in that year to the total energy demand estimated in the ICCT dataset for 2030. These scaling factors are then applied uniformly across all charger types, ensuring that the mix of chargers remains consistent with the ICCT projections while accounting for changes in overall demand. Peak Load and Nameplate Capacity were calculated using the same approach. It should be noted that this approach is relatively simple and is based on several assumptions, such as the charger mix remaining constant over time without accounting for shifts in the mix of the MHD vehicle fleet.

Challenges of Estimating Vehicles and Charging

Estimating the future number of EVs in New Jersey, including both LD vehicles and MHD vehicles, presents significant challenges due to numerous dynamic factors. Economic fluctuations, shifts in State and federal support, technological advancements, and changes in the costs of EVs and their components collectively complicate projections. Each variable plays a crucial role in determining the pace and extent of public transition to electric vehicles, making accurate predictions difficult.

Additionally, forecasting the required number of EV chargers for New Jersey's evolving fleet involves various uncertainties. Projecting the mix of EV types on the roads, technological improvements in battery efficiency, and vehicle ranges, along with faster charging technologies, complicates predictions of charger type and distribution needs. These advancements might decrease the overall number of chargers but increase the demand for more robust charging stations. Furthermore, shifts in driver behaviors—such as increased telecommuting, rising ride-sharing popularity, and changes in public transit usage—impact charging requirements for both vehicle types.

For MHD EVs, the future design of charging infrastructure is a critical consideration that significantly affects both the number and type of chargers needed. Whether the strategy favors centralized charging hubs or dedicated depots will influence the number of chargers that will be required. Charging hubs might facilitate shared resources for fleets, while depots could serve as exclusive charging points for specific companies.

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