



# ELECTRIC VEHICLE PRIMER

A RESOURCE FOR:  
LOCAL GOVERNMENTS  
BUSINESSES &  
CONSUMERS



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# ABOUT

## CROSS COUNTY CONNECTION TMA



Cross County Connection is the designated Transportation Management Association (TMA) for the seven-county southern New Jersey region: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem. Cross County Connection addresses the region's mobility needs by fostering the implementation and use of sustainable transportation modes.

Cross County Connection, a non-profit organization, was formally incorporated in 1989 through the efforts of a group of southern New Jersey business leaders, local governments, and state agencies to address traffic congestion and improve air quality in the region.

Cross County Connection's programs and services encourage and facilitate the safe use of public transit, shuttle services, carpooling, vanpooling, bicycling and walking for all. Additional services include public transit travel training, bicycling and walking safety programs, assistance with electric vehicle charging infrastructure and fleets, bicycle and pedestrian infrastructure planning, grant assistance and more. Services are provided to county and local governments, the business community, federal, state and regional transportation agencies, schools, social service organizations and the general public.

**Mission statement:** Creating equitable, safe, and environmentally-sustainable transportation options in South Jersey.

**Vision Statement:** To be the trusted resource empowering the South Jersey region to –

- Reduce pedestrian & bicyclists' crashes in all communities
- Improve air quality and reduce traffic congestion through the increased use of commute alternatives
- Create a culture that embraces safe public transit, walking and biking as an everyday means of transportation *for all*

Visit [www.driveless.com](http://www.driveless.com) to learn more about Cross County Connection's services and resources.



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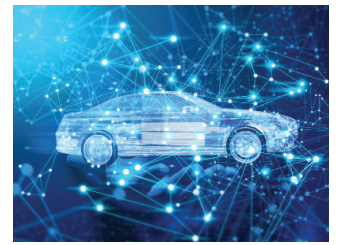


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# CROSS COUNTY CONNECTION'S ELECTRIC VEHICLE PRIMER



Electric vehicles (EVs) are becoming a common sight on New Jersey's roads. Year after year, more residents are purchasing an EV as technology advances. Local governments, public agencies, local businesses, and consumers are jumping on board, purchasing EVs and installing charging stations. The state has passed legislation calling for "at least 330,000 EVs registered in New Jersey by December 31, 2025 and at least 2 million EVs registered in New Jersey by December 31, 2035."<sup>1</sup>

EVs have become a major focus of both the federal and state governments' transportation policy. The Inflation Reduction Act (IRA) has introduced \$43 billion in tax credits for consumers to purchase new EVs, and the Infrastructure Investments and Jobs Act (IIJA) has set aside more than \$30 billion for EV related investments. This includes \$7.5 billion put towards improving EV charging infrastructure.

Within the state, the 2019 NJ Energy Master Plan set a goal to electrify the transportation sector nearly 100%. To achieve this, the State of New Jersey is providing subsidies for the purchase or lease of EVs and has created grant programs to purchase, install and maintain charging stations. Locally, PSE&G vowed to invest \$166 million over the next six years into EV charging infrastructure. In 2021, Governor Murphy signed into law a package of bills requiring municipalities to incorporate EV charging station installation into their zoning, permitting, and redevelopment processes. The New Jersey Department of Community Affairs (NJDCA) created a model ordinance to make this process easier for municipalities.

EVs and charging stations may be a new and unfamiliar topic for many, but Cross County Connection is here to help. Use this primer as a resource to get a sense of EV owner experience, technology, charging infrastructure, municipal planning considerations, and grant programs. Cross County Connection is a source of information and resources to help potential EV owners understand the technology and assist local governments and businesses meet the future demand for charging stations.

For those reading the print version of the EV Primer that would like to access web resources listed throughout, visit [www.driveless.com](http://www.driveless.com) to access an electronic version of this document. Cross County Connection's EV Resource Guide is also available on-line. It provides more specific information to assist a variety of audiences - the public, property developers, real estate companies, businesses, local governments, schools, and public transit agencies. The EV Primer and EV Resource Guide are companion pieces providing all audiences with the knowledge needed to transition to electric transportation, both now and into the future.

<sup>1</sup> [N.J.S.A. 48:25-1 et seq.](#)



# WHAT ARE EVs?



EVs are vehicles that use one or multiple electric motors powered by a rechargeable battery. Some EVs use battery-powered motors in tandem with a gasoline-powered internal combustion engine (ICE), referred to as a hybrid, while others are fully electric. EVs can significantly reduce fossil fuel consumption and greenhouse gas (GHG) emissions. As electricity generation continues to become cleaner, moving away from coal-powered plants to renewable sources, the environmental impact of driving an EV will become increasingly lower than that of a vehicle that solely relies on gasoline.

Hybrid vehicles have been around for a while, and they were most Americans' earliest introduction to electrification of motor vehicles. These used a small battery to assist the engine and improve gas mileage. While these are still around, these are not what most — including the government, media, and the automotive industry — call an EV. They are referring to plug-in EVs, which have two defining characteristics:

1. Batteries large enough to power the vehicle to travel using electric power alone
2. Plug into an external source of electricity to charge the batteries, whether it be a home-outlet or charging station

There are two types of plug-in EVs on the road today — plug-in hybrid vehicles (PHEVs) and battery electric vehicles (BEVs). This distinction is important as some information, including the financial incentives discussed in this primer, will only apply to BEVs, also referred to as fully electric vehicles.

## PLUG-IN HYBRID ELECTRIC VEHICLES (PHEV)

Like hybrid vehicles that have been around for years, PHEVs use both an ICE and an electric motor to power the vehicle. The difference is that a PHEV has a larger battery that is plugged in to charge. The larger battery provides the capability to drive using only electric power for short trips. Most of the PHEVs sold in the United States offer 30+ miles of fully electric driving range. The gasoline-powered engine can be used to supplement the electric motor to improve gas mileage or relieve the anxiety of being left stranded if the battery dies.

## BATTERY ELECTRIC VEHICLES (BEV)

BEVs are what consumers typically think of when discussing EVs. BEVs use a rechargeable battery that powers one or more electric motors to drive the vehicle. These fully electric vehicles have become the most popular type of plug-in EV, outselling PHEVs in NJ since 2018. In 2022, fully electric vehicle sales reached over 800,000 in the United States, nearly doubling the number sold in 2021.<sup>2</sup> The technology is improving with 14 models with a maximum range of 300 miles or more in 2022, up from five in 2021.<sup>3</sup>

<sup>2</sup>[The Wall Street Journal – January 6, 2023](#)

<sup>3</sup>[United States Department of Energy, Office of Energy Efficiency and Renewable Energy](#)

# EV MARKET GROWTH AND OPTIONS

The number of EVs on the market has grown substantially in the last decade. In 2011, EVs were still new. Two vehicles accounted for 98% of the 17,763 plug-in EVs sold in the US – the Nissan Leaf (BEV) and the Chevy Volt (PHEV). In late 2017, the Tesla Model 3 arrived, and dramatically changed the EV market. EV sales jumped 86% in 2018. The Model 3 was the top selling EV that year, with 139,782 sold. The next closest was the Toyota Prius Prime PHEV which sold 27,595 vehicles. Since its release over 804,200 Model 3s have been sold in the United States.<sup>4</sup>

The market is growing, with well over 1.6 million plug-in EVs sold in the U.S. between 2020 and 2022, and more than 10 million sold worldwide just in 2022 alone.<sup>5,6</sup> As of June 2023, there were 123,551 plug-in EVs registered in New Jersey. There were 338 in 2012.<sup>7</sup> There are 33 PHEV and 40 BEV light-duty cars and trucks available in 2023, with more on the way.<sup>8</sup> GM, Ford, Volkswagen, Mercedes, and Volvo have announced plans to feature an all-EV lineup sometime between 2030 and 2035. Even Apple is getting in the game, setting a target to release an EV in 2026.

## COMMERCIAL AND GOVERNMENT FLEET VEHICLES

For purposes of business and government related travel, EVs could replace existing ICE vehicles. In many cases they are cheaper to operate and maintain. Runnemede Township and the Borough of Collingswood in Camden County use EVs for lighter tasks such as trips associated with inspection and code enforcement. There are examples of police departments switching to EVs. This includes patrol vehicles in places as diverse as New York City and small towns like Bargersville, Indiana.

For other purposes, there are EV options outside of passenger cars, SUVs and pick-up trucks. Fully electric cargo vans, buses, garbage trucks and even tractor trailers are available as of 2020. Ford offers the E-Transit, a fully electric version of America's best-selling van. NJ TRANSIT operates eight battery-electric buses in Camden. This is the first step towards meeting the agency's goal of transitioning to a 100% zero-emission fleet by 2040.

For public entities interested in buying EVs, although options are limited, using the New Jersey State Purchasing Contract is a way to speed up the procurement process and save money. This ensures compliance with New Jersey's contracting and purchasing regulations.

### Entities eligible include:

- Municipalities
- Counties
- School Districts
- Volunteer Fire Departments and Rescue Squads
- County and State Colleges
- Independent Authorities
- Quasi-State Agencies
- Independent Institutions of Higher Education

### Plug-in EVs included in the purchasing contract are:

- Toyota Prius Prime – PHEV Compact Hatchback
- Nissan Leaf S – BEV Compact Hatchback
- Toyota RAV4 Prime – PHEV SUV
- Ford Mustang Mach-E – BEV SUV



<sup>4</sup>[United States Department of Energy. Alternative Fuels Data Center](#)

<sup>5</sup>[United States Bureau of Traffic Statistics](#)

<sup>6</sup>[International Energy Agency](#)

<sup>7</sup>[New Jersey Department of Environmental Protection](#)

<sup>8</sup>[United States Department of Energy. Alternative Fuels Data Center](#)

# BENEFITS OF EV ADOPTION

On top of being better for the environment, EVs have other surprising benefits for EV owners! This is especially true for BEVs.



## Less Expensive to Fuel

EVs have much lower fuel costs on average than conventional gasoline-fueled vehicles. Electricity is less expensive per mile than gasoline.

## Less Maintenance

BEVs have much simpler drive-trains than an ICE vehicle, so there are fewer parts that can break down. EVs also use the motor's resistance to slow down, reducing wear on brake pads and rotors. Electric motors also do not require oil changes!

## More Space

An engine and fuel tank take up a lot of space. In a BEV, the electric motors and the battery are underneath the car and not under the hood, freeing up space to allow for roomier interiors and extra storage.

## Performance

BEVs are fun to drive! Torque delivery (what actually makes the car go) is linear, meaning the car has full power from the get-go and accelerates faster than an ICE car with a similar amount of horsepower.



# OVERCOMING BARRIERS TO EV ADOPTION

## Financial Incentives

One drawback of EVs is that they can be expensive. As an example, in February 2023, the average cost of a new ICE vehicle was \$56,962, while the average cost of a BEV was \$65,202.<sup>9</sup> Both the state and the federal government offer financial incentives to offset some of the cost and make EVs a more attractive option. Compared to other states, New Jersey has a strong incentive package to help make purchasing a new BEV more affordable. The 2022 Inflation Reduction Act (IRA) made changes and additions to the federal EV purchase incentives that went into effect on January 1, 2023.

Key changes resulted in specifying which vehicles are eligible for the incentives. Only fully electric BEVs are eligible for state programs. Both BEVs and PHEVs are eligible for federal programs, though there are a series of requirements that limit which specific makes and models are eligible. Also, these requirements will change over time as efforts are made to boost battery production in the United States and its North American free trade partners.

### State EV Purchase Incentives

- Charge Up New Jersey is a tax rebate program that provides \$25 per mile of EPA-rated all-electric range, up to a maximum of \$4,000, for the purchase or lease of a new BEV. The rebate can be applied at the point of sale.
- Exemption from state vehicle sales tax

In April of 2023, the Charge Up New Jersey program was paused for the remainder of the fiscal year due to high demand. It is anticipated the program will return in fiscal year 2024, which starts on July 1, 2023. Purchasing a car earlier in the fiscal year, before it potentially runs out of funds, is suggested.

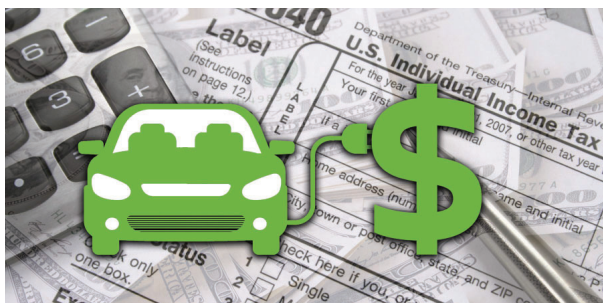
### Federal EV Purchase Incentives

The Inflation Reduction Act (IRA) of 2022 created three new tax credit programs for the purchase of EVs: the New Clean Vehicle Tax Credit, the Used Clean Vehicle Tax Credit, and the Commercial Clean Vehicle Tax Credit. These federal programs are non-refundable tax credits. A non-refundable tax credit only covers the amount you owe on your income taxes. If you owe less taxes than the credit you are eligible to receive, you will not receive the remainder as a refund. In 2024, however, the dealer can receive the credit and apply the savings at the time of purchase.

For all federal tax rebate programs, more information, including a list of qualified vehicles, can be accessed at [irs.gov/clean-vehicle-tax-credits](https://irs.gov/clean-vehicle-tax-credits). The requirements and list of eligible vehicles will be subject to change. While the requirements themselves can be a bit complicated to decipher, as long as you meet the income requirements and purchase a vehicle on the list, you will qualify for the credit.

### New Clean Vehicle Tax Credit

The New Clean Vehicle Tax Credit provides up to a \$7,500 tax credit for the purchase of a new plug-in electric vehicle. Both PHEVs and BEVs are eligible. Under the IRA, this program made significant changes to the previous federal tax incentive. Under the previous EV tax credit program, once a manufacturer had sold 200,000 EVs, those vehicles were no longer eligible for the rebate. Now, any EV that meets the federal requirements will receive the credit, regardless of the manufacturer. Both BEVs and PHEVs are eligible for the credit.



<sup>9</sup> [National Automobile Dealers Association](https://www.nada.com)



## Eligibility

To be eligible for the credit, the vehicle must:

- Have a battery storage capacity of 7 kilowatt-hours (kWh) or more
- Have undergone final assembly in North America
- Not exceed a manufacturer-suggested retail price (MSRP) of
  - \$80,000 for vans, sport utility vehicles, and pickup trucks
  - \$55,000 for other vehicles

On April 18, 2023, two battery production requirements were added. These impact eligibility and the maximum credit someone that purchased an EV can receive. These battery production requirements will increase year-to-year as part of an effort to limit battery material sourcing to United States free-trade partners and increase battery production in North America. Currently, China dominates the battery material sourcing and production world economy.

### The 2023 requirements are:

- 40% of the battery's critical minerals must be extracted or processed in the United States, or in any country with which the US has a free trade agreement, or were recycled in North America, and/or
- 50% of the battery components must be manufactured or assembled in North America

### The maximum allowable credit is:

- \$3,750 if the vehicle meets the critical mineral requirements only
- \$3,750 if the vehicle meets the battery components requirement only
- \$7,500 if the vehicle meets both
- If it meets neither, the vehicle is not eligible for any credit

The purchaser's eligibility to receive the credit is also based on their income.

Eligible recipients are:

- Individuals with adjusted gross incomes (AGI) of \$150,000 or less
- Heads-of-household with an AGI of \$225,000 or less, or
- Joint filers with an AGI of \$300,000 or less



More information about the New Clean Vehicle Tax Credit, including a list of qualified vehicles, can be accessed on [www.fueleconomy.gov/feg/taxcenter](http://www.fueleconomy.gov/feg/taxcenter). The requirements and list of eligible vehicles will be subject to frequent updates as more vehicles come into compliance.

## Used Clean Vehicle Tax Credit

Used vehicles are a common way to purchase a more affordable car. With many EV models now available, the inventory of used EVs will increase when they are traded in for new models. Previously, used vehicles did not qualify for any federal incentive program, but that has changed. The Used Clean Vehicle Tax Credit equals 30 percent of the sales price, up to a maximum \$4,000.

To qualify, the purchaser must:

- Be an individual who bought the vehicle for use and not for resale
- Not be the original owner
- Not be claimed as a dependent on another person's tax return
- Not have claimed another used clean vehicle credit in the 3 years before the purchase date

In addition, the purchaser's modified adjusted gross income (AGI) may not exceed:

- \$150,000 for married couples filing jointly or a surviving spouse
- \$112,500 for heads of households
- \$75,000 for all other filers

The vehicle must:

- Cost \$25,000 or less
- Have a model year at least two years earlier than the calendar year when bought
- Have a gross vehicle rating of less than 14,000 pounds
- Have a battery capacity of at least 7 kilowatt hours
- Be purchased from a car dealer who reports information at time of sale to the purchaser and the IRS
- Both BEVs and PHEVs are eligible for the credit



The list of vehicles that qualify for the credit is too extensive to include in this primer. At the time of publishing, there were 92 models that qualify for the Used Clean Vehicle Tax Credit. More information on this tax credit, including a list of qualified vehicles, can be found on [fuelconomy.gov/feg/taxused.shtml](http://fuelconomy.gov/feg/taxused.shtml).

## Commercial Clean Vehicle Tax Credit Program

The Commercial Clean Vehicles Credit is available to any individual or business that purchases a qualified commercial clean vehicle for business use. The size of the credit depends on vehicle weight: if the EV has a gross vehicle weight rating (GVWR) of less than 14,000 pounds, the credit is limited to \$7,500. For heavier-duty vehicles over 14,000 pounds, the maximum credit goes up to \$40,000. The New Clean Vehicle Credit and the Commercial Clean Vehicle Credit cannot be combined.

The amount of the Commercial Clean Vehicles Credit is the lesser:

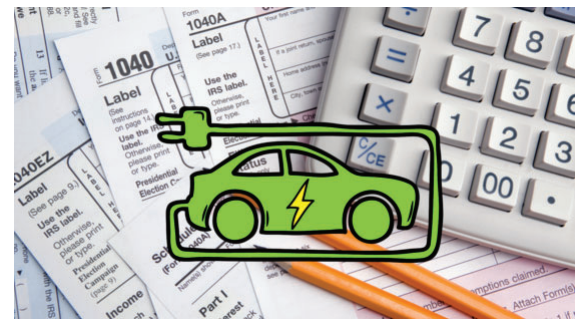
- 30% of the taxpayer's tax basis
- The incremental cost of the vehicle. Incremental cost is defined as the excess of the EV's purchase price, over the price of a solely gasoline-or-diesel-powered vehicle comparable in size and use to the EV purchased.

To qualify the purchaser must be a:

- Business or tax-exempt organization

The vehicle must be:

- Made by a qualified manufacturer. A list is provided at [irs.gov](http://irs.gov).
- A plug-in electric vehicle that draws significant propulsion from an electric motor with a battery capacity of at least:
  - 7 kWh if the GVWR is under 14,000 pounds
  - 15 kWh if it is over 14,000 pounds
- For use in a business, not for resale
- For use primarily in the United States



At the time of publication, the IRS was still finalizing the form to apply for the commercial credit and will provide updates at [irs.gov/credits-deductions/commercial-clean-vehicle-credit](http://irs.gov/credits-deductions/commercial-clean-vehicle-credit).

## Range Anxiety

Range anxiety refers to the fear of running out of battery while on the road, leaving you stranded. Virtually any EV currently on the market has the necessary range to easily handle everyday driving. An American Automobile Association (AAA) survey finds that the average person drives 31.5 miles per day.<sup>10</sup> The average range of BEVs in 2021 reached 234 miles per charge, meaning a typical driver will not often have to worry about charging while on the road before arriving home.<sup>11</sup>

A Volvo and Harris Poll survey found that prior to purchasing an EV, current owners overestimated how often they would need to charge somewhere other than at home. Among EV owners polled, 65% had range anxiety prior to purchase, but found that concern dissipated after a few months. In fact, according to the US Department of Energy, 80% of EV charging takes place at home.<sup>12</sup>

However, some very real concerns may justify potential EV buyers' apprehension when it comes to forgoing the pump for the plug. Even though most needs can be met by charging at home, the long-distance road trip is still something most prospective buyers want to do without the stress of worrying if they will have access to a charging station. And for those without a driveway or garage, even the home is not a reliable charging option. This makes it difficult for those living in cities, apartments, and other forms of multi-family housing to consider switching to an EV, limiting their impact in areas where air quality is often in the most need for improvement.

## Overcoming Range Anxiety

Both the private and public sectors have a role to play in overcoming the real and perceived factors contributing to range anxiety. Expanding charging station availability is the single most important way to encourage more people to switch to EVs. The Volvo and Harris Poll survey found that 61% of non-EV drivers would be more likely to purchase an EV with an increase in public charging station availability, making it the number one factor that could sway them to switch from an ICE vehicle.

As of 2022, most locations in New Jersey are within a 25-mile radius of a fast-charging option that is capable of providing a full charge in under 30 minutes.<sup>10</sup> While this is a good start, drivers want to see more public charging infrastructure to instill confidence that they can switch to an EV. Charging stations in visible and convenient locations is the best way to address a prospective EV buyer's fear.

<sup>10</sup> [American Automobile Association \(AAA\)](#)

<sup>11,12</sup> [United States Department of Energy, Office of Energy Efficiency and Renewable Energy](#)

<sup>13</sup> [New Jersey Clean Air Council](#)



# CHARGING STATION BASICS

In New Jersey, charging infrastructure is continually expanding with the number of charging stations increasing every year. Charging stations can have one or more ports, the equivalent to a fuel pump for ICE vehicles. As of August 2023, there are 2,004 Level 2 and 916 DC fast charging ports that are publicly accessible in New Jersey.<sup>14</sup>



## TYPES OF CHARGING STATIONS

Not all EV chargers are created equal. Some charge quickly, while others are better suited for overnight charging. Here is an overview of charger types.

- **Level 1** – Refers to simply plugging into a normal 120 volt outlet found at home. Adds 3-5 miles of range per hour.
- **Level 2** – Adds 10-20 miles of range per hour. Good for use at offices and places where an EV will be parked for a few hours. A Level 2 charger is 240 volts and can be installed at home.
- **Level 3** – Depending on the vehicle and charging equipment, a Level 3 station can typically add 90-120 miles of range per half-hour. There are currently two types of Level 3 charging stations – Tesla Superchargers and DC fast chargers. Teslas can use either station type. All other brands must use DC fast, however this is changing. Car manufacturers, including Ford, GM, and Volvo will be using Tesla’s North American Charging Standard (NACS) technology starting with 2024 model year EVs.

These are a few terms that are helpful to understand when researching charging stations, especially when researching the grant and financial incentive programs that support their installation.

**Make-Ready:** Anything that goes into pre-wiring a parking space(s) to support a Level 2 or 3 charging station. This includes service panels, junction boxes, transformers, meters, conduit wiring, and other items associated with preparing a site for EV charging station installation.

**Electric Vehicle Supply Equipment (EVSE):** EVSE is the charging station and all its components – the circuits, cables, ports, and plugs. This also covers the point-of-sale equipment if fees are collected.

**Ports:** These are the equivalent of the fuel pump for an EV. Some charging stations may have one port, while others have multiple ports, capable of charging multiple vehicles at one time.

State and federal grant programs prioritize the installation of Level 2 and 3 charging stations to create confidence in the state’s EV charging network and make owning an EV a more practical choice for everyone. New Jersey’s utility companies also offer incentives to support the installation of charging stations. These programs are open to businesses, governments, non-profit organizations, educational institutions and owners of multi-family residential properties and multi-tenant office properties. Some programs will cover EVSE and make-ready costs, while others, may only cover make-ready costs. Information on these programs can be found in *Grants and Incentive Programs*, pg 21.

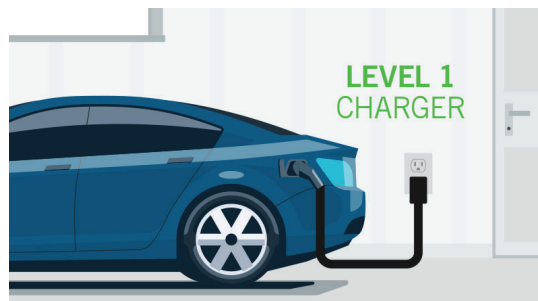


<sup>14</sup> [Atlas Public Policy](#)

## IDEAL LOCATIONS FOR CHARGING STATIONS

### Level 1 Stations

The only truly viable locations for Level 1 stations are places where consistent access to overnight charging is expected - most commonly, the home. Someone who does not drive every day or has a short commute may find a Level 1 charger adequate. Level 1 chargers may also be sufficient for a PHEV's smaller batteries.



### Level 2 Stations

With charge rates of 10-20 miles per hour, Level 2 stations are well suited for those with longer commutes or that drive every day. Level 2 stations are well suited for the home and locations where someone can expect to park for a few hours such as a movie theater, shopping center, or place of work. Hotels are well-suited for Level 2 stations and may ease concerns about range anxiety of longer-range trips, such as vacations. Property owners need to consult with experts prior to installation to evaluate if they have the capability to properly accommodate charging stations and what is needed to lay the groundwork to do so. These experts include utility companies, electrical contractors, and charging station providers.

#### *Level 2 Stations at the Workplace*

The workplace is typically where someone spends the second most time during the day. Having the opportunity to charge at work would certainly make the decision to purchase an EV easier. From the employer's perspective, offering charging stations could be an extra benefit to current employees and an incentive to prospective hires. Providing workplace charging also demonstrates a commitment to environmental sustainability. From a commercial property owner's perspective, current and potential tenants will find office properties with EV charging stations desirable.



### Where to Prioritize Level 3 Charging Stations

Level 3 stations are appropriate for convenient and safe locations where individuals typically stop for 20 or more minutes and experience a lot of traffic. With current technology, EV owners need to wait longer than they would for a fill-up at the gas station. Charging times for every BEV will differ, but generally it takes up to 30 minutes to charge an EV battery to the recommended 80% Level using a Level 3 charging station. These Level 3 charging stations require a 480-volt circuit, so they are more suited for commercial areas such as highway rest stops, shopping centers, and community charging hubs. They are ideal for locations where patrons expect to spend approximately 30 minutes of their time to allow for a quick charge.

#### *Shopping Centers*

Malls, grocery stores, restaurants, convenience stores are the types of places where it is becoming more common to see Tesla and Level 3 Charging stations. While Level 2 chargers may be adequate, the Level 3 charger's 20-30 minute charge time is more attractive in many cases. This brings in customers as the EV owner will want to do something productive while waiting, such as running errands, shopping, or visiting a restaurant.

Large supermarket chains have taken note and added charging infrastructure as an amenity for customers. Walmart pledged to install 120 charging stations at their stores nationwide, with plans to add more. Somerdale's Walmart Supercenter currently features eight charging stations. The Somerdale Walmart is an approximate two mile drive from entrance/exits for I-295 and the NJ Turnpike. Other ideal locations would be gyms and fitness centers. The Volvo and Harris Poll survey found that respondents identified the gym as a top location to charge.

However, the costs of a Level 3 charging station are significantly higher than Level 1 or 2. Level 3 stations can cost between \$28,400 to \$140,000 with higher costs for networked stations, while a Level 2 station can cost between \$1,400 to \$4,100.<sup>15</sup> The anticipated usage of the station should be taken into consideration before moving forward. NJDEP's It Pays to Plug In program has provided funding support for Level 3 chargers along priority highway corridors including I-295 and the NJ Turnpike, and in community locations where large concentrations of people live and work. You can see where priority locations are on the NJDEP website, [dep.nj.gov/drivegreen/it-pays-to-plug-in](http://dep.nj.gov/drivegreen/it-pays-to-plug-in).

### *Interstates and Highways*

Much like gas stations tend to cluster around highway exits, Level 3 Chargers are becoming more common at these locations. Visit a Wawa in South Jersey just off the NJ Turnpike or I-295, and there is a good chance you will see a charging station. Level 3 charging stations offer an opportunity for businesses along a busy highway or interstate corridor to bring in customers that are traveling through the area in addition to local customers.

Rest stops are also logical places to install Level 3 stations. The state has pledged to install 240 stations along the NJ Turnpike and Garden State Parkway by 2033. The South Jersey Transportation Authority (SJTA) has plans to install four Level 3 stations at the Atlantic City Expressway's Farley Service Plaza.

<sup>15</sup> [United States Department of Energy, Alternative Fuels Data Center](http://www.eia.doe.gov)



## EXPANDING CHARGING STATION ACCESS TO ALL

### Apartments and Multi-Family Residences

For those who live in apartments or other multi-family units, charging at home could be a challenge. For property managers and developers, providing charging stations in dedicated EV parking spots is an effective way to attract tenants, especially as the EV market continues to grow.

For multi-family buildings, no two cases are the same. Here are some things property managers and developers need to consider:

- Logistics: Is parking assigned, deeded, or first-come, first-served at your building?
- Electrical Capacity: Property managers must determine whether the building has enough additional electrical capacity when adding charging infrastructure.
- Cost recovery: Will your building charge its tenants to use charging infrastructure? If so, property managers should determine how that will work. Some methods used are assigning chargers to individual drivers or installing charging equipment with a payment system.

New Jersey provides grant programs to help cover the costs of installing charging stations in locations with multi-family housing properties. Those with a minimum of four units are eligible for NJDEP's *It Pay\$ to Plug In* grant program, which is detailed in the *State Programs and Incentives* section of this primer.



### Making Charging Stations Work in Cities

For city dwellers, charging is more difficult. Residents often do not have a driveway or garage to plug in at home. Some cities are creating dedicated curbside spots for EVs equipped with Level 2 stations. Cities in California have taken measures to ensure residents can purchase an EV with peace of mind that they can charge it. Los Angeles has installed charging stations utilizing existing light-poles to create dedicated curbside EV parking spots. The City of Sacramento provides Level 2 stations in city owned garages and parking lots and offers lower parking rates for BEV owners, who pay 50% less for monthly parking compared to their neighbors with ICE vehicles.



# MAKING MUNICIPALITIES EV FRIENDLY

## NEW JERSEY LEGISLATION

Starting 2020, a package of bills was passed that require municipalities to lay the groundwork for the expansion of EV charging stations. In addition, Governor Murphy filed of the Advanced Clean Cars II (ACCII) proposal with the Office of Administrative Law in July 2023. ACCII requires vehicle manufacturers to sell 100% Zero Emission Vehicles (ZEVs) by 2035. As of August 2023, this proposal was open for public comment.



### Recent State EV Legislation

**NJ P.L.2019, c.267** - This law, passed in January 2020, amends New Jersey's Municipal Land Use law (MLUL) to include provisions requiring municipalities to inventory current EV infrastructure and identify future locations for charging stations during their master plan re-examination. This re-examination must be completed every 10 years. The law also amends the Local Redevelopment and Housing Law (LRHL) to require publicly available electric vehicle charging infrastructure be considered in local redevelopment plans.

**NJ P.L.2021, c.168** - This law, passed in July 2021, encourages the development of zero-emission vehicle (ZEV) fueling and charging infrastructure in redevelopment projects. EVs are one type of ZEV, but they also include hydrogen fuel cell vehicles, technology that is currently not as readily available on the market. Most importantly, the law also provides for additional funding opportunities to help municipalities purchase and install charging stations. Specifically, the law authorizes municipalities to use revenue streams available for funding infrastructure related to redevelopment projects to install publicly available charging stations.

**NJ P.L. 2021, c. 171** - This law, also passed in July 2021, mandates that an application for development, submitted solely for the installation of electric vehicle supply equipment (EVSE) or make-ready parking spaces, is now a permitted accessory use and permitted accessory structure in all zoning or use districts regardless of the municipality's zoning ordinance. EVSE is the charging stations themselves and make-ready spaces refers to the electrical infrastructure required to support the stations. The new law also sets numerical requirements on the number of parking spaces that must be make-ready for charging stations.







To streamline the zoning and site plan review processes for municipalities, the law required the New Jersey Department of Community Affairs (NJDCA) prepare a model ordinance. The NJDCA published the *Model Statewide Municipal Electric Vehicle (EV) Ordinance* on September 1, 2021. The ordinance is mandatory and became effective in all municipalities upon publication, superseding any previous municipal requirements associated with EV charging stations and EV parking.

### What is in the NJDCA Statewide Municipal Electric Vehicle (EV) Ordinance

The NJDCA *Model Statewide Municipal Electric Vehicle (EV) Ordinance* requires municipalities to designate EV charging stations as a permitted accessory use in all zoning or use districts. The ordinance also includes all associated installation and parking requirements.

Some of the key provisions included in the ordinance are as follows:

- Municipalities may not make changes to any section of the model ordinance other than the Reasonable Standards section, which can be adjusted to fit a location's needs and context. These standards include:
  - Size and location of accessible EVSE and make-ready parking spaces
  - EV-only parking, violations, use of time limits
  - Safety Issues - lighting, setbacks, mounting of EVSE, cord management system, etc.
  - Signage (regulatory and wayfinding)
  - Usage fees
- EVSE or make-ready parking spaces shall be considered permitted accessory use and permitted accessory structure in all zoning or use districts and shall not require a variance.
- The ordinance applies to existing buildings and new buildings. If existing, it shall not require site plan approval and shall be approved through issuance of a zoning permit.
- Parking spaces with EVSE or make-ready shall count as at least 2 parking spaces in the calculation of minimum required parking spaces.
- To secure site plan approval for multi-unit residential projects with five or more units, including mixed-use development, the requirements are:
  - Immediately upon construction: 15% of parking spaces shall be make-ready and 1/3 of those shall have EVSE installed
  - Within 3 years: install EVSE in an additional 1/3 of the original 15%
  - Within 6 years: install EVSE in the final 1/3 of the original 15%
  - Overall, at least 5% of EVSE must be accessible for people with disabilities
- For all other non-residential projects involving a parking lot or garage, the minimum number of spaces required to be make-ready are as follows:
  - 50 or fewer: one
  - 51-75: two
  - 76-100: three
  - 101-150: four, with at least one being accessible to persons with disabilities
  - 150+: 4% of total spaces, 5% of which shall be accessible to persons with disabilities
  - Retail specific properties with 25 or fewer spaces are not subject to these requirements
- For all project types, the municipality may encourage (but not require) additional EVSE or make-ready parking spaces.

For a full copy, visit the NJDCA's Division of Local Planning Services (LPS) website:

[www.nj.gov/dca/divisions/lps](http://www.nj.gov/dca/divisions/lps). The ordinance is subject to change, so it is important to check its content regularly.

### **Additional considerations for municipalities**

Charging fees: Much like a municipality would charge a fee to park through the use of meters/parking stations, charging stations can be equipped to charge a fee. Typical rates are \$1.50 - \$2.00 per hour. This can be in addition to or replace regular parking fees. On the other hand, allowing EVs to park for free while charging in paid lots or metered spaces could be a perk to encourage EV adoption.

Time limits and restrictions: Specifying a time limit for charging in a parking code is a measure to prevent EVs from staying parked in a charging station for too long. A best practice is to restrict the use of EV charging station parking spaces to vehicles that are plugged in and actively charging. To avoid having EVs dwell too long, charging fees can increase after a few hours, and/or parking rates can increase over time.

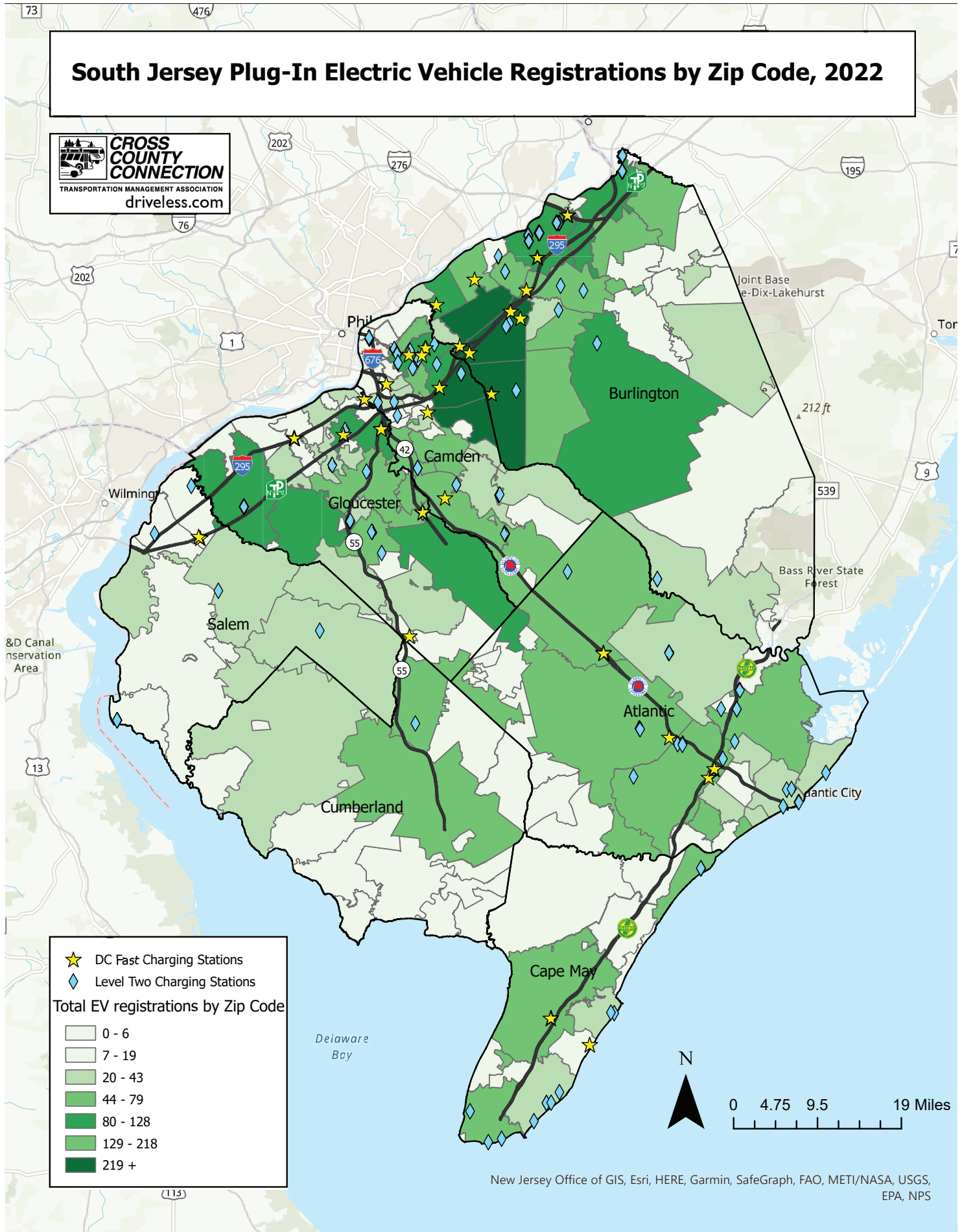
Permitting and inspection: Transitioning municipalities towards being EV-friendly can be difficult if permitting and inspection processes are not easy to understand. Producing information on EV charging infrastructure permitting and streamlining the permitting and inspection process is an effective way to make the transition to EVs smooth for both residents and businesses.

## **LOCATION OF EV CHARGING STATIONS RELATIVE TO PROJECTED EV REGISTRATIONS IN SOUTH JERSEY**

Cross County Connection has created a map, displayed on the next page, that shows where charging stations are currently located in relation to the projected number of EV registrations per zip code in 2025. Currently, in parts of South Jersey where projected EV growth is high, there are noticeable gaps where there is little to no access to publicly available charging stations. In these areas, a driver may not see a charging station during their day-to-day travels. With these new planning laws in place, it is time to identify those locations where charging stations should be located in South Jersey.



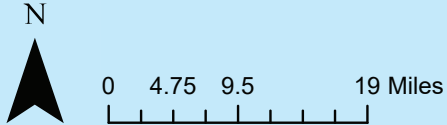
# South Jersey Plug-In Electric Vehicle Registrations by Zip Code, 2022



★ DC Fast Charging Stations  
◆ Level Two Charging Stations

**Total EV registrations by Zip Code**

	0 - 6
	7 - 19
	20 - 43
	44 - 79
	80 - 128
	129 - 218
	219 +



New Jersey Office of GIS, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS

## South Jersey EV Ownership and EV Charging Station Location Facts

- Within Cross County Connection's seven counties, there are 34 public Level 3 Charging station locations and 105 public Level 2 charging station locations.
- Charging stations are clustered in the urban areas in Burlington and Camden Counties, as well as within the shore communities.
- The zip code with the most charging stations is 08016 (Burlington City). The city has seven total stations: two Level 3 station locations and five Level 2 charging stations.
- There is only one charging station location within the entirety of Cumberland County, a Level 2 station in Vineland. There are a total of 222 EV registrations in that county.
- Despite having high numbers of EV registrations, Voorhees and Moorestown do not have any publicly accessible EV charging stations, according to NJDEP data.

The top five zip codes in terms of total EV registrations are all adjacent to one another in Burlington and Camden Counties.

1. 08003 - Cherry Hill (366)
2. 08057 - Moorestown (305)
3. 08043 - Voorhees (303)
4. 08054 - Mt. Laurel (289)
5. 08053 - Marlton (252)

The following is the top five zip codes in terms of EV's share of total vehicle registrations in South Jersey. 7 EVs account for 1.26% of all vehicle registrations in the entire South Jersey seven-county region.

1. 08057/Moorestown (3.90%)
2. 08033/Haddonfield (3.30%)
3. 08003/Cherry Hill (3.28%)
4. 08043/Voorhees (2.76%)
5. 08402/Margate (2.74%)

Note: Only zip codes with a minimum of 1,000 total vehicle registrations were evaluated to avoid small zip codes skewing the results



# GRANTS & INCENTIVE PROGRAMS

New Jersey state agencies and local utility companies offer grant and incentive programs to assist with purchasing and installing EV charging stations. There are opportunities available to support municipalities, counties, businesses, and even private residents. Programs administered through the New Jersey Department Environmental Protection (NJDEP) and the New Jersey Board of Public Utilities (NJBPUB) require the use of “networked” smart chargers. These are equipped with software to manage the stations online. This allows for charging user fees, tracking usage, identifying issues, and controlling other functions remotely. This software is provided through a network service provider. NJDEP maintains a list of approved network service providers on [dep.nj.gov/drivegreen/network-service-providers](http://dep.nj.gov/drivegreen/network-service-providers).

For an extensive list of grants and incentives, see Cross County Connection’s EV Resource Guide at [www.drivess.com](http://www.drivess.com).

## New Jersey Department of Environmental Protection (NJDEP) - It Pay\$ to Plug In

The [It Pay\\$ to Plug In program](#) is open to businesses, government entities, non-profit organizations, educational institutions, and multi-unit dwellings. NJDEP will reimburse grantees for charging stations by type. Reimbursement for charging port types is as follows:

- \$750 per Level 1 port
- \$4,000 per Level 2 port
- \$200,000 for Level 3 Chargers, with a 2 port minimum per grant



## New Jersey Board of Public Utilities (NJBPUB)

Multi-Unit Dwelling (MUD) EV Charger Incentive

This NJBPUB incentive program, open to property owners and municipalities, offers up to:

- \$4,000 towards the purchase of a dual-port, networked Level 2 charging station
- \$6,000 towards the purchase of a Level 2 EV charging station in an NJDEP identified overburdened municipality



## EV Tourism Grant

This program is open to businesses and municipalities. It is limited to key New Jersey tourism sites, landmarks, and other areas of interest, ranging from boardwalks, parks, overnight lodging establishments, and others. The program offers:

- Up to \$5,000 for eligible networked Level 2 charging stations. Maximum of six chargers.
- Up to \$50,000 for a Level 3 Charger. Maximum of two chargers.

You can find more information on these programs at the NJBPUB website, [njcleanenergy.com/ev](http://njcleanenergy.com/ev).

## Local Utility Companies

### PSE&G Electric Vehicle Charging Program

This program covers make-ready costs required for the installation of Level 2 or 3 charging stations within PSE&G’s service area. It is open to state government agencies, schools, nonprofits, businesses, multi-unit dwellings, and individual residents. Incentives vary based on location and charger type:

- Residences — on-bill credit of up to \$1,500 per Level 2 charger
- Mixed-use commercial sites — on-bill credit of up to \$30,000 per Level 2 charger, with a four port maximum
- Level 3 charging — on-bill credit of up to \$100,000 per site with a four port maximum

### Atlantic City Electric EV Smart Program

This program covers make-ready costs required to install Level 2 or Level 3 charging stations within Atlantic City Electric’s service area. It is open to state government agencies, schools, nonprofits, businesses, multi-unit dwellings, and individual residents. The incentives vary based on location, charger type, and use:

- Public chargers — rebates up to \$4,500 per Level 2 charging port. Up to \$60,000 per Level 3 charging port. There is a two port maximum per site.
- Workplace — rebates up to \$4,500 per Level 2 charging port with a 10 port maximum.
- Fleet vehicle chargers — rebates up to \$2,500 per Level 2 charging port with a 10 port maximum.
- Single family residential - rebates up to \$1,000 for a single Level 2 charging port.
- Multi-family housing - rebates up to \$5,000 per Level 2 charging port, or \$6,700 in NJDEP identified overburdened communities, with a 10 port maximum.



**PSEG**



# E-BIKES

Recent years have seen a significant growth in the popularity of a different kind of EV—e-bikes. Their ability to replace short motor vehicle trips makes them an attractive option for many commuters and recreational riders alike. State and local governments have seen the benefits of e-bikes and established rebate programs to lower costs. E-bikes can lead to increased levels of biking, reduce congestion, and improve air quality. They also could be a transportation option for lower-income populations that cannot afford a motor vehicle.



## What is an E-Bike?

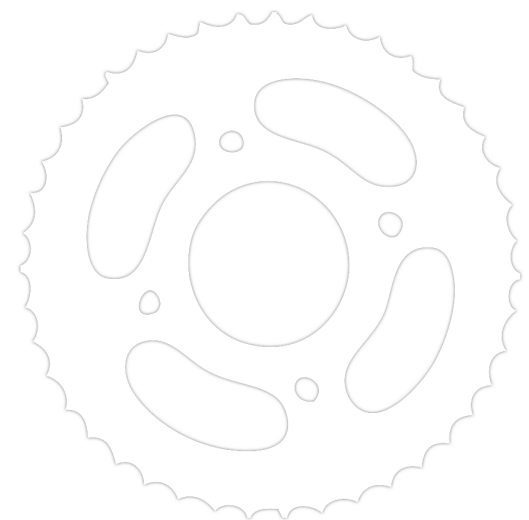
An e-bike is a bicycle with an electric motor that assists the rider with pedaling. Depending on the model, an e-bike can have a range between 20 to 100 miles and be fully charged in 3-6 hours when plugged into a standard household 110v socket. Many e-bikes have removable batteries, making charging in the home easier. They often feature much thicker tires and heavier frames as well, giving them the ability to traverse rough terrain.

There are two types of low-speed e-bikes on the market, class 1 and class 2, which can reach a maximum assisted speed of 20 mph. These classes are categorized as bicycles and are subject to the same laws and regulations. Faster class 3 e-bikes are also available but with more restrictions and registration requirements because they are classified in the same category as mopeds.

**Class 1**— Referred to as pedal-assist, require the rider to pedal in order to receive assistance from the electric motor. A rider does not need to pedal as hard as they would on a regular bike to get up to speed.

**Class 2**— Referred to as throttle-assist, allow the rider to engage the electric motor regardless of whether they are pedaling or not. This can allow the rider to achieve higher speeds with more ease but will drain the battery faster than pedal-assist.

**Class 3** — These e-bikes are not classified as low-speed electric bicycles but rather motorized bikes, such as mopeds, which can travel up to 28 mph. This makes them a good option for commuting as well. These have stricter regulations, such as requiring registration and helmet use at all times.





## E-BIKES, cont'd.

### Growth in Popularity

The e-bike market has substantially outpaced the electric vehicle market. During 2020 and 2021 in the United States, more than 900,000 electric vehicles were sold.<sup>16</sup> Within the same years, more than 1.3 million e-bikes were sold.<sup>17</sup> With prices ranging from approximately \$500 to \$3,000, e-bikes have become a widely available transportation option, and for many, one that can replace a significant number of car trips.

### Benefits of E-Bikes

**Low-Cost**– E-Bikes require no registration (class 1 and 2 only), have no fuel tank to fill with gas, and contain hardly any recurring costs other than the electricity used to charge them.

**A Viable Option for Non-Drivers**–People who do not own a car can increase their effective travel range and employment opportunities by investing in an e-bike. One survey of more than 11,000 consumers found that nearly 40% of those who own an e-micromobility vehicle use them to commute.<sup>18</sup> E-micromobility refers to using small EVs that operate at speeds lower than 30 MPH including e-bikes, e-scooters and e-mopeds.

**Faster & Further Travel**– E-Bikes' electric motors give the rider a boost. It will be much easier to go up hills and take faster, longer rides since the user will be less fatigued than they would be when riding standard bicycles.

**Exercise**– While they are easier to pedal than a regular bike, e-bikes are still an excellent way to get some exercise while commuting or riding for recreation.

**Reduced Climate Impact**–As compared to driving a car, operating an e-bike contributes to none of the greenhouse gas emissions that cause global warming.

**Reduced Congestion** – With each car trip replaced with an e-bike trip, there is one less car on the road, resulting in less traffic and faster commutes. Surveys suggest that one third of e-bike trips taken replaced a car trip.



<sup>16</sup>[United States Bureau of Traffic Statistics](#)

<sup>17</sup>[Bicycling.com](#)

<sup>18</sup>[BCG.com](#)

## E-BIKES, cont'd.



### Barriers

**Lack of Infrastructure** – As with regular bikes, e-bikes benefit from bike lanes and bike paths being available. Without bike paths, e-bike users are forced to ride on the road. Many potential users may not feel comfortable riding alongside traffic, even if they can travel at the same speed. With faster speeds, inexperienced riders will need safe and predictable pathways to stay safe and maintain a pace at which they are more comfortable.

**Restrictive Policies** – Individual municipalities of New Jersey have the right to approve their own regulations on e-bike use. This means that a policy could, for example: impose speed limits for e-bikes; require e-bikes be officially registered with the community; require helmets on e-bike riders; ban e-bikes in specific areas; or ban the use of e-bikes entirely.



An outright ban of e-bikes is an extreme measure, and not recommended, as e-bikes have great potential to increase access to employment opportunities for residents of disadvantaged communities, specifically those for which owning a motor vehicle is not convenient or even possible. They can also give older adults and persons with disabilities, who are unable to operate standard bicycles, the opportunity to bike. It is important for municipalities to implement forward-thinking policies which take into consideration the positive impacts e-bikes can have on equity and accessibility and strike a balance between safety and travel independence for many.

**Making Municipalities E-Bike Friendly** – Investments put into bike lanes and bike corrals, with or near electrical outlets to plug into, will make using e-bikes safer and more convenient for riders and will prepare municipalities for the rising popularity of e-bikes in the future. Ensuring that places such as commercial areas and schools have ample bike parking is a must for making cycling a more attractive option, and creating charging opportunities will also reduce range-related anxiety among riders. Municipalities may also want to invest resources into e-bike education programs so that citizens are able to ride safely and confidently.

**National Examples of E-Bike Incentives** – The upfront cost of an e-bike is a barrier for many people wanting to enjoy the increased access and freedom that they can provide. For this reason, some states and municipalities provide substantial tax incentives and rebate programs for the purchase of e-bikes. Some examples of state incentive programs include:



- **Denver, Colorado's** incentive program, which gives residents a \$300 rebate to purchase an e-bike. For qualifying lower-income residents, the rebate is \$1,200 and for persons with disabilities, \$1,400 when purchasing an adaptive e-bike, customized to meet their needs.

- In **Massachusetts**, residents receive a \$500 rebate, and low-income residents can receive a \$750 rebate.

- In **Connecticut**, residents can receive a \$300 incentive, and low-income residents can receive a \$700 rebate.



## E-BIKES, cont'd.



### E-Bikes as Tools for Equity

E-Bikes' longer range compared to standard bicycles and relatively low cost compared to automobiles put them in a unique position to make a substantial impact on equity in transportation. Realizing this, the state of California plans to distribute \$10 million in e-bike rebates, with up to 80% going to low-income families.

**Bikeshare** – For those that still cannot afford the full cost of purchasing an e-bike, bikeshare programs can give them the opportunity to access these devices. Philadelphia's Indego electric bike-share program features an annual pass for low-income residents that costs just \$48 a year and 7 cents per minute to ride their e-bikes. Low-income neighborhoods accounted for 34% of rides taken on Philadelphia's Indego electric bikeshare program. Compared to the 22% they accounted for on Indego's standard bicycles during the same year. As another example on how to provide access to low-income populations, while open to all, Nashville's public libraries distribute free passes to use the city's e-bikeshare system. The pass allows 2-hour rides for up to a week at a time.



**E-Bike Libraries** – While a bikeshare system like Indego may not be viable for many South Jersey communities, e-bike libraries may be a potential alternative. Many have become established across the country, such as Local Motion, a Vermont non-profit that allows residents to borrow e-bikes free of charge. Equitcity in Chicago, Illinois does the same, and their libraries double as community gathering centers and mobility hubs. Equitcity and its partners have helped establish free e-bike libraries in other cities as well, including Pacoima, CA, and Buffalo, NY.



# ADDITIONAL RESOURCES

The following is a list of web resources covering purchasing EVs, information on planning for and installing charging stations, as well as grants and incentive programs that can help cover some or all of the costs

- **NJDEP's [Drive Green NJ](#)** website provides information on grants and programs available, along with a multitude of other resources on EVs including the [Electric Vehicle Resources Fact Sheet](#), which covers all the incentives, policy and planning support initiatives throughout the state for EV adoption and the [Public Electric Vehicle Charging Locator](#) map, which provides up-to-date locations of EV charging stations in New Jersey
- **The Delaware Valley Regional Planning Commission (DVRPC)** hosts a series of helpful guides and tools related to EVs and charging stations available at [dvrpc.org/energyclimate/electricvehicle](http://dvrpc.org/energyclimate/electricvehicle). A highlight is the Electric Vehicle Resource Kit for Municipalities, which addresses the question of “What should my municipality do about electric vehicles?”. It is written specifically for municipal managers in Pennsylvania and New Jersey, with a focus on the Greater Philadelphia region. However, the information it provides is likely to be useful to other audiences, including businesses, fleet managers, and potential electric vehicle owners.
- **The North Jersey Transportation Planning Authority (NJTPA)** has a series of resources that can be accessed at [ev-resources-njtpa.hub.arcgis.com](http://ev-resources-njtpa.hub.arcgis.com). Resources include:
  - Adding EVs to government and commercial fleets
  - Best practices for local governments and advocates to accelerate EV adoption. This includes information about creating an EV-friendly government administration, installing public EV infrastructure and promoting EVs to the community.
  - Incentives and federal funding to install EV charging infrastructure and purchase EVs
- **ChargeEVC NJ**, a coalition that advocates for electric vehicles in New Jersey, regularly provides legislative updates, prepares policy documents, and provides helpful documents and links on their website, [chargevc.org/new-jersey](http://chargevc.org/new-jersey).



# WE ARE HERE TO HELP!



**And of course Cross County Connection TMA is here to help** local businesses and governments get started with funding and implementing charging stations. The organization offers EV webinars, stays up-to-date on best practices and has connections to state agencies and organizations that can provide further information to guide local governments and businesses through the EV planning process. Cross County Connection also offers several services related to planning, including:

- **EV ordinance research, planning and development**
- **Providing information on the expanding list of funding sources for EVs in New Jersey**
- **Connecting your municipality to local experts on installing and operating EV charging infrastructure**
- **Guidance on charging station locations**



**Contact us for assistance at (856) 596-8228 or at [ccctma@driveless.com](mailto:ccctma@driveless.com)**





**CROSS COUNTY CONNECTION** is the NJ state-designated Transportation Management Association for southern New Jersey's seven-county region: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem.

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