New York State Energy Research and Development Authority

ENERGETICS
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WXY

PROMOTING ELECTRIC VEHICLE CHARGING STATION INSTALLATIONS

Increasing Planner's & Municipal Planning Board's Involvement

Genesee Finger Lakes Regional Planning Council
Regional Local Government Workshop
May 19th, 2017

NOTICE

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KEY ACRONYMS

EV	Electric Vehicle (charges its batteries by plugging in)
BEV	Battery Electric Vehicle (only electric motor and battery)
PHEV	Plugin Hybrid Electric Vehicle (electric motor and gas engine)
kWh	Kilowatt-hours (electrical energy stored by batteries)

EVSE	Electric Vehicle Supply Equipment or EV Charging Station
AC	Alternating Current (electrical grid)
DC	Direct Current (batteries)
kW	Kilowatt (electrical power of motors or chargers)

NYSERDA	New York State Energy Research and Development Authority
NYSDEC	New York State Department of Environmental Conservation
NYPA	New York Power Authority
TCI	Transportation and Climate Initiative (Northeast & Mid-Atlantic)
U.S. DOE	United States Department of Energy

ABOUT US

As a public benefit corporation, **NYSERDA** offers objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. NYSERDA advances energy solutions while working to protect the environment.

Energetics Incorporated is an engineering and management consulting firm assisting government and industry in developing new solutions in energy, climate, transportation, and security.

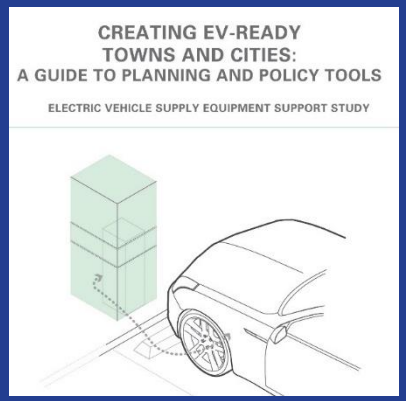
WXY

WXY architecture + urban design is a planning and design firm focused on social and environmental transformation of the public realm at multiple scales.

KEY EV & EV CHARGING EXPERIENCE

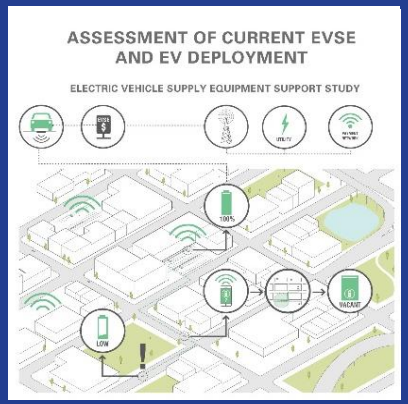
Staff have assisted with the deployment of EV and EV charging stations across NYS

EVSE Siting and Design Guidelines

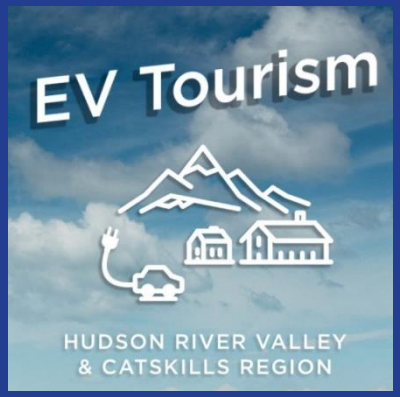


Creating EV-Ready Towns and Cities

Best Practices for EV Charging



Assessment of EVSE and PEV Deployment



EV Tourism in New York State

Green Loading Zones

EV Plans for I-90 Regions

EVSE Deployment Program Support (700+ Charging Ports)

USING THIS RESOURCE

The purpose of this resource is to help facilitate EV charging station installations

1. **Who is this resource for?**

   Developed primarily for planning board members throughout New York State, this may also be helpful for zoning board members, planners, and developers.

2. **How can this resource be used?**

   View the entire presentation for an educational overview on EVs and charging stations, then keep and use as a reference when addressing these topics in your community.

3. **What does the resource cover?**

   Information and reports on EVs and EV charging stations, municipal planning tools, and case studies with real-life examples of EV infrastructure deployments.

CLICK HERE

External links with more information on each topic!

- Website
- Link to PDF
- Embedded PDF

USING THIS RESOURCE

Recommended Adobe PDF Reader Settings

This document contains embedded PDFs. Download file to access embedded documents. Follow these instructions to open PDFs full-size in a new window:

Embedded PDF

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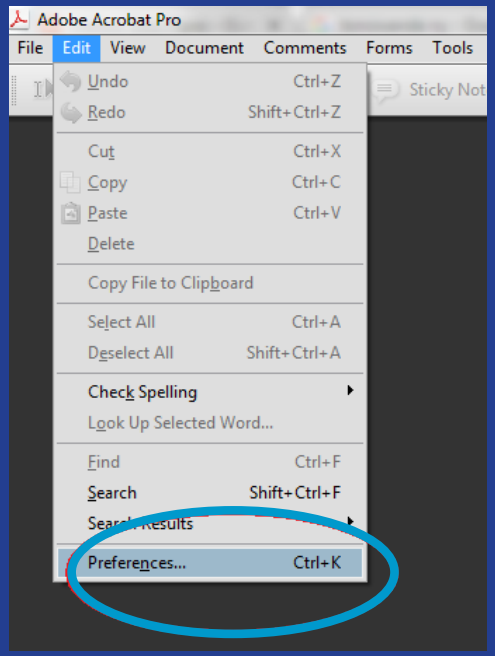

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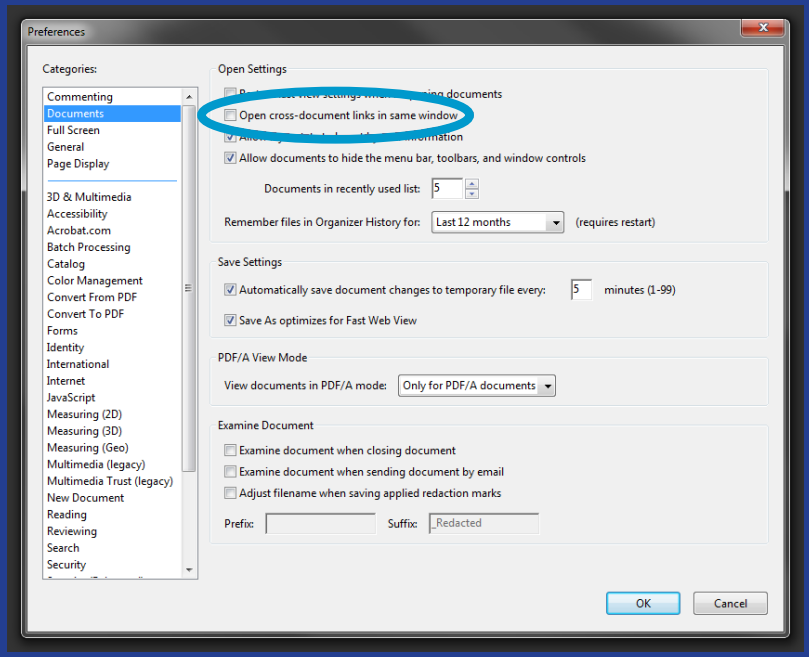


TABLE OF CONTENTS

1 Introduction to EVs & EV Charging

1.1 BENEFITS OF EVs

EVs offer local, regional, and global environmental and economic benefits

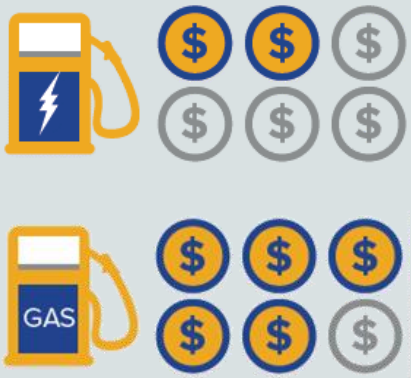
Fuel Efficient

With an efficiency of about 90%, electric motors are about **three times more efficient** than a gas engine. EVs recover energy while decelerating.

Environmental Benefits

Electric driving creates **zero tailpipe emissions**. Much of New York State's electricity comes from low-carbon sources (hydro, nuclear, wind, solar).

Cost Savings



Electricity is **less expensive** than gasoline based on energy content and EVs require less maintenance.

Vehicle Cost Calculator (U.S. DOE)

More EV Benefits (NYSERDA)

eGallon Calculator (U.S. DOE)

1.2 EV TECHNOLOGY OVERVIEW

Several EV models are available that meet many driver's needs

Plug-in Hybrid Electric Vehicles (PHEV)

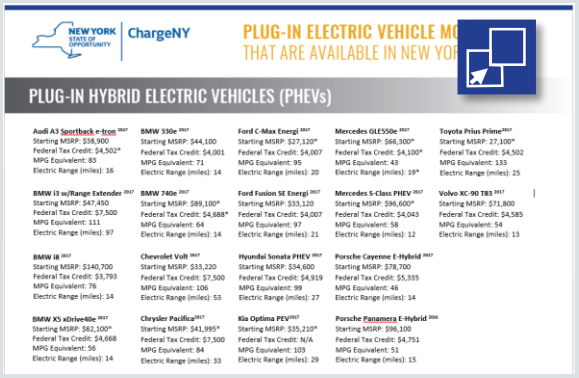
- Battery-powered electric motor (smaller battery) with an internal combustion engine powered by another fuel (ex. gas or diesel)
- 15-100 electric miles / 80-20 kWh
- 18 offered in NYS, including:
  - Audi A3 Sportback e-tron (16 e-miles)
  - Ford C-Max Energi (20 e-miles)
  - Toyota Prius Prime (25 e-miles)
  - Chevrolet Volt (53 e-miles)
  - BMW i3 w/ Range Extender (81 e-miles)

Drive Clean Rebate (NYSERDA)

Battery Electric Vehicles (BEV)

- Battery-powered electric motor (larger battery)
- Battery charged by plugging into charging outlet
- 60-200 electric miles / 16-80 kWh
- 12 offered in NYS, including:
  - Kia Soul EV (93 e-miles)
  - Nissan Leaf (107 e-miles)
  - Volkswagen e-Golf (125 e-miles)
  - Chevrolet Bolt (238 e-miles)
  - Tesla Model S (265 e-miles)

Rochester NY parking garage



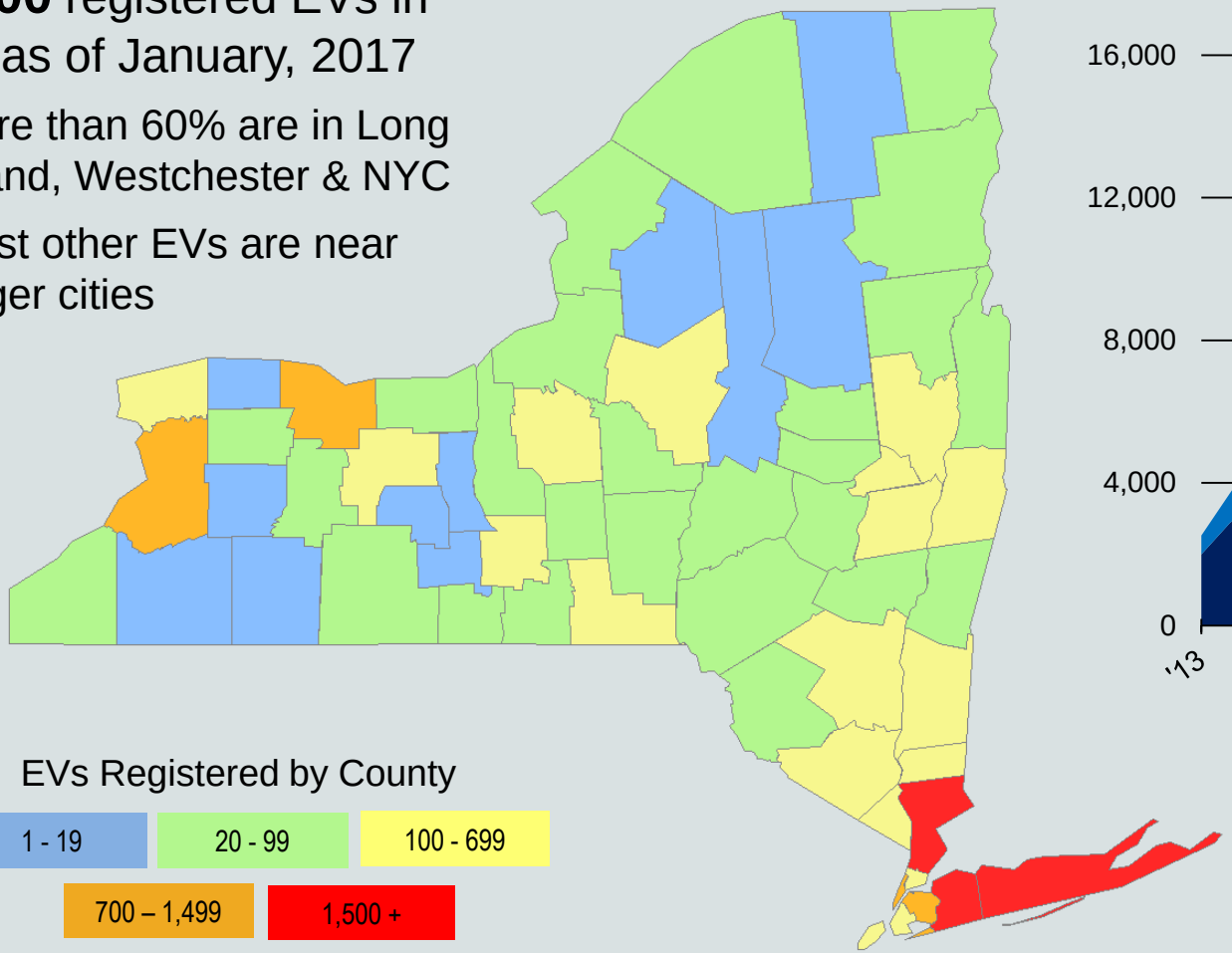
Price Chopper in Queensbury, NY

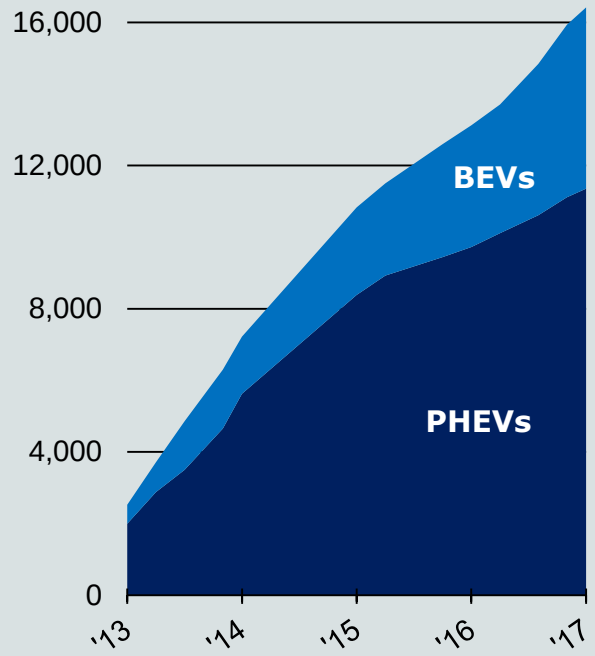
1.3 EVs IN NEW YORK STATE

EV ownership is increasing

16,600 registered EVs in NYS as of January, 2017

- More than 60% are in Long Island, Westchester & NYC
- Most other EVs are near larger cities





NYS EV Registrations (NYSERDA)

1.4 EV CHARGING STATIONS (EVSE)

The level of charge determines the duration of charging

DC FAST CHARGE

- Direct Current (DC) provided at 40-100 kW
- 80% charge in 20 minutes
- Requires 480V supply at 80-200 A
- Station cost is $7,000-$40,000 per port
- J1772 Combo, CHAdeMO, or Tesla connector

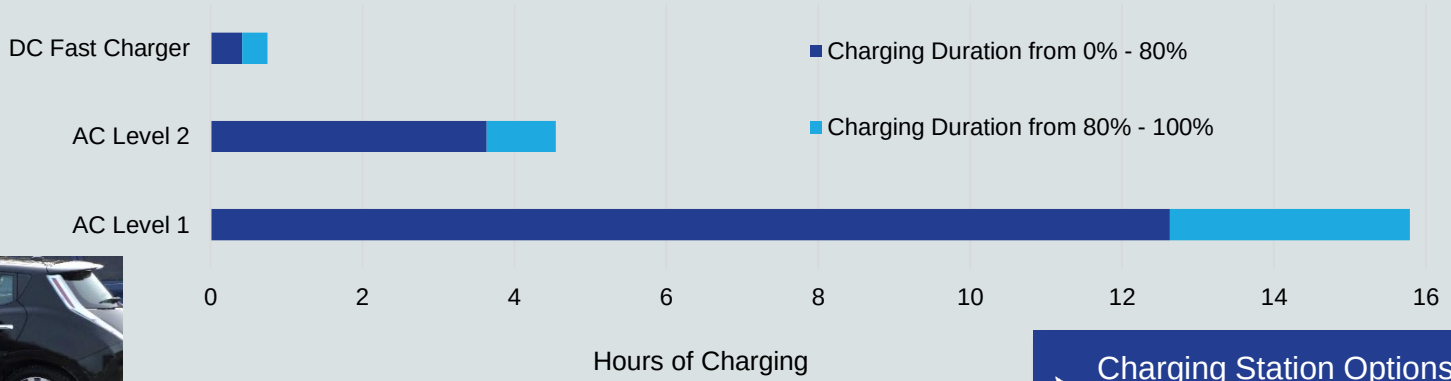
AC LEVEL 2

- Alternating Current (AC) provided at 3.3-19.2 kW (6.6 kW most common)
- 10-20 electric miles per hour
- Requires 208/240V supply at 20-80 A
- Station cost is $600-$5,000 per port
- J1772 or Tesla connector

AC LEVEL 1

- Alternating Current (AC) provided at 1.4-1.9 kW
- 2-5 electric miles per hour
- Requires 120V supply at 12-16 A
- Station cost is $500-$1,000 per port
- J1772 or Tesla connector

Charging Times for a 30 kWh BEV

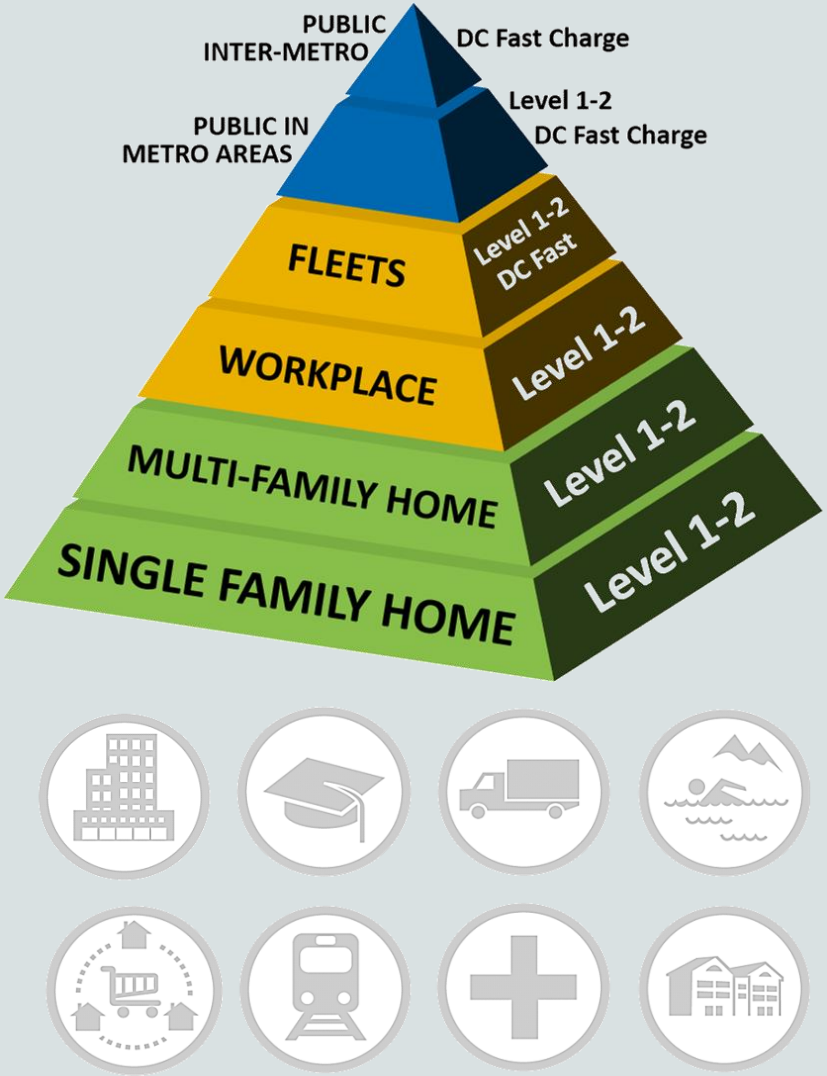


Charging Station Options (NYSERDA)

1.4 EV CHARGING STATIONS (EVSE)

The installation context helps determine the appropriate level of charge

- **DC fast charge** stations are for faster charging of multiple vehicles, such as fleet or for public use in a metro area.
- **Level 2** stations are for dwell times between two and six hours, such as retail, municipal parking lots, businesses, and tourist or leisure destinations.
- **Level 1** stations are for very long dwell times, such as overnight charging at a residence or all day charging at a workplace.



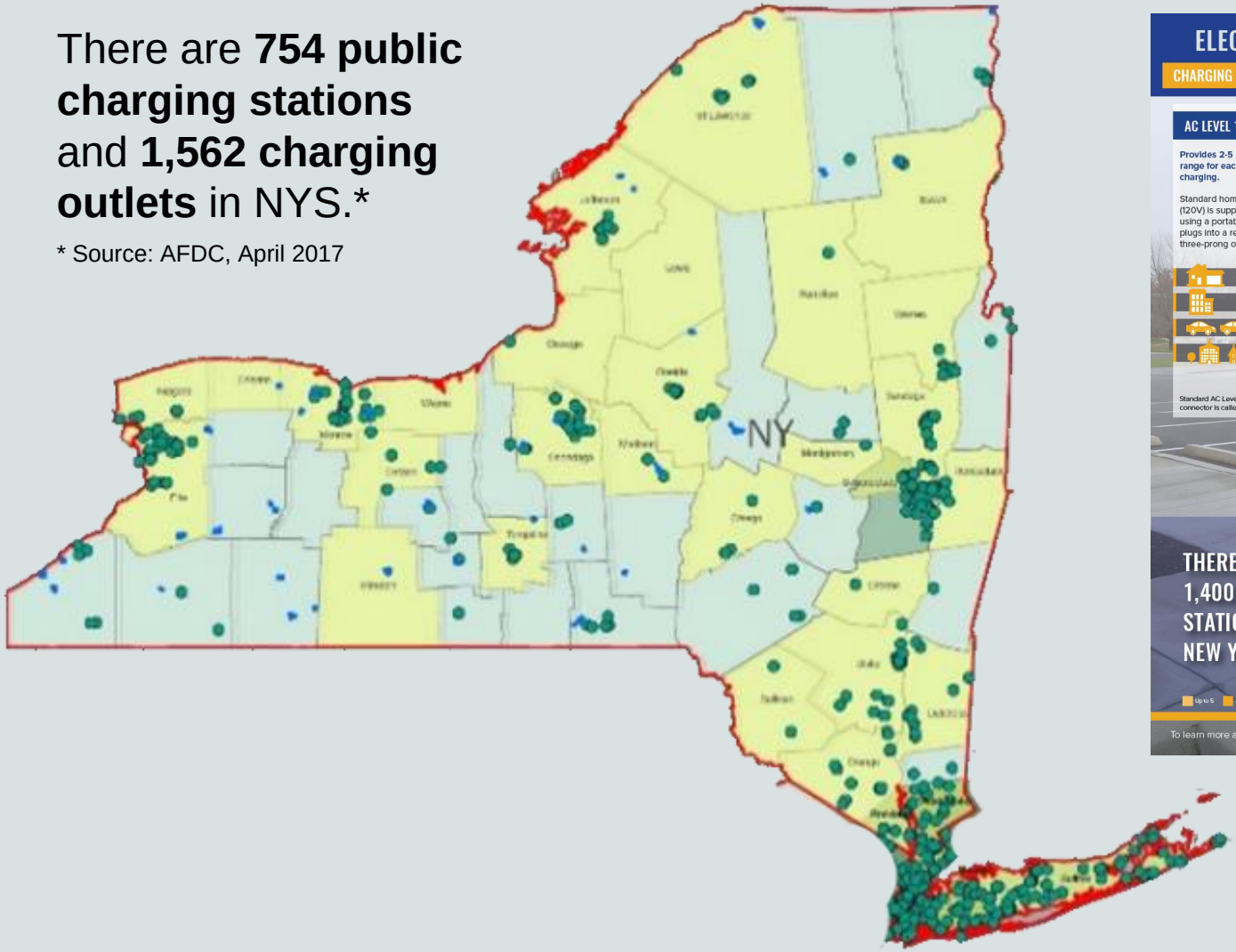
EV Cluster Analysis (NYSERDA)

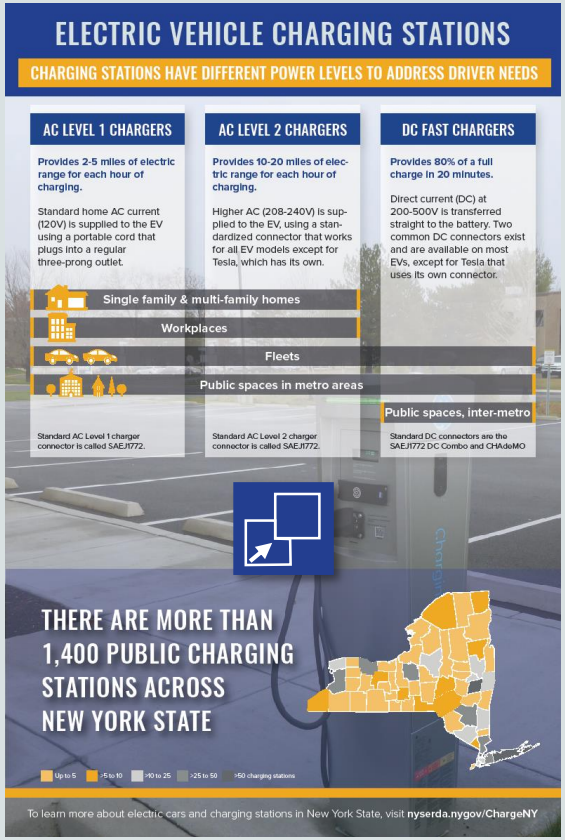
1.5 EV CHARGING STATIONS IN NYS

EV drivers are finding more opportunities to charge away from home and extend the use of their BEV or put more electric miles on their PHEV

There are **754 public charging stations** and **1,562 charging outlets** in NYS.*

* Source: AFDC, April 2017





NYS EV/EVSE Data (NYSERDA)

EVSE Station Locator (U.S. DOE)

1.6 | EV BENEFITS FOR MUNICIPALITIES

There are environmental, health, and economic benefits with increased use of EVs and EV charging station installations.

Making EV charging available will **attract EV drivers** and **prepare communities** for the electrified future of transportation.

EV charging in Albany

Overview of EV Deployment in the Northeast (TCI)

EV Drivers tend to be…

- Tech savvy and eco-conscious
- Highly educated

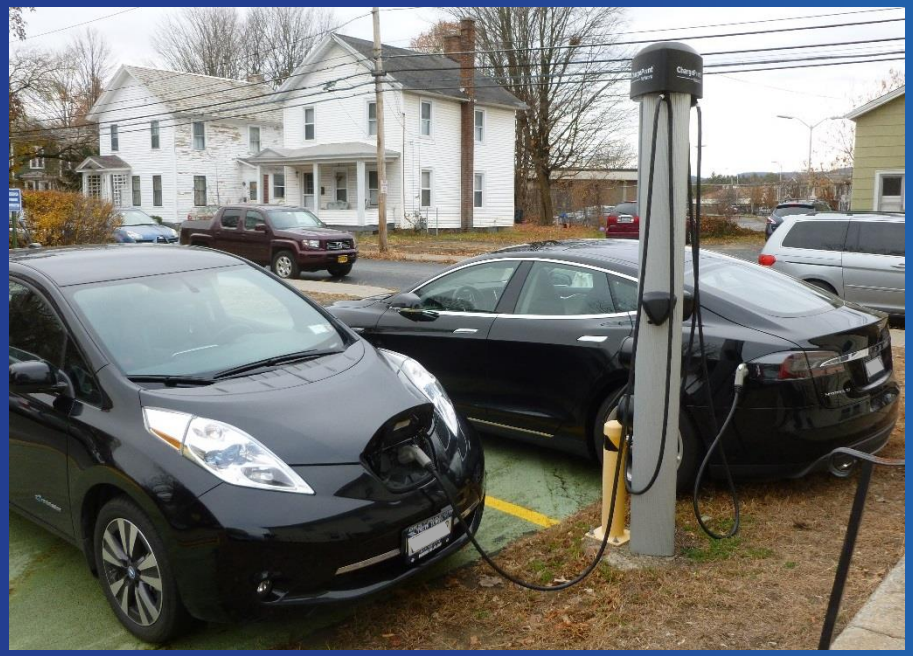
EV Charging stations…

- Attract EV drivers and encourage local spending, a potential to boost local economies
- Enhance “green” status & promote “green” tourism

Electric Vehicles…

- Have zero or low tailpipe emissions and improve air quality
- Lead to reduced reliance on imported fuels
- Use electricity generated from domestic and renewable sources
- Reduce reliance on oil and adds resiliency to our communities

2 Tools to Facilitate EV Adoption



2.1 EV PLANNING & POLICY TOOLS

- Zoning
- Codes
- Permitting
- Parking
- Partnerships & Procurement

Planning and policy tools can

1. **Allow,**
2. **Incentivize,**
3. **Require,** or
4. **Regulate**

EV charging stations. These tools can **lower the cost** and **streamline the administrative process**.

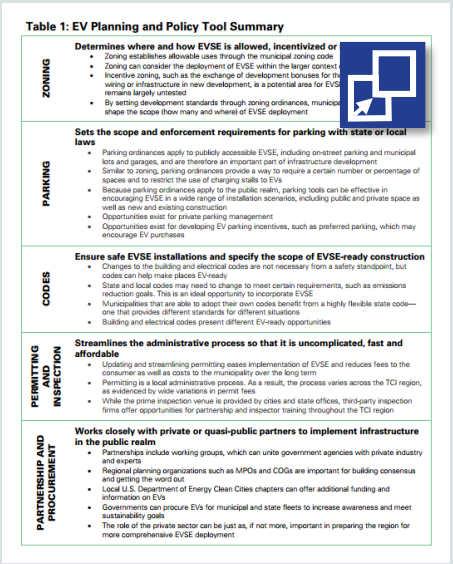


Table 1: EV Planning and Policy Tool Summary

ZONING	**Determines where and how EVSE is allowed, incentivized or** • Zoning establishes allowable uses through the municipal zoning code • Zoning can consider the deployment of EVSE within the larger context • Incentive zoning, such as the exchange of development bonuses for th wiring or infrastructure in new development, is a potential area for EVS remains largely untested • By setting development standards through zoning ordinances, municip shape the scope (how many and where) of EVSE deployment
PARKING	**Sets the scope and enforcement requirements for parking with state or local laws** • Parking ordinances apply to publicly accessible EVSE, including on-street parking and municipal lots and garages, and are therefore an important part of infrastructure development • Similar to zoning, parking ordinances provide a way to require a certain number or percentage of spaces and to restrict the use of charging stalls to EVs • Because parking ordinances apply to the public realm, parking tools can be effective in encouraging EVSE in a wide range of installation scenarios, including public and private space as well as new and existing construction • Opportunities exist for private parking management • Opportunities exist for developing EV parking incentives, such as preferred parking, which may encourage EV purchases
CODES	**Ensure safe EVSE installations and specify the scope of EVSE-ready construction** • Changes to the building and electrical codes are not necessary from a safety standpoint, but codes can help make places EV-ready • State and local codes may need to change to meet certain requirements, such as emissions reduction goals. This is an ideal opportunity to incorporate EVSE • Municipalities that are able to adopt their own codes benefit from a highly flexible state code—one that provides different standards for different situations • Building and electrical codes present different EV-ready opportunities
PERMITTING AND INSPECTION	**Streamlines the administrative process so that it is uncomplicated, fast and affordable** • Updating and streamlining permitting eases implementation of EVSE and reduces fees to the consumer as well as costs to the municipality over the long term • Permitting is a local administrative process. As a result, the process varies across the TCI region, as evidenced by wide variations in permit fees • While the prime inspection venue is provided by cities and state offices, third-party inspection firms offer opportunities for partnership and inspector training throughout the TCI region
PARTNERSHIP AND PROCUREMENT	**Works closely with private or quasi-public partners to implement infrastructure in the public realm** • Partnerships include working groups, which can unite government agencies with private industry and experts • Regional planning organizations such as MPOs and COGs are important for building consensus and getting the word out • Local U.S. Department of Energy Clean Cities chapters can offer additional funding and information on EVs • Governments can procure EVs for municipal and state fleets to increase awareness and meet sustainability goals • The role of the private sector can be just as, if not more, important in preparing the region for more comprehensive EVSE deployment

Planning and policy tools can also be used to **set design standards**. This **simplifies installations** for both municipalities and developers and ensures **safe installation and operation** of EV charging stations.

EV Resources for Planners and Municipalities (NYSERDA)

2.2 ZONING

Preliminary steps to ensure EV charging deployment is not restricted

Allow

- Define EV and EV charging stations in local planning and land use contexts
- List EV charging stations in Zoning Use Tables
- Review zoning ordinances to ensure EV charging stations are permitted in logical locations

Incentivize

- Add incentive zoning: EV charging station pre-wiring or installation in exchange for a developer incentive (fewer required parking spaces, or density bonus, for example).

Require

- Restrict, permit, or require EV charging infrastructure based on zoning districts
- Establish minimum number and type (level) of EV charging stations

A Guide to EVSE Planning and Policy Tools (NYSERDA)

2.3 CODES AND PERMITTING

Requiring EV infrastructure significantly increases adoption rates

Allow

- Set high-level design, accessibility and parking enforcement criteria
- Provide information to municipal inspectors and staff on EV requirements
- Standardize EV charging station permitting procedures
- Lower EV charging station permitting costs

Require

- Require conduit in new parking lot projects
- Set numerical or percentage-based goals or limits for EV charging stations in new construction
- Establish standards for safety of EV charging stations

Permit Processing Streamlining Report (NYSERDA)

EV Ready Codes for the Built Environment (NYSERDA)

2.4 PARKING

Support for EV drivers to charge ensures successful implementation

Incentivize

- Provide preferential parking spots for EV drivers

Regulate

- Use standardized signage to mark EV-only spots
- Enforce fees when non-EVs occupy EV-only spots

Without proper signage and regulation, non-EVs may block EV users from charging

Signage and clear marking can be used to communicate EV parking policy

2.4 PARTNERSHIPS & PROCUREMENT

Incentives support EV charging station installations and encouraging EV use

Incentivize

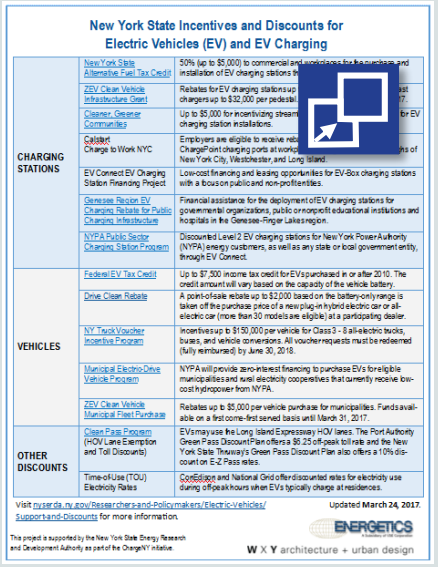
- Work closely with private or quasi-public partners to implement infrastructure in the public realm

Regulate

- Enforcing EV-only spaces requires partnership with EVSE hosts and potentially local law enforcement

Discounts, **incentives** & **programs** for public and private entities to:

- Purchase and operate EVs
- Install EV charging stations
- Streamline permitting and ordinance
- Promote EV adoption



New York State Incentives and Discounts for Electric Vehicles (EV) and EV Charging

CHARGING STATIONS	New York State Alternative Fuel Tax Credit	50% (up to $5,000) to commercial and municipal entities for the purchase and installation of EV charging stations th
	ZEV Clean Vehicle Infrastructure Grant	Rebates for EV charging stations up chargers up to $32,000 per pedestal
	Cleaner, Greener Communities	Up to $5,000 for incentivizing stream charging station installations.
	Calstart Charge to Work NYC	Employers are eligible to receive reb ChargePoint charging ports at worki New York City, Westchester, and Long Island.
	EV Connect EV Charging Station Financing Project	Low-cost financing and leasing opportunities for EV-Box charging stations with a focus on public and non-profit entities.
	Genesee Region EV Charging Rebate for Public Charging Infrastructure	Financial assistance for the deployment of EV charging stations for governmental organizations, public or nonprofit educational institutions and hospitals in the Genesee-Finger Lakes region.
	NYPA Public Sector Charging Station Program	Discounted Level 2 EV charging stations for New York Power Authority (NYPA) energy customers, as well as any state or local government entity, through EV Connect.
VEHICLES	Federal EV Tax Credit	Up to $7,500 income tax credit for EVs purchased in or after 2010. The credit amount will vary based on the capacity of the vehicle battery.
	Drive Clean Rebate	A point-of-sale rebate up to $2,000 based on the battery-only range is taken off the purchase price of a new plug-in hybrid electric car or all-electric car (more than 30 models are eligible) at a participating dealer.
	NY Truck Voucher Incentive Program	Incentives up to $150,000 per vehicle for Class 3 - 8 all-electric trucks, buses, and vehicle conversions. All voucher requests must be redeemed (fully reimbursed) by June 30, 2018.
	Municipal Electric-Drive Vehicle Program	NYPA will provide zero-interest financing to purchase EVs for eligible municipalities and rural electricity cooperatives that currently receive low-cost hydropower from NYPA.
	ZEV Clean Vehicle Municipal Fleet Purchase	Rebates up to $5,000 per vehicle purchase for municipalities. Funds available on a first come-first served basis until March 31, 2017.
OTHER DISCOUNTS	Clean Pass Program (HOV Lane Exemption and Toll Discounts)	EVs may use the Long Island Expressway HOV lanes. The Port Authority Green Pass Discount Plan offers a $6.25 off-peak toll rate and the New York State Thruway's Green Pass Discount Plan also offers a 10% discount on E-ZPass rates.
	Time-of-Use (TOU) Electricity Rates	ConEdison and National Grid offer discounted rates for electricity use during off-peak hours when EVs typically charge at residences.

Visit nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Support-and-Discounts for more information. Updated March 24, 2017.

This project is supported by the New York State Energy Research and Development Authority as part of the ChargeNY initiative.

ENERGETICS

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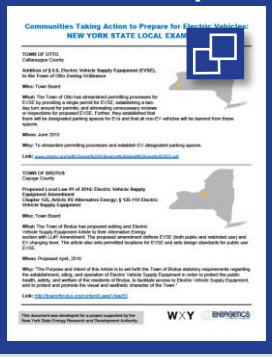
2.6 NYS LOCAL EXAMPLES

Municipalities tailor EV charging policy to the needs of their community

Local Examples



Town of Otto

- Define EV charging technology

Town of Brutus

- Add EV charging equipment to use table
- Permit EV charging in all zoning districts

City of Oneida

- Define permitted locations and permitting process
- Define design standards for permitted locations

City of Kingston

- Worked with the County to install 9 charging stations
- Participates in aggregate purchasing program to add EVs to the City fleet

Town of New Paltz

- Set EV charging parking space requirement
- Authorize planning board to simplify site plan procedure
- Authorize planning board to implement design standard regulations

2.7 ACTION ITEMS FOR EV READY COMMUNITIES

Electric vehicles (EVs) are becoming an important part of our transportation landscape. Municipalities are in a unique position to use planning and policy tools to encourage a simple and successful transition to EVs.

ACTION ITEMS FOR
EV READY COMMUNITIES

CLIMATE SMART COMMUNITIES

A network of New York communities engaged in reducing greenhouse gas emissions and improving climate resilience. Climate Smart Communities includes a certification program, one element of which is EV charging stations. The Climate Smart Communities program is jointly sponsored by six New York State agencies: Energy Research and Development Authority; Department of Environmental Conservation; Public Service Commission; Department of State; Department of Transportation; and the Department of Health.

www.dec.ny.gov/energy/76483.html

ADD EV CHARGING LANGUAGE TO THE MUNICIPAL ZONING

Update zoning laws to include EV charging equipment definitions, list EV charging infrastructure in Use Tables, and ensure zoning resolutions and ordinances allow EV charging in logical locations

SUPPORT EV INFRASTRUCTURE DEPLOYMENTS

Incorporate EV readiness into the Comprehensive Plan's sustainability goals, or create an EV Infrastructure Plan to make charging readily available which encourages EV use and helps improve air quality.

ESTABLISH REGULATIONS FOR EV CHARGING USE

Regulations on EV charging station use clarifies the expectations for EV drivers and non-EV drivers. Regulations can impose fines or tow non-EVs parking in EV charging station spaces.

REQUIRE EV CHARGING STATIONS OR PREPARATIONS THROUGH CODE

Require conduit and sufficient electrical capacity for EV charging in parking lot projects, set numerical or percentage-based goals or limits for EV infrastructure in new construction, or establish standards for safety and scope of EV charging stations.

STANDARDIZED EV SIGNAGE

Establish a standard for EV charging station signage so both EV and non-EV drivers can identify charging station locations and understand any applicable regulations.

This document was developed for a project supported by the New York State Energy Research and Development Authority

For more information on EVs visit: www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles

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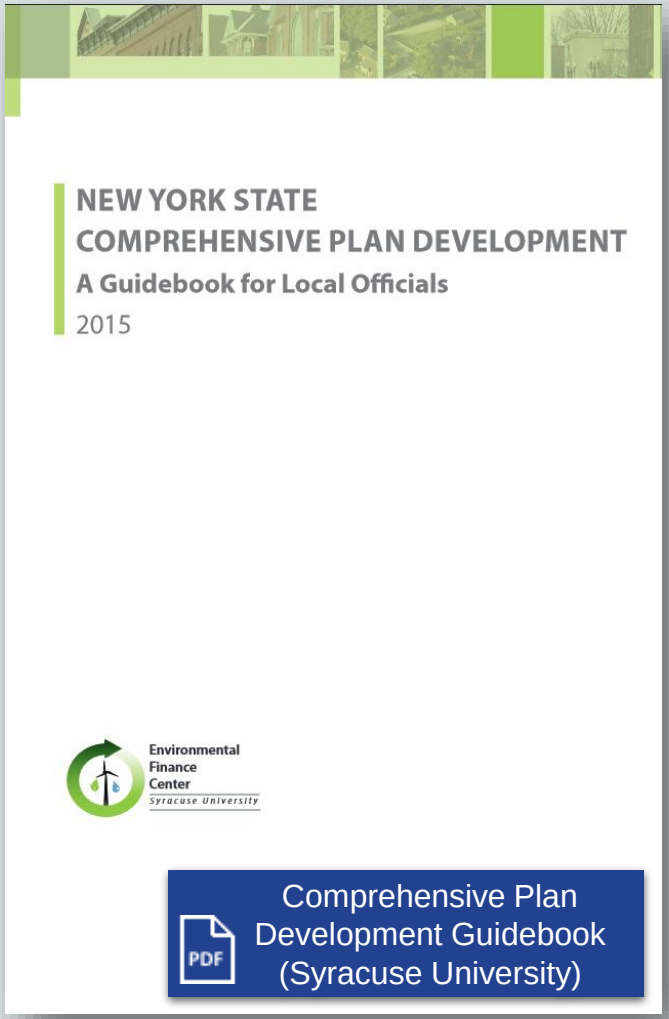
3 Other Options for Encouraging EV Adoption

3.1 COMPREHENSIVE PLANS

Mentioning EVs in the Comprehensive Plan paves the way for EV-readiness



A Comprehensive Plan:

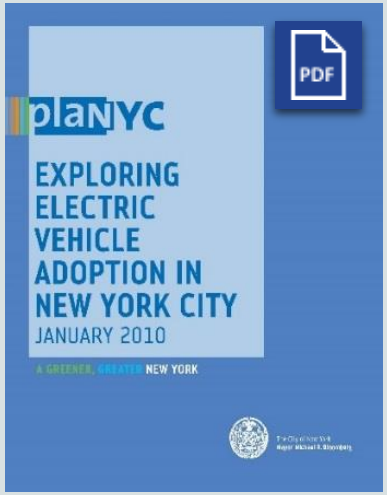
1. Provides **guidance for regulation**
2. Provides a basis for other actions affecting the **development of the community**
3. Helps establish policies relating to the **creation and enhancement** of community assets

When developing the Comprehensive Plan:

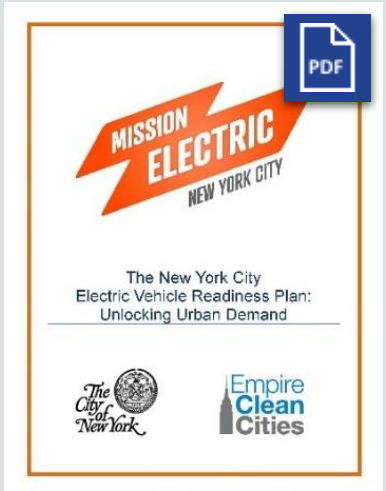
- **Suggesting EV or EV** charging can catalyze installations
- **Identifying sustainability** as an issue and goal can **guide future development** to include EV policy

3.1 | COMPREHENSIVE PLAN EXAMPLES

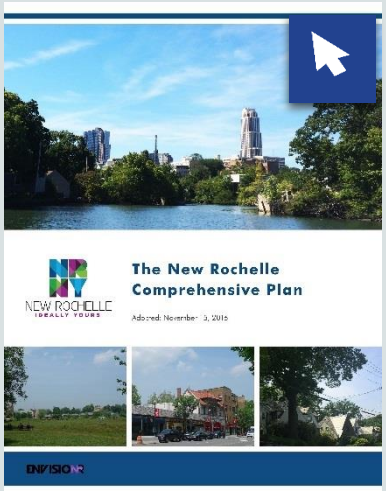
New York City and New Rochelle call for EV support in Multiple Plans



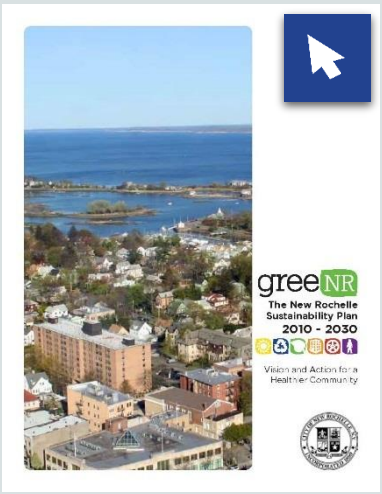
***PlaNYC*'s Exploring EV Adoption** investigates how to facilitate early adoption of EV technology that support the goal of **reducing transportation greenhouse gases** by 44%.



The **NYC EV-Readiness Plan** advances EV implementation potential through public outreach to **raise EV awareness**.



***EnvisioNR* Comprehensive Plan** incorporates principles of sustainability using New Rochelle's ***GreeNR* Sustainability Plan** framework.



Recommendations include an expansion of the City's **Green Fleet initiative**, installing more **EV charging stations**, and establishing an **EV shuttle service**.

3.2 EXECUTIVE ACTION

Official executive action or expressed support can encourage EV adoption

Sustainability standards are governed by an overlapping set of **state laws** and **Executive Orders**.

New York State
Executive Order No. 4 (2008)

State Green Procurement and Agency Sustainability Program directs state agencies, public authorities and public benefit corporations to green their procurements and to implement sustainability initiatives

Ulster County Executive and others at the signing of Local Law #3.

County and local executives can encourage EV/EVSE installations using **Executive Orders**.

Ulster County
Local Law #3 (2015)

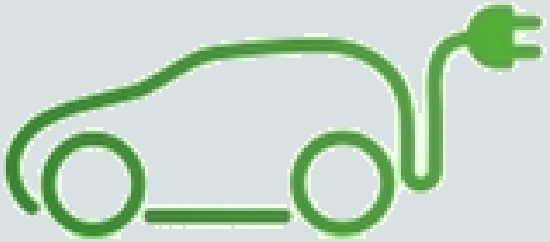
A Sustainable Green Fleet Policy sets a goal of having 5% of the fleet be Green Vehicles by 2020, and after 2020, 20% of new passenger purchases will be Green Vehicles.

- ✓ 9 EV charging stations at municipal locations with 6 more to be installed in 2017
- ✓ 8 EVs in the fleet with 12 to be added in 2017

Green Fleet Initiative (Ulster County)

3.3 PARTICIPATION IN INITIATIVES

Recognizing, endorsing, and engaging in EV efforts demonstrates commitment.



Understand and follow developments in large EV efforts to **identify opportunities** to replicate actions locally or **leverage for funding technology deployments**.

- Zero-Emission Vehicle (ZEV) Action
- ChargeNY
- Volkswagen Settlement Funds for EVs

Participate in programs specifically **designed for municipalities** to **implement clean energy actions**, address climate change, and improve the environment.

- Climate Smart Communities
- Clean Energy Communities
- Clean Cities
- Municipal Electric-Drive Vehicle and Public Sector Charging Station Program

3.3 PARTICIPATION EXAMPLE

Participation in national or state initiatives can help raise EV awareness

National Drive Electric Week

- Annual national outreach initiative to **heighten EV awareness**
- Events **showcase EV products**, with some offering ride and drives
- **Organized by local co-sponsors** with support from Plug-In America, Sierra Club, and Electric Auto Association
- 2016 NY participants included Delmar, Freeport, Ithaca, Kingston, Pleasantville, Rochester, Syracuse, Jones Beach, and White Plains

Syracuse EV and PV Expo in 2016

Delmar's 2016 National Drive Electric Event
(Image provided by Bethlehem Chamber)

National Drive Electric Week Resources

3.4 LEADING BY EXAMPLE

Demonstrating EV use or installing EVSE encourages others.

Municipalities and organizations can **install charging stations and use EVs** in their fleet to **promote EV adoption**.

Hauppauge municipal EV charging

Town of Southold municipal EV charging

Standard signage helps EV drivers **locate stations**, but are also very effective at fostering EV adoption by **increasing awareness** and advertising the local municipality's **commitment to sustainability**.

EVSE Signage Guidance (NYSERDA)

3.5 SPECIAL PROGRAMS

Participation in special programs can promote EVs and drive the local economy

Drive Electric Hudson Valley

Workplace Charging Challenge
U.S. DEPARTMENT OF ENERGY

Aggregate purchasing campaigns can secure discounted prices on EVs and EV charging stations for groups of buyers.

U.S. DOE's **Workplace Charging Challenge**, NYSERDA and Calstart's **Charge to Work NYC**, and other workplace outreach programs target **employees** who can commute with an EV and **employers** that allow them to charge at work.

Sustainable weekend tourism models **promote EV use** through **comprehensive tourism** and dvoted **partnerships** with electric car rental companies.

EV Tourism in NYS (NYSERDA)

Ulster County Alive! EV Tourism (Ulster County)

4 Planner & Planning Board Actions

4.1 EV SITE CONSIDERATIONS

Recognize opportunities to incorporate EV charging stations in new developments

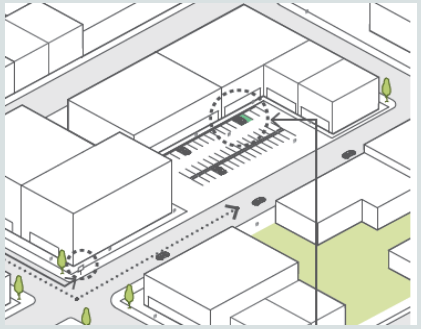
Charging stations in key EV Clusters (medical campuses, higher education, retail complexes, and multi-use downtown parking areas) are more likely to be used and will help **foster increased use** of EVs.

Look for **site characteristics** that facilitate cost effective installations and increase value to EV drivers:

- Dwell times between 2-4 hours
- 240V power available near parking spaces
- Easily accessible and open 24 hours with lighting
- Larger parking lots with excess spaces
- Offer image value to host or community
- Easy to find along major roadways
- Protected from harsh environment conditions

Carports add visibility and shelter

Carport, Price Chopper, Schenectady



Hosts can highlight EVSE with priority placement and proximity to building entrances

SUNY Plattsburg

4.2 | FACILITATING EVSE INSTALLATIONS

Many elements influence cost and utilization of EV charging

Every EV charging station installation context is **unique,** but all should use **certified equipment** and a **licensed electrician**. Complying with **industry best practices** for siting, design, and installation will help lower costs and increase value to EV drivers.

<u>Site elements to consider:</u>

1. **Location:** visibility/preferred parking, parking lot management, station mounting, wire run
2. **Wire run**: distance and obstructions between panel and station, need for boring/trenching
3. **Electrical Supply**: power capacity, panel up to code, potential to use an existing subpanel
4. **EVSE:** mounting type (wall or pedestal), cord management, networking, certification, make
5. **Permitting**: process, cost, local experience
6. **Other**: protection, signs, maintenance

Mount to existing structures to reduce cost
Albany, NY

Bollards for protection and extra spaces
Rochester, NY

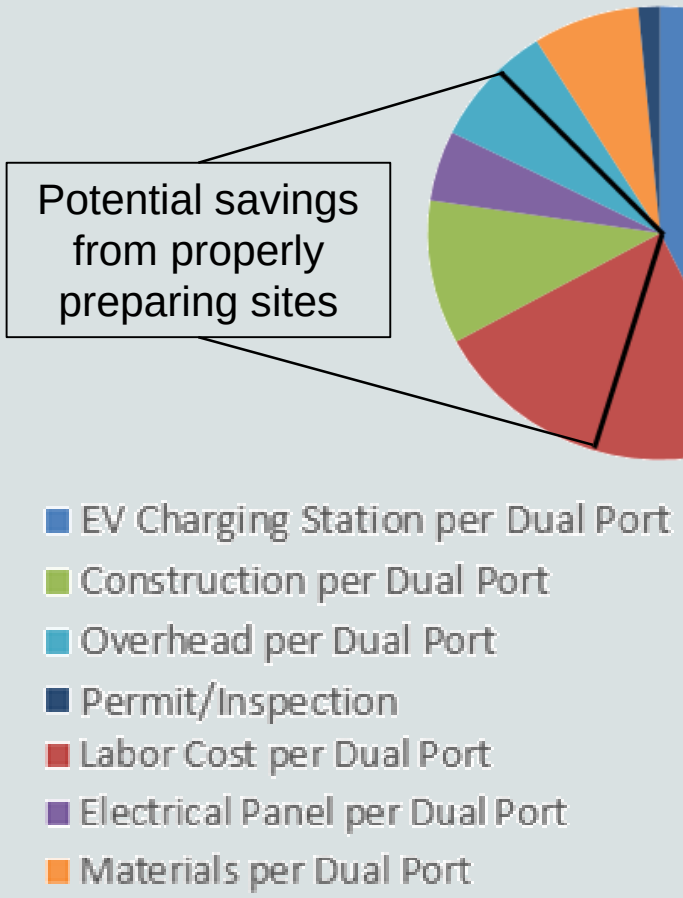
Best Practice Guides (NYSERDA)

4.3 | INCLUDING CONDUIT IN PARKING LOTS

Preparing for future EVSE installations can significantly lower costs

The average **Level 2 dual-port** station **costs $20,000.** Properly preparing a site for EVSE can **reduce total installation costs** by about **33% or $6,700.**

- 1” – 1.5” **conduit** run from the electrical panel to the potential EV charging station location
- **Electrical panel** with additional capacity and available breaker slots



Costs Associated with Non-Residential EVSE (U.S. DOE)

4.4 SITE SELECTION GUIDE FOR EVSE

SITE SELECTION GUIDE FOR EV CHARGING STATIONS

Considering an electric vehicle (EV) charging station installation?

This guide will help determine if to recommend an EV charging station for a particular location.

More information on why these factors contribute to a good EV charging site is found on the other side.

CATALYZING EV CHARGING STATION DEPLOYMENT

A desire, need, or requirement for EV charging can justify the installation of a station.

	Yes / No
Are there mandates or requirements set by the state, regional, or local government requiring EV charging or alternate fuel vehicle technology use?	
Are there EV drivers who regularly park at this location?	
Have there been requests for EV charging by employees, patrons, or visitors?	
Would enhancing sustainability or portraying a "green" image be beneficial to the site host?	

Answering "yes" to any of these questions indicates a potential need and benefit for installing EV charging stations.

PARKING DEMOGRAPHICS

Alternative current (AC) Level 1 stations provide 2-5 miles of electric range per hour of charging, AC Level 2 stations provide 10-20 miles of electric range per hour of charging, and direct current fast charging (DCFC) can fully charge most EVs in less than one hour. Station costs increase significantly with faster charging capabilities.

	Yes / No
Is the average parking event more than two hours?	
Does the proposed site location have excess parking spaces available?	

An AC Level 2 station is suitable if answering "yes" to both of these questions, otherwise DCFC is likely needed.
In locations where vehicles park for extended periods of 8 hours or more, AC Level 1 stations could be considered.

SITE CHARACTERISTICS

Charging stations at workplaces, higher education, medical campuses, larger retail centers (malls), and multi-use lots are typically used more often.

	Yes / No
Is there parking within 200 feet of the electrical panel and no major obstructions to run power to the station?	
Is sufficient power available (120V-20A for AC Level 1, 240V-40A for AC Level 2, 480V-80A for DCFC)?	

Answering "no" to either of these questions will likely result in costly installations.

OTHER CONSIDERATIONS

Many factors influence the installation costs, as well as the expected use of the station by EV drivers.

	Yes / No
Is the parking space covered and does it have lights?	
Can electrical power be run to the station without crossing an impervious surface (sidewalk or pavement)?	
Can the station be placed where it does not impact snow removal or other parking lot maintenance?	
Can EV drivers access the station 24 hours a day and 7 days a week without a permit or fee to park?	

Answering "no" to any of these questions will likely increase the cost of installation or decrease utilization by EV drivers.

This document was developed for a project supported by the New York State Energy Research and Development Authority
ENERGETICS A Subsidiary of VHB Corporation W X Y architecture + urban design

INFLUENCING FACTORS AFFECTING EV CHARGING

LOCAL AND REGIONAL POLICY	Local or regional governments may establish requirements for new developments to include EV charging stations. Facilitating more EV use can help to achieve the sustainability goals of the local Comprehensive Plan and improve local air quality. EV charging stations support Climate Smart and Clean Energy Community Initiatives.
GO GREEN	New developments can use EV charging stations to achieve higher LEED levels or other green building certifications. It also conveys an interest in sustainability.
EMBRACE THIS EVOLVING MODE OF TRANSPORTATION	A network of charging stations will make travel easier for local EV drivers and attract EV tourists. There are a growing number of EV drivers in most NY communities: www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Tools/Electric-Vehicle- **By 2017 there were 16,600 EVs registered in New York**
LOCATION MATTERS	EVs are typically found in clusters with neighbors or colleagues that have similar demographics. EV charging stations have been most used at workplaces, higher education, medical campuses, larger retail centers (malls), and multi-use lots.
PARKING AVAILABILITY	Large parking lots that are regularly used will most likely have some EVs that often use the charging station. However, if parking lots are always full, but end up with vacant EV charging spaces, it can be irritating for non-EV drivers.
STATION PLACEMENT	An EV charging station in prime parking spaces provides good visibility, but could also draw attention to when it is not being used or the special treatment given to EV drivers. Comply with ADA requirements by leaving sufficient passageways on sidewalks when installing stations and consider its potential impact on snow removal or maintenance.
INSTALLATION COSTS	Installation costs can be equal to, or even greater than, the station hardware. Wall mounted stations near the electrical room of a building are least expensive to install. A pedestal station in a parking lot that requires an electrical run under or through pavement will be more expensive. Electrical upgrades also add significant cost.
EQUIPMENT SELECTION	DC fast chargers are costly and intended to mimic conventional vehicle refueling at a convenient store where they can charge numerous EVs per day. In parking lots, AC Level 2 stations are used for charging durations between 2 and 6 hours. AC Level 1 stations may be considered for longer term parking situations. Networked stations track use and allow payments, but require the host site to pay for a subscription.
SIGNAGE AND MANAGEMENT	Signage should be used to clearly make parking spaces for "EV Charging Only", which can be enforced by regulations that ticket or tow non-EVs that park there. Networked stations that can impose fees for EVs parked in these spaces excessively long will help encourage EV drivers to move after fully charging so another EV can charge.
PREPARING FOR FUTURE STATIONS	When renovating a parking lot, encourage the installation of one 1½" rigid conduit for each potential dual-port EV charging station. New electrical panels that service parking lots should include additional capacity for future EV charging station installations.

For more information visit: www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Info/Charging-Station-Hosts

This document was developed for a project supported by the New York State Energy Research and Development Authority
ENERGETICS A Subsidiary of VHB Corporation W X Y architecture + urban design

4.5 | BARGAINING EVSE FOR A VARIANCE

Installing EV charging stations may be part of approval negotiations.

EV charging can be considered a bargaining tool in negotiations for variances given the **public benefit** EV charging provides.

- Support for EVs or EV charging stations should be expressed by the municipality to justify its use in negotiations.

- EV charging may be **leveraged in exchange** for variances on parking requirements, open space, or other criteria on a case-by-case basis

EV charging at the University of Albany

4.6 RECOGNITION FOR EVSE

EV charging adds credits in environmental recognition programs.

Green Building certificates **showcase a commitment to sustainability** and are often leveraged for marketing or publicity purposes.

Several building certification programs **require** or **provide points** for installing EV charging stations.

LEED (Leadership in Energy & Environmental Design) certification designates points to new buildings that designate 5% of parking spaces as preferred parking for green vehicles *and* EV charging stations.

STARS (Sustainability Tracking, Assessment, & Rating System) allows for colleges and universities to measure their sustainability performance. EV chargers can contribute to points through the “Support for Sustainable Transportation" category.

ENERGY STAR for Buildings and Plants consider EV charging as an energy use that can be excluded from total energy consumption, so that EV charging doesn’t lower the overall ENERGY STAR score.

GREEN GLOBES is an environmental assessment and certification program for commercial buildings. It offers five points toward new construction for installing EV charging stations.

EVSE Credits for Green Building Certificates (U.S. DOE)

Appendix

A. Resources Cited

B. Embedded Documents

A. Resources Cited

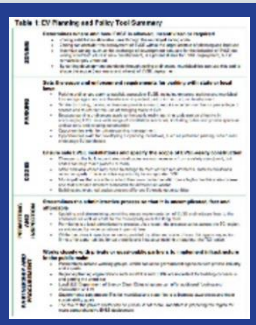
	Author	Category	Link
EV & EV CHARGING STATION INFORMATION			
ChargeNY	NYSERDA	Website	https://www.nyserda.ny.gov/All-Programs/Programs/ChargeNY
Charging Station Options	NYSERDA	Website	https://www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Basics/Charging-Station-Options
eGallon Calculator	U.S. DOE	Website	https://energy.gov/maps/egallon
EV Benefits	NYSERDA	Website	https://www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Basics/Benefits
EV Charging Station Locator	U.S. DOE	Website	http://www.afdc.energy.gov/locator/stations/
Multi-State Zero-Emission Vehicle (ZEV)	ZEV Task Force	Website	http://www.zevstates.us/
National Drive Electric Week Resources	Drive Electric Week	Website	https://driveelectricweek.org/resources.php
NYS EV Registrations	NYSERDA	Website	https://www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Tools/Electric-Vehicle-Registration-Map
Vehicle Cost Calculator	U.S. DOE	Website	http://www.afdc.energy.gov/calc/
GRANTS, REBATES & PROGRAMS			
Clean Cities	Clean Cities	Website	https://cleancities.energy.gov/coalitions/
Clean Energy Communities	NYSERDA	Website	https://www.nyserda.ny.gov/Contractors/Find-a-Contractor/Clean-Energy-Community-Coordinators
Climate Smart Communities	DEC	Website	http://www.dec.ny.gov/energy/76910.html
Drive Clean Rebate	NYSERDA	Website	https://www.nyserda.ny.gov/All-Programs/Programs/Drive-Clean-Rebate
Volkswagen Settlement Funds for EV	EPA	Website	https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement
EV Green Building Charging Credits	U.S. DOE	Website	https://energy.gov/eere/vehicles/workplace-charging-credit-green-building-certification
Municipal Electric-Drive Vehicle and Public Sector Charging Station Program		Website	https://www.governor.ny.gov/news/governor-cuomo-announces-3-million-available-municipalities-zero-emission-vehicles-and-charging
GreeNR: The New Rochelle Sustainability Plan, 2016	New Rochelle	Website	http://www.newrochelleny.com/349/GreeNR-Sustainability-Plan
The New Rochelle Comprehensive Plan, 2015	New Rochelle	Website	http://www.newrochelleny.com/944/EnvisioNR
Ulster County Alive! EV Tourism Program	Ulster County	Website	http://www.ulstercountyalive.com/electric-vehicle-tourism
Ulster County Green Fleet Initiative	Ulster County	Website	http://ulstercountyny.gov/environment/environment/sustainability-energy/green-fleet-initiative
REPORTS & BEST PRACTICES			
A Guide to EVSE Planning and Policy Tools	NYSERDA	PDF	https://www.nyserda.ny.gov/-/media/Files/Programs/ChargeNY/Planning-and-Policy-Tool-Guide.pdf
Comprehensive Plan Development Guidebook	Syracuse University	PDF	http://efc.syr.edu/wp-content/uploads/2015/03/ComprehensivePlanning.pdf
Costs Associated with Non-Residential EVSE	U.S. DOE	PDF	www.afdc.energy.gov/uploads/publication/evse_cost_report_2015.pdf
EV Cluster Analysis	NYSERDA	PDF	https://www.nyserda.ny.gov/-/media/Files/Programs/ChargeNY/EVSE-Cluster-Analysis.pdf
EV Tourism in NYS	NYSERDA	PDF	https://www.nyserda.ny.gov/-/.../Electric-Vehicle-Tourism-in-New-York-State.pdf
EVSE Signage Guidance	NYSERDA	PDF	https://www.nyserda.ny.gov/-/media/Files/Programs/ChargeNY/EVSE-Signage-Overview.pdf
Exploring EV Adoption in NYC, 2010	NYC Mayor's Office	PDF	http://www.nyc.gov/html/om/pdf/2010/pr10_nyc_electric_vehicle_adoption_study.pdf
Overview of EV deployment in the Northeast	NYSERDA	PDF	https://www.nyserda.ny.gov/-/media/Files/Programs/ChargeNY/PEV-Deployment-in-the-Northeast.pdf
Permit Processing Streamlining Report	NYSERDA	PDF	https://www.nyserda.ny.gov/-/media/Files/Programs/ChargeNY/Permit-Process-Streamlining.pdf
The NYC Electric Vehicle Readiness Plan	Empire Clean Cities	PDF	https://cleancities.energy.gov/files/u/projects_and_partnerships/project_material/supporting_material/232/nyc_readiness_plan.pdf
Best Practices Guides for Charging Stations	NYSERDA	Website	https://www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Resources/Best-Practice-Guides-for-Charging-Stations
EV Resources for Planners and Municipalities	NYSERDA	Website	https://www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Info/Planners-and-Municipalities
NYS EV and EV Charging Station Data Reports	NYSERDA	Website	https://www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Resources/Electric-Vehicle-Charging-Station-Data

B. Embedded Resources

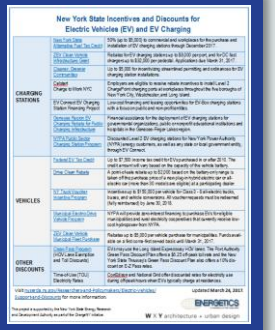
Plug-In EVs Available in NYS

Electric Vehicle Charging Stations

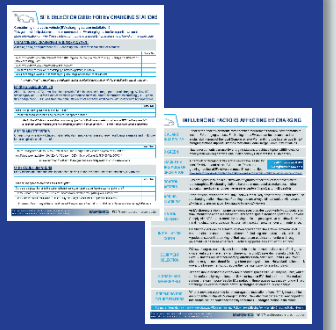
EV Planning & Policy Tool Summary



NYS Incentives & Discounts for EV & EVSE



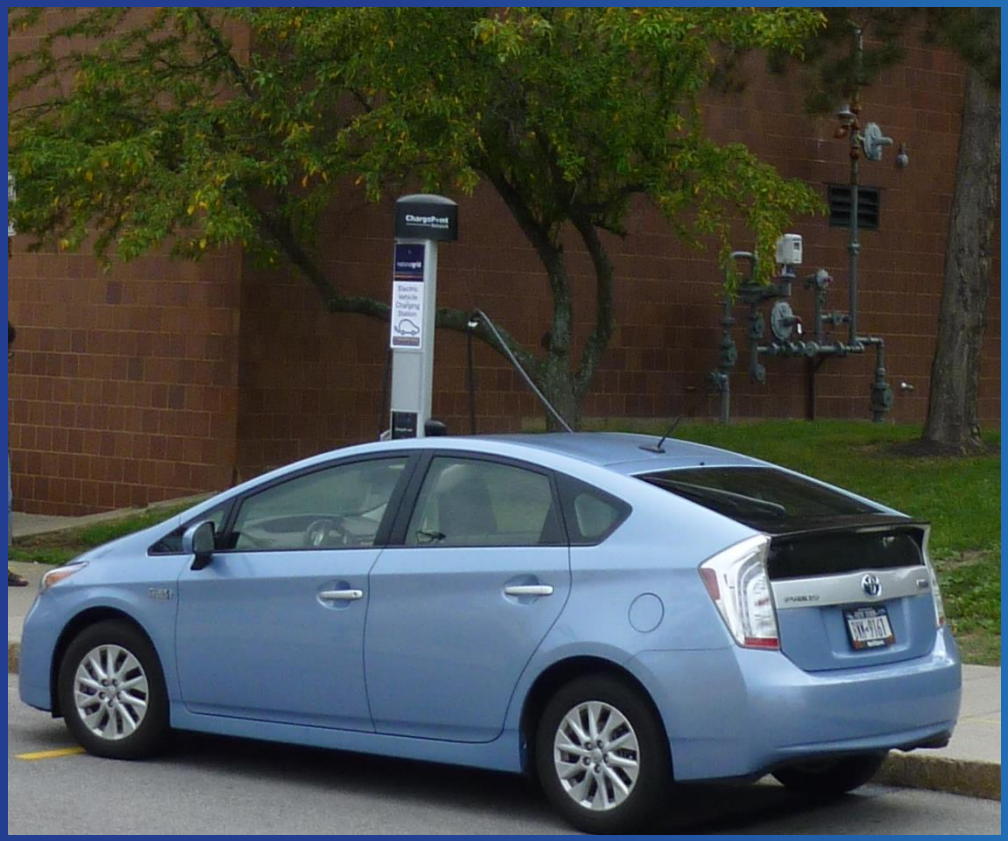
Site Selection Guide for EV Charging Stations



Action Items for EV Ready Communities

Communities Taking Action: New York State Local Examples

Questions?



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