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# PROMOTING ELECTRIC VEHICLE CHARGING STATION INSTALLATIONS

## Increasing Planner's and Municipal Planning Board's Involvement

New York Planning Federation Annual Conference

March 28<sup>th</sup>, 2017

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

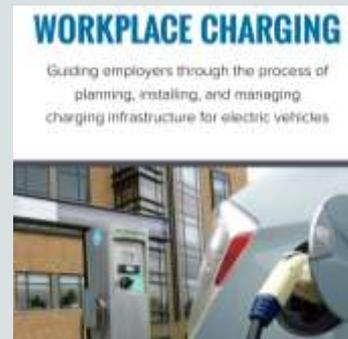


WXY architecture + urban design is a **planning and design** focused on social and environmental transformation of the public realm at multiple scales.

*Content and insight within this resource come from several past projects that have assisted with the deployment of EVs and EV charging stations*

## Energetics and WXY EV and EV Charging Station Experience

- EV Planning Resources for the Northeast for Transportation & Climate Initiative
- NYSERDA EV Charging Station Deployment Program Support (>700 charging ports)
- EV Infrastructure Plans for I-90 Regions and Tompkins County
- EV Tourism in the Hudson Valley and Catskills
- NYC Green Loading Zones Feasibility Study
- Electric Pedestals for Food Trucks
- EV Charging Station Deployment and Outreach (EV Tourism, EV Communities)



## **PART I – INTRODUCTION**

- 1.1 EV Benefits
- 1.2 EV Technology
- 1.3 EV Charging Stations
- 1.4 Importance of EVs for Municipalities

## **PART II – POLICY TOOLS**

- 2.1 EV Charging Policy Tools
- 2.2 Allowing EV Infrastructure
- 2.3 Incentivizing EV Technology
- 2.4 Requiring EV Stations
- 2.5 Regulating EV Charging
- 2.6 NYS Policy Examples

## **PART III – OTHER OPTIONS**

- 3.1 Comprehensive Plans
- 3.2 Executive Action
- 3.3 Participation in Initiatives
- 3.4 Leading By Example
- 3.5 Special Programs

## **PART IV – PLANNING BOARD ACTIONS**

- 4.1 When to Suggest EV Charging Stations
- 4.2 Facilitating Installations in the Planning Process
- 4.3 Bargaining EV Charger Use in Exchange for Variances
- 4.4 Include Conduit in New Parking Lot Projects

# HOW TO USE 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 comprises this resource?

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

Click these blue buttons to follow external links for more information on each topic!



Website



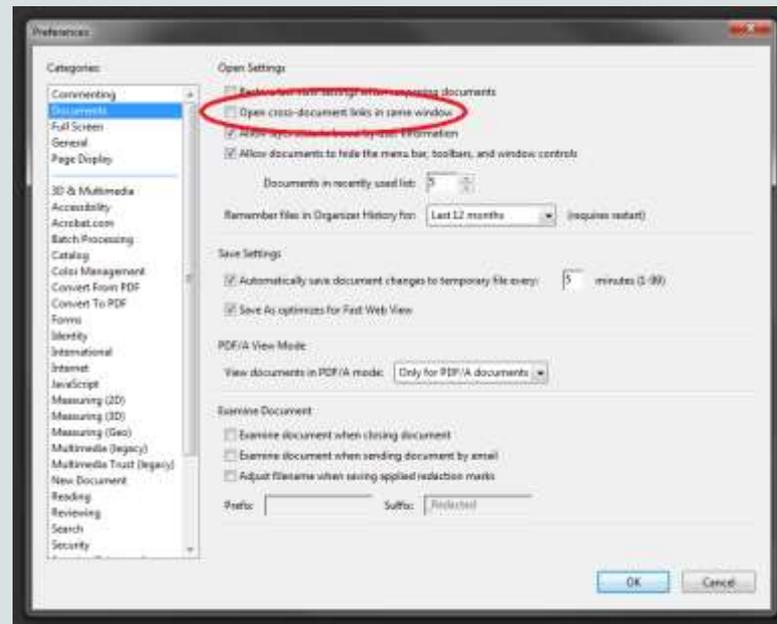
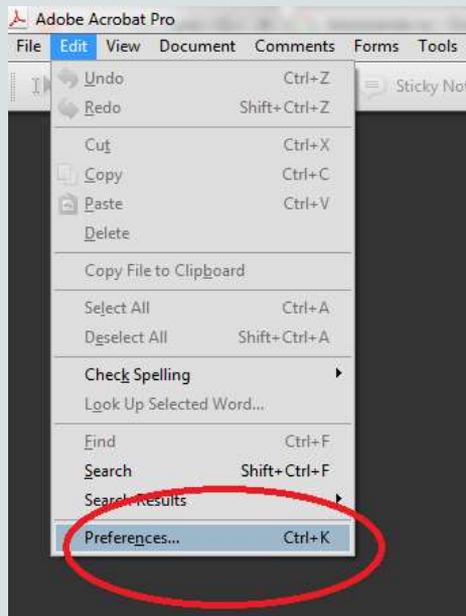
PDF Document

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2. In the “Documents” category, **Un-Check** the box next to “Open cross-document links in same window”



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<u>EV</u>	Electric Vehicle that charges its batteries by <b>plugging in</b>
PHEV	Plug-in Hybrid Electric Vehicle (electric motor and gas engine)
BEV	Battery Electric Vehicle (only electric motor and battery)
kWh	Kilowatt-hours (electrical <b>energy</b> stored by batteries)

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

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

# 1

# Introduction to EVs and EV Charging Stations

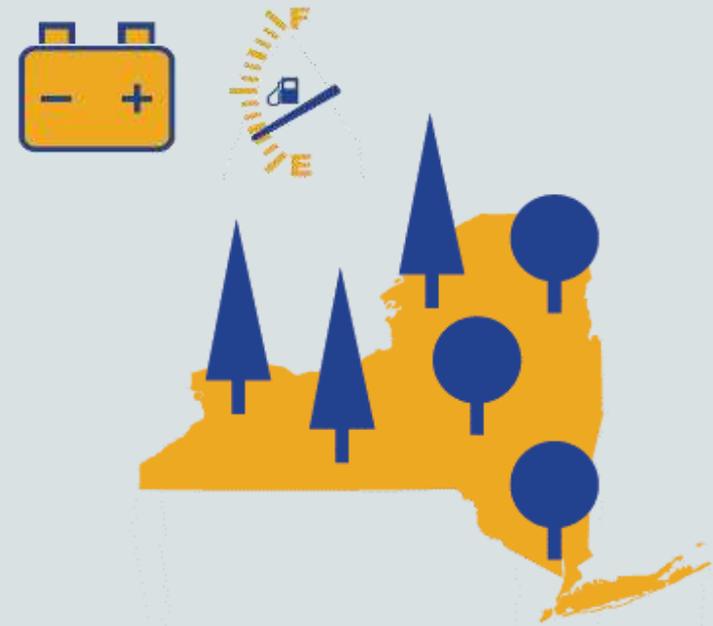


- 1.1 EV Benefits
- 1.2 EV Technology
- 1.3 EV Charging Stations
- 1.4 Importance of EVs for Municipalities

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

### More 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.



### Better for the Environment

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

### Lower Operating Costs

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)

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

## EVs Offered in NYS

**18 PHEVs** powered by an electric motor with a smaller battery pack (8-20 kWh) and a gasoline engine

- 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)

**12 BEVs** powered only by an electric motor, but have larger battery packs (16-80 kWh)

- 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)

**PLUG-IN HYBRID ELECTRIC VEHICLES (PHEVs)**

<b>Audi A3 Sportback e-tron</b> <sup>***</sup> Starting MSRP: \$55,900 Federal Tax Credit: \$4,902* MPG Equivalent: 83 Electric Range (miles): 16	<b>BMW i3xe</b> <sup>***</sup> Starting MSRP: \$44,300 Federal Tax Credit: \$4,901 MPG Equivalent: 73 Electric Range (miles): 14	<b>Ford C-Max Energi</b> <sup>***</sup> Starting MSRP: \$27,330* Federal Tax Credit: \$4,007* MPG Equivalent: 95 Electric Range (miles): 16	<b>Mercedes GL550e</b> <sup>***</sup> Starting MSRP: \$66,900* Federal Tax Credit: \$4,100* MPG Equivalent: 40 Electric Range (miles): 18*	<b>Toyota Prius Prime</b> <sup>***</sup> Starting MSRP: \$17,330* Federal Tax Credit: \$4,901 MPG Equivalent: 133 Electric Range (miles): 25
<b>BMW i3 w/Range Extender</b> <sup>***</sup> Starting MSRP: \$47,450 Federal Tax Credit: \$7,500 MPG Equivalent: 111 Electric Range (miles): 37	<b>BMW i4xe</b> <sup>***</sup> Starting MSRP: \$89,300* Federal Tax Credit: \$4,488* MPG Equivalent: 64 Electric Range (miles): 14	<b>Ford Focus SE Energi</b> <sup>***</sup> Starting MSRP: \$33,320 Federal Tax Credit: \$4,007* MPG Equivalent: 97 Electric Range (miles): 21	<b>Mercedes S-Class Plug In</b> <sup>***</sup> Starting MSRP: \$96,900* Federal Tax Credit: \$4,061 MPG Equivalent: 58 Electric Range (miles): 11	<b>Vauxholt Ampera</b> <sup>***</sup> Starting MSRP: \$71,800 Federal Tax Credit: \$4,588 MPG Equivalent: 94 Electric Range (miles): 15
<b>BMW 5e</b> <sup>***</sup> Starting MSRP: \$140,700 Federal Tax Credit: \$5,795 MPG Equivalent: 78 Electric Range (miles): 34	<b>Chevrolet Volt</b> <sup>***</sup> Starting MSRP: \$33,320 Federal Tax Credit: \$7,500 MPG Equivalent: 109 Electric Range (miles): 53	<b>Hyundai Ioniq PHEV</b> <sup>***</sup> Starting MSRP: \$34,600 Federal Tax Credit: \$4,503 MPG Equivalent: 39 Electric Range (miles): 27	<b>Porsche Cayenne E-Hybrid</b> <sup>***</sup> Starting MSRP: \$78,700 Federal Tax Credit: \$5,355 MPG Equivalent: 48 Electric Range (miles): 34	
<b>BMW X5 xDrive40e</b> <sup>***</sup> Starting MSRP: \$64,888 Federal Tax Credit: \$4,888 MPG Equivalent: 55 Electric Range (miles): 14	<b>Chrysler Pacifica</b> <sup>***</sup> Starting MSRP: \$41,399* Federal Tax Credit: \$7,500 MPG Equivalent: 84 Electric Range (miles): 33	<b>Kia Optima PHEV</b> <sup>***</sup> Starting MSRP: \$35,110* Federal Tax Credit: \$4,101 MPG Equivalent: 109 Electric Range (miles): 28	<b>Porsche Panamera E-Hybrid</b> <sup>***</sup> Starting MSRP: \$96,100 Federal Tax Credit: \$4,781 MPG Equivalent: 51 Electric Range (miles): 15	

**BATTERY ELECTRIC VEHICLES (BEVs)**

<b>BMW i3 BEV</b> <sup>***</sup> Starting MSRP: \$42,488 Federal Tax Credit: \$7,500 MPG Equivalent: 124 Electric Range (miles): 81	<b>Chrysler Bolt</b> <sup>***</sup> Starting MSRP: \$36,600 Federal Tax Credit: \$7,500 MPG Equivalent: 119 Electric Range (miles): 238	<b>Ford Focus Electric</b> <sup>***</sup> Starting MSRP: \$33,800 Federal Tax Credit: \$7,500 MPG Equivalent: 113 Electric Range (miles): 84	<b>Ford Focus Electric</b> <sup>***</sup> Starting MSRP: \$33,820 Federal Tax Credit: \$7,500 MPG Equivalent: 107 Electric Range (miles): 115	<b>Kia Soul EV</b> <sup>***</sup> Starting MSRP: 2,250 Federal Tax Credit: \$7,588 MPG Equivalent: 108 Electric Range (miles): 93	<b>Mercedes B250e</b> <sup>***</sup> Starting MSRP: \$50,000* Federal Tax Credit: \$7,588 MPG Equivalent: 85 Electric Range (miles): 87	<b>Mitsubishi i-MiEV</b> <sup>***</sup> Starting MSRP: \$21,066 Federal Tax Credit: \$7,588 MPG Equivalent: 111 Electric Range (miles): 98	<b>Nissan Leaf</b> <sup>***</sup> Starting MSRP: \$30,680* Federal Tax Credit: \$7,588 MPG Equivalent: 111 Electric Range (miles): 107	<b>Smart Electric Drive</b> <sup>***</sup> Starting MSRP: \$25,000 Federal Tax Credit: \$7,588 MPG Equivalent: 107 Electric Range (miles): 98	<b>Tesla Model S</b> <sup>***</sup> Starting MSRP: \$66,000* Federal Tax Credit: \$7,588 MPG Equivalent: 104* Electric Range (miles): 265*	<b>Tesla Model S</b> <sup>***</sup> Starting MSRP: \$85,000* Federal Tax Credit: \$7,588 MPG Equivalent: 98 Electric Range (miles): 257*	<b>Volkswagen e-Golf</b> <sup>***</sup> Starting MSRP: \$31,895* Federal Tax Credit: \$7,588 MPG Equivalent: 115 Electric Range (miles): 115
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\*Specifications are based from the U.S. Department of Energy's fuel economy guide unless noted by \*\* in which case it came from the manufacturer. All models listed are currently available, but the specifications are for the model year 2016.

NEW YORK STATE | ChargeNY | NYSERDA | ENERGETICS

Drive Clean Rebate (NYSERDA)

# Drive Clean Rebate for Plug-In Electric Cars



The Drive Clean Rebate amount depends on the EPA all-electric range for that car model

Greater than 120 miles

40 to 119 miles

20 to 39 miles

Less than 20 miles

Electric cars with MSRP >\$60,000  
(MSRP is the manufacturer's suggested retail price)

**\$2,000 OFF**  
**\$1,700 OFF**  
**\$1,100 OFF**  
**\$500 OFF**  
**\$500 OFF**

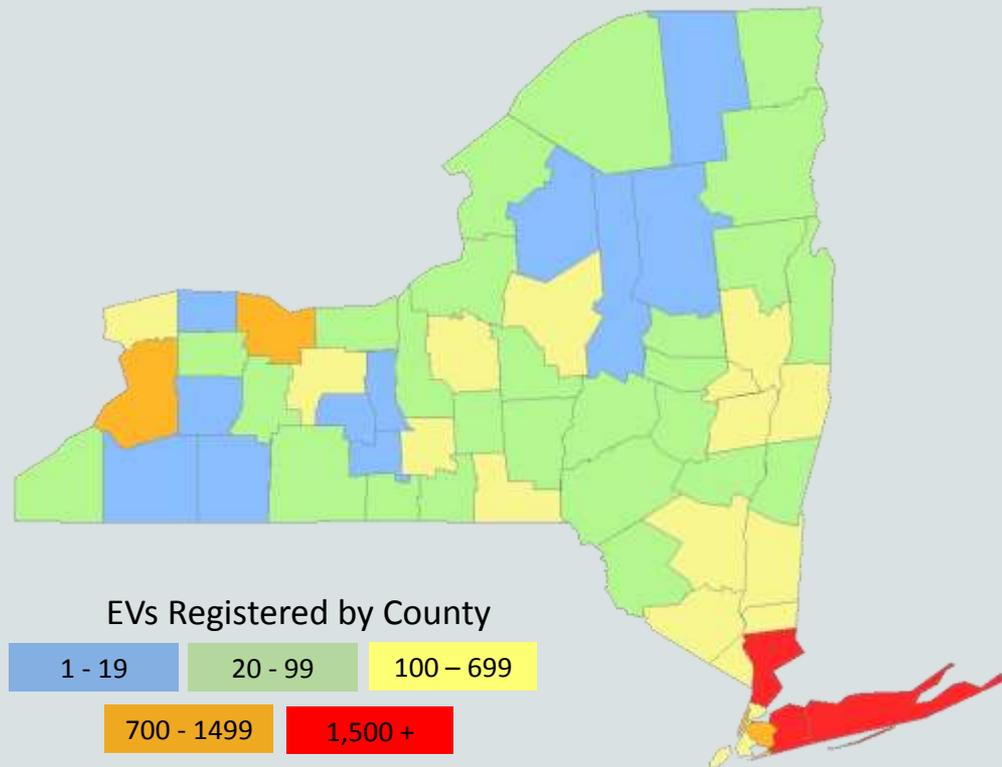
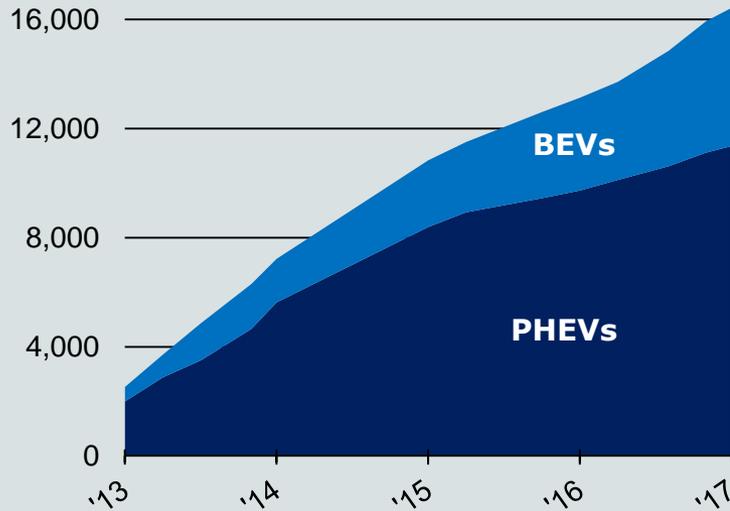
# EV OWNERSHIP IN NEW YORK STATE

*EV registrations are concentrated in larger cities and increasing*

## EV Ownership

**16,600 EVs** were registered in New York State as of January 1, 2017

Over 60% of EVs are in **Long Island, Westchester, and New York City**  
Most other EVs are near **larger cities**



*Various infrastructure solutions provide charging for different parking durations*

## EV Charging Stations (EVSE)

### DC Fast Charging

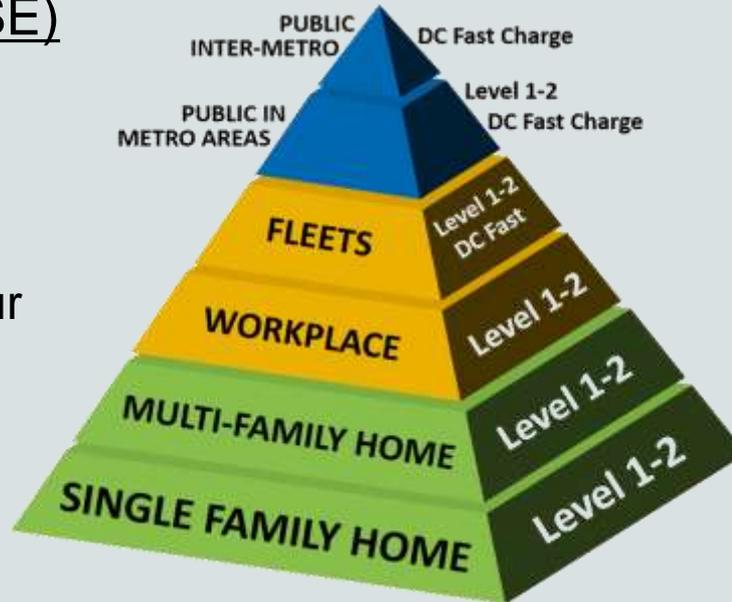
- 80% in 20 minutes

### 240 V AC Level 2

- 10-20 electric miles per hour

### 120 V AC Level 1

- 2-5 electric miles per hour



## Charging Connectors

### Standard J1772 connector

for AC Level 1 & 2

### Multiple connectors

for DC Fast Charging



Charging Station Options  
(NYSERDA)

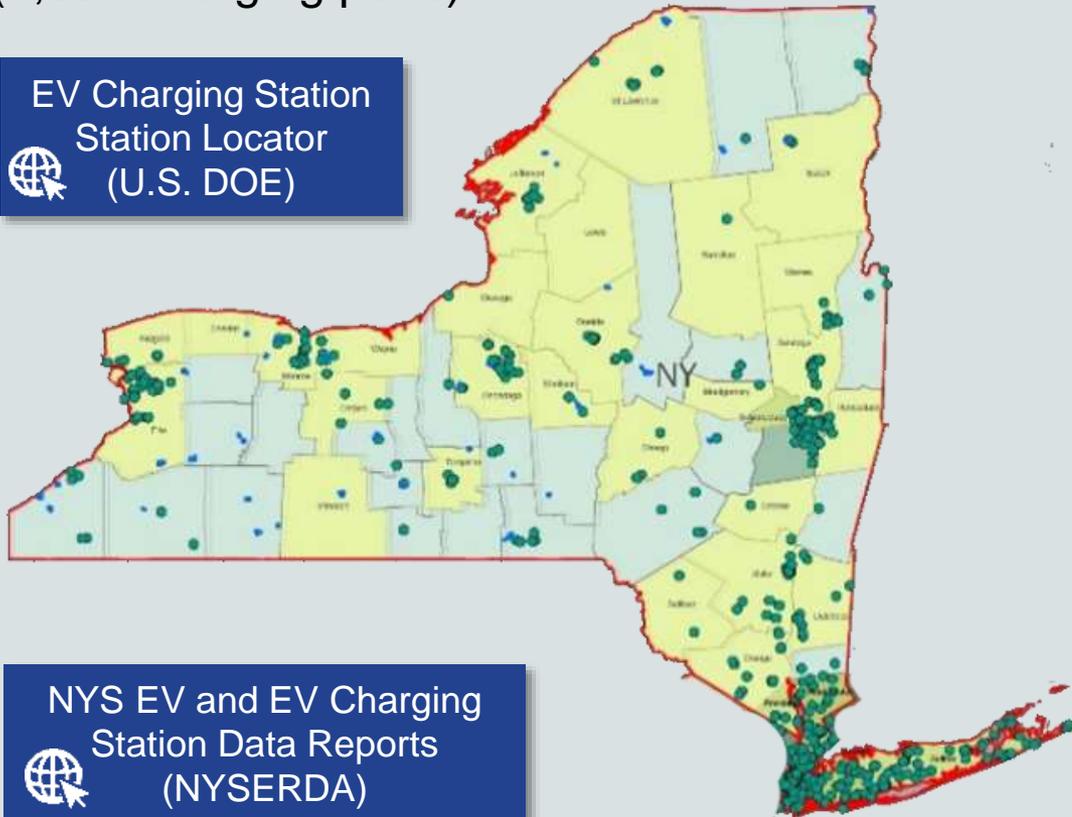


*EV drivers are finding more opportunities to charge away from home and extend the use of their BEV or put more electric miles on their PHEV*

Charging Stations

New York State has **754** public charging stations (1,562 charging ports)

EV Charging Station Station Locator (U.S. DOE)



NYS EV and EV Charging Station Data Reports (NYSERDA)

**ELECTRIC VEHICLE CHARGING STATIONS**

CHARGING STATIONS HAVE DIFFERENT POWER LEVELS TO ADDRESS DRIVER NEEDS

AC LEVEL 1 CHARGERS	AC LEVEL 2 CHARGERS	DC FAST CHARGERS
Provides 2-5 miles of electric range for each hour of charging. Standard home AC current (120V) is supplied to the EV using a portable cord that plugs into a regular three-prong outlet.	Provides 10-20 miles of electric range for each hour of charging. Higher AC (208-240V) is supplied to the EV, using a standardized connector that works for all EV models except for Tesla, which has its own.	Provides 80% of a full charge in 20 minutes. Direct current (DC) at 200-500V is transferred straight to the battery. Two common DC connectors exist and are available on most EVs, except for Tesla that uses its own connector.
Single family & multi-family homes	Workplaces	Public spaces, inter-metro
Standard AC Level 1 charger connector is called SAE J1772	Standard AC Level 2 charger connector is called SAE J1772	Standard DC connectors are the SAE J1772 DC Combo and CHAdeMO

Single family & multi-family homes  
Workplaces  
Fleets  
Public spaces in metro areas

Public spaces, inter-metro

THERE ARE MORE THAN 1,400 PUBLIC CHARGING STATIONS ACROSS NEW YORK STATE

To learn more about electric cars and charging stations in New York State, visit [nyscrda.ny.gov/ChargeNY](http://nyscrda.ny.gov/ChargeNY)

**Residential Chargers**  
Shared by PlugShare members

**Public Stations**  
Installed by business or government

**High Power Stations**  
DC fast charge or Superchargers

**In-Use Stations**  
Currently in-use

More Options

### Hampton Inn and Suites Saratoga Springs

PlugScore **10.0** Ports **2 EV Plug (J1772)s**

Stations  
**ChargePoint**  
EV Plug (J1772)

Address  
25 Lake Ave, Saratoga Springs, New York, 12866

Description  
Located on the first floor of the parking garage. Need room key to access garage. Hotel guests only.

Photos

Last Check In  
**volthead** May 17, 2015 11:02 AM [Show Comments](#)

[Check In](#) [Directions](#) [Share](#)

*EV drivers share environment, health, and economy benefits with their community*

## Driver Demographics

EV drivers help **boost the local economy** in a number of ways including **attracting tourism** and **shopping locally**, while anchoring a **talented workforce** and **creating jobs**.

## Community Benefits

Making EV charging available will **attract EV drivers** and **prepare communities** for the evolving transportation future that will incorporate electric technology. EV drivers extend their electric miles by using public charging stations which improves **air quality** and **human health** for the local community.

Reducing our reliance on imported petroleum fuels with **electricity generated from domestic and renewable sources** has additional **economic benefits**.



Overview of EV Deployment  
in the Northeast  
(TCI)



# 2

# Policy Tools to Facilitate EV Adoption



- 2.1 EV Charging Policy Tools
- 2.2 Allowing EV Infrastructure
- 2.3 Incentivizing EV Technology
- 2.4 Requiring EV Stations
- 2.5 Regulating EV Charging
- 2.6 NYS Policy Examples

Zoning



Planning and policy tools can be used to **allow, require, regulate, and incentivize** EV charging stations. These tools can **lower the cost** and **streamline the administrative process**.

Partnerships &  
Procurement



Codes



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

Permitting



Parking



EV Resources for Planners  
and Municipalities  
(NYSERDA)



*Preliminary steps to ensure EV charging deployment is not restricted*

Zoning

Specifically **define EV and EV chargers** in local planning and land use contexts

Partnerships &  
Procurement

List EV infrastructure in **Zoning Use Tables**

Codes

Ensure zoning resolutions and ordinances **allow EV charging in logical locations**

Permitting

**Educate** staff and inspectors on EV technology and requirements

Parking

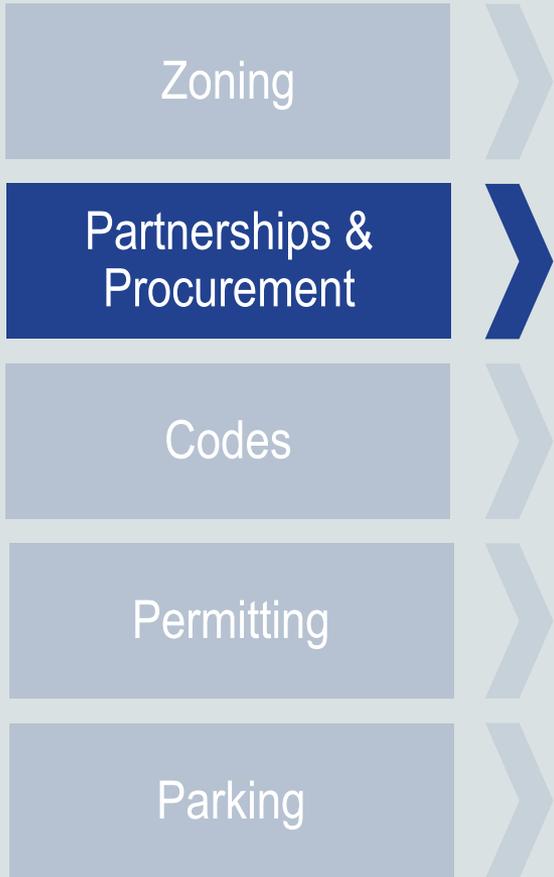
**Standardize and streamline** EV charging station installation permitting procedures and costs



Permit Processing  
Streamlining Report  
(NYSERDA)

# INCENTIVIZING ELECTRIC VEHICLE TECHNOLOGY

*Incentives support EV charging station installations and encouraging EV use*



**Several discounts, incentives, and programs for public and private entities:**

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

CHARGING STATIONS	<a href="#">New York State Alternative Fuel Tax Credit</a>	50% (up to \$5,000) to commercial and workplaces for the installation of EV charging stations through December 2017.
	<a href="#">ZEV Clean Vehicle Infrastructure Grant</a>	Rebates for EV charging stations up to \$8,000 per port, and for DC fast chargers up to \$32,000 per pedestal. Applications due March 31, 2017.
	<a href="#">Cleaner, Greener Communities</a>	Up to \$5,000 for incentivizing streamlined permitting and ordinances for EV charging station installations.
	<a href="#">CalStart Charge to Work NYC</a>	Employers are eligible to receive rebate incentives to install Level 2 ChargePoint charging ports at workplaces throughout the five boroughs of New York City, Westchester, and Long Island.
	<a href="#">EV Connect EV Charging Station Financing Project</a>	Low-cost financing and leasing opportunities for EV-Box charging stations with a focus on public and non-profit entities.
	<a href="#">Genesee Region EV Charging Rebate for Public Charging Infrastructure</a>	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.
VEHICLES	<a href="#">NYPA Public Sector Charging Station Program</a>	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.
	<a href="#">Federal EV Tax Credit</a>	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.
	<a href="#">Drive Clean Rebate</a>	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.
	<a href="#">NY Truck Voucher Incentive Program</a>	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.
	<a href="#">Municipal Electric-Drive Vehicle Program</a>	NYPA will provide zero-interest financing to purchase EVs for eligible municipalities and rural electricity cooperatives that currently receive low-cost hydropower from NYPA.
	<a href="#">ZEV Clean Vehicle Municipal Fleet Purchase</a>	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	<a href="#">Clean Pass Program (HOV Lane Exemption and Toll Discounts)</a>	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-Z Pass rates.
	<a href="#">Time-of-Use (TOU) Electricity Rates</a>	ConEdison and National Grid offer discounted rates for electricity use during off-peak hours when EVs typically charge at residences.

Visit [nyscrda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Support-and-Discounts](http://nyscrda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Support-and-Discounts) for more information. Updated March 24, 2017.

*Requiring EV infrastructure significantly increases adoption rates*

Zoning

**Restrict, permit, or require** EV charging infrastructure based on zoning districts

Partnerships &  
Procurement

**Establish development standards** on the number and type (level) EV charging stations permitted or even required

Codes

**Require conduit and sufficient electrical capacity** for EV charging in parking lot projects

Permitting

Set **numerical or percentage-based goals** or limits for EV infrastructure in new construction

Parking

Establish **standards for safety and scope** of EV charging stations

A Guide to EVSE Planning  
and Policy Tools  
(NYSERDA)



*Support for EV drivers to charge ensures successful implementation*

Zoning

Partnerships &  
Procurement

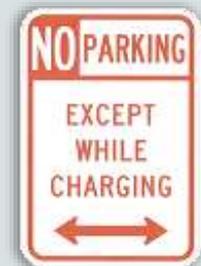
Codes

Permitting

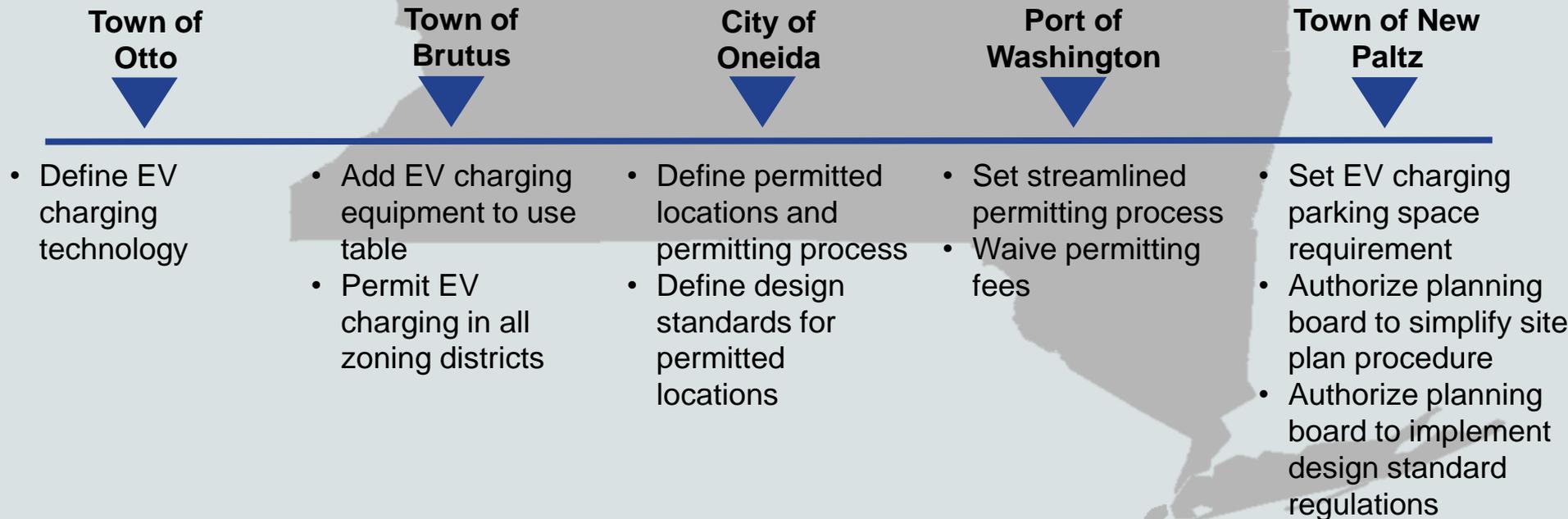
Parking



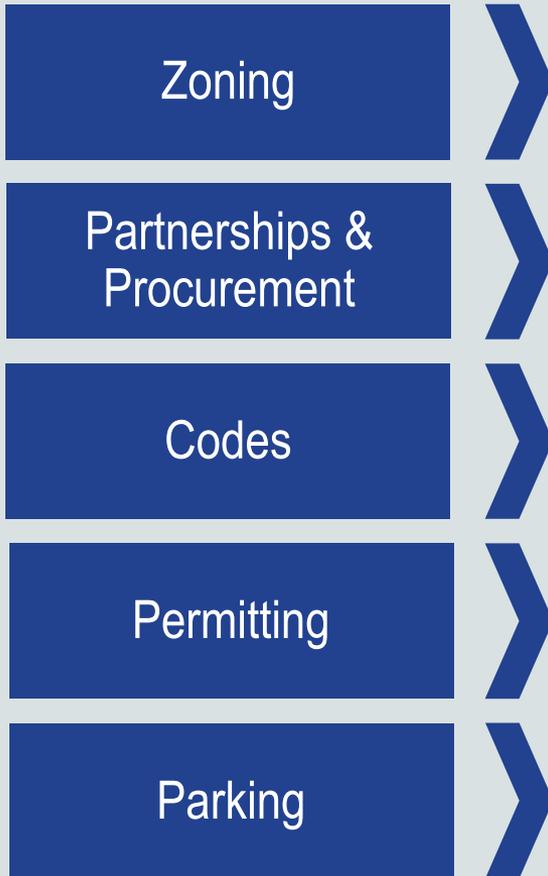
**Establish fees or other penalties** to discourage non-EVs from occupying charging spots



*Municipalities tailor EV charging policy to the needs of their community*



# EV CHARGING PLANNING & POLICY TOOLS



**Table 1: EV Planning and Policy Tool Summary**

<b>ZONING</b>	<p><b>Determines where and how EVSE is allowed, incentivized or required</b></p> <ul style="list-style-type: none"> <li>• Zoning establishes allowable uses through the municipal zoning code</li> <li>• Zoning can consider the deployment of EVSE within the larger context of planning and land use</li> <li>• Incentive zoning, such as the exchange of development bonuses for the inclusion of EVSE pre-wiring or infrastructure in new development, is a potential area for EVSE deployment, but it remains largely untested</li> <li>• By setting development standards through zoning ordinances, municipalities can use this tool to shape the scope (how many and where) of EVSE deployment</li> </ul>
<b>PARKING</b>	<p><b>Sets the scope and enforcement requirements for parking with state or local laws</b></p> <ul style="list-style-type: none"> <li>• 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</li> <li>• 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</li> <li>• 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</li> <li>• Opportunities exist for private parking management</li> <li>• Opportunities exist for developing EV parking incentives, such as preferred parking, which may encourage EV purchases</li> </ul>
<b>CODES</b>	<p><b>Ensure safe EVSE installations and specify the scope of EVSE-ready construction</b></p> <ul style="list-style-type: none"> <li>• Changes to the building and electrical codes are not necessary from a safety standpoint, but codes can help make places EV-ready</li> <li>• 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</li> <li>• Municipalities that are able to adopt their own codes benefit from a highly flexible state code—one that provides different standards for different situations</li> <li>• Building and electrical codes present different EV-ready opportunities</li> </ul>
<b>PERMITTING AND INSPECTION</b>	<p><b>Streamlines the administrative process so that it is uncomplicated, fast and affordable</b></p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Permitting is a local administrative process. As a result, the process varies across the TCI region, as evidenced by wide variations in permit fees</li> <li>• 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</li> </ul>
<b>PARTNERSHIP AND PROCUREMENT</b>	<p><b>Works closely with private or quasi-public partners to implement infrastructure in the public realm</b></p> <ul style="list-style-type: none"> <li>• Partnerships include working groups, which can unite government agencies with private industry and experts</li> <li>• Regional planning organizations such as MPOs and COGs are important for building consensus and getting the word out</li> <li>• Local U.S. Department of Energy Clean Cities chapters can offer additional funding and information on EVs</li> <li>• Governments can procure EVs for municipal and state fleets to increase awareness and meet sustainability goals</li> <li>• The role of the private sector can be just as, if not more, important in preparing the region for more comprehensive EVSE deployment</li> </ul>

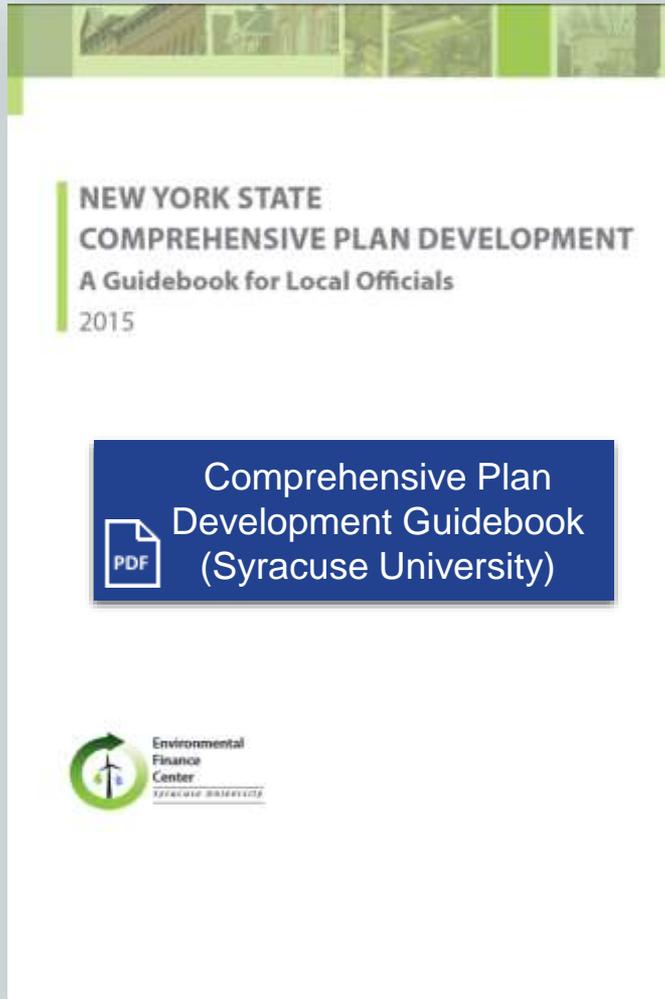
# 3

## Other Options for Encouraging EV Adoption



- 3.1 Comprehensive Plans
- 3.2 Executive Action
- 3.3 Participation in Initiatives
- 3.4 Leading by Example
- 3.5 Special Programs

*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

*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%.

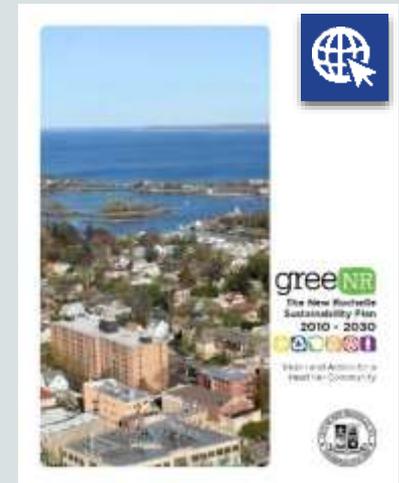
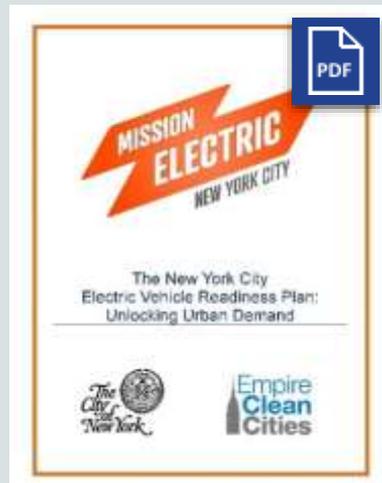
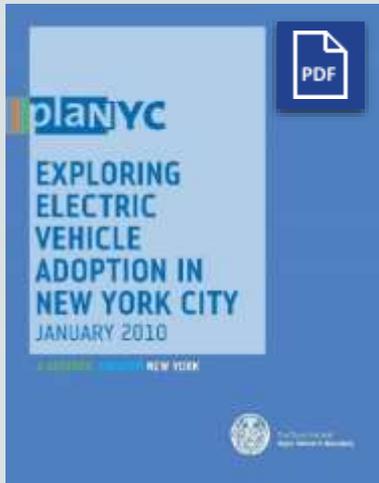
### **The NYC EV-Readiness Plan**

advances EV implementation potential through public outreach to **raise EV awareness**.

### **EnvisioNR Comprehensive Plan**

incorporates principles of sustainability using New Rochelle's **GreenNR 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**.



*Official executive action or expressed support can encourage EV adoption*

Energy efficiency and sustainability standards are governed by an overlapping set of state laws and Executive Orders.

**NYS Executive Order No. 4 (2008)** directs state agencies, public authorities and public benefit corporations to **green their procurements** and to **implement sustainability initiatives**.

**Ulster County Local Law #3 (2015)** establishes a **Sustainable Green Fleet** and goal of having 5% of the fleet be Green Vehicles by 2020, after which, 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)

*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**.

 Multi-State 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



*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



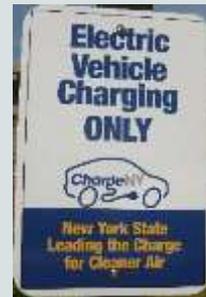
Delmar's 2016 National Drive Electric Event  
(Image provided by Bethlehem Chamber)

*Demonstrating EV use or installing EV charging stations encourages others*

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



**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)



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



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



EV Tourism in NYS  
(NYSERDA)



Ulster County Alive! EV  
Tourism Program  
(Ulster County)

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.



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

# ACTION ITEMS FOR EV READY COMMUNITIES



## 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.



### 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](http://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.nyseda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles](http://www.nyseda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles)



W X Y architecture + urban design

# 4

# Planner and Planning Board Actions



- 4.1 When to Suggest EV Charging Stations
- 4.2 Facilitating Installations in the Planning Process
- 4.3 Bargaining EV Charger Use in Exchange for Variances
- 4.4 Include Conduit in New Parking Lot Projects

*Recognize opportunities to incorporate EV charging stations in new developments*

### Site Selection for public AC Level 2 Stations

Charging stations in EV Clusters are more likely to be used and will help **foster increased use** of EVs. New developments or projects at venues such as **medical campuses, higher education, retail complexes, and multi-use downtown parking areas** should consider incorporating EV charging stations.

EV Cluster Analysis  
(NYSERDA)



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

- Dwell times between 2-4 hours
- 240V power available near parking spaces
- Easily accessible and open 24 hours (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



*EV charging stations gain credits toward environmental recognitions*

Green Building certificates **showcase an organization's commitment to sustainability** and are often used for marketing or publicity by the owner.

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

- **LEED** (Leadership in Energy and Environmental Design) certification designates points to new buildings that designate 5% of parking spaces as preferred parking for green vehicles *and* EV charging stations.
- **Green Globes** offers five points toward new construction for installing EV charging stations.
- **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.
- **STARS** (Sustainability Tracking, Assessment, and 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.



EV Charging Credits for Green Building Certificates (U.S. DOE)

# SITE SELECTION GUIDE FOR EV CHARGING STATIONS



## SITE SELECTION CHECKLIST 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 charge over 50 miles 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.*



## 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:

**By 2017 there were 16,500 EVs registered in New York**

[www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Tools/Electric-Vehicle-](http://www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Tools/Electric-Vehicle-)

### 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](http://www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Info/Charging-Station-Hosts)

*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.

### Site elements to consider:

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, brand
5. **Permitting:** process, cost, local experience
6. **Other:** protection, signs, maintenance

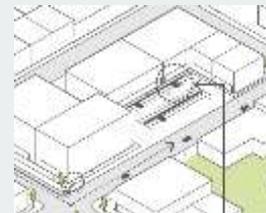


Best Practice Guides  
(NYSERDA)

Carports add visibility and protection



Priority spaces for image and convenience

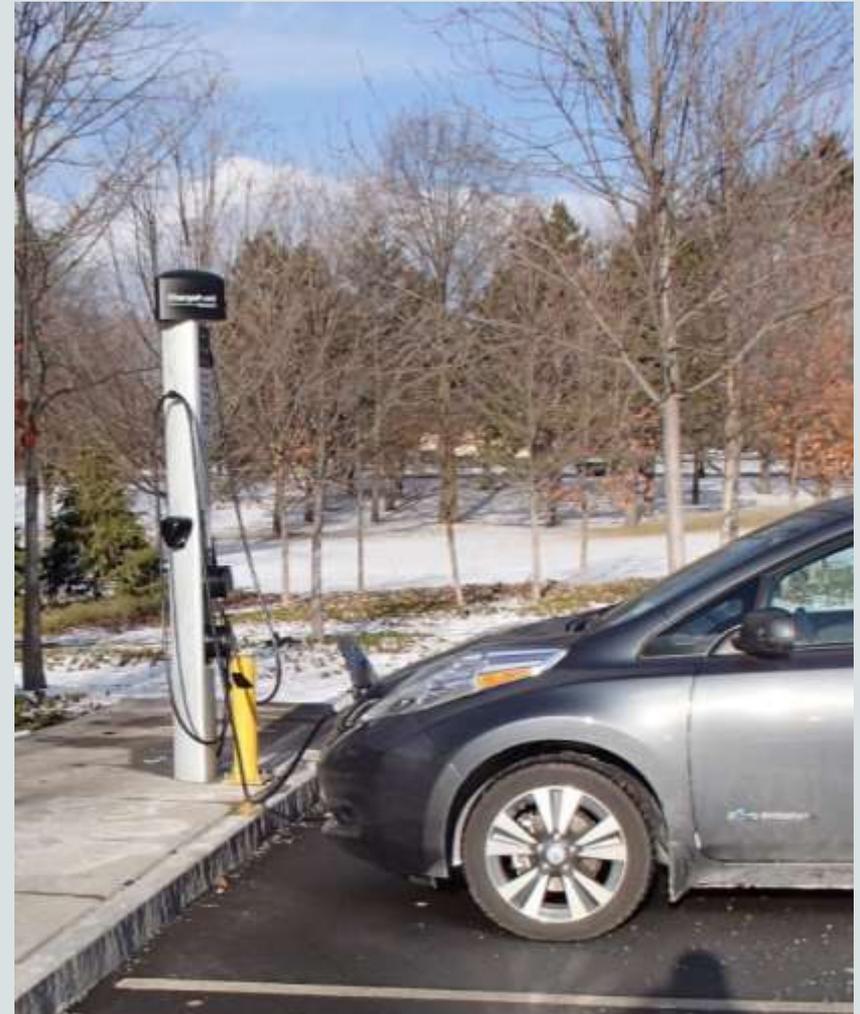


Bollards for protection and extra spaces

*Installing EV charging stations may be part of approval negotiations*

Given the **public benefit** EV charging provides, it could be a **bargaining tool** as part of the negotiations for development projects when other requirements are not appropriate.

- 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



*Properly preparing for future installations can significantly lower costs*

### Planning for lower costs

Properly preparing a site for a charging station installation can **reduce total installed costs** by about **33% or \$6,700** from the \$20,000 average cost for a Level 2 dual port station:

- 1.5" – 2" **conduit** run from the electrical panel to the potential EV charging station location
- **Electrical panel** with additional capacity and available breaker slots



- EV Charging Station per Dual Port
- Construction per Dual Port
- Overhead per Dual Port
- Permit/Inspection
- Labor Cost per Dual Port
- Electrical Panel per Dual Port
- Materials per Dual Port

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

# Questions



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