

# Making Local Government EV Ready

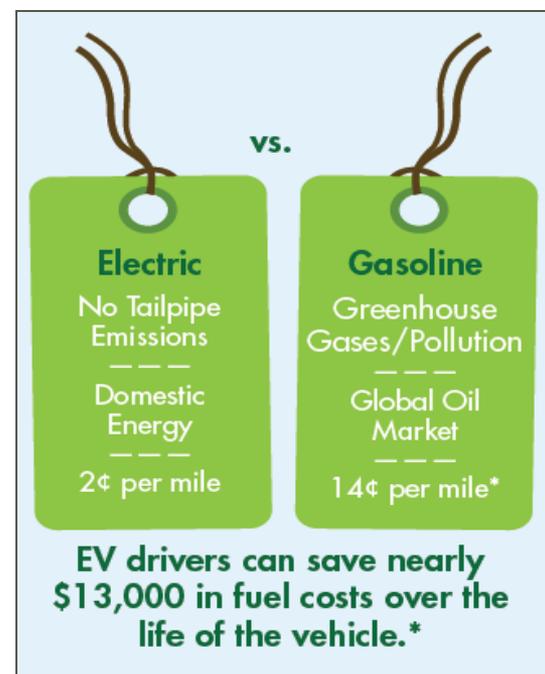
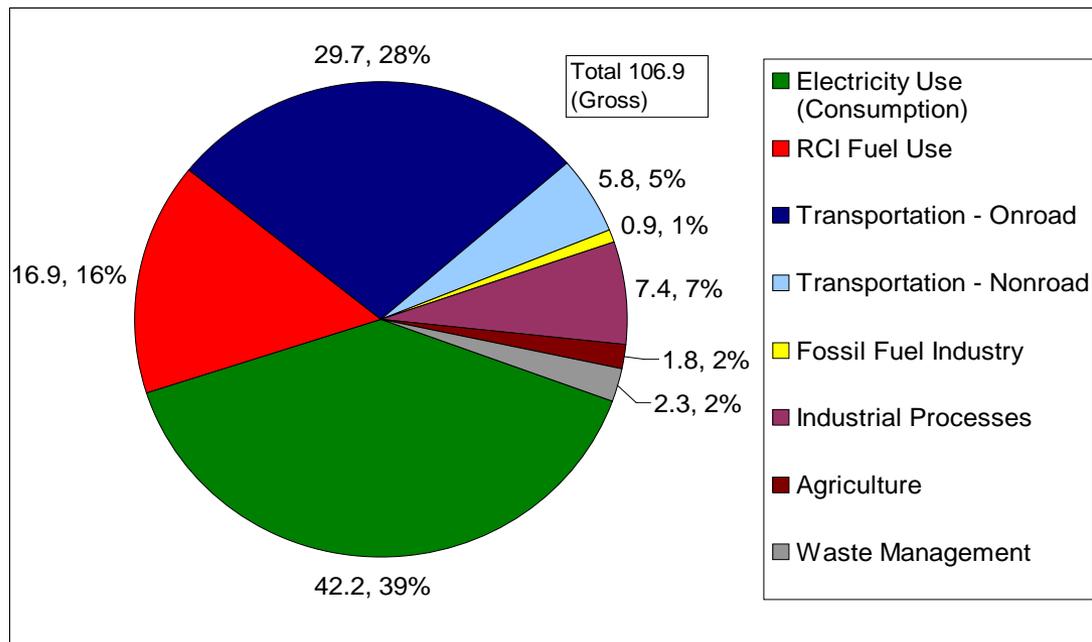
Maryland Electric Vehicle Infrastructure Council  
Local Government Outreach Project

December 2013

A decorative graphic at the bottom of the slide consisting of a dark green area on the left, a black horizontal band, and a light green area on the right that tapers to the right.

# How Do EVs Benefit Maryland?

- q Cars and trucks emit one-third of the State's GHG emissions and ozone-forming pollutants
- q The Greenhouse Gas Emissions Reduction Act requires a 25% reduction in GHG emission levels by 2020
- q EV initiatives – key component of State's strategy to achieve long-term GHG and air quality goals
- q Electric propulsion of vehicles produces zero tailpipe emissions
- q EVs charged on Maryland's grid have lower life cycle GHG emissions than conventional vehicles and will get even lower over time
- q EVs save drivers \$\$ in fuel and maintenance



# EV Initiatives in Maryland



## q **The Clean Cars Program/ZEV**

- § MD is one of 10 states to adopt the California ZEV program
- § Governor signed multi-state ZEV MOU in October 2013
- § Requires 3.3 Million EVs in ZEV states by 2025

## q **Electric Vehicle Infrastructure Council**

- § Goal of 60,000 EVs in MD by 2020
- § Charging infrastructure to support goal

## q **Transportation and Climate Initiative**

## q **Proposed State Fleet Goal: 10% by 2020, 25% by 2025**

- § Piggyback purchasing opportunities

## q **DOD ZEV initiative at federal facilities**

- § Piggyback purchasing opportunities

# Today's Electric Vehicles



## All-Electric Vehicles (BEVs)

- Ford Focus EV
- Toyota RAV4 EV
- Tesla Model S
- Nissan Leaf
- Mitsubishi i
- Honda Fit EV
- Coda Electric Sedan
- Chevrolet Spark EV
- BMW ActiveE
- Fiat 500e
- Scion iQ EV
- Smart ForTwo



## Plug-in EV Hybrids (PHEVs)

- Ford C-Max Energi
- Ford Fusion Energi
- Toyota Prius Plug-in
- Honda Accord Plug-in
- Chevy Volt
- Cadillac ELR
- Audi A4 Plug-in
- Porsche Panamera Plug-in



# EV Basics

*EVs can plug directly into any standard wall outlet or higher-voltage electric vehicle supply equipment for a faster recharge.*

*The majority of commuters drive less than 40 miles per day – well within an EV's range.*

## **Level 1 – 120 V**

- § 3-16 hrs to charge Volt (PHEV)
- § 20 hrs+ to charge Leaf (BEV)
- § \$10-\$20 to install

## **Level 2 – 240 V**

- § 1.5-6 hrs to charge Volt
- § 4-7 hours to charge Leaf
- § \$2,000-\$6,000 to install

## **Level 3/DC Fast Charge**

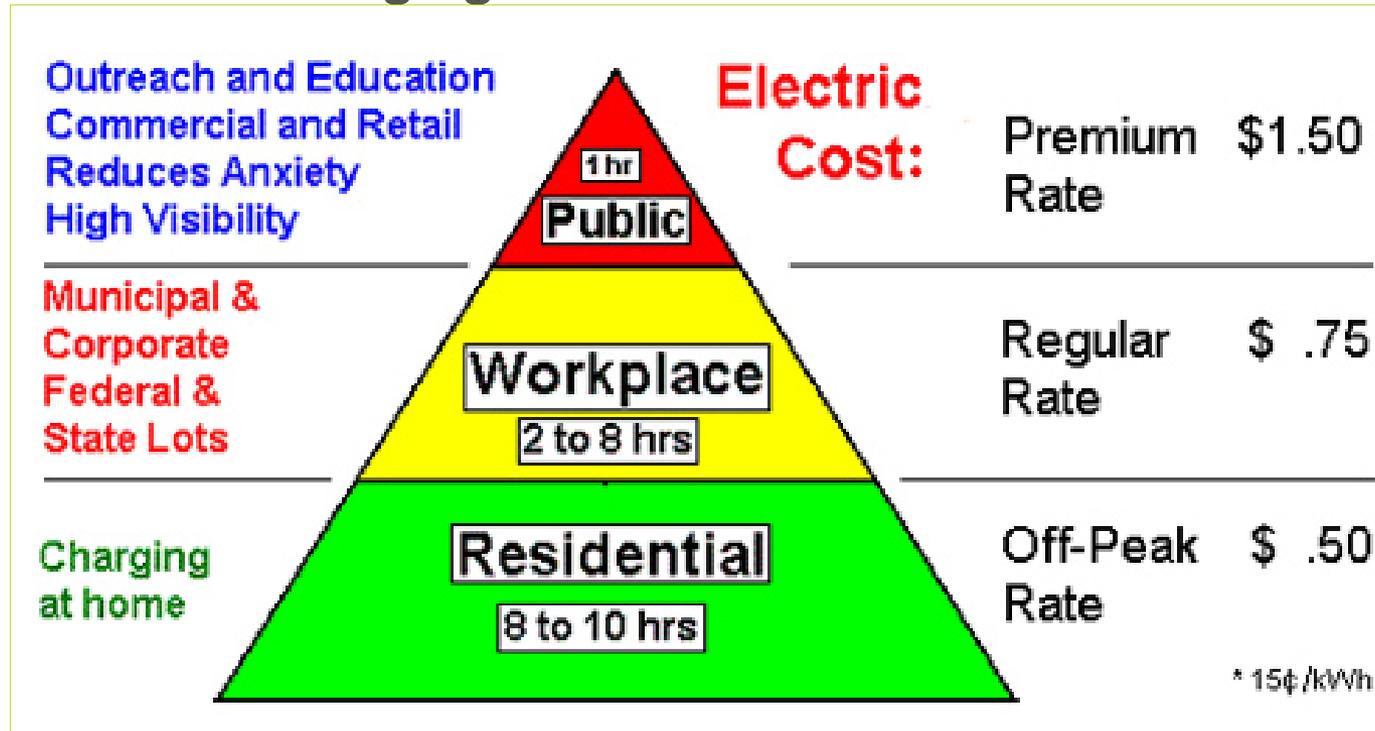
- § 440V, 3-phase
- § 30 minutes for 80% charge
- § Only charges BEVs (Leaf, etc)
- § \$25,000-\$50,000 to install



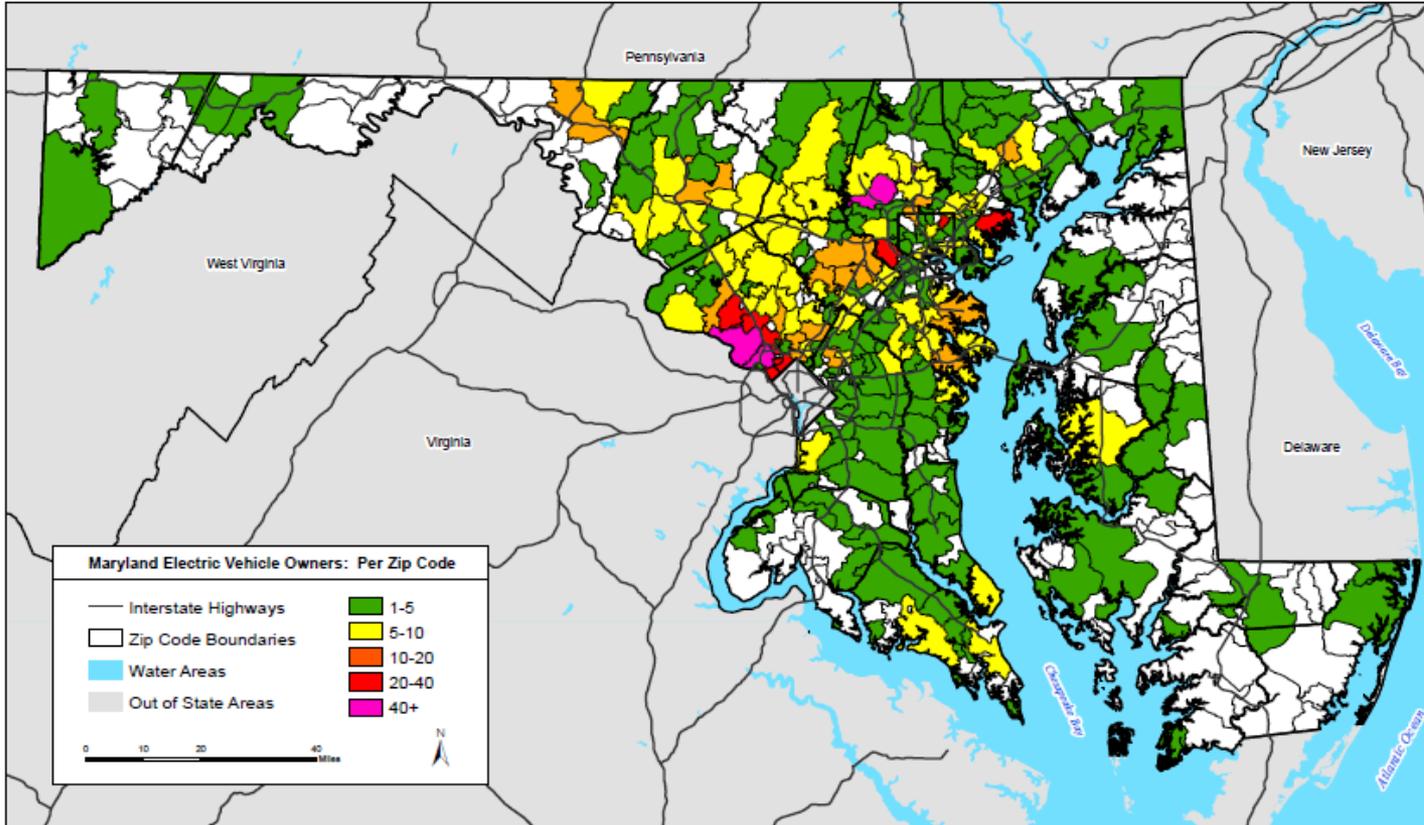
# Where Do EV Drivers Charge?



## Charging Pyramid – home, work, community, travel 70% of charging occurs at home and at work



# MD EV Owners by Zip Code



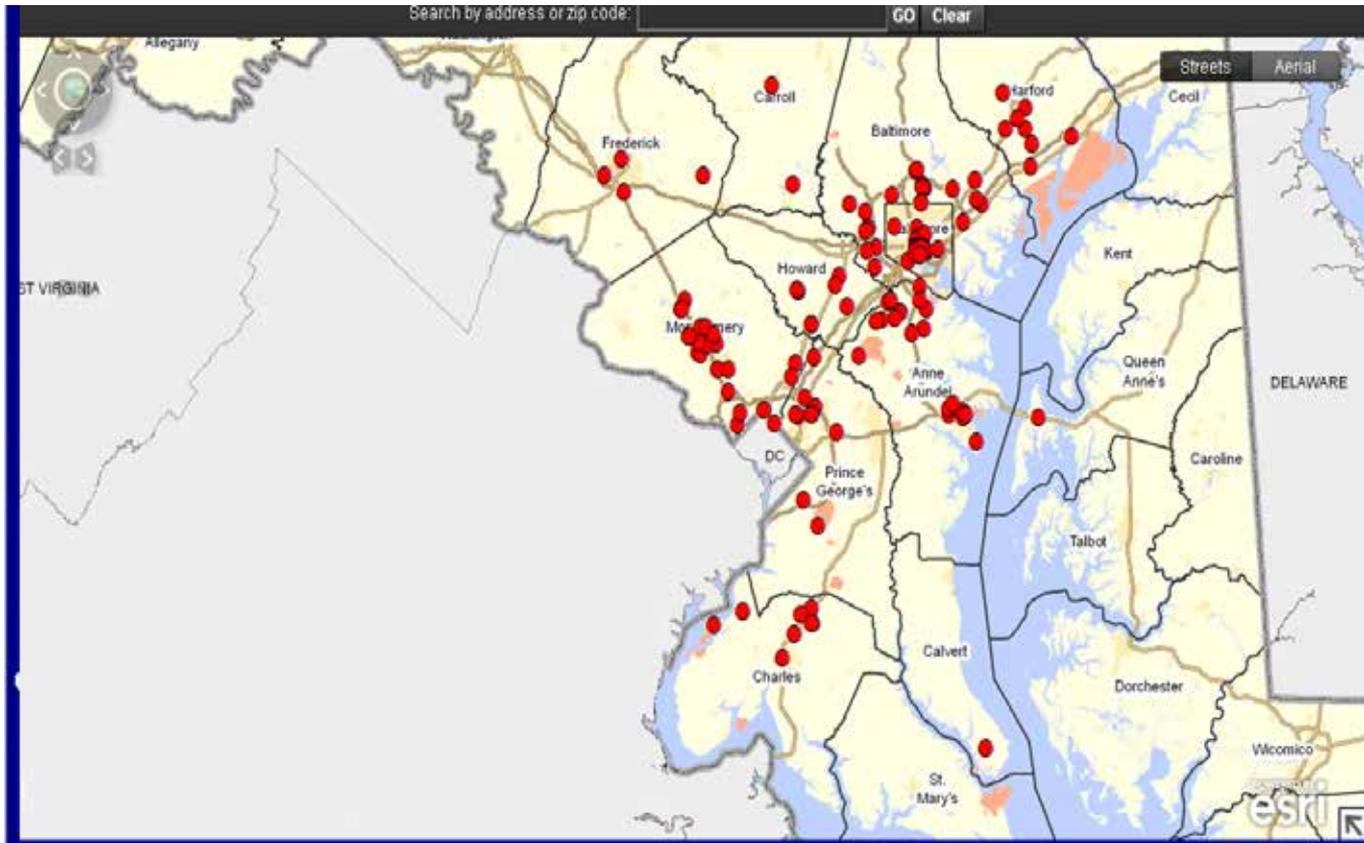
q Today, 15 EV models available for purchase in MD

q More than 1,900 EVs registered in MD through October 2013

q Sales of EVs increased by over 400% from 2011 to 2012

q 2013 – monthly sales significantly ahead of 2012

# Public Charging Station Locations



q Over 440 Level 1 and 2 public charging stations

q Over 1,000 private Level 1 or 2 charging stations

q \$1M in State's FY14 budget for Level 1 and 2 charging stations at Metro and MARC Park & Rides

q DC Fast charging stations planned for rest areas, along major roads, tourist destinations and other locations

# Special Challenges and Opportunities

Up to 46% of Maryland residents do not have private access to an electrical outlet.

## q **Multi-dwelling units**

- § Convene educational workshops and webinars for developers, property managers and homeowner associations on the benefits of providing charging for residents

## q **Urban**

- § Facilitate on-street charging by building on the municipal parking permit model for residential on-street parking with charging
- § Investigate options for wiring existing publicly and privately owned garages and parking lots for EV charging
- § Pilot Projects: Demonstrate options for shared use of existing parking facilities, allowing urban residents to park and charge at night in facilities used for business and employment during the day

## q **Workplace**

- § Convene workshops to share best practices and benefits of providing EV charging for employees
- § Encourage businesses to join U.S. DOE Workplace Charging Challenge and TCI EV Pledge Partners
- § Recognize business leaders

# TCl Guidance Documents and Outreach Materials



## Guidance Documents include:

- q Creating EV Ready Towns and Cities: A Guide to Planning and Policy Tools
- q EV-Ready Codes for the Built Environment
- q Electric Vehicle Siting and Design Guidelines
- q Lessons from Early Deployments of Electric Vehicle Charging Stations
- q Electric Vehicle Supply Equipment Cluster Analysis

## Brochures targeted to:

- q General Public
- q Local Governments
- q Employers
- q Multi-Unit Housing Owners
- q Utilities



[www.transportationandclimate.org](http://www.transportationandclimate.org)

[www.northeastevs.org](http://www.northeastevs.org)

# TCI Guide to Planning and Policy Tools



Provides guidance to local governments for implementing EV charging

- q Creating, administering and amending planning processes, rules and regulations
- q Best practices for promoting EV-friendly zoning regulations, parking ordinances, building codes, permitting practices, and partnership and procurement policies
- q Sample zoning, parking, building and electrical code amendments in **Appendix C to Guide, pp. 38-47**

Zoning

Parking

Codes

Permitting

Partnerships &  
Procurement

# Planning and Policy Tools: Zoning



## Zoning actions can:

- q Establish clear delineation and use for groups of EV and EV supply equipment (EVSE)
- q Set out high-level criteria for design, accessibility, and parking enforcement
- q Permit EVSE in logical locations
- q Require or incentivize EVSE in certain locations

Methuen, Massachusetts adopted an addendum to the city zoning resolution that specifies permissible use of Level 1 and Level 2 charging stations in residential zones.

Level 1 and 2 permitted as accessory uses to parking facilities in all areas.

DC fast charge permitted as principal use in commercial or industrial zones or conditional use in general.

Zoning

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# Planning and Policy Tools: Parking



q **Counties and municipalities can use parking ordinances to:**

- § Scope EVSE pre-wiring or installation from a transportation and logistics perspective
- § Set standards for on-street EV charging and parking
- § Provide guidance on how best to manage user rotation, access, and violations

q **Private organizations can also promote EV parking by offering EV-only spots in their lots**

**Price Chopper**, the supermarket chain, has located EV-only parking with charging stations that include a marketing-oriented canopy design near store entrances.

Zoning

**Parking**

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# Planning and Policy Tools: Parking



## q **Local governments can use pricing to manage demand**

**Free charging is effective in encouraging sales of electric vehicles,  
but charging fees can solve some implementation issues:**

- § Demand for free chargers may outpace practical installation rates
- § Potentially requires expensive panel upgrades to keep up with demand
- § Congestion at chargers can decrease reliability for all-electric vehicles
- § Other facility users subsidize the cost of electricity

Zoning

**Parking**

Codes

Permitting

Partnerships &  
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# Planning and Policy Tools: Building and Electrical Codes



Building and electrical codes can set standards for safety and scope of EVSE deployment by:

- q Setting numerical or percentage-based EVSE installations for new construction
- q Providing for new permitting or inspection protocols

## EVIC Outreach to Local Electrical Inspectors

EVIC conducted regional meetings in 2012 followed by an online survey of chief electrical inspectors from each county, Baltimore City and other municipalities

Zoning

Parking

Codes

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# Planning and Policy Tools: Permitting



- q **Localities can make it easier to install EVSE through streamlined permitting processes that:**
  - § Standardize permitting across jurisdictions and minimizing permitting cost and procedure
  - § Classify EVSE installation as “minor work”
  - § Provide a permitting template or online permitting to applicants
  - § Ensure that inspections are conducted in a timely manner
  
- q **EVIC outreach to electrical inspectors concluded no significant barriers exist to EVSE permitting in Maryland**





# Planning and Policy Tools: Partnerships and Procurement

- q **Diverse partnerships can strengthen the EV planning process**
  - § Involving private companies, utilities, MPOs and others helps a community become EV-ready
- q **Procurement policies can promote the purchase of EVs**

## EV Stakeholders

Government agencies – planning and zoning, public works, building and electrical code enforcement, parking authority

Historic district commissions

Utilities

Multi-dwelling units – condo, townhouse and apartment developers, property managers, homeowner associations

Large employers

Parking facility owners/operators

Retail businesses

Accessibility advocates (ADA)

Zoning

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# EV-Ready Codes for the Built Environment



q This TCI report provides an overview of building and electrical codes as they relate to EVs, best practices from around the country and recommendations

q Report conclusions:

- § Existing codes do not present a significant barrier EVSE deployment, but could be revised to more clearly encourage EV-readiness
- § Codes can create a high-level planning framework while retaining flexibility at the local level
- § Adopting EV-friendly codes works best when part of a collaboration among partners and stakeholders

**Pre-wiring for EV during new construction is much less costly than retrofitting later.**



# EV-Ready Codes



## Case study: Los Angeles

- q Top-down approach: California adopted CALGreen, the nation's first mandatory green building code, and includes an EV-ready policy
- q Includes "tiers" of compliance allowing jurisdictions to choose the most appropriate level for local conditions
- q Los Angeles City has amended its code to require EV pre-wiring in new construction (including 5% of multi-dwelling unit parking stalls)

## Case study: Vancouver, B.C.

- q Created a collaborative working group to develop EV-readiness strategies
- q Amended building code to require EV pre-wiring in new construction (including 20% of multi-dwelling unit parking stalls)

| Los Angeles   |                           |
|---|---------------------------|
| <b>Designated Parking.</b> Provide designated parking, by means of permanent markings or a sign, for any combination of low-emitting, fuel-efficient, and carpool/van pool vehicles.        |                           |
| <b>Mandatory</b>  | 8%                        |
| <b>Voluntary (Tier 1)</b>   | 10%                       |
| <b>Voluntary (Tier 2)</b>   | 12%                       |
| <b>Electric vehicle supply wiring.</b> For each space, provide one 12- VAC 20 amp and one 208/240 V 40 amp, grounded AC outlets or panel capacity and conduit installed for future outlets. |                           |
| Total Number of Parking Spaces  | Number of Required Spaces |
| <b>0–50</b>   | 1                         |
| <b>51–200</b>   | 2                         |
| <b>201 and over</b>   | 4                         |

# TCI Siting and Design Guidelines



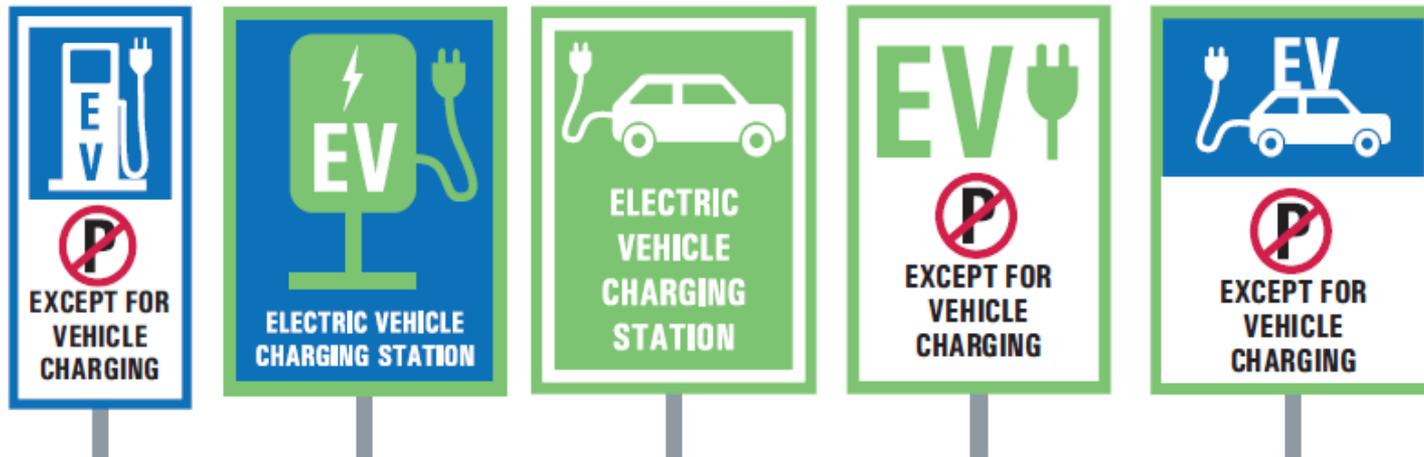
- q Provides siting and design recommendations at the micro level:
  - § Key siting and design issues for local governments, developers, homeowners, businesses, utility providers and other organizations
  - § Site selection and design elements and schematic drawings
- q Specific guidelines for commercial lots, multi-family residences, on-street charging, service station models, fleets and handicap access



# Siting and Design Guidelines: Signage



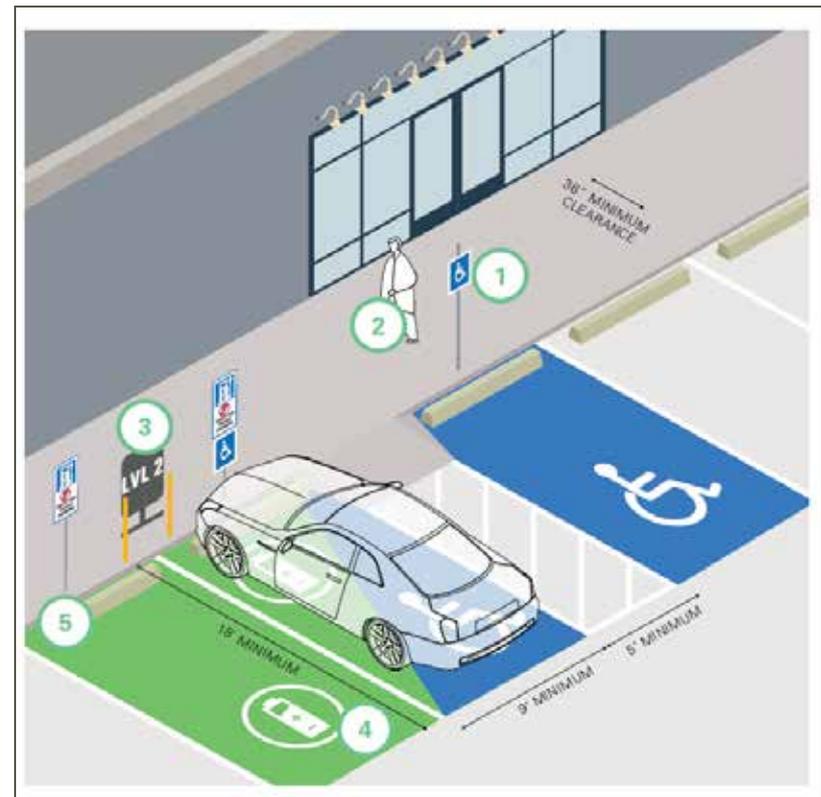
- q A combination of symbol and text is recommended
- q The term “charging” should be used to ensure hybrid vehicles do not use the spaces for parking
- q The selected EV symbol should be larger and more pronounced than the no-parking symbol to avoid confusing messages



# Siting and Design Guidelines: Commercial Sites



- q Signage is critical for finding stations in a busy lot
- q Allow sufficient room for pedestrian access and keep path clear for pedestrians
- q Visible EVSE can help with green branding
- q Carefully site EVSE to minimize cost – may be most cost effective to locate EVSE near electrical panel



# Siting and Design Guidelines: Multi-Dwelling Units



- q Consider how electricity consumption is metered and billed
- q Consider distance to electrical panel and potential concerns from residents when siting EVSE
- q Be creative when locating EVSE in a crowded garage – EVSE can be mounted on a wall when space is tight
- q Make sure there is sufficient room in the electrical panel to accommodate EVSE installations



# Siting and Design Guidelines: On-street



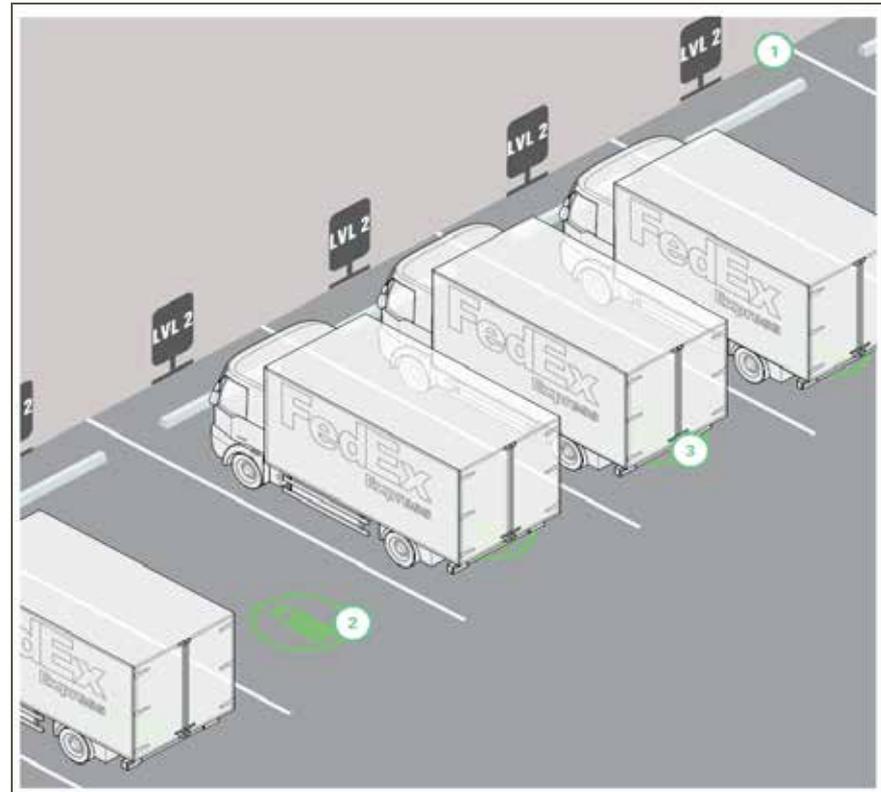
- q Signage and way finding is critical – consider locating EVSE in prominent locations
- q Space is often limited, so stations with a streamlined and simple design are desirable
- q On-street EVSE will need to draw power from a local business or street outlet
- q Allow sufficient space for the driver to plug-in his/her vehicle



# Siting and Design Guidelines: Fleets



- q Determine whether proximity to loading zones is crucial or if EVSE should be located further from building entrances
- q Length of stay will determine appropriate level of charge
- q Work with local utility to ensure necessary upgrades are made

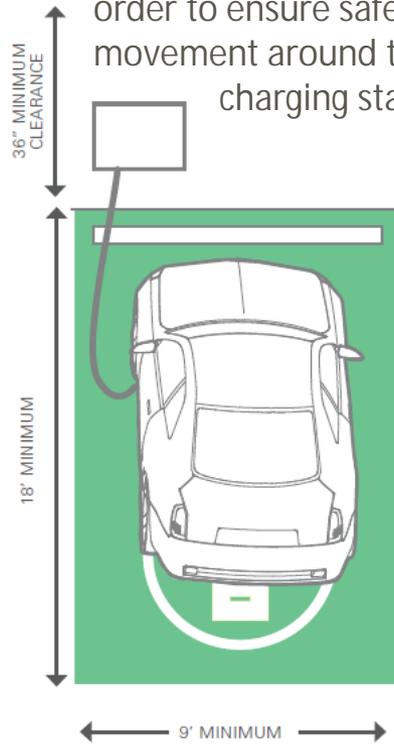


# Siting and Design Guidelines: ADA



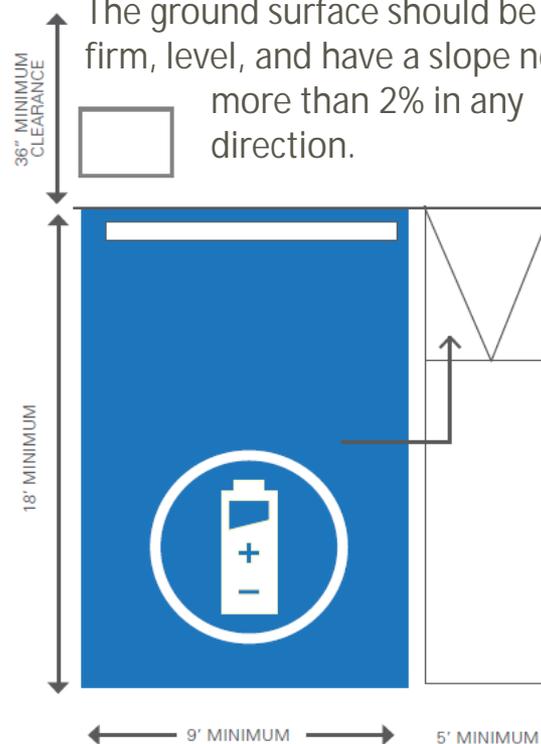
## Standard Parking Space

Considerations: More than typical space is required in order to ensure safe and easy movement around the charging station.



## Parking Space Considerations for Wheelchair Accessibility:

The ground surface should be firm, level, and have a slope no more than 2% in any direction.



## Possible Variations for Wheelchair Accessible EVSE Charging Spaces





TCI Guidance Documents and Brochures available at:

[www.transportationandclimate.org](http://www.transportationandclimate.org)



and

TCI's Northeast Electric Vehicle Network

[www.northeastevs.org](http://www.northeastevs.org)



