Becoming EV Ready









SolSmart Success

- Streamline solar codes
- Extensive checklist & point system

Illinois

- Work collaboratively
- 5800% in rooftop solar in Schaumburg

Permitting

Action	Points	We've done this!	Documentation
Create and make available an online checklist detailing the steps of your community's solar permitting process (Required).	Req'd		Share link:
Provide a streamlined permitting pathway for small PV systems with turn-around time of no more than 3 days (Required for Gold).	20 Req'd for Gold		Share link:
Distinguish between systems qualifying for streamlined or standard review.	5		Share link:
Require no more than one application form for a residential rooftop PV project.	5		Share link:
Review of solar permit fees for residential and commercial solar.	5		Share link:
Earn additional points: Revise or demonstrate that permit fees reflect national best practices (e.g. \$400 or less for residential, and based on cost-recovery for commercial).	5		Share link:
Review permitting process for efficiency improvements and reduce processing time to 10 days or fewer.	10		Share link:
Adopt a standard solar permit form aligned with best practices (e.g. Solar ABCs).	10		Share link:
Train permitting staff on best practices for permitting solar PV and/or solar and storage systems.	10		Share link:
Train fire and safety staff on solar PV.	10		Share link:



Becoming EV Ready Project





THANK YOU TO THE JOYCE FOUNDATION!





Listening Sessions



Municipalities

- Elected Officials
- Planners
- Building code officials
- Fire safety
- EV Industry
 - EV dealers
 - Electrical contractors
 - Charging station vendors
- ComEd
- Downtown business association
- Environmental advocates



The EV Ready Team held a listening session on March 3, 2020, at the South Suburban Mayors and Managers Association (SSMMA) Transportation Committee.





EV Readiness Checklist



Commit to EV Readiness
Zoning and Planning
Permitting
Inspection and Safety
Parking and Access
New Construction
EV Owner Rights
Municipal Fleets
Utility Engagement
Community Engagement
Market Development and Finance

Full checklist at: mayorscaucus.org/initiatives/environment/becoming-ev-ready/







ZONING AND PLANNING

Clarify or establish new zoning rules to facilitate EVCS installation.

Define transportation electrification technologies (EVs, EVCSs) to be considered.

Review zoning requirements and remove restrictions that intentionally or unintentionally hinder. EVCS installations.

Establish EVCS parking, signage, and wayfinding appearance rules.

Establish EVCS zoning siting criteria.

Establish zoning rules based on facility type, safety and risk.

Establish regulations for the commercial operation of EVCSs.

Explain rules for advertising on EVSE.

Clearly and concisely communicate EVCS zoning rules.





Adopt a STANDARD EVCS permit process primarily for Level 2 non-residential, workplace and multiple-unit dwelling installations.

Distinguish and define permitting requirements for multiple-unit dwelling and non-residential EVCSs.

Detail conditions in which a special permit is required.

Characterize standard EVCS permits as non-discretionary.

Require EVCS installers to be registered with the Illinois Commerce Commission (ICC).

Require EVSE to be verified safe and code compliant.

Require EVCS projects to be registered with the utility.

Clearly describe any basis for rejecting a permit up front.

Create and utilize one standard permit form for EVCS installation projects.

Establish prompt, predictable timelines from application to approval.

Establish reasonable permit fees based on cost recovery.

Adopt a SPECIAL EVCS permit process for Level 3/DC Fast Chargers, and large, complex Level 2 installations.

Define when special permits are required, based on power level, project complexity, project scope, and/or uniqueness.

Follow STANDARD EVCS permit process and establish requirement(s) for special permits: professional certifications/stamps, design deliverables, review and approval processes.

Characterize special EVCS permits as discretionary.

ERMITTING

Incentivize or require new construction to be EV CAPABLE or EV READY to reduce costs of future EVCS installation.

EV CAPABLE includes power supply, breakers and conduit near EV parking areas or spaces, terminated in outlets or junction boxes.

EV READY includes EV CAPABLE plus wiring to outlet or junction box and EVSE.

Establish requirements for making new single-family RESIDENTIAL units EV READY or EV CAPABLE.

Establish standard electrical amperage requirements for as-built electrical panels and EVCS circuits to make structure EV READY or EV CAPABLE.

Establish requirements for making new multiple-unit dwellings and commercial, workplace, and municipal facilities EV READY or EV CAPABLE.

EV-Capable

Install electrical panel capacity with a dedicated branch circuit and a continuous raceway from the panel to the future EV parking spot.



EVSE-Ready Outlet

Install electrical panel capacity and raceway with conduit to terminate in a junction box or 240-volt charging outlet (typical clothing dryer outlet).





Green Ways 2Go www.greenways2go.com

NEW CONSTRUCTION

Graphic source: Southwest Energy Efficiency Project

PARKING AND ACCESS

Establish parking policies to balance constituent needs and support growth in EV readiness.

Require safe cord management, such as retractable cords to accommodate all EVs and avoid trip hazards.

Establish parking enforcement policies and procedures.

Identify and promote EVCSs.

Provide wayfinding signage to direct EV drivers to EVCSs.

Recommend registration of public EVCSs on websites such as the Alternative Fuels Data Center to help

EV drivers find EVCSs.

ENERGY Energy Efficiency & Renewable Energy

Alternative Fuels Data Center







What part of the EV Readiness Checklist are you most interested in? (Check as many that apply.)

Zoom poll, question 1



Commit to EV Readiness

Zoning and Planning

Permitting

Inspection and Safety

Parking and Access

New Construction

EV Owner Rights

Municipal Fleets

Utility Engagement

Community Engagement

Market Development and Finance





EV Readiness Decision Guide: Support Local Governments

- Making purchase decisions EVs, EV Charging
- Planning / deploying EV Charging Projects
- Measuring Success
 - Sustainability and fleet operation impacts and business cases
- Policies and incentives
- Parking considerations
- Connecting Regionally
- Utility and the grid
- Electrifying Public Fleets
- Looking Forward



Green Ways 2Go www.greenways2go.com <u>Available at:</u> <u>https://mayorscaucus.org/initiatives/en</u> <u>vironment/becoming-ev-ready/</u>







EV Readiness Decision Guide

- EV and EV Charging Choices, options and features explained plus useful links
 - ABCs of EVs
 - Types, availability and timing of EVs
 - Types of EV Chargers
 - EV batteries & range
 - EV charging best practice
 - Charging levels
 - Costs, ROIs and project justifications
 - Charging at public, workplace, Multiple Unit Dwelling sites
 - Finding chargers
 - Selecting EV Charger sites





EV Readiness Decision Guide: Excerpts

EV Choices, options, features, standards and links



EV READINESS DECISION GUIDE

5. MAKING PURCHASING DECISIONS

This chapter introduces materials and services integral to EV Readiness, including the vehicles, the charging devices, and the connected charging infrastructure. The goal is to prepare decision-makers and other stakeholders in understanding planning, procurement, and execution steps in the realm of EVs. Many sections provide content and related footnotes and resource links to allow the reader to explore beyond this Guide. Some additional resources are provided in the *REFERENCES* section, including *Useful EV Resource Links* and *Endnotes* sections for those that may want to drill down on some subjects. Hyperlinks are embedded in the electronic version, but key links are also available in textual form in the *Endnotes*.

Selecting EVs

When considering purchasing electric cars, trucks, buses, and specialty vehicles (generally referred to as "EVs"), the selection is typically based on the following criteria:

- · Electric Vehicle Choices, Options and Features
- · Available EVs and Links
- · EV Selection Factors
- · EV Servicing and Warranties

Each of these topics is discussed next.

ELECTRIC VEHICLE CHOICES, OPTIONS AND FEATURES

EV choices may be characterized by:

- Plugin Capabilities
- Energy Storage Capabilities
- Energy Recovery Systems
- Type and use of EV
- Typical vehicle features and options

The basic group of Electric Vehicles (EVs) are listed in Table 1.



Green Ways 2Go www.greenways2go.com

EV RE

Electric Vehicle Connector Standards

In the interest of safety and to provide for a functional safe and ubiquitous system, various technical organizations have established regulatory and standards-based requirements related to the hardware, software, and the integration of all the technology.

EVs built in the US use the Society for Automotive Engineers (SAE) *J1772* connector (Figure 4) to charge with Level 1 and Level 2 chargers. All EVs have a connection receptade to malch a corded connector and cable, that plugs into the EVs connection point. The cable originates in the charging device, commonly called Electric Vehicle Supply Equipment or *EVSE*.



Electric Cars

- AFDC Hybrid and Electric Vehicle Information
 xx
- AFDC, EV Model Availability^{xvi}
- EV Available Models EV Adoption Website^{xx}
- Consumer Reports, "Hot New Electric Cars"
- EV Database Webpage, "Newest EVs" xis
- Plugstar EV Browser^{xx}
- My EV Website, "EVs are Better" xxi
- CNET Road Show webpage, "Here's every electric vehicle on sale in the US for 2020 and its range" ^{xxii}
- Digital Trends Webpage, "The Best Electric Cars for 2020" xxiii

Electric Buses

- <u>Wikipedia, Electric Buses</u>
- Wikipedia, "List of Electric Bus Makers and Models"
- EV Trader, "List of Global E Bus Manufacturers"
 XXIV

Electric Trucks (2021 and later)

- Wikipedia, Electric Trucks
- Top 8 Hybrid and Electric Pickup Trucks Worth Waiting For
- 8 Electric Truck and Van Companies to Watch 2020
- <u>Rivian R1T</u>
- Tesla Cybertruck
- <u>Tesla Semi</u>
- GMC Hummer EV SUT
- Ford 150 Electric
- Bollinger B1 & B2
- Nikola Badger
- Lordstown Endurance
- <u>Atlis XT</u>
- Workhorse C1000



Figure 4: Society of Automotive

male connector, upper right.

female receptacle and bottom

showing charging connection.

Engineers (SAE) J1772 Connector for Level 1 and 2. Upper left -



EV Readiness Decision Guide: Excerpts

• EV Charging Levels, Charge Times, Links

EV READINESS DECISION GUIDE

Selecting EV Charging Solutions

An *Electric Vehicle Charging System (EVCS)* includes the EV Charging station, the conduit, wiring, circuit breaker and other hardware to supply and manage the electricity from the electrical power supply into an EV's batteries. The *Electric Vehicle Supply Equipment (EVSE)*, or simply "EV Charging Station" or "EV Charger", is the main device that safety controls the charging process. In addition, some EVSEs feature hardwired or wireless communication with a network for managing the EVSE.

EV CHARGING LEVELS

There are three standard charging levels (1, 2 and 3). Level 1 and Level 2 EVSE's output Volts AC (VAC), which are converted to Volts Direct Current (VDC) on board the vehicle. Level 3 most commonly outputs Volts DC and is commonly referred to as a DC Fast Charger. The standard charging levels in the United States are (refer to Table 2 for more details):

- Level 1: 110 to 120 VAC, typically 8 to 16-amp, power range is from 880 Watt (0.88 kilowatts, kW) to 1920 kW (1.92 kW). 110/120 VAC is the same voltage as in your home or office. Level 1 uses the standard, grounded, three-prong 120volt outlet (NEMA 5-15⁷) with ground fault circuit interrupter (GFCI) typically already available at any facility.
- Level 2: 208 to 240 VAC, typically 16 to 80 Amps (and most commonly 30 to 32 A), meaning the power range is from 3.3 kW to 19.2 kW and most commonly 6.2 to 7.2 kW. 208/240 VAC is used for electric clothes dryers, air conditioners and other appliances in homes and in offices. Level 2 uses the standard, grounded, three-prong 240-volt outlet (e.g. NEMA 14-50) with ground fault circuit interrupter (GFCI) typically already available at a facility.
- 3. Level 3 is supplied with 3 phase 480 VAC or higher. Level 3 chargers can output either VAC or VDC. The currently most common standard is VDC, meaning the electricity flows from the charger to the EV's battery directly as direct current. The range of options in Level 3 power levels starts at 25 kW up to 600 kW. For retail applications, the typical range is 50 to 150 kW. Level 3 charging using VAC is currently uncommon.



AVAILABLE EVSES / LINKS

For those wanting to research the types of EVSE, station finders, infrastructure standards, and other EVSE information, some links are provided. Sites are intended for information and are not supplier endorsements.

EVSE Manufacturers

- Robotics and Automation News Webpage, "EV Charging Station Companies"xill
- Electric Vehicle Supply Equipment (EVSE) Manufacture & Vendors- Plugin recharge website^{xillit}

Metropolitan

EVSE LLC Overhead Garage EVSEs

DC Fast Charger EVSEs

 Charged EVs Webpage, "Which companies are the top DC Fast Charger Manufacturers?"

Electrify America Program

Electrify America EV Charging Program



EV Readiness Decision Guide: Excerpts

Quantifying EV Charging Needs

Quantifying EV Charging Needs

For an EVCS project, the number of EVs predicted or planned to be charged on a regular basis and the respective target range miles to be supplied, defines the demand and the EVCSs need to provide the supply to match. This decision further relates to the number and levels of EVSEs to install now vs. the future. All of these decision factors must be assessed case-by-case, such as:

- · Application type (fleet, public/private, workplace, multiple unit dwelling, residential)
- Estimates of the amount of energy (kwh) needed on hourly, daily, weekly, and annual basis
 - Current and near-term EVs planned to be charged (e.g. fleet EVs)
 - That will fit operational needs and
 - Estimate associated battery capacities and daily range expectations
 - o Regional quantity of current EVs that might use a planned EVSE investment
- · Charging level alternative strategies
 - o Self-charging
 - Use of public or private EVSEs
- Organizational sustainability goals
- Estimates of economic strategies
 - Available funds and / or willingness to take on debt
 - o Ability to develop pricing strategies and successfully generate revenue
 - Availability, timing, and rules of EV and EVCS incentives
 - o Marketing strategies getting the word out, use of advertising approach
- Based on schedules of expected EV purchases or leases, determine real world availability of suitable EVs, including applicability for application (right sizing) considerations
- New planned facility projects and EVCS considerations and local ordinances requiring EV readiness planning
- · Retrofit construction and EVCS requirements



Selecting EV Supply Equipment (EVSE) Sites

Selecting EVCS Sites

Before proceeding with quotations from installation vendors, proposed EV charging host sites should be evaluated, as the power needs to be sourced from proper and safe electrical infrastructure. As discussed in the prior section, for publicly accessible EVSEs, facility location is important – proximity to customers and accessibility must be considered. For fleets, proximity to operations is a normally a priority siting criteria. Evaluations determine EVCS locations, logistics, and installation cost factors as listed in the previous section, which will define the project specifications. An assessment may use in-house resources and/or a qualified independent consulting firm to define the site's needs.

The determination of where to locate EVSEs depends which property, which facility and where specifically at a given facility EVSEs be located. Siting will also be influence by whether the site and facility is new or existing.

For fleet, MUD and workplace charging, the property and the host facility are frequently known, and the variable is where on the property to place EVSEs. Specific locations are frequently driven by the distance (and cost) of the branch runs and impacts on operations. For publicly accessible EVSEs, the specific sitting also relates to the potential to generate revenue.

For Multiple Unit Dwellings ("MUDs"), including condominiums or apartment complexes, the determination of where to locate *shared* chargers will be based largely on existing electrical service, access and egress, and what areas might best serve the most residents. For deeded space EVSEs, the site is determined by the deeded space location.

Siting is a challenging part of the decision process. There are many factors and typically there is an optimization process to balance cost with function. Assuming the planning has defined the number, level, and features of the EVSEs, the decision criteria for picking sites involves the following:

- · Whether the site is for municipal, workplace, multiple unit dwelling, public vs. private use
- · Types of EVs planning to be charged (e.g. cars vs. trucks vs. buses and battery capacities)
- Parking considerations
- · Provisions for security
- Power supply considerations
- Budgets and incentives
- Zoning requirements
- New construction vs. retrofit construction
- Regional economic and sharing considerations
- Inclusion of revenue generation
- Available and usable property
- · Facility and parking space ownership considerations
- Social equity considerations



Future EV Ready program





Collaboration and Facilitation

Recognition

0

Regional planning

Commit to EV Readiness

Zoning and Planning

Permitting

Inspection and Safety

Parking and Access

New Construction

EV Owner Rights

Municipal Fleets

Utility Engagement

Community Engagement

Market Development and Finance





Questions about the Checklist and Guide?





Metropolitan Mayors Caucus

Metropolitan

Complementary EV policies & investments





US FAST Act retiring

- Proposed replacements include grants for EV, NG, Hydrogen
- S 230 America' Transportation Infrastructure Act
 - \$200M/yr for 5 years (\$1B total)
- HR 2 INVEST (Investing in a New Vision for the Environment and Surface Transportation) in America Act
 - ▶ 5-year, \$494B total investment
- ► FY 2021 Appropriations Bill
 - Funding for alternate fuel corridors





EV Charging Infrastructure Corridors

US DOT

I-94 EV Corridor



Metropolítan



ative Fuel Corrido

EV Charging Infrastructure Corridors

• Tesla Supercharging



Red icons = current Superchargers

Gray icons = Superchargers that are coming soon







- From VW settlement
- Nationwide \$1.2 billion in commercial EV charging stations
- Planned in 3 cycles
 - Cycle 3 Jan 2022 June 2024
 - ▶ \$500 million
- MMC & CACC commented on plans
 - Equity & EV Ready communities
- Dialogue in early December



Electrify America's Ultra-Fast EV Charging Network Features Two Cross-Country Routes



Governor Pritzker's Eight Principles for a Clean & Renewable Illinois Economy

Electrify & Decarbonize Illinois' Transportation Sector

- 1. Increase EVs in IL to 750,000 by 2030.
- 2. Tax credit for EV companies that locate downstate or in a disproportionately impacted area.
- 3. IEPA to revise VW settlement to mesh with \$70 million for EVCS
- 4. Incentives & EVCS and installation
- 5. Clean state fleets
- 6. IEPA EV Coordinator & Advisory Council
- 7. DCEO to educate consumers
- 8. Revamp alternate fuels rebate program swap gas for EV
- 9. Low-carbon fuels in transition to electrification



Putting Consumers & Climate First

Governor Pritzker's Eight Principles for a Clean & Renewable Illinois Economy



The need for comprohensive seegrep return is Block has never been parents. One the last density the typering of the last his has increased be increased and a demonstratic scalar docks, which cleans the subcets temperature of the family temperature is Block has never see approximately. If a since the baginning of the 200 centry, Flood we becoming once has placed, and its cover on the Grant Lass is forming alter or melling issors. The formation becoming increased and the set of the set of the set lass is through alter or melling issors. The formation becames in new laws.





Guiding Principles for Beneficial Electrification of Transportation



UIC Workshops on Beneficial Electrification of Transportation

Report out soon





Would your municipality be interested and ready in buying an electric passenger vehicle for your fleet if grant funds were available?

Zoom poll, question 2









Would your municipality be interested and ready in buying an electric truck for your fleet if grant funds and electric trucks were available?

Zoom poll, question 3









 If grant funds were available, how soon would you be ready to buy an EV?
 Zoom poll, question 4

10 10 20 20 \mathbf{n} Calendar Friday Saturday Thursday Monday Wednesday





EV

Rea

Thank you!

Metropolitan Mayors Caucus

Edith Makra

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Green Ways 2Go

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Full checklist at: mayorscaucus.org/initiatives/environment/becoming-ev-ready/









James Schulte

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