Electric Vehicles (EV) Research Report for Champaign County, Illinois

Electric vehicles (EVs) charging in the Champaign Meijer parking lot

Champaign County Regional Planning Commission (CCRPC)

July 2022

CHAMPAIGN COUNTY
REGIONAL PLANNING
COMMISSION

Table of Contents

1.0 Introduction **3**

2.0 Electric Vehicle Types **3**

2.1 Maintenance 4

2.2 Annual Vehicle Emissions 4

2.3 Sources 4

3.0 EV Consumer Incentives **5**

3.1 Purchasing Incentives 5

3.2 Residential Charging Incentives 5

3.3 Sources 5

4.0 EV Chargers **6**

4.1 Charging Station Demand & Placement 6

4.2 Sources 6

5.0 EVs & Municipalities **7**

5.1 Building Codes 7

5.2 Zoning Codes 7

5.3 Permitting 8

5.4 Public Parking 8

5.5 Sources 9

6.0 EV Chargers & Land Uses **10**

6.1 Residential 10

6.2 Non-Residential 10

6.3 Public Areas & Facilities 11

6.4 University 11

6.5 Sources 11

7.0 EV Adoption Challenges **12**

7.1 Sources 12

8.0 EV Infrastructure Funding Sources **13**

8.1 Bipartisan Infrastructure Law (BIL) / Infrastructure Investment and Jobs Act (IIJA) 13

8.2 Illinois Charging Incentive Program 14

8.3 Alternative Fuels Innovation Finance Toolkit 14

8.4 Sources 15

9.0 Other EV Resources **16**

10.0 EV Readiness Plans **17**

1.0 Introduction

The member agencies of the Champaign County Regional Planning Commission (CCRPC) requested staff to research information about electric vehicles (EVs) as they become a larger share of the motorized transportation market. The purpose of this document is to provide a foundation for Champaign County communities to prepare for the increased EV charging demand at the municipal and regional levels, by individuals and organizational fleets, in public locations and private residences. Information and funding sources on this topic are rapidly evolving, and all information in this document is up to date as of July 2022. Readers can use the links provided in this document to find the most updated information beyond the publication of this document.

2.0 Electric Vehicle Types

The following table lists the different types of EVs, and the distinctions between them.

Vehicle Type	Abbreviation	Description	Example
Battery Electric Vehicle	BEV	Runs fully on electricity, no gasoline engine. Highway operable.	Nissan Leaf
Plug-In Hybrid Electric Vehicle	PHEV	Can operate on electricity alone. Once the electric driving range is depleted, gasoline engine extends driving range. Highway operable.	Hyundai Ioniq Plug-In Hybrid
Hybrid	None	Gasoline engine. The battery is not charged by being plugged in, but by regenerative braking while driving. Highway operable.	Toyota Prius
Neighborhood Electric Vehicle	NEV	Run fully on electricity, no gasoline engine. For short range drives in urban areas. Not for use on roads or highways with limits over 35 mph.	Aspen, CO Downtowner

Battery Electric Vehicles (BEV) use only electricity to power the vehicle. The range for BEVs is around 300 miles before they need to be charged again.

Plug-In Hybrid Electric Vehicles (PHEV) are powered by both electricity and gas. The range for PHEVs is about 10 to 50 miles on electricity alone.

EV battery technology is developing rapidly, and vehicle range is expected to continue improving while EV prices will continue to fall. Major automakers promise as many as 50 new EV models by 2025.

2.1 Maintenance

According to Ameren Illinois, the drivetrain in gasoline-powered cars can have over 200 parts, while the typical EV has around 20. The lower number of parts on an EV translates into lower maintenance costs, and the brakes even wear less on EVs with regenerative braking technology.

2.2 Annual Vehicle Emissions

The following table lists the differences in the average annual emissions per vehicle, between traditional vehicles that run solely on gasoline and the various types of EVs. All of the hybrid and fully electric vehicles release fewer emissions into the atmosphere, which reduces the impact of transportation on the environment.

Vehicle Type	Pounds of CO_2 Equivalent
Gasoline	11,435
Plug-In Hybrid	6,731
Hybrid	6,285
All Electric	5,440

2.3 Sources

- Ameren Illinois. (30 March 2022). *EV 101 Webinar Resources*. https://amerenillinois.thedrivenexperience.com/ev-101-follow-up-and-resources-ns/
- Ameren Illinois. (2022). *Electric Vehicles Residential Rate Program*. https://www.ameren.com/illinois/residential/electric-vehicles/rate
- Armstrong, Laura. (January 2017). *Aspen Community Electric Vehicle Readiness Plan*. City of Aspen. https://www.cityofaspen.com/DocumentCenter/View/977/Aspen-Electric-Vehicle-Readiness-Plan-PDF.
- Iowa Clean Cities Coalition, Iowa Economic Development Authority. (July 2016). *Advancing Iowa's Electric Vehicle Market*. https://www.iowaeda.com/UserDocs/AdvancingIowasElectricVehicleMarketReport.pdf.
- ICF. (May 2017). *Tahoe-Truckee Plug-In Electric Vehicle Readiness Plan, A Road Map to Charging Infrastructure and Zero Tailpipe Emissions*. http://tahoealternativefuels.com/wp-content/uploads/2017/06/Tahoe_Truckee_PlugInPlan_Final_web.pdf.
- U.S. Department of Energy, Alternative Fuels Data Center. (May 2016). *Emissions from Hybrid and Plug-In Electric Vehicles*. http://www.afdc.energy.gov/vehicles/electric_emissions.php.

3.0 EV Consumer Incentives

Consumer incentives for purchasing an EV can include tax credits, vehicle rebates, insurance discounts, and charging rate reductions.

3.1 Purchasing Incentives

There are multiple incentives for an individual purchasing an EV in Illinois:

- Federal Tax Credit up to $7,500
- Illinois' Climate Rebate of $4,000, starting July 1, 2022
    - Buyers must apply for the rebate within 90 days of purchase
    - Incentive drops to $2,500 in July 2026
    - Incentive drops to $1,000 in July 2028
    - Applies to new or used EVs
    - State law states that rebates will last as long as funds are available

3.2 Residential Charging Incentives

Ameren Illinois also offers an EV Rate Program, an optional rate program for Ameren Illinois residential customers who drive an EV and charge their vehicle at home. This program encourages residents to charge their EV at home during the preferred charging times of 11 PM to 7 AM, during the Preferred Charging Period (PCP). Residents who charge during the PCP receive a credit for their electric delivery service for every kilowatt-hour (kWh) of usage. Residents who charge during the Non Preferred Charging Period (NPCP) of 11 AM to 7 PM will receive an additional charge for each kWh used during the highest one hour of household usage from the billing period within this timeframe. However, to offset potentially higher charges for usage during the NPCP, Ameren Illinois offers a monthly bill credit for the resident's first 12 consecutive months enrolled in the EV Rate Program. This is to help residents adjust to charging during the PCP. No additional credits or charges for electric usage are given for the other hours of the day.

3.3 Sources

- Ameren Illinois. (30 March 2022). *EV 101 Webinar Resources*. https://amerenillinois.thedrivenexperience.com/ev-101-follow-up-and-resources-ns/.
- Ameren Illinois. (2022). *Electric Vehicles Residential Rate Program*. https://www.ameren.com/illinois/residential/electric-vehicles/rate.
- Armstrong, Laura. (January 2017). *Aspen Community Electric Vehicle Readiness Plan*. City of Aspen. https://www.cityofaspen.com/DocumentCenter/View/977/Aspen-Electric-Vehicle-Readiness-Plan-PDF.
- ICF. (May 2017). *Tahoe-Truckee Plug-In Electric Vehicle Readiness Plan, A Road Map to Charging Infrastructure and Zero Tailpipe Emissions*. http://tahoealternativefuels.com/wp-content/uploads/2017/06/Tahoe_Truckee_PlugInPlan_Final_web.pdf.

4.0 EV Chargers

Equipment used to charge EVs is called "Electric Vehicle Supply Equipment," also known as "EVSE." There are three levels of EVSE, described in the following table:

Charger Level	Voltage	Charge & Range Information	Average Installation Cost
Level 1	120 volts	5 miles of range per 1 hour of charge	N/A
Level 2*	240 volts	25 miles of range per 1 hour of charge	$3,000
Level 3 / Direct Current Fast Charging (DCFC)	480 volts	100-200 miles of range per 30 minutes of charge. Charges 80% of battery in about 30 minutes.	N/A

**Level 2 chargers are the most commonly available chargers.*

Common mobile apps and websites that travelers can use to find charging stations along their travel route include ChargePoint, Electrify America, EVgo, OpenCharge, and PlugShare. There are 29 public EV charging stations in Champaign County as of July 2022, according to PlugShare.

As of 2021, there were 100,000 publicly available charging ports in the United States. By 2030, the U.S. Department of Energy forecasts that 9,600,000 charging ports will be needed in the United States.

4.1 Charging Station Demand & Placement

According to the Iowa Clean Cities Coalition, industry reports have estimated that for every 100 EVs on the road, there should be 20 to 40 public charging ports (a single charging station can have more than one port). A general guideline would be to have at least one public charging port for every 2.5 to 5 EVs on the road in a particular area.

According to the U.S. Department of Transportation (USDOT), the goal for the national EV network is to have EVSE installed every 50 miles along the Interstate system, within one mile of an exit.

4.2 Sources

- Ameren Illinois. (30 March 2022). *EV 101 Webinar Resources*. https://amerenillinois.thedrivenexperience.com/ev-101-follow-up-and-resources-ns/.
- Intel and PEP Stations. (2012). *Charging Stations Keep Electric Vehicles Moving Ahead*. https://www.intel.com/content/dam/doc/case-study/energy-atom-pep-stations-study.pdf.
- Iowa Clean Cities Coalition, Iowa Economic Development Authority. (July 2016). *Advancing Iowa's Electric Vehicle Market*. https://www.iowaeda.com/UserDocs/AdvancingIowasElectricVehicleMarketReport.pdf.
- United States Department of Transportation (USDOT). (February 2022). *Charging Forward: A Toolkit for Planning and Funding Rural Electric Mobility Infrastructure*. https://www.transportation.gov/rural/ev/toolkit/ev-basics/charging-speeds.
- U.S. Department of Energy, Alternative Fuels Data Center. (2021). *Developing Infrastructure to Charge Electric Vehicles*. https://afdc.energy.gov/fuels/electricity_infrastructure.html.
- Vock, Daniel C. (Summer 2021). Charging Ahead. *Planning Magazine, Volume 87* (Number 3), pages 22-29. American Planning Association (APA). https://www.planning.org/planning/2021/summer/electric-vehicles-are-on-the-rise-is-your-community-ready/.

5.0 EVs & Municipalities

Public agencies including municipalities and the University of Illinois can play a role in encouraging EV adoption. These agencies can use codes and programs to regulate and encourage EVSE installation, as well as public parking incentives.

5.1 Building Codes

The *Tahoe-Truckee Plug-In EV Readiness Plan* identifies two major opportunities to create building codes that support EV deployment.

1. Specify standards for EVSE in the building code to ensure that any EVSE installations are safe and accessible.
2. Require pre-wiring for EVSE to lower the cost of future EVSE installations. Pre-wiring refers to the practice of providing sufficient basic infrastructure, such as conduits, junction boxes, outlets serving garages and parking spaces, adequate wall or lot space for future EVSE, and adequate electrical panel and circuitry capacity to meet anticipated future demand for EVSE.

California's Building Code and Electrical Code both include specifications related to EVSE. Local governments in that state have adopted the 2016 California Building Codes. This includes the 2016 California Green Building (CALGreen) Code, which requires that all new developments include pre-wiring for Level 2 (208/240V) charging, so any local government that adopts the state building code by reference will have pre-wiring requirements in place.

Local governments can take additional action to exceed the mandatory requirements in CALGreen by mandating pre-wiring for a greater proportion of spaces at non-residential developments or requiring actual charger installations in lieu of pre-wiring. This could be achieved by adopting all or part of the voluntary Tier 1 or Tier 2 sections of CALGreen through an ordinance amending the local municipal code.

Local governments in Champaign County can look to the CALGreen standards as a resource when they are ready to update their municipal codes to accommodate EV chargers.

5.2 Zoning Codes

Zoning codes can allow, encourage, or require appropriate placement of EVSE in various land use designations associated with developed land. Zoning code provisions, design standards, and parking rules can also specify requirements for design and installation, signage, accessibility, fees, time limits, lighting, and maintenance.

California adopted accessibility requirements for EVSE into Chapter 11B of the 2016 Building Code. The code requires that if EVSE will be available for use by the public, the installation(s) need to comply with the minimum designated accessibility requirements, as outlined in the following table.

Total Number of EV Charging at a Facility	Minimum Number (by type) of EV Charging Stations Required to Comply w/ Section 11B-812		
	Van Accessible	Standard Accessible	Ambulatory
1 to 4	1*	0	0
5 to 25	1	1*	0
26 to 50	1	1	1*
51 to 75	1	2	2*
76 to 100	1	3	3*
101 and over	1, plus 1 for each 200, or fraction thereof, over 100	3, plus 1 for each 60, or fraction thereof, over 100	3, plus 1 for each 50, or fraction thereof, over 100

**Accessible EV Charging Stations designed for accessibility but not reserved for exclusive use by people with disabilities.*

Source: California Division of the State Architect. Access California – New Regulations for Electric Vehicle Charging Stations. Presentation provided to the Electric Vehicle Charging Association on March 9th, 2016.

5.3 Permitting

The State of California requires that any city or county with more than 200,000 people must create an ordinance to expedite and streamline EV charging. The city or county will consult with the local fire department or district and the utility director to develop the ordinance, which will include a checklist of all requirements for EVSE to be eligible for expedited review. The law requires the approval of an application consistent with the city or county ordinance, and notification of the required information for entities submitting incomplete applications who would like expedited permit issuance.

The 2020 population of Champaign County is 205,865. While the State of Illinois does not currently have this permitting requirement, Champaign County may still want to consider such an ordinance due to its growing population and location along the alternative fuel corridors (AFCs) of Interstates 57 and 74.

All seven agencies in the Tahoe/Truckee region of California and Nevada require a building permit for installation of EVSE, typically showing the site details and wiring methods. Douglas County, Nevada near Lake Tahoe provides an incentive to applicants by giving a fifty percent discount on building permits for alternative energy projects.

5.4 Public Parking

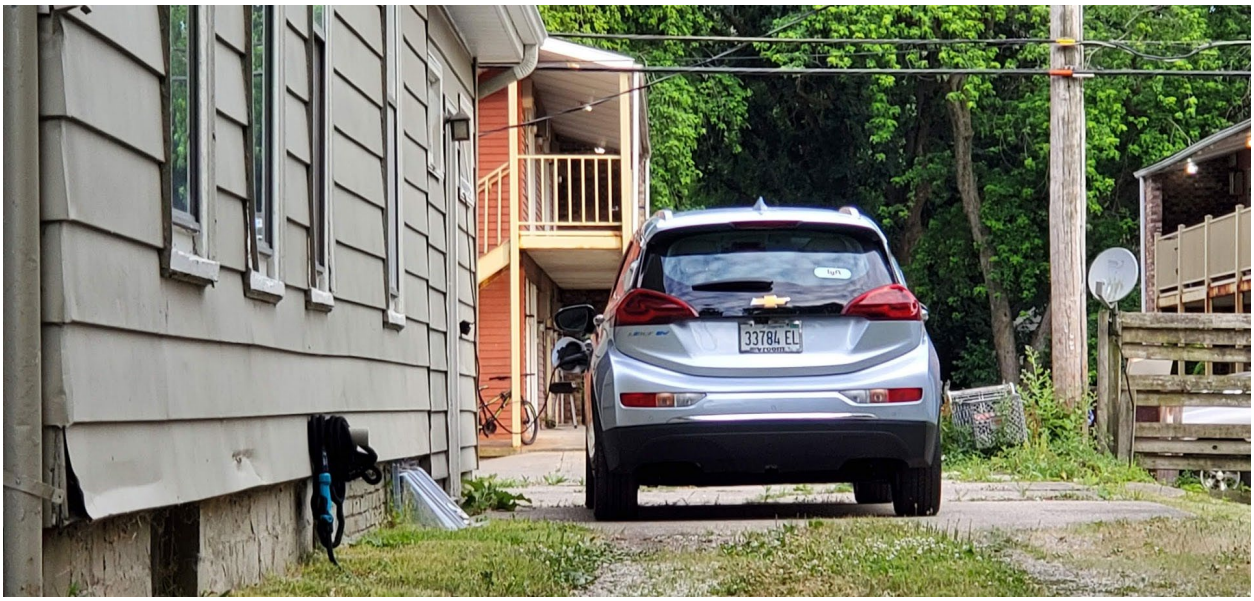
The State of Nevada offered an Alternative Fuel Vehicle (AFV) Parking Fee Exemption in a program that ended in December 2017. This program offered free parking for EVs at public metered parking areas. Each local authority was responsible for creating an application process and issuing a distinctive decal for AFVs. This is an example of a program that could be considered by Champaign County municipalities to encourage EV adoption.

5.5 Sources

- California Department of General Services. (2016, 2019, 2021). *California Green Building Standards Code (CALGreen).* https://www.dgs.ca.gov/BSC/CALGreen.
- ICF. (May 2017). *Tahoe-Truckee Plug-In Electric Vehicle Readiness Plan, A Road Map to Charging Infrastructure and Zero Tailpipe Emissions.* http://tahoealternativefuels.com/wp-content/uploads/2017/06/Tahoe_Truckee_PlugInPlan_Final_web.pdf.
- Iowa Clean Cities Coalition, Iowa Economic Development Authority. (July 2016). *Advancing Iowa's Electric Vehicle Market.* https://www.iowaeda.com/UserDocs/AdvancingIowasElectricVehicleMarketReport.pdf.
- United States Census Bureau. (2021). *2020 DEC Redistricting Data (PL 94-171).* https://data.census.gov/cedsci/.

6.0 EV Chargers & Land Uses

A municipality can create requirements for the number of EV charging ports that should be installed by land use. This section includes information on this topic from CALGreen and the Charging Forward toolkit. Additional information can be found in the EV readiness plans listed in Section 10.



Electric vehicle (EV) charging outside of a house in Urbana

6.1 Residential

The 2016 CALGreen mandatory requirements specify that new single-family homes and townhomes with attached garages must pre-wire locations where vehicles will be parked.

The 2016 CALGreen mandatory requirements specify that multifamily developments with 17 or more units must pre-wire at least three percent of total parking spaces. Ameren Illinois provides information for multifamily property owners & managers as well as renters online.

6.2 Non-Residential

The 2016 CALGreen mandatory requirements specify that at non-residential developments, pre-wiring is required for a portion of total parking spaces, as summarized in the following table:

Total Number of Parking Spaces	Number of Required EV Charging Spaces
0-9	0
10-25	1
26-50	2
51-75	4
76-100	5
101-150	7
151-200	10
201 and over	6 percent of total

Source: CALGreen Non-Residential EV Pre-Wiring Requirements

As part of a pilot study, ChargePoint and a major retail chain installed six, free-to-use Level 2 charging stations at the retail chain's new California location. After nine months, based on the charging session lengths, the retailer saw that the average EV-driver was spending 72 minutes at the retail site, which was 50 minutes longer than the average customer. Additionally, the chain saw increased revenue of $56,000 while spending only $430 on electricity. On average, the shoppers spent about one dollar for every minute they were in the store.

6.3 Public Areas & Facilities

Municipal and county governments are crucial partners as community site owners. Community sites such as libraries, schools, business districts, and even public facilities like curbside parking spaces play an important role in ensuring widespread access to EV charging. For example, renters may not have options for home-based charging unless their landlords choose to install EVSE. Residents who have only Level 1 charging capabilities at home may find they need to travel long distances on single trips, not have sufficient downtime at home for charging, or experience financial burden from home charging, particularly during peak times for electricity use. EV chargers that are publicly available, especially those with unrestricted access, can fill the gaps in EV charging to make an electric vehicle a feasible option for more residents of rural areas.

6.4 University

The University of Illinois district of Urbana-Champaign contains a variety of land uses, so adjacent municipalities should coordinate with the University on EVSE deployment. The Illinois Climate Action Plan (iCAP) 2020 includes an objective to establish an EV task force to identify key goals for supporting the use of EVs on and off campus. The Transportation SWATeam and Parking Department have drafted a list of potential staff, faculty, and students for consideration to join the EV Task Force. The EV Task Force previously met in Spring 2018, and produced a report of their findings. The University is interested in reconvening its EV Task Force beginning in Fall 2022. The University is also partnering with a local EV advocate to provide a QR code to an EV user survey at its existing charging stations, to better understand EV owner behavior and preferences.

6.5 Sources

- Ameren Illinois. (2022). *Multifamily Property Owners & Renters*. https://amerenillinoissavings.com/multifamily/.
- ICF. (May 2017). *Tahoe-Truckee Plug-In Electric Vehicle Readiness Plan, A Road Map to Charging Infrastructure and Zero Tailpipe Emissions*. http://tahoealternativefuels.com/wp-content/uploads/2017/06/Tahoe_Truckee_PlugInPlan_Final_web.pdf.
- United States Department of Transportation (US DOT). (February 2022). *Charging Forward: A Toolkit for Planning and Funding Rural Electric Mobility Infrastructure*. https://www.transportation.gov/rural/ev/toolkit/ev-basics/charging-speeds.
- University of Illinois at Urbana-Champaign. (2020). *iCAP 2020: Illinois Climate Action Plan, Electric Vehicle (EV) Task Force*. https://icap.sustainability.illinois.edu/project/electric-vehicle-ev-task-force.

7.0 EV Adoption Challenges

The Tahoe-Truckee region acknowledges five challenges to increasing wider EV adoption:

1. Charging infrastructure deployment
2. Coordination for charging infrastructure deployment
3. Streamlining charging infrastructure deployment
4. Consumer vehicle preferences
5. Consumer awareness

As of March 2022, Ameren Illinois states that the electric grid can currently provide sufficient energy to charge the existing amount of EVs. However, they recognize that charging demand will continue to grow, and their system planners are monitoring existing loads to address increased future demand. System planners are also beginning to analyze if Vehicle to Grid (V2G) charging is reliable and robust.

7.1 Sources

- Ameren Illinois. (30 March 2022). *EV 101 Webinar Resources*. https://amerenillinois.thedrivenexperience.com/ev-101-follow-up-and-resources-ns/.
- ICF. (May 2017). *Tahoe-Truckee Plug-In Electric Vehicle Readiness Plan, A Road Map to Charging Infrastructure and Zero Tailpipe Emissions*. http://tahoealternativefuels.com/wp-content/uploads/2017/06/Tahoe_Truckee_PlugInPlan_Final_web.pdf.

8.0 EV Infrastructure Funding Sources

This section lists federal and state programs that could provide funding for the installation of public EV charging stations, as well as adding EVs to public agency fleets.

8.1 Bipartisan Infrastructure Law (BIL) / Infrastructure Investment and Jobs Act (IIJA)

The federal Infrastructure Investment and Jobs Act (IIJA) of 2021, also known as the Bipartisan Infrastructure Law (BIL), enhances existing programs and creates new programs to support EV infrastructure in the United States.

- National Electric Vehicle Infrastructure (NEVI) Formula Program
    - Lead federal agency: United States Department of Transportation (USDOT)
    - Program information: $5 Billion available to build out a national EV charging network
        - August 1, 2022: State EV plans are due to the Federal Highway Administration (FHWA)
            - The Illinois Department of Transportation (IDOT) plans to submit the Illinois EV Plan in mid-July. There will be a virtual public meeting about the plan on Thursday, July 28, 2022 at 6:00 pm.
        - September 30, 2022: FHWA approval of State plans
        - The national EV network goal is to have EVSE installed every 50 miles along the Interstate system, within one mile of an exit.
- National EV Infrastructure Discretionary Program
    - Lead federal agency: USDOT
    - Program information: $2.5 Billion in community grants for EV charging, as well as hydrogen, natural gas, and propane fueling infrastructure.
- Low-No Emissions Grants Program for Transit
    - Lead federal agency: USDOT
    - Program information: $5.6 Billion in support of low- and no-emission transit bus deployments.
- Clean School Bus Program
    - Lead federal agency: United States Environmental Protection Agency (USEPA)
    - Program information: $5 Billion in support of electric school bus deployments.
- Public School Energy Program
    - Lead federal agency: United States Department of Energy (USDOE)
    - Program information: DOE must establish for local educational agencies a competitive grant program for energy improvements upgrades, including installation of AFV fueling or charging infrastructure on school grounds and purchase or lease of AFVs. AFV fueling or charging infrastructure can be exclusively for the school fleet or students, or open to the public. Eligible AFVs include school buses and school fleet vehicles.
- Alternative Fuel Corridor (AFC) Grants
    - Lead federal agency: USDOT
    - Program information: The USDOT must establish a competitive grant program to strategically deploy publicly accessible electric vehicle charging and hydrogen, propane, and natural gas fueling infrastructure along designated FHWA AFCs. The grant will

provide funding for designated Corridor-Pending AFCs to install infrastructure to convert to Corridor-Ready AFCs, and for Corridor-Ready AFCs to install alternative fuel infrastructure to provide station redundancy and meet higher demand. Propane fueling infrastructure is limited for use by medium- and heavy-duty vehicles. Eligible entities include states, metropolitan planning organizations (MPOs), local governments, political subdivisions, and tribal governments. Additional funding eligibility and considerations will apply. The grant program must be established by November 15, 2022.

  - Local information: Interstates 57 and 74 are the AFCs in Champaign County.
- Community Alternative Fuel Infrastructure Grants
  - Lead federal agency: USDOT
  - Program information: The USDOT shall establish a competitive grant program to fill gaps in publicly accessible EV charging and hydrogen, propane, and natural gas fueling infrastructure in community locations, such as parking facilities, public schools, public parks, or along public roads. Funding of up to 80% of project costs will be available for both development phase planning activities and the acquisition and installation of charging or alternative fueling infrastructure. Five percent of the grant fund awarded may be used for educational and community engagement activities to develop and implement education programs through partnerships with schools, community organizations, and vehicle dealerships to support the use of zero-emission vehicles and associated infrastructure. USDOT must prioritize projects that expand access to charging and alternative fueling infrastructure within rural areas, low- and moderate-income neighborhoods, and communities with limited parking space or a high ratio of multi-unit dwellings to single-family homes. Eligible entities include states, metropolitan planning organizations (MPOs), local governments, political subdivisions, and tribal governments. Additional funding eligibility and considerations will apply.

8.2 Illinois Charging Incentive Program

The Illinois Environmental Protection Agency (IEPA) is directed to provide funding, consistent with Illinois Commerce Commission (ICC)-approved Beneficial Electrification Plans, to public and private organizations and companies to install and maintain Level 2 or Level 3 charging stations.

Up to 80% of the cost of the installation of charging stations may be funded. Additional awards may incentivize charging infrastructure in eligible communities. Applications will be posted to the IEPA Climate and Equitable Jobs Act webpage when available.

8.3 Alternative Fuels Innovation Finance Toolkit

FHWA and the Oregon Department of Transportation (ODOT) have developed an online toolkit available at www.altfueltoolkit.org/ to provide a library of curated resources related to innovative finance mechanisms for Alternative Fuel Vehicles (AFVs) usable by transportation agencies and others. Resources include reports and case studies of past projects, as well as plans, guides, and tools that can assist in future development.

8.4 Sources

- Ameren Illinois. (30 March 2022). *EV 101 Webinar Resources*. https://amerenillinois.thedrivenexperience.com/ev-101-follow-up-and-resources-ns/.
- ICF. (May 2017). *Tahoe-Truckee Plug-In Electric Vehicle Readiness Plan, A Road Map to Charging Infrastructure and Zero Tailpipe Emissions*. http://tahoealternativefuels.com/wp-content/uploads/2017/06/Tahoe_Truckee_PlugInPlan_Final_web.pdf.
- Illinois Environmental Protection Agency (IEPA). (2021). *Climate and Equitable Jobs Act*. https://www2.illinois.gov/epa/topics/ceja/Pages/default.aspx.
- United States Department of Energy (US DOE), Alternative Fuels Data Center. (2021). *Infrastructure Investment and Jobs Act of 2021*. https://afdc.energy.gov/laws/infrastructure-investment-jobs-act.

9.0 Other EV Resources

The following list provides more resources that readers can visit for more information on EVs:

- Ameren Illinois: https://www.ameren.com/illinois/company/environment-and-sustainability/electric-vehicles
    - EV Corridors map: https://www.arcgis.com/apps/webappviewer/index.html?id=c1be35bccc1f4ae9a8af5a1e2a69c268
- Center for Advancing Research in Transportation Emissions, Energy, and Health (CARTEEH): https://www.carteeh.org/
- Chicago Clean Cities Coalition Network: https://chicagocleancities.org/
    - US DOE Clean Cities Coalition Network webpage: https://cleancities.energy.gov/coalitions/chicago
- Chicagoland Metropolitan Mayors Caucus, Becoming EV Ready: https://mayorscaucus.org/initiatives/environment/becoming-ev-ready/
    - Includes an EV Readiness Checklist and an EV Readiness Decision Guide for Local Governments
- Climate Mayors EV Purchasing Collaborative: https://driveevfleets.org/
- Electrification Coalition (EC): https://www.electrificationcoalition.org/
- ElectroTempo: https://www.electrotempo.com/
- EV Hub: https://www.atlasevhub.com/
- EV Infrastructure Projection Tool (EVI-Pro) Lite: https://afdc.energy.gov/evi-pro-lite
    - This tool provides a simple way to estimate how much electric vehicle charging you might need and how it affects your charging load profile.
- Great Plains Institute Summary of Best Practices in EV Ordinances: https://www.betterenergy.org/wp-content/uploads/2019/06/GPI_EV_Ordinance_Summary_web.pdf
- Illinois AFC Laws and Incentives database: https://afdc.energy.gov/laws/state_summary?state=il
- Justice40 Initiative: https://www.transportation.gov/equity-Justice40
    - This is a White House initiative aiming to deliver 40 percent of overall benefits of federal investments to disadvantaged communities.
- National Renewable Energy Laboratory (NREL) State and Local Planning for Energy (SLOPE): https://maps.nrel.gov/slope/
    - The SLOPE Platform supports data-driven state and local energy and decarbonization planning, and includes a Scenario Planner and Data Viewer.
- Reimagining Electric Vehicles (REV) Illinois Program: https://www2.illinois.gov/dceo/businesshelp/REV/
- Rural Opportunities to Use Transportation for Economic Success (ROUTES): https://www.transportation.gov/rural
- Transportation for America: https://t4america.org/
- University of Illinois Civil & Environmental Engineering Kontou Research Group, Transportation Electrifcation & Energy Use: https://publish.illinois.edu/kontou/
- U.S. Joint Office of Energy and Transportation: https://driveelectric.gov/

10.0 EV Readiness Plans

Following are links and summaries to additional EV readiness plans that readers can refer to when researching specific aspects of installing EVSE in their community.

- Armstrong, Laura. (January 2017). *Aspen Community Electric Vehicle Readiness Plan*. City of Aspen. https://www.cityofaspen.com/DocumentCenter/View/977/Aspen-Electric-Vehicle-Readiness-Plan-PDF.
    - This community-wide plan is a tool to educate and inform the public, City Council members, and City of Aspen staff about EVs and their associated infrastructure. It is also a strategic document to guide preparation for a future with an increased number of EVs. This document is a product of the City of Aspen EV Readiness Team, which was convened as a result of a City Council Best Year Yet goal in 2014. The document includes an outcome statement for Aspen, executive summary, introduction, guiding principles for Aspen, strategies to promote EV readiness in Aspen, and support for different sections of EV use.
- California Center for Sustainable Energy, San Diego Association of Governments (SANDAG). (January 2014). *San Diego Regional Plug-In Electric Vehicle (PEV) Readiness Plan*. https://www.sandag.org/uploads/publicationid/publicationid_1817_17061.pdf.
    - This readiness plan was developed to support the growing market of PEVs in the San Diego region by enabling municipalities and others to address and resolve challenges of deploying charging infrastructure (EVSE). This document includes an introduction, and sections on the San Diego Regional EV Infrastructure (REVI) Working Group and Stakeholders; PEVs and public charging infrastructure in the San Diego region; the basics of PEVs and charging infrastructure; regional PEV infrastructure existing conditions; regional barriers to EVSE deployment and key recommendations; and the road ahead.
    - Plug-in San Diego: https://www.sandag.org/index.asp?classid=17&subclassid=46&projectid=511&fuseaction=projects.detail.
    - San Diego Regional Plug-In Electric Vehicle Infrastructure Working Group (REVI): https://www.sandag.org/index.asp?projectid=413&fuseaction=projects.detail.
- DeYoung, Todd, Barati, Mehri, and Sheikh, Samir. San Joaquin Valley Air Pollution Control District. (March 2021). *San Joaquin Valley Plug-In Electric Vehicle Readiness Plan*. California Energy Commission. Publication Number: CEC-600-2021-019. https://www.energy.ca.gov/sites/default/files/2021-04/CEC-600-2021-019.pdf.
    - The purpose of this plan is to help the San Joaquin Valley develop effective PEV readiness strategies to prepare the region for PEVs through recommendations and best practices to help address the barriers to PEV adoption. This plan builds upon a previous PEV readiness assessment developed in 2014, and is part of the ongoing efforts to prepare communities for PEVs. This plan acknowledges that all segments of the population, especially low income and rural communities, must be considered to enable widespread PEV adoption. This plan discusses its purpose and approach;

activities and results; assessment of success; and observations, conclusions, and recommendations.

  - 2014 Readiness Assessment: California Center for Sustainable Energy, San Joaquin Valley Air Pollution Control District. (May 2014). *San Joaquin Valley Plug-In Electric Vehicle Readiness Plan*. http://valleyair.org/grants/documents/pev/6-25-14/san_joaquin_valley_pev_readiness_plan.pdf.
    - This document includes an introduction, and sections on lack of public awareness and economic challenges; zoning policies for PEVs; parking and signage; training for electrical contractors; permitting and inspection; utility system impacts and rate design; workplace charging; building codes for PEV charging; charging at multi-unit dwellings; fleet electrification; leveraging renewable energy; and the road ahead.

- ICF. (December 2013). *Bay Area Plug-In Electric Vehicle Readiness Plan*. Bay Area Air Quality Management District. https://www.baaqmd.gov/plans-and-climate/bay-area-pev-program/bay-area-pev-ready.
  - This plan was developed to provide guidance and best practices to help local and regional government agencies, utilities, and other stakeholders to engage in efforts that can lead to accelerated local adoption of EVs. This document includes sections on the status of plug-in electric vehicles in the Bay Area, strategies for accelerating PEV adoption, guidance for PEV readiness, and a glossary.
- ICF. (March 2018). *Santa Clara County Office of Sustainability, Driving to Net Zero: Plug-In Electric Vehicle Best Practices Compendium*. https://dtnz.sccgov.org/sites/g/files/exjcpb481/files/Task-1A-EV-Best-Practices-Compendium.pdf.
  - This guide was developed as part of the Santa Clara County, CA Driving to Net Zero Project. It provides an overview of the key considerations for local governments who are seeking to support the deployment of plug-in electric vehicles (PEVs) and charging infrastructure. The following topics are covered in this guide: building, permitting, and parking codes; permitting; planning; multi-unit dwellings; regional charging network; fleets; interoperability; and outreach and education.
  - Santa Clara County Driving to Net Zero homepage: https://dtnz.sccgov.org/home.
- ICF. (May 2017). *Tahoe-Truckee Plug-In Electric Vehicle Readiness Plan, A Road Map to Charging Infrastructure and Zero Tailpipe Emissions*. http://tahoealternativefuels.com/wp-content/uploads/2017/06/Tahoe_Truckee_PlugInPlan_Final_web.pdf.
  - The Tahoe Regional Planning Agency (TRPA) partnered with the Truckee-Donner Public Utility District and the Tahoe-Truckee Plug-in Electric Vehicle (PEV) Coordinating Council to accelerate transportation electrification in the Tahoe-Truckee Region in California and Nevada. The coordinating council outlined the following vision for the region: Establish Tahoe-Truckee as a leader in mass PEV deployment supported by robust PEV education and engagement; a convenient network of charging infrastructure; streamlined charger installation; standardization of codes; and widespread use of renewable energy resources. This readiness plan includes sections on the deployment and forecasted growth of the regional PEV market; policies, programs, incentives, and funding; barriers to regional PEV

adoption; charging infrastructure siting analysis; and regional transportation electrification goals and implementation.

- ICF, Greener by Design, Fitzgerald & Halliday, Inc., and North Jersey Transportation Planning Authority. (December 2017). *Alternative Fuel Vehicle Readiness: A Guidebook for Municipalities*. https://www.njtpa.org/NJTPA/media/Documents/Planning/Regional-Programs/Studies/Alternative%20Fuel%20Vehicles%20Infrastructure/NJTPA-AFV-Readiness-Guidebook_Dec2017_FINAL.pdf.
    - As part of its efforts to support Alternative Fuel Vehicles (AFVs), the North Jersey Transportation Planning Authority (NJTPA) partnered with three pilot municipalities to develop local readiness plans that encourage the widespread use of AFVs, with a focus on plug-in electric vehicles (PEVs) and natural gas vehicles (NGVs). Incorporating lessons learned from the individual community readiness plans, this guidebook is for all municipalities in New Jersey to design and conduct AFV readiness planning efforts in their own communities. Municipalities will benefit from taking a comprehensive approach to AFV readiness planning and this guidebook includes the information and direction necessary to do so. It also provides best practices on recommended actions for zoning and parking, permitting and inspection, stakeholder engagement, and targeted education and outreach.
    - NJTPA AFVs Infrastructure website: https://www.njtpa.org/AFVstudy.aspx.
- Iowa Clean Cities Coalition, Iowa Economic Development Authority. (July 2016). *Advancing Iowa's Electric Vehicle Market*. https://www.iowaeda.com/UserDocs/AdvancingIowasElectricVehicleMarketReport.pdf.
    - The Iowa Economic Development Authority (IEDA) commissioned a study on electric vehicle charging to assess the current EV market, forecast future market conditions, and evaluate programs and policies that could potentially help the market meet these projections. Contents of this study include an executive summary, introduction, assessment of the current EV market, Iowa ChargePoint station analysis, electricity rates and impacts, the future of the EV market, recommended public charging station locations, recommendations for an Iowa electric highway, business models, policy/program descriptions and impacts, and EV charging station ownership and operational responsibilities.
- Region 1 Planning Council (RPC). (April 2021). *Electric Vehicle Readiness Plan for the Rockford Region*. https://tinyurl.com/45mjkvt4.
    - This EV readiness plan was developed by the MPO for the Rockford, IL region in collaboration with its member agencies, partnership organizations, and local stakeholders. The document includes an introduction, and sections on goals & strategies, policy & planning tools, procurement process, EV charging station network, funding sources & incentives, and a conclusion. The appendices and attachments include a glossary of terms, zoning ordinance template, parking ordinance template, building code templates, permitting and inspection templates, and an EVSE procurement request for proposal template. The R1PC is also hosts an annual Drive Electric Week each summer with daily community events; the 2022 event is scheduled for July 25-29.

- Sheehy, Philip, Eliot Rose, James Choe, and Jubran Kanaan. ICF International. (March 2021). *Coachella Valley Plug-In Electric Vehicle Readiness Plan*. California Energy Commission. Publication Number: CEC-600-2021-020. https://www.energy.ca.gov/sites/default/files/2021-04/CEC-600-2021-020.pdf.
    - This plan builds upon a previous PEV readiness plan developed in 2014. This plan includes the following sections: PEVs in the Coachella Valley – today and tomorrow; overview of readiness; local and regional governments – getting ahead of the curve; PEV drivers – consumers and fleets; and utilities – providing reliable infrastructure and affordable fuel. The following readiness elements outlined in this plan also include key recommendations for each element: plans, policies, and parking regulations; building codes; and permitting and inspection. Also included are PEV-related recommendations in these areas: attracting PEV-related enterprise to the Coachella Valley; integrating PEVs into the region's Sustainable Community Strategy; stakeholder training; and coordinated regional policy and planning activities.
    - 2014 Readiness Plan: ICF International. (April 2014). *Coachella Valley Plug-In Electric Vehicle Readiness Plan*. https://www.cvag.org/library/pdf_files/trans/CVAG_PEV_Readiness_Plan%20(FINAL%20print).pdf.
- Toor, Will, and Salisbury, Mike. (April 2015). *Boulder Electric Vehicle Infrastructure and Adoption Assessment*. Southwest Energy Efficiency Project (SWEEP). https://www.swenergy.org/data/sites/1/media/documents/publications/documents/Boulder_Electric_Vehicle_Infrastructure_and_Adoption_Assessment_April-2015.pdf.
    - The research presented in this report was undertaken to provide recommendations on steps that local governments and other institutions in Boulder County, Colorado can take to promote electric vehicles among their employees and residents. The report includes summary and discussion of best practices and cutting edge ideas for supporting electric vehicle charging in the workplace, residence, and the public. This report includes a section on incorporating EV charging into building code and planning requirements.
- United States Department of Energy (US DOE). (November 2020). *Federal Workplace Charging Program Guide*. https://www.energy.gov/sites/default/files/2020/11/f80/federal-workplace-charging-guide.pdf.
    - This model program guide is designed to support federal agencies developing and refining workplace charging programs for employee privately owned vehicles (POV). This guide addresses seven topics related to the planning and execution of a workplace charging program: roles and responsibilities; employee survey; EVSE planning, acquisition, and installation; installation costs/fee structure; fee collection; program management; and reporting. Although this was developed for federal agencies, it can be used as a foundation for state, local, and private workplaces.