Planning for Electric Vehicle Infrastructure: What Cities Need to Know

2023 City Engineers Association of Minnesota Annual Conference

Wednesday, January 25, 2023

Our Speakers

Diana McKeown
Metro CERT Director, Great Plains Institute

Shawn Blaney
Director of Public Works, City of Red Wing, MN

Brian Hansen
Development Coordinator, City of Bloomington, MN

Erin Kayser
Electric Vehicle Program Coordinator, City of St. Paul, MN

EV Charging Overview

City Engineers Association of Minnesota January 25, 2023

Intro

Diana McKeown

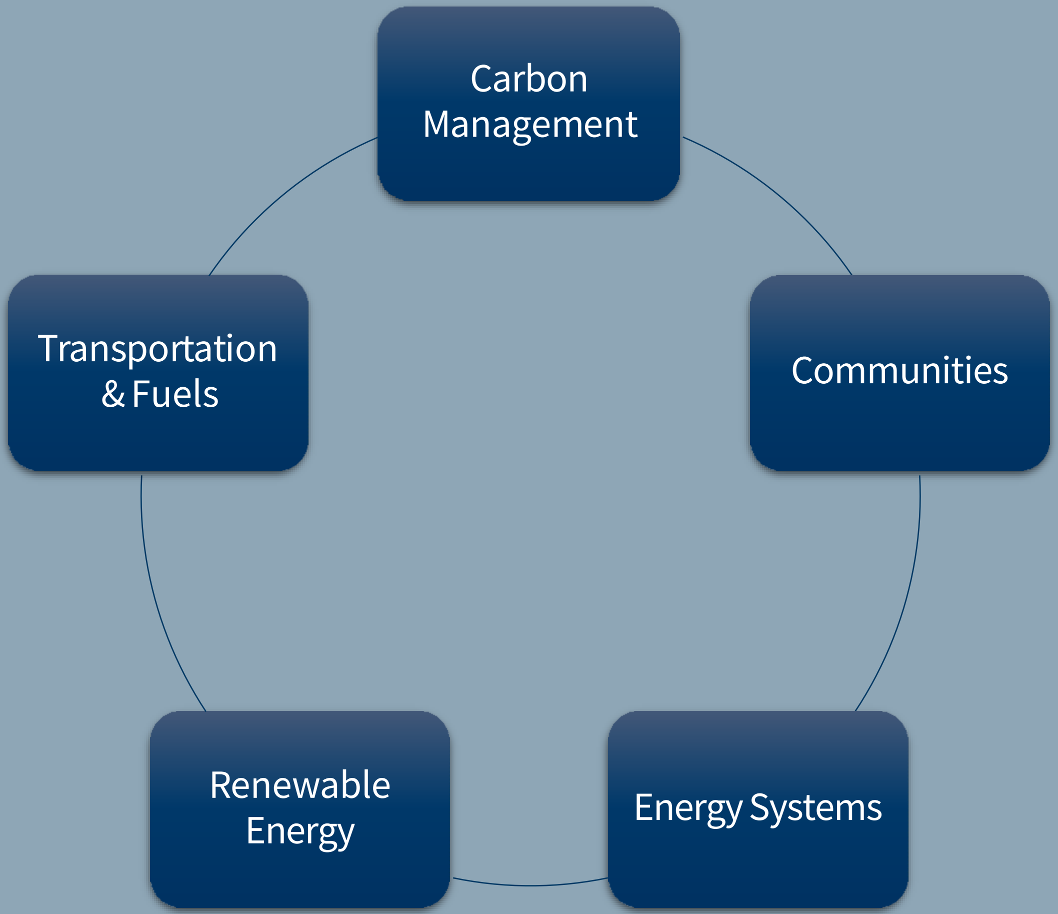
Metro CERT Director
Great Plains Institute
EV Owner

CERTs CLEAN ENERGY RESOURCE TEAMS

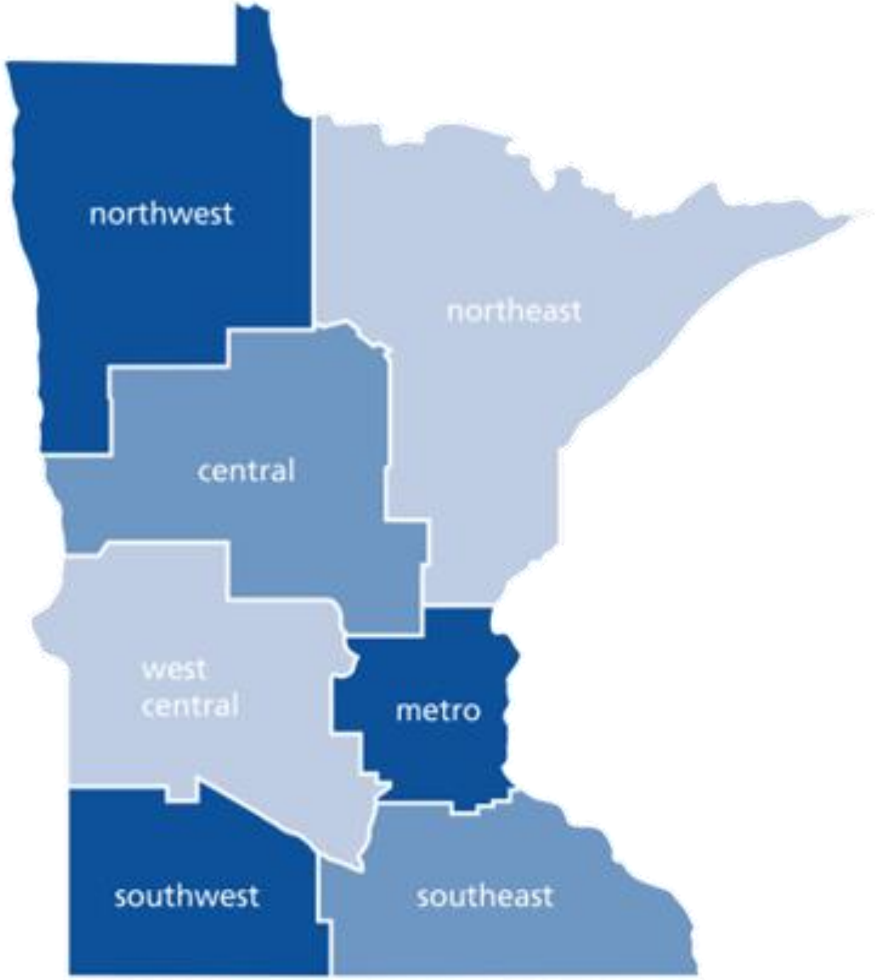
GREAT PLAINS INSTITUTE | Better Energy. Better World.

About Great Plains Institute

- National 501(c)3 non-profit, headquartered in Minneapolis, MN
- Mission: Transform the energy system to benefit people, the economy, and the environment
- Partnership with CERTs
- Facilitate Drive Electric MN



Clean Energy Resource Teams (CERTs)



MISSION

We connect individuals and their communities to the resources they need to identify and implement community-based clean energy projects

https://www.cleanenergyresourceteams.org/

Drive Electric Minnesota

By bringing together all the parts and players in the electric vehicle industry, **Drive Electric MN will accelerate the adoption of electric vehicles in Minnesota**

Partnership of EV champions from around MN

Utilities, dealerships, nonprofits, charging providers, auto dealers, and more are involved

https://driveelectricmn.org/

Short history of EVs in Minnesota

2010 Drive Electric MN begins as public private partnership

2013 Minnesota Plug-in Vehicle Owners Circle forms (originally 176, now has 3000 members!)

2017 Electric School Bus Pilot launched in Lakeville. First in the Midwest

2018 - Volkswagen Settlement $43 Million – 15% for Electric Vehicle Charging Stations

- 2021 Over 40 cities participate in Cities Charging Ahead Peer Cohorts

2019 Accelerating Electric Vehicle Adoption: A Vision Statement

2020 Clean Transportation Pilot launched, MN Department of Transportation

2021 - Clean Cars Minnesota – First Midwest State to adopt LEV/ZEV

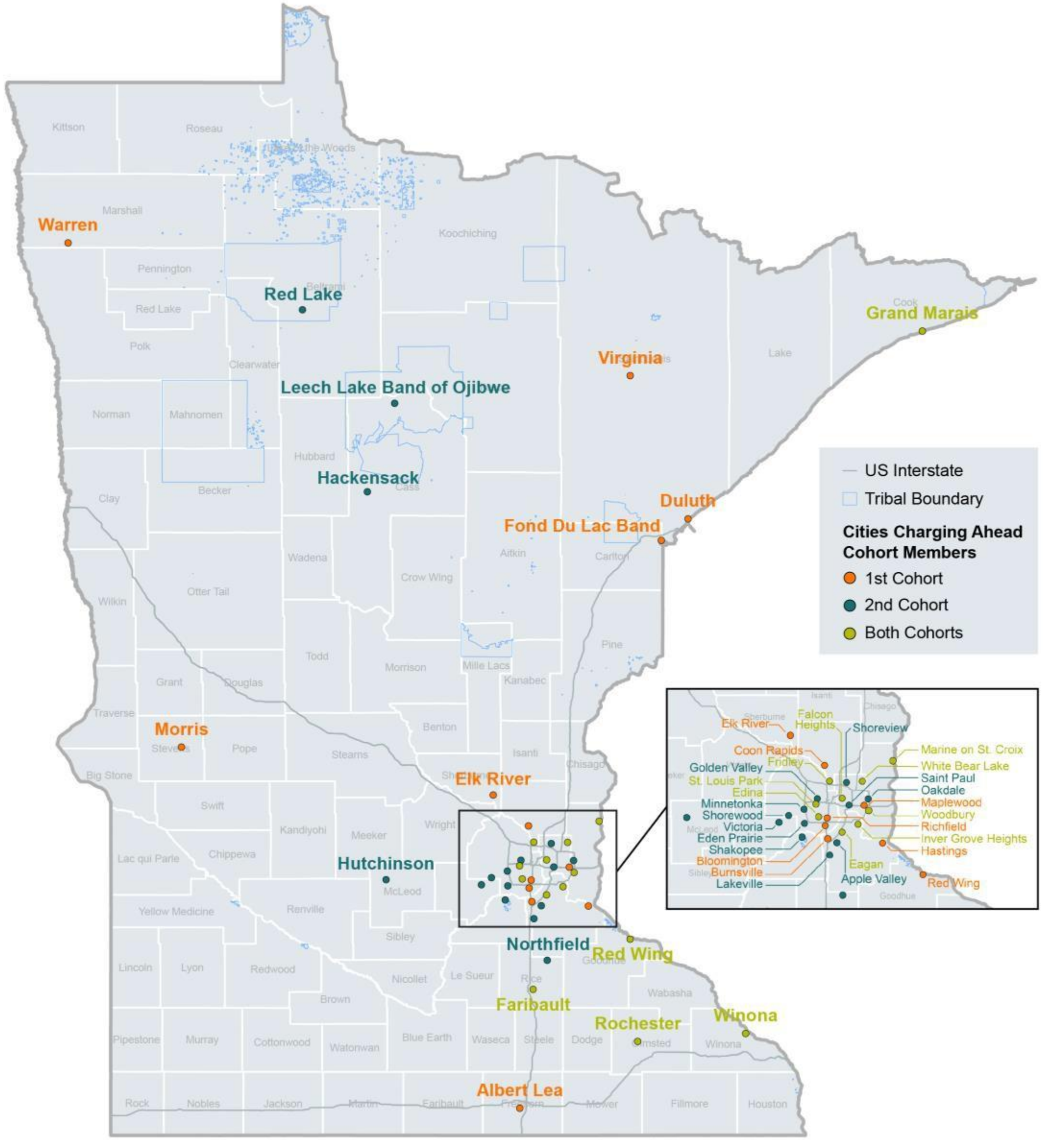
- Electric Vehicle Assessment, MN Department of Transportation

2022 - Electric Vehicle Planning Study, Metropolitan Council

- Federal Guidance for National Electric Vehicle Infrastructure Formula Plan (MN will get $68 million over 5 years)

How it Started & How it's Going

- GreenStep Cities
  - January 2018 Workshop
- Cities Charging Ahead!
  - 2 cohorts
  - 43 total communities
  - Accomplishments as of2021:
    - 13+ fleet analyses conducted
    - Across 23 communities, 27 EVs have been purchased, with 16+ planned purchases
    - 58 chargers installed
    - 11 cities working towards implementing development guidelines



https://driveelectricmn.org/cities-charging-ahead/

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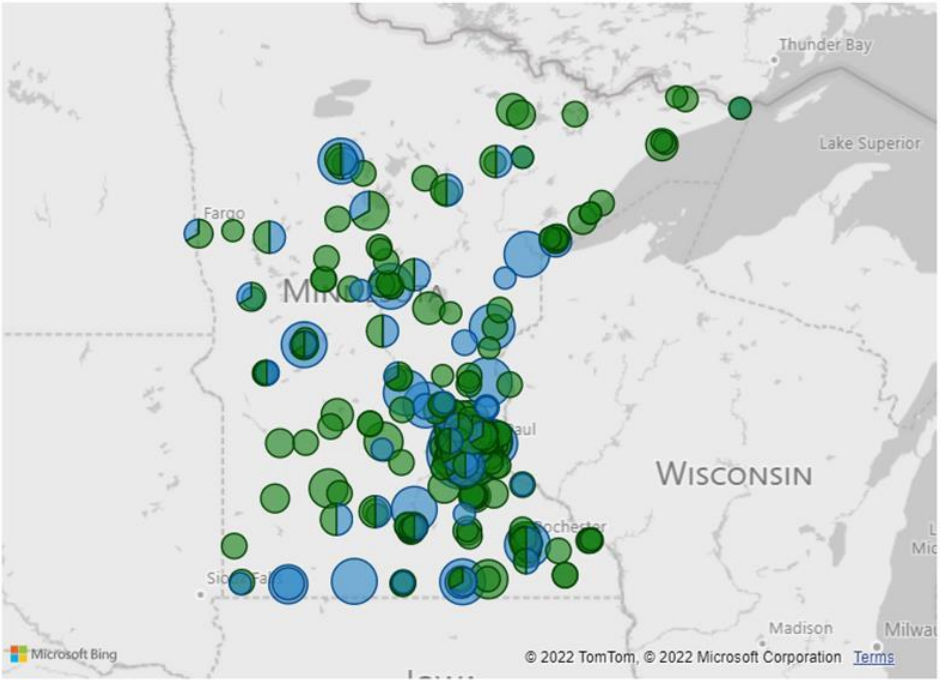
MN Electric Vehicle Adoption-2022

26,343	1,033	276	5,600,601	$67,096	4/1/2022
EVs on the Road	Level 2 Ports	DCFC Ports	Current Population	Median HH Income	Latest DMV Snapshot Date

EVs on the Road

Charging Ports by Power Level



Charging Level ● DC Fast Charge Ports ● Level 2 Ports

http://www.dot.state.mn.us/sustainability/electric-vehicle-dashboard.html

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EV Charging Basics

Charging Levels

Level 1

- 120 V
- 2 to 5 miles per hour

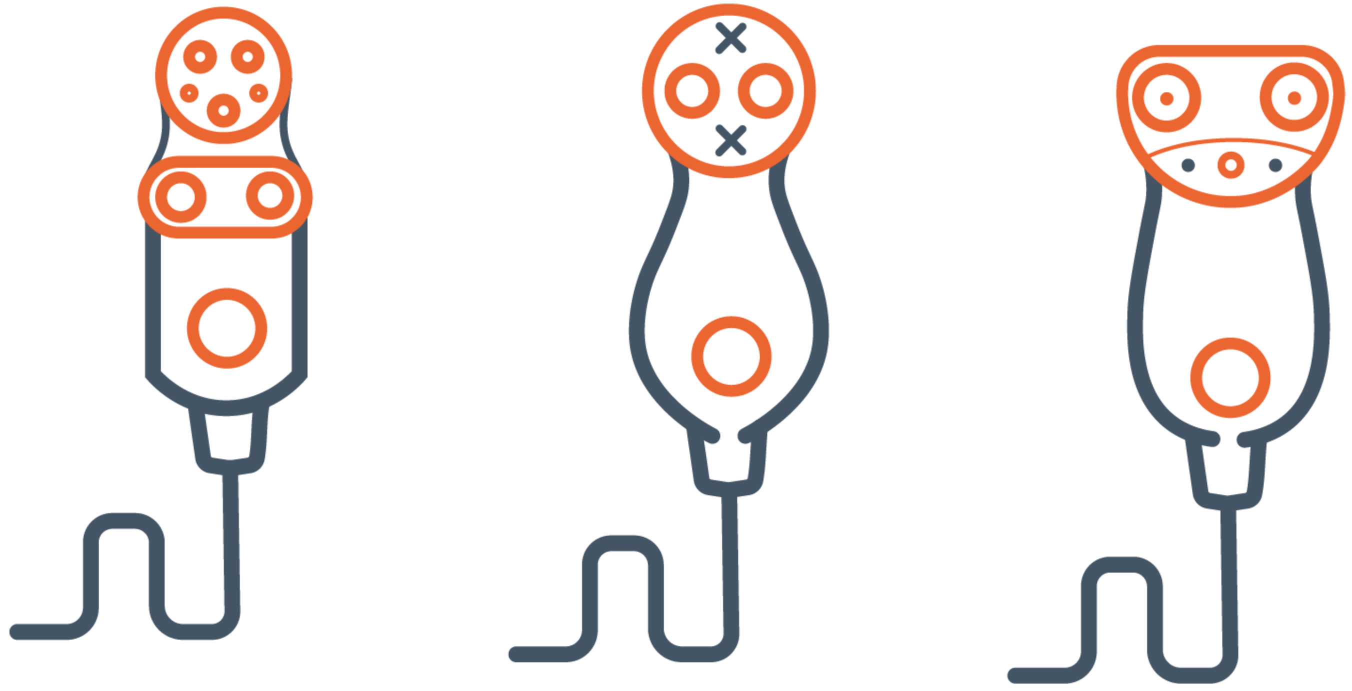
Level 2

- 240 V
- 10 to 20 miles per hour

https://driveelectricmn.org/charging/

Charging Levels

- Direct Current Fast Chargers (DCFC)



Plug standard: CCS-1 (or SAE Combo)
Energy output: 25kW-350kW

Plug standard: CHAdeMO
Energy output: 25kW-150kW

Plug standard: Tesla Supercharger
Energy output: Up to 250kW

- <u>50 kW:</u> 80-90 miles in 30 minutes
- <u>150 kW:</u> becoming more common

https://driveelectricmn.org/charging/

"Dumb" vs. "Smart" Charging

Dumb Charging

- Non-networked
- Acts like a standard 240 V outlet
- Doesn't allow:
  - Payment
  - Connection to renewable energy

Pro: Costs less

Con: Lacks capabilities and some utility incentive programs require smart chargers to track and/or control time of charging

Smart Charging

- Networked
- Allows:
  - Payment
  - Connection to on-site renewable energy
  - Variable Pricing

Pro: Future-proofing

Con: Costs more (cloud services, subscription costs)

Charging Checklists

https://driveelectricmn.org/charging-guidance/

Siting a Charger

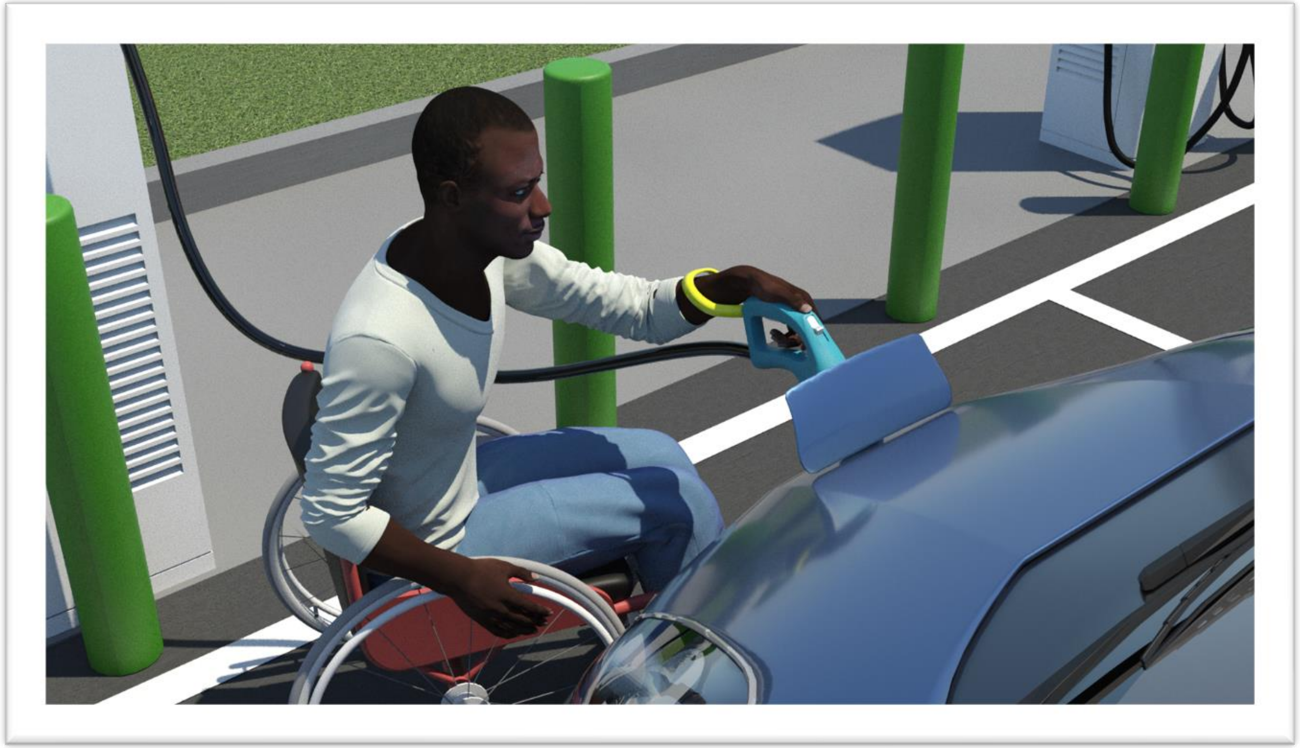
Siting Matters

- More expensive the further it is from the electricity source
- “EV-Ready” parking stalls save money and allows for future growth
    - Laying the conduit needed for a station without installing the station
- Location determines the charging level needed (Level 2 or DCFC)
- User safety (lighting nearby) and accessibility (follow ADA guidelines)

https://driveelectricmn.org/charging-guidance/

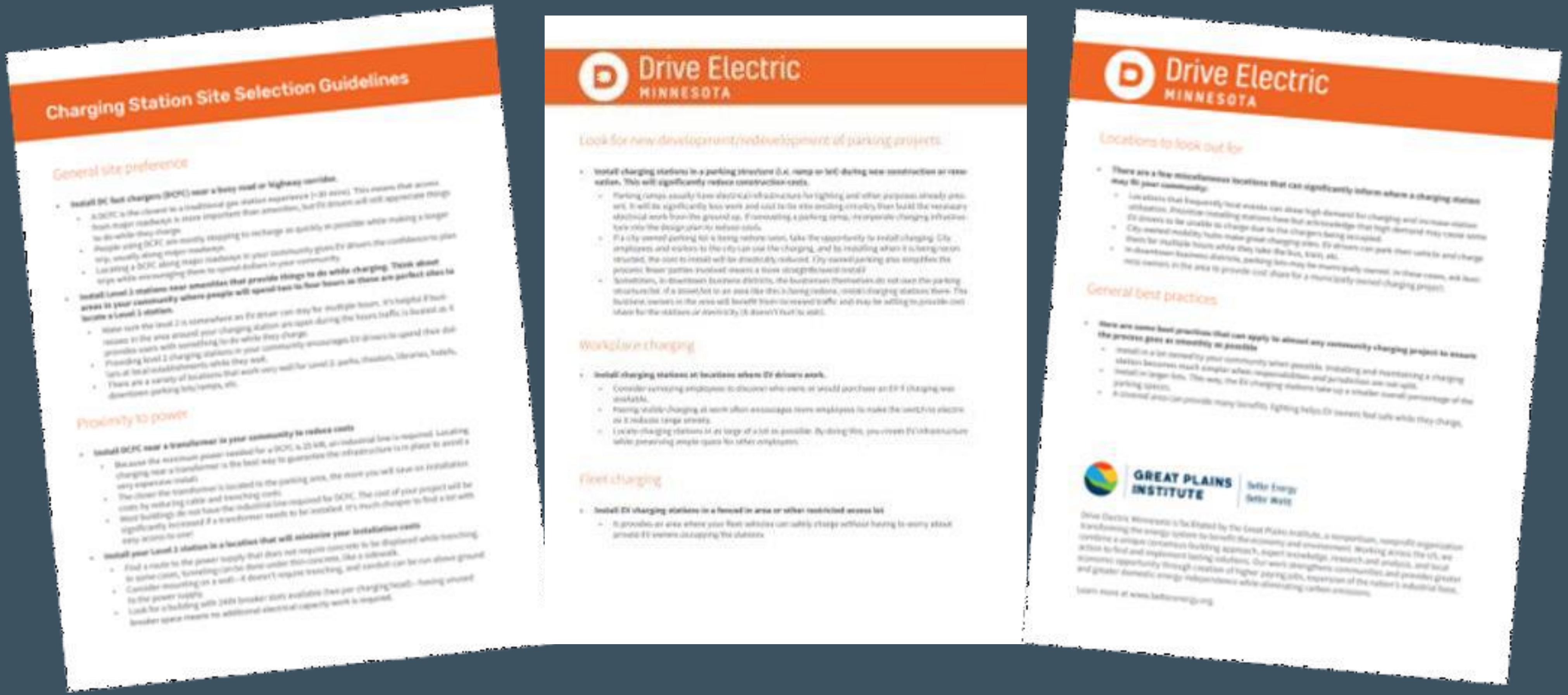
ADA/Accessibility

- Accessibility is an equity issue.
- There is guidance available on the Access board's website
- Accessibility has ancillary benefits to for many people



https://www.access-board.gov/tad/ev/

Site Selection Guidelines



https://www.driveelectricmn.org/wp-content/uploads/2019/10/electric-vehicles-charging-site-selection.pdf

Purchasing

Common Vendors in MN

- ZEF Energy
- ChargePoint
- Clipper Creek
- Enel X
- Greenlots
- Tesla
- Siemens

Purchasing a Charger

- Electric Utility
- Cooperative Purchasing (State Contract)
- Electrical Contractor
- Box store (Home Depot, Costco, etc.)
- E-commerce (Amazon)
- Electric Vehicle Service Provider
- OEM (mostly just for fleets)

Cooperative Purchasing

State Contract

- https://mn.gov/admin/government/purchasing-contracting/

Formerly National Joint Powers Alliance (NJPA)

- https://www.sourcewell-mn.gov/cooperative-purchasing/how-it-works

Guide to Purchasing Chargers

Drive Electric
MINNESOTA

Guide to Purchasing an EV Charging Station

Purchasing an electric vehicle (EV) charging station can be intimidating, given the wide variety of options. With this guide, you'll have the information needed to take steps toward purchasing a station, including common station features to consider, where to buy, and funding opportunities.

COMMON STATION FEATURES

The most basic charging station is a Level 2, or dumb charger, that lacks data tracking, payment collection abilities, and numerous other features, and is less expensive (~$400; unit only). Smart chargers offer a variety of features and come at an additional cost (~$600-700 for residential application Level 2; $1,000-$2,000 for commercial grade Level 2). The third option is a DC fast charger, which can cost $40,000 for the unit.

FEATURE	DESCRIPTION	APPLICABILITY		
		Smart Residential Level 2	Commercial Level 2	DC Fast Charger
Advertising Capabilities	Generate additional revenue by using the display screen for third-party ads.		Some	Some
Beacon Light	Increase visibility at the station, especially at night; reduce vandalism.		Some	Some
Access Management	Control use through apps, radio frequency identification, or other hardware and software features.	Some	X	X
App-Based Payments	Accept payment via a network-specific app. Less expensive than installing a credit card swipe but requires a network membership to operate.		X	X
Credit Card Swipe/ Chip Reader	Accept payment via a credit card swipe or chip reader. More expensive to install but does not require a network membership to operate.		X	X

This will guide you through topics to consider when purchasing an EV charging station such as common station feature to consider, where to buy and funding opportunities.

https://www.driveelectricmn.org/wp-content/uploads/2020/10/Guide-to-Purchasing-an-EV-Charging-Station_.pdf

Funding

National Electric Vehicle Infrastructure (NEVI)

Building out the I-35W and I-94 Corridors

- Consultant for site feasibility analysis and developing RFP for competitive selection process to help MnDOT select vendors to install NEVI compliant fast chargers at 16 sites.

Competitive Grants

- Guidance (still waiting for it to be issued)
- Comment period
- Issue RFPs for funding (late 2023? Early 2024?)

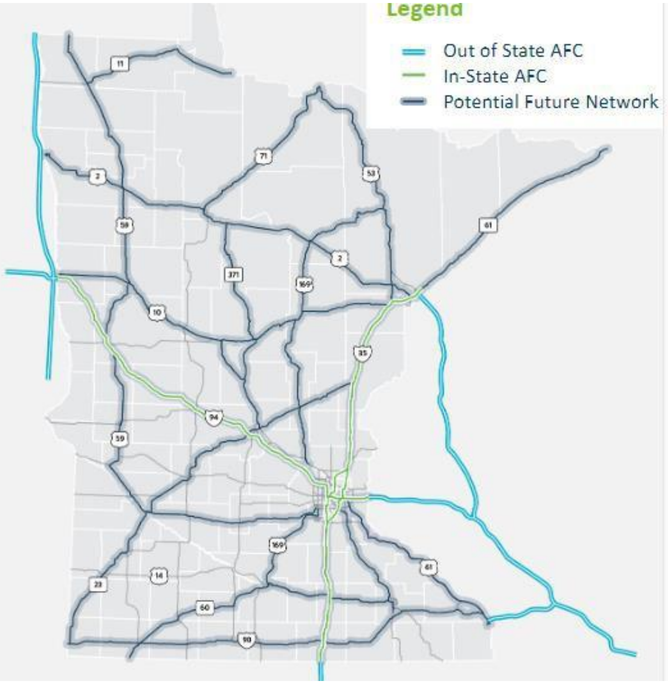
https://edocs-public.dot.state.mn.us/edocs_public/DMResultSet/Urlsearch?columns=docnumber,docname&folderid=20009901

National Electric Vehicle Infrastructure (NEVI)

DRAFT EV Fast Charging Network

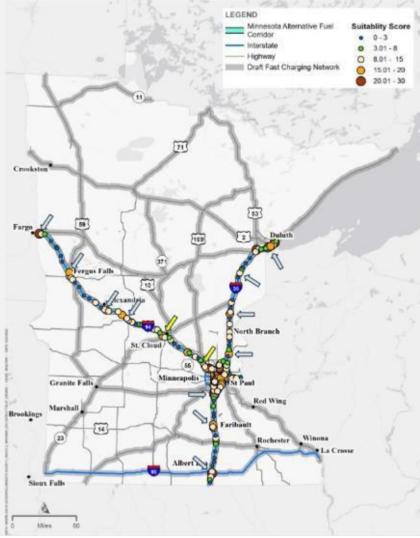
Includes all potential corridors for investment with the $68 million of NEVI funds (FY 2022-2026)

- Promotes coverage across the state
- Prioritizes roadways that serve long distance travel
- Creates a network that connects to other networks
- Recognizes both rural and urban communities
- Serves current and future EV drivers



Exit Suitability

Initial set of potential NEVI-funded fast charger locations (statewide)



Suitability Scoring Criteria

Justice40

- < 0.5 mi: 10
- 0.5 – 1 mi: 8
- 1 -2 mi: 5
- 2 – 5 mi: 3

Intersections with other Corridors

- Yes: 10
- No: 0

Proximity to Substations

- < 0.5 mi: 10
- 0.5 – 1 mi: 5
- 1 – 2 mi: 3

Proximity to Existing DCFC

- Yes: 10
- No: 0

Exit Suitability

https://talk.dot.state.mn.us/ev-infrastructure-plan

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IRA and EVs

- **A LOT of unknowns.**
- **Which vehicles will qualify in 2023 and beyond?**
- **Will there be tweaks to the legislation, likely.**
- **Will WTO challenge the US manufacturing aspect?**

Receive up to $7,500 off a new EV:

- Through the end of December 2022:
  - EV must be manufactured in North America
  - Manufacturer must be under 200,000 EVs sold
  - US Department of Energy provides a list of eligible vehicles at **https://afdc.energy.gov/laws/electric-vehicles-for-tax-credit**
- Starting in January 2023, income limits apply:
  - Individuals must earn less than $150,000 per year
  - Couples must earn less than $300,000 combined per year
- From 2023 through 2032 (end of program), only certain EVs meeting additional requirements (price, location of EV battery manufacturing, and location of EV battery mineral extraction) will be eligible for the full credit. The federal government will likely provide a list of eligible vehicles.

Receive up to $4,000 or 30 percent off a used EV:

- Begins January 2023
- Eligibility is limited to individuals making less than $75,000 per year or couples making less than $150,000 combined per yearned
- The federal government does not provide a list of eligible used EVs, but here's the criteria to look for in the EV specifications sheet:
  - EV sales price must be less than $25,000
  - EV must be at least two years old
  - EV must weigh less than 14,000 lbs

https://www.cleanenergyresourceteams.org/inflation-reduction-act-what-you-need-know-about-clean-energy-incentives

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Level 2 EV Charging Station Grants

- $664,000 available through MPCA
- For installations in public places, workplaces, and MUDs
- Proposals due February 28, 2023
  - No later than 4:30 pm Central
- More information can be found here: [https://www.pca.state.mn.us/grants-and- loans/level-2-electric-vehicle-ev-charging-station- grants](https://www.pca.state.mn.us/grants-and-loans/level-2-electric-vehicle-ev-charging-station-grants)

Source: MPCA

EV Smart Program

EV Smart City Basics

- Technical assistance
- Partnership development with local electric utilities
- Save money
- Connect and learn from peer cities across the state
- Future proofing your community (getting the rules of the road right)

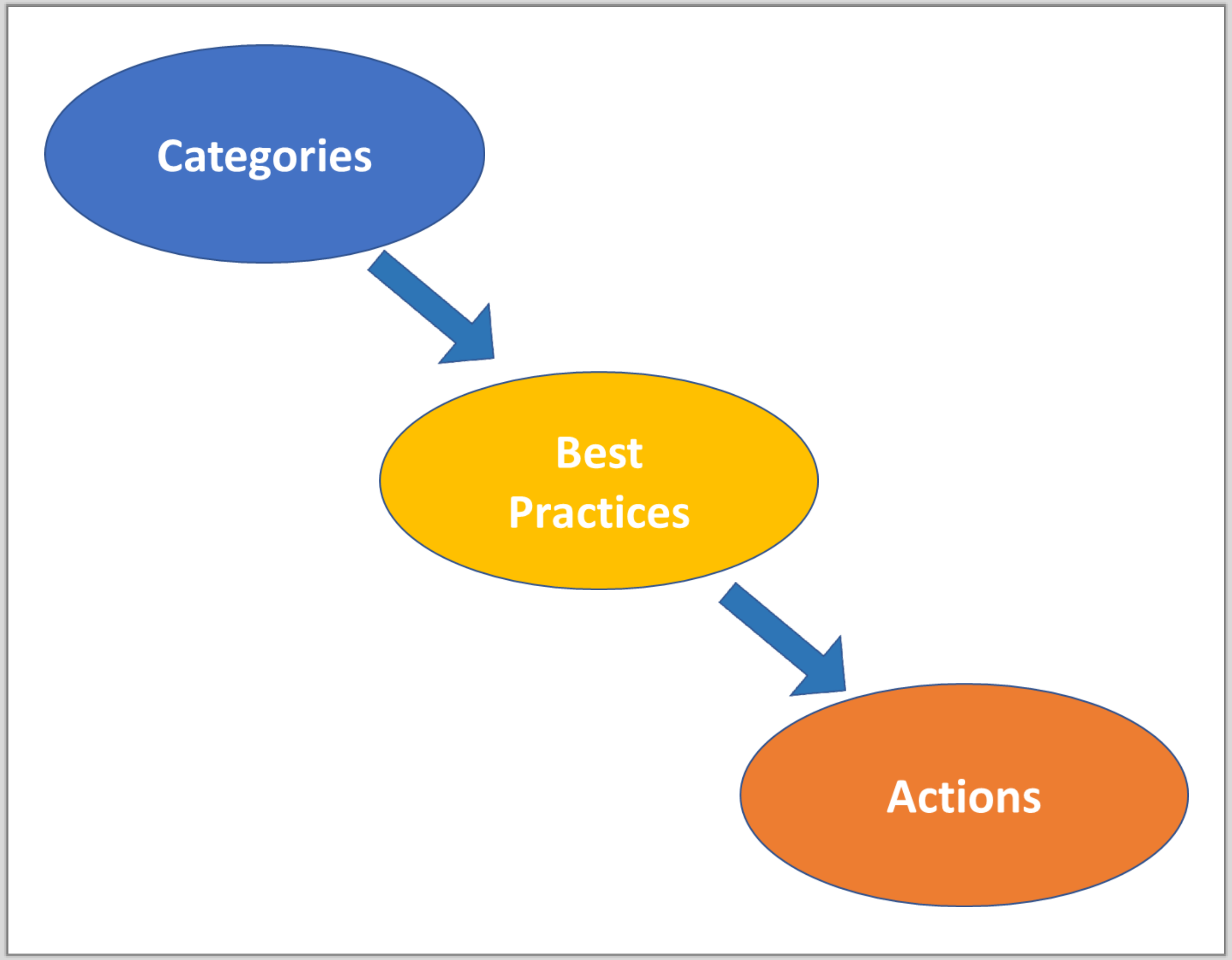
- Roadmap to securing both state and federal funding opportunities for EVs and charging infrastructure
- Paving the way for economic development (EV chargers that bring folks in)
- Join and be recognized as an EV Smart City

https://betterenergy.org/blog/ev-smart-cities-and-native-nations-program-launches/

City Program Framework

- Planning
- Regulation
- Utility Engagement
- Education and Incentives
- Governmental Operations
- Shared Mobility

Equity



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Planning	Regulation	Utility Engagement	Education and Incentives	Government Operations	Shared Mobility
Address EVs and EVSE in comprehensive plan	Enable EV and EVSE in land use regulations	Work with utility on collaborative education and communication initiatives	Host public education events and campaigns	Electrify public fleet	Deploy electric transit, para-transit vehicles
Address EVs and EVSE in specific-area plan	Incorporate EVSE in building code or zoning standards	Work with utility on interconnection process	Create an EV landing page on the city website	Provide public chargers	Deploy electric school buses
Address EVs and EVSE in functional plan	Encourage EVSE in or near to affordable multi-family housing	Work with utility or regulatory authority to address EV charging initiatives	Provide EV/EVSE education to commercial property owners	Right-of-Way (ROW) charging deployment	Develop electric micro-mobility transportation opportunities
Establish deployment benchmarks and goals	Incorporate EV and EVSE in permitting	Expand utility EV programs and rates	Offer financial incentives for EVSE installation*	Install employee reserved EVSE	Develop EV car sharing program
	Host regulatory process resources online	Work with utility to integrate renewable energy into EVSE	Offer financial incentives for purchasing EVs		

Utility Engagement
Work with utility on collaborative education and communication initiatives
Work with utility on interconnection process
Work with utility or regulatory authority to address EV charging initiatives
Expand utility EV programs and rates
Work with utility to integrate renewable energy into EVSE

- Meet with utilities to discuss collaboration opportunities
- Host or support EV readiness workshops with utility
- Collaborate with utility to co-promote utility EV programs, rates, and incentives including EV integrated renewable energy
- Work with utility to promote EVs at local dealerships

Shared Mobility
Deploy electric transit, para-transit vehicles
Deploy electric school buses
Develop electric micro-mobility transportation opportunities
Develop EV car sharing program

- Collaborate with utility to co-promote utility EV programs, rates, and incentives, including EV integrated renewable energy
- Work with transit operator to adopt conversion goals for EV transit and/or para-transit with timelines*
- Work with transit operator to purchase EVs for transit and/or para-transit use to meet adopted goals*
- Track EV metrics (i.e., usage, reduced GHG emissions, savings, etc.)*

Program Requirements

- Staff Capacity to participate fully
  - Identify at least one staff person
- Any city
- Complete a Letter of Commitment to implement EV Smart action(s)
- Complete a self-assessment

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https://betterenergy.org/blog/ev-smart-cities-and-native-nations-program-launches/

Program Details

- No cost to participate
  - Only staff time
- Program Length
  - November 2022 – March 2024
- Time Commitment
  - One to three one-on-one meetings and/or technical assistance
  - Optional webinars on best practice topics
  - Self-directed work to meet local goals

https://betterenergy.org/blog/ev-smart-cities-and-native-nations-program-launches/

How to Reach Me

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CERTs CLEAN ENERGY RESOURCE TEAMS

CITY OF RED WING

CHARGING STATIONS

Charging Stations and Sites

DCFC

Old West Main DCFC

City Hall Level 2

DCFC CHARGING STATION

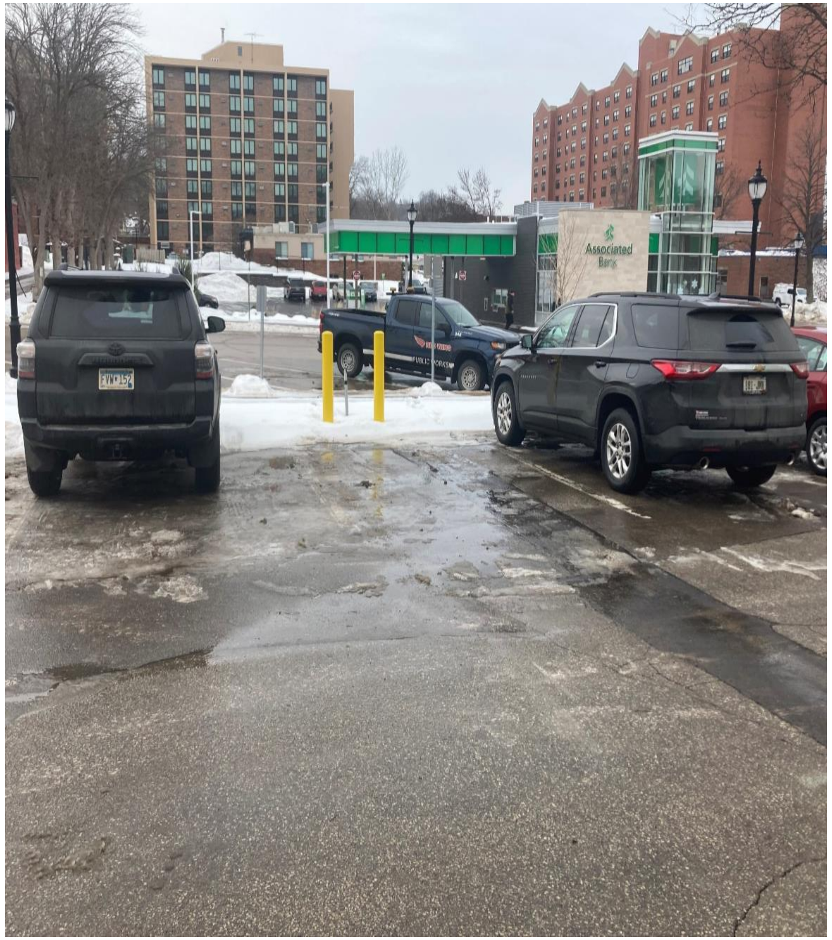
- Opened for use on November 17, 2018, located in municipal parking lot in downtown Red Wing.
- This charging station is the central part of a pilot project driven by Red Wing's Sustainability Commission.
- Station utilizes early generation level 3 equipment that is non-networked.
- Technical Specifications/Equipment Used: Delta DC Fast Charger Dual Wall-box 25 Kw.
- The equipment was originally covered under warranty for two years.
- In order to meet budget constraints, the unit chosen was a low-cost model.

OLD WEST MAIN DCFC/LEVEL 2 CHARGING STATION

- Site was developed as part of an overall reconstruction project.
- Site designated as part of MPCA Phase 2 DC Fast Charging Corridor Project which was awarded to ZEF Energy.
- Planned equipment would include 50KW DCFC with the capability of being expanded to 600KW and 8 charging ports along with a dual 11.5KW level 2 charger.
- This station will be capable of charging users with fees determined by the Red Wing City Council.

CITY HALL LEVEL 2 CHARGING STATION

- Originally planned at Studebaker Parking ramp.
- Partially funded from MPCA grant.
- Technical Specifications/Equipment to be Used: ZEFNET-40-PRO, 15.4 kw.
- The equipment comes with a 5-year warranty and 5-year subscription to the ZEFNET software.
- This unit will be capable of charging users with fees determined by the Red Wing City Council.



Challenges

DFC

- The station had several maintenance issues in the first couple of years.
- Delta replaced entire unit under warranty in April 2020.
- Site does not meet accessibility requirements.
- We have no way to track usage of the station.

OLD WEST MAIN

- Originally no cost to city but vendor has indicated a local match will be needed due to inflationary increases.
- Shift in council priorities regarding support of EV charging stations.

CITY HALL

- Accessibility requirements at original location would have required elimination of 7 regular parking stalls.
- Push back from City Hall regarding loss of 3 parking stalls to accommodate 2 charging stalls.
- Considerable site work in order to meet accessibility requirements.

Costs Associated

DCFC

- RW opted to not to charge users for using the station.
- The energy bill is processed and paid by the city but then the city is reimbursed by the Chamber of Commerce.
- The labor costs to maintain and repair the station since it was installed are $1948.07.
- Project Cost: Total cost to install in 2018: $22,094.
- Break down of overall utility bills September 2019 through October 2022:
  - KWH consumption: 22,521
  - Non demand KWH: 22521 or 99% of total KWH
  - Non demand charges: $3672.75 or 58% of total
  - Demand KWH: 219 or 1% of total KWH
  - Demand charges:$2,682.01 or 42% of total
  - Total charges including all fees : $6,354.76

THANK YOU!

EV Infrastructure – Developing a Citywide Plan

CEAM Annual Conference January 25, 2023

Why develop an EV Infrastructure Plan?

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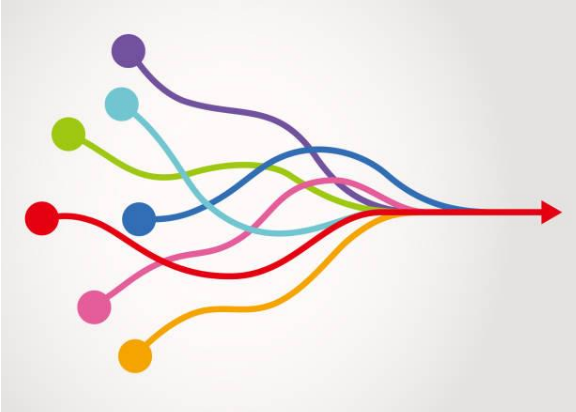
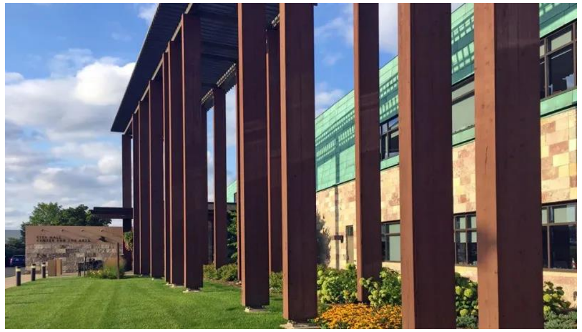
- Want to be prepared to effectively implement EV technology throughout the City.
- Consolidate individual divisions policies, practices or plans related to EV infrastructure into one comprehensive plan.
- Goal is to have a completed plan adopted by the City Council and compliment our City's Comprehensive Plan.



You decided you want an EV Infrastructure Plan, now what?

CITY OF BLOOMINGTON MINNESOTA

- Identify and define what you want to see in your plan.
  - City Fleet
  - City Facilities
  - Parks and Public Spaces
  - Private Development
  - Residential



- Determine who will produce the plan.
  - City Staff
  - Consultant
  - Fleet Electrification Advisory Services (Xcel Energy)
  - EV Smart Cities Program (Great Plains Institute)

You decided you want an EV Infrastructure Plan, now what?

- Identify City stakeholders.
  - Engineering
  - Fleet Maintenance
  - Park & Rec
  - Sustainability
  - Equity & Inclusion Office
- Identify external stakeholders.
  - Developers
  - Residents
  - Business Owners
  - Property Manager
  - Utility Providers

Time to create your EV Infrastructure plan!

- Identify a study champion/project manager.
- Gather feedback and input from key departments or divisions.
  - Create a Technical Advisory Committee (TAC).
- Compile any existing polices, procedures or plans related to EV Infrastructure.
- Solicit feedback and information from identified groups, boards, commissions, utility providers etc. throughout the drafting of the plan.
  - Informational tables at community events.
  - Public open house.
  - Hold meetings with business owners, developers and property managers.
  - Provide the plan to the following City bodies for review and comment.
    - Office of Racial Equity, Inclusion and Belonging
    - Sustainability Commission
    - Planning Commission
    - City Council

Final Plan and implementation

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- The final plan will be adopted by the City Council and be utilized as a planning document.
- The plan should include recommendations to guide Staff in meeting the identified goals outlined in the document.
- The Plan should provide guidance for Staff so EV infrastructure implementation can be included in conjunction with other projects and programs (PMP, Park Maintenance Projects, Private Development, District Plans.)
- Provide a way to measure and track the progress of the City's EV infrastructure implementation.

Where Bloomington Stands Today

- The RFP that was posted closed on December 21, 2022.
- The City received and reviewed seven proposals.
- A proposal was selected, and the City is now working on finalizing a contract to begin the work.
- It is anticipated that the Plan will take 11 months to complete and be formally adopted by the City Council.

EV Infrastructure – Siting Public Chargers

Erin Kayser
City of Saint Paul: Electric Vehicle Program Coordinator

SAINT PAUL
MINNESOTA

Evie Carshare

SAINT PAUL
MINNESOTA

- 170 Electric Vehicles (Chevy Bolts and Nissan Leafs)
  - ‘Free Floating’ Public Carshare System
  - Reservable by App, Website, or Phone Call
- 38 square mile service area
  - 70 Charging Stations

evie
Operated by HOURCAR

EV Spot Network

- Charger Network Supporting:
  - Evie Carshare
  - Private Electric Vehicle Owners
- 70 Sites Selected for Phase 1
  - Span Service Area
  - Two Chargers at Each Site, Two Ports Per Charger
  - 10 DC Fast Chargers Included in Network

EV Spot Network Timeline

1

2018

EV Spot Network Planning Conception and CMAQ funding proposal

2

2019

CMAQ unique projects awarded; project planning begins

3

2019-2020

Robust Engagement process and Hub Site Selection work begins

4

2021

Evie Carshare pilot launches in Fall 2021; Delays in procurement and battery recalls delay launch

5

2022

Official launch of EV Spot Network

6

PRESENT

Chargers and cars continue to be added; usage of Evie Carshare and public charging continues to grow

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Spot Network Site Selection Process

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1 Neighborhood Selection

Considerations taken when selecting neighborhoods for the charging hub locations include:

- Transit usage
- Resident demographics
- Density of renters & public housing
- Density of one- and zero-vehicle households
- Density of existing & planned bicycle facilities
- Roughly a 10-min walk between hubs within the service area

2 Siting Requirements

Is there 80-100’ of uninterrupted curb that meets these requirements?

- 5’ from driveways and alleys
- 30’ from stop signs
- 10’ from any fire hydrant
- Wide boulevard and sidewalk
- Ideally located on a two-lane road

Is there bike parking nearby or room to install some?

Does the site allow for ADA considerations?

Are there any bicycle facilities nearby?

Does it conflict with an existing or planned bicycle facility?

Is there a transit stop nearby?

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EV Spot Network Locations and Evie Carshare Home Area

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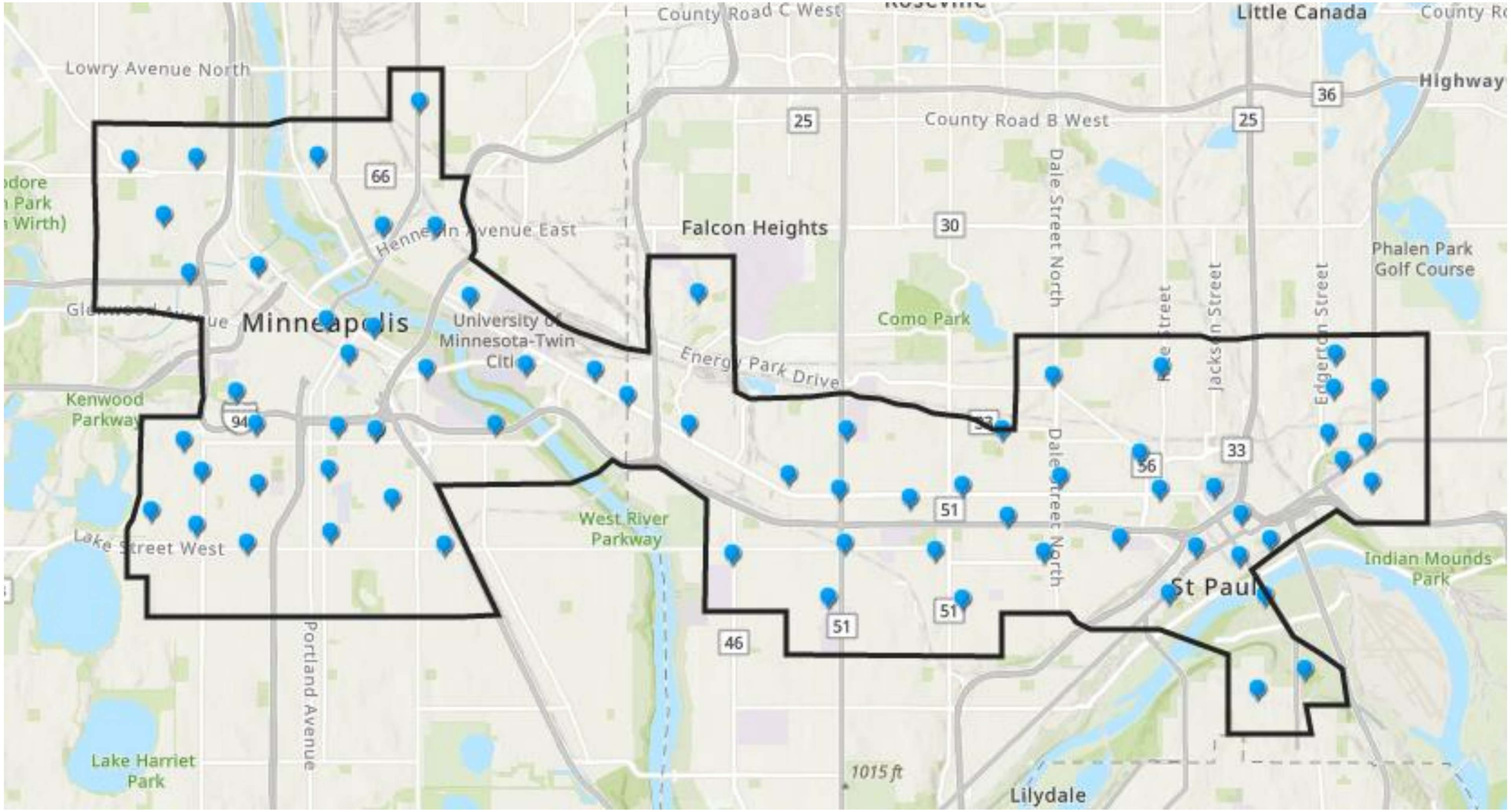

Questions?

Thank you speakers:

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