DEPARTMENT OF TRANSPORTATION

2022

MINNESOTA ELECTRIC VEHICLE INFRASTRUCTURE PLAN

July 2022

In order to receive NEVI Formula Program funds, each state must develop a Federal Highway Administration (FHWA)-approved EV infrastructure deployment plan that describes how the state intends to use the funds according to NEVI Formula Program Guidance. Refer to Section III.B of the Program Guidance for additional details on each section within the Plan.

To request this document in an alternative format, please contact The Office of Equity and Diversity at 651-366-4723 or 1-800-657-3774 (Greater Minnesota); 711 or 1-800-627-3529 (Minnesota Relay). You may also send an email to **ADArequest@state.mn.us**.
(Please request at least one week in advance).

This report was prepared by the Minnesota Department of Transportation Office of Sustainability and Public Health, with special thanks to the many stakeholders who shared their time and thoughts to help guide the development of this plan.

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Acronyms and Abbreviations

Note that the following abbreviations are used in this document:

AADT	average annual daily trips
ADA	Americans with Disabilities Act
ADM	Department of Administration
AFC	alternative fuel corridor
BA	Buy America
BEV	battery electric vehicle
BIL	Bipartisan Infrastructure Law
BIPOC	Black, Indigenous, and People of Color
BNSF	Burlington Northern Santa Fe
CN	Canadian National
COMM	Minnesota Department of Commerce
CP	Canadian Pacific
CRW	Climate and Resilience Workgroup
CVSS	common vulnerability scoring system
DBE	disadvantaged business enterprise
DCFC	direct current fast charger
DiD	Defense-in-Depth
DLI	Department of Labor and Industry
DMV	Department of Motor Vehicles
DOE	Department of Energy
DOT	Department of Transportation
EJ	Environmental Justice
EO	Executive Order
EV	electric vehicle
EVITP	Electric Vehicle Infrastructure Training Program
EVSE	electric vehicle supply equipment
F	Fahrenheit
FHWA	Federal Highway Administration
FY	fiscal year
GHG	greenhouse gas
GPS	global positioning system
IDS	intrusion detection system
IIJA	Infrastructure Investment and Jobs Act
IPS	intrusion prevention system
ISCM	information security continuous monitoring
KPI	key performance indicator
kW	kilowatt(s)
kWh	kilowatt hour(s)
LMI	low to moderate income
MFAC	Minnesota Freight Advisory Council
MnDEED	Department of Employment and Economic Development
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MPO	metropolitan planning organization
MSP	Minneapolis-St. Paul International Airport
NEPA	National Environmental Policy Act
NEVI	National Electric Vehicle Infrastructure
NIST	National Institute of Standards and Technology
NPRM	Notice of Proposed Rulemaking
O&M	operations and maintenance
OEM	original equipment manufacturer
P3	public-private partnership
PCI	payment card industry
PHEV	plug-in hybrid vehicle
ROW	right of way
SbD	Security by Design
SIEM	security information and event management
SMTP	Statewide Multimodal Transportation Plan
SOC	Security Operations Center
SP	Special Publication
STAC	Sustainable Transportation Advisory Council
SUV	sport utility vehicle
TBI	Travel Behavior Inventory
UP	Union Pacific
U.S.	United States
VW	Volkswagen

DEPARTMENT OF TRANSPORTATION

SUMMARY

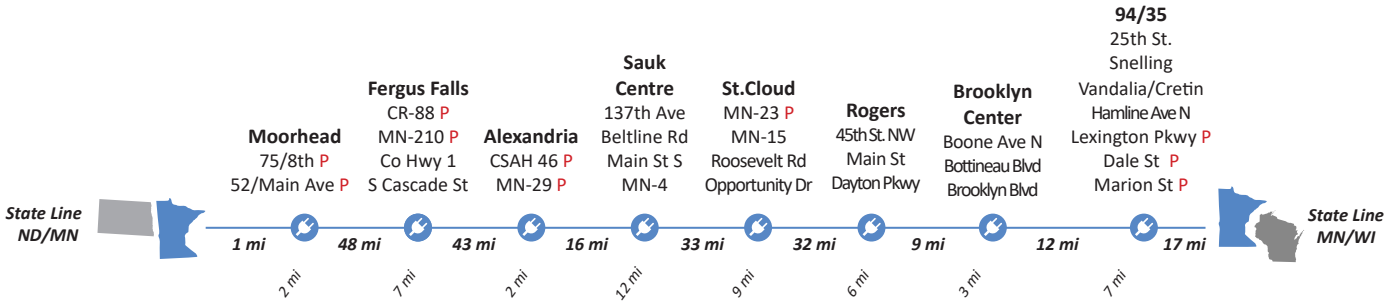
The federal Bipartisan Infrastructure Law (BIL) created the National Electric Vehicle Infrastructure (NEVI) Formula Program. The new program provides funds for states to install fast chargers for electric vehicles along designated corridors. Minnesota will receive $68 million in federal funds from the NEVI Formula Program over five years.

The Minnesota Electric Vehicle Infrastructure Plan describes how Minnesota will spend the first year of NEVI Formula Program funds. The Minnesota Department of Transportation (MnDOT) developed this plan in coordination with the public and stakeholders throughout the state. The plan builds on past efforts to advance electric vehicles and electric vehicle infrastructure in Minnesota. Minnesota will update the plan annually to reflect progress towards implementation and provide more opportunities for public input.

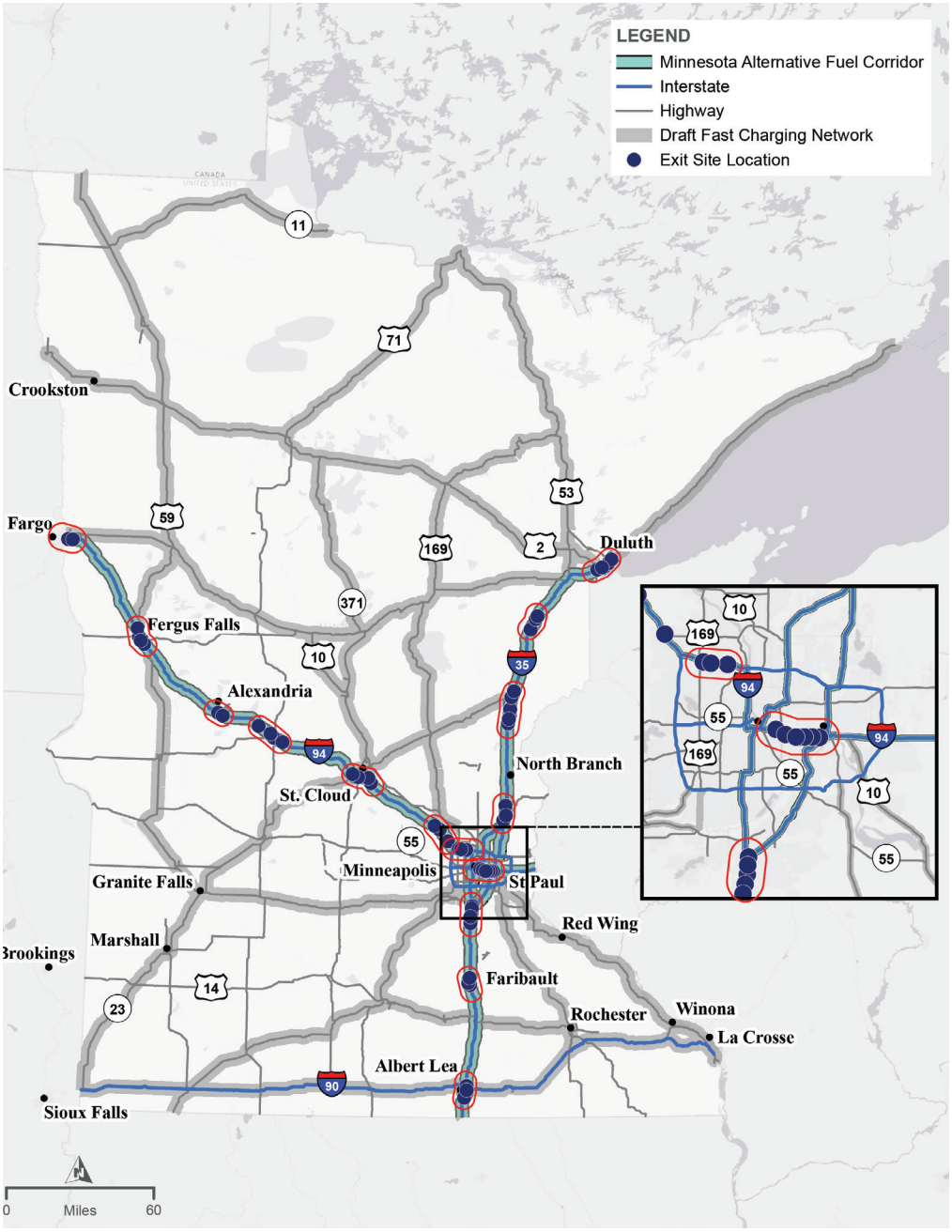
The plan includes a vision and goals for a statewide fast charger network that provides convenient, reliable, and accessible EV charging across Minnesota.

The plan identifies potential locations along Minnesota's two existing Alternatives Fuel Corridors, Interstates 35 and 94, where the agency will initially work with third parties to install fast chargers (see **Figure 1** next page).

The plan also describes implementation considerations related to operations and maintenance, civil rights, equity, labor and workforce, and cybersecurity. The plan concludes with information about how MnDOT will evaluate the NEVI Formula Program implementation in Minnesota.



"P" indicates that 3-phase power is available within one mile of the interchange.



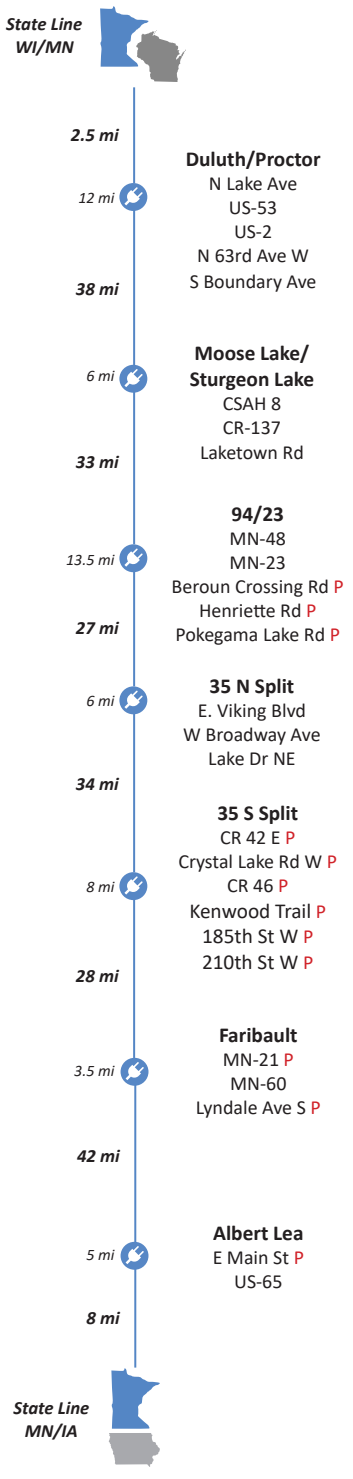


Figure 1: Initial NEVI Investment Locations

1. INTRODUCTION

The new federal NEVI Formula Program provides funds for states to strategically deploy fast chargers for electric vehicles (EVs) along designated corridors. The new program aims to provide reliable, long-distance EV travel, while also recognizing the unique needs of different regions and communities.

Initially, states must spend NEVI Formula Program funds to build out federally-designated Alternative Fuel Corridors (AFCs). Full build out includes installing fast chargers every 50 miles within 1 mile of the AFC and providing at least four 150kW direct current fast chargers that are capable of simultaneously charging 4 EVs. Once the state's AFCs are fully built out, funding may be used on any public road or in other publicly accessible locations.

Minnesota expects to invest about $68 million in federal funding from this program over 5 years, along with a 20% non-federal match of $17M. Minnesota will finalize and submit this document by August 1, 2022, for eligibility for federal funding.

The Minnesota Electric Vehicle Infrastructure Plan is a first step toward the planning, prioritization, and implementation of a statewide network of high-powered direct current fast charger (DCFC) stations along state highways. The plan's vision is a network that provides all Minnesotans the choice to drive or ride electric vehicles, with a goal of developing a convenient, reliable, affordable, and equitable charging experience.

Minnesota will start by building out the two existing AFCs: Interstates 35 and 94. These are two of the highest volume corridors in the state and provide important regional and national connections. Building out these two AFCs will help Minnesota establish an efficient and effective procurement process before expanding to additional corridors.

The plan builds off past efforts to advance EVs in Minnesota and will complement other government and private investment in EV infrastructure. Between 2020 and 2022, the Minnesota Pollution Control Agency distributed VW Settlement grants to fund 104 Level 2 charging ports and 43 DCFC stations. Minnesota utilities are exploring opportunities to pilot EV infrastructure and support EV charging. And private companies installed the majority of public chargers available in the state. MnDOT coordinated with key EV industry stakeholders in Minnesota to align the Minnesota Electric Vehicle Infrastructure Plan with related EV infrastructure plans and projects.

It will take time and collaboration to achieve the vision of a convenient, reliable, affordable, and equitable charging experience throughout Minnesota. The first year of investment from the NEVI Formula Program will serve as a catalyst for future EV charging station deployment. Minnesota will update the plan annually and will identify additional corridors for investment based on technical analysis and stakeholder input.

DATES OF STATE PLAN FOR ELECTRIC VEHICLE INFRASTRUCTURE DEPLOYMENT DEVELOPMENT AND ADOPTION

Minnesota prepared the Electric Vehicle Infrastructure Plan in the spring of 2022, following the initial NEVI Formula Program Guidance from Federal Highways Administration (FHWA). The schedule for plan development and implementation is as follows:

MARCH – JULY 2022

- Minnesota elected not to nominate additional AFCs during the 2022 nominations process
- Stakeholder and Public Involvement
- Draft EV Plan
- Minnesota Electric Vehicle Infrastructure Plan approved by MnDOT senior leadership team

ON OR BEFORE AUGUST 1, 2022

- Submit Minnesota Electric Vehicle Infrastructure Plan to FHWA

ON OR BEFORE SEPTEMBER 30, 2022

- FHWA approves Minnesota's plan

FALL/WINTER 2022

- Minnesota explores contracting options to prepare for infrastructure deployment

2. STATE AGENCY COORDINATION

NEVI FORMULA PROGRAM GUIDANCE RESPONSE AND PLAN SCOPING

The Minnesota Department of Transportation (MnDOT) coordinated with the state's environmental and energy departments—the Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Commerce (COMM), respectively—to review NEVI Formula Program Guidance, submit comments on behalf of state agencies, and develop the scope of work for the Minnesota Electric Vehicle Infrastructure Plan (Plan). The state agencies worked together to review program guidance and collaborated on EV planning and implementation considerations.

MnDOT gathered feedback from MPCA and COMM on the scope of work for the Plan. COMM provided insights on how to best engage with utilities, and MPCA shared lessons learned from administering the Volkswagen (VW) Settlement program. This early coordination leveraged each agency's expertise to develop the Plan.

PLAN DEVELOPMENT

MPCA, COMM, and the Minnesota Department of Employment and Economic Development (DEED) representatives actively engaged in decision-making about the Plan through formal workgroup meetings (see **Section 3**). State agencies also provided targeted input to MnDOT through ad-hoc small group meetings. MnDOT met with MPCA staff to provide updates and seek input on whether to nominate additional AFCs and potential fast-charger locations beyond the current AFC designations of I-35 and I-94. MnDOT also met with the Department of Natural Resources and Explore Minnesota to gather input on the Plan.

MAXIMIZING OPPORTUNITIES TO USE U.S.-MADE EQUIPMENT

Submitting comments in response to the Buy America Request for Information (Docket No. FHWA 2021-0015) helped Minnesota agencies better understand opportunities to use U.S.-made electric vehicle supply equipment (EVSE). MnDOT, MPCA, COMM, and the Minnesota Department of Administration (ADM) strongly support the intent of Buy America requirements. President Biden's ambitious goal of building a new national network of 500,000 EV chargers by 2030, and funding through the Infrastructure Investment and Jobs Act (IIJA), can bolster domestic manufacturing and domestic supply chains and create job opportunities for Americans.

In December 2021, the ADM and MnDOT sent an informal inquiry about Buy America compliance to the ten vendors on the Minnesota EVSE state contract. Six vendors responded. Only ChargePoint and FreeWire indicated they could meet FHWA's Buy America requirements, but they did not share the percentage of U.S.-manufactured components in their Buy America-compliant models. See **Section 7** for additional information about potential challenges and risks associated with Buy America requirements. MnDOT will include details about Buy America requirements in its requests for bids for EV chargers funded through the NEVI Formula Program.

3. PUBLIC ENGAGEMENT

The MnDOT Strategic Plan echoes the agency's commitment to strengthening relationships with community members through open decision-making that includes opportunities for the public to influence process. The following principles guided Plan engagement:

- Identify clearly when stakeholders and the public can influence transportation decisions.
- Implement an appropriate timeline and process for the public and stakeholders to engage based on capacity and time available.
- Use a variety of methods and platforms.
- Inform policies, strategies, and investment direction (as applicable).
- Use easy to understand language and graphics and culturally responsive practices.
- Comply with federal and state requirements.

The content and format of engagement varied by audience and ranged from obtaining feedback on topics or decisions to collaborating with groups on final decisions with MnDOT's partners. The intent of engagement was to allow Minnesotans to actively participate in the planning process and inform the outcome of the the Minnesota Electric Vehicle Infrastructure Plan. More detail on engagement outcomes is discussed in the following subsections.

STAKEHOLDER INVOLVEMENT

EV SUBGROUP MEETINGS

MnDOT created the Climate and Resilience Workgroup (CRW) in response to the three new transformative federal climate and resilience programs established in the IIJA (NEVI Formula Program, Carbon Reduction Program, and PROTECT). The CRW will provide recommendations for consideration by MnDOT leadership and convened an EV subgroup to guide the Plan development process, including identifying and prioritizing locations for NEVI-funded

UTILITIES WORKSHOP FEEDBACK

(29 Participants)

- Locations along I-94 and/or I-35 to consider:
  - Pine City, Rush City, North Branch
  - I-35/I-90 Corridor
  - I-94 Albertville
  - Exits #100 and #103
- Focus on outstate corridors for these chargers
- Consider rest areas

Consider utility grid capacity at potential locations:

- Identify exits with 3-phase power capable of at least 600 kilowatt (kW) capacity
- Evaluate proposed locations against make-ready costs

Continued outreach with local utilities will be key:

- Conduct more stakeholder workshops and meetings throughout the process

EV CHARGER INSTALLERS WORKSHOP FEEDBACK (15 Participants)

Location selection should consider:

- Power availability
- Incorporating density of EV registrations into analysis
- Challenges related to site expansion
- Leveraging EV installers' site development capabilities

Operations and maintenance (O&M) strategies:

- O&M could be more costly in Greater Minnesota
- Experience and capabilities assessments
- National service contracts
- 24/7 monitoring

Data collection strategies:

- Gather standard language from federal RFI comments
- Aggregate data so that individual sessions are not shared
- Provide redundancy in remote data (have backup when fiber fails)

Other topics:

- Multiple payment options
- Future-proofing stations for new charging technologies and capabilities
- Driver communication apps
- Pull-through stations
- Request for continued coordination

LOCAL GOVERNMENTS WORKSHOPS FEEDBACK

(50 Participants)

Location selection:

- Density and traffic volumes
- Origin-destination data
- Private sector coordination
- Mixed feedback about the split between investment in Greater MN and the metropolitan area

Local permitting requirements:

- State restrictions (right of way [ROW] advertising, off-street charging)
- Local advertising restrictions (zoning/signage)
- Local land use and access permitting

Gaps in the draft DCFC network:

- Highways – 29, 36, 694, 2, 169, 65, 47, 11, and 52
- Scenic river routes like 95 and 61
- Southeast corner of state

Continued coordination:

- Review local plans
- Promote funding opportunities
- Continue to conduct frequent, robust workshops

DCFCs. Workgroup members included representatives from MnDOT, state agencies, FHWA, tribal governments, cities and counties, metropolitan planning organizations (MPOs), regional development organizations (RDOs), EV advocacy organizations, environmental organizations, gas stations and convenience stores, labor, and utilities. The workgroup held regular meetings to discuss Plan development updates from April through June 2022.

VIRTUAL STAKEHOLDER WORKSHOPS

MnDOT held three virtual stakeholder workshops tailored to different stakeholder groups, including local governments, utilities, and EVSE installers, on May 23, 24, and 26, 2022, respectively. Workshop participants listened to a program overview and then responded to questions specific to their areas of expertise. The following infographics summarize the results of these discussions.

ADDITIONAL MEETINGS AND PRESENTATIONS

MnDOT staff also presented at approximately 60 meetings to over 1,500 individuals representing nearly 1,000 organizations. Meetings ranged from providing general information about the Plan to soliciting targeted feedback from specific stakeholders. Organizations included MPOs and RDOs; counties and cities; state agencies; tribal governments; electric utilities; freight industry groups; environmental justice, equity, and other community organizations; private sector electric vehicle charging station network operators, and gas station owners and operators.

PUBLIC OUTREACH

PLAN WEBSITE

MnDOT developed a website to provide updates about the planning process and a forum for submitting public input. The website received 24,649 visits, and MnDOT received 93 comments between April 4 and June 24, 2022. **Appendix A** provides a summary of these comments and describes how they will inform fast charger planning and implementation.

STATEWIDE SURVEY

MnDOT administered a public online survey statewide from April 11 to May 3, 2022, promoted via stakeholder emails and targeted social media ads, and received 5,681 responses, including 13,000+ open-ended comments. MnDOT specifically promoted the survey to rural, underserved, and disadvantaged stakeholders. Generally, survey-respondent demographics aligned with statewide demographics, although white men between the ages of 35 and 54 were slightly overrepresented. **Appendix B** provides a complete summary of the survey results.

The survey results indicate the following insights:

- 40% of respondents plan to, or would like to, own an EV in the future.
- Respondents identified high EV prices and a lack of public chargers as the top two obstacles preventing them from purchasing an EV.
- Respondents ranked interstates, transportation access, rural/Greater MN needs, and long-distance travel as the top criteria MnDOT should use to prioritize DCFC locations.
- Respondents listed more convenient travel as the main benefit of adding DCFCs in Minnesota.
- Respondents listed cost as the top concern for building, charging, and maintaining DCFCs.

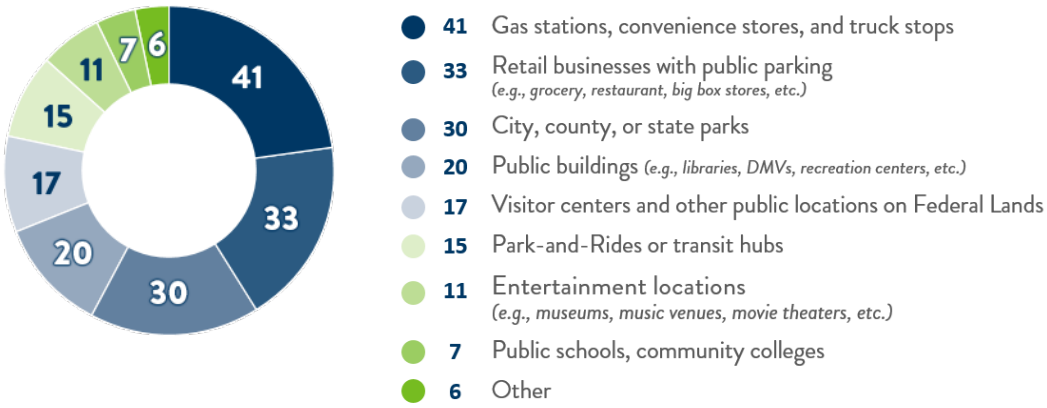


Figure 2: Where should EV fast charging stations be located?

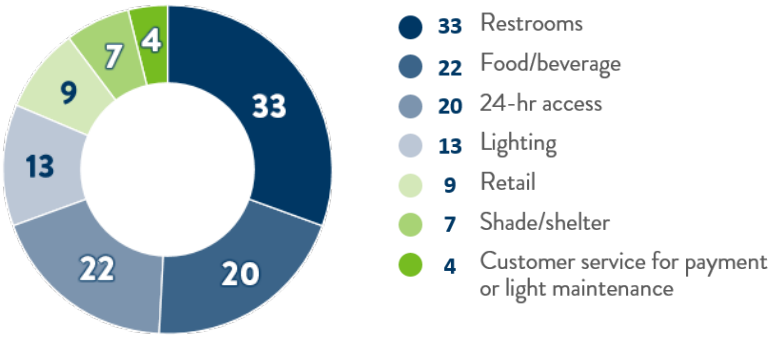


Figure 3: What location types and site amenities would you like to see?

COMMUNITY EVENTS

MnDOT hosted four in-person community events throughout the state in June 2022, with the goal of gathering feedback from the public, including underserved and disadvantaged communities that might not otherwise engage in the planning process (see **Figure 4**). All four events were located in communities on either I-35 or I-94:

- Minneapolis, Midtown Global Market, *June 1, 2022*
- Duluth, Bayfront Playfront Park, *June 2, 2022*
- Albert Lea, Thursdays on Fountain, *June 9, 2022*
- Fergus Falls, Summerfest, *June 11, 2022*

Display boards at each event explained the NEVI Formula Program and initial focus on I-35/94, a potential future statewide EV DCFC network, and the public engagement process. **Figures 2, 3, and 5** illustrate the results of 135 interactions the team had with Minnesotans at these events. Participants placed sticker dots where they would like to see DCFCs and voted on charger location types and site amenities.

Other key themes from the community events:

- Skepticism about lithium battery recycling and environmental benefits of EVs
- Interest in fast charging at rest areas, state parks, and casinos
- Concerns about charger maintenance, reliability, security, payment, and fuel taxes
- Desire for EV charging experience that mirrors the gas station experience
- Prioritize rural locations and access for long trips

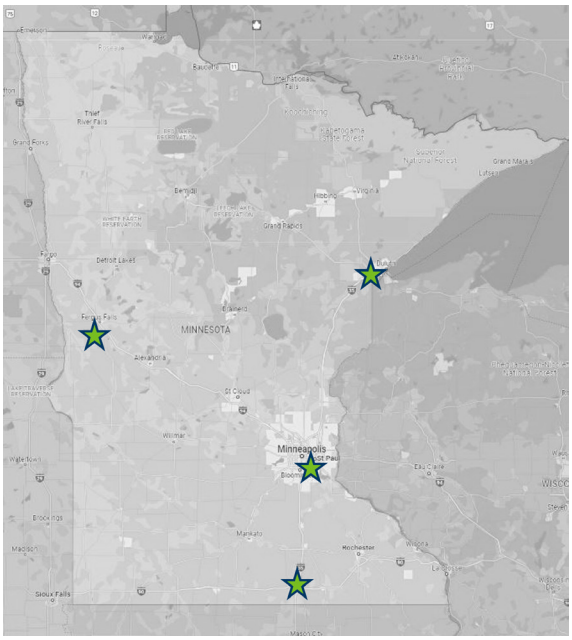


Figure 4: Community Event Locations

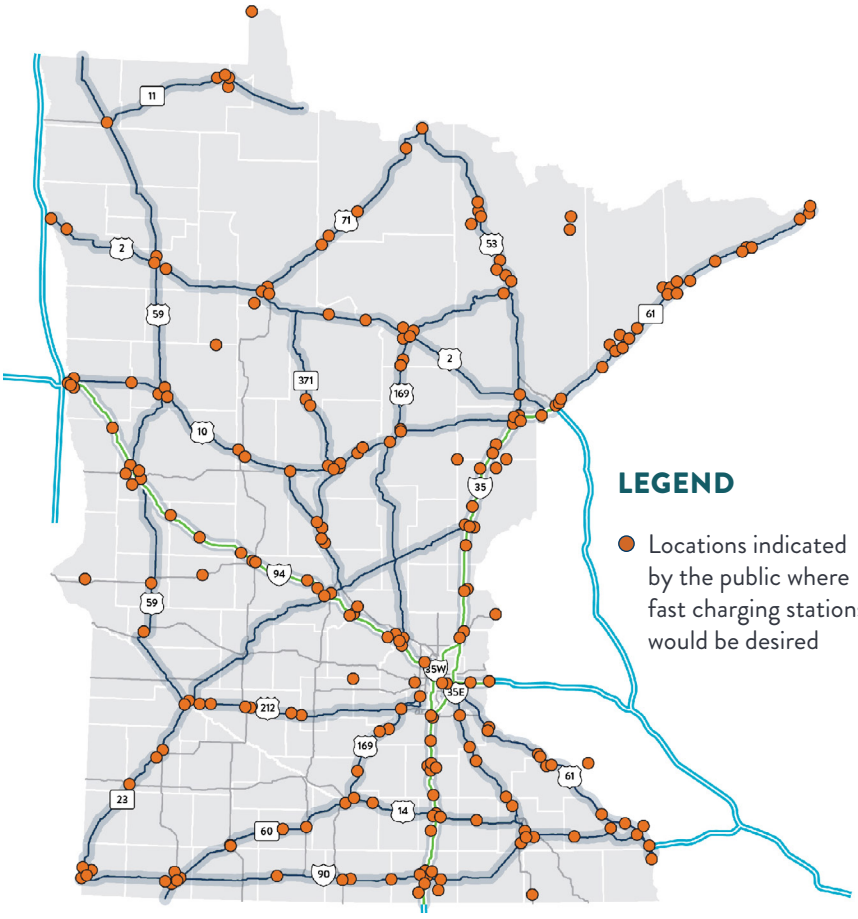


Figure 5: Where in Minnesota would you like to see EV fast charging stations?

Key Engagement Takeaways

The following themes emerged across all engagement activities (virtual workshops, community events, and the survey). Participants explored barriers to deployment, opportunities for successful implementation, and areas where additional coordination or efforts will need to be made. Their feedback supported the Plan and will help inform the forthcoming guide for program implementation. Below is a summary of key engagement takeaways.

- Participants generally support expanding the statewide network in the future to the corridors shared during public engagement.
- Criteria for chargers funded through the NEVI Formula Program should consider power availability, travel data, population data, EV registrations, and local community input.
- Participants expressed interest in siting DCFCs at gas stations, retail businesses, parks, and tourist destinations.
- Maintenance and reliability are top concerns; assessing EV charger installer experience and requiring 24/7 monitoring can help.
- Participants want DCFCs to be easily accessible and be near amenities, such as restrooms and food/beverage options, and to have 24-hour access.
- It will be necessary to clarify the role of rest areas in siting and future engagement efforts.
- Utilities, EV charger installers, and local governments are key partners; continued coordination and regular communication is important.
- Participants expressed excitement and curiosity about how discretionary funds will be allocated; continued outreach on this topic will be helpful.

MnDOT will conduct ongoing public and stakeholder engagement about the site selection process. More information about workshop and event dates will be available in Fall 2022.

Informing the Plan

Public and stakeholder engagement played a key role in Plan development. Throughout the process, MnDOT used public and stakeholder input to validate technical analysis results. While engagement informed many aspects of the Plan, the following bullets describe key areas where engagement was critical to informing the Plan's direction:

- Creating and valiging the Minnesota EV fast charging network vision: Stakeholders and the public helped identify criteria and provide input on the draft network vision. MnDOT added additional corridors (TH 169 and TH 52, and TH 14) to the vision based on the input.
- Understanding siting considerations and amenities: MnDOT used feedback on preferred site hosts and amenities to help identify locations for the first year of NEVI investment. The clusters of exits at each location will increase opportunities to select sites with the preferred amenities.
- Validating the importance of serving rural, tribal, and Justice40 communities: This feedback was consistent throughout the engagement process, and the need to expand the fast charging network vision geographically to serve all of greater Minnesota was a key result. Many of the corridors identified in the network are adjacent to or within close proximity of rural, tribal, or Justice40 communitiy, and the criteria used to identify the clusters were also informed by this consideration.

4. PLAN VISION AND GOALS

EV FAST CHARGING NETWORK VISION

While initial investment will focus on I-35 and I-94, Minnesota will use NEVI Formula Program funds to invest throughout the state in the coming years. During the Plan development process, MnDOT gathered input on potential future locations for fast chargers, with the goal to provide convenient, reliable, and accessible EV charging across Minnesota.

The EV Fast Charging Network includes corridors for potential future investment with NEVI Formula Program funds after I-35 and I-94 are built out or when MnDOT nominates additional corridors for AFC designation by FHWA. Public input informed the criteria below which were used to develop the network that will be the foundation for engagement on future NEVI Formula Program investment.

Connectivity: The ability to support interstate travel and connect to AFCs in neighboring states and in Canada.

Disadvantaged Communities: The network prioritizes communities most affected by poverty and pollution and Tribal lands (see **Figure 6)** and supports the Justice40 Initiative to allocate 40% of overall benefits from federal programs to disadvantaged, underserved communities. [1]

Connect to Existing Infrastructure: Corridors with existing EV DCFCs can leverage past investments in EV chargers.

Serve Long-Distance Travel: MnDOT identified roadways (principle alterial and above, see **Figure 7**) with the highest traffic volume as potential corridors to support long-distance travel by EV. MnDOT also identified future corridors that fulfill the criteria above. The current and proposed network (**Figure 8**) would make interstate connections to six AFCs in neighboring states and seven border crossings between Minnesota and Canada, including International Falls, Baudette, Warroad, and Grand Portage.

The network includes many of the the highest volume corridors in Minnesota, serving high-demand travel throughout the Twin Cities metropolitan area and popular destinations in Greater MN. The corridors also support connections to a majority of Minnesota's rural and underserved areas including many of the tribal lands located in northern Minnesota.

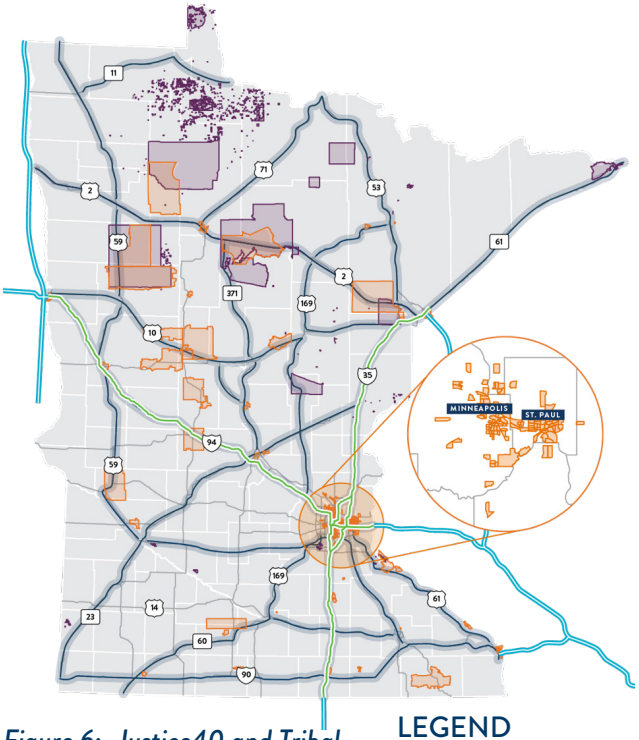


Figure 6: Justice40 and Tribal Communities in relation to the DCFC Network

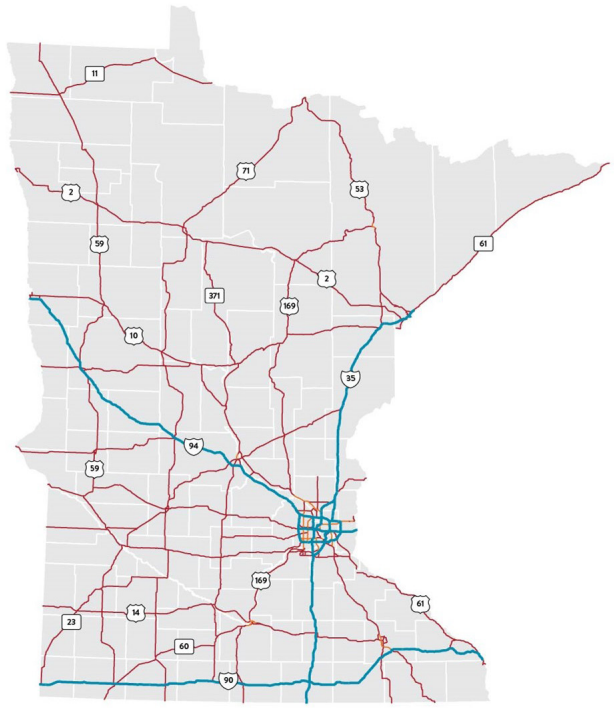


Figure 7: State Trunk Highway System

[1] *"Disadvantaged" is defined through data investigation of these communities by a combination of variables including low income (and/or highpersistent poverty), acial minority composition, linguistic isolation, high transportation-cost burden, high energy-cost burden, and disproportionate environmental stressors.*

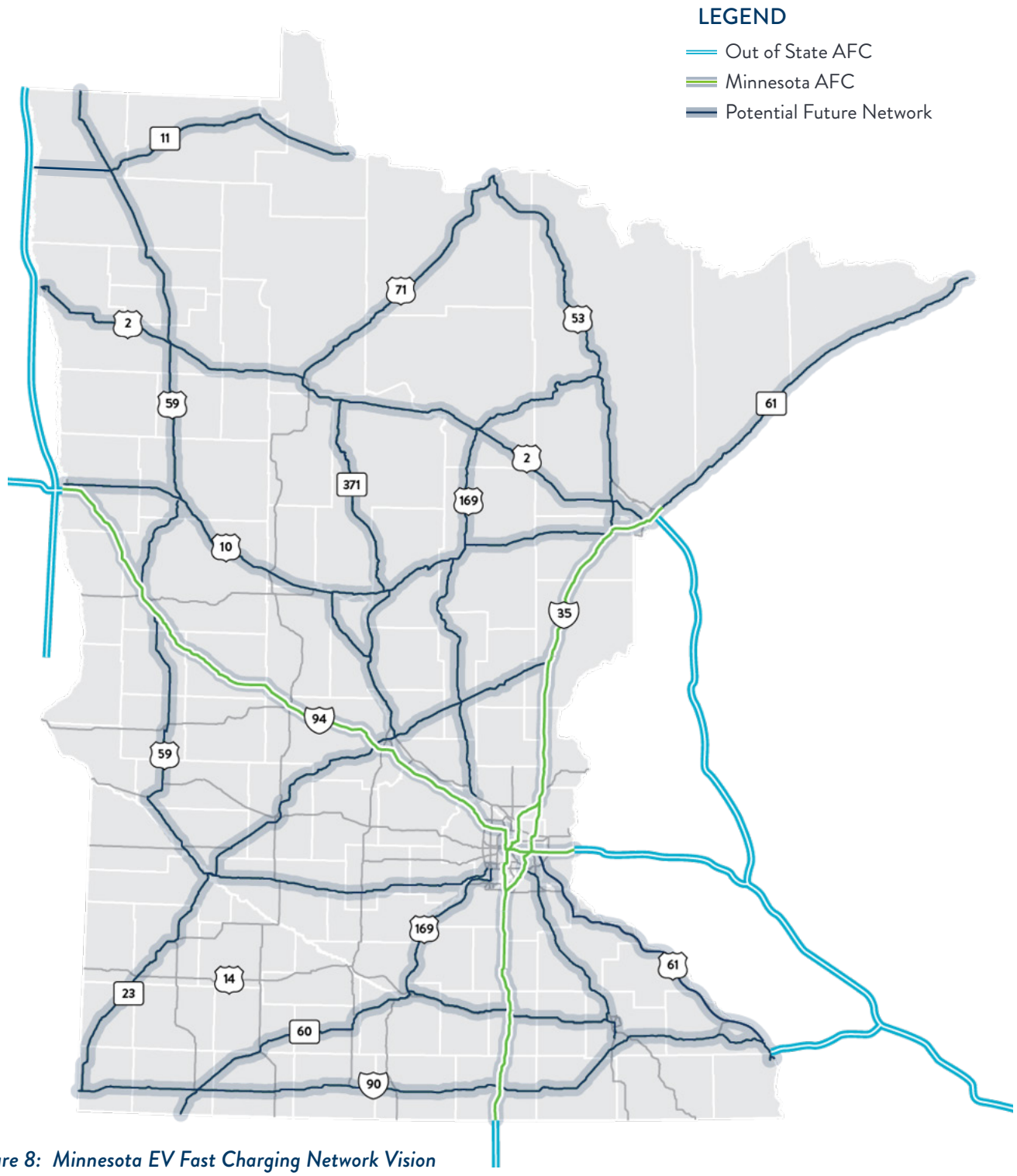


Figure 8: Minnesota EV Fast Charging Network Vision

GOALS

MnDOT developed the Plan goals according to the Joint Office of Energy and Transportation NEVI Formula Program guidance and to align with the 2022 Minnesota Statewide Multimodal Transportation Plan (SMTP) objectives and strategies outlined in the 2019 Accelerating Electric Vehicle Adoption in Minnesota. **Table 1** presents the Plan goals and how they align with MnDOT's current goals and objectives.

MNDOT OBJECTIVES AND STRATEGIES REFERENCED

2022 SMTP Objectives:

1. **Open Decision Making**—Make equitable transportation decisions through inclusive and collaborative processes that are supported by data and analysis.
2. **Transportation Safety**—Safeguard transportation users and the communities the system traveles through. Apply proven strategies to reduce fatalities and serious injuries for all modes. Foster a culture of transportation safety in Minnesota.
3. **System Stewardship**—Strategically build, maintain, operate, and adapt the transportation system based on data, performance, and community needs. Ensure effective and efficient use of resources.
4. **Climate Action**—Advance a sustainable and resilient transportation system. Enhance transportation options and technology to reduce greenhouse gas emissions and adapt Minnesota's transporation system to a changing climate.
5. **Critical Connections**—Maintain and improve multimodal transportation connections essential for Minnesotans' prosperity and quality of life. Strategically consider new connections that help meet performance targets and maximize social, economic, and environmental benefits.
6. **Healthy Equitable Communities**—Foster healthy and vibrant places that reduce disparities and promote healthy outcomes for people, the environment, and our economy.

Accelerating Electric Vehicle Adoption: A Vision for Minnesota (2019) Strategies:

- **Strategy 1:** Accelerate Sales and Use
- **Strategy 2:** Build Out Charging Infrastructure
- **Strategy 3:** Coordinate on Regional and National Initiatives
- **Strategy 4:** Prioritize Renewable Energy to Charge Electric Vehicles

Table 1: Plan Goals

MINNESOTA EV INFRASTRUCTURE GOALS	2022-2041 SMTP OBJECTIVES*	ACCELERATING EV ADOPTION STRATEGIES*
Goal 1: Support Minnesota's greenhouse gas (GHG) emission reduction goals and minimize transportation's impact on human and environmental health	O4, O6	S4
Goal 2: Facilitate regional and statewide travel while setting the standard for EV infrastructure in the Midwest	O1, O5	S2, S3
Goal 3: Distribute 40% of NEVI Formula Program benefits towards disadvantaged communities in Minnesota	O3, O5, O6	S2
Goal 4: Advance EV adoption	O3	S2
FIVE YEAR TARGETS		
Five Year Target 1: Full build-out of all two-digit interstates to full NEVI-compliance by the end of the program		
Five Year Target 2: Build-out of the EV Fast Charging Network (to potentially secondary standards) by the end of the program		

5. CONTRACTING

MnDOT intends to partner with at least one third party to design and install EV chargers funded through the NEVI Formula Program, manage long-term operations and maintenance and ultimately own the chargers. MnDOT will use a competitive selection process to identify partners with industry expertise who can meet all federal requirements. Agency staff will assemble a program guide for the selection process by early calendar year 2023 that addresses the following:

- Outline the state's legal and procurement framework for EV charging.
- Identify mechanism for non-federal match.
- Determine whether selection will be at the site or corridor level (or a hybrid).
- Identify process to meet all federal requirements (e.g., National Environmental Policy Act [NEPA], Buy America, etc.).
- Clarify expectations for revenue generated from the EV chargers.
- Clarify expectations for monitoring and reporting.

CONTRACTING GOALS

MnDOT will design the contracting approach to meet the following goals:

1. Maximize federal dollars while following federal requirements.
2. Deliver projects efficiently (e.g., execute contracts within six months after award).
3. Have a choice of proposers with proven knowledge and experience installing EV chargers.
4. Encourage bids from Minnesota-based Targeted Group, Economically Disadvataged, and Veteran-Owned small businesses.
5. Minimize MnDOT staff time spent on contracting and contract administration, design, construction, operations, maintenance, and monitoring.
6. Include a process for communities, including black, indigenous, and people of color (BIPOC) and low-income communities who have been traditionally marginalized, to influence site selection and key project elements.
7. Guarantee that charger operations, maintenance, and ownership can be handled by an experienced contract partner and will not be the responsibility of MnDOT.

OPPORTUNITIES FOR SMALL BUSINESSES

MnDOT will explore opportunities for small businesses to apply for NEVI Formula Program funds, including the MnDOT Office of Civil Rights. The agency will also partner with state agencies like DEED and Department of Labor and Industry (DLI) to promote the program guide to small businesses that are eligible for the funding. MnDOT will host pre-solicitation workshops to help qualified small businesses understand federal requirements associated with the NEVI Formula Program and support technical assistance needs to complete the application.

EFFICIENT AND EFFECTIVE DEPLOYMENT

MnDOT initiated a Clean Transportation Pilot Program to provide federal transportation funding to pilot, test, and increase adoption of clean transportation technologies, especially where cost is a barrier to implementation. MnDOT selected the first round of project, including EV charger installation projects, in March 2021. Contracting has been delayed while the agency works with grantees and partner agencies to meet all state and federal requirements (e.g., procurement, vendor selection, and environmental compliance). In many cases, MnDOT developed new processes to meet these requirements which may require changes to state statute. MnDOT executed the first grant contract in March 2022 and plans to announce the projects selected for the first round of funding by fall 2022, after the agency executes contracts with all the grantees. The agency will document and apply lessons learned from the pilot to support efficient charger deployment through the NEVI Formula Program. See the Known Risks and Challenges section for more information.

OPERATIONS AND MAINTENANCE

Public and stakeholder engagement revealed that some EV drivers are concerned about the reliability of the existing EV charging network in Minnesota. MnDOT is committed to ensuring efficient delivery of ongoing operations and maintenance (O&M) services for EV chargers funded through the NEVI Formula Program. The competitive selection process will include criteria for demonstrating the ability to provide reliable O&M. The agency will collect historic information from bidders about charger uptime and response time to maintenance issues. MnDOT will research industry trends and best practices and develop a process for ensuring a smooth transition for EV charging-station owners to fund O&M independently after the 5-year period of support from the NEVI Formula Program concludes. This remains a topic with questions that the agency hopes to resolve during program guide development.

COMMUNITY ENGAGEMENT

Contracting will include a process for communities, including BIPOC, rural, and low-income communities, to influence site selection and key project elements. MnDOT staff will explore opportunities to support community engagement in the site selection and design process. The agency will use resources provided by FHWA and internal staff expertise and experience.

In addition to community engagement around site selection, MnDOT will work with a range of partners, especially those most impacted by pollution from transportation and who have not historically been part of transportation planning, to help determine what metrics will be used in annual evaluations for reporting progress around Justice40 efforts. It is important that we ask communities what benefits are important to them and determine ways to track those benefits.

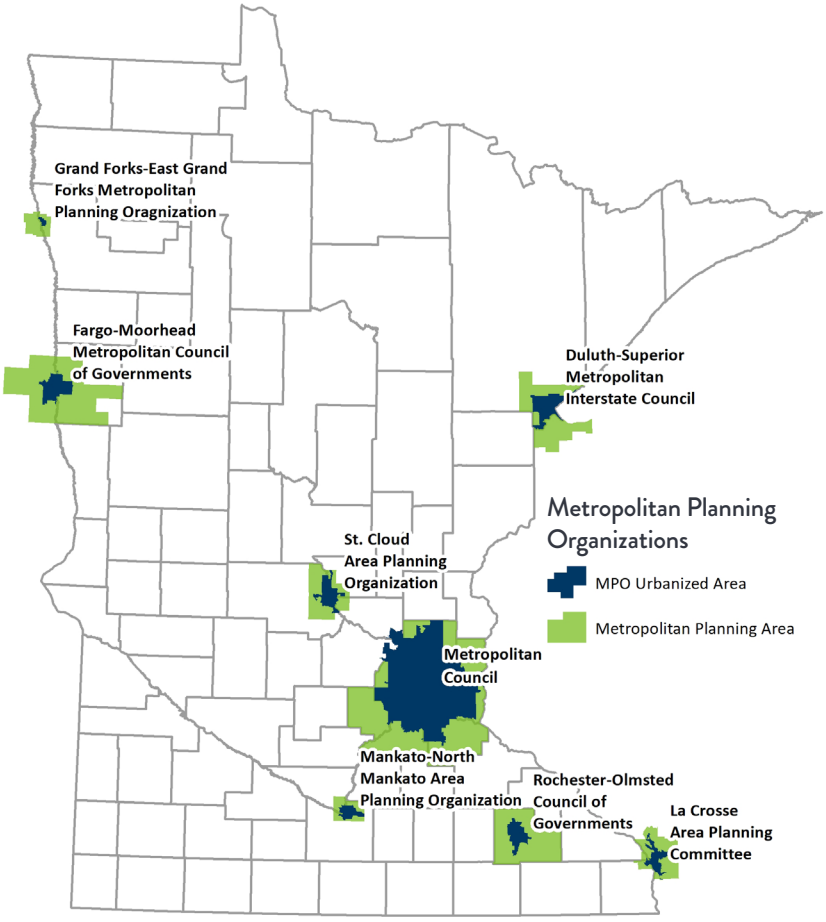


Figure 9: Metropolitan Planning Organizations in Minnesota

6. EXISTING AND FUTURE CONDITIONS ANALYSIS

STATE GEOGRAPHY, TERRAIN, CLIMATE, AND LAND USE

Minnesota is home to a unique range of geography, from rugged rocky landscapes and thick swaths of deciduous and coniferous forests in the north, to river valleys that cut through agrarian landscapes in the south. The terrain in Minnesota is not expected to reduce the usable range of EVs.

Minnesota is becoming warmer and wetter, warming by 3°F between 1895 and 2020, with annual precipitation having increased 3.4 inches on average[2]. Heavy rainfall is more common and intense, with an increase in large-area extreme and damaging rainstorms. Climate projections indicate that these conditions will continue to grow in frequency and severity. Strategies to address Minnesota's climate risks are described in the Implementation section.

The state experiences temperature extremes, with cold winters and hot summers. On average, Minnesota experiences 32 inches of rain and 47 inches of snow per year. June is the wettest month of the year with an average precipitation of 4 inches. January is typically the coldest month in Minnesota, with an average low of 10 degrees Fahrenheit (°F) and a high of 24°F. The hottest month of the year is July, when the average temperature low is 65°F and the average high is 83°F. Cold temperatures can reduce EV range up to 40%, which highlights the importance of adequate, reliable charging for drivers to use year-round.

Minnesota is the 22nd most populous state in the United States, with over 5.75 million residents. The population is expected to grow to 6.6 million by 2070. Approximately 60% of Minnesota's population is centered in the Minneapolis-St. Paul metropolitan area. Hennepin, Ramsey, Dakota, Anoka, and Washington counties are the most populous counties in the state, and no other county in Minnesota has a population greater than 250,000.[3] Minnesota has eight metropolitan planning areas with a population over 50,000 (**Figure 9**). Urban areas comprise a relatively small percentage of the total land use or cover in the state. Outside of urban areas, agricultural

[2] *https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html*

[3] *https://mn.gov/admin/demography/data-by-topic/population-data/our-estimates/*

land use, forests, and wetlands make up a significant portion of land cover.[4] Rural EV chargers are essential to support statewide EV travel and may require more resources to install and maintain.

EV USE AND AVAILABILITY

The number of EVs and EV chargers in Minnesota continues to grow. Model availability is expected to improve with the adoption of Clean Cars Minnesota, a state rule that requires more EVs to be available beginning in 2025. As of April 2022, Minnesota had 26,109 registered EVs. EV adoption varies by location. Most EVs are registered in the Twin Cities and other urbanized areas across the state (see **Figure 10**), but EVs are registered in all counties statewide. Rochester and communities along the North Shore of Lake Superior have some of the highest density of EVs outside the Twin Cities, with close to 1% of total vehicles. Minnesota EV registrations have increased significantly in the last 5 years; however, EVs make up less than 1% of total light-duty vehicle registrations.[5] To meet state decarbonization goals for transportation, EVs would have to make up 60% of all new car sales and 20% of cars on the road in 2030.

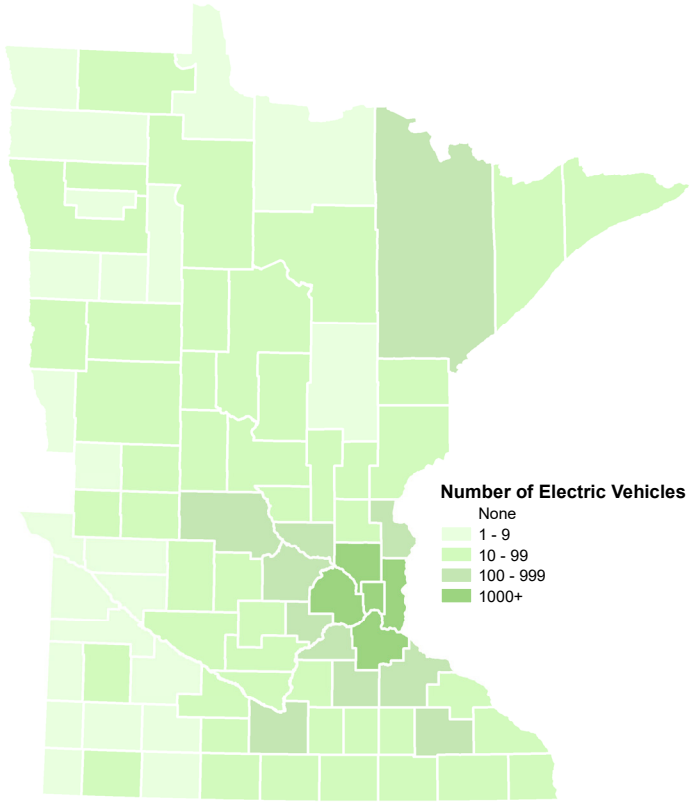


Figure 10: EVs by County (April 2022)

Minnesota's EV sales are not on track to meet the emission reduction goals outlined in the 2019 Pathways to Decarbonizing Transportation in Minnesota. To understand the sales increases needed to reach these targets, MnDOT developed three additional EV sales growth scenarios for sedans and sport utility vehicles (SUVs) using April 2021 EV registration numbers as a baseline (see **Figure 11**), including a Reference scenario, an 80x50 scenario, and a 100x50 scenario. The scenarios address different levels of policy and market intervention, resulting in different EV sales totals and GHG emissions reductions. The 80x50 scenario models a pathway to an 80% reduction in total surface transportation emissions by 2050, aligning with the Next Generation Energy Act goal. The 100x50 scenario models a pathway to achieve a 100% reduction by 2050. The Pathways scenarios align with the state's goal to achieve 20% light-duty EVs on the road by 2030.

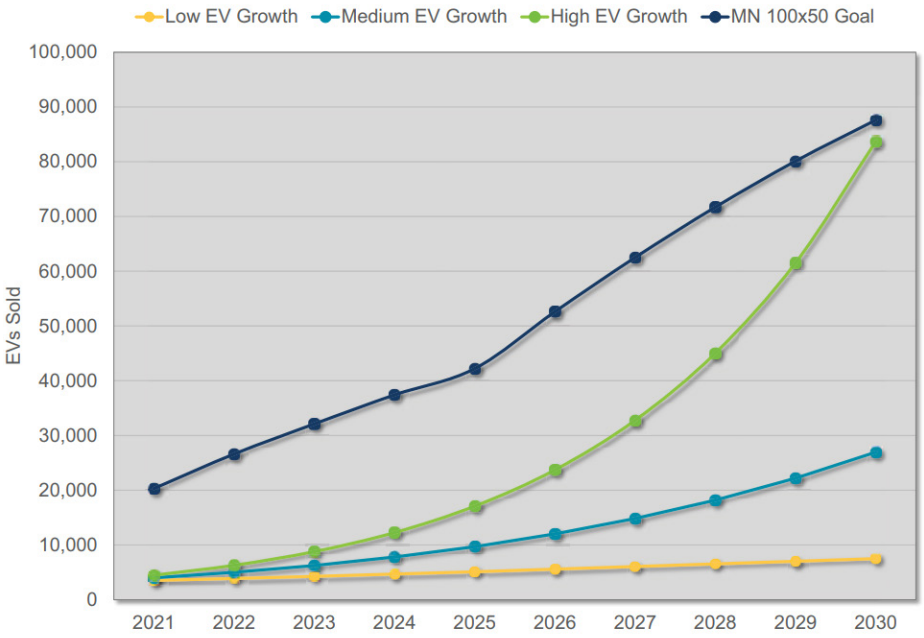


Figure 11: Annual EV Sales in Minnesota by Growth Scenario

Source: Scenario EV sales forecasts are based on both historic sales trends and the "Annual Energy Outlook 2020 | Table 2. Energy Consumption by Sector and Source," U.S. Energy Information Administration, https://www.eia.gov/outlooks/aeo/data/browser/#/?id=2-AEO2020&cases=ref2020&sourcekey=0, which forecasts electricity consumption in the transportation sector.

[4] *http://doi.org/10.13020/D6JP4S*

[5] *2021 Minnesota Electric Vehicle Assessment*

STATE TRAVEL PATTERNS, PUBLIC TRANSPORTATION NEEDS, AND FREIGHT AND OTHER SUPPLY CHAIN NEEDS

STATE TRAVEL PATTERNS

The Metropolitan Council (Met Council)'s Travel Behavior Inventory (TBI) provides data on travel patterns in the Twin Cities metropolitan region. This survey, along with other data (such as the census and regional development trends), helps depict travel trends in Minnesota. Key findings from the 2019 TBI include:

- Driving remains the main way people travel throughout the region, accounting for nearly 85% of trips, up slightly from 2010.
- 51% of household trips are for everyday activities like healthcare visits, shopping, errands, or picking up and dropping off family members.
- Work and work-related trips account for 25% of all trips; 83% of workers typically drive alone.

Travel behavior data are not available for other parts of the state, but average annual daily travel (AADT) volumes are available statewide. The map below (**Figure 12**) shows roads with the top 25% of AADT statewide in red, and the **Table 2** shows AADT at locations along Minnesota's three interstate highways, I-35, I-94, and I-90.[6]

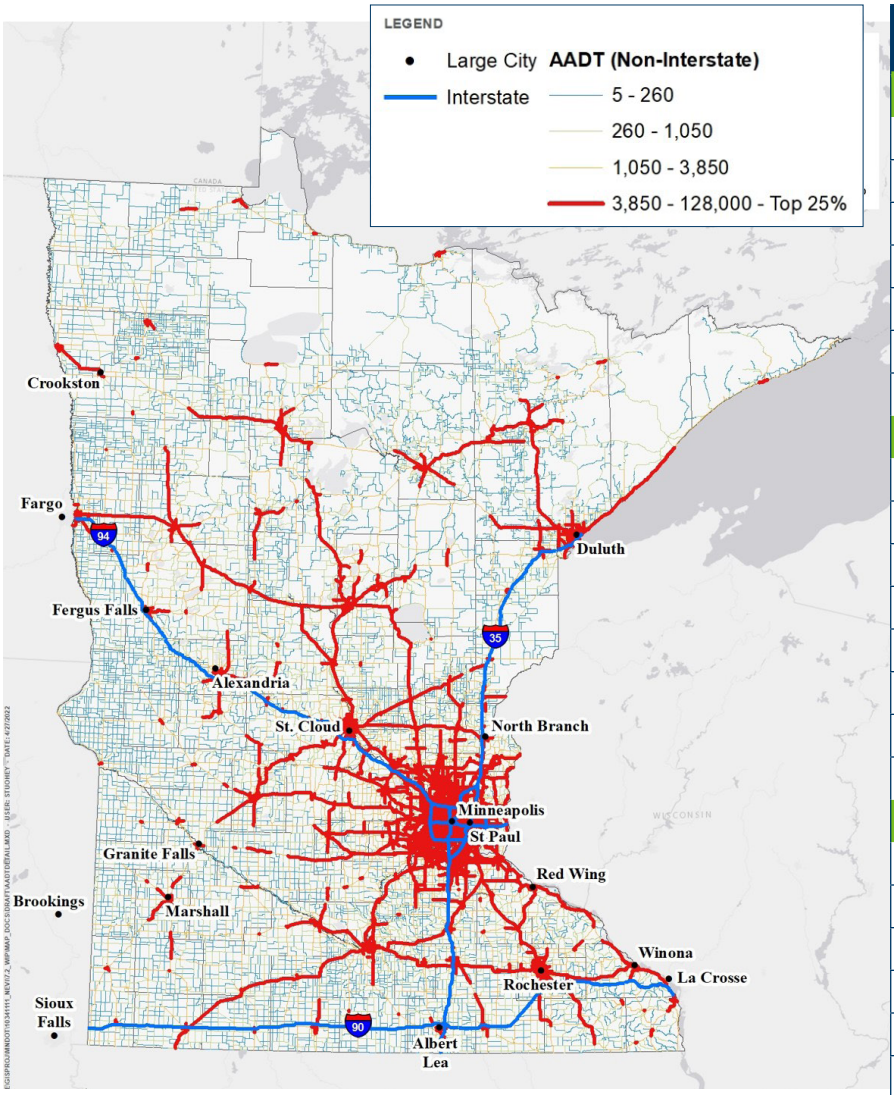


Figure 12: Minnesota Annual Average Daily Traffic Map

Table 2: Annual Average Daily Traffic at Key Locations

LOCATION	AADT (2017-21)
I-35	
Duluth	44,000
Moose Lake/Sturgeon Lake	16,400
Hinckley/Pine City	24,522
Wyoming/Forest Lake	54,687
Burnsville	93,076
Faribault	15,200
Albert Lea	22,400
I-94	
Moorhead	38,816
Fergus Falls	17,300
Alexandria	21,093
Sauk Centre	24,714
St. Cloud	27,000
Maple Grove	109,189
Minneapolis/St. Paul	137,581
Oakdale/Woodbury	111,971
I-90	
Rochester/Stewartville	11,600
Austin	18,679
Albert Lea	12,600
Blue Earth	9,300
Fairmont	10,200
Worthington	12,400
Luverne	10,500

[6] *AADT data from MnDOT's Traffic Mapping Application*

PUBLIC TRANSPORTATION NEEDS

The market for transit in the Twin Cities region is changing. While downtown Minneapolis and St. Paul have experienced dramatic increases in density, much of the regional job growth has occurred in suburban areas that are more difficult to serve with traditional fixed route transit.

The Met Council is responsible for developing policies and plans to guide development of the region's transit system, which is currently served by multiple transit agencies, each with different missions, objectives, constituencies, and resources. Metro Transit, the largest, has traditionally concentrated on serving multiple core activity centers. Metro Transit purchased 136 hybrid electric buses between 2002 and 2015 and recently completed a Zero Emission Bus Transition Plan that describes how the council will deploy zero-emission transit buses.[7]

Outside the core urban areas, service from regional transit agencies is a mix of on-demand service, low-frequency fixed-route service, and commuter express services. As of June 2016, Greater Minnesota had 40 public transit systems serving 80 counties. Of these systems, 28 are rural, seven are small urban systems, and five are operated by tribal nations. To meet objectives related to global and national competitiveness, sustainability and resiliency, and growth and economic development, Greater Minnesota transit systems have goals to upgrade fleet equipment and storage facilities, including by electrifying fleets. Duluth Transit Authority and Rochester Transit Authority operate electric transit buses, and other Greater Minnesota transit providers will begin operating electric transit buses soon. While the first year of investment from the NEVI Formula Program will focus on light-duty passenger vehicle charging, future planning cycles will explore opportunities to provide charging for medium- and heavy-duty vehicles, including public transit vehicles.

FREIGHT AND OTHER SUPPLY CHAIN NEEDS

The structure of Minnesota's economy—population; per capita income; employment; and the type, size, and locations of businesses and industries—determines the volume of freight moving in the state. Minnesota's central location within America's Midwest and the state's proximity to Canada also has a large impact on the volume and type of freight that moves throughout the state.

Minnesota's economy is diverse and driven by the business services, finance, and healthcare industries and by freight- or trade-related industries such as agriculture, mining, and manufacturing. Trade-related industries are key drivers of the economy. Minnesota is also home to the headquarters of 16 Fortune 500 companies. Trucking is the largest component of this system, and it plays a role in distribution for all industries. Even goods moving via other modes of transportation often use trucks for the first and last mile of the trip.[8] As an example, for freight movement from the Twin Cities metropolitan area to rural areas, trucks carry about 86% of freight by weight and 82% by value.[9] The state highway system in Minnesota consists of nearly 12,000 miles of roadway, and some of these highways average more than 5,000 truck trips per day.[10]

Rail also plays a significant role in the movement of freight in Minnesota. Minnesota has the eighth highest number of rail miles in the nation. Rail accounts for 25% of freight tonnage moving in the state and is especially important in moving bulk commodities such as minerals and agricultural products.[11] The state's rail network supports regional and national movement of goods between major shipping centers in Chicago and points west, including Pacific Northwest ports. The four primary Class I rail operators in the state are Burlington Northern Santa Fe (BNSF) with about 1,600 miles of track, Canadian Pacific (CP) with 650, Union Pacific (UP) with 500, and Canadian National (CN) with 450. In addition, 18 other short line or other regional railroads operate in Minnesota.[12]

In addition to trucking and rail, freight also moves through, into, and out of the state via water and airports. Minnesota has a unique position for waterway movements, as it is located on both the Mississippi River and the Great Lakes via Lake Superior. The Mississippi River provides access to river ports to the south and to the Gulf of Mexico via New Orleans. The Great Lakes-St. Lawrence Seaway provides access to other ports along the Great Lakes to the Atlantic Ocean. Thus, Minnesota has four public and four private port authorities in operation: four on the Mississippi River system and four along Lake Superior. Minnesota is home to 133 airports listed in the 2022 Minnesota GO State Aviation System Plan. Of these, nine are identified as key commercial service airports.[13] Minneapolis-St. Paul International Airport (MSP) is one of the top 30 air cargo airports in the nation.

[7] *https://www.house.leg.state.mn.us/comm/docs/VTAD3Cx1zkKBXGNaC8eRkg.pdf*

[8] *Minnesota Department of Transportation 2018*

[9] *Minnesota Freight Advisory Committee 2020*

[10] *Minnesota Department of Transportation 2018*

[11] *https://www.dot.state.mn.us/planning/railplan/2015report/1.pdf*

[12] *https://www.dot.state.mn.us/planning/freightplan/pdf/statewidefreightplanrevised2018.pdf*

[13] *Ibid.*

MnDOT is keeping abreast of new technology in the freight transportation sector. The agency is working with the University of Minnesota to investigate infrastructure needs for medium- and heavy-duty electric trucks. This research will identify candidate locations for charging stations based on freight traffic, power availability, and environmental factors like flood risk.[14] MnDOT also coordinates with regional partners through the bipartisan REV Midwest coalition focused on medium-duty/heavy-duty vehicle electrification and will continue to engage with public- and private-sector freight partners through the Minnesota Freight Advisory Council (MFAC) and the MnDOT Sustainable Transportation Advisory Council (STAC). MnDOT is aware of input from private sector stakeholders on other potential fuel sources, such as hydrogen, and will continue to collaborate with the private sector to develop solutions for alternative fuels for freight vehicles.

AFC - CORRIDOR NETWORKS

MnDOT plans to use initial NEVI Formula Program funds to deploy EV charging infrastructure on existing AFCs. The currently designated AFCs are I-94 and I-35, as shown in **Figure 13**. Stretches along these corridors are considered pending because they do not have sufficient EV charging to meet FHWA requirements for signage. For I-94, the stretch between St. Cloud and Alexandria is pending. The portion of the I-35 corridor from the Iowa border to approximately Burnsville is also pending. Minnesota did not nominate additional corridors for AFC status during the most recent round of nominations, so the first year of NEVI Formula Program funds will be invested in installing DCFCs along I-94 and I-35. Minnesota intends to nominate additional corridors in the future based on analysis and stakeholder input.

EXISTING LOCATIONS OF CHARGING INFRASTRUCTURE ALONG AFCs

Minnesota has a number of charging stations located throughout the state, particularly along the AFCs and within the Twin Cities metropolitan area. There are currently 524 level 2 and DCFC public charging stations in Minnesota. **Figure 13** shows these stations. A total of 208 charging stations reside within 1 mile of existing AFCs. The table in **Appendix C** lists these DCFC and level 2 charging stations.

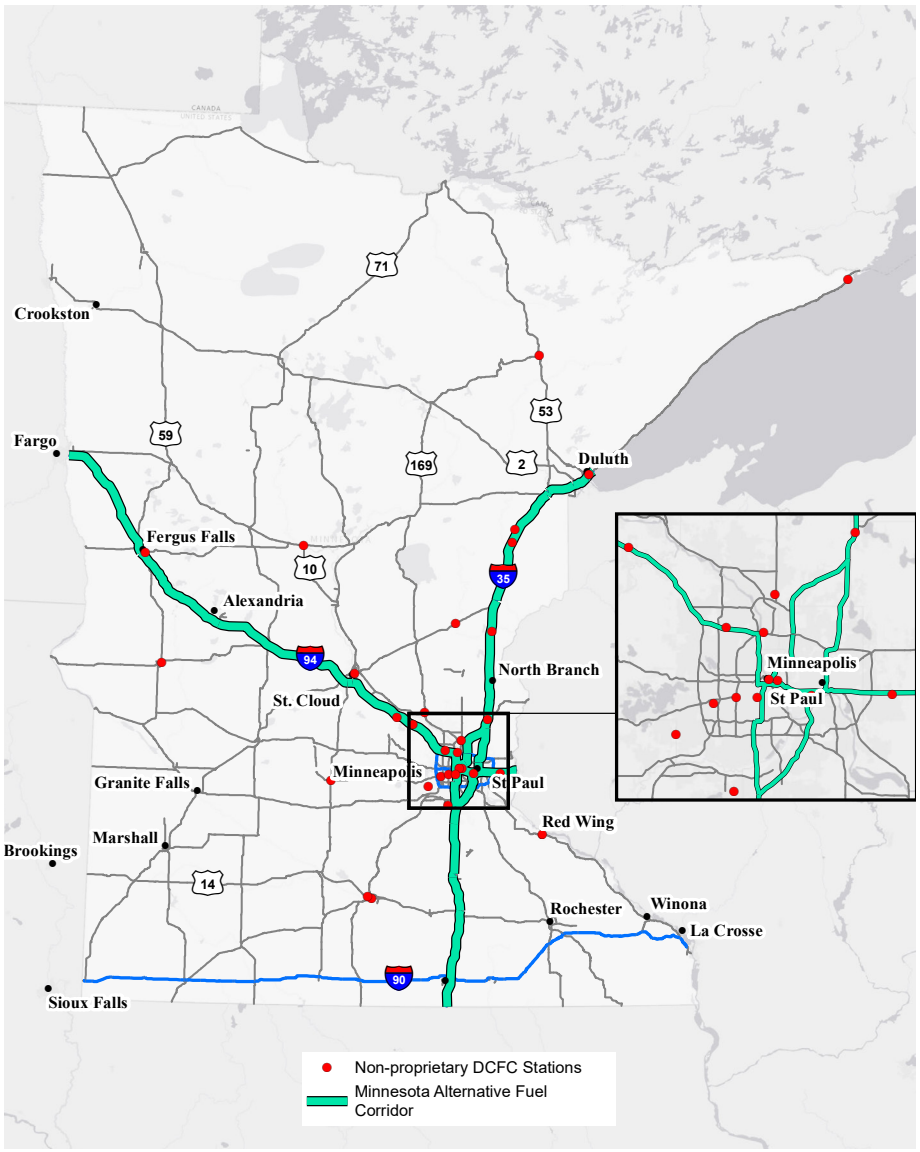


Figure 13: Minnesota Alternative Fuel Corridors and existing DCFC Sites

[14] *Identifying and Optimizing Electric Vehicle Corridor Charging Infrastructure for Medium and Heavy Duty Trucks*

KNOWN RISKS AND CHALLENGES

Clean Transportation Pilot Program

Minnesota's Clean Transportation Pilot Program revealed several risks related to efficiently deploying electric vehicle chargers funded by federal transportation programs. The agency has experienced more than a year of contracting delays for federally funded electric vehicle charging projects. In many cases, the agency has not yet been able to execute contracts based on the following factors:

- **Buy America requirements:** Buy America (BA) requirements are new to the EV charging industry. Standardized BA certification paperwork for EV chargers does not exist, so MnDOT worked with the FHWA to identify the information vendors needed to provide prior to federal authorization for the pilot projects. Vendors were not able to demonstrate BA compliance during the first 16 months of contract development. In some cases the equipment was not compliant, and in other cases it took time to gather details about the supply chain and obtain approvals to share the information.
- **National Environmental Policy Act documentation:** All federal transportation projects, including Clean Transportation Pilot Program projects, must be NEPA compliant. Aligning the process for NEPA documentation with standard practices in the EV charging industry for site selection and development delayed contract execution by over a year. One of the pilot project workplans included public and stakeholder engagement to select optimal sites for chargers. The EV installer could not begin the workplan without federal authorization, and federal authorization was contingent on NEPA documentation. NEPA documentation is contingent on having global positioning system (GPS) coordinates for a site. MnDOT is working with the vendor to phase the project and address this challenge.
- **Project accounting procedures:** Establishing accounting procedures to track reimbursement for the pilot projects took time. It took over a year to develop a new accounting code and establish a process for tracking and paying project invoices. Part of the challenge was that the state often pays the required match for a typical federally-funded transportation construction project. Third parties will provide the match for the pilot project and will spend it directly. MnDOT established new processes to accurately capture the match spending, given the limitations of the existing accounting systems.
- **User fees:** Some pilot projects will involve charging users to use DCFCs. Federal regulations set guidelines for revenue generation from federal grants. MnDOT worked with FHWA to explore the collection of user fees. However, more guidance is needed in this area.

BARRIERS TO EV INFRASTRUCTURE DEPLOYMENT

- **Time Required for Utility Upgrades:** Grid capacity must be able to support chargers.
  - Potential concern for supplying the day-to-day charging needs of EVs.
  - Transformer upgrades can take time. Current estimates are a year between ordering and delivery.
- **Utility Demand Charges:** Rate structures can be a barrier to high power low-utilization loads.
  - While EV adoption is low, utilization will also be low, and costs for electricity will be high.
  - Increased utilization reduces demand charge impacts, but may be difficult to achieve if charging fees are high.
- **Rural/Underserved Infrastructure Gaps:** Supporting long-distance travel means supporting travel through rural areas.
  - These areas may have a small number of local EVs but higher volumes of pass-through EV traffic.
  - These areas may not have easy or existing access to the 3-phase power required by DCFCs.
- **Regulatory framework:** Planning and zoning will be inconsistent throughout many of the station sites.
  - Some local regulatory agencies do not have experience with EVSE, which may complicate project permitting.
  - Different localities may have different regulations and processes.

7. EV CHARGING INFRASTRUCTURE DEPLOYMENT

NEVI-funded infrastructure will comply with NEVI Formula Program requirements. These requirements include locating EVSE along AFCs and within a one mile of an AFC corridor. NEVI Formula Program requirements also stipulate that charging stations be located no more than 50 miles apart. Charging stations must provide at least 4 CCS ports while accomodating at least 150kW charging per port and 600 kW for simultaneous charging. All NEVI Formula Program compliant charging stations must be open to the general public or at least two authorized commercial motor vehicle operators.

MnDOT has been and will continue to coordinate with neighboring states to ensure the station placement is consistent along neighboring AFCs.

FUNDING SOURCES

The State of Minnesota currently does not have a source of state matching funds for NEVI Formula Program projects. All non-federal matching funds will likely need to come from private companies, entities, businesses, or local jurisdictions for at least fiscal year (FY) 2022. MnDOT recognizes this may pose challenges for small businesses hoping to apply for NEVI Formula Program funds and is researching strategies to ensure an equitable contractor and site selection process. The state will continue to explore opportunities to obtain state-funded matching funds for future years of the program.

The total five-year federal share of NEVI Formula Program funds available to Minnesota is $68,164,918, with a total estimated available funds of $85,206,147 when including the 20% non-federal match. FY2022 federal share is $10.1M, with a total year-one project cost of $12,625,000 (including the 20% non-federal match).

For planning purposes, a site cost of $900,000 was used to estimate that a total of 14 charging stations can be built with FY 2022 funding, which can achieve a nearly full build-out of the I-94 and I-35 corridors (which will need 15 stations for full build-out).

2022 INFRASTRUCTURE DEPLOYMENTS/ UPGRADES

The inaugural year of the NEVI Formula Program in Minnesota will focus on the build-out of the two existing AFCs: I-94 and I-35. **Figure 14** shows the clusters of potential exits for DCFC installation along with details on the length of interstate between each potential exits cluster (in bold) as well as the length of the cluster of exits (italicized). Potential exits were selected based on NEVI Formula Program guidelines, power availability, proximity to disadvantaged communities, proximity to existing infrastructure, proximity to existing corridors, and public input. MnDOT will select one site per cluster through a competitive selection process. **Appendix D** provides a detailed description of the process for selecting location clusters.

UPGRADES OF CORRIDOR-PENDING DESIGNATIONS

Portions of I-94 and I-35 are considered corridor-ready, although most of these sections are classified under pre-NEVI Formula Program criteria. MnDOT anticipates that both corridors will be built to full NEVI Formula Program compliance using FY 2022 funds.

INCREASES OF CAPACITY/ REDUNDANCY ALONG EXISTING AFC

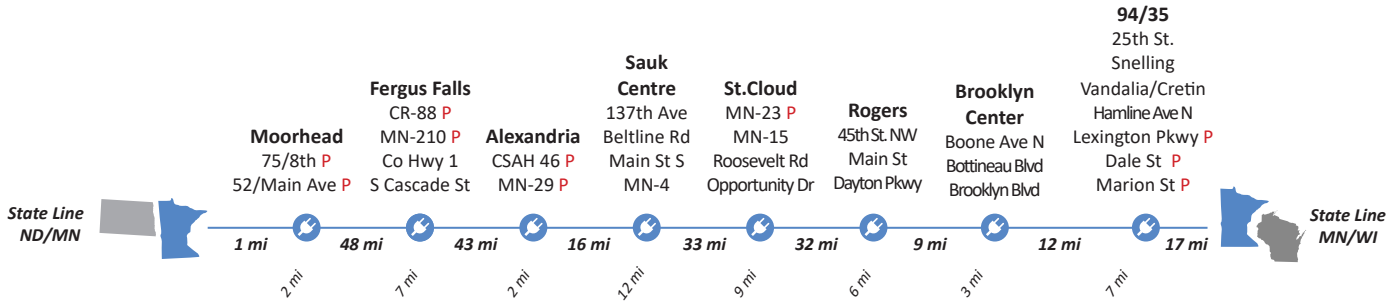
MnDOT is pursuing a strategy of building additional stations to meet NEVI Formula Program compliance. Private partners may choose to expand an existing station beyond the minimum requirements, if desired. At this time, the standard NEVI-compliant station will include four 150 kilowatt (kW) DCFC chargers, although MnDOT may explore stations with power-sharing capabilities that may allow up to 350 kW charging if only one vehicle is present. MnDOT may also explore modular charging units that minimize charger down-time and support easier upgrades to the system.

To support the higher density of EV ownership, traffic, and population, the Twin Cities area has charger locations planned on the east, west, and south of the cities along the two AFCs, with two charging stations planned for the Minneapolis and St. Paul area, for a total of six stations (including the existing station at Woodbury Drive near the border to Wisconsin).

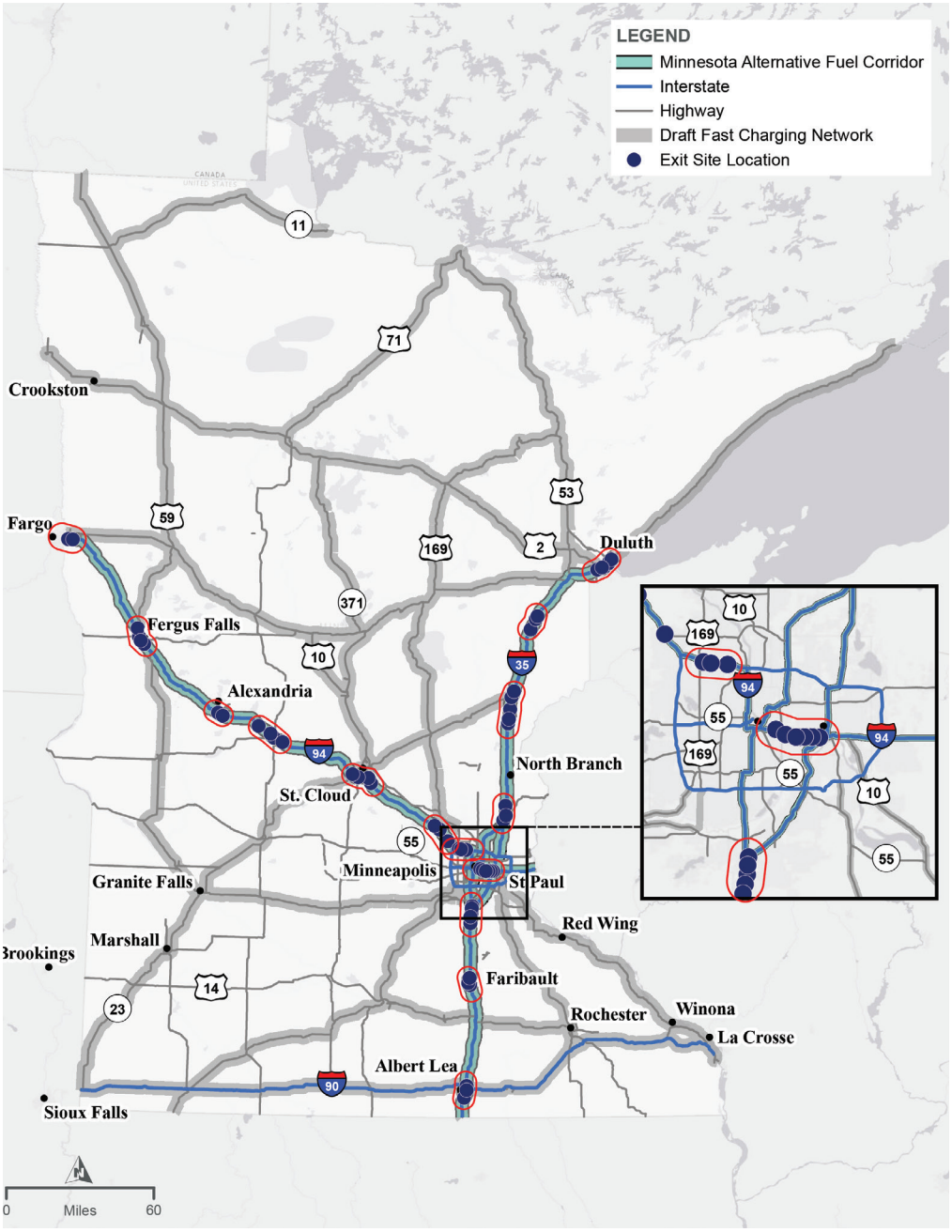
Because the clusters are spaced at 40-mile intervals and additional chargers are planned for the Minneapolis-St. Paul area, the average charger density along both corridors will be approximately one station per 35 miles.

EV FREIGHT CONSIDERATIONS

At this time, NEVI Formula Program investments will target light-duty EV charging needs. Infrastructure and power requirements needed to serve freight would be far in excess of the infrastructure being deployed in FY 2022. However, by the close of the NEVI Formula Program, we expect I-90, a primary route for interstate freight, to be fully built-out. While plans have not been developed to address freight, there may be some consideration when I-90 is in planning stages. The level of power needed for freight electrification will require substantial coordination with utilities, freight providers, and neighboring states to determine feasibility.



*The "P" indicates confirmation that 3-phase power is available within one mile of the interchange.



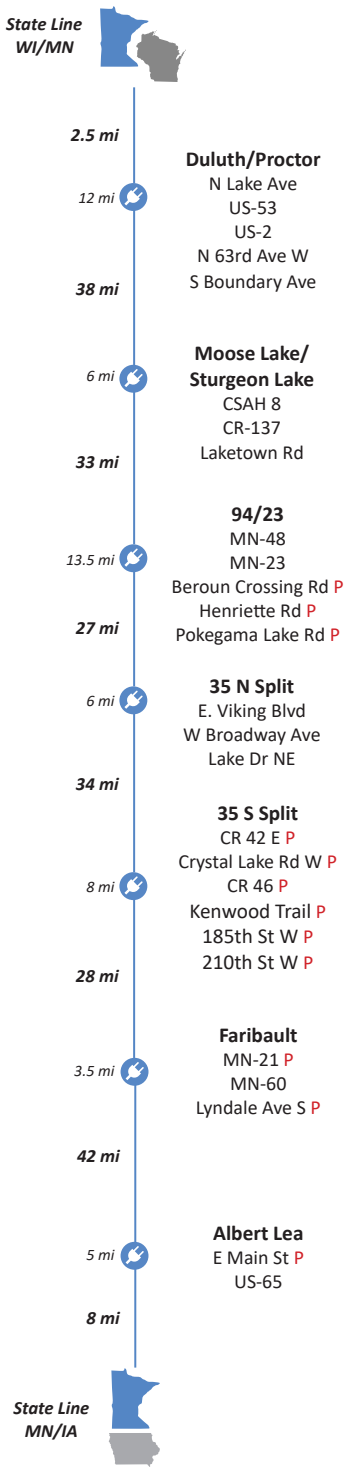


Figure 14: Initial NEVI Investment Locations

PUBLIC TRANSPORTATION CONSIDERATIONS

At this time, NEVI Formula Program investments will target light-duty EV charging needs. MnDOT anticipates transit providers working to electrify their fleets will develop policies and plans that match their unique needs and pursue funding through the Federal Transit Administration's Low/No and Buses and Bus Facilities programs. However, transit providers that operate light-duty vehicles, such as Paratransit, will be able to access the NEVI-funded EV chargers. Where Americans with Disabilities Act (ADA)-compatible EVs are deployed into paratransit service, MnDOT anticipates further planning may be needed to address these needs.

FY 2023-2026 INFRASTRUCTURE DEPLOYMENTS

At this time, NEVI Formula Program investments will target light-duty EV charging needs. MnDOT has not yet begun identifying the next group of corridors to nominate to the AFC program. However, the Draft Fast Charging Network provides an overview of which corridors will potentially be nominated throughout the NEVI Formula Program.

STATE, REGIONAL, AND LOCAL POLICY

STATE POLICY

MINN. STAT. 216H: Greenhouse Gas Emissions

In 2007, the state passed the bipartisan Next Generation Energy Act, which established goals for the state to reduce GHG emissions by 15% below 2005 levels by 2015, 30% by 2025, and 80% by 2050. However, the state did not meet the 2015 goal and is not on track to meet its future goals. Transportation became the largest emitter of carbon pollution in the state in 2016.

MINN. STAT. 174.01: Department of Transportation Creation

MnDOT has 16 goals defined in statute (174.01) that guide agency work to create an integrated multimodal transportation system in Minnesota. A number of these goals directly relate to increasing low-emission vehicles, reducing GHG emissions, and minimizing environmental impacts.

EXECUTIVE ORDER 19-37:

In 2019, Governor Walz signed Executive Order (EO) 19-37 to address the size and scope of the climate crisis, rally the resources of state government, and push the state forward on climate action. The EO describes the existential threat of climate change to all Minnesotans, including risks to health and wellbeing, natural resources, the economy, and quality/ways of life. It also highlights that significant disparities exist in Minnesota and that these existing disparities mean climate risks are not distributed equally; some communities bear a disproportionate burden of the negative impacts. Therefore, effective change and planning must consider differences based on race, gender, geography, and economic status to make sure Minnesota's climate solutions consider equity, respond to community needs, and bring benefits to all Minnesotans. EO 19-37 established the Climate Change Subcabinet and the Governor's Climate Change Advisory Council to address these issues.

STATE PARTNERSHIPS

Sustainable Transportation Advisory Council

The Sustainable Transportation Advisory Council (STAC) makes recommendations to the MnDOT Commissioner to help the agency reduce carbon pollution from the transportation sector in Minnesota, consistent with MnDOT statutory goals outlined in Minn. Statute 174.01, the Next Generation Energy Act, and the annual MnDOT Sustainability Report. The STAC is a type of long-form public engagement with leaders from public, private, and nonprofit sectors in Minnesota. STAC workgroups develop recommendations that prioritize climate action and equity. The goal of the STAC is to help Minnesota transition to a low-carbon transportation system consistent with statutory goals for energy and emissions reductions to maximize benefits to Minnesota, while recognizing the importance of improving safety, reducing inequities, and supporting economic development. The STAC has provided several recommendations to MnDOT about advancing EV adoption and expanding the EV charging network in Minnesota.

Governor's Climate Change Subcabinet

The Governor's Climate Change Subcabinet includes executives from 15 state agencies, departments, and boards and is responsible for several actions:

- Identify policies and strategies to put Minnesota back on track to meet or exceed the Next Generation Energy Act goals to reduce greenhouse gas emissions.
- Identify policies and strategies to enhance the climate resilience of Minnesota's natural resources, working lands, and communities and to assist state agencies, businesses, and local communities to prepare for climate change impacts that cannot be avoided or mitigated.
- Engage with Minnesotans on these complex issues.
- Promote equitable policy solutions that reduce disparities in Minnesota, ensure a just transition for impacted workers and communities, and encourage green economic development and job creation.

To help identify the most effective policies and strategies, state leaders created action teams to bring together subject-matter experts across state agencies and gather knowledge about different sectors of the economy and society and

the challenges and opportunities each faces from climate change. Action teams engage with thought leaders, community groups, and other stakeholders to initiate new relationships, build upon existing ones, and actively seek input and feedback on climate policy solutions. MnDOT participates on three action teams to gather input to inform state-level transportation, sustainability, and public health strategies.

Transportation Action Team: MnDOT leads the Transportation Action Team to address climate change and decarbonize the transportation sector in Minnesota. Examples of work include developing analysis, implementation plans, and policies to support the Climate Change Subcabinet, such as proposed actions to expand the statewide EV charging network.

Mid America Association of State Transportation Officials

Minnesota participates in the Mid America Association of State Transportation Officials (MAASTO) EV Committee, which includes State DOT staff representatives from Ohio, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Missouri, Minnesota, and Wisconsin. The group met several times during the spring and summer of 2022 to coordinate regionally on the development of statewide electric vehicle infrastructure deployment plans. Minnesota will continue to actively participate in the MAASTO EV Committee to ensure that fast charger planning and deployment aligns with efforts in neighboring states to the extend possible.

LOCAL ZONING

Local governments in Minnesota are encouraging more EV charging infrastructure through their zoning ordinances:

- Some cities requires charging infrastructure to be installed in all new or reconstructed parking structures, with varying requirements for multi-unit dwellings and non-residential buildings.
- Bloomington permits EV chargers in every zoning district as an accessory use. For multi-unit dwellings, the city requires one space per 50 units to have at least a level 2 charging station.

EDUCATION AND OUTREACH

In Minnesota, nonprofit organizations, local governments, utilities, and others provide educational materials and outreach to residents to accelerate EV adoption in the state.

Drive Electric Minnesota. Drive Electric Minnesota is a "partnership of Minnesota's electric vehicle (EV) champions, dedicated to encouraging the deployment of EVs and the establishment of EV charging infrastructure through public-private partnerships, financial incentives, education, technical support, and public policy." Facilitated by the Great Plains Institute, Drive Electric Minnesota partners with city governments, state agencies, electric utilities, charging providers, and dealerships to increase EV adoption.

MN Electric Vehicle Owners. MN Electric Vehicle Owners is the Minnesota chapter of the National Electric Auto Association, a group of EV owners who meet every other month around the state. Their three main objectives are to provide a space for EV owners to connect, continuously learn about new vehicles and technologies, and be a resource for prospective EV buyers. Their private Facebook group has over 2,170 members.

Local Governments. The city of Fridley hosted a ride-and-drive event for their citizens, to encourage EV adoption. The city also incorporated EV awareness efforts into other city events like parades and environmental fun fairs. Another way cities and tribal nations have acted is by participating in Cities Charging Ahead!, a peer cohort of cities working to become EV-ready facilitated by the Great Plains Institute and Clean Energy Resource Team. Through the cohort, 12 cities purchased, leased, or plan to purchase a total of 21 EVs; 11 cities installed or plan to install a total of 27 charging stations; and 13 cities completed or are working to implement guidance on EV-ready development in the private sector.

Utilities. As previously discussed, many electric utilities in Minnesota are educating their customers about EVs by hosting ride-and-drives, including information on their websites, and more.

Minnesota Clean Cities Coalition. Minnesota Clean Cities Coalition is designated under the U.S. Department of Energy's Clean Cities program and hosted by the American Lung Association in Minnesota. The Coalition is implementing or supporting several federally-funded projects to expand access to light-, medium-, and heavy-duty electric vehicles and charging infrastructure. In addition, the Coalition provides technical assistance for fleets and coordinates public education and outreach activities, such as EV ride-and-drives.

UTILITY GRID IMPACTS

Minnesota's electric grid providers have been engaged throughout the process and have provided MnDOT with a cursory understanding at this early stage where 3-phase power is likely available along each of the AFCs. **Figure 15** shows utilities with proposed NEVI investment in their territory. Many utilities will experience minimal impacts with only one charging station within their boundary. As the Plan is implemented, the continued engagement of utilities stakeholders will be necessary to support the efficient planning, design, and construction of stations.

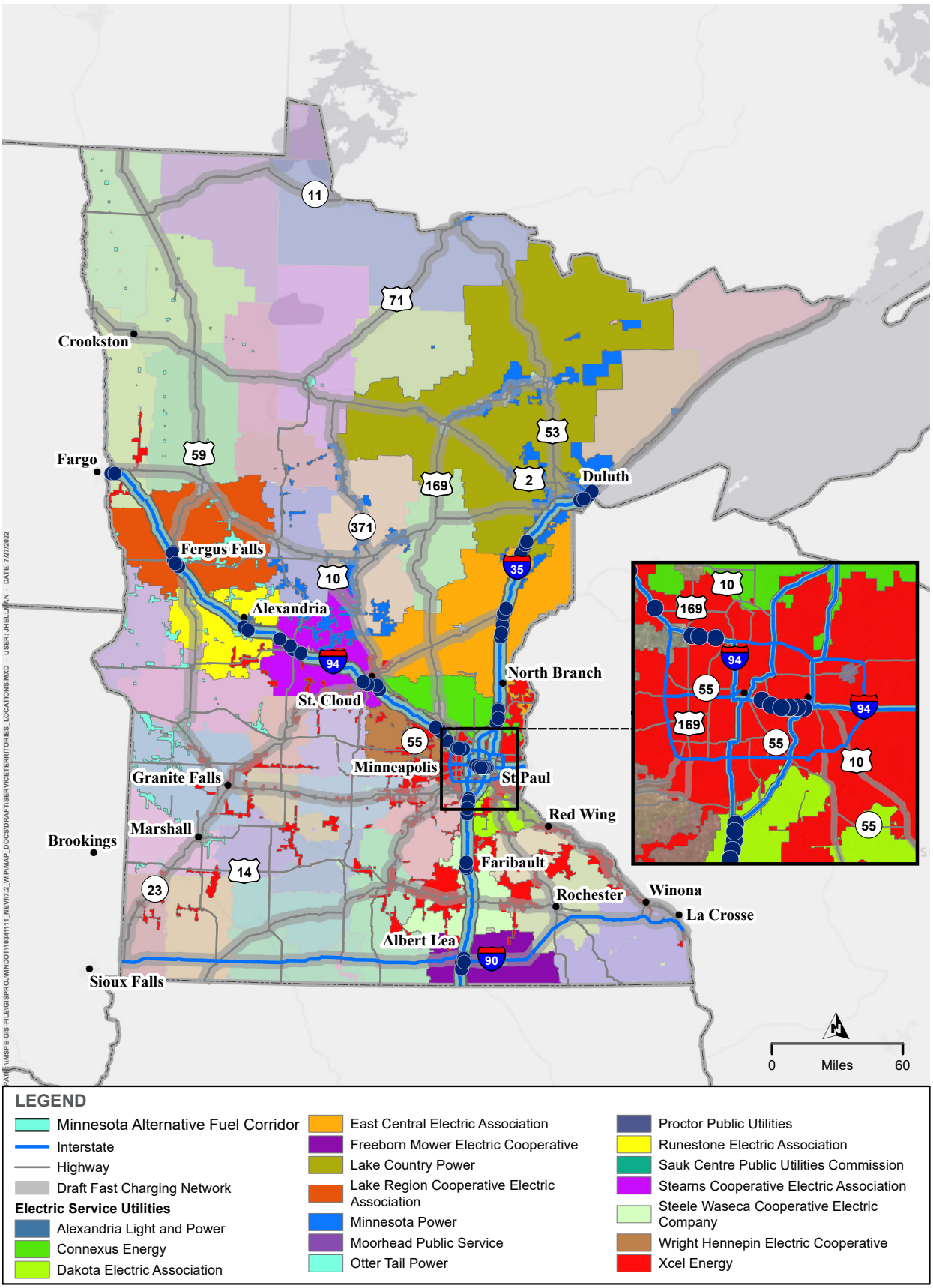


Figure 15: Utility Boundary Map

8. IMPLEMENTATION

The June 22, 2022 Notice of Proposed Rulemaking (NPRM) established proposed minimum standards and requirements. The minimum standards and requirements will not be finalized prior to the submittal of the Plan. Key proposed standards and requirements from the NPRM are identified in the subsections below. Minnesota will incorporate the final NEVI Formula Program minimum standards and requirements into the competitive selection process for contractors.

STRATEGIES FOR EVSE OPERATIONS AND MAINTENANCE

Minnesota aims to provide an accessible and reliable charging experience with no or minimal wait times. Through public and stakeholder engagement on the plan, MnDOT learned that reliability and long-term performance of EV chargers is a top concern for drivers and industry stakeholders. MnDOT will use NEVI Formula Program funds to contract with a third party for the first 5 years of O&M for the EV chargers. The agency will incorporate the NEVI Formula Program minimum standards and requirements for O&M into the competitive selection process for contractors. Based on NPRM requirements and industry best practices, MnDOT anticipates that contractors will need to meet O&M requirements including, but not limited to the following:

- Charging stations must be available for use 24 hours a day, 7 days a week, and on a year-round basis, with minor exceptions.
- Charging ports must have an average annual uptime of greater than 97%.
- Contractor(s) must demonstrate a history of timely maintenance and ability to meet the uptime requirement.
- Contractor(s) will provide 24/7 diagnostic modeling and remote start capability and identify and address maintenance issues efficiently.
- Contractor(s) will provide a process for customers to report outages, malfunctions, and other issues with charging infrastructure. Reporting mechanisms must comply with ADA requirements and multilingual access.
- Equipment maintenance and operations (as opposed to site maintenance) will be performed by a well-qualified, highly-skilled, certified, licensed, and trained workforce.
- Contractor(s) will provide operations and usage data, including data identifying charging station locations, charging session metrics, how much energy has been dispensed per port, and maintenance and reliability data such as charging station uptime; the total cost of electricity that the charging station operator must pay to operate on a charging station (including demand charges, energy charges [$/kWh], fixed charges, taxes, and all other fees); and typical maintenance and repair costs per charging station.
- Contractor(s) will provide a proposal for O&M after the first 5 years that identifies how O&M will be sustainable after the contract ends (e.g., responsible parties, funding sources, and anticipated costs).
- The agency may also encourage additional reliability safeguards by awarding bonus points during the contractor selection process. MnDOT may award bonus points for 24/7 remote diagnostics technology, remote maintenance technology, and modular charging station designs.[15]

MnDOT will develop more detailed strategies for operations and maintenance once the agency selects a contracting mechanism.

STRATEGIES FOR IDENTIFYING EV CHARGER SERVICE PROVIDERS AND STATION OWNERS

MnDOT will use existing competitive solicitation methods to advertise, select, and award NEVI Formula Program funds to third party contractors. For additional information about Minnesota's proposed contracting approach, see **Section 4**. The agency will leverage relationships built through the public engagement process for the Plan. For a list of EV charger service providers and potential third party contractors that provided input on the Plan, see **Appendix E**.

During the plan development process, MnDOT received many questions about siting chargers at rest areas. Rest areas are not a priority for the fast chargers because they lack many of the amenities of privately-owned sites. Rest areas could be an option if MnDOT cannot identify private site hosts. Due to current federal and state regulations, the agency cannot charge drivers a fee to use fast chargers at rest areas. This makes the business case for fast chargers challenging because of the costs to operate fast chargers.

STRATEGIES FOR EVSE DATA COLLECTION AND SHARING

MnDOT anticipates that private partners will collect and share a majority of the network-specific EVSE data. This includes charger uptime, reliability, and utilization to be submitted monthly to MnDOT and in the format required by FHWA. MnDOT will compile the data into a template and submit it, as required by the NPRM. The contracting process will include additional public-facing data collection and sharing requirements, which will allow charger data to be transmitted in real-time to consumers or consumer-

[15] *Using modular design can enhance resilience because if an isolated module fails, the other modules will continue to function. Crews can visit the site and swap out the isolated module in the field.*

facing third party entities that can communicate availability, connector type, power-level, real-time status, and real-time prices in accordance with the NPRM.

STRATEGIES TO ADDRESS RESILIENCE, EMERGENCY EVACUATION, AND SNOW REMOVAL/SEASONAL NEEDS

Climate risks in Minnesota include extreme precipitation, flooding, extreme temperatures, and longer wildfire seasons. Excessive downpours have become more frequent and more intense over the past several decades, and projections indicate further increases in extreme precipitation in the future. Annual precipitation across the state has increased by an average of 3.4 inches, with southeast Minnesota increasing by twice that amount. Historic flooding is becoming more common in the state as well. While winter nights in northern Minnesota are 7.3° F warmer than a century ago, the state experiences extreme heat and extreme cold that can pose reliability issues for EV chargers. The combination of increased temperatures and shorter winters means that the wildfire season is longer than average, which can lead to road closures, detours, and increased pressure on the statewide EV charging network.

MnDOT will plan for infrastructure resilience by selecting appropriate equipment for Minnesota's climate, carefully selecting sites with current and future climate conditions in mind, and developing best practices for emergency evacuation and snow removal. MnDOT intends to encourage higher ingress protection ratings for equipment to cope with harsh weather conditions such as winter storms and hot or humid weather. The agency will use the best available data to avoid current and anticipated flood zones when selecting sites for EV chargers. MnDOT will require contractors to provide timely snow removal and will take action if contract agreements are not honored. The agency will also work with contractors to develop site-specific plans for emergency evacuation in the event of climate emergencies such as flooding or wildfires.

STRATEGIES TO PROMOTE STRONG LABOR, SAFETY, TRAINING, AND INSTALLATION STANDARDS

MnDOT will continue to promote the use of small businesses in the construction and maintenance of Minnesota's transportation infrastructure. For this program, MnDOT, other state agencies, and private partners may be able to identify workforce training opportunities. For example, equipment could possibly be made available for training purposes. The purchase of a DCFC solely for training purposes can be a substantial investment for a vocational school, but opportunities may exist to use real-world DCFCs and equipment located in the AFCs for educational purposes prior to (or during) equipment installation. This could apply to the actual installation process of the equipment, where the contractor may be asked to provide educational assistance to further develop a skilled Minnesota workforce related to charging infrastructure. This is also an opportunity to engage with the underserved, disadvantaged communities to develop workforce training opportunities related to infrastructure installation, operation, and maintenance. Contractors should also recognize that ongoing O&M of the infrastructure and the sites should be an opportunity to develop regional skills and workforce opportunities, and that the training of this workforce should be a key component of the program.

MnDOT is planning to identify opportunities for workforce development that meet the standards proposed in the NPRM for technician qualifications and consistency, with certification through the Electric Vehicle Infrastructure Training Program (EVITP). MnDOT is anticipating that private providers will work with MnDOT, training providers, workforce boards, labor unions, community-based organizations, non-profits, and other worker organizations to encourage the development of a broad workforce that can safely operate and maintain this charging infrastructure.

Regarding safety, training should be made available to first responders and site hosts to provide guidance and safety procedures to manage infrastructure in the case of malfunction, equipment destruction, or an emergency event. This plan includes some initial draft standards related to charging sites, chargers, and desired amenities. MnDOT will work with private providers to develop a set of installation and design standards for the program and apply those as the basis for standards for the following years of program. MnDOT anticipates that these standards should allow flexibility for different technologies and chargers to be deployed at a future date. For future contracts that may be utilized for regional projects, contractors may develop modified standards that respond to regional characteristics or site-specific requirements.

9. CIVIL RIGHTS

MnDOT routinely administrates federal-aid funds and, as such, is committed to compliance with state and federal civil rights laws as a regular business practice. MnDOT will implement NEVI Formula Program using the adopted practices related to civil rights compliance that other federal funding programs have successfully implemented for decades. The Disadvantaged Business Enterprise (DBE) Program, Title VI of the Civil Rights Act, ADA, Section 504 of the Rehabilitation Act, and all accompanying U.S. Department of Transportation (DOT) regulations and ancillary programs will be an automatic part of the NEVI Formula Program from the onset.

The state of Minnesota protects all Minnesotans from discrimination through the Minnesota Human Rights Act, one of the strongest civil rights laws in the country. The Minnesota Human Rights Act prohibits discrimination in business, credit, education, employment, housing, public spaces, and government services, including retaliation based on race, color, creed, religion, national origin, sex, marital status, disability, public assistance, age, sexual orientation, gender identity, familial status, and local human rights commission activity.

TITLE VI AND ADA

MnDOT is committed to ensuring that projects, programs, and services are performed without discrimination, under Title VI and the ADA. To accomplish this, MnDOT is responsible for ensuring the implementation and enforcement of the civil rights program within their activities and programs and any representatives or contractors associated with the NEVI Formula Program.

This is accomplished by:

- Incorporating Title VI and ADA nondiscrimination requirements into appropriate manuals, directives, and regulations.
- Incorporating Title VI and ADA nondiscrimination requirements into the designing and planning phases of project development.
- Developing procedures to advise beneficiaries of all nondiscrimination laws.
- Maintaining documentation of beneficiary nondiscrimination activities.
- Ensuring that workforce and budget appropriations are adequate to accomplish nondiscrimination commitments.
- Ensuring that federally funded contracts with consulting firms contain Title VI/ADA protections.
- Providing/obtaining nondiscrimination assurances and ensuring that consultants comply.
- Notifying the public of compliance with Title VI and ADA.
- Providing a complaint process that allows for investigations of alleged violations and provides clear and effective access to efficient resolutions.
- Creating a uniform data collection standard for evaluation of, and outreach to Environmental Justice (EJ) communities in alignment with the Justice40 Initiative.

10. EQUITY CONSIDERATIONS

MnDOT recently drafted a transportation equity statement of commitment, which includes a definition of transportation equity, that will be published in the 2022 Statewide Multimodal Transportation Plan. The next annual update to the Minnesota Electric Vehicle Infrastructure Plan will reflect any changes to the statement of commitment made after August 2022.

ACKNOWLEDGMENT OF PAST HARMS

MnDOT acknowledges that the transportation system and agency decisions have in the past underserved, excluded, harmed, and overburdened some communities. Some past decisions denied Black and Indigenous communities and people with disabilities the full participation of transportation benefits. These and other underserved communities have historically carried disproportionate burdens of transportation decisions.

WHAT TRANSPORTATION EQUITY MEANS TO MNDOT

MnDOT is committed to creating an equitable transportation system. Transportation equity means that the benefits and burdens of transportation systems, services, and spending are fair and just, which historically has not been the case. Transportation equity requires ensuring underserved communities, especially BIPOC, share in the power of decision making. MnDOT will not transform its transportation systems, services, and decision-making processes overnight and will not always be initially successful in implementing positive, equitable change. Transportation equity is an ongoing journey of listening, learning, changing, implementing, and adapting. All agency members, regardless of position or work assignment, have a responsibility to advance transportation equity. MnDOT will partner with community members, community-based organizations, transportation service providers, Tribal Nations, and government institutions to evolve, improve, and change outcomes for Minnesota communities.

EQUITY CONSIDERATIONS FOR TRANSPORTATION ELECTRIFICATION

MnDOT commits to addressing equity considerations when planning for EV charging infrastructure and investments in the state. While the number of electric vehicles in the state increased in the past decade, EV users are predominantly white, middle-and-upper income, and male, most often living in urban areas. Additionally, the current build-out of EV charging infrastructure is inadequate to equitably

support the transition to a sustainable transportation future. Low-to-moderate income (LMI) households, BIPOC communities, women, disabled residents, and rural residents may experience intersecting barriers to EV use and can be underserved by current EV programs and policies.

Strategies for enhancing equity in the context of EV charging infrastructure include increasing EV charger access for LMI Minnesotans, particularly those that reside in multi-family housing; addressing the lack of charging in LMI, BIPOC, and rural communities; providing affordable charging; and designing charger stations to support personal safety[16]. MnDOT will aim to integrate these strategies into NEVI Formula Program investments and coordinate with partners to advance equitable transportation electrification in the state.

MnDOT intends to disperse infrastructure equitably throughout corridors of the state, focusing investment in rural, disadvantaged, and tribal communities to allow those that are often underserved, or those that disproportionately bear the burden of transportation system impacts, to receive significant benefits from EV charging investments. The Justice40 Initiative, established in January 2021 by Presidential Executive Order 14008 on Tackling the Climate Crisis at Home and Abroad, requires at least 40% of the overall benefits of certain federal investments to flow to disadvantaged communities. The Interim Implementation Guidance for the Justice40 Initiative (released July 2021) and the NEVI Formula Program Guidance (released in February 2022) identifies clean transportation, including the NEVI Formula Program, as Justice40-covered programs. This is especially relevant to energy and transportation decision-making, as the burdens of these systems have been disproportionately borne by disadvantaged communities. Incorporation of the Justice40 Initiative into Minnesota's Plan can help ensure that the benefits of EV charging infrastructure investment benefit these communities.

IDENTIFICATION AND OUTREACH TO DISADVANTAGED COMMUNITIES IN THE STATE

As part of the U.S. DOT and U.S. Department of Energy (DOE) partnership in implementing the Justice40 Initiative, an interim definition for disadvantaged communities was developed to assist states in identifying such areas. "Communities" are defined as a group of individuals living in close geographic proximity to one another. "Disadvantaged" is defined through data investigation of these communities by a combination of variables including low income (and/or high-persistent poverty), racial minority composition, linguistic isolation, high transportation-cost burden, high energy-cost burden, and disproportionate environmental stressors.

MnDOT used the Electric Vehicle Charging Justice40 Map tool to analyze the existing and planned future EV network in Minnesota and incorporated the location of these communities as key criteria for the selection of corridors and the priority scoring of interchanges along these corridors.

MnDOT has developed and implemented procedures to encourage and monitor public participation in the planning process. This includes, but is not limited to, meaningful engagement in projects and programs with BIPOC and low-income individuals, those with limited English proficiency, and other underserved groups. MnDOT is developing approaches to encourage and monitor public participation. The NEVI Formula Program planning process included community members in the extensive outreach and engagement program (see **Section 3**). Further engagement will include meaningful participation in projects and programs with these same groups. Over the course of the NEVI Formula Program, MnDOT will engage these groups to understand the potential for workforce development, potential barriers for effective deployment and use of the infrastructure, and potential to adjust the program to better suit the needs of every community member. The agency will engage with community members to determine benefits to measure as well as barriers.

PROCESS TO IDENTIFY, QUANTIFY, AND MEASURE BENEFITS TO DISADVANTAGED COMMUNITIES

MnDOT sees value in performance-based planning and is experienced in measuring performance and reporting in accordance with U.S. DOT requirements. MnDOT recognizes the emerging nature of the NEVI Formula Program and looks forward to working with U.S. DOT to measure the benefits of this program as it evolves. Benefits of the NEVI Formula Program beyond geographic location can only be discussed qualitatively, as tools do not yet exist to measure other expected benefits. MnDOT expects the NEVI Formula Program will evolve and mature to have a national standard for benefit metrics and measurement set by U.S. DOT. Until that time comes, MnDOT is evaluating existing programs and data tools that can be used to internally enhance, target, and measure the benefits of the NEVI Formula Program to disadvantaged communities. Initially, MnDOT will track the location of EV chargers and the percentage of those located in U.S. DOT-designated disadvantaged communities using the EV Charging Justice40 Map tool. In addition, workforce participation from underserved, disadvantaged, and tribal communities will be a measured metric, as well as the overall reduction of vehicle emissions in underserved, disadvantaged areas (as estimated through AADT measurements combined with EV adoption rates). MnDOT anticipates working in consultation with community members to determine additional benefit metrics they would find valuable to track.

[16] *2021 Minnesota Electric Vehicle Assessment*

MnDOT will also explore opportunities to enhance and measure DBE utilization on NEVI Formula Program projects. The Labor and Workforce Considerations section discusses this in additional depth. MnDOT will also explore existing partnerships with MPOs and local jurisdictions to refine potential measurements and improvements for gauging statewide air quality, particularly in disadvantaged communities.

BENEFITS TO DISADVANTAGED COMMUNITIES THROUGH THIS PLAN

MnDOT expects the benefits of this investment go beyond geographic location of the chargers. Increased EV adoption, for example, will reduce GHG emissions that cause climate change, while also improving air quality, particularly for LMI and BIPOC Minnesotans who are disproportionately exposed to tailpipe emissions. NEVI Formula Program investments will also support job growth in EV-related industries, as well as bring financial benefits to EV users through reduced operating and maintenance costs. The NEVI Formula Program can contribute to a more just and sustainable transportation landscape in Minnesota.

11. LABOR AND WORKFORCE CONSIDERATIONS

LABOR AND WORKFORCE OVERVIEW

The NEVI Formula Program generates opportunity for job creation in the electrical and construction trades as a nationwide network of EV DCFCs are planned, designed, installed, and commissioned. The NEVI Formula Program will also increase opportunities for power generation and power distribution utilities to strengthen their workforce to provide EV transportation that is convenient, reliable, affordable, and equitable. Minnesota is prepared to meet this opportunity through its strong utility stakeholders and robust workforce practices.

The state of Minnesota has a construction workforce of over 135,689 as of May 2022, approximately 4.3% of the state's labor force. [17] Within the construction industry, the development of the NEVI Formula Program network will rely on labor throughout the state and will need to leverage specialty contractor services, particularly electricians.

LOCATION OF CONSTRUCTION LABOR FORCE

Approximately 62% of Minnesota's workforce is within the Minneapolis-St. Paul metropolitan region. Given Minnesota's many small and medium size urbanized areas and expansive rural areas, and MnDOT's intention for the NEVI Formula Program network to provide statewide coverage, the NEVI Formula Program will generate construction activity distant from primary centers of construction workers. Proactive development of local construction workforces will be necessary across the state, including in underserved communities, to ensure that rural and disadvantaged communities will benefit from this added job growth.

ELECTRICAL TRADE

The use of well-trained electrical staff will be critical to the success of building out the NEVI Formula Program network in Minnesota. Of the full construction workforce, 11,210 are electricians. The state is also well prepared with 35 Minnesota-based electrical contractors that have become EVITP certified.

LABOR AND WORKFORCE STRATEGIES

The state of Minnesota has strong existing strategies that will enable NEVI Formula Program investment to create jobs, a diverse and sustainable electric vehicle workforce, and inclusive, local benefits. Further, all strategies will be coordinated with the DEED and DLI, with goals to expand the sources of training, experience level, and diversity of the workforce that is installing and maintaining EV charging infrastructure. Strategies will include taking proactive steps to encourage broader participation among women, Black, Latino, Asian American, Pacific, Indigenous, and other underrepresented groups in the development of those workforces. Strategies may also include utilizing geographic, economic, or other hiring preferences or innovative contracting approaches authorized by law to maximize job creation and economic benefits for local communities. MnDOT is also soliciting stakeholder input from major stakeholders such as the state's utilities. MnDOT anticipates the following components will be part of a successful workforce strategy:

EDUCATIONAL COLLABORATION

MnDOT is planning to work with agency partners to confirm the availability of technical training and higher education in sufficient quantity and diversity to support the NEVI Formula Program impact on the local workforce. The NEVI Formula Program will potentially incorporate outreach

[17] *https://mn.gov/DEED/data/data-tools/current-employment-statistics/*

strategies with local schools, colleges, and vocational programs to develop a pipeline of employees with skillsets needed for the deployment of the NEVI Formula Program.

INCLUSIVE INPUT AND OUTREACH

The workforce development training and outreach plans will include input from diverse communities, advocacy groups, and industry organizations, as well as diverse/DBE firms. MnDOT will apply their tested practices to establish appropriate trainee and apprentice goals for NEVI Formula Program deployment projects.

INCLUSIVITY OF CONTRACTORS

Minnesota has a successful DBE program that aims to increase the participation of women- and minority-owned businesses in state contracts and procurements.

12. CYBERSECURITY

Minnesota and MnDOT are committed to public service, including cybersecurity, cyber-resiliency, and privacy protections for all services and systems in the communities in which they serve.

The BIL has allocated funds for deployment of EVSE within the transportation system. The potential sources and types of cybersecurity threats for EVSEs are evolving, and regularly scheduled risk assessments are prudent and necessary to provide Defense-in-Depth (DiD) protection. Successful exploitation of even a single DCFC can cause relay chatter, other various power quality issues, and phase instability, which can have cascading effects upstream.

Primary goals of the EVSE cybersecurity guidance are:

- Ensure that all EVSE infrastructure deployed within the MnDOT transportation system is secure. "Secure" is defined as:
  - Protected against physical or electronic intrusion by unauthorized persons or entities.
  - Hardened against damage or loss of service due to weather, environment, transient surge voltages, traffic incidents, etc.
  - Protected against insider threats, whether malicious or inadvertent.
  - Segmented (separated) to protect against unintended damage, unauthorized access, loss of data, service availability, privacy breach, etc. from unprotected connections among stakeholder partner and user systems. Ensure that all revenue and financial systems are compliant with payment card industry (PCI) requirements.
- Ensure that all security operations are compliant with, and certification maintained for, Security Operations Center – Level 2 (SOC2) audit requirements.
- Ensure that the functionality required for a fully functional EV charging system is available to support commercial vehicle operations, state fleet operations, and service to private motorists, while assuring maintenance of the above secure environment.
- Ensure physical and electronic resiliency is built in.
- Ensure Security by Design (SbD) is implemented for each project.

CURRENT CYBERSECURITY STATE OF THE INDUSTRY

INDUSTRY STUDIES/REPORTS

According to a September 2021 joint report by Sandia National Labs and the U.S. Department of Energy[18] "… there is no comprehensive EVSE cybersecurity approach, and limited best practices have been adopted by the EV/EVSE industry." The report went on to state "There is an incomplete industry understanding of the attack surface, interconnected assets, and unsecured interfaces."

NEED TO CONDUCT PROJECT SPECIFIC RISK ASSESSMENTS

Since the industry does not yet have a clear picture of the attack surfaces, each project (or group of related projects) will require a full-scope risk assessment to identify the comprehensive threat surface presented by and against the elements of all stakeholder partners/users (grid operators, vehicles, original equipment manufacturer [OEM] vendors, charging network operators, etc.).

Sandia National Labs followed the above process/task flows in conducting their research on potential risk models for EVSE. This is a recommended approach.

Microsoft created the STRIDE Model for capturing threat surfaces, which is a good tool for documenting threat surfaces based on analysis of Processes, Data Flows, Endpoints, Trust Boundaries, and Electrical Equipment. These key elements for analysis are identified from the architecture and assessed for risk against the threats represented by STRIDE (see **Figure 16**).

[18] *https://www.osti.gov/servlets/purl/1706221*

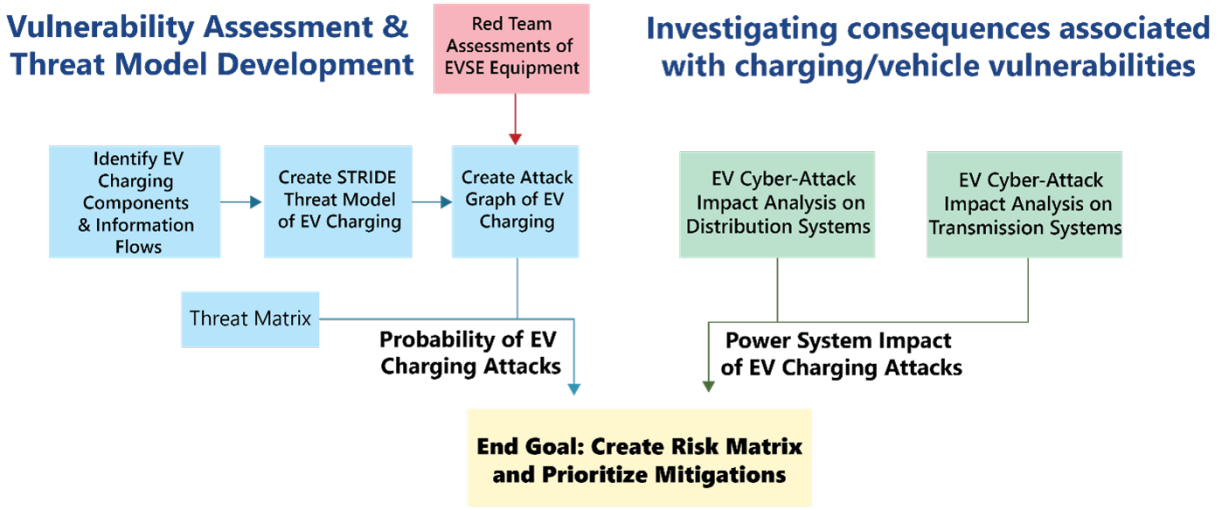


Figure 16: Risk/Consequence Process Flows (Source: Sandia National Labs)

BEST PRACTICES- MINIMUM GUIDELINES

A critical element to establishing and achieving the expectations outlined in this EVSE security plan is following a set of best practices. The EVSE implementer will follow best practices for ensuring cybersecurity of the EV infrastructure.

Threat	Desired property
Spoofing	Authenticity
Tampering	Integrity
Repudiation	Non-repudiability
Information disclosure	Confidentiality
Denial of Service	Availability
Elevation of Privilege	Authorization

Threat model includes:
- Processes (P)
- Data Flows (DFs)
- Endpoint (EE)
- Trust Boundaries (dashed)
- Electrical Equipment (green)

Figure 17: STRIDE Model Elements (Source: Sandia National Labs)

BEST PRACTICES- FOUNDATIONAL PRINCIPLES

Employing two foundational principles, Security by Design (SbD) and Defense-in-Depth (DiD), facilitates achieving the best feasible protective posture.

- Security by Design is the controlled use of established processes to build security functions, safeguards, and procedures into software and system design from project initiation, ensuring security is considered and tested throughout the entire design/engineering phase.
- Defense in Depth is the practice of constructing cybersecurity defense via layers of protection that overlap and enhance adjacent layers. Where one layer is defeated, another is automatically implemented to step into the gap and continue defensive efforts.

BEST PRACTICES - FOLLOWING EXISTING STANDARDS

MnDOT requires compliance with all applicable national and Minnesota and industry standards.

GENERAL BEST PRACTICES

A common set of recommended best practices is summarized below for the EV deployers. Details of these are available from: https://doi.org/10.2172/1706221.

Risk Management

- Establish full life-cycle risk reviews and prioritize improvements based on risk to EVSE operations.
- Maintain updated architecture diagrams to identify critical assets, internet connections, open ports, and supported protocols.
- Establish a process for active security patch management.

Configuration and Change Management

- Create a formal process for uploading code.
- Properly secure keys, credentials, and other secret items.

Identity and Access Management

- Require individual credentials for system login and do not reuse credentials.
- Limit the use of system/maintenance accounts.

Threat and Vulnerability Management

- Use a common vulnerability scoring system (CVSS) to evaluate potential vulnerabilities and prioritize responses.
- Establish and regularly update a comprehensive threat profile.

Communications

- Encrypt all information both internal and external to the EVSE.
- Apply network segmentation and security systems including intrusion detection systems (IDS's), intrusion prevention systems (IPS's), and firewalls.

Event and Incident Response; Continuity of Operations

- Implement information security continuous monitoring (ISCM) per National Institute of Standards and Technology Special Publication (NIST SP) 800-137.
- Establish protocols and procedures for immediate response to logs or alerts from ISCM, security information and event management (SIEM), and IDS/IPS systems.
- Create a Security Operations Center (SOC) and maintain SOC2 certification.
- Establish business continuity, incident response, and disaster recovery plans. Conduct regularly scheduled tabletop exercises, drills, and reviews to test procedures, train staff, and update per technology changes.

Supply Chain Management

- Use secure shipping channels that include verification of the state of EVSE when it departs a facility.
- Use tamper-resistant seals, alarms, and other protective measures to prevent and report attempts of unauthorized access to equipment or enclosures.

Workforce Management

- Ensure that critical roles have redundancy in personnel and cross-function capabilities.
- Evaluate competence of staff with periodic social engineering (phishing), audits, etc.

Cybersecurity Program Management

- Mature a cybersecurity program strategy with clear priorities and governance model.
- Include a "safe" environment for anonymous or protected means to report violations or vulnerability concerns.

13. PROGRAM EVALUATION

MnDOT will develop a program evaluation plan that will provide the Joint Office of Energy and Transportation (created through the BIL to facilitate collaboration between the U.S. DOE and the U.S. DOT) with data documenting the impacts of the federal dollars invested in EV charging infrastructure. It will also provide the Joint Office and MnDOT with metrics regarding Minnesota's progress towards its goals and the performance of the EV charging network. Working in conjunction with its public and private partners, MnDOT will collect data and report progress on its EV goals annually at minimum, but MnDOT is committed to collecting and sharing data on the schedule required by the Joint Office. MnDOT will use this information to inform network development and the installation of additional chargers based on the use and performance of existing chargers in the network in which they serve.

A summary of MnDOT's program evaluation approach by EV goal is shown in **Table 3**. Each goal is tied to one or more metrics that measure progress toward each goal. Through regular, holistic evaluation of Minnesota's charging network, MnDOT can determine the most effective ways to strengthen or reorient its investment and overall program.

14. DISCRETIONARY EXCEPTIONS

MnDOT does not anticipate the need for any discretionary exceptions for infrastructure built using FY 2022 funds.

Table 3: Proposed Program Evaluation Metrics

GOAL	FOCUS AREA	METRIC
Support Minnesota's GHG emission reduction goals and minimize transportation's impact on human and environmental health		Air quality (modeled pollutants)
		GHG emission reduction (calculated from kWh consumption)
Facilitate regional and statewide travel while setting the standard for EV infrastructure in the Midwest	Minimum viable network	Number of stations meeting NEVI Formula Program guidance minimum standards
		Number of stations exceeding NEVI Formula Program minimum standards
		Statewide system miles covered by EV charging stations
	Access	Percent of population within 50 miles of a station
		Percent of population within 15 miles of a station
		Average waiting time for a charger
	Reliability	Charger availability/uptime
		Number of calls/complaints per location
	Utilization	Percent of time with a vehicle connected aggregated by time of day, payment type, land use, and location
		Number of charging events
		Energy consumed per charge event and in aggregate
Distribute 40% of NEVI Formula Program benefits towards disadvantaged communities in Minnesota		Percent of workforce drawn from disadvantaged communities
		Share of chargers installed in or adjacent to disadvantaged communities
		Disadvantaged population within 15 miles of a station
Advance EV adoption		Registered light-duty vehicles that are BEVs (# and %)
Support job creation and workforce development		Number of new jobs created by investment
		Number of workers engaged in the NEVI Formula Program

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The NEVI Formula Program offers Minnesota an incredible opportunity to expand EV charging. The initial investment along I-94 and I-35 will serve as a catalyst for future fast charger deployment. MnDOT will update the Minnesota Electric Vehicle Infrastructure Plan on an annual basis with the next update scheduled for Spring/Summer 2023.

Prepared with support from HDR.


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