



MICHIGAN STATE PLAN for

Electric Vehicle Infrastructure Deployment

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Contributors

State Team

Judson Herzer, Director of Strategic Policy, Department of Labor & Economic Opportunity (LEO), Michigan Office of Future Mobility and Electrification (OFME)

Robert Jackson, Assistant Division Director and Energy Ombudsman, Michigan Department of Environment, Great Lakes, and Energy (EGLE)

Niles Annelin, Manager, Policy Section, Bureau of Transportation Planning, Michigan Department of Transportation (MDOT)

Tremaine L. Phillips, Commissioner, Michigan Public Service Commission (MPSC)

Al Freeman, Assistant to Division Director, Energy Resources Division, MPSC

Kelly Bartlett, Vehicle Policy Specialist, MDOT

Andrew Sibold, Transportation Planner, Federal Highway Administration (FHWA) Michigan Division

Authors

HNTB

Katie Ott Zehnder, PE, PTOE, AICP

Arif Cekic, PhD, PE

Jeff Feeney, PE, PTOE

Alexandra Horst, AICP

Bradleigh Merrill

Bud Braughton, PE

Robert Evans

Sherry Kish, Esq.

Scott Lowry, PE

Andrew Conley

Marie Tam Turner

Casey Cooper-Fenske

Elias Fischer

Michigan State University (MSU)

EVNoire

Atlas Public Policy

CALSTART

Table 1: Acronyms/Abbreviations

Acronyms/Abbreviations	Definitions
AADT	Annual average daily traffic
ADA	Americans with Disabilities Act of 1990
AFC	Alternative Fuel Corridor
AFDC	Alternative Fuels Data Center
BEV	Battery Electric Vehicle
BIL (also known as IIJA)	Bipartisan Infrastructure Law
CCS	Combined Charging System
CFME	Council on Future Mobility & Electrification
<i>CFR</i>	<i>Code of Federal Regulations</i>
DAC	Disadvantaged Community
DBE	Disadvantaged Business Enterprise
DCFC	Direct Current Fast Charger
DDA	Downtown Development Authority
DIFS	Michigan Department of Insurance and Financial Services
DNR	Michigan Department of Natural Resources
DOE	U.S. Department of Energy
DOJ	U.S. Department of Justice
DOL	U.S. Department of Labor
EC	Electrification Coalition
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EIBC	Energy Innovation Business Council
EV	Electric vehicle
EVITP	Electric Vehicle Infrastructure Training Program
EVSE	Electric Vehicle Supply Equipment
FHWA	Federal Highway Administration

Acronyms/Abbreviations	Definitions
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FY	Fiscal year
GHG	Greenhouse gas
HHS	U.S. Department of Health & Human Services
IBEW	International Brotherhood of Electrical Workers
IEEE	Institute of Electrical and Electronics Engineers
IIJA (also known as BIL)	Infrastructure Investment and Jobs Act
kW	Kilowatt
kWh	Kilowatt hour
LARA	Michigan Department of Licensing and Regulatory Affairs
LDV	Light-duty vehicle
LEO	Michigan Department of Labor and Economic Opportunity
MAASTO	Mid America Association of State Transportation Officials
MAC-EJ	Michigan Advisory Council on Environmental Justice
MBE	Minority Business Enterprise
MDARD	Michigan Department of Agriculture and Rural Development
MDCR	Michigan Department of Civil Rights
MDHHS	Michigan Department of Health and Human Services
MDOT	Michigan Department of Transportation
MEC	Michigan Environmental Council
MEDC	Michigan Economic Development Corporation
MI	Michigan
MIO	Michigan Infrastructure Office
<i>MM2045</i>	<i>Michigan Mobility 2045</i>
MML	Michigan Municipal League

Acronyms/Abbreviations	Definitions
MOU	Memorandum of Understanding
MPA / MACS	Michigan Petroleum Association / Michigan Association of Convenience Stores
MPO	Metropolitan Planning Organization
MPSC	Michigan Public Service Commission
MPTA	Michigan Public Transit Association
MSU	Michigan State University
MTPA	Michigan Transportation Planning Association
MWh	Megawatt hour
NAAQS	National Ambient Air Quality Standards
NACSE	Northwest Alliance for Computational Science & Engineering
NEC	National Electrical Code
NEPA	National Environmental Policy Act
NEVI	National Electric Vehicle Infrastructure
NFPA	National Fire Protection Association
NHS	National Highway System
NOx	Nitrogen oxides
O&M	Operations and maintenance
OASAM	Office of the Assistant Secretary for Administration & Management
OCPI	Open Charge Point Interface
OCPP	Open Charge Point Protocol
OD	Origin-destination
OEM	Original Equipment Manufacturer
OFME	Office of Future Mobility and Electrification
OMB	Office of Management and Budget
P3	Public-private partnership

Acronyms/Abbreviations	Definitions
PHEV	Plug-In Hybrid Electric Vehicle
PM	Particulate Matter
REV	Regional Electric Vehicle
RFP	Request for Proposals
ROW	Right-of-way
SBA	U.S. Small Business Administration
SBP	Small Business Program
SDB	Small Disadvantaged Business
SEMCA	Southeast Michigan Community Alliance
SEMCOG	Southeast Michigan Council of Governments
SOAR	Strategic Outreach and Attraction Reserve
SOM	State of Michigan
STIP	State Transportation Improvement Program
UAW	International Union, United Automobile, Aerospace and Agricultural Implement Workers of America
UP	Upper Peninsula
UPPCO	Upper Peninsula Power Company
U.S.	United States
U.S.C.	United States Code
USDOT	U.S. Department of Transportation
USGS	U.S. Geological Survey
V2G	Vehicle-to-grid
VSS	Vendor Self-Service
VW	Volkswagen
WBE	Women's Business Enterprise
WIN	Workforce Intelligence Network

Chapter 1 Introduction

The Bipartisan Infrastructure Law (BIL), enacted as the Infrastructure Investment and Jobs Act (IIJA), was signed into law on November 15, 2021, and is being administered by the Joint Office of Energy and Transportation. As part of the BIL, five billion dollars are allocated for the National Electric Vehicle Infrastructure (NEVI) Formula Program, which is focused on establishing a network of fast chargers across the country to accelerate the adoption of electric vehicles (EVs), reduce transportation-related greenhouse gas (GHG) emissions, and position United States (U.S.)-based industries for global leadership in the vehicle electrification ecosystem. The NEVI Formula Program will allocate \$110 million to the State of Michigan (MI) between fiscal years (FYs) 2022 and 2026 to install four 150 kilowatt (kW)-or-greater chargers with Combined Charging System (CCS) ports at intervals of no more than 50 miles along each of the state's designated Alternative Fuel Corridors (AFCs). Once the AFCs are fully built out and certified by the U.S. Department of Transportation (USDOT) Secretary, the remaining funds become discretionary and can be used on any public road or in other publicly accessible areas.¹

The *Michigan State Plan for Electric Vehicle Infrastructure Deployment* has been developed through collaboration with several State agencies and alignment with other State plans. It sets the direction for a successful deployment of NEVI Formula Program funding within Michigan. The vision for the plan, as defined in Chapter 4, is to:

Develop a safe, equitable, reliable, convenient, and interconnected transportation electrification network that enables the efficient movement of people, improves quality of life, spurs economic growth, protects Michigan's environment, and facilitates data collection.

Outside of the NEVI Formula Program, Michigan's public and private entities have established various EV charging station incentives to help advance the state's network, including the:

- Michigan Department of Environment, Great Lakes, and Energy's (EGLE's) [Charge Up Michigan](#),
- DTE Energy's [Charging Forward](#),
- Consumers Energy's [PowerMIDrive](#),
- Indiana Michigan Power's [IM Plugged In](#),
- Upper Peninsula Power Company's (UPPCO's) recently approved [pilot program](#)^{2, 3, 4, 5, 6, 7}, and
- [Alpena Power Company's](#) recently approved pilot program.

Although they still represent fewer than one percent of registered vehicles in Michigan, plug-in electric vehicles registered in the state have increased in number by over 400% in the last three years. To prepare for the accelerated growth, the State is advancing partnerships to create a safer, more equitable and environmentally conscious transportation future for all Michiganders, as highlighted in Chapter 2 and Chapter 3.

1.1 Dates of State Plan for EV Infrastructure Deployment Development and Adoption

Table 2 identifies important NEVI milestones, while Table 3 provides a high-level overview of the annual deployment focus for the NEVI Formula Program. The State will continue to monitor supply chain availability, inflation, and technology advancements to determine if adjustments to this plan are necessary.

Table 2: Anticipated NEVI Milestones

Anticipated Dates	Milestones
February-July 2022	<ul style="list-style-type: none"> Stakeholder engagement AFC nomination and approval Draft <i>Michigan State Plan for Electric Vehicle Infrastructure Deployment</i> development
August 1, 2022	<ul style="list-style-type: none"> <i>Michigan State Plan for Electric Vehicle Infrastructure Deployment</i> submission to the Federal Highway Administration (FHWA)
September 30, 2022	<ul style="list-style-type: none"> <i>Michigan State Plan for Electric Vehicle Infrastructure Deployment</i> approval by FHWA
October-December 2022	<ul style="list-style-type: none"> Procurement development and advertisement
2023-2026 (annual activities)	<ul style="list-style-type: none"> Applications reviewed, contracts awarded, and infrastructure deployed Continued stakeholder engagement conducted Workforce development programs initiated and continued NEVI Formula Program monitored for reporting purposes Additional AFCs nominated <i>Michigan State Plan for Electric Vehicle Infrastructure Deployment</i> updated and resubmitted annually

Table 3: Anticipated NEVI Deployment Packages

Anticipated Dates	2022	2023	2024	2025	2026
Interstates					
Other AFCs					
Additional Non-AFC Corridors					
Additional Charging on AFC Corridors					





Chapter 2 State Agency Coordination

The *Michigan State Plan for Electric Vehicle Infrastructure Deployment* was developed with the involvement of many State agencies, as well as coordination with border states and international entities.

2.1 Michigan State Agency Coordination

The *Michigan State Plan for Electric Vehicle Infrastructure Deployment* was spearheaded by EGLE, the Michigan Department of Labor and Economic Opportunity (LEO), Michigan Department of Transportation (MDOT), and Michigan Public Service Commission (MPSC), with support from many other agencies. Throughout the planning process, weekly meetings were held between EGLE, LEO, MDOT, and MPSC to set priorities, evaluate results, and identify next steps to help the State maximize electrification opportunities for motorists and the local workforce. Table 4 identifies State agencies and their EV roles. Additionally, in February 2020, Governor Gretchen Whitmer created the Council on Future Mobility & Electrification (CFME) to advise the Governor, State government administration, and State legislature.⁸ CFME has an electrification advisory group and provides policymakers with recommendations annually to ensure the State's continued leadership in mobility and electrification.⁹

Table 4: Michigan Agencies and Their EV Roles

Agency	Role
	EGLE coordinates with electric utilities and EV operator applicants to provide funding for site preparation, qualified Direct Current Fast Charger (DCFC) EV charging equipment, equipment installation, networking fees, and signage. EGLE's Charge Up Michigan Program has provided a foundation for the State's NEVI Formula Program, with its model for state prioritization, a contracting framework, and installation lessons learned. ¹⁰
	The Michigan Department of Licensing and Regulatory Affairs (LARA) oversees employment, professional licensing, construction, and commerce. Critical to the NEVI Formula Program, LARA houses the MPSC, Bureau of Professional Licensing, and Bureau of Fire Services. ¹¹
	LEO provides the connections, expertise, and innovative solutions to drive continued business growth, retain key talent to fill Michigan's vast pipeline of opportunities, build vibrant communities, and generate tourism. ¹² LEO is responsible for overseeing the Michigan EV jobs and infrastructure academies and ensuring Michigan remains the global leader in transportation technologies.
	The Michigan Department of Civil Rights (MDCR) is responsible for ensuring that civil rights are protected equally and discrimination complaints are investigated. MDCR enforces civil rights laws and supports diversity, inclusion, and equity efforts. ¹³ MDCR is working in partnership with other State agencies to establish Americans with Disabilities Act of 1990 (ADA) standards for EV charging parking spaces.

Agency	Role
	MDOT is responsible for Michigan's nearly 10,000 miles of State highway system. MDOT is also in charge of NEVI reporting and U.S. Code Title 23 compliance activities, including National Environmental Policy Act (NEPA) documentation and real estate requirements. ¹⁴
	The Michigan Economic Development Corporation (MEDC) markets Michigan as the place in which to do business, assists companies with their growth strategies, and fosters the development of vibrant communities. MEDC works closely with economic development partners and businesses located throughout Michigan and supports conversations with potential EVSE bidders. ¹⁵
	The Michigan Department of Agriculture and Rural Development (MDARD) houses the Weights and Measures Service Agency, which is responsible for enforcing consumer protection standards for people providing EV charging services, which include station inspections. ¹⁶
	The Michigan Infrastructure Office (MIO) was created by Governor Whitmer to coordinate and oversee the expenditure of BIL/IIJA funds. MIO is housed within the Office of the Governor. ¹⁷
	The Office of Future Mobility and Electrification (OFME), which is within LEO, works with the State government, academia, and private industry to enhance Michigan's mobility ecosystem, including efforts to develop dynamic mobility and electrification policies and support the startup and scale-up of emerging mobility and electrification technologies and businesses throughout Michigan. OFME has initiated EV collaboration and support between State departments in charge of infrastructure, passenger transportation, industry, workforce, climate solutions, and the grid. ¹⁸
	MPSC ensures the energy infrastructure supporting the State's EV adoption program remains safe, reliable, and accessible. MPSC closely monitors and coordinates with utility companies in Michigan as they implement Electric Vehicle Supply Equipment (EVSE) programs. MPSC reviews and decides whether to approve investor-owned utility EV charging infrastructure programs in electric rate cases or other proceedings before the MPSC. ¹⁹

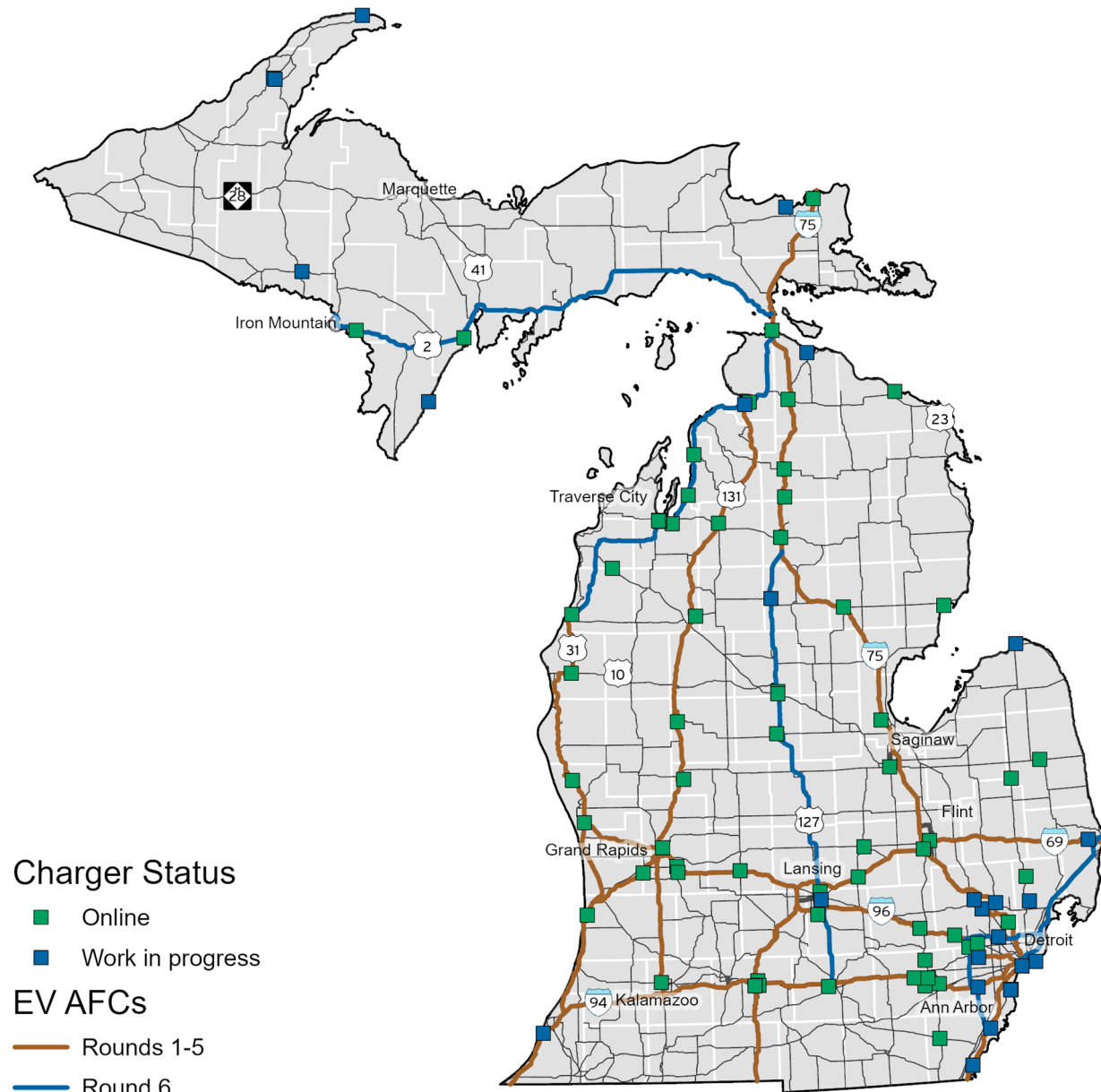
In addition to coordinating on the development of the *Michigan State Plan for Electric Vehicle Infrastructure Deployment*, these agencies are collaborating on other complementary EV initiatives across Michigan, as well as with other states, as discussed later in this chapter. Michigan initiatives include the following:

- **Development of North America's first wireless EV charging road system** in Detroit through a collaboration led by MDOT and OFME to deploy North America's first public in-road, dynamic charging system, allowing EVs to charge while in motion. The State may pursue future grants to help fund commercial deployment of this type of technology.
- **National Park Service (NPS) EVSE planning** is underway, with the cooperation of the Michigan Department of Natural Resources (DNR) and OFME, to identify potential projects within National and State Parks and shorelines that would enable NPS visitors and staff to improve access to charging stations, reduce congestion, and enhance accessibility through advanced mobility services.²⁰
- **Michigan State Park EV Charger Deployment** will install approximately 15 EV charging sites at State Parks and a State Fish Hatchery in Michigan through a State partnership with Adopt A Charger and Rivian.²¹

- **Southeast Michigan Council of Governments' (SEMCOG's) [EV Resource Kit and Planning Hub](#)** provides a comprehensive platform for local governments, community leaders, and residents to consider EV adoption and the deployment of EV infrastructure at the local level.²² OFME is working with SEMCOG and other partners to expand the awareness of this toolkit statewide.
- **EGLE's [Charge Up Michigan](#)** Program is an EV charger program that aims to build the infrastructure for DCFC stations in Michigan to ensure the feasibility of long-distance trips for EV users within the state and to neighboring states and Canada. To achieve this, EGLE and its electric utility and applicant partners provide funding for site preparation, DCFC EV charging equipment, equipment installation, networking fees, and signage. Sites are selected and funds distributed through a competitive grant process.²³ To date, the program has invested \$16.1 million of the \$20.6 million in Volkswagen (VW) settlement funds available for EV charging stations and installed 276 chargers, as shown in Figure 1.
- **The [Michigan Mobility Funding Platform](#)** was launched by MDOT and OFME in 2021 to provide grants to mobility and electrification companies to deploy technology solutions in the state of Michigan. The funding program is designed to accelerate investment in:
 - Mobility and electrification solutions that create safer, more equitable and environmentally conscious transportation for all Michigan residents; and
 - High-potential mobility and electrification companies that anticipate long-term growth in Michigan and seek to play a meaningful role in the state's mobility ecosystem.²⁴
- **[MI Power Grid](#)** is a customer-focused, multi-year stakeholder initiative established by Governor Whitmer in collaboration with the MPSC to maximize the benefits of the transition to clean, distributed energy resources for Michigan residents and businesses. The initiative includes outreach, education, and changes to utility regulation designed to ensure that the state's clean energy future provides safe, reliable, affordable, and accessible energy resources. MI Power Grid will achieve this by focusing on three areas of emphasis:
 - Customer engagement,
 - Integrating emerging technologies, and
 - Optimizing grid performance and investments.²⁵

Please see Chapter 5 and Chapter 11 for steps the State is taking to maximize opportunities for U.S.-made EVSE.

Figure 1: Charge Up Michigan Charging Stations



2.2 Border State Agency Coordination

Collaboration is underway with the States of Indiana, Illinois, Iowa, Kansas, Kentucky, Minnesota, Missouri, Ohio, and Wisconsin through the following organizations and initiatives:

- **Regional Electric Vehicle (REV) Midwest Coalition:** In September 2021, the Governors of Illinois, Indiana, Michigan, Minnesota, and Wisconsin signed a [Memorandum of Understanding \(MOU\)](#) to form the REV Midwest Coalition. The goals of REV Midwest include accelerating medium- and heavy-duty fleet vehicle electrification, elevating economic growth and industry leadership, and advancing equity and a clean environment.²⁶
- **Mid America Association of State Transportation Officials (MAASTO):** The MAASTO Board of Directors established the EV Infrastructure Committee for the member States of Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. The goal is to identify opportunities for collaboration on the implementation of an EV charging network across MAASTO states.
- **Lake Michigan EV Circuit Tour:** DNR, LEO, and OFME, along with the States of Illinois, Indiana, and Wisconsin, are partnering with the private sector to establish a network of EVSE around Lake Michigan at small businesses, lodging and resort businesses, and every feasible State Park, lighthouse, and shoreline. The network is intended to provide a long-distance EV route with zero range anxiety and promote ecotourism around Lake Michigan. The Michigan locations in the EV Circuit are illustrated in Figure 2.

Table 5 lists the designated Michigan AFCs that cross into neighboring states. Michigan has coordinated with the surrounding states and does not have any AFC mismatches at borders.

Table 5: Border State AFC Crossings in Michigan

Border State	Route	Designated AFC in Border State?
Indiana	I-94, I-69	Yes
Ohio	I-75	Yes
Wisconsin	US-2	Pending

2.3 International Agency Coordination

Michigan has three bridge crossings and one tunnel crossing facilitating international highway travel between the U.S. and Canada, and one new bridge crossing is currently under construction by a public-private partnership (P3), as shown in Table 6. The Detroit-Windsor Tunnel crossing is in the process of establishing a discounted EV toll rate to encourage EV adoption. In addition, Michigan and Ontario have signed the [Cross-Border Mobility Technologies MOU](#) to spur border-crossing technology innovations and transportation solutions, such as clean powertrain technologies.²⁷

Table 6: International Border Crossings in Michigan

Crossing	Location	Route	Designated AFC?
Ambassador Bridge	Detroit	I-75 / I-96	Yes
Blue Water Bridge	Port Huron	I-94	Yes
Detroit-Windsor Tunnel	Detroit	M-10 / I-375B / Jefferson Avenue	No
Gordie Howe International Bridge (<i>under construction</i>)	Detroit	I-75	Yes
International Bridge	Sault Ste. Marie	I-75	Yes

Figure 2: Lake Michigan EV Circuit



Chapter 3 Stakeholder and Public Engagement

The State brings a foundation of robust stakeholder relationships to EV infrastructure planning, leveraging its long history of working successfully across sectors to plan and implement statewide and regional infrastructure projects. Extensive EV infrastructure outreach and engagement efforts have been underway for years as a key input to the *Michigan Mobility 2045 (MM2045): A transportation plan for a connected future* (February 2018-November 2021), the Optimized EV Charger Placement Plan / Charge Up Michigan Program (March 2018-January 2020), the Catalyst Communities Initiative (November 2020-July 2022), and the [MI Healthy Climate Plan](#) (April 2021-February 2022). Through these initiatives, the State has engaged over 7,000 attendees in virtual workshops and in-person forums, received feedback from over 9,000 survey participants, hosted over 11,000 website visitors, and had 500,000 social media advertisement views. Stakeholders engaged in these efforts are indicated in Figure 3.

Figure 3: Stakeholders Engaged in Previous Outreach Efforts^{28, 29, 30, 31}



3.1 Stakeholders Involved in Plan Development

Building on previous stakeholder engagement efforts, the State has continued outreach and engagement efforts specific to the *Michigan State Plan for EV Infrastructure Deployment* development. As of July 31, 2022, 26 meetings were held, covering over 200 of the entities listed in Figure 4, with numerous future meetings scheduled. The stakeholder meetings were held virtually with public and private entities representing a full spectrum of the EV ecosystem. The purpose of these discussions was to:

- Inform stakeholders of the NEVI program and guidance requirements,
- Gain insights into key planning considerations for EV charging buildout, and
- Understand how the State can support implementation.

Additional stakeholder meetings will be held throughout the deployment phase of the NEVI program, which will be summarized through an annual stakeholder engagement meeting report.

3.2 Public Outreach

Public outreach and engagement have occurred and will continue throughout the lifecycle of the program. Current outreach efforts include:

- Ongoing use of a [survey](#) posted on OFME's (LEO's) website and linked from the MDOT and EGLE websites that is used to obtain input from stakeholders and the public after each meeting,³² and
- A webinar conducted on July 18, 2022, to educate the general public about EVs and the *Michigan State Plan for EV Infrastructure Deployment*.

Continuing engagement will include:

- Conducting a series of meetings with various organizations, such as Clean Cities Coalitions, community-based organizations, the State of Michigan Office of the Environmental Justice Public Advocate, tribal governments, and workforce trade organizations, in order to:
 - Inform them about how the NEVI Formula Program and various activities can potentially impact them;
 - Seek their feedback to better understand community equity challenges, needs, and perspectives; and
 - Identify how Disadvantaged Communities (DACs) could benefit from deployment of the EV charging network;
- Hosting a series of five listening sessions across the state to educate the public on EV opportunities and hear from residents; and
- Integrating the input received into future NEVI planning and workforce development programs aimed at training and upskilling the local employment base to be able to capitalize on EVSE installation and operations and maintenance (O&M) opportunities.

Figure 4: Stakeholders Engaged in Michigan State Plan for EV Infrastructure Deployment Outreach Efforts



Chapter 4 Plan Vision and Goals

The *Michigan State Plan for Electric Vehicle Infrastructure Deployment* vision and goals, shown in Table 7, were developed through a collaborative approach with various State agencies and alignment with other State plans to set the direction for successfully deploying NEVI Program funding within Michigan. In particular, the following state sustainability goals were established in the 2022 *MI Healthy Climate Plan*:

- Reduce GHG emissions economy-wide by 28% below 2005 levels by 2025, en route to achieving carbon neutrality by 2050; and
- Build the safe, convenient, affordable, reliable, and equitable infrastructure necessary to support two million EVs on Michigan roads by 2030.³³

Recommendations on how to achieve these goals may include purchase incentives, transitioning the State of Michigan's fleet to 100% zero-emission vehicles, and adopting a Clean Fuels Standard.³⁴ The NEVI Formula Program will help Michigan make early progress towards deploying the DCFC infrastructure needed to support the goals in the *MI Healthy Climate Plan*.

Table 7: Plan Vision, Goals, and Outcome

VISION	Develop a safe, equitable, reliable, convenient, and interconnected transportation electrification network that enables the efficient movement of people, improves quality of life, spurs economic growth, protects Michigan's environment, and facilitates data collection.
GOALS	<ol style="list-style-type: none"> 1. Reduce vehicle emissions to improve air quality and increase the protection of human health and the environment; 2. Build a stronger state economy and workforce through safer, more equitable and environmentally conscious transportation for all Michigan residents; 3. Plan and deliver a NEVI charging infrastructure program that provides a safe and reliable electric transportation option for motorists throughout Michigan; and 4. Leverage ongoing utility EV pilots and programs, encourage charging deployment that enhances electric grid utilization and distribution system reliability, and support the buildout of a statewide charging network that provides benefits to all ratepayers.
OUTCOME	The State of Michigan will deploy 127 DCFC chargers to achieve a fully built-out AFC corridor network by 2026.

Chapter 5 Contracting

The State of Michigan will contract with private and/or other public entities for the acquisition, installation, and O&M of publicly accessible EV charging infrastructure to maximize the use of the NEVI Formula Program funding. The State will utilize the existing [Charge Up Michigan](#) Program to administer most of the NEVI funds for AFC buildout. The program is currently supported by the VW settlement funds and is the planned mechanism to evaluate and award contracts as part of the Lake Michigan EV Circuit Tour initiative.³⁵ Other programs and initiatives may be leveraged to enhance EV infrastructure deployments and innovation once AFC buildout certification has been achieved.

The State plans to modify the existing Charge Up Michigan Program framework to account for the NEVI Formula Program's Notice of Proposed Rulemaking requirements, as summarized in Figure 5 and Table 8. The steps to develop the contracting approach needed to facilitate the use of NEVI Formula Program funding fully, efficiently, and effectively are further explained in Section 5.1. The procurement process will be structured to deliver EV charging infrastructure in a manner that leads to effective deployment and efficient delivery of ongoing O&M based on the goals of the *Michigan State Plan for Electric Vehicle Infrastructure Deployment*. The State will identify lessons learned from the current Charge Up Michigan procurement process through outreach to the following groups:

- EGLE staff responsible for facilitating the Charge Up Michigan Program; and
- Charge Up Michigan participants, such as applicants, landowners, EVSE manufacturers, installation contractors, utilities, and local agencies.

In addition, the State will obtain market feedback, as necessary, to refine changes and draft competitive procurement language.

Figure 5: Contracting Approach



Table 8: Charge Up Michigan and NEVI Contracting Considerations

Category	Charge Up Michigan General Guidance	NEVI Considerations
Eligibility	<ul style="list-style-type: none"> Any public or private organization located or having a significant presence in Michigan 	<ul style="list-style-type: none"> Open to public and private organizations Incorporate aspects of the State's Small Business Program (SBP) or Disadvantaged Business Enterprise (DBE) program, as applicable, for participation in operating, maintaining, and installing EVSE^{36, 37}
Location	<ul style="list-style-type: none"> Within five miles of designated locations based on the Optimized EV Charger Placement Plan / Charge Up Michigan Program May submit alternative locations with supporting rationale 	<ul style="list-style-type: none"> Every 50 miles along AFCs and within one mile of an AFC Allow for submissions outside of AFCs when fully built out and certified Determine location bundling and/or grouping/phasing to define a “project” Utilize EV charger optimization modeling to identify EV charging location needs and number of chargers Assess utility readiness
Charging Infrastructure	<ul style="list-style-type: none"> 50 kW capacity; futureproof to 100 kW Public availability New equipment No wireless charging 	<ul style="list-style-type: none"> Minimum of four DCFCs of 150 kW each Publicly accessible New equipment and/or upgrades to existing EVSE equipment Installed and maintained using certified, licensed professionals

Category	Charge Up Michigan General Guidance	NEVI Considerations
Grant Amount	<ul style="list-style-type: none"> • Lesser of 33.3% of the total cost or direct match of the amount provided by the utility • Total grant amount cannot exceed \$70,000 per station 	<ul style="list-style-type: none"> • Federal cost share of 80% • Determine other cost-share participants (e.g., State, utility, applicant) • Determine the maximum allocation of funding available per location and/or “project” • Clarify the ability to combine funding with other eligible USDOT funding sources for EV charging infrastructure projects • Determine if incentives will be provided to ensure that all sites receive applications for the complete buildout of AFCs • Consider a funding model that increases the cost-share provided to the applicant when using Michigan-based labor or charging devices made with Michigan components
Reimbursable Items	<ul style="list-style-type: none"> • Site preparation • EV charging equipment • EV equipment installation • Networking fees • Signage 	<ul style="list-style-type: none"> • Consider adding operating assistance for up to five years • Add planning, design, and development phase activities • Add data-sharing of EV charging infrastructure
Application Process	<ul style="list-style-type: none"> • Requests for Proposals (RFPs) with online submittal • Submission form window remains open until all funds are exhausted³⁸ 	<ul style="list-style-type: none"> • Governed by Chapter 1 of Title 23 of the U.S. Code • Add NEVI as an option to the Charge Up Michigan Grant Application³⁹ • Require applicants to be registered with the State via SIGMA Vendor Self-Service (VSS) to track information and facilitate payment⁴⁰

Category	Charge Up Michigan General Guidance	NEVI Considerations
Scoring Criteria	<ul style="list-style-type: none"> • Station location and access to nearby amenities • Station design, facility requirements, and minimum specifications • Project communication and strategic partnerships • Budget, budget narrative, business model, and proof of financial security • Organization, staff experience, and qualifications • Innovation and sustainability • Pounds of nitrogen oxides (NOx), Particulate Matter (PM) 2.5, and other emissions reduced for the life of the charging station • Grant cost effectiveness (total NOx emissions reduced divided by grant amount) • Total cost effectiveness (total NOx emissions reduced divided by total project cost)^{41, 42} 	<ul style="list-style-type: none"> • Consider a two-step scoring evaluation: pass/fail to meet the mandatory minimum NEVI requirements, then rank/score candidate projects • Incorporate disadvantaged and rural communities • Incorporate high-/low-demand variability to achieve coverage every 50 miles • Incorporate use of Michigan labor and prevailing wage • Establish other State priorities, such as filling critical gaps and high-demand areas, utility readiness, distance from interchanges, environmental justice, new deployments vs. upgrades, alignment with initiatives such as REV Midwest, etc.
Construction	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Seek community engagement prior to construction of EV chargers • Require that installation be performed by licensed professionals certified to work on EV charging infrastructure
Reporting and Monitoring	<ul style="list-style-type: none"> • The State can request usage statistics for up to five years after the agreement ends 	<ul style="list-style-type: none"> • Add the specific reporting and data-sharing required to support program evaluation • Ability to share data with third-party data aggregators for EV charging information, including both websites and applications, through Open Charge Point Interface (OCPI) protocol • Require reliability metrics during O&M period

5.1 Contracting Approach

The following seven-step process has been developed to facilitate the State's contracting and implementation:

Step 1: Determine charging location needs

- a. Update the *Electric Vehicle Charger Placement Optimization in Michigan: Phase I – Highways (Supplement I: Full Tourism Analysis)* report based on NEVI deployment requirements⁴³
- b. Publish an online map showing the needed EV charging locations with associated priority phases, and/or bundling

Step 2: Develop contractual requirements

- c. Develop contractual requirements for the following to ensure an efficient and effective deployment; support program evaluation; and safeguard the affordability, resilience, and reliability of EV charging stations:
 - Planning, environmental clearance, design, permitting, and installation
 - Roles of property owners, installation contractors, utilities, networking companies, the State, and local agencies
 - Collaboration and coordination with property owners, municipalities, utilities, other impacted entities, and the public
 - Stakeholder and public engagement responsibilities and expectations
 - Participation in outreach and educational campaigns
 - Small business and DBE involvement
 - Minimum EV charging equipment specifications
 - EV charging equipment aesthetic guidelines and restrictions, such as advertising
 - Procurement and construction adhering to Buy America⁴⁴
 - Determine if surety and/or performance bonds will be required
 - O&M of hardware, networks, charger availability, safety data, cybersecurity data, and data monitoring
 - Reporting and data-sharing
 - At a minimum, the number of charging events per day, month, and year by time of day; number of charging events by vehicle model; availability of chargers per month and year; number of times per year that chargers were not working properly, with summary data; number of charging events by time of day, average time per charge, and how much energy was delivered; annual maintenance costs; and technology issues
 - Consider the use of a central management software with established application programming interfaces for data-sharing and reporting
 - Establish the cadence, format, submission, and record retention processes
 - Define uptime, and establish minimum uptime requirements
 - Determine how to measure, report, and enforce uptime requirements
- d. Performance evaluation and penalties for failing to adhere to contract requirements (e.g., repayment if a charging station does not remain in operation for the defined O&M period)

- e. Transition options when the required O&M period expires
- f. Guidance on eligibility for participation in other Michigan funding initiatives

Step 3: Develop and advertise RFP

- g. Update the [Request for Proposals: Charge Up Michigan](#) to incorporate the NEVI Formula Program requirements, including new selection criteria and funding reimbursement amounts⁴⁵
- h. Revise the [Charge Up Michigan sample agreement](#)⁴⁶
- i. Update the [Charge Up Michigan Grant Application](#) to include the NEVI Formula Program⁴⁷
- j. Establish associated timeline requirements
- k. Determine the application review team and processes for award notifications (e.g., rolling vs. defined submittal windows)
- l. Consider qualifications and responsible contracting requirements for EVSE vendors, installers, networks, O&M, etc.
- m. Consider list of qualified EVSE vendors and/or installation contractors
- n. Advertise RFP

Step 4: Evaluate applications and award contracts

- o. Establish application review committee with NEVI expertise
- p. Receive, review, score, and select applications for award
- q. Award to and execute contracts with selected applicants

Step 5: Provide planning, design, and construction support and oversight

- r. Establish a group responsible for managing and overseeing the planning, designing, permitting, constructing, and inspecting of EV charging stations
- s. Determine the inspection processes, staff qualifications, and fee structures to approve and transition stations into O&M, such as:
 - Municipality inspections as per applicable code(s)
 - MDARD inspections prior to new devices being placed into commercial service

Step 6: Provide O&M oversight

- t. Establish a group responsible for overseeing and monitoring program performance and contract adherence
- u. MDARD to establish inspection frequency and conduct inspections during the O&M phase

Step 7: Facilitate project closeout

- v. Establish an expiration and release-of-terms process
- w. Establish a group responsible for closing out projects and supporting transitions when the O&M period expires

Chapter 6 Existing and Future Conditions Analysis

This chapter provides an overview of Michigan's geography, terrain, and climate, including current and future temperature, precipitation, and land use patterns; known risks and challenges; and industry and market conditions.

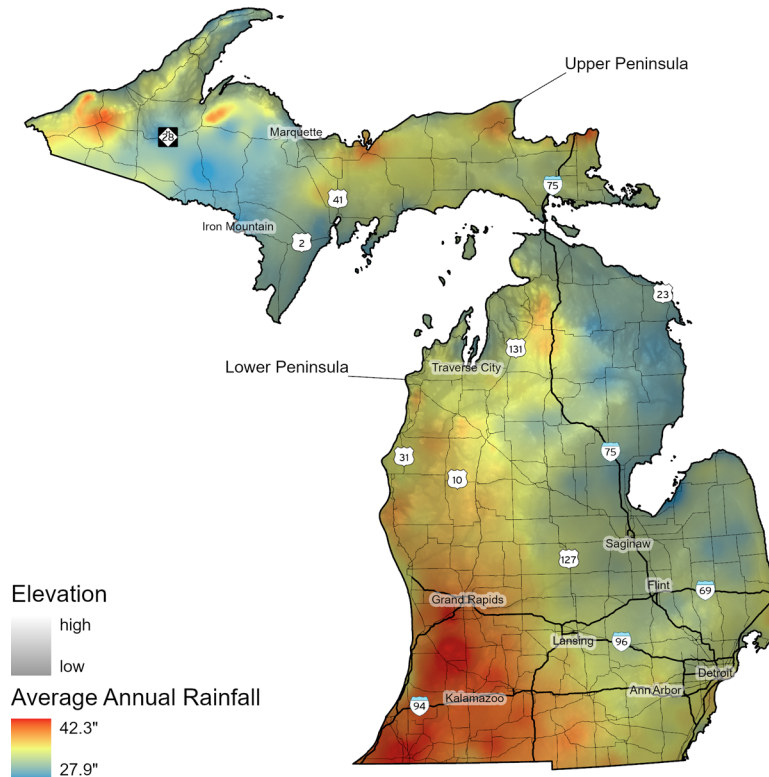
6.1 State Geography, Terrain, Climate, and Land Use Patterns

Michigan borders Canada, Indiana, Ohio, and Wisconsin. The state's land and water area make it the 10th largest in the U.S. In Michigan, there are 58,110 square miles of land; 1,305 square miles of inland water; 3,288 miles of Great Lakes shoreline; and 8,575 square miles of Great Lakes water. Wetlands cover about 15% of the state. The highest point in the state is 1,981 feet above sea level, and the lowest point is 572 feet above sea level.⁴⁸

Michigan is divided into two main land areas, the UP and the Lower Peninsula, and borders all Great Lakes except for Lake Ontario. While Isle Royale is part of Michigan and was included in the state's rainfall and land use statistics, it was not otherwise considered for the NEVI Formula Program due to its status as a National Park.

Winter low temperatures in Michigan average around 13°F, while summer highs reach the mid-80s°F. As shown in Figure 6 below, the state receives an average of 34.5" of rain per year, which is four inches higher than the national average, and the southwestern portion of the state gets more average rainfall than does the rest of the state.⁴⁹

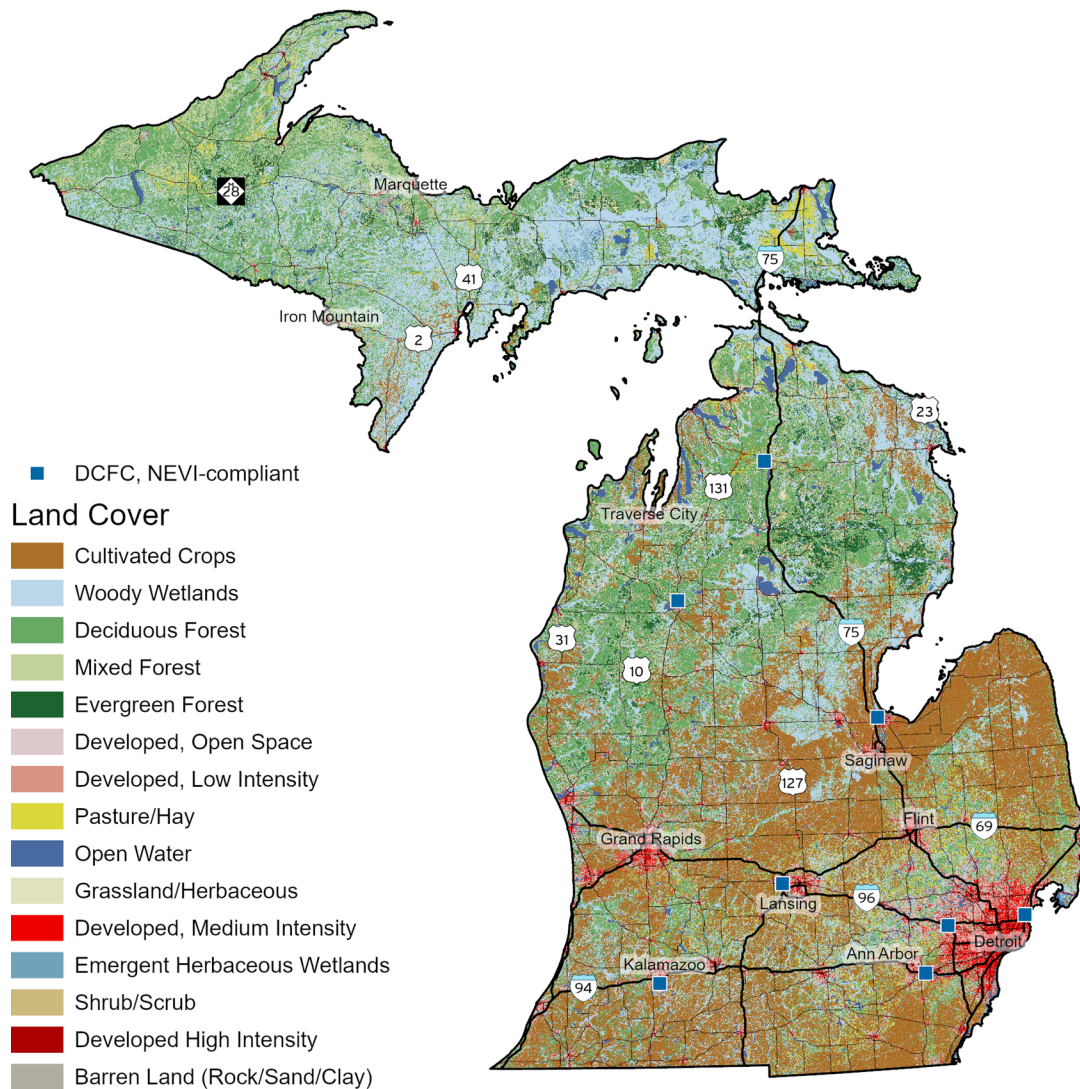
Figure 6: Michigan Elevation and Rainfall⁵⁰



Summers are warming and becoming dryer, while recent winters have been characterized by polar vortexes. Intense rainfall during storms has caused flooding and high water levels. These factors contribute to habitat, wildlife, and crop losses; increased pests and diseases; infrastructure damage; and power outages.⁵¹

The State's land cover is shown in Figure 7. The UP is primarily covered with woody wetlands and forestland, as is the northern portion of the Lower Peninsula. Moving from north to south, there is an increase in farmed and developed land. The state is home to approximately 47,600 farms, with a total of almost 10 million acres of farmland. Michigan produces over 300 agricultural commodities, constituting the country's second most diverse agriculture industry, including the most dry black and cranberry beans, begonias, blueberries, tart cherries, pickling cucumbers, Easter lilies, geraniums, low-fat ice cream mix, impatiens, petunias, and squash in the U.S. Christmas tree growing, dairy production, and livestock raising are significant in Michigan as well. Finally, year-round tourism driven by the state's geography is critical to the economy.^{52, 53}

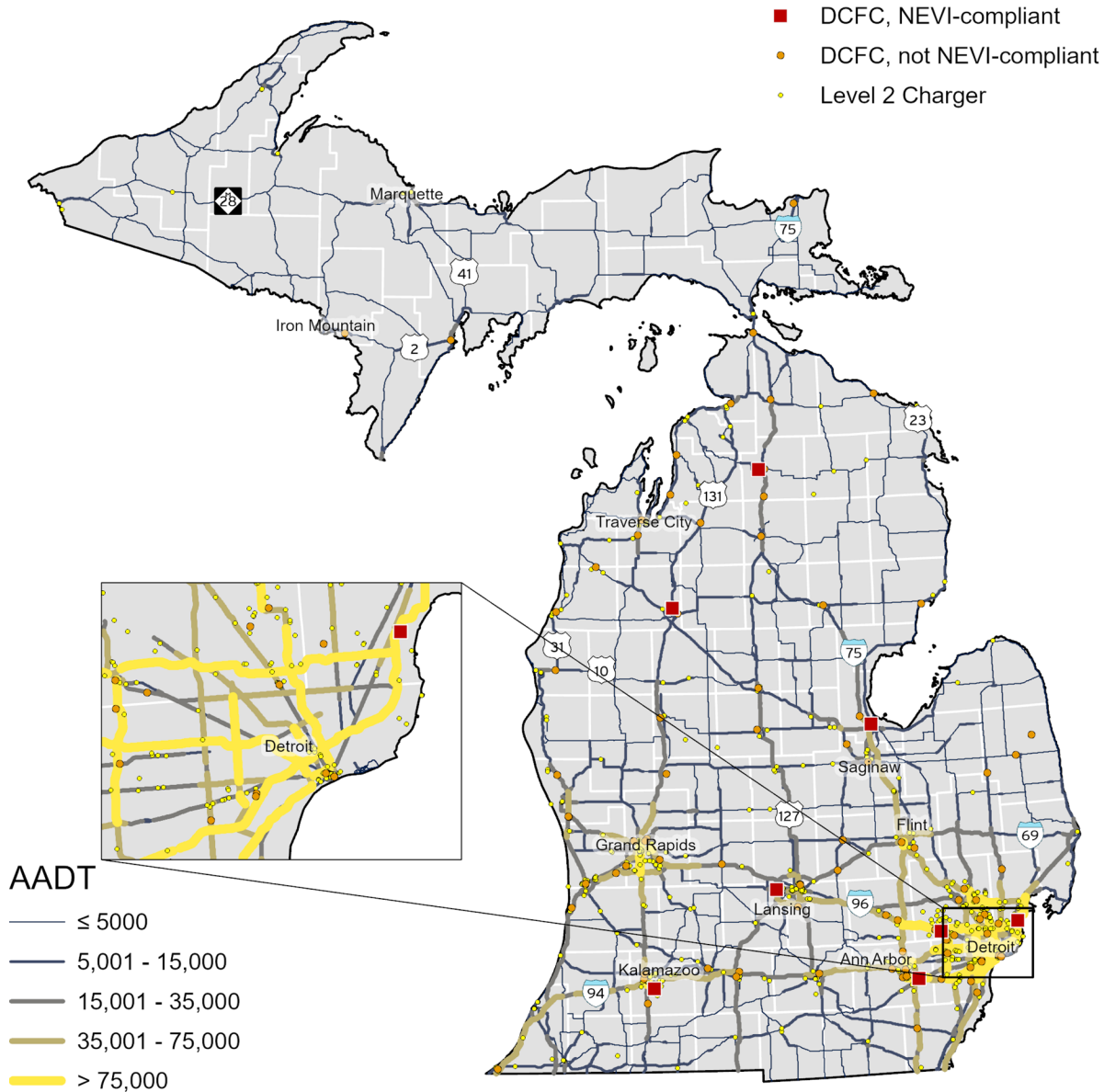
Figure 7: Michigan Land Cover⁵⁴



6.2 State Travel Patterns and Public Transportation, Freight, and Other Supply Chain Needs

State travel patterns and annual average daily traffic (AADT) are shown in Figure 8. Interstates and other AFCs have significantly more AADT, moving from north to south in Michigan.

Figure 8: Michigan Travel Patterns and AADT⁵⁵



To determine DCFC demand on Michigan's AFCs, the MDOT road network and origin-destination (O-D) travel demand were used. The state TransCAD network, shown in Figure 9, contains 83,820 links and 62,996 nodes. This model, previously used to support prioritization of charging locations for the Charge Up Michigan Program, was updated to meet the NEVI requirements, as discussed in Section 7.2.

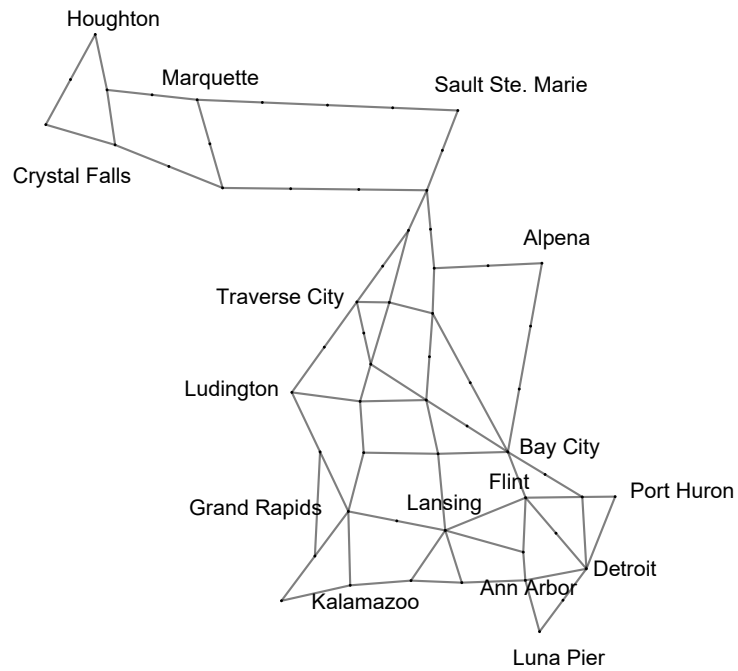
To improve computational efficiency, a simplified model, shown in Figure 10, was developed to represent a weekday in the fall with normal weather conditions. Demand from 23 nodes representing cities with

populations of 50,000 or more was used to load the network and analyze charging demand in various scenarios discussed later in this chapter.

Figure 9: Michigan TransCAD Network

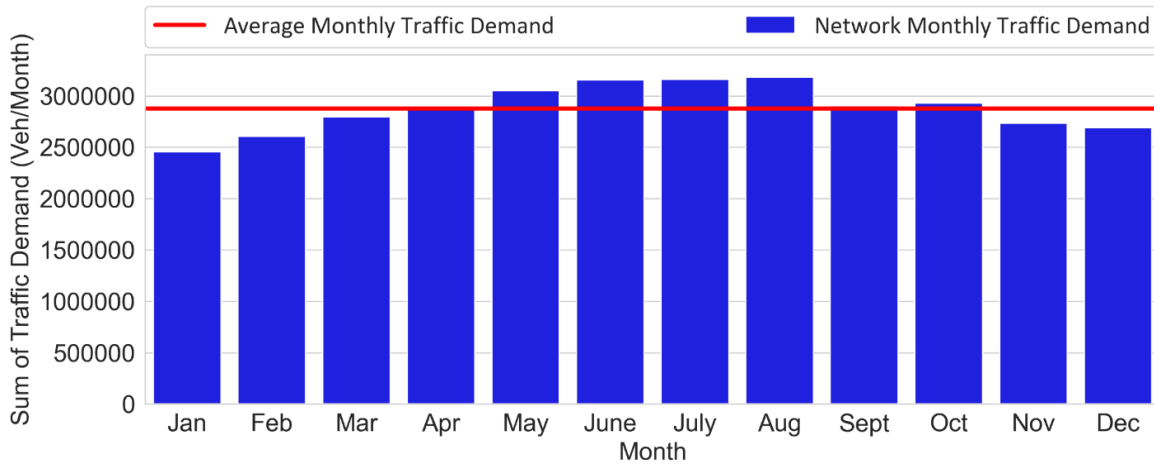


Figure 10: Simplified Road Network Model



Network and average monthly traffic demand based on this simplified model are shown in Figure 11. Travel demand in Michigan, particularly in the UP, can vary significantly throughout the year, in part due to cold winter weather and scenic views year-round in the state. Using data from 69 MDOT continuous counting stations on the simplified network, travel demand was calibrated. As the State of Michigan moves beyond the initial interstate deployment of EVSE, variations will need to be considered in more detail.

Figure 11: Average Monthly Traffic Demand in Michigan



6.2.1 Public Transportation Needs

MDOT oversees more than 135 public transportation providers, rideshare providers, and passenger marine vessels in the state. Michigan has 82 public transit agencies, including urban, rural, and four ferry boat agencies, that serve the state's 83 counties.^{56, 57} Public transit is available in every county in the state.⁵⁸ Michigan is unique in the fact that MDOT covers the 20% cost-share requirements for all rural transit agencies, which offsets any additional cost burdens they may have.

In 2020, MDOT received \$6.3 million from the Federal Transit Administration's (FTA's) Low or No Emission (Low-No) program to support the deployment of 12 shuttle buses and five 40'-long buses.⁵⁹ In 2021, MDOT received \$5.1 million on behalf of the Huron Transit Corporation / Thumb Area Transit to improve a transit facility in a rural county through FTA's Low-No program.⁶⁰ To date, 10 transit agencies in the state have deployed zero-emission battery electric buses, and 17 zero-emission battery electric school buses have been introduced across seven school districts. Currently, there are more than 29 additional buses ready for procurement. The FTA is making funding available to support the transition to no- and low-emission vehicles, though this requires applying agencies to develop no-emission fleet transition plans.⁶¹ More than 14 agencies in Michigan recently requested federal funding to deploy another 50 zero-emission battery electric buses. Transit agencies across the state have established zero-emission goals, and local governments have adopted climate plans. The State will continue to pursue funding to help support these efforts and lower emissions.

Transit services can play a leadership role in the EV transition in the U.S.⁶² However, challenges to widespread adoption of electric buses remain. Transit agencies often need support with funding, workforce development, staff training, EV route planning, deploying charging infrastructure, upgrading electrical networks, environmental reviews, land acquisition, and other efforts. Initial c⁶³

Capital costs are the largest barrier, as electric buses, not including the charging infrastructure, can cost up to twice as much as the cost of equivalent diesel buses.

6.2.2 Freight and Other Supply Chain Needs

Trucks move approximately 71% of the 528 million tons and 74% of the \$799 billion of freight that travels through Michigan each year, and Michigan's transportation sector accounts for almost 28% of the state's total GHG emissions, with 65% from light-duty vehicles (LDVs) and 21% from freight. Freight volumes are forecasted to grow across Michigan's roads over the next 25 years. The total tonnage carried via trucking is projected to increase by 15% from 2019 to 2045, with about half of the growth coming from pass-through traffic. During that same time period, the total value of freight shipments is forecasted to grow by 46%. The increase in freight volume will cause more demand on the state's highway infrastructure, negatively impacting existing bottlenecks and supply chains.

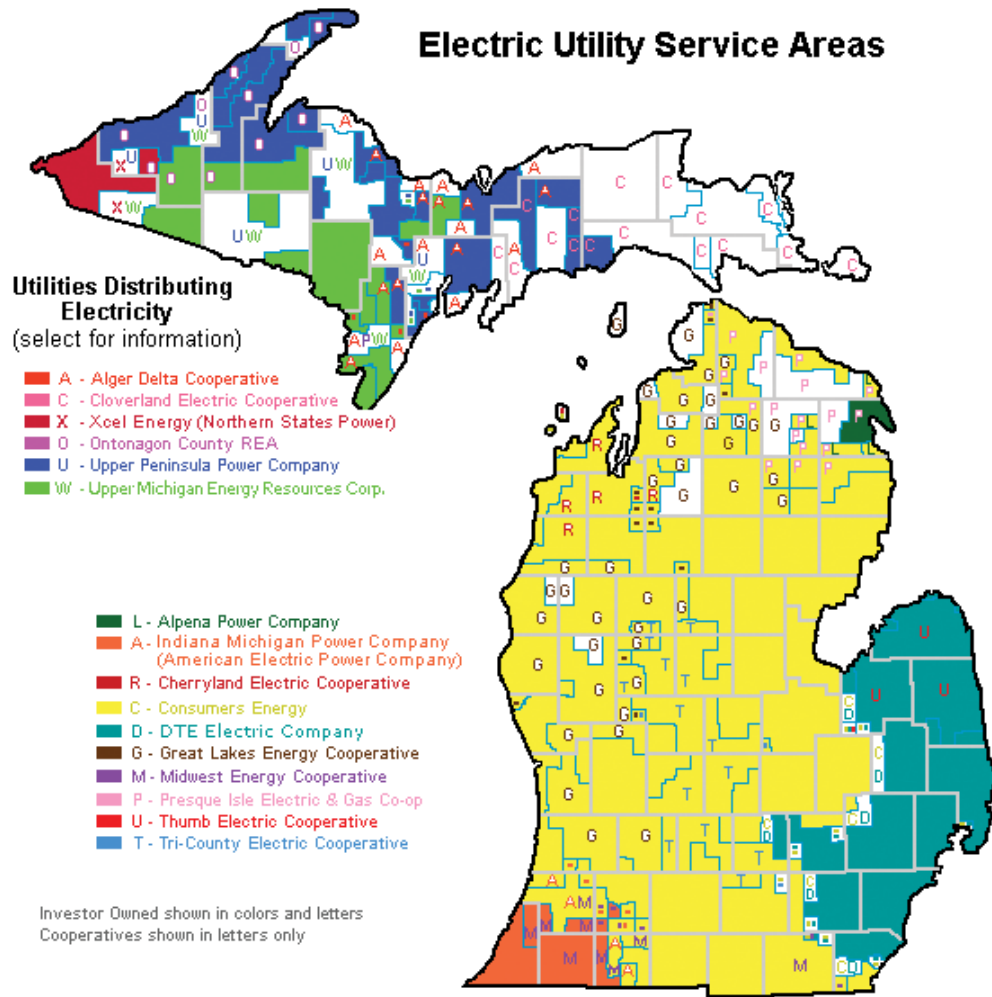
The State anticipates that the supply chain and freight transportation routes will diversify. Funding to preserve and expand the freight system after years of under-investment is essential to Michigan's ability to recapture and grow the manufacturing industry. Many industries are rethinking their supply chains to mitigate disruption, take advantage of emerging modes of production, and respond to consumer preferences. The state's importance as a gateway to Canada will likely rise as more freight volumes flow across the continent.

Freight electrification has been slower for larger medium-duty and long-haul vehicles because of their [higher energy needs](#).⁶⁴ These vehicles weigh more, pull heavier loads, and often have more intensive duty cycles than LDVs. The freight industry will require a network of megawatt charging systems along AFCs to increase the adoption of electric freight vehicles and the funding to support the development and deployment of the vehicles. A recent letter to the USDOT and U.S. Department of Energy (DOE) penned by EV companies requested that 10% of EV charging be allocated to medium- and heavy-duty vehicle infrastructure.^{65, 66}

6.3 State Electric Utility Service Areas

Michigan's existing electric utility distribution is shown in Figure 12 below. Michigan has eight investor-owned utilities, 40 municipal power providers, and nine rural cooperatives.

Figure 12: Michigan Statewide Electric Utility Distribution⁶⁷



6.4 AFC Networks

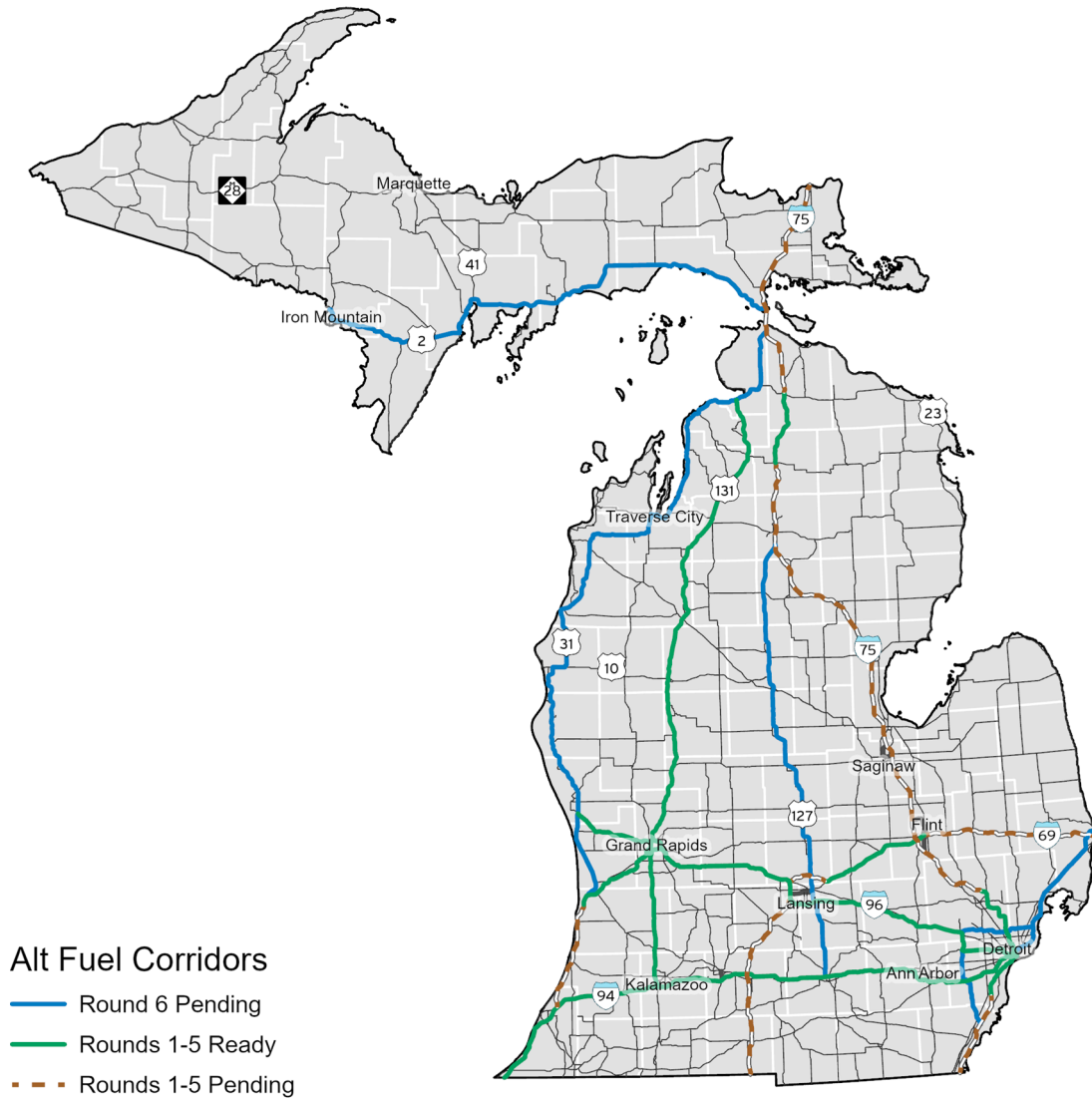
Michigan's existing and proposed AFCs and NEVI-compliant chargers are identified in Figure 13. The State, along with Michigan Clean Cities, Clean Fuels Michigan, SEMCOG, and Southwest Detroit Environmental Vision, submitted seven new MDOT-jurisdiction National Highway System (NHS) corridors in FHWA's Round 6 nomination process in May 2022.

These seven corridors, shown in blue in Figure 13 and Figure 14, represent critical routes between cities and innovation centers in the Upper Midwest Region; support the Lake Michigan EV Circuit; and serve as key east-west and north-south interstate and international routes that sustain the nation's economy, mobility, and defense:

- I-94 from Detroit to Port Huron (EV Pending),
- I-94 from Ypsilanti to Port Huron (Hydrogen Fuel Cell Pending),
- I-696 from I-96 to I-94 (EV Ready),
- I-275 from I-75 to I-96 (EV Ready),

- US-31 from Holland to the Mackinac Bridge (EV Pending),
- US-127 from Jackson to its terminus at I-75 (EV Ready and Pending), and
- US-2 from St. Ignace to Iron Mountain, Wisconsin (EV Pending).

Figure 13: Ready, Pending, and Nominated AFCs in Michigan



Installing EV chargers along these AFC routes will improve environmental and public health by promoting the use of low-emission fuels and vehicles and contributing to the development of electric and alternative fueling sites in Michigan. It will also enhance environmental preservation, energy security, and quality of life. After the State's Round 6 nominations are approved by FHWA, most interstate routes in Michigan will be on the electric AFC network, designated as either Corridor Ready or Corridor Pending.⁶⁸

6.5 Existing Locations of Charging Infrastructure along AFCs

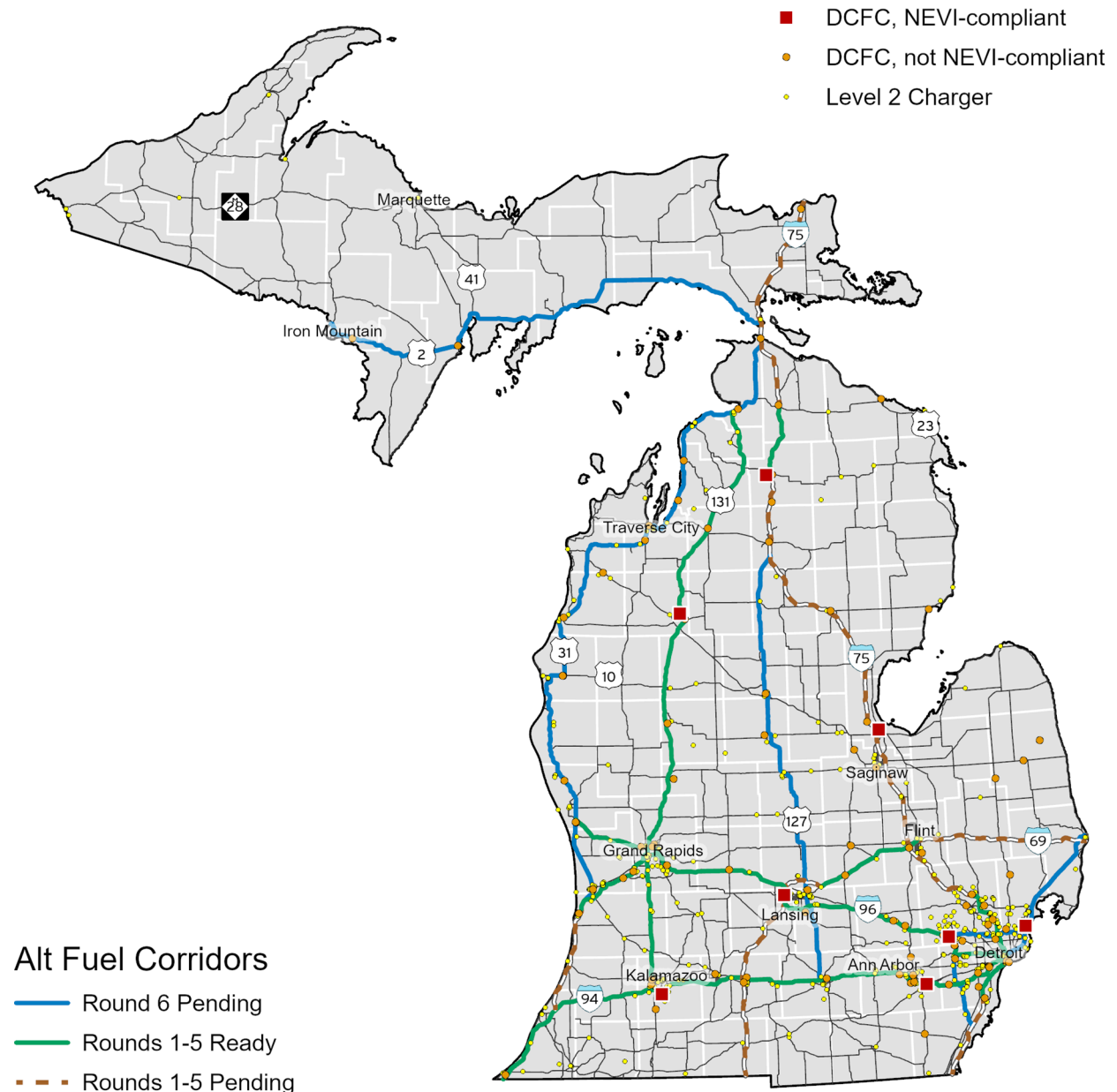
Table 9 provides details about the existing charging infrastructure locations along Michigan's AFCs, as of June 2022. In addition, various public utilities and Electrify America have plans to add high-powered DCFC stations to the network over the next few years. See Section 7.3 for more information on the utility programs.

Table 9: Michigan EV Charging Infrastructure, as of June 2022

ID	Number, Power of Chargers	Route	Location	EV Network
11176	2x 150 kW, 2x 350 kW	I-96, I-69	Walmart 2869 409 North Marketplace Boulevard Lansing, MI 48917	Electrify America
11179	4x 150 kW, 2x 350 kW	I-94	Sam's Club 6661 7021 South Westnedge Avenue Portage, MI 49002	Electrify America
12731	4x 150 kW, 2x 350 kW	I-94	Roundtree Place 2539 Ellsworth Road Ypsilanti, MI 48197	Electrify America
12746	2x 150 kW, 2x 350 kW	I-96	Walmart 5893 26090 Ingersol Drive Novi, MI 48375	Electrify America
23488	2x 150 kW, 2x 350 kW	I-94	Meijer Roseville 30800 Little Mack Avenue Roseville, MI 48066	Electrify America
24039	2x 150 kW, 2x 350 kW	I-75	Meijer Bay City 2980 Wilder Road Bay City, MI 48706	Electrify America
24040	2x 150 kW, 2x 350 kW	US-131	Meijer Cadillac 8605 East 34 Road Cadillac, MI 49601	Electrify America
24041	2x 150 kW, 2x 350 kW	I-75	Meijer Gaylord 250 Meijer Drive Gaylord, MI 49735	Electrify America ⁶⁹

The 15 existing DCFC stations in Michigan with a total of 55 chargers over 150 kW are shown in Figure 14 below.

Figure 14: Michigan AFC and Public DCFC and Level 2 Chargers⁷⁰



6.6 Known Risks and Challenges

Governmental agencies and private entities have implemented programs to construct EV charging stations in Michigan for several years now. As a result of lessons learned, risks that may occur during the planning, procurement, installation/testing, and O&M processes are known. Determining roles and responsibilities for all parties involved early in the project development phase will help avoid possible setbacks. Maintaining a risk register helps keep the management of risks top-of-mind.

Table 10 identifies some of the risks, the project stage in which challenges are most likely to be anticipated, and actions that should be considered to mitigate or eliminate potential challenges.

Table 10: Potential EV Deployment Challenges and Actions

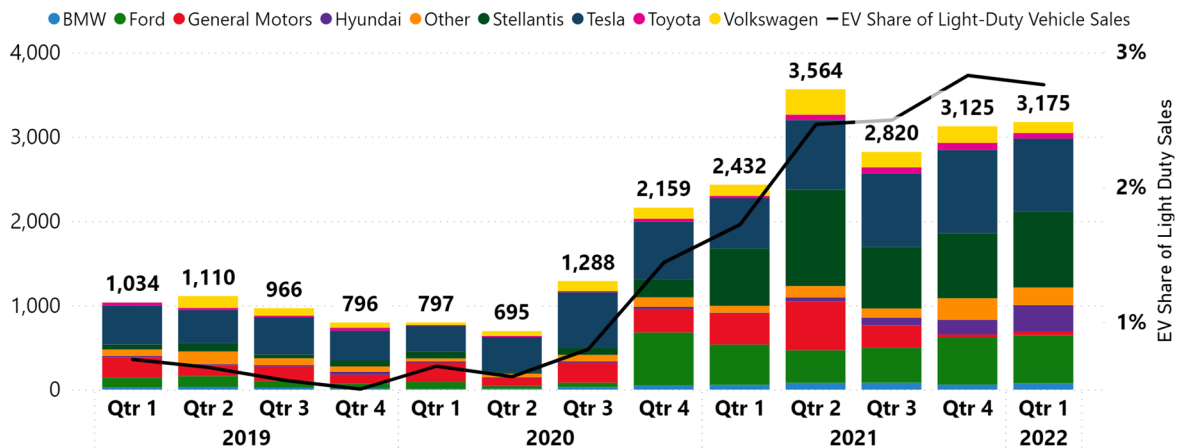
Phase	Potential Challenges	Mitigation Actions
Planning	<ul style="list-style-type: none"> • Viable location • Lack of space for EVSE • Property ownership 	Communicate constraints on and requirements for properties in the RFP process. Analyze and evaluate bids to ensure locations are appropriate for EVSE.
	<ul style="list-style-type: none"> • EV-only space requirements • Americans with Disabilities Act of 1990 (ADA) EV space requirements • Code requirements 	Property owners and designers must work with local agencies on design to ensure the requirements are fully met.
	<ul style="list-style-type: none"> • Lack of use • Loss of profitability • Demand charges 	Conduct public engagement, reference siting studies, and determine potentially viable high-traffic locations. Coordinate locations and rates with utility companies, and implement demand management software.
Procurement	<ul style="list-style-type: none"> • Supply chain delays • Infrastructure capacity • Reliability • Peak demand load management 	Ensure discussions have taken place with utility companies and EVSE vendors/suppliers so that equipment such as power transformers, cables, distribution panels, and chargers will be available on schedule and the power capacity needed during peak demand can be met with a high level of confidence.
	<ul style="list-style-type: none"> • Permitting responsibilities • Payment responsibilities • Surety bonds 	Make sure permitting requirements are understood by potential bidders to enable successful charger deployment. Include performance bonds to ensure construction and operation terms are fulfilled.
Installation and Testing	<ul style="list-style-type: none"> • Compatible equipment • Certified installer • Contractor default • Equipment vendor support 	Review and approve all plans to ensure installation specifications are clear. Implement performance bonds in case contractors or operators fail to fulfill contracts. Perform site inspections. Require evidence that installers are certified and trained to install equipment.

Phase	Potential Challenges	Mitigation Actions
O&M	<ul style="list-style-type: none"> EV charger reliability Communication link reliability Payment Monitoring and program oversight Cybersecurity 	These are all items that affect uptime. Verify connectivity, as loss of connection keeps chargers out-of-service. As a part of the RFP and agreement processes, ensure the equipment will be monitored and returned to service without delay. Ensure cybersecurity issues are adequately addressed with robust software and payment processes.
	<ul style="list-style-type: none"> Vandalism Rodent damage General cord damage Vehicle crashes 	Implement specifications for equipment, curb, bollard, retractable cord, and vandal-proof charging equipment.
	<ul style="list-style-type: none"> Lightning Water/flooding 	Ensure chargers and charging EVs are located outside of flood-prone areas and that adequate surge suppression is provided.

6.7 Industry and Market Conditions

The national trend of accelerated EV adoption is also present in Michigan. Figure 15 shows the increasing trends in Michigan EV sales and market share from Quarter 1 of 2019 to Quarter 1 of 2022. Ford and Stellantis NV have higher market shares of EV sales in Michigan than their national averages. Tesla's market share for new EV sales in Michigan, however, was 27% in Quarter 1 of 2022, significantly below its national average of 55%. Of all the EVs in Michigan, the state has a much higher proportion of plug-in hybrid EVs (PHEVs) (55%) than both the national average (33%) and surrounding states. The EV market share in Quarter 1 of 2022 as a whole was just below three percent; nationally, it was six percent.⁷¹

Figure 15: Michigan EV Sales by Automakers through Quarter 1 of 2022



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Michigan has more EV sales per 1,000 people than any of its surrounding states besides Illinois, as shown in Table 11. Michigan's long history of automotive manufacturing has continued with the EV expansion, as the state is home to EV facilities for Bollinger Motors, Ford, General Motors, LG Electronics, Rivian, and Stellantis NV. At least 14,830 EV manufacturing jobs have been announced in Michigan, and the state leads all others in the U.S. in declared EV manufacturing investments, with more than \$15 billion.⁷³

Table 11: EV Sales in Michigan and Surrounding States

State	Total EV Sales	Battery EV (BEV) Sales	PHEV Sales	EVs per 1,000 People
Illinois	60,040	42,311	17,729	4.70
Michigan	42,357	19,136	23,221	4.25
Ohio	37,577	24,076	13,501	3.22
Indiana	16,780	10,546	6,234	2.52
Wisconsin	18,165	11,449	6,716	3.14 ⁷⁴

Michigan leads all neighboring states in the number of charging ports per 1,000 people, as shown in Table 12. The state has 2,429 ports across 1,054 locations. Of the DCFC ports, slightly fewer than 180 have been registered since January 1, 2021, and around half are Tesla chargers, with the other half being non-Tesla fast chargers.⁷⁵

Table 12: Charging Ports in Michigan and Surrounding States

State	Level 2 Ports	DCFC Ports	Level 2 Ports per 1,000 People	DCFC Ports per 1,000 People
Illinois	2,204	562	0.17	0.04
Michigan	1,982	447	0.20	0.04
Ohio	2,083	410	0.18	0.04
Indiana	706	277	0.11	0.04
Wisconsin	737	202	0.13	0.03 ⁷⁶

Chapter 7 EV Charging Infrastructure Deployment

This chapter discusses the analysis completed to identify Michigan's charging needs, the general funding plan, and considerations for future planning and deployment.

7.1 Funding Sources

The five-billion-dollar NEVI Formula Program is the formula-allocated portion of the \$7.5 billion in EV infrastructure funding made available by BIL/IIJA. It aims to provide a network of 500,000 ultra-fast EV charging stations along AFCs. The State will receive \$110 million in NEVI funds between FYs 2022-2026, which will be used to plan, install, operate, and maintain the infrastructure. The NEVI Formula Program requires a 20% non-federal match, which the State anticipates being met with private-sector matching funds. See Section 7.3 for more information on how the State is preparing for this.

The remaining \$2.5-billion competitive grant program designed to expand EV charging access throughout the country, including in rural and underserved communities, will be announced later in 2022. The State will pursue grants to compensate for potential funding gaps.

In addition, funds from other formula-based programs, such as the Carbon Reduction Program, Congestion Mitigation and Air Quality Improvement Program, Surface Transportation Block Grant Program, and National Highway Performance Program, will be explored and utilized to the extent possible to build out the EV charging network further and supplement NEVI funding.

7.2 2022 Infrastructure Deployments/Upgrades

This section summarizes the process for identifying charging priorities for investing NEVI Formula Program funds across Michigan. The following data, from the identified sources, was used for the analysis:

- Current location of DCFC (EGLE and the Alternative Fuels Data Center (AFDC)),
- Road network (MDOT),
- Traffic Analysis Zones (MDOT),
- Travel demand matrix (MDOT),
- Electricity provision costs (utilities),
- Charging station and charger costs (charging station companies), and
- Vehicle specifications (automotive companies).

The following approach was used to determine the location and quantity of chargers needed:

- Map the current location of DCFC,
- Find the optimum location of four 150 kW-or-more chargers to ensure the feasibility of intercity trips,
- Calculate the difference between the above two items to determine the upgrades required, and
- Test additional scenarios to improve understanding.

Five scenarios were tested, as identified in Table 13, to gain insight on the impact of changing input variables, such as the assumed percentage of EVs on the road, or EV market share; vehicle battery size; charging speed; and initial state of charge on the modeling outputs.

Table 13: Scenario Testing Assumptions and Results

		1	2	3	4	5
Inputs	EV Market Share	6%	25%	25%	25%	25%
	Battery (kW)	70	70	70	70	70
	Charger (kW)	150	150	150	350	350
	Initial State of Charge	100%	100%	60%	100%	60%
Outputs	NEVI Chargers	127	127	127	168	168
	Total Number of Chargers	253	482	2,136	290	968
	Average Delay (minutes)	9.7	10.2	8.4	4.0	4.9
	Total Energy Demand (megawatt hours (MWh))	92	326	1,877	342	1,922

Aside from Scenario 1, all the scenarios assume the need to provide for a 25% EV market share by 2030. The current market share is around 0.5% of vehicles on the road, with an adoption rate close to 3% for Quarter 1 of 2022. The other factor contributing to the significant need for chargers in Scenario 3 is the lower initial state-of-charge, meaning EVs are not assumed to be fully charged when they start trips. Scenario 3, highlighted in green in Table 13, was chosen by the State to project NEVI-compliant charging needs within Michigan. The total number of chargers needed is based on the projected demand, which exceeds the minimum NEVI guidance.

To further test the system, Scenarios 4 and 5 evaluated the use of more, higher-power 350 kW chargers. Results from Scenario 5, the complement to Scenario 3 but with higher-power chargers, indicate that several locations would benefit from 350 kW chargers. As the State develops plan and procurement documents, EV charger and vehicle capabilities mature, and demand increases, the number of 350 kW chargers per location and timing of deployments will be considered by the State. This is discussed further in Section 7.2.2.

The proposed AFC sites are depicted in Figure 16, and more information is provided in Table 14. These are general locations, as the modeling identified a five-mile-radius area that is optimal for the placement of charging stations.

Figure 16: FY 2022 Michigan Infrastructure Deployments/Upgrades

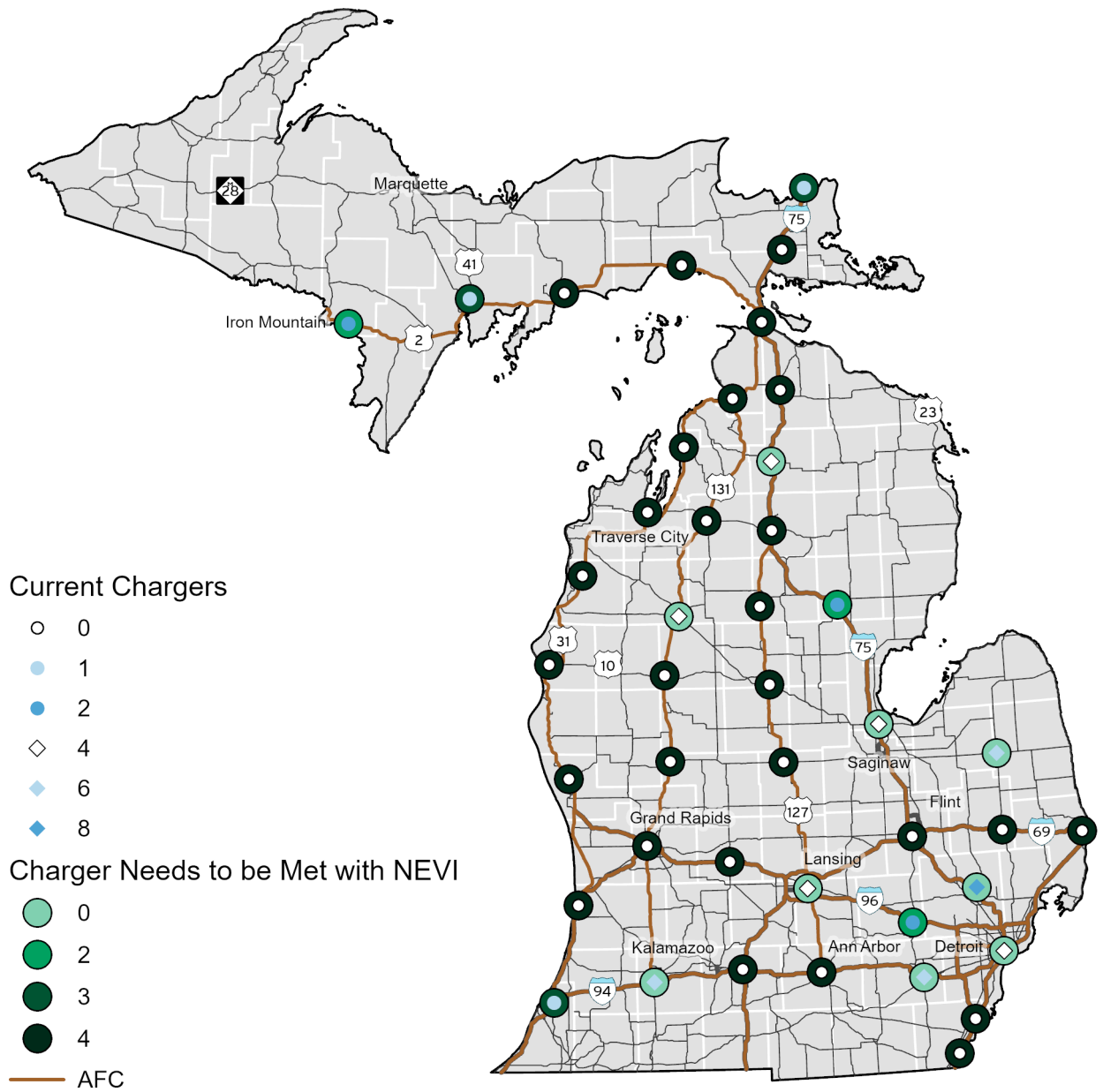


Table 14: FY 2022 EV Infrastructure Deployments/Upgrades

ID	Route	Location	NEVI Chargers Needed	EV Network*	Utility Territory	Station Owner*	FY 2022 Funding*	FYs 2023- 2026 Funding*
3	I-75	Sault Ste. Marie	3		Cloverland			
6	US-41, US-2	Rapid River	3		Alger Delta, DTE, Escanaba, Gladstone, UPPCO, Upper Michigan			
7	I-75	Mackinaw City	4		CE, Harbor Springs, Presque Isle, Wolverine Power			
8	US-31, M-37	Traverse City	4		CE, Traverse City, Wolverine Power			
9	I-75, M-72	Grayling	4		CE, DTE, Wolverine Power			
11	US-31, US-10	Ludington	4		CE, DTE, Wolverine Power			
12	US-10, US-127	Clare	4		CE, DTE, Tri-County			
13	I-75, US-10	Bay City	0		Bay City, CE			
14	I-196, US-131	Grand Rapids	4		CE, DTE			
15	I-96, US-127	Lansing	0		CE, Lansing, Wolverine Power			
16	I-75, I-69	Flint	4		CE			
17	I-69, I-94	Port Huron	4		DTE			
18	I-94, I-196	Benton Harbor	3		Midwest, Niles			
19	I-94, US-127	Portage	0		CE, Midwest			
20	I-94, I-69	Marshall	4		CE			
21	I-94, US-23	Ann Arbor	0		Clinton, DTE			
22	I-94, I-75	Detroit	0		DTE, Wyandotte			
23	I-75	Luna Pier	4		CE, Midwest			

CHAPTER 7: EV CHARGING INFRASTRUCTURE DEPLOYMENT

ID	Route	Location	NEVI Chargers Needed	EV Network*	Utility Territory	Station Owner*	FY 2022 Funding*	FYs 2023- 2026 Funding*
25	US-131, US-31	Petoskey	4		CE, DTE, Great Lakes, Harbor Springs, Petoskey, Presque Isle, Wolverine Power			
26	I-75, M-32	Gaylord	0		CE, DTE, Great Lakes, Presque Isle, Wolverine Power			
27	US-131, M-72	Kalkaska	4		Cherryland, CE, DTE, Wolverine Power			
28	US-131, M-55	Cadillac	0		Cherryland, CE, DTE, Great Lakes			
29	US-131, US-10	Reed City	4		CE, DTE, Wolverine Power, Great Lakes			
30	US-131, M-46	Howard City	4		CE, DTE, Wolverine Power, Great Lakes			
31	US-127, M-46	Alma	4		CE, Tri-County, Wolverine Power			
32	I-69, M-53	Imlay City	4		DTE			
33	I-94, US-127	Jackson	4		CE			
34	I-96, US-23	Brighton	2		DTE			
41	I-75	Rudyard	4		Cloverland			
42	US-2	Norway	2		Alger Delta, DTE, Norway, Upper Michigan, UPPCO			
43	US-2	Manistique	4		Alger Delta, Cloverland, UPPCO			
44	US-2	Naubinway	4		Cloverland, Presque Isle			

CHAPTER 7: EV CHARGING INFRASTRUCTURE DEPLOYMENT

ID	Route	Location	NEVI Chargers Needed	EV Network*	Utility Territory	Station Owner*	FY 2022 Funding*	FYs 2023- 2026 Funding*
45	I-75	Indian River	4		CE, DTE, Great Lakes, Presque Isle, Wolverine Power			
46	US-31	Bear Lake	4		Cherryland, CE, Wolverine Power			
47	US-31	Kewadin	4		CE, DTE, Wolverine Power			
49	US-127	Houghton Lake	4		CE, DTE			
50	I-75	West Branch	2		CE, DTE			
54	US-31	Muskegon	4		CE, DTE, Wolverine Power			
56	M-46	Marlette	0		Croswell, DTE, Thumb			
57	I-96	Ionia	4		CE, Wolverine Power			
58	I-196	Saugatuck	4		CE, Holland, Wolverine Power			
59	I-75	Auburn Hills	0		DTE			
60	I-75, I-275	Newport	4		DTE, Midwest			
Total			127					

Utility Territory: Alger Delta = Alger Delta Cooperative Electric Association; Bay City = Bay City Electric Light and Power; Cherryland = Cherryland Electric Cooperative; Clinton = Village of Clinton Electric & Water/Sewer; Cloverland = Cloverland Electric Cooperation; CE = Consumers Energy; Croswell = Croswell Light and Power; DTE = DTE Energy; Escanaba = City of Escanaba Electric Department; Gladstone = City of Gladstone Electrical; Great Lakes = Great Lakes Energy Cooperative; Harbor Springs = City of Harbor Springs Utilities; Holland = City of Holland Board of Public Works; Lansing = Lansing Board of Water & Light; Midwest = Midwest Energy & Communications; Niles = City of Niles Utilities Department; Norway = City of Norway Department Of Power & Light / Electric Department; Petoskey = City of Petoskey Electric Division; Presque Isle = Presque Isle Electric & Gas Co-op; Thumb = Thumb Electric Cooperative; Traverse City = City of Traverse City Department of Municipal Utilities; Tri-County = Tri-County Electric Co. of Washtenaw County; Upper Michigan = Upper Michigan Energy Resources; Wyandotte = Wyandotte Municipal Services

*Columns to be populated as NEVI funds are used to deploy EV charging infrastructure

7.2.1 Upgrade of Existing EV Charging Sites

The following existing EV charging sites may be good candidates for expansion to meet the NEVI site requirements cost-effectively:

- Electrify America has eight NEVI-compliant sites, as shown above in Figure 14;
- 23 of the 27 Tesla Supercharger sites in the state are within one mile of a Michigan AFC;⁷⁷ and
- There are four locations within one mile of a Michigan AFC Ready Corridor that have existing high-powered fast chargers but not the required four chargers, as noted in Table 15.

Table 15: Existing Charge Up Michigan Chargers

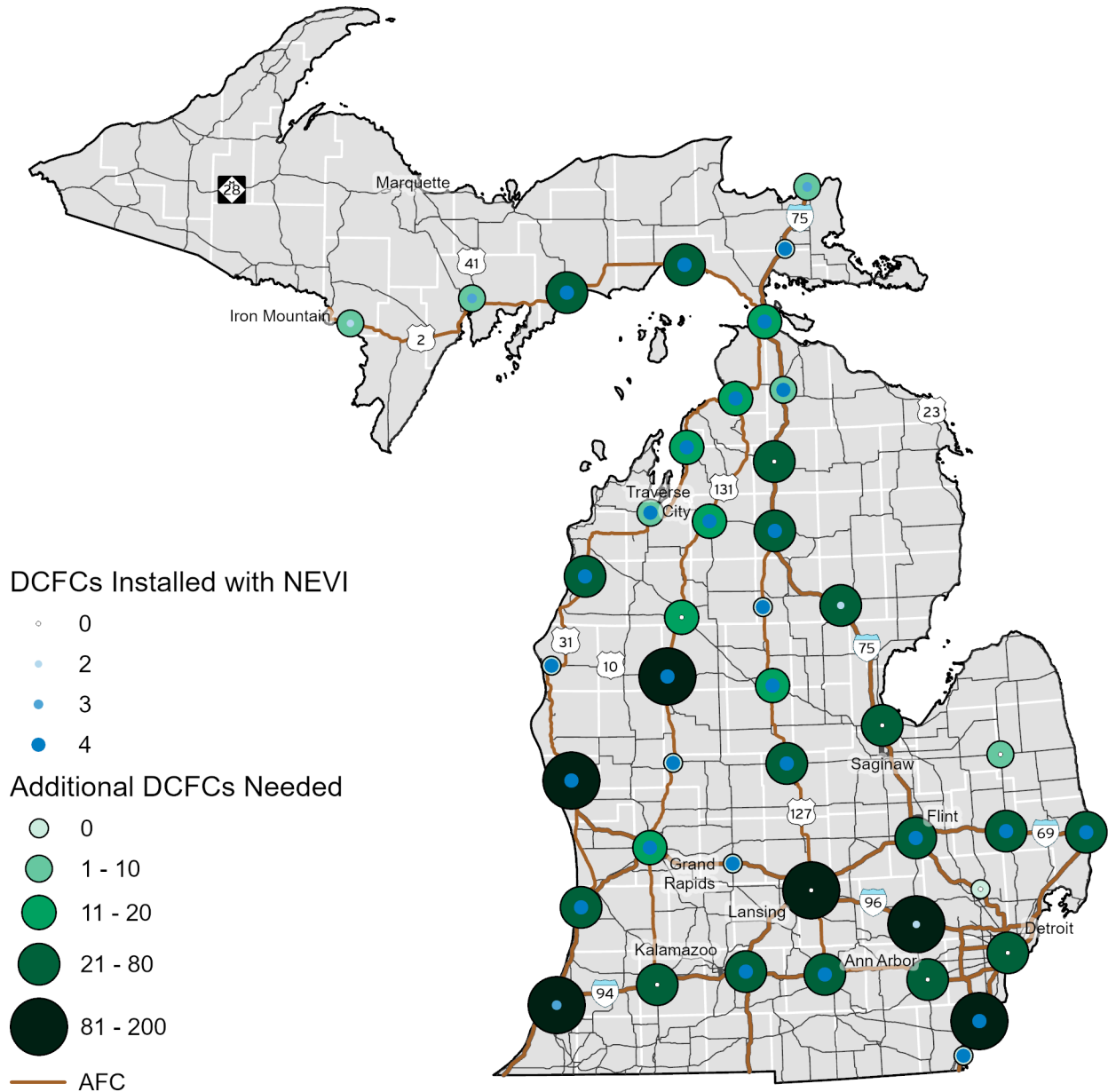
Route	City	Number, Power of DCFC Ports	NEVI Ports Proposed	Network
I-75	Sault Ste. Marie	1x 160 kW	3	Shell Recharge Solutions
US-41, US-2	Rapid River	1x 160 kW	3	Shell Recharge Solutions
I-94, I-196	Benton Harbor	1x 150 kW (construction began in May 2022)	3	RED E
I-75	West Branch	2x 175 kW	2	Shell Recharge Solutions

7.2.2 Increases of Capacity/Redundancy along Existing AFCs

Scenario 3 modeling indicates that accommodating two million EVs on Michigan roads with 150 kW chargers requires 15 times the proposed NEVI levels (127 vs. 2,136). Locations in Benton Harbor, Brighton, Muskegon, Newport, and Reed City need more than 130 additional chargers each within a five-mile radius of the recommended locations to meet the expected demand. Figure 17 depicts these additional DCFC needs. Scenario 5 indicates that using 350 kW chargers can provide improved wait times with less than half the number of overall chargers using a similar total amount of energy.

Combined with data collected as sites are brought online, this modeling will help identify where future capacity and redundancy along the AFCs should focus.

Figure 17: Additional DCFC Needs



7.2.3 EV Freight Considerations

International freight is critical to the State of Michigan. Canada has set an ambitious goal for zero-emission vehicles: By 2030, 35% of the country's medium- and heavy-duty vehicles will be zero-emission. Michigan must be ready for this transition.

Commercial vehicles only make money while moving, so it is critical that high-capacity (350 kW and above) charging infrastructure is deployed across the state. Commercial electric trucks need to be able to charge quickly during driver breaks without delaying shipping schedules. However, current DCFCs do not deliver enough power to freight vehicles, and many chargers and their placements are

not designed to accommodate large vehicles (i.e., pull-through design). Thus, the freight industry will need a network of megawatt charging systems with specific structural and site accommodations for commercial vehicles. These systems will likely require electric power grids to be updated to charge multiple electric trucks simultaneously alongside major freight corridors and at logistics hubs.

As NEVI planning continues, Michigan will consider further the opportunities for freight, whether through specifying the need for trailers or larger vehicles to be able to pull through at charger locations, increasing the maximum charging supply at NEVI locations, and/or developing projects that install shared charging hubs for fleet vehicles.

7.2.4 Public Transportation Considerations

As mentioned in Section 6.2.1, transit agencies will likely need support with funding, staff training, EV route planning, deploying charging infrastructure, upgrading electrical networks, environmental reviews, land assistance, and other technical assistance. Similar to EV freight considerations, the State will consider opportunities for public transportation, whether through specifying the need for larger vehicles to be able to pull through at charger locations, increasing the maximum charging supply at NEVI locations, and/or developing projects that install shared charging hubs for fleet vehicles. Long-distance passenger trips can also be provided by smaller-size electric public transit vehicles that can utilize publicly accessible NEVI-compliant EVSE located along AFCs. In pursuit of the *MI Healthy Climate Plan* goals, Michigan aims to purchase 100% zero-emission public transit vehicles and school buses by 2030.⁷⁸

7.3 FYs 2023-2026 Infrastructure Deployments

As noted earlier, prior to the NEVI Formula Program, Michigan's public and private entities analyzed and implemented EV charging stations to advance the state's charging network through several programs. The programs include MPSC-approved EV pilots from Alpena Power Company, UPPCO, DTE Energy, Consumers Energy, and Indiana Michigan Power. Those entities' territories collectively serve over 90% of Michigan residents.⁷⁹ A list of the active investor-owned electric utility EV pilot programs is provided in Table 16.

Table 16: Electric Utility EV Pilot Program Comparisons

Company*	UPPCO	DTE Energy	Consumers Energy	Consumers Energy	Indiana Michigan Power
Program	N/A	Charging Forward	PowerMIDrive	PowerMIDrive and PowerMIFleet	IM Plugged In
Rate Case	U-21137	U-20162	U-20134	U-20697	U-20359
Money Approved	Up to \$750,000	\$13 million	\$10 million	\$12 million (PowerMIFleet)	\$675,000
DCFC Rebates	Up to \$70,000 per DCFC	\$50,000	Up to \$70,000 per DCFC	\$500,000 (up to \$70,000 for public use and \$35,000 for non-public use)	\$20,000
Level 2 Charger Rebates	N/A	\$2,500	\$5,000	N/A	\$2,500
Residential Rebates	N/A	\$500	\$500	N/A	\$500

*On July 27, 2022, the MPSC in docket number U-21234 approved Alpena Power Company's EV Pilot Program.

EGLE, LEO, MDOT, and MPSC are strategizing on how these and other programs, as well as the remaining VW funds, can be used in coordination with the NEVI funds for the greatest benefits to the State of Michigan and the local workforce. In some cases, this may be through matches of NEVI Formula Program funds or involve funding State priorities that are not a focus of the NEVI Formula Program.

The Charge Up Michigan Program is being delivered using an equal funding split among VW funds, an electric utility, and an EVSE/site host. Once the procurement details are finalized, Table 17 will be populated.

Table 17: 2023-2026 Infrastructure Deployments

	Federal*	Utility*	Bidder*
Spending in Years 2-5 of NEVI Formula Program			
Percent			

*Columns to be populated after the State's procurement details are finalized

7.4 State, Regional, and Local Policy

Policy considerations at the state, regional, and local levels are vital to the success of EV adoption. Such considerations are discussed below.

7.4.1 State Policy

In Michigan, changes to provide policy support for EVs are being enacted at the State level. Governor Whitmer signed an executive order in 2020 setting forth goals to achieve carbon neutrality by no later than 2050. An executive directive in 2020 established the OFME. Implementing Statewide policies in support of electrification is an integral part of Michigan's goal to decrease GHG emissions while significantly increasing public health, social equity, and economic development.^{80, 81} State agencies driving electrification policy and their basic roles are identified in Table 4.

Policy recommendations in the *Council on Future Mobility & Electrification 2021 Report* cover multiple areas of consideration, such as building/development codes, permitting, incentives to support EV adoption, state EV fees, clean fuels standards, utility rate cases, cybersecurity, economic development, workforce training, and education. Some recommendations include pairing economic development and talent goals; expanding research and development tax credits, with specific electrification targets; creating a talent attraction and retention fund to increase the workforce by 2030 to 15,000 advanced mobility employees; and establishing an EV Academy to educate and train a skilled workforce. With the Charge Up Michigan Program, the State is already well-established in creating and maintaining EVSE partnerships, so CFME recommends a legislative vehicle to support the development of State-administered incentive programs and a utility-administered incentive program overseen by MPSC. EVSE policy recommendations include analyzing which EV consumer incentives would best increase equitable EV adoption in Michigan and the impact of electrification on traditional transportation infrastructure financing systems, updating the Michigan Uniform Energy Code and Michigan Residential Code to require EV readiness for new construction, supporting EV readiness in building

codes, pursuing federal funding for EVSE, funding a transit and school bus electrification transition pilot program, and continuing to incentivize EVSE purchase and installation.⁸²

The CFME also recommended the establishment of strategic economic development and site readiness funds to attract and grow EV-related investments in the state. The resulting Strategic Outreach and Attraction Reserve (SOAR) fund was vital to multiple business development opportunities, most notably the historic, seven-billion-dollar General Motors investment in EV production.⁸³ CFME also recommended the State invest \$25 million in a Mobility Futures Initiative. This initiative was created in the State's FY 2022 budget and is being used to support mobility and electrification projects. The funds will help Michigan retain its global leadership position in mobility by making investments in the EV manufacturing and EV charger manufacturing, installation, and maintenance workforces; supporting communities' transitions to electrified mobility and related economic impacts; and encouraging more mobility and electrification innovation.

OFME has also founded a new partnership between the State of Michigan, Ford, Google, and the City of Detroit to create an innovation hub in the city's Corktown District. Corktown is home to the Michigan Central Station, a formerly abandoned train depot, which is being redeveloped into an advanced mobility campus. This new partnership will co-operate the Michigan Central Innovation District, a unique geographical zone with streamlined permitting access for testing real-world mobility and electrification technology applications. It provides collaborative workspaces and access to capital and startup investments and will focus on economic, workforce, and community development while supporting mobility and electrification innovation.⁸⁴

Michigan also leverages tax policy to support transportation electrification. Charging station owners are eligible for a personal property tax exemption under Section 211.9o of Michigan's General Property Tax Act if the aggregate value of all industrial or commercial personal property in a local taxing jurisdiction is less than \$80,000. The exemption may be claimed in each local taxing jurisdiction. The total value limit for the exemption will automatically increase to \$180,000 per local taxing jurisdiction beginning in the 2023 tax year. The State also provides an alternative energy personal property tax exemption for qualifying alternative energy systems under Section 211.9i of the General Property Tax Act.

7.4.2 Regional Policy

With regard to the Midwest region, Michigan joined REV Midwest through an MOU with Illinois, Indiana, Minnesota, and Wisconsin in September 2021. The REV Midwest MOU creates a regional framework to spur vehicle electrification in the Midwest. Taskforce coordinating activities include accelerating medium- and heavy-duty fleet electrification, elevating economic growth and industry leadership, and advancing equity and a clean environment.⁸⁵

Within the state of Michigan itself, MPOs play an important role regionally in identifying local needs, communicating with local governments, and providing guidance and support to smaller jurisdictions. In some cases, MPOs are evaluating regional EV infrastructure needs and helping secure additional funds for infrastructure. Another important role of MPOs is to ensure that transportation projects are in conformance with the National Ambient Air Quality Standards (NAAQS) and support transportation-related pollution reduction in nonattainment areas.⁸⁶

7.4.3 Local Policy

Michigan's local governments perform a vital role in regard to EV policy. Cities are installing EV charging stations, purchasing electric fleet vehicles, and retiring internal combustion engine vehicles. Budgets include carbon reduction goals and EV purchases for fleets. Development and zoning codes are being modified to allow EV-only parking spaces to count as minimum parking spaces and for EV parking spaces and the EV readiness of new infrastructure to be required. For example, the Cities of Ann Arbor, Dearborn, and Ferndale and the Village of Milford added EV parking regulations to their codes. As a result of Ann Arbor, Grand Rapids, and Ypsilanti joining the Climate Mayors EV Purchasing Collaborative, those particular municipalities will receive substantial cost savings on EV purchases.^{87, 88, 89, 90, 91, 92}

Chapter 8 Implementation

As described in Chapter 5, the State will comply with all federal and State legal provisions. To achieve the State's goals, Michigan plans to develop a competitive procurement program to award and disburse NEVI Formula Program funds.

8.1 Strategies for EVSE O&M

EV charging station manufacturers, installers, and network integrators should all meet EVSE qualifications and responsible contracting requirements. The State intends to work with electric utility companies, especially regarding the oversight of distribution and metering equipment specifications. As equipment is designed and constructed, communication protocols between electric utility companies, charging company vendors, contractors, and State or local inspectors are key.

Provisions will be in place to ensure that equipment is properly operated and maintained. Community outreach and engagement with local businesses and organizations will help create a viable operations and management strategy. Specifications in plans and agreements can help ensure well-designed systems and consumer reliability. Specifications must be included to meet other local requirements for safety, underground utility districts, and aesthetics. As a Title II entity, the State will ensure that ADA requirements, including considerations of access, reach, and availability, are met.⁹³ Adequate specifications also help guarantee that repairs are made to the satisfaction of local residents and businesses.

Especially as EVSE technology continues to advance, it is important to protect equipment from obsolescence as much as possible. Software should be updated and maintained, with open communication protocols, as needed. Warranties are not effective if replacement materials and maintenance personnel are not readily available for repairs. Agreements will contain specific details for responsible parties to handle allowable downtime for equipment failures, vandalism, networking, and other issues.

Table 18 identifies important considerations for governmental agencies, utility companies, and other parties involved in providing specifications for EV charging equipment installation and O&M.

Table 18: Considerations for Charging Equipment Installation and O&M

Category	Considerations for Charging Equipment Installation and O&M
Ownership	<ul style="list-style-type: none"> • Government property, including facilities, easements, and ROW • Private property
Payment	<ul style="list-style-type: none"> • Pricing constraints • Personal information security • Non-membership for charger use • Customer support
Operations	<ul style="list-style-type: none"> • Terms and conditions, including agreements, contract durations, fees and requirements, and cost-sharing • Site improvements and equipment updates • 24/7 service phone numbers
Maintenance	<ul style="list-style-type: none"> • Warranty • On-hand materials and components • Permissible downtime • Hardware/software upgrades • Property clean-up
Charge Management	<ul style="list-style-type: none"> • Open Charge Point Protocol (OCPP) network connections • Demand management • Peak operation conditions
Data Collection and Monitoring	<ul style="list-style-type: none"> • Reporting • Remote restarts

8.2 Strategies for Identifying EV Charger Service Providers and Station Owners

The State's procurement process and contracts with service providers and station owners for NEVI Formula Program funds will seek to ensure the considerations listed in Table 18 for NEVI-funded EVSEs are addressed. Outreach to industry, specifically the Charge Up Michigan participants, will continue to support strong program participation.

8.3 Strategies for EVSE Data Collection & Sharing

EVSE data collection and sharing will follow the requirements in FHWA's *23 Code of Federal Regulations (CFR) Part 680*. Only customer data that is necessary for charging will be collected, and it will be safeguarded (see Chapter 12 for more details). On a quarterly basis, the State will submit data to FHWA on EVSE real property acquisition costs, EVSE acquisition and installation costs, EVSE locations, grid connection and upgrade costs, peak kW per port, charger uptime, cost of electricity to operate EVSE, session start and end times, kilowatt hours (kWh) per port per session, and maintenance and repair costs. The State will submit EVSE station names, addresses, and involved enti⁹⁴

ties' names and statuses to FHWA annually. Third-party software developers must be able to access such data as EVSE identifiers, addresses, installation dates, operator information, network providers, number of ports per connector, maximum kWh per port, prices, and OCPP statuses for free.

8.4 Strategies to Address Resilience, Emergency Evacuation, Snow Removal, and Seasonal Needs

The *MM2045* vision specifically addresses resilience and the importance of a sustainable, environmentally, and economically resilient transportation system in Michigan. *MM2045* devotes an entire chapter to network resiliency and the value of resilience to MDOT. Resilience is among the plan's themes, with strategies about increasing the resilience of the state's transportation network and infrastructure.⁹⁵

In extreme weather and during emergencies, continued access to EV charging infrastructure ensures first responders and the general public remain able to travel as needed. Chargers must be located with consideration given to flood and other weather-related risks, as well as drainage and the ability for prompt snow removal. MDOT spends approximately 40% of its total maintenance budget on winter maintenance each season. While all AFCs have Priority Level 1 status, which prioritizes the winter maintenance services along these corridors under prevailing weather conditions over the remaining road network in Michigan, local access to the chargers, which will be located in parking areas, has similar priority treatment.⁹⁶ In the event of a weather emergency, natural disaster, or human-caused incident, consideration of redundant power sources and the power grid's capability of accommodating increased demand are necessary. Agencies can support policies and projects that enhance resilience and emergency preparedness through technologies such as vehicle-to-grid (V2G), stationary and mobile battery storage, distributed generation, and microgrids.⁹⁷

While hurricanes and wildfires are the most likely causes of evacuation, neither is common in Michigan. Nonetheless, if a mass evacuation is necessary, it will be critical to ensure that people can charge EVs and electric buses along evacuation routes and that response team vehicles are supported. It is important to consider the increased demand for and capacity of the electrical system, as well as the potential for vehicles to queue while waiting to charge. This can be mitigated by longer battery ranges, grid capacity improvements, more DCFCs with decreased distances between them, limited vehicle charging times, and earlier evacuation notices.⁹⁸ If a disaster or imminent severe weather can be predicted, it will be essential for electric utilities and public agencies to communicate to EV owners the need to charge vehicles preemptively. Legislation may also be enacted requiring EV charging stations along evacuation routes to have backup generators and/or battery storage, though this alone may not be able to ensure adequate power.⁹⁹

EV batteries may be able to provide backup power to communities that lose electricity.¹⁰⁰ Mobile charging stations may also be capable of providing backup power or roadside assistance and supporting critical responses and evacuations during emergency scenarios.¹⁰¹ However, such stations may need to be able to operate in isolation of the broader electric grid if the power grid becomes damaged or nonfunctioning as a result of a disaster. Battery swapping requires charged battery reserves.¹⁰² As the State and vendors deploy EV chargers, they should coordinate with federal, State, and local emergency management entities to ensure that vehicle charging infrastructure is considered in emergency management plans and contracts and that equipment is in place to enhance system reliability and resilience prior to an emergency.

8.5 Strategies to Promote Strong Labor, Safety, Training, and Installation Standards

One of the State's core objectives is to enable its mobility workforce by assuring that entities and individuals working on EV charging infrastructure are appropriately trained and qualified to perform such work. Collaboration with LEO is critical in this regard. The EV Jobs Academy is a cooperative of over 100 public and private partners identifying needed EV skills and developing postsecondary training programs. It is focused on transitioning the automobile manufacturing workforce and training utility workers and electricians. LEO awarded a grant to the Southeast Michigan Community Alliance (SEMCA), which will use the five-million dollars to create and improve training academies focused on providing industry-based skills. The academy will attract and train the workforce, especially historically underserved populations, to support the electrification of vehicles in Michigan. Small businesses, DBEs, and Michigan-owned businesses will also be promoted.¹⁰³

The success of the Jobs Academy model has led the State to begin development of a new workforce training program to support the training of licensed electricians so they can become certified to the highest standard for the construction, installation, and maintenance of EV charging equipment. The EV Infrastructure Training Program (EVITP), given its development via a collaboration of automobile and EVSE manufacturers, educational institutions, utility companies, electrical professionals, IBEW, and others, is the standard for certification of EV charger electricians. Training on and proficiency in installation standards and safety-related practices and procedures are imperative. As industry standards continue to advance rapidly, design professionals, vendors, and contractors must ensure employees' skills are regularly updated.¹⁰⁴

The State will specify that contractors and subcontractors use EVITP-certified electricians to install and maintain the EVSE funded by the NEVI program. Electricians performing EVSE installation and maintenance work at job sites will have a current EVITP electrician certification.

Table 19 below identifies considerations for training, labor, safety, and installation.

Table 19: Considerations for Training, Labor, Safety, and Installation

Category	Considerations for Training, Labor, Safety, and Installation
Training	<ul style="list-style-type: none"> • Local workforce, EVITP, and community colleges • Electrical workers, utility workers, mechanics, and inspectors
Labor Qualifications	<ul style="list-style-type: none"> • Prequalification, including of small businesses, DBEs, and Michigan-owned businesses, by the State • Contractor experience, including number of prior installations and certification
Safety Compliance	<ul style="list-style-type: none"> • National Fire Protection Association (NFPA), National Electrical Code (NEC), industry, and local standards • Emergency response plans • Emergency shutoffs
Installation Requirements	<ul style="list-style-type: none"> • DCFC or Level 2; kW • National standards, ADA compliance • UL or equivalent equipment certification • Procurement schedules • Permitting • Distribution panels, metering • Temperature tolerance • Inspections

Chapter 9 Civil Rights

While all State agencies comply with federal and State civil rights laws, MDOT, EGLE and LEO work particularly closely with MDARD and MDCR in navigating the NEVI requirements. MDARD is responsible for protecting consumers by enforcing laws related to weights and measures. MDCR investigates and resolves discrimination complaints and works to prevent discrimination through educational programs that promote voluntary compliance with civil rights laws.^{105, 106}

MDARD, MDCR, EGLE, LEO, and MDOT will work together to administer compliance of the NEVI Formula Program with all federal and State laws, including ADA, Title VI of the Civil Rights Act of 1964, and Section 504 of the Rehabilitation Act.^{107, 108, 109} Compliance will be ensured through the actions in Table 20 below.

Table 20: Civil Rights Actions

Phase	Actions
Outreach and Planning	<ul style="list-style-type: none"> At all NEVI public meetings during the five-year NEVI Formula Program, the team will follow the guidelines and use the tools in the <i>2020-2023 State Transportation Improvement Program (STIP) Public Participation Plan</i>, which sets standards to ensure that appropriate measures are taken to accommodate all community members¹¹⁰ As shown in Figure 3 and Figure 4, engagement efforts thus far have reached many stakeholders and helped create the <i>Michigan State Plan for Electric Vehicle Infrastructure Deployment</i>; these efforts will continue during annual plan updates
Procurement	<ul style="list-style-type: none"> All NEVI contracts will include nondiscrimination language and require third-party contractors to use the same language in all subcontracts; a breach of contract related to nondiscrimination will be considered a material breach of contract RFPs will include similar nondiscrimination language
Installation	<ul style="list-style-type: none"> Documentation to show that charging locations are ADA-accessible EV charger location information will be made available to the public in multiple formats following ADA guidelines in order to allow for sufficient access
O&M	<ul style="list-style-type: none"> Data collection will be required for general reporting on and tracking of performance Verification of nondiscrimination compliance will be included in contracts

Chapter 10 Equity Considerations

To ensure equity considerations for underserved communities, funding will address the historically disproportionate adverse impacts of transportation on infrastructure, housing, and clean air in DACs. NEVI Formula Program funds will be used to maximize benefits to DACs, as well as rural and underserved communities, in alignment with the Justice40 Initiative. The funds will help support environmental justice efforts, integrate climate justice into NEPA processes, and reduce exposure of DACs to GHG emissions, pollutants, and hazardous wastes.

Workforce development programs foster a diverse pipeline of workers in EV-related careers. Equity-driven workforce training promotes diversity, inclusion, and accessibility. Michigan has an extensive manufacturing history and currently is home to 17% of total U.S. and 11% of North American vehicle production.¹¹¹ The state will continue to lead in providing next-generation transportation technology jobs to DACs. NEVI Formula Program funds will be used to support Michigan's existing and new workforce development programs by attracting, hiring, and retaining racially and ethnically diverse workers, especially women of color and individuals with disabilities, and ensuring hiring processes are accessible to underrepresented groups. Engagement practices with disadvantaged, underserved, and marginalized populations will be assessed on an ongoing basis to determine whether new or innovative approaches may be warranted to understand community needs and ensure engagement throughout project lifecycles better.

Figure 18 and Figure 19 illustrate areas of Michigan with minority populations and persistent poverty.

Figure 18: Michigan Areas with Minority Populations

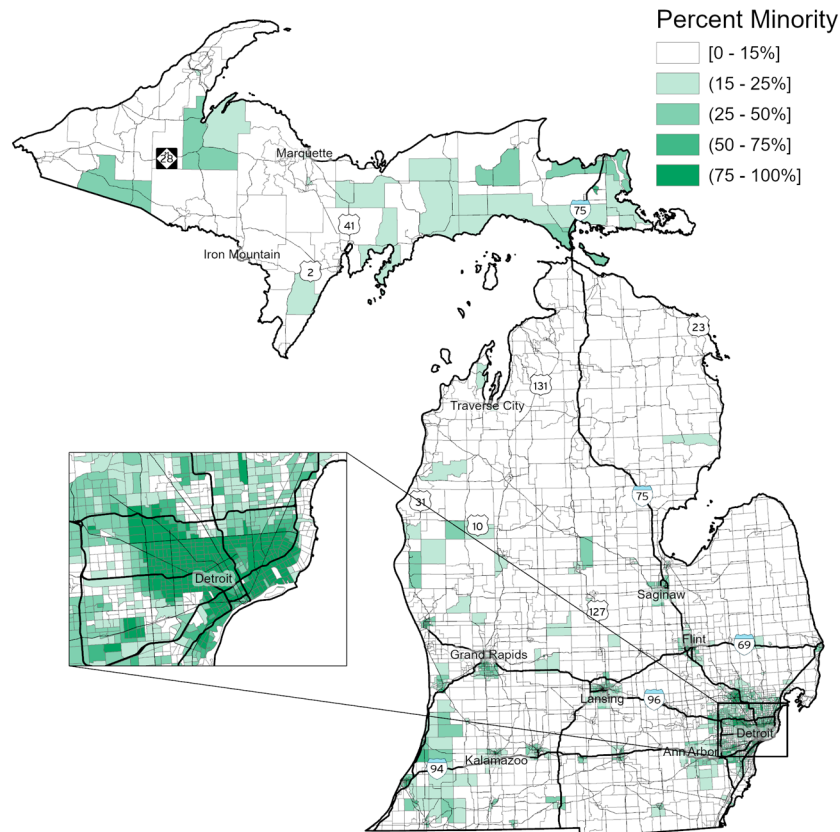
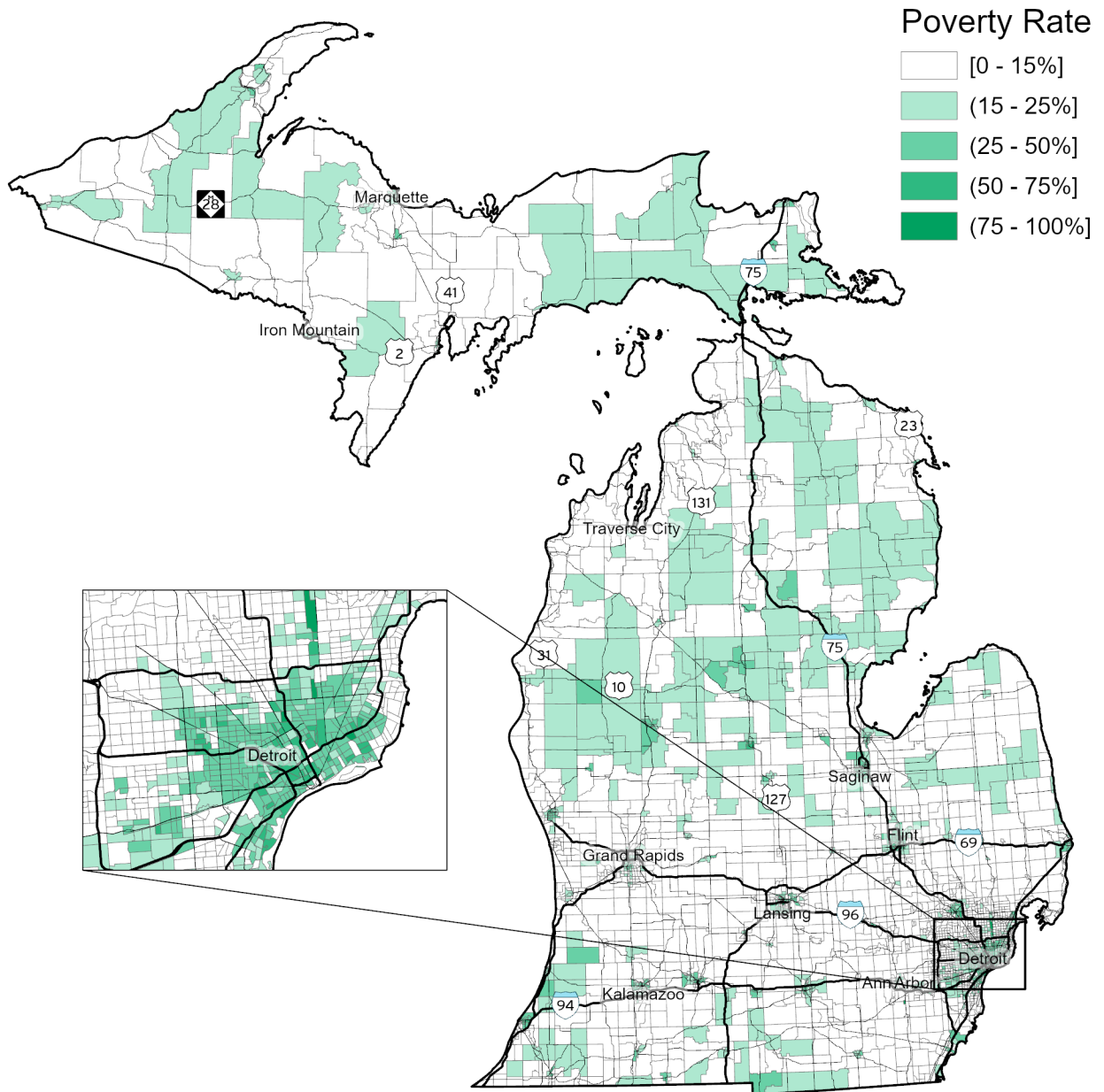


Figure 19: Michigan Areas of Persistent Poverty



10.1 Identification of and Outreach to DACs in the State

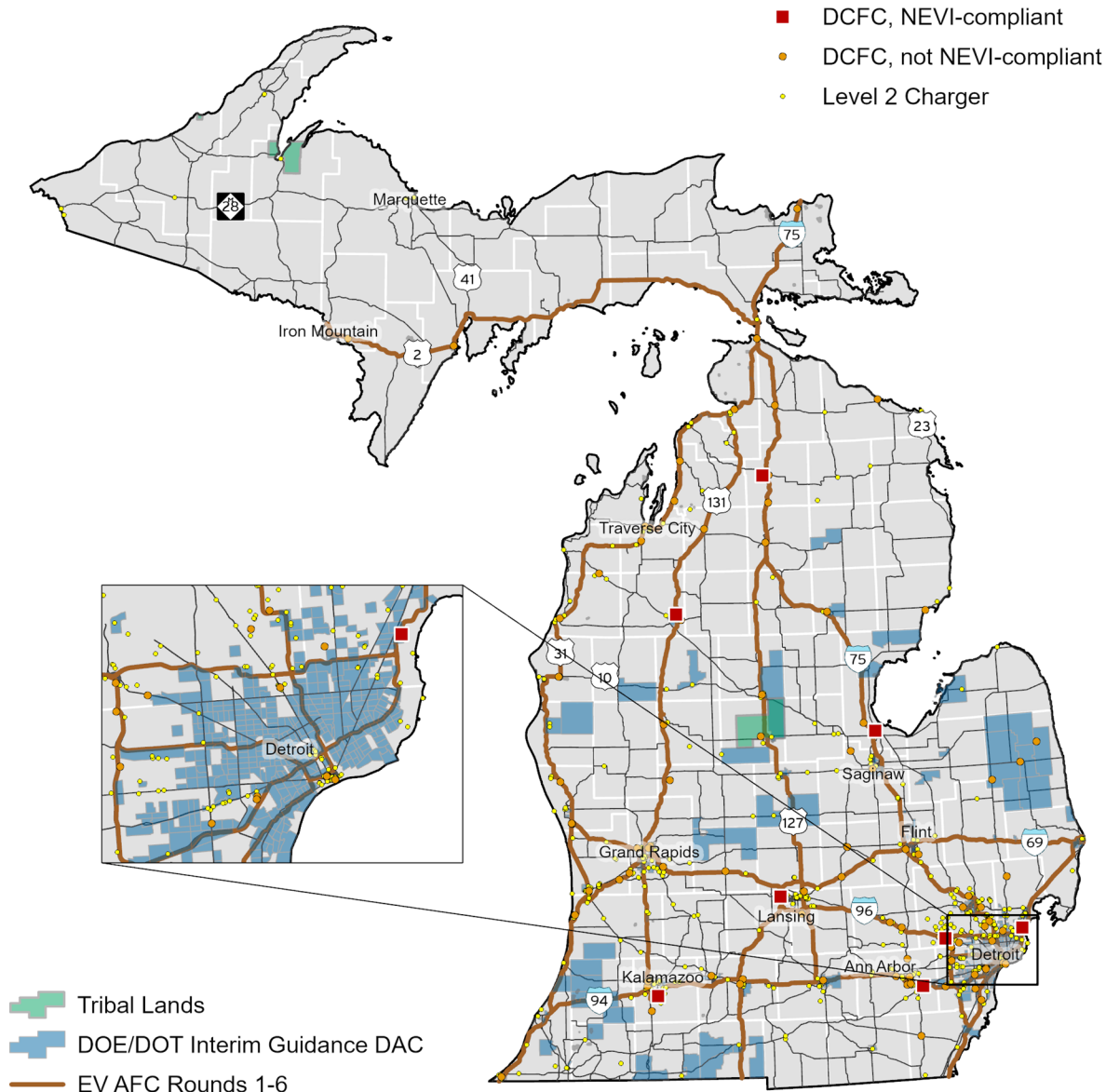
As identified in the *MI Healthy Climate Plan*, transportation represents approximately 28% of total GHG emissions in Michigan.¹¹² DACs are more likely to have a high number of energy-burdened households and to be impacted by pollution and poor air quality. The *Michigan State Plan for Electric Vehicle Infrastructure Deployment* will help to build out the necessary charging network to transition Michigan's vehicles to EVs.

The State used methods outlined by the DOE and USDOT to identify Census tracts containing DACs in order to target investments in those areas. The State will calculate the benefits that flow from electrification and accrue in DACs over time, in congruence with guidance outlined by the federal government, and stakeholder and public engagement will ensure that communities agree with those benefits.^{113, 114}

Michigan DACs and tribal lands are shown in Figure 20 below. The state contains over 7,015 square miles of DACs (12% of the state's land) and more than 682 square miles of tribal lands (one percent of the state's land). Federally recognized tribal lands and U.S. territories are categorized as DACs in accordance with the Office of Management and Budget's (OMB's) definition of community. The State recognizes that tribal nations have faced disproportionate burdens and are especially vulnerable to the impacts of pollution because of their deep ties to the land and reliance on hunting, fishing, and gathering.

MDOT's Round 6 AFC nominations serve DACs that suffer disproportionate negative impacts from emissions, supporting Justice40 and environmental justice efforts. Ready, Pending, and Nominated AFCs constitute over 216 miles of the state's more than 2,119 miles of roads in DACs and 11 miles of roads in tribal lands.^{115, 116}

Figure 20: Michigan DACs, Tribal Lands, and AFCs^{117, 118}



The State recognizes its responsibility for ensuring fairness and accessibility in its programs, services, and activities and is committed to providing safe, equitable, and environmentally conscious transportation for Michigan residents. The State has a duty to serve all Michiganders, including minority and low-income populations, persons whose first language is not English, the elderly, people with disabilities, and out-of-state and international travelers.

Through inclusive and comprehensive stakeholder and public engagement, the State will identify solutions to challenges for DACs, such as range anxiety, initial ownership costs, and accessibility. Solutions include increasing access to reliable multimodal transportation opportunities, alleviating mobility barriers, and modernizing existing transportation systems. MAC-EJ will help ensure that resources are distributed equitably.¹¹⁹

10.2 Processes to Identify, Quantify, and Measure Benefits to DACs

The State is guided by the standards outlined in Executive Order 14008 and Justice40 and prepared to follow the standards established by the Joint Office.¹²⁰ The State actively pursues opportunities to transform systems and behaviors that disproportionately harm DACs. Michigan works to eliminate barriers to opportunity and provide additional resources to underserved communities. In response to range anxiety in rural Michigan, Round 6 AFC nominations were intended to make roads and bridges more accessible to EVs. The process of identifying, quantifying, and measuring benefits to DACs is shown in Figure 21 below.

Figure 21: Process of Identifying, Quantifying, and Measuring Benefits to DACs



Potential benefits to DACs can be summarized as follows:

- Clean transportation access,
- Reduced transportation emissions,
- Improved air quality,
- Energy resilience,
- Decreased transportation cost burden,
- Jobs and job training, and
- DBE opportunities.

Through continued stakeholder outreach, the State will build upon these benefits. Efforts may include focus groups, surveys, websites, and/or social media messaging, as well as outreach to existing community groups.

The State has identified increased accessibility to public transportation, resilience, and the measuring of economic and social disadvantages as priorities in Michigan. The *MI Healthy Climate Plan* states that approximately 19% of Michigan homeowners and renters do not have vehicles. Furthermore, nearly three out of every five jobs are not accessible by public transit. The State could track and measure lowered emissions as bus fleets are electrified and increased access to jobs. LDVs currently account for 65% of the transportation sector's GHG emissions. As investments in EV infrastructure are deployed and EV adoption is expanded, the State will track emission levels in line with the

transportation sector's 2050 decarbonization goals and how NEVI Formula Program funds will create new contract opportunities for DBEs and SBPs. Furthermore, MPOs will track reductions in NAAQS pollutant emissions, especially in nonattainment areas.¹²¹ As MDOT currently has a system in place for tracking the percentage of its work in terms of contract dollars performed by DBEs, the State could track new DBE and SBP contracts throughout NEVI Formula Program deployment similarly.

The State is implementing rebate programs to offset the purchase of new EVs and residential charging infrastructure. In 2021, MEDC and OFME launched the Michigan Mobility Funding Platform. Through the program, grant dollars are used to facilitate P3s that will help attract technology companies to Michigan, ultimately increasing the number of jobs available and the opportunities to enhance accessibility in underserved communities. The funds are focused on increasing access in rural and lower-income urban areas, in particular. Thus far through the program, the State has awarded over \$500,000 in grant funding to mobility entities to support efforts to increase access to EVs by expanding vehicle charging infrastructure and identifying key locations for EV infrastructure within DACs.¹²²

10.3 Benefits to DACs through this Plan

EV adoption in Michigan will benefit DACs by improving air quality and public health and expanding job opportunities. As DACs experience disproportionate exposure to harmful air and noise pollution, EV adoption will reduce vehicle emissions, improving public health. The cost to operate an EV is significantly less, especially if gasoline prices remain around five dollars per gallon, providing households the ability to spend more money on other needs, such as food and housing. Partnerships and investments in Michigan are creating thousands of new jobs and opportunities for new careers. The *Michigan State Plan for Electric Vehicle Infrastructure Deployment* will serve as a catalyst for enhancing transportation connectivity within and across the state.

Chapter 11 Labor and Workforce Considerations

The State is focused on creating new job opportunities for all skilled trades, including electrical and construction work, while retaining today's manufacturing and transportation labor force through strategic workforce planning. The State is committed to fostering a diverse and inclusive industry. It will continue to invest in firms owned by minorities, women, and other socially and economically disadvantaged people through contracting opportunities using existing SBP and DBE programs. This will help ensure businesses owned by disadvantaged individuals are able to participate in and be supported with DBE certification and contracting opportunities.^{123, 124}

The Michigan EV Jobs Academy and Michigan EV Charging Jobs Academy developed by LEO will prepare Michigan's workforce for EV and charging station equipment jobs and career pathways. Michigan is the state with the largest 2021 energy sector job growth. The energy sector now constitutes 393,207 jobs, 255,622 of which are focused on motor vehicles, or 9.5% of the state's employment.¹²⁵

In May 2022, LEO provided testimony on the EV workforce to the U.S. House Science, Technology, and Space Committee's Subcommittee on Research and Technology.¹²⁶ As part of that testimony, many of the following entities spearheading notable labor and workforce initiatives were discussed (see Table 21).

Table 21: Labor and Workforce Initiatives

Entity	Labor and Workforce Initiatives
EV Charging Jobs Academy	The EV Charging Jobs Academy is being developed to prepare Michigan's workforce for EV and charging station equipment jobs and new career pathways.
EV Jobs Academy / SEMCA	Together with SEMCA, the EV Jobs Academy will provide rapid and accelerated training and retraining on EVs, alternative fuels, and other advanced vehicle technologies. Eight employer-led collaboratives are working together to upskill Michigan's EV workforce. ¹²⁷ The academy will provide the same strategic workforce training for electricians working on charging stations. The State is initially investing five million dollars over five years into the academy initiative. It will build off of the Michigan Alliance for Greater Mobility Advancement, founded in 2009 by six academic institutions, five Original Equipment Manufacturers (OEMs), and five suppliers, to upskill engineers and technicians for the production of EVs. At least 35% of academy participants are required to come from underrepresented populations. Graduates will earn credentials that align with Governor Whitmer's objective to grow the percentage of Michiganders who have post-secondary credentials to 60% by the year 2030. ¹²⁸
FLO Services USA Inc.	EV charger manufacturer FLO Services USA Inc. recently made a three million dollar investment that will result in at least 130 new jobs in the state. ¹²⁹
Ford / Michigan Central Innovation District	The City of Detroit, Ford, Google, and the State entered into a partnership to invest over \$126 million into the Michigan Central Innovation District in Corktown. The four areas of focus for the partnership are workforce development, a designated Transportation Innovation Zone, economic development, and community development. This district is expected to create 5,000 jobs; be a hub for mobility innovation, talent, sustainability, small business opportunities, and community engagement; and be home to a one-mile EV wireless charging corridor. Ford is also developing a new battery facility in Michigan, investing \$250 million in three other facilities in the state, and producing 450 new jobs in those three facilities. ^{130, 131}
General Motors	General Motors is investing seven billion dollars into its EV development and manufacturing facilities, which will create 4,000 new jobs and retain 1,000 others. 1,500 workers, the sixth highest figure in the nation, are currently employed at various battery OEM locations in Michigan. ¹³² General Motors has also committed to providing 2,200 jobs at its Hamtramck EV manufacturing facility. ¹³³
Stellantis NV	Stellantis NV is constructing PHEVs in Detroit, providing 4,100 jobs for Detroiters and 6,433 total jobs in Michigan. ¹³⁴
University of Michigan	LEO has allocated \$130 million in general purpose funding for an EV teaching, training, and development center that will be located at the University of Michigan.

Chapter 12 Cybersecurity

Cybersecurity and personal privacy risks continue to intensify as technology advances at a rapid pace, making cybersecurity plans and ongoing reviews necessary. Through the Charge Up Michigan Program, MDOT contracts with third parties to provide all services related to EV chargers, including procurement of the equipment and software; location, installation, and O&M of chargers; and data collection at chargers. The third parties are responsible for cybersecurity.¹³⁵ It is expected that NEVI procurement will be handled through the Charge Up Michigan Program.

The State will likely use the *Michigan State Plan for Electric Vehicle Infrastructure Deployment* to update its procurement and contractual processes to ensure cybersecurity and privacy requirements are met. A new prerequisite for a cybersecurity plan will be added to all NEVI-funded projects. The cybersecurity plan shall include an understanding of high-level security and privacy practices, including physical and technological solutions, in place to protect the chargers and data from cyberattacks. Data protection is critical during the data collection, transmission, sharing, storage, and destruction phases. This cybersecurity plan requirement will give the NEVI team an early understanding of the cybersecurity ability of the third parties, which can help define final contract terms.

After third-party providers are selected in the procurement process, the following items will be considered and may be required in final contracts:

- Cybersecurity plans and updates;
- Privacy impact assessments and an understanding of general cybersecurity protection and data collection methodologies;
- Regular cybersecurity software updates from third parties;
- Notification requirements related to security and privacy breaches;
- Statements of compliance to follow all federal, State, and local laws related to cybersecurity and privacy and with payment card industry requirements; and
- De-identified datasets to be shared with the State.

Chapter 13 Program Evaluation

Program evaluation data will help the State to assess the performance of the *Michigan State Plan for Electric Vehicle Infrastructure Deployment* vision and goals. Since the chargers installed as part of the NEVI Formula Program will be networked using OCPP standards, the State will be able to monitor and report on specific charger metrics, such as charger utilization, charger uptime, initial battery state-of-charge, time charging, time plugged in, energy delivered per port, number of sessions, monthly electricity costs (including demand charges, energy charges per kWh, fixed charges, taxes, and all other fees), and maintenance and repair costs. More general program progress will be reported quarterly and annually and discuss the following:

- EV adoption, equity impacts, environmental benefits, workforce effects, tourism impacts, and media and educational benefits; and
- Funds distributed per year; installation costs; funds distributed to small businesses, DBEs, and Michigan-owned businesses; the amount of time between initial funding allocation and chargers being operational; the amount of charge leveled per federal dollar; and site host feedback.

The State is planning to use and upgrade the Charge Up Michigan dashboard to serve as both a portal for the FHWA data collection requirements and a tool for the public to understand the successes and benefits of the program. A risk register will also be used for program evaluation, with strategies created to improve metrics that do not meet goals. In addition, detailed community engagement tracking will be completed annually, as required. Data collected throughout the program will help the program office adjust more efficiently as new information becomes available.

Chapter 14 Discretionary Exceptions

The State has not identified at this time any necessary exceptions to the requirement for EV chargers to be located every 50 miles along Michigan's portion of the Interstate Highway System within one travel mile of the interstate. As the State progresses toward solicitation and ultimately awards contracts to install, operate, and maintain EVSE, the State will monitor all future Michigan NEVI locations for discretionary exemptions. If a discretionary exemption becomes necessary, the State will provide the Joint Office the information needed for its review.

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