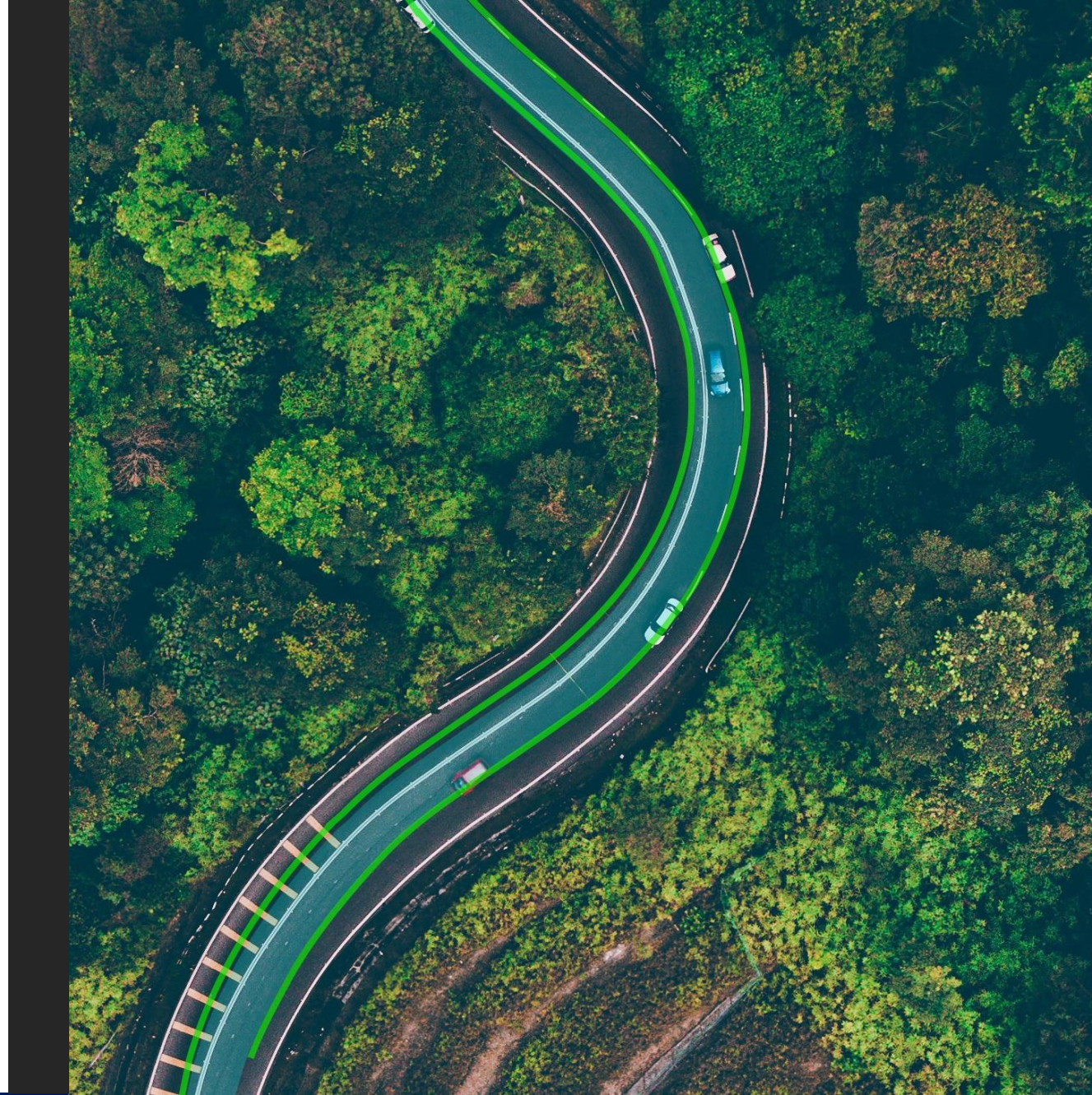


MI Future Mobility Plan

November 2022



The MI Future Mobility Plan

Mobility refers to technologies and services that enable people and goods to move more freely. The MI Future Mobility Plan is designed to grow Michigan's mobility leadership, and complement the state's economic development, workforce, energy, and infrastructure priorities.

This is a cross-departmental plan that will enhance communities across the state through responsive policies and dynamic programming that prepares Michigan for the future.

The following state departments came together to construct this plan at the recommendation of the Michigan Council on Future Mobility and Electrification:

- **Executive Office of the Governor (EOG)**
- **Michigan Office of Future Mobility and Electrification (OFME)**
- **Michigan Council on Future Mobility and Electrification (CFME)**
- **Michigan Department of Labor & Economic Opportunity (LEO)**
- **Michigan Department of Environment, Great Lakes & Energy (EGLE)**
- **Michigan Department of Transportation (MDOT)**
- **Michigan Economic Development Corporation (MEDC)**
- **Michigan Public Service Commission (MPSC)**
- **Michigan Department of Insurance and Financial Services (DIFS)**
- **Michigan Department of Treasury**
- **Michigan State Police (MSP)**

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Executive Summary

MI Future Mobility Plan: Executive Summary

Plan Vision: Enable a stronger state economy through safer, more equitable and environmentally sound transportation for all Michigan residents.

Pillar #1: Transition and Grow Our Mobility Industry and Workforce

Desired Outcomes:

- Create 20,000 new jobs by 2026 while increasing the median wage of mobility sector jobs.
- Add 7,000 workers with mobility credentials by 2030 — while increasing diversity in the mobility sector's workforce.
- Ensure Michigan maintains a resilient automotive manufacturing sector that supports at least 170,000 jobs through 2030.

Pillar #2: Provide Safer, Greener and More Accessible **Transportation Infrastructure and Services**

Desired Outcomes:

- By 2030, deploy 100,000 EV chargers to support 2,000,000 EVs and improve access to hydrogen infrastructure.
- Maintain at least 80% of EV charging off-peak to minimize impacts on the grid.
- Reduce congestion and traffic crash rates statewide by 2026.
- Provide residents with consistent access to mobility-as-a-service options across Michigan's 77 transit agencies by 2025.

Pillar #3: Lead the World in Mobility and Electrification **Policy and Innovation**

Desired Outcomes:

- Maintain #1 state ranking for mobility and electrification research and development spend.
- Become a top 10 state for growth in venture capital funding by 2026.
- Become a top 10 state for federal investments related to mobility and vehicle electrification.
- Lead the nation in electric and automated vehicle friendliness through responsive policies.

Case For Urgency

Michigan's
mobility sector
has momentum.

Under Governor Whitmer's Leadership, Michigan has:

- **Created over 28,000 new jobs in the auto industry** and maintained its position as America's #1 auto R&D and manufacturing state.
- Made the **largest education investment in state history** to prepare future generations of Michiganders for careers in future mobility.
- Set a **path to carbon neutrality by 2050**, which includes a worry-free, statewide electric vehicle charging network before 2030.
- Continued to fix its roads, while also **futureproofing with multiple American firsts** like the first autonomous vehicle corridor, and first wireless charging corridor for electric vehicles.
- Led national mobility policy conversations that include the creation of the **first 5-state compact in the Midwest to focus on EV adoption.**

However, there are challenges ahead.

Michigan's Biggest Mobility Challenges This Decade:

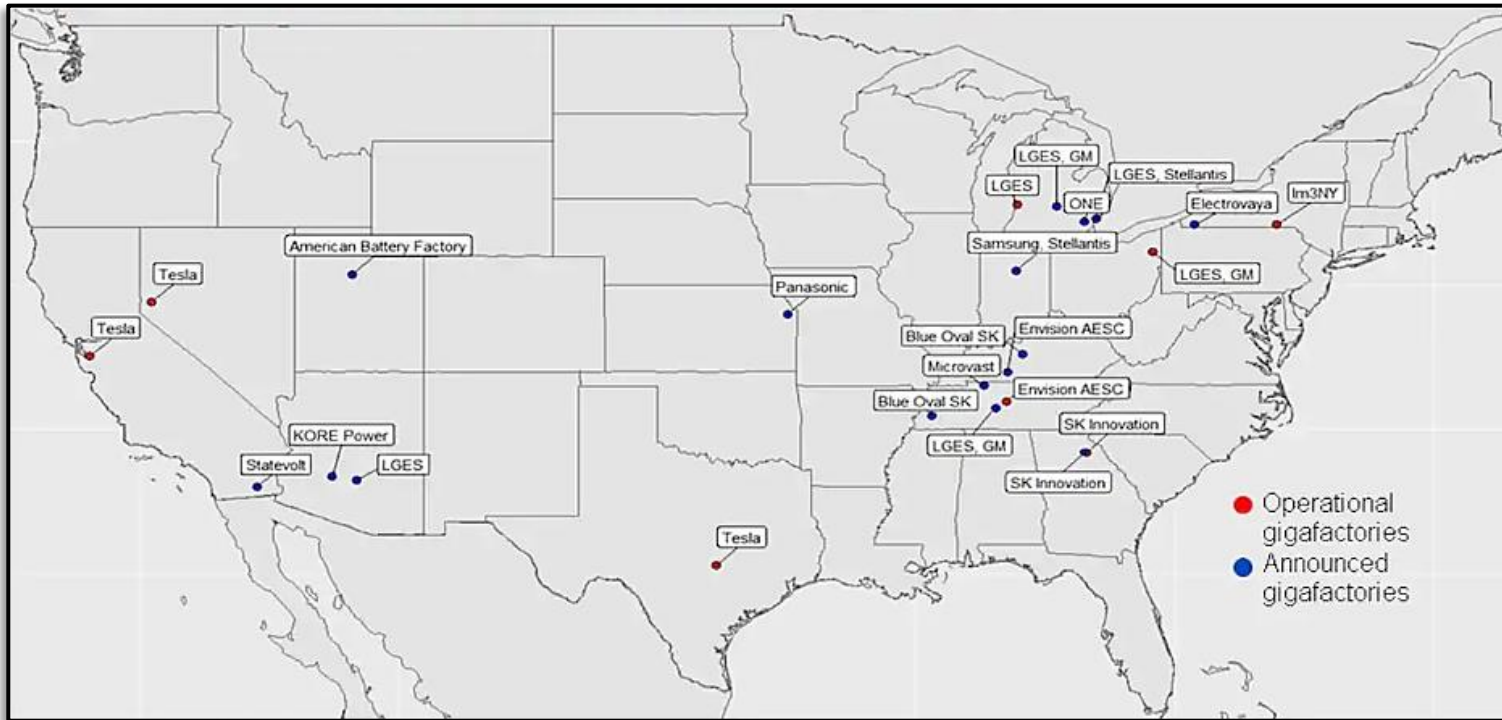
1. **Fierce competition for jobs** in future mobility and electrification.
2. **Fierce competition for investment** in new R&D and risk capital.
3. **Transitioning Michigan's workforce** from traditional internal combustion engine skillsets to future mobility skillsets.
4. **Transitioning Michigan's infrastructure and grid** from primarily serving internal combustion engine vehicles to also serving EVs and AVs.
5. **Ensuring state regulatory environments keep pace** with the domestic and global markets.
6. **Decarbonizing the transportation sector** to fight climate change.

Challenge #1: Competition for New Mobility Jobs

The impending demand for a robust domestic mobility supply chain and workforce will require significant increases in capacity over the next ten years. Michigan is well-positioned to take advantage of this opportunity, but other states are highly competitive.

New Gigafactories Cluster in the Midwest, South, and Near Tesla Facilities

Source: Dallas Federal Reserve, 2022.



Where Michigan Stands Nationally

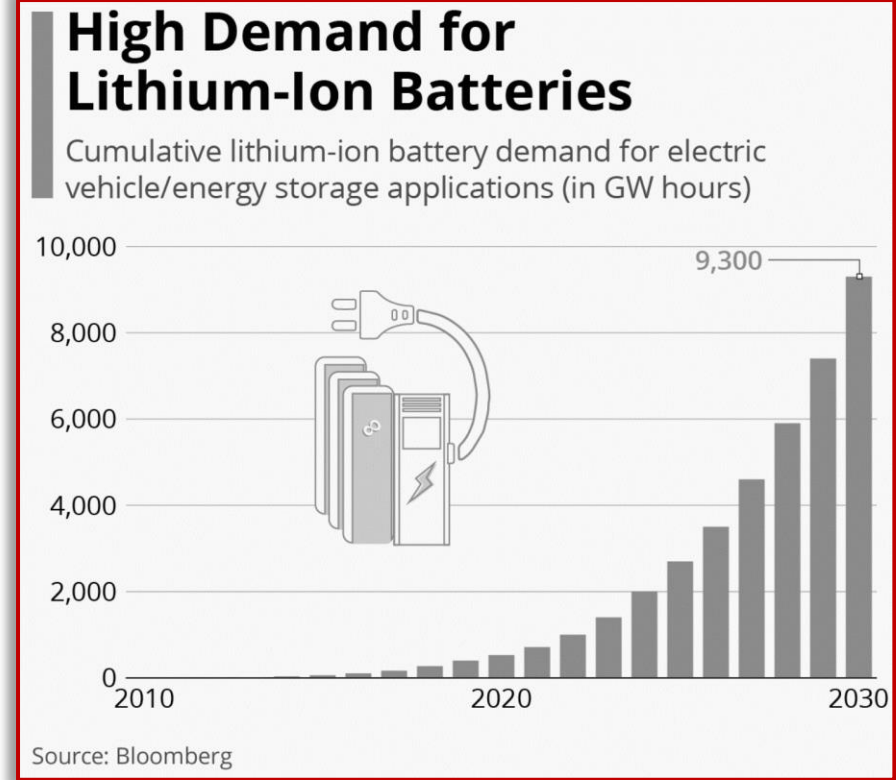
- **Major companies are building out their mobility supply chains in Michigan.** Key recent investments include Ford's \$100M battery research facility in Romulus, Magna's \$70M manufacturing facility in St. Clair, GM's \$7B investment in EV and battery production across four Michigan sites, ONE's \$1.6B battery factory in Van Buren, and Gotion's \$2.3B battery components complex in Big Rapids.
- **Other states are competitive and winning similarly.** Key recent investments include Ford's Oval City investment in Tennessee and Kentucky, Hyundai's \$5.5B battery manufacturing facility in Georgia, Volkswagen's \$22M EV battery lab in Tennessee (part of a broader \$7.1B investment), and Stellantis and Samsung's \$2.5B EV battery plant in Indiana.

Challenge #1: Competition for New Mobility Jobs

Automakers expect that within five years, EVs will cost the same to produce as internal combustion vehicles. The transition to a post-ICE world will only accelerate with the rise of autonomy and more large job-creating investments and joint ventures. Most level four and five AVs will be battery-powered EVs.

America's EV and AV Supply Chain

- The number of EVs on US roads alone is estimated to be **nearly 19 million by 2030**, up from 1 million in 2019. This will necessitate more transformational job-creating investments in North America.
- Demand for lithium-ion batteries is set to **increase nearly ten-fold by 2030**, fueled by the rapid growth of the EV market, necessitating more job-creating investments.
- Building out domestic EV supply chain capacity is critical to reducing dependence on China and **facilitating the green energy transition**.

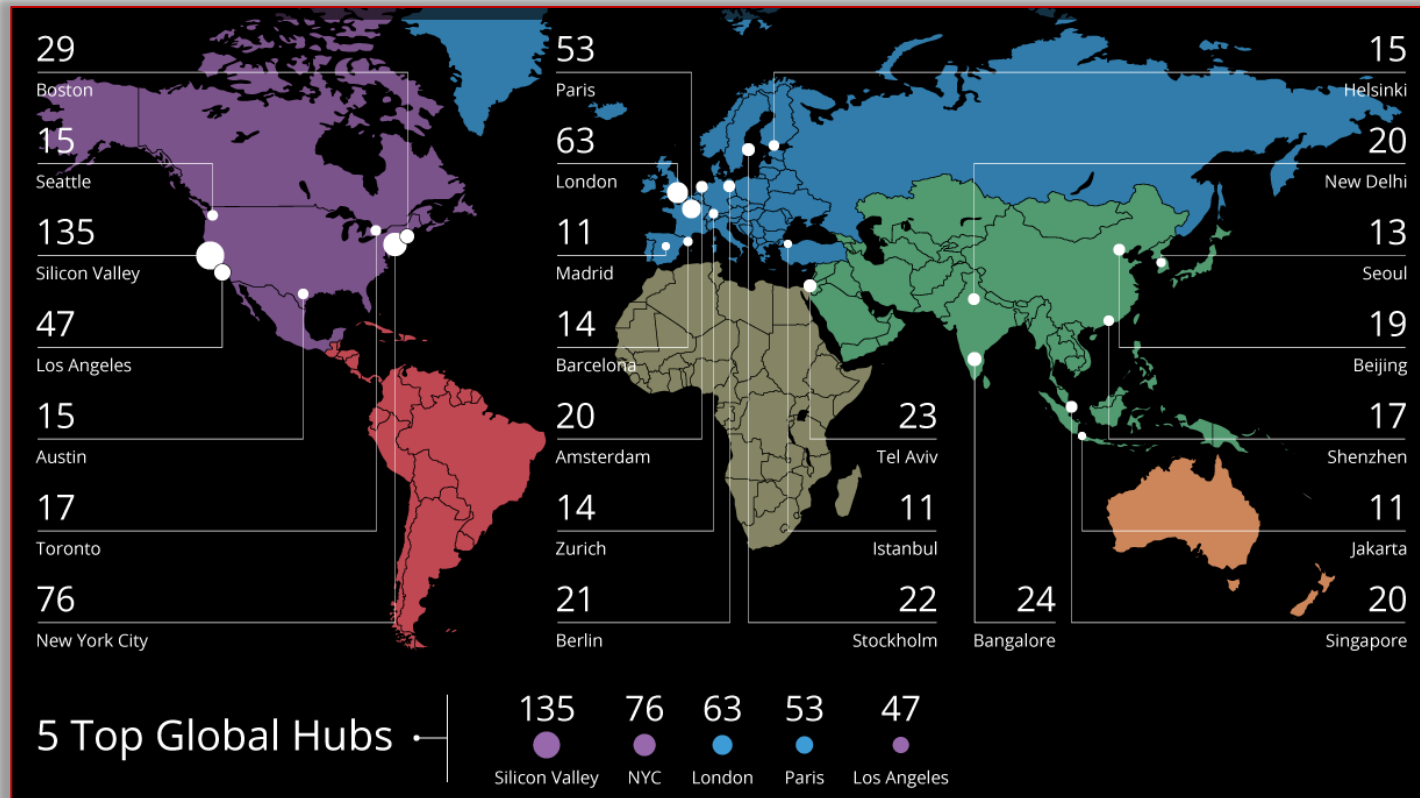


Challenge #2: Competition for New Mobility R&D and Risk Capital

Although VC investment set record highs in 2020 and 2021, Michigan lagged because its companies are primarily hardware-based. As software becomes more dominant than hardware in the mobility space, supporting software entrepreneurs will be key to maintain Michigan's competitiveness.

Global Mobility Startup Hub, Activity Analysis

Source: StartUS, 2020



Venture Capital in Michigan

- While Michigan is the **2nd highest state in mobility and electrification VC spend**, California's VC ecosystem is more than 10x larger and software-focused. Michigan's has been hardware-focused.
- Other locations are positioning themselves as the brains of the new AV world. "The way I always say it is, Silicon Valley is the money, **Detroit is the hardware, and Pittsburgh is the brains**," says Jackie Erickson, a founder of the Pittsburgh Robotics Network. Waymo selected Pittsburgh in July 2021 to be the location for its third and newest office.
- As of 2020, Silicon Valley, New York City, London, Paris, and Los Angeles are the top global mobility hubs for startups. Not Detroit.

Challenge #2: Competition for New Mobility R&D and Risk Capital

To maintain Michigan's position as the friendliest place to research and design new mobility technologies, it will be critical to advance investments and policies that create a robust and diversified innovation ecosystem.

Michigan's Innovation Ecosystem

- Michigan is home to various **accelerator programs** (e.g., Plug and Play, Centrepolis, TechTown), **coworking spaces** (e.g., Bamboo), and **knowledge centers** (e.g., Automation Alley).
- Michigan's network of universities and community colleges – from Wayne State University to Washtenaw Community College – generates a **powerful R&D pipeline**. Providing pathways to commercialization and scale is key to ensure these entrepreneurs stay and grow their companies in-state.
- The forthcoming Michigan Central Innovation District – catalyzed by Ford in Corktown – will provide a new **regional innovation asset for entrepreneurs** seeking to scale their mobility ideas in Michigan.

National Benchmarks

ion

The Ion – Houston, TX

The Ion Innovation Hub is a 300,000 square foot mixed-use development – catalyzed by Rice University and the City of Houston – that will anchor the new 16+ acre South Main Innovation District.



AllianceTexas – Fort Worth, TX

AllianceTexas is a 26,000-acre development and inland port with multimodal transportation infrastructure that includes the Mobility Innovation Zone (MIZ), an integrated testing platform for public-private cooperation.

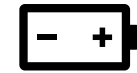
Challenge #3: Transitioning Michigan's Workforce

The rise of AVs/EVs will necessitate a new mobility workforce that focuses on software and advanced manufacturing. Although some jobs related to internal combustion engine production lines will become obsolete, there will be a significant net gain in mobility jobs in the coming years.

The Emerging Mobility Job Market

- A combination of government incentives and regulatory changes to encourage EV and AV adoption is estimated to **create over 220,000 U.S. jobs** and support another 425,000 over one to five years.
- EV powertrains are less mechanically complex than internal combustion engines and composed of more modular parts, **requiring fewer workers to build**. New jobs in mobility will therefore require upskilling and/or reskilling the existing workforce. And defining leadership in other modes of transport.
- By 2030, the **average car is expected to have around 300 million lines of code**, and AVs could have as many as 500 million. Demand will increase for skilled workers in imaging, robotics, navigation, connectivity, computer vision, and AI/ML.

Key Advanced Manufacturing Sectors



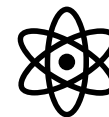
Battery Assembly & H2 Fuel Cell



Electric Motors



Advanced Driving Systems



Semiconductors

Challenge #3: Transitioning Michigan's Workforce

Michigan's workforce is highly skilled, particularly in STEM fields. However, the generational shift toward AV/EV will require both reskilling existing workers and training new workers to meet the impending demand created by thousands of new mobility jobs.

By the Numbers: Michigan Workforce

- Michigan will need **12,000 people with computer-related engineering skills** to retain its pole position as the global mobility leader.
- Michigan ranks **9th in the nation for total STEM degree completions.**
- Michigan has **250,000 workers in the skilled trades,** ranking in the top 10 nationally.
- In 2021, Michigan ranked **#1 in the nation for concentration of engineers** employed per thousand jobs.

Representative Programs in Other States

Illinois

Heartland Community College announced that it would launch an EV training academy with a combination of state (\$7.5M) and private (\$1.5M) funding. The Electric Vehicle-Energy Storage Manufacturing Training Academy is meant to provide a talent pipeline to Rivian's production in Normal, IL.

Arizona

TuSimple and Pima Community College announced the launch of a first-of-its-kind autonomous driving certificate program for truck drivers. The program trains students to operate as test drivers or conduct remote monitoring of operations from a control center.

Challenge #4: Transitioning Michigan's Infrastructure and Grid

In order to meet the Biden administration's EV goals, state-level smart and charging infrastructure development must keep pace with EV adoption. Favorable EV incentives, coupled with charging infrastructure investments, will determine which states are perceived as mobility hubs.

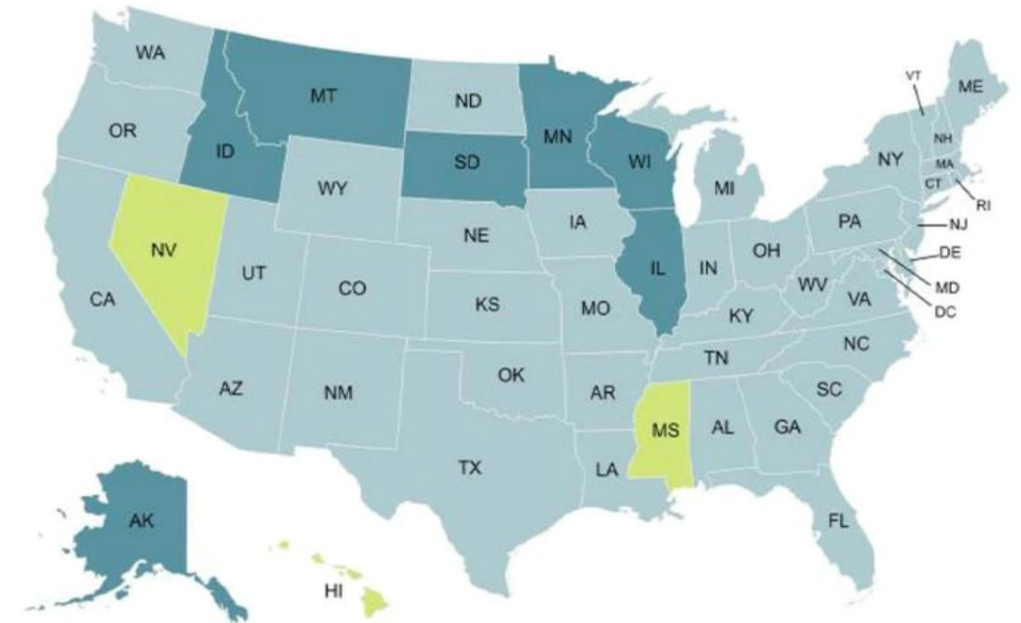
EV Market & Policy Environment

- President Biden's vision is that **half of all new cars sold in 2030** will be EVs.
- The USA has tens of thousands of public charging stations with about 110,000 chargers. But experts say that the number needs to be **5 to 10 times as big to achieve the president's goal.**
- According to Asad Hussain, a senior analyst at PitchBook, a research firm, "EV charging infrastructure is the **single biggest barrier** to EV adoption."
- The electric vehicle charger market size was valued at **\$3.8 billion** in 2019, and is projected to reach **\$25.5 billion** by 2027, registering a CAGR of 26.8% from 2020 to 2027.

EV Readiness Score

< 10	Least EV ready
10 - 14.9	EV progressive
15 - 19.9	EV accepted
20 - 25	EV ready

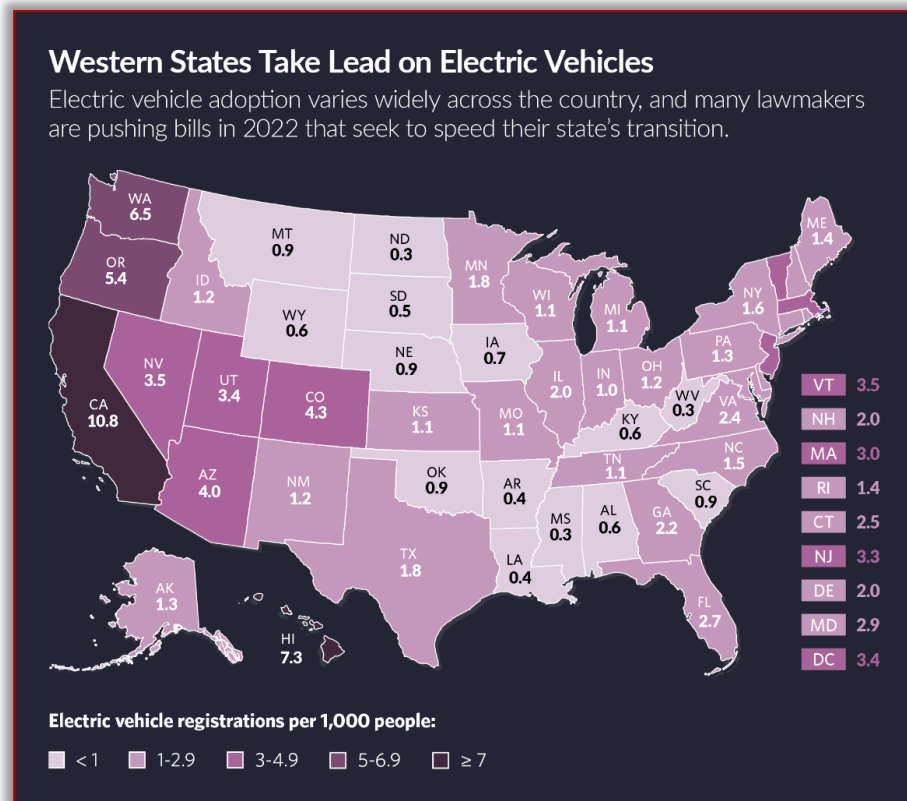
LeasePlan 2022 EV Readiness Index



Challenge #4: Transitioning Michigan's Infrastructure and Grid

Both federal and private sector demand signal for EV investment is strong and increasing. Lack of charging infrastructure development could delay long-term EV adoption trends in Michigan, reduce associated economic activity, and signal uncertainty to OEMs and Tier 1s.

Michigan is in the second-lowest category for EV registration by state, with 1.1 vehicles registered per 1,000 people in 2022.



Source: U.S. Department of Energy 2022.

Where Michigan Stands Nationally

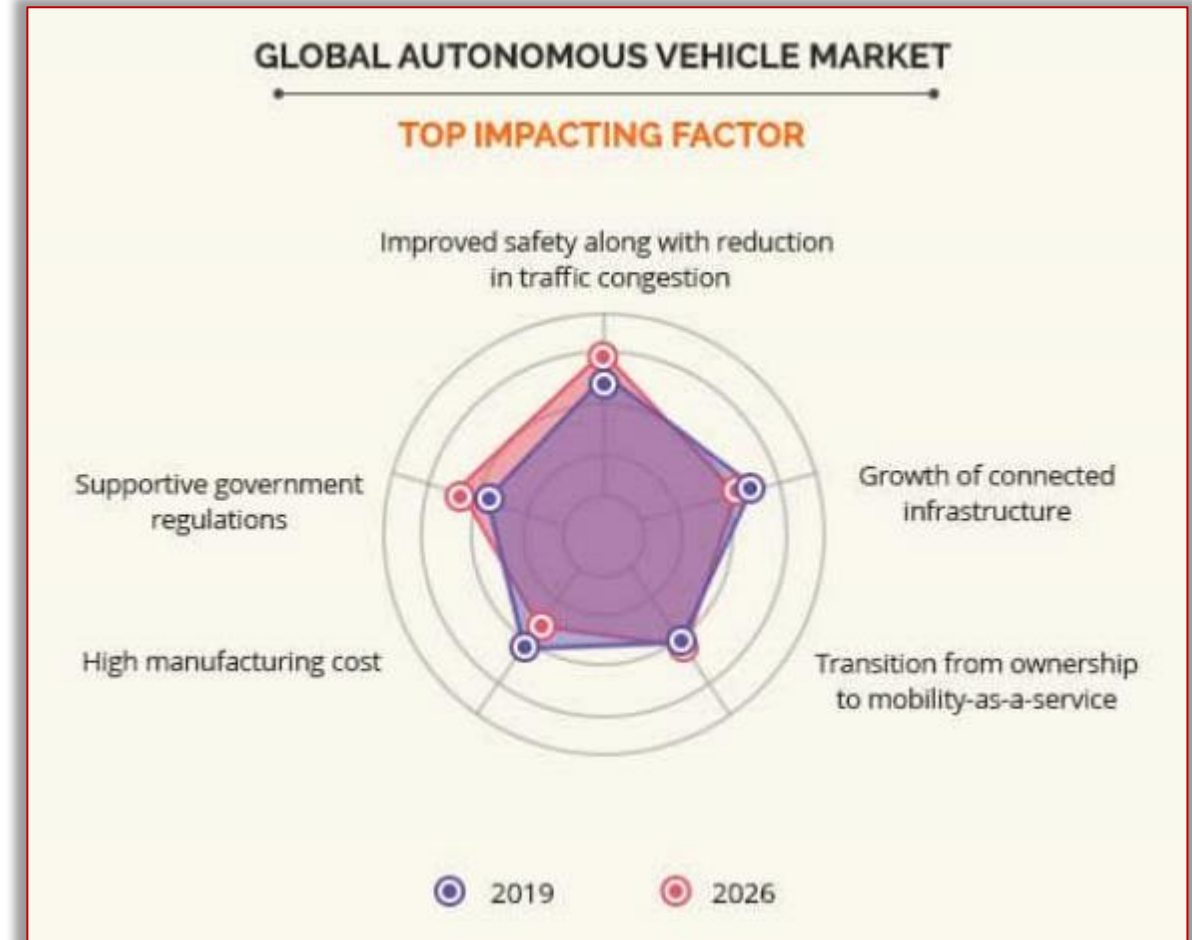
- Michigan is **not a top 10 state** for charging points per vehicle. The top five states are Vermont, California, Massachusetts, Hawaii, and Colorado.
- In February 2021, the American Council for an Energy-Efficient Economy (ACEEE) **ranked Michigan 29th in a survey** of state electrification initiatives.
- States like California topped the ACEEE ranking due to their **policy incentives** for charging infrastructure, EV ownership and electric fleets.
- Recent programs like Michigan's \$16M Charge Up initiative are in the right direction, but much **more substantial investment is critical** to pull ahead.

Challenge #5: State Regulations and Resources Keeping Pace

AVs will be foundational to the future mobility economy. Capturing the market represents a generational opportunity for Michigan to establish itself as the core location for autonomy and autonomy-adjacent fields.

AV Market & Policy Environment

- The global AV market was valued at \$54 billion in 2019 and is projected to reach **\$557 billion by 2026**.
- The future of the mobility economy will be shaped by demand for the **underlying technologies required to enable autonomy at scale** (e.g., LiDAR, radar, image processing, computer vision, and AI/ML).
- While the top impacting factor for AVs today is high manufacturing costs, **supportive government regulations will be most critical** in five years.
- The states that have invested in creating a favorable regulatory environment for AV testing in real-world conditions have **attracted the majority of AV companies and associated economic impact**.

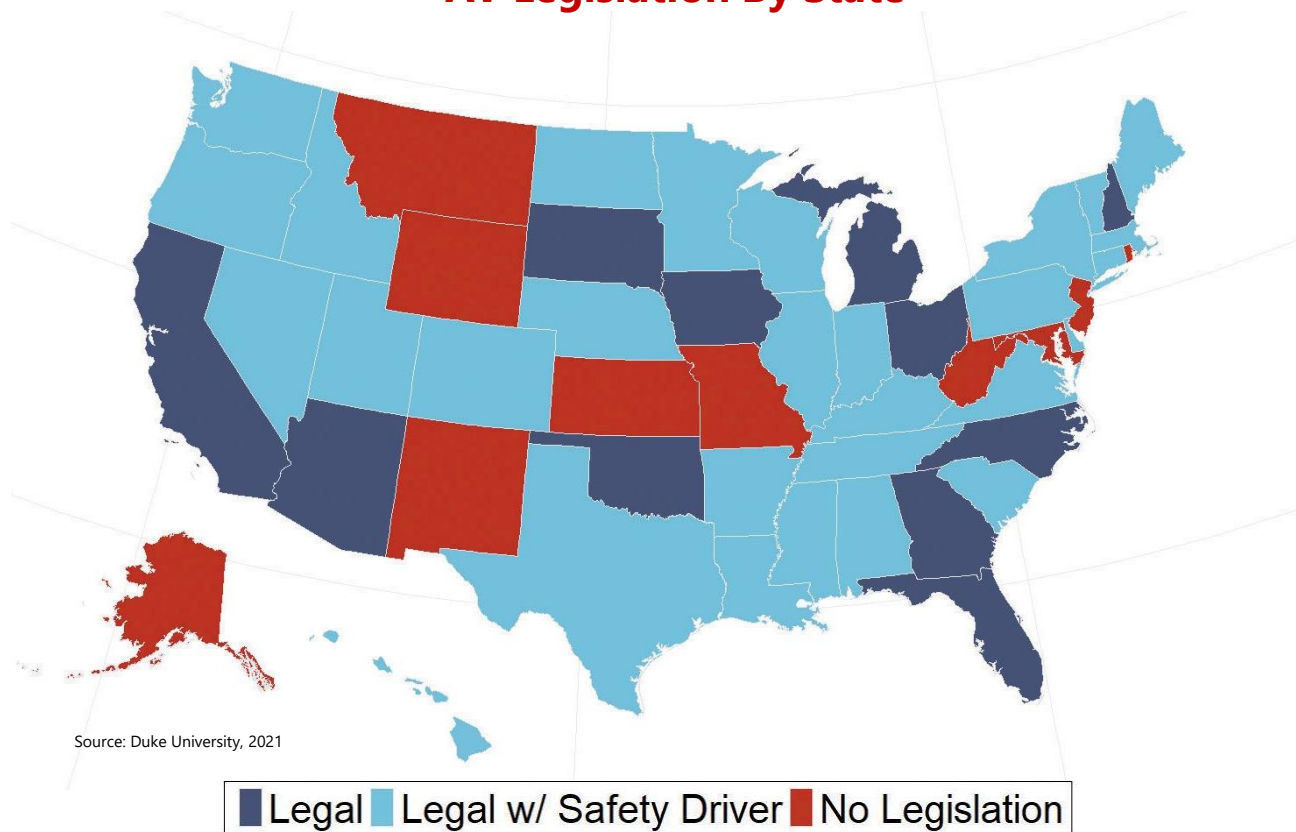


Source: Allied Market Research 2018

Challenge #5: State Regulations and Resources Keeping Pace

Michigan has had some activity in recent years due to its regulatory environment and infrastructure projects like the Detroit-Ann Arbor CAV Corridor. However, states like Arizona are also perceived as leading and benefit most from economic impact associated with AV testing.

AV Legislation By State



Where Michigan Stands Nationally

- **Michigan is a strong testing location for AVs.** Michigan is one of the five states where companies most frequently test AVs. The other states are California, Arizona, Pennsylvania and Florida.
- **However, Michigan lags in autonomous trucking specifically.** Deloitte currently predicts that Michigan will be in the third and final wave of states to implement self-driving trucks at scale, following the Southwest first and the South/East Coast second.
- **Other states are perceived as more dominant.** Arizona is seen as the top state for AV companies, with 300-400 of Waymo's 600 autonomous vehicles located there. California remains the busiest hub, with 50+ companies testing AV technology in the state.

Challenge #5: State Regulations and Resources Keeping Pace

Competitive US states have various levers to attract mobility companies. The most successful states use a combination of levers to create viable conditions for company attraction, growth and retention by approaching both the supply side (direct incentives and investments to target companies) and the demand side (adoption incentives for consumers). Levers include:

✓ Funding for grants/competitive prizes

- ✓ Public transportation & infrastructure (ex. [EVolve NY program](#), [Illinois Transportation Electrification Infrastructure projects](#))
- ✓ Advanced/innovative transportation (ex. [CA Clean Transportation Program](#), [Arizona's Innovation Challenge](#))
- ✓ Cleantech/mobility startups (ex. [CalSEED](#), [Indiana's Elevate Ventures](#))
- ✓ Workforce development & training (ex. NY's [Clean Energy Workforce Development](#))

✓ Incentives

- ✓ Subsidies and rebates to accelerate adoption of EVs/cleaner energy vehicles and/or infrastructure for residents and public/private fleet owners.

✓ AV/EV regulations & policies

- ✓ Regulations making it easier for in-state autonomous vehicle testing
- ✓ Legislation outlining the requirements for a self-driving vehicle to operate in the state without a human operator present in the vehicle

✓ Setting up relevant institutions/committees and/or regional alliances

- ✓ Addressing community mobility challenges (ex. [Texas Innovation Alliance](#))
- ✓ Attracting startups/companies into the region (ex. [Arizona's Institute for Automated Mobility](#))
- ✓ Piloting new advanced mobility technologies (ex. [DriveOhio](#), ex. Illinois Department of Transportation's (IDOT) [Autonomous Illinois initiative](#))
- ✓ Research transition into EV future (ex. Indiana's [Electric Vehicle Product Commission](#))

✓ Partnering with universities

- ✓ To innovate on transportation infrastructure/mobility (ex. Indiana's [The Joint Transportation Research Program](#))
- ✓ To provide pilot test sites (ex. [the City of Atlanta and Georgia Tech launched the North Avenue Smart Corridor](#))
- ✓ To promote relevant EV programs at universities (ex. Arizona's Pima Community College (PCC) announced their [Autonomous Driver Program](#))

Challenge #5: State Regulations and Resources Keeping Pace

Michigan has strong competitors. So, it is critical that the state's mobility and electrification programs be resourced to keep up.

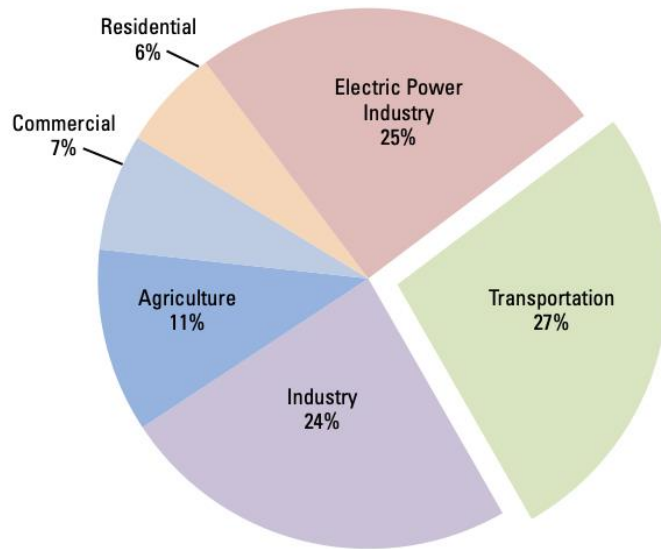
	Grants, Prizes & Investments	Alternative Fuel Incentives	Regulation & Policy	Regional Assets	Academic Partnerships
Michigan	High	High	High	High	High
Arizona	Medium	Medium	High	High	High
California	High	High	High	High	High
Georgia	Low	Medium	High	Medium	High
Illinois	High	Medium	Medium	High	Medium
Indiana	Medium	Medium	High	Low	Medium
New York	High	High	Medium	Medium	Medium
Ohio	High	Medium	High	High	High
Tennessee	Medium	Medium	High	Medium	Medium
Texas	High	High	High	Medium	High

Strength of Program, Policy or Investment: ■ High ■ Medium ■ Low

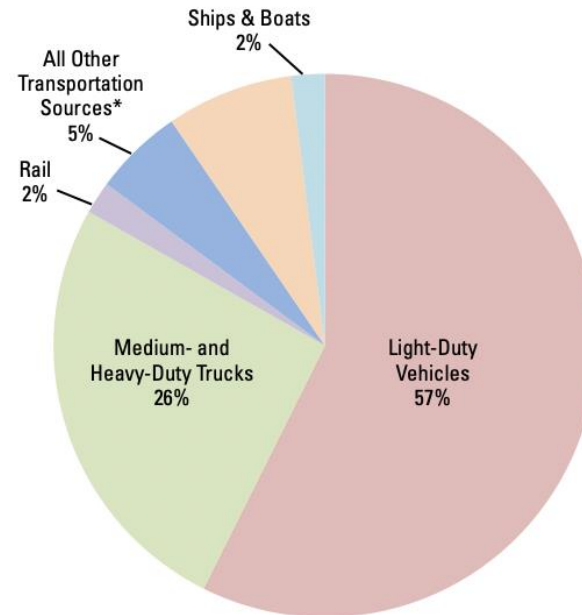
Challenge #6: Decarbonizing the Transportation Sector

The transportation sector is one of the largest contributors to anthropogenic U.S. greenhouse gas (GHG) emissions. The burning of fossil fuels like gasoline and diesel releases carbon dioxide (CO₂), a greenhouse gas, into the atmosphere. The buildup of CO₂ and other greenhouse gases like methane, nitrous oxide, and hydrofluorocarbons is causing the Earth's atmosphere to warm, resulting in changes to the climate that we are seeing today.

Share of U.S. GHG Emissions by Economic Sector



Share of U.S. GHG Emissions by Transportation Sector



Effects of Transportation on Climate Change

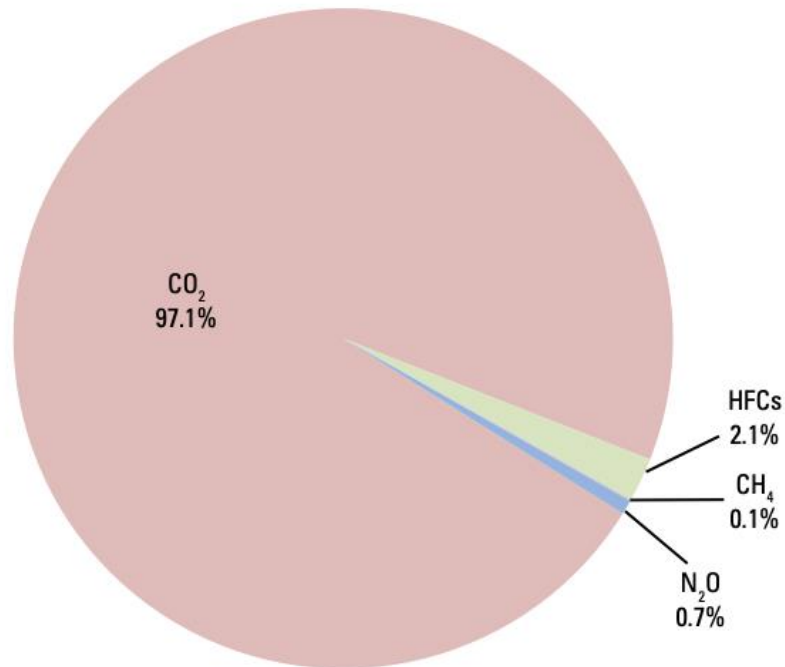
- Greenhouse gas emissions from the transportation sector primarily involve fossil fuels burned for road, rail, air, and marine transportation. **Almost all (95%) of the world's transportation energy comes from petroleum-based fuels**, largely gasoline and diesel.
- GHG emissions from **transportation account for about 27 percent of total U.S. greenhouse gas emissions**, making it the largest contributor of U.S. GHG emissions.
- Between 1990 and 2020, **GHG emissions in the transportation sector increased more** in absolute terms than any other sector.

Source: nepis.epa.gov 2020

Challenge #6: Decarbonizing the Transportation Sector

In 2005, the transportation sector in Michigan emitted 59.26 million metric tons (mmt) of CO₂ emissions – most of which came from light-duty passenger vehicles and heavy-duty freight trucks. As EVs became more available and modern internal combustion engine (ICE) vehicles became more fuel efficient, transportation emissions dropped slightly to 53.04 mmt CO₂ emissions in 2019 – a 10 percent reduction since 2005.

Share of U.S. Transportation Sector GHG Emissions by Gas



Source: nepis.epa.gov 2020

Where Michigan Stands Nationally

- **EVs represent a small fraction of Michigan's current auto sales today.** Just 0.62 percent of all vehicles sold here in 2020 were electric. Two of the key current barriers to widespread uptake are the higher purchase cost typically associated with EVs and the real or perceived lack of EV charging infrastructure.
- **Vehicle electrification cannot be the only transportation decarbonization solution for Michigan.** Vehicle fleets have inherently slow turn-over rates.
- **The majority of vehicles on Michigan's roads will still be burning gasoline in 2030.** Expanding access to safe and convenient public transit, mobility solutions like car sharing, and high-quality bike and walking infrastructure will play a vital role in decarbonization.

MI Future Mobility Plan: Introduction

Governor Whitmer's MI Future Mobility Plan addresses these challenges. The plan is anchored by three pillars and a clear vision statement.

Vision Statement:

Enable a stronger state economy through safer, more equitable and environmentally sound transportation for all Michigan residents.



Michigan's performance within these pillars will determine whether we secure Michigan's position as a global mobility powerhouse, and create more high-wage, high-skill jobs statewide.

These three pillars are designed to confront key future questions.



“Is Michigan still the leader for vehicles and components in a world after internal combustion engines? How big is the lead?”

“Is Michigan the leader in the transition for autonomous, connected driving? Have we leveraged our automotive advantage to lead in other modes of transportation for both people and goods?”

“Is Michigan achieving economic prosperity within AV and EV sectors while household incomes are rising?:



“Did Michigan build an infrastructure that was sufficient for a complete transition to zero-emission vehicles and autonomous vehicles for everyone?”

“Did Michigan hit its 2050 goal of becoming a carbon neutral state?”

“Did Michigan bring the annual traffic fatality rate down to zero through smarter technologies?”



“Is Michigan considered the most-friendly policy environment for all modes of mobility?”

“Is Michigan the friendliest place to research and design new mobility tech?”

“Is Michigan considered the global leader in mobility innovation?”

“Is Michigan the top U.S. destination for mobility and electrification startups and investors?”

...and achieve the following outcome-based mobility goals.

Pillar #1: Transition and Grow Our Mobility Industry and Workforce

Desired Outcomes:

- Create 20,000 new jobs by 2026 while increasing the median wage of mobility sector jobs.
- Add 7,000 workers with mobility credentials by 2030 — while increasing diversity in the mobility sector's workforce.
- Ensure Michigan maintains a resilient automotive manufacturing sector that supports at least 170,000 jobs through 2030.

Pillar #2: Provide Safer, Greener and More Accessible **Transportation Infrastructure and Services**

Desired Outcomes:

- By 2030, deploy 100,000 EV chargers to support 2,000,000 EVs and improve access to hydrogen infrastructure.
- Maintain at least 80% of EV charging off-peak to minimize impacts on the grid.
- Reduce congestion and traffic crash rates statewide by 2026.
- Provide residents with consistent access to mobility-as-a-service options across Michigan's 77 transit agencies by 2025.

Pillar #3: Lead the World in Mobility and Electrification **Policy and Innovation**

Desired Outcomes:

- Maintain #1 state ranking for mobility and electrification research and development spend.
- Become a top 10 state for growth in venture capital funding by 2026.
- Become a top 10 state for federal investments related to mobility and vehicle electrification.
- Lead the nation in electric and automated vehicle friendliness through responsive policies.

MI Future Mobility Plan: Initiatives

MI Future Mobility Plan: Introduction to Initiatives

Michigan’s position as a leader in mobility and electrification will be impacted by the level of collaboration within government, and with industry. **With that perspective in mind, leaders across state government and industry came together through the Michigan Council on Future Mobility and Electrification (CFME) to determine the right set of initiatives for this plan.**

State Leaders, and CFME Private/Public Sector Members, Providing Initiative Recommendations for the MI Future Mobility Plan:

EOG: Executive Office of the Governor	Treasury: Michigan Dept. of Treasury	CFME Member: Rivian
LEO: Michigan Dept. of Labor and Economic Opportunity	MSP: Michigan State Police	CFME Member: Waymo
EGLE: Michigan Dept. of Environment, Great Lakes and Energy	CFME Members: Senate Majority	CFME Member: Ford
MDOT: Michigan Dept. of Transportation	CFME Members: Senate Minority	CFME Member: Toyota
MEDC: Michigan Economic Development Corp.	CFME Member: House Majority	CFME Member: Stellantis
MPSC: Michigan Public Service Commission	CFME Member: House Minority	CFME Member: General Motors
OFME: Michigan Office of Future Mobility and Electrification	CFME Member: Clean Fuels Michigan	CFME Member: Michigan State University
DIFS: Michigan Dept. of Insurance and Financial Services	CFME Member: United Auto Workers	CFME Member: University of Michigan

Guiding Principles for Initiative Recommendations:

- **A systems-level approach will create economic development advantages.** How people and goods move is not isolated to one mode. Simply being the best at autonomous cars is too narrow of a win to claim global leadership over all of mobility. Core elements of the new mobility era (autonomous, connected, shared and electric vehicle technologies) are systematically linked. A state that intentionally and consistently integrates all these elements into its systems of movement for people and goods will have more wins.
- **Collaboration between the public and private sector is more critical than ever.** A state that leverages public investment to spark private investment will move faster, build deeper partnerships and have a greater global impact.
- **Responsive policy is a core asset.** A state that focuses on new policy frameworks that account for future mobility scenarios will have the agility to hold leadership positions as the transportation landscape rapidly evolves.
- **Smarter and greener infrastructure is a new and cutting-edge economic development tool.** A state's infrastructure is a critical new asset/currency for economic development. It is a foundational platform that drives business attraction, growth and new job-creating business models.

Pillar 1:
Transition and Grow
Our Mobility
**Industry and
Workforce**

- A. Create 20,000 new jobs by 2026 while increasing the median wage of mobility sector jobs.
- B. Add 7,000 workers with mobility credentials by 2030 — while increasing diversity in the mobility sector’s workforce.
- C. Ensure Michigan maintains a resilient automotive manufacturing sector that supports at least 170,000 jobs through 2030.

Pillar 1 Initiatives: Industry and Workforce

Job Creation Initiatives

- **Continued Incentive Tool Development and More Comprehensive Lead Generation:** Continue bolstering a flexible and robust SOAR Fund toolkit for MEDC to attract top mobility and electrification suppliers, manufacturers, and maintenance providers. Also, establish benchmarks with peer states that are prioritizing mobility, while also developing more comprehensive systems for identifying targets in high-growth mobility sub-sectors. This includes leveraging regional partners and Michigan expats to pinpoint demand in way that shortlists Michigan before domestic or global investment attraction opportunities are public.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MEDC
- **More Comprehensive Site Development for Mobility Companies:** Support MEDC in growing the number of move-in ready large and medium sites. And accompany new site-based assets with funding and tax abatements for the owners of those properties until they can be leased.
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, MEDC

GOAL A:

Create 20,000 new jobs by 2026 while increasing the median wage of mobility sector jobs.

Median Wage Initiatives

- **High-Tech Talent Retention Funding:** Provide increased funding for higher ed student aid, with a specific focus on programs that retain computer science graduates to fill open jobs in mobility-related fields. This includes supporting partners, like MICHauto, University of Michigan's EV Center, and the MEDC Talent Action Team. A larger workforce of highly skilled and educated talent will raise average wages for all.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MEDC, LEO
- **Double Down on High-Tech Talent Lead Generation and Remote Work Programming:** Leverage existing industry relationships, and in-house MEDC marketing resources to develop advertising campaigns that attract software engineering talent and highlights unique assets like Michigan Central Innovation District in Detroit. Additionally, to get new computer-related engineers in-state faster, develop programs to attract out-of-state remote workers to Michigan to join local software and robotics credentialing programs, with in-state job matching.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MEDC, LEO

Pillar 1 Initiatives: Industry and Workforce

GOAL B:

Add 7,000 workers with mobility credentials by 2030 — while increasing diversity in the mobility sector's workforce.

Credentialing Initiatives

- **Develop and Support More Signature EV and AV Training:** Grow EV-focused and AV-focused academies, like the Michigan EV Jobs Academy, in partnership with industry, colleges, and universities – these partners would provide a credential or nano-degree. These academies must be paired with aggressive job placement programs. And, resource programs, like Michigan's Going Pro, that have a proven track record in assisting the auto sector's shift to EV production.
Time Period for Results: 2023-24; Recommendation: CFME, EOG, MEDC, LEO
- **Develop System for Futureproofing Curricula:** Funding for schools that focus on upskilling, retraining, continuous learning and provide funds for workers directly for their continuous learning. This includes incentives to become engaged with their local educational institutions (time in class, first robotics, adjunct professor, projects, mentorships, sponsorships, interns, etc.). Leverage Michigan Reconnect Program for earlier access to talent for mobility companies.
Time Period for Results: 2024-25; Recommendation: CFME, EOG, MEDC, LEO

Diversity-Driven Initiatives

- **Build Systems and Services for Supply Chain Reshoring:** Provide new funding sources for the construction of critical supply chain facilities, and the localizing of software-based operations, both from an R&D and scaling perspective.
Time Period for Results: 2024-25; Recommendation: CFME, EOG, MEDC, LEO
- **More Comprehensive Immigration Support:** Better link state and national immigration programs to Michigan's mobility Industry, creating stronger pipelines for global talent to fill key positions at autonomous, electric, and connected technology companies. This includes creating better sponsor programs, and communication of career paths in Michigan.
Time Period for Results: 2024-25; Recommendation: CFME, EOG, MEDC, LEO
- **Scale In-State STEM and Cybersecurity Education Systems in Diverse Communities:** Support Michigan's scaling up of its in-demand STEM and cybersecurity programs for K-12 and college students. Increase the placement of STEM and Cybersecurity college students in internships at local emerging companies. Bolster initiatives that provide more access points for K-12 students to experience mobility.
Time Period for Results: 2024-25; Recommendation: CFME, EOG, MEDC, LEO

Pillar 1 Initiatives: Industry and Workforce

Manufacturing Resiliency Initiatives

GOAL C:

Ensure Michigan maintains a resilient automotive and parts manufacturing sector that supports a minimum of 170,000 jobs through 2030.

- **Create a Portfolio of New and Proactive Supply Chain Planning and Retooling Services:** Provide cash grants for planning, retooling, constructing new EV, AV, and component facilities as well as making them energy efficient. This includes battery production, labs for autonomous/connected/shared technology and assembly facilities.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MEDC, LEO
- **Communicate Mobility and Industry 4.0 Efforts as Complementary:** Create marketing campaigns, and lead generation systems that provide new mobility business opportunities for traditional manufacturers to retain jobs and accelerate Industry 4.0 adoption. Additionally, existing and low-overhead programs like Automation Alley and MEDC's Pure Michigan Business Connect and International Trade Program that connect manufacturers to new business partnerships should be scaled.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MEDC, LEO
- **Systematize State Services for Auto Worker Displacement:** Ensure the jobs created making new technologies come with, at a minimum, the pay and benefits of the jobs they are displacing, making sure unionization in the manufacturing factor is preserved. And investing in communities with a high percentage of workforce vulnerable to displacement.
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, LEO
- **Create Electric Vehicle Transformation Impact Program (EVTIP):** Create a program that provides transition strategy resources to communities affected by the closure of ICE employers because of EVs. This program would be modeled after Treasury's Energy Transition Impact Program (ETIP).
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, LEO, Treasury

Pillar 2:
Provide Safer,
Greener and More
Accessible
**Transportation
Infrastructure and
Services**

- A. By 2030, deploy 100,000 EV chargers to support 2,000,000 EVs and improve access to hydrogen infrastructure.
- B. Maintain at least 80% of EV charging off-peak to minimize impacts on the grid.
- C. Reduce congestion and traffic crash rates statewide by 2026.
- D. Provide residents with consistent access to mobility-as-a-service options across Michigan's 77 transit agencies by 2025.

Pillar 2 Initiatives: Transportation Infrastructure and Services

GOAL A:

By 2030, deploy 100,000 EV chargers to support 2,000,000 EVs and improve access to hydrogen infrastructure.

Charging Initiatives

- **Bolster Charge Up Michigan Program to Accelerate Growth of Charging Infrastructure Statewide:** Leverage NEVI funds and other federal/state funding, utility collaborations, and innovative public-private partnership models to deploy EV charging infrastructure along Michigan's interstates and strategic thoroughfares. This includes creating regulatory rights of way to speed up charging station deployment. And continue to build out signature routes like the Lake Michigan loop to extend around the Great Lakes to reduce range anxiety and stimulate tourism clusters. The state should lead by example and procure 100% zero-emission vehicle (ZEV) vehicles by 2035 for light-duty vehicles, 2045 for medium- and heavy-duty vehicles, and coordinate plan for ZEV charging.
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, EGLE, MDOT, LEO
- **More Accessible and Equitable Charging Investments and Tools:** Develop resource to assist local communities in supporting buildout of EV charging networks. Incentivize buildout in commercially inviable areas. Deploy funds to design local strategic plans for siting EV chargers based on user-experience, and at locations where make-ready infrastructure can be leveraged. Plans should target incentives for retrofitting multi-unit dwellings and offer charging to lower income communities. Finally, the state should take a lead position in developing ADA-compliant accessibility standards for EV chargers.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, EGLE, MDOT, LEO, MEDC

EV Adoption Initiatives

- **Accelerate Fleet Transition:** New incentives to motivate public and private fleet transitions for both passenger and freight vehicles. Rebates and/or tax credits for retirement of ICE vehicles and purchasing of replacement EVs. Provide extra incentives for small and medium businesses, lower-income neighborhoods; and fleets in areas with a history of environmental injustice. Bolster EGLE's resources for existing programs and expand electric utility fleet electrification and education.
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, EGLE, LEO
- **New Incentive Tools to Purchase Passenger EVs:** Approve and execute a state \$2,500 rebate/POS incentive (\$2,000 for the vehicle, \$500 for charging equipment). The state should fund a statewide rebate program for EVs that aligns with existing programs and complements the existing \$7,500 federal credit.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, EGLE, LEO, MEDC
- **More EV Seller Education Tools:** Target the total cost of ownership comparison with more robust awareness campaigns. Ensure dealer entities have demonstration EVs and chargers. Work for rebates on consumer-purchased EVs that scale based on household income and the fuel efficiency of any trade-in.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, EGLE, MDOT, LEO

Hydrogen Initiatives

- **Improve Competitiveness for H2 Investment:** Nominate more H2 DOE Alternative Fuel Corridors and conduct a study on commercial goods movement to inform future federal grant applications for H2 technology. Continued state support for H2 coalitions around the Midwest and in Canada that benefit Michigan's carbon neutrality interests. Support H2 R&D and production efforts by private sector partners in-state. Develop state strategy for hydrogen deployment.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MEDC, EGLE, LEO, MPSC

Pillar 2 Initiatives: Transportation Infrastructure and Services

Grid Resiliency Initiatives

GOAL B:

Maintain at least 80% of EV charging off-peak to minimize impacts to the grid by 2030.

- **Develop Next-Generation Charging and Energy Storage Testbeds and Deployments:** Execute grant programs for battery innovation and charging that align with federal programs. Continue to lead on wireless charging, building on MDOT-Electreon pilot. Create electric utility demand response testbeds paired with grants to couple level 2 and DCFC fast charging installations with managed charging or demand response programs (and onsite renewable energy/storage technologies) that reduce the grid impacts of on-peak charging. Also, create vehicle-to-everything (V2X) testbeds that provide for the testing, valuation, and real-world application of V2X solutions that provide more local and grid-wide capacity, reliability, and resiliency. Pilots would include the testing of various vehicle-to-home, vehicle-to-building, and vehicle-to-grid technologies and business models.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MPSC, EGLE, MDOT, LEO
- **Develop Systems and Policy that Address Charger Uptime and Make-Ready Infrastructure: Develop Systems and Policy that Address Charger Uptime and Make-Ready Infrastructure:** Further enable time-of-use rates or direct controls to reduce charging that could impact local grids. Adopt the National Electric Vehicle Infrastructure Program's uptime requirements (97%) in all state and ratepayer-funded public EV charging programs and set an expectation that charging infrastructure malfunctions and repairs should be addressed in 48 hour's notice and 7-10 days for complex or significant issues, like vandalism. And develop systems and policy for the reinstatement of demand charges. This would follow demand charge holidays that incentivize the reduction of loads through the rate structure from 2026-2030.
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, EGLE, MPSC, MDOT, LEO
- **Create Better Systems for Tracking Grid-Vehicle Relationships and Increase Public Access to Grid Capacity Data:** Increased attention paid to how transportation electrification can negatively and positively impact grid reliability, resilience, and affordability for electric customers. Tie this to utility rate cases. Also, charging infrastructure developers, municipalities, fleet owners, and other stakeholders should have enhanced access to electric distribution system data (e.g., hosting capacity maps). Making this data more accessible will better inform the public of where there is available capacity on the grid to accommodate Level 2, DCFC, Fleet, and other charging infrastructure.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MPSC, EGLE, MDOT, LEO

Congestion and Safety Initiatives

- **New Funding Tools To Deploy Smart Infrastructure:** Provide funding for Michigan's P3 C-AV laneway development. Fund state's portal facilitating dig-once policies as precursors to integration of infrastructure asset networks and operations. Scale work zone safety pilots to de-risk vulnerable parts of the state's transportation system. And leverage road user charging study results to uncover new revenue models around AVs and EVs.
Time Period for Results: 2023-24; Recommendation: CFME, EOG, MDOT, LEO
- **Become a National Leader in Supply Chain/Logistics Innovation:** Leverage programs like the Michigan Mobility Funding Platform to prove out larger in-state private investment in autonomous last-mile delivery, drones, rail, smart food distribution and other cutting-edge multimodal solutions. Provide grants to mobility companies to develop these use cases. Create use cases to strengthen partnership between Michigan and Ontario.
Time Period for Results: 2023-24; Recommendation: CFME, EOG, MDOT, LEO
- **Develop Policy for AV Industries to Innovate Faster:** With safety in mind, relax outdated policies and rules related to vehicle design certifications. Allow for deviations in the testing of alternatively designed vehicles. Via R&D incentives, invest in alternative vehicle design development and testing. Relax liability requirements for alternative AV design and real-world testing. And analyze other states' security laws and regulations, develop requirements for CAV data platform management and cyber security.
Time Period for Results: 2024-25; Recommendation: CFME, EOG, MDOT, LEO
- **Advance Timelines on CV2X Infrastructure:** Lead the national conversation around funding Cellular Vehicle-to-Everything (CV2X) infrastructure and the office support needed to operate. Do this in a way that prioritizes funding for states that have stranded investments in Digital Short-Range Communications (DSRC or radio) systems. Focus on infrastructure and systems that can facilitate a roundtrip data dialogue of <10milliseconds.
Time Period for Results: 2024-25; Recommendation: CFME, EOG, MDOT

GOAL C:

Reduce congestion and traffic crash rates statewide by 2026.

Transit-Based Initiatives

- **New Programs that Leverage Technologies to Solve Mobility Barriers:** Fund grant programs, like the MDOT Office of Passenger Transportation and Michigan Mobility Funding Platform, that incent companies to bring pilot projects and field offices to Michigan to address urban and rural transit challenges. The State should consider funding or providing matching funds to catalyze innovative projects within SE Michigan transit community, such as Ann Arbor to Detroit commuter rail service and the development of locally preferred bus rapid transit.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MDOT, LEO, MEDC
- **Develop Smart City Grant Programs:** Launch projects with industry like the Detroit Smart Parking Lab, or new assets like curbside monetization platforms or last-mile delivery hubs. The State should also fund pilots to reduce mobility insecurity across the state, which could include funds for car sharing/transit options for mobility insecure populations (low-income housing, the elderly, etc.). Scale OFME and MDOT's Intelligent Transportation Systems (ITS) team to support.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MDOT, LEO, MEDC
- **Create New Transit Tools for Michigan's Workforce:** Push for a commuter tax credit to enable all populations to get to jobs. Deposit funds into transit accounts via common payment applications. Incentives to use ride sharing.
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, LEO, MDOT
- **Become a National Leader in Transit Payment Systems:** The state should develop a mobility wallet – a statewide common payment platform for transit agencies, micro-mobility providers, and other providers. This will enable a base-level of universal mobility that assists all residents and can be an attractive asset in courting new business investment.
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, MDOT, LEO CFME, MDOT, LEO

GOAL D:

Provide all residents with consistent access to mobility-as-a-service options across Michigan's 77 transit agencies by 2026.

Pillar 3:

Lead the World in Mobility and Electrification Policy and Innovation

- A. Maintain #1 state ranking for mobility and electrification research and development spend.
- B. Become a top 10 state for growth in venture capital funding by 2026.
- C. Become a top 10 state for federal investments related to mobility and vehicle electrification.
- D. Lead the nation in electric and automated vehicle friendliness through responsive policies.

Pillar 3 Initiatives: Policy and Innovation

R&D-Driven Initiatives

- **Enable University Centers of Excellence for Battery Innovation and Responsible AI:** Support the development of the University of Michigan's Electric Vehicle Center and Battery Lab. And partner on associated courses, curriculum, lab access, and work environments that develops talent in the EV/battery/charging fields. A multi-university partnership should also be established to apply responsible AI that improves local transportation and logistics networks. Selected universities would work together to develop AI algorithms meant to improve global infrastructure starting in Michigan. And evolve batteries to achieve faster charging, charge rate parity, and new recycling technologies.
Time Period for Results: 2025-26; Recommendation Leads: CFME, EOG, LEO, MEDC
- **Develop Systems and Policies focused on Battery Innovation and Reuse:** Incentivize firms to develop the technology, applications, and refining processes of used raw materials. Target geographical proximity to battery innovation, manufacturing concentrations. Make Michigan as competitive as possible for federal grants.
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, MEDC, LEO, EGLE
- **Create Testing Site Access for Emerging Companies:** The more a company tests in a region, the more likely that a company will invest and create jobs regionally. Bolster grant programs like the OFME testing site grant program, as well as providing more custom data packages to AV and EV companies if they use Michigan testing sites and public roads over those in peer regions. Improve MDOT capacity for scaling advanced mobility pilots and studies, such as MDOT's Work Zone Safety Program and the MDOT-OFME Beyond Visual Line-of-Sight Digital Drone Skyway project.
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, LEO, MEDC, MDOT
- **Develop More Multimodal, Multi-Dimensional Mobility Programming:** Develop feasibility studies, and strategic programming to support air, maritime, rail, defense, and off-road vehicle innovation. Improve coordination between key state agencies: OFME, MDOT aviation/rail teams, and DNR/MEDC outdoor recreation offices.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, LEO, MEDC

GOAL A:

Maintain #1 state ranking for mobility and electrification R&D spend.

Pillar 3 Initiatives: Policy and Innovation

Risk Capital-Generating Initiatives

- **Create More New Risk Capital Tools:** Attract new risk capital to the state and support local startups by co-developing new funds, like the MI New Economy Startup Resiliency Fund. Design tools within MEDC to attract out-of-market venture funds that complement the local ecosystem.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, LEO, MEDC
- **Create Policies that spur Mobility Innovation Hubs, “Startup Assembly Lines”:** Help emerging companies, including those building in the electric, shared, autonomous and connected vehicle space, scale locally. These hubs would facilitate access to capital and close critical funding gaps, supporting companies as they scale. The Michigan Central Innovation District partnership between Ford, the state, and the City of Detroit, and the Detroit Regional Partnerships GEM program can be models for other hubs. This includes partnering with best-in-class global tech accelerators to grow next-generation technology companies locally.
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, LEO, MEDC

GOAL B:

Become a top 10 state for growth in venture capital funding by 2026.

Pillar 3 Initiatives: Policy and Innovation

Federal Fund-Generating Initiatives

- **Maximize Federal Tools to Develop Future Mobility Technologies in Michigan:** Position the state to maximize funds received from the Infrastructure Investment and Jobs Act (IIJA) and Inflation and Reduction Act (IRA). Also position Michigan for any testing/validation grants as well as a National Lab. Work towards funding for across multiple federal agencies. Including but not limited to Army RDT&E Appropriations Requests, DOT CMAQ funding for state clean vehicle initiatives, Federal Highway Administration (FHWA) Congestion Mitigation and Air Quality (CMAQ) funding, DOT Clean Corridors Program funding, EPA DERA funding, and National Science Foundation (NSF) AV and Innovation-Based Grants.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MEDC, EGLE, MDOT, EGLE
- **Bolster Systems for Supporting Existing In-State Testing:** Generate federal funding for the state to lead battery, AV, and hydrogen R&D consortiums in Michigan. Especially those that integrate the federal government, global partners, universities, and industry. Specifically, create new funding opportunities at DOE for state-supported R&D and testing facilities partnering with charging station manufacturers to develop, next-gen EVSE, carbon capture technologies, and hydrogen infrastructure/vehicle development (to hit state 2050 carbon neutrality goal).
Time Period for Results: 2024-25; Recommendation Leads: CFME, EOG, MEDC, EGLE, LEO
- **Expand Effective In-State Innovation-Based Programs:** Authorize/Increase federal funding for the DOE Clean Cities alternative fuel deployment program (\$60M), the US EPA Diesel Emission Reduction Act Grants (\$100M). Push to expand and extend 30C and 30D tax credits to include permitting and inspection fees, in-home and multi-unit dwelling charger installations, and to include new vehicle purchases through 2030.
Time Period for Results: 2025-26; Recommendation Leads: CFME, EOG, EGLE, MEDC, LEO
- **Leverage Global Partnerships to Attract New State Investment:** Target collaboration on standards at key trading points, for example the Detroit and Windsor-Essex corridor. Look at critical areas such as the EV battery supply chain.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MEDC, LEO, MDOT

GOAL C:

Become a top 10 state for federal investments related to mobility and vehicle electrification.

Pillar 3 Initiatives: Policy and Innovation

Policy-Based Initiatives

- **Enhance the R&D Tax Credit:** Be more inclusive with items that qualify. Target mobility, electrification, robotics and software. Work with legislature to develop sustainable tools to incent companies to invest in R&D jobs.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MEDC, LEO
- **EV and AV Revenue Modeling Systems:** Establish leadership in understanding the affect of transitioning to EVs on current transportation revenue sources (gas tax, registrations) and alternative future infrastructure financing.
Time Period for Results: 2025-26; Recommendation Leads: CFME, EOG, MDOT, LEO, EGLE
- **National AV and Smart Infrastructure Policy Leadership for On-Road and Off-Road Vehicles:** Work for state and national AV policies. Examples include passing the Mobility Futures initiative, permitting operations of automated delivery devices, and developing systems for sharing of real-time construction zone data. This includes cleaning up language, definitions, and taxonomy in PA 332 of 2016 (Michigan Vehicle Code). And eliminate or extend the sunset on the prohibition of local regulations of automated motor vehicle networks.
Time Period for Results: 2025-26; Recommendation Leads: CFME, EOG, MEDC, EGLE, MDOT, EGLE
- **Prioritize Mobility-Based Partnerships with Other States:** Create similar partnerships to the REV Midwest coalition to build up infrastructure along key interstate commercial corridors. Leverage state relationships to develop federal policy recommendations that create favorable regulatory environments for industry growth.
Time Period for Results: 2023-24; Recommendation Leads: CFME, EOG, MEDC, LEO, EGLE, MDOT, EGLE
- **Set Clear Clean Energy Standards Effecting Michigan Mobility Companies:** Push for the adoption of a clean fuels standards policy. Government can accelerate reduction of electricity (i.e., fuel) costs and emissions across the U.S. with increased clean energy and renewables deployment incentives. This includes funding for load management and innovative V2G programs.
Time Period for Results: 2025-26; Recommendation Leads: CFME, EOG, MEDC, EGLE, MDOT, EGLE

GOAL D:

Lead the nation in electric and automated vehicle friendliness through responsive policies.

MI Future Mobility Plan: Implementation

Implementation: Next Steps and Approach

The Michigan Office of Future Mobility and Electrification (OFME), and the Michigan Council on Future Mobility and Electrification (CFME), will co-lead the implementation of this strategy. With support from LEO, MEDC, MDOT, EGLE, MPSC and the Governor's Office (Michigan Infrastructure Office).

Near-Term Next Steps:

1. Validate with key public and private sector stakeholders.
2. Create cross-functional, cross-departmental teams to be accountable for each initiative and outcome.
3. Develop tracking system and dashboard to measure performance and progress.
4. Setup communication plan to ensure the business community, local governments and the public can clearly understand the vision and goals.
5. Plan for short-term and long-term resource requests stimulated by this plan.

Implementation Approach:

Our approach is to launch and grow programs that create the right set of conditions for economic and community development

