



MICHIGAN IS AUTO MOBILITY



MICHIGAN ECONOMIC
DEVELOPMENT CORPORATION

PURE MICHIGAN®



STATE OF MICHIGAN
EXECUTIVE OFFICE
LANSING

RICK SNYDER
GOVERNOR

BRIAN CALLEY
LT. GOVERNOR

Dear Friends:

Welcome to Planet M — where big ideas in mobility are born.

Planet M represents the collective mobility efforts across the state of Michigan, involving the technologies and services that enable people and goods to move around. It is no surprise that this initiative is happening right here in Michigan, the state synonymous with the auto industry. Throughout the past several decades, Michigan has continued to build upon its robust automotive history. Through our innovative spirit, industrial landscape and collaborative atmosphere we are driving the next generation of transportation.

Although this industry is one that continues to evolve, our state has remained at the forefront of this expansion. Michigan is home to more than 75 percent of North America's automotive R&D, 60 percent of the industry's suppliers and a quarter of all U.S. assembly plants. Additionally, Michigan ranks number one in new automotive-related jobs created since 2009 and number one nationally in having the highest concentration of mechanical and industrial engineers. Together, these statistics all mean one thing — the future, including self-driving cars, connected vehicles and other new innovations — is coming together right here in Michigan.

It is also being shaped by ongoing collaboration with our partners in the auto industry. These partners include the future American Center for Mobility, located on the site of the legendary Willow Run manufacturing plant, Mcity, located in Ann Arbor, and other automotive developments near Detroit, Grand Rapids and Lansing.

Through these types of programs and initiatives, we have been able to continually demonstrate Michigan's leadership role in developing the technology necessary to power the vehicles of the future. No other state brings this type of sustained commitment.

Throughout this report, you will learn even more about why Michigan is the preeminent leader of the automotive and next-generation mobility industries. With our deep dedication to the facilitation of public and private collaboration, we will continue to foster the growth of automotive and technology companies for years to come.

Sincerely,

A handwritten signature in black ink that reads "Rick Snyder". The signature is fluid and cursive, with the first letters of "Rick" and "Snyder" being capitalized and prominent.

Rick Snyder
Governor

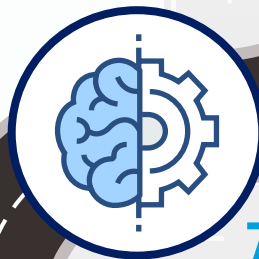
Auto Industry at a Glance

With its **high-tech engineering, top-notch research, highly skilled workforce** and **close proximity to a premier global supply chain**, Michigan has it all. Michigan is positioned for success with its dense automotive industry cluster made up of manufacturers, suppliers and businesses from around the world.

92 of the top 100 automotive suppliers to North America have a presence in Michigan, 60 are headquartered in Michigan.



16 original equipment manufacturers (OEMs) have headquarters or technology centers in Michigan.



74% of Michigan's business-funded R&D, totaling \$10.7 billion, is in the automotive sector.

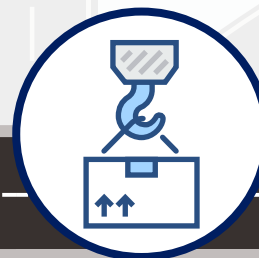
6,600+ engineers graduate from Michigan universities annually.



Michigan has **4** institutions with ranked graduate engineering programs.



Michigan has **20** institutions with ranked undergraduate engineering programs.



Michigan exported **\$26.3 billion** in transportation equipment in 2016.

Greatest Concentration of Global OEM Presence in the World.



F I A T C H R Y S L E R A U T O M O B I L E S

NISSAN



TOYOTA



Volkswagen



HYUNDAI

Automotive R&D Epicenter

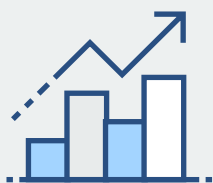
With **\$10.7 billion** in business-funded automotive-related research and development, along with key global industry players who have facilities in Michigan, the state remains at the forefront of innovation to meet the consumer and technological demands of today's automotive industry.



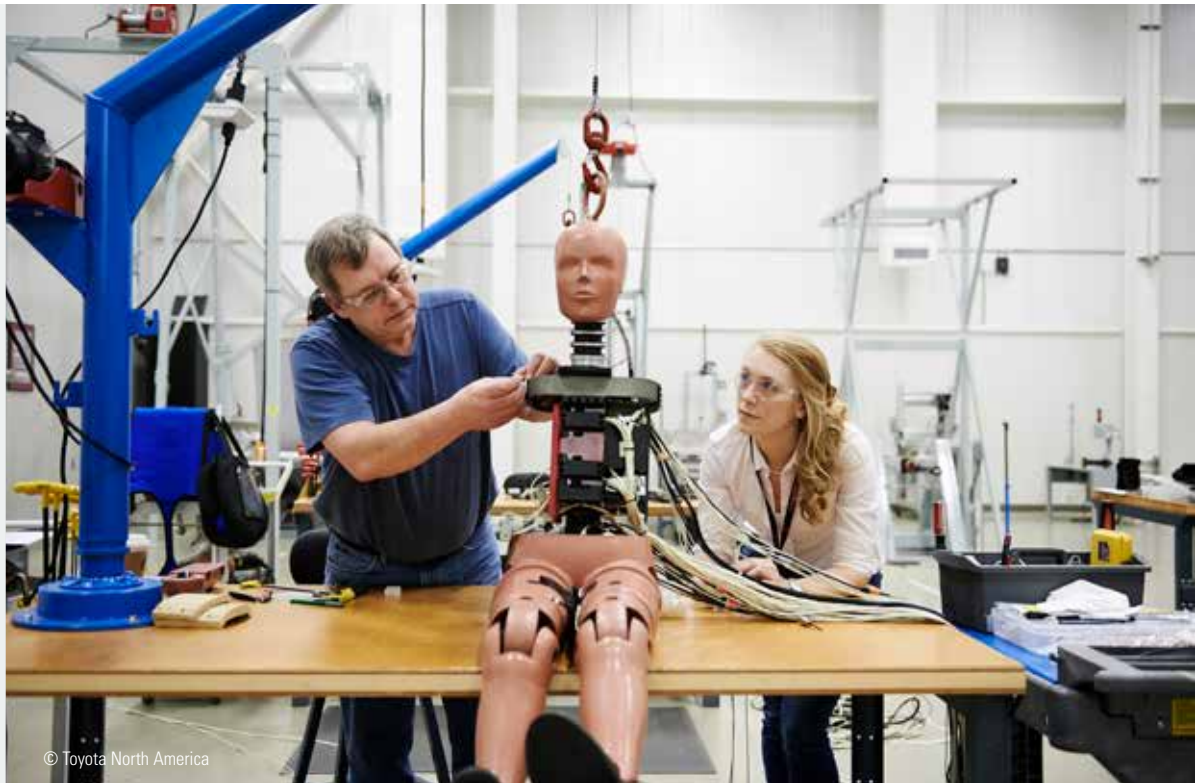
There are **114,910** engineers in Michigan, up **65%** since 2009.



Michigan has the **greatest** number of mechanical (42,080) and industrial (26,660) engineers in the nation.



Michigan has the **2nd highest** Business R&D to GDP ratio among all states, after California, and twice as high as the United States.



© Toyota North America

Research Institutions and Labs



- LIFT (Lightweight Innovations for Tomorrow) is operated by American Lightweight Materials Manufacturing Innovation Institute (ALMMII) and the Institute for Advanced Composites Manufacturing Innovation (IACMI) through a shared space in Detroit for advanced lightweight material and advanced composite manufacturing technologies.
- University Research Corridor (URC) is an alliance of Michigan's three leading research institutions: Michigan State University, the University of Michigan and Wayne State University.
- U.S. Environmental Protection Agency's National Vehicle and Fuel Emissions Laboratory (NVFEL) provides emission testing services for motor vehicles, heavy-duty engines and non-road engine programs.
- U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) is the nation's laboratory for developing advanced military ground vehicle technologies, ground vehicle power and mobility, ground vehicle robotics, ground systems survivability and vehicle electronics and architecture, and process integration expertise and system-of-systems engineering solutions for force projection technology.

Advanced Manufacturing

Michigan employs nearly **600,000** people in manufacturing jobs, more than **170,000** in automotive manufacturing. Michigan **leads the nation** in manufacturing jobs created, adding **57,865** jobs since 2012.

19.4% of all 2016 U.S. vehicle production occurred in Michigan, leading the nation.

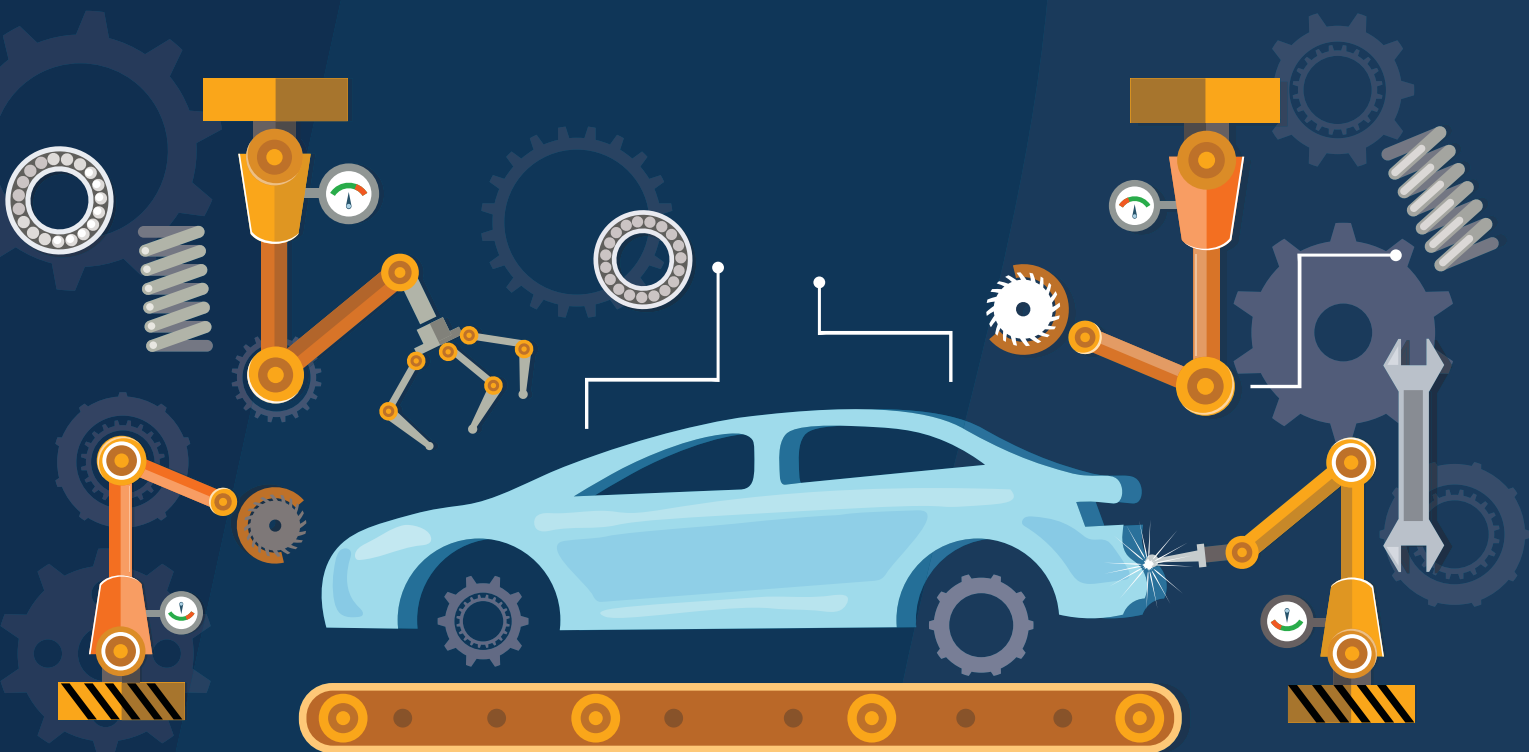
Michigan is home to **1,772** motor vehicle and motor vehicle parts manufacturer establishments, 29% of these (509) are foreign-owned.

Michigan accounted for **13.2%** of all North American vehicle production in 2016.

Michigan has **12** original equipment manufacturer (OEM) assembly plants, more than any other state and Canada.

24 vehicle models assembled in Michigan during 2017.

There are **1,389** tool and die establishments in Michigan, more than any other state.



Global Impact

Michigan's access to a robust supplier network and expertise in moving freight anywhere in the world positions the Motor State as a **magnet for automotive investment**.

509 foreign automotive firms operating in Michigan, announcing 19,622 jobs created and \$4.8 billion invested since 2012.



\$13.9 billion in automotive-related investments announced in Michigan since 2012. 4,686 jobs and \$1 billion announced investments occurred in 2016 alone.



\$26.3 billion of Michigan's \$54.5 billion in exports, in 2016, were transportation equipment.

13 airlines at Detroit Metropolitan Airport (DTW) provide more than 1,100 flights per day to destinations on four continents.



Oakland County International Airport (PTK) is the **2nd** busiest airport in Michigan, serving Fortune 500 companies and housing more than 500 private and corporate aircrafts.



Michigan is home to the **2nd** busiest North American border crossing.

Business Climate

Michigan continues to streamline regulations and improve its business and tax climate, resulting in **one of the fastest-growing states.**



© BorgWarner Auburn Hills Technical Center

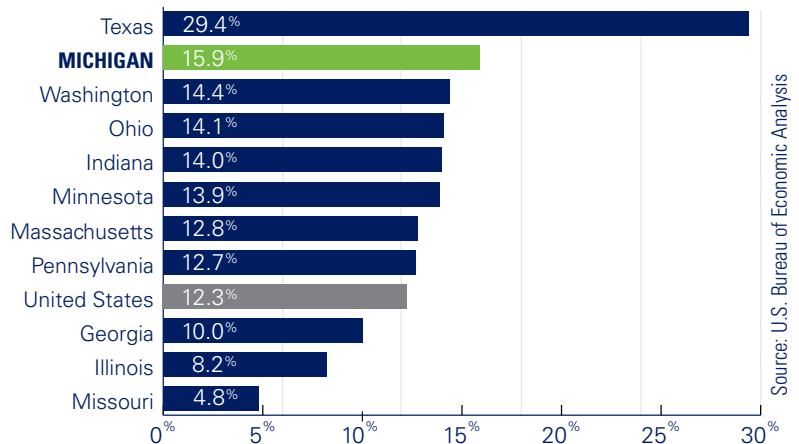


5% unemployment rate for the state of Michigan (January 2017), slightly above the nation.



Detroit was named one of the **2016 best places to live** for tech entrepreneurs, according to Tech Insurance.

Real Gross Domestic Product (GDP) Growth, 2009-2015



Rankings

10th for best quality of life and 15th for best economic climate in November 2016.

7th on CNBC's "America's Top States for Business 2016."

3rd best city for women in technology in December 2016 according to SmartAsset.

6th most private sector job creation since 2010.



Top 10 state for employment growth since 2012.



Michigan passed **right-to-work** legislation in 2012.

Tax Climate

Michigan ranks **12th** among all states for overall business tax climate in 2017 by the Tax Foundation.

Michigan eliminated the personal property tax in 2014 – saving businesses **\$5 million annually.**

Michigan's corporate tax ranking rose to **8th** best in 2017 from 49th in the United States.

Michigan eliminated **2,127** outdated, unnecessary and burdensome regulations.

Made in Michigan

Michigan's footprint in automotive manufacturing continues to **lead the nation**. With state-of-the-art facilities, FCA US LLC, Ford Motor Co., and General Motors Co. (GM) assembled more than **2.4 million** vehicles in Michigan in 2016. All three of the nation's top-selling vehicles are produced in Michigan – Ford F-Series, Chevrolet Silverado and Dodge RAM. Michigan is also home to the **first high-volume lithium-ion battery assembly plant** in the United States operated by a major automaker.



Buick Enclave
Lansing Delta Township

Buick LaCrosse
Detroit-Hamtramck

Cadillac ATS
Lansing Grand River

Cadillac CTS
Lansing Grand River

Cadillac CT6
Detroit-Hamtramck

Chevrolet Bolt
Orion Township

Chevrolet Camaro
Lansing Grand River

Chevrolet Impala
Detroit-Hamtramck

Chevrolet Silverado
Flint Truck

Chevrolet Sonic
Orion Township

Chevrolet Traverse
Lansing Delta Township

Chevrolet Volt
Detroit-Hamtramck

GMC Acadia
Lansing Delta Township
(moving in 2017)

GMC Sierra
Flint Truck



Dodge Durango
Jefferson North

Jeep Grand Cherokee
Jefferson North

Ram 1500
Warren Truck

SRT Viper
Conner Avenue



Ford C-MAX
Michigan Assembly

Ford F-150
Dearborn Truck

Ford Focus
Michigan Assembly

Ford Fusion
Flat Rock

Ford Mustang
Flat Rock

Lincoln Continental
Flat Rock

Automotive Culture

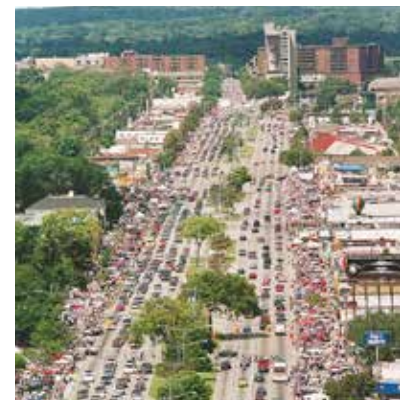
Home to world-leading automotive manufacturers and suppliers, the Automotive Hall of Fame and the global epicenter of research and development, Michigan has an unparalleled automotive legacy. From the days when the first automobile rolled off the assembly line to today's innovative work in connected and automated vehicle development, Michigan is a **premier destination for companies on the cutting-edge of automotive technology**.



With an unparalleled collection of vehicles, The Henry Ford in Dearborn is a regional jewel showcasing the story of how automotive innovations have changed consumers' lives and influenced American culture.



The Chevrolet Detroit Belle Isle Grand Prix attracts thousands of race fans to Detroit annually, generating more than \$45 million in revenue for the local economy.



The Woodward Dream Cruise is the world's largest one-day celebration of classic car culture. Featuring more than 30,000 muscle cars, custom, collector and special interest vehicles, cruisers follow a 16-mile stretch down Woodward Avenue touching nine communities.

Automotive Asset Map

• OEM Headquarters and Technology Centers

Changan U.S. Research and Development Center Inc.	Plymouth
DAIMLER - Research and Development North America Inc.	Redford
FCA US LLC Headquarters and Technology Center	Auburn Hills
Ford Motor Co. Research and Innovation Center	Dearborn
General Motors Co. Technical Center	Warren
General Motors World Headquarters	Detroit
Honda Research and Development	Southfield
Hyundai America Technical Center Inc.	Superior Charter Twp.
Isuzu Technical Center of America Inc.	Plymouth
Mahindra North American Technical Center	Troy
Maserati North American Headquarters	Auburn Hills
Mazda North American Operations	Flat Rock
Mitsubishi Electric Automotive America	Northville
Nissan Technical Center North America	Farmington Hills
Subaru Research and Development	Ann Arbor
Toyota Technical Center	Ann Arbor
Volkswagen Group of America Inc.	Auburn Hills

• OEM Component Assembly Plants

FCA Dundee Engine	Dundee
FCA Mack Ave. Engine (Two Plants)	Detroit
FCA Mt. Elliot Tool & Die	Detroit
FCA Sterling Stamping	Sterling Heights
FCA Trenton Engine (Two Plants)	Trenton
FCA Warren Stamping	Warren
Ford Dearborn Diversified Manufacturing Plant	Dearborn
Ford Dearborn Engine	Dearborn
Ford Dearborn Stamping	Dearborn
Ford Dearborn Tool & Die	Dearborn
Ford Livonia Transmission	Livonia
Ford Rawsonville Components	Ypsilanti
Ford Romeo Engine	Romeo
Ford Sterling Axle	Sterling Heights
Ford Van Dyke Transmission	Sterling Heights
Ford Woodhaven Forging	Woodhaven
Ford Woodhaven Stamping	Woodhaven
General Motors Bay City Powertrain	Bay City
General Motors Brownstown Battery Assembly	Brownstown Charter Twp.
General Motors Flint Engine	Flint
General Motors Flint Metal	Flint
General Motors Flint Tool & Die	Flint
General Motors Grand Rapids Operations	Wyoming
General Motors Pontiac Metal	Pontiac
General Motors Romulus Powertrain	Romulus
General Motors Saginaw Metal Casting Operations	Saginaw
General Motors Warren Transmission	Warren
General Motors Wixom	Wixom

• Proving Grounds

FCA Chelsea Proving Grounds	Chelsea
Continental - Brimley Development Center	Brimley
Ford Dearborn Development Center	Dearborn
Ford Michigan Proving Ground (MPG)	Bruce Township
FT Techno of America, Fowlerville Proving Ground	Fowlerville
General Motors Proving Grounds	Milford
Robert Bosch LLC - Automotive Proving Ground	Flat Rock

• Universities – Ranked Engineering Programs

Andrews University	Berrien Springs
Baker College of Flint	Flint
Calvin College	Grand Rapids
Central Michigan University	Mt. Pleasant
Ferris State University	Big Rapids
Grand Valley State University	Allendale
Hope College	Holland
Kettering University	Flint
Lake Superior State University	Sault Ste. Marie
Lawrence Technological University	Southfield
Michigan State University	East Lansing
Michigan Technological University	Houghton
Oakland University	Rochester
Saginaw Valley University	Saginaw
University of Detroit Mercy	Detroit
University of Michigan - Ann Arbor	Ann Arbor
University of Michigan - Dearborn	Dearborn
University of Michigan - Flint	Flint
Wayne State University	Detroit
Western Michigan University	Kalamazoo

Sources: Automotive News, Michigan Venture Capital Association, State of Michigan, U.S. News & World Report and Detroit Regional Chamber Analysis

• OEM Assembly Plants

FCA Conner Avenue	Detroit
FCA Jefferson North	Detroit
FCA Sterling Heights	Sterling Heights
FCA Warren Truck	Warren
Ford Dearborn Truck	Dearborn
Ford Flat Rock	Flat Rock
Ford Michigan Assembly	Wayne
General Motors Detroit-Hamtramck	Detroit
General Motors Flint Assembly	Flint
General Motors Lansing Delta Township	Lansing
General Motors Lansing Grand River	Lansing
General Motors Orion	Lake Orion

• Transportation Infrastructure

Ambassador Bridge	Detroit
Bishop International Airport	Flint
Blue Water Bridge	Port Huron
Capital Region International Airport	Lansing
Cherry Capital Airport	Traverse City
Chippewa County International Airport	Kincheloe
CN Railroad	Detroit
Coleman A. Young International Airport	Detroit
CR Railroad	Detroit
CSX Transportation Railroad	Detroit
Detroit Metropolitan Airport	Detroit
Detroit Wayne County Port Authority	Detroit
Detroit-Windsor Tunnel	Detroit
Gerald R. Ford Airport	Grand Rapids
Kalamazoo / Battle Creek International Airport	Portage
MBS International Airport	Freeland
NS Norfolk Southern Railroad	Waterford
Oakland County International Airport	Monroe
Port of Monroe	Gwinn
Sawyer International Airport	Smiths Creek
St. Clair County International Airport	Ypsilanti
Willow Run Airport	Ypsilanti

• Mobility Assets

American Center for Mobility	Ypsilanti Township
Ann Arbor Connected Vehicle Test Environment	Ann Arbor
Center for Advanced Automotive Technology (CAAT) @ Macomb Community College	Warren
Connected Vehicle Trade Association (CVTA)	Plymouth
Detroit Test Bed	Detroit
Google Development Center	Novi
I-69 TARDEC - MDOT Platooning Project	St. Clair-Lapeer
I-94 Truck Parking Information and Management System (TPIMS)	Warren
Joint Ground Robotics Enterprise - TACOM	Flint
Kettering University General Motors Mobility Research Center	Flint
Keweenaw Research Center	Calumet
Lawrence Technological University - Autonomous and Interconnected Vehicles Lab	Southfield
Mcity at the University of Michigan's Mobility Transformation Center	Ann Arbor
MDOT Instrumented Fleet	Lansing
MDOT Intelligent Transportation System	Lansing
MDOT Transportation Operations Center - Blue Water Bridge	Port Huron
MDOT Transportation Operations Center - City of Detroit	Detroit
MDOT Transportation Operations Center - Grand Rapids	Grand Rapids
MDOT Transportation Operations Center - Lansing	Lansing
MDOT Transportation Operations Center - Macomb County	Mount Clemens
MDOT Transportation Operations Center - Oakland County	Beverly Hills
MDOT Transportation Operations Center - Southeast Michigan (SEMTOC)	Detroit
Michigan Council on Future Mobility	Lansing
Michigan International Speedway Vehicle Testing Facility	Brooklyn
Michigan Mobile Technology Association (MMTA)	Southfield
Michigan Tech Research Institute	Ann Arbor
Michigan Tech Transportation Institute	Houghton
Next Energy	Detroit
Oakland County Connected Car Task Force	Waterford Twp.
PrePass - Monroe	Monroe
PrePass - New Buffalo	New Buffalo
Smart Corridor	I-96/I-696/I-94/US-23
Southeast Michigan Connected Vehicle Test Bed	Southfield
Toyota Research Institute	Ann Arbor
Uber Technology Center	Wixom
USDOT Center for Connected Automated Transportation	Ann Arbor
Velocity Collaboration Center - Michigan Cyber Range	Sterling Heights
Washtenaw Community College Advanced Transportation Center	Ann Arbor

• Top Suppliers to North America

ABC Group Inc.	Southfield
AEES	Farmington Hills
Aisin World Corp. of America	Northville
Akebono Brake Corp.	Farmington Hills
Alpine Electronics of America Inc.	Auburn Hills
American Axle & Manufacturing Holdings Inc.	Detroit
American Mitsuba Corp.	Mount Pleasant
Autoliv North America	Auburn Hills
Autoneum North America	Farmington Hills
BASF Corp.	Wyandotte
BorgWarner Inc.	Auburn Hills
Bridgewater Interiors	Detroit
Brose North America Inc.	Auburn Hills
CalsonicKansei North America Inc.	Farmington Hills
CIE Automotive USA Inc.	Shelby Township
CITIC Dicastal Co.	Greenville
Continental Automotive Systems U.S. Inc.	Auburn Hills
Cooper-Standard Automotive	Novi
Cummins Inc.	New Hudson
Dana Holding Corp.	Auburn Hills
Delphi Automotive Systems	Troy
Denso International America Inc.	Southfield
Dow Automotive/Related Businesses	Auburn Hills
DTR Industries Inc. (now SumiRiko)	Novi
DuPont Automotive	Troy
Dura Automotive Systems	Auburn Hills
Eberspaecher North America Inc.	Novi
Faurecia	Auburn Hills
Federal-Mogul Corp.	Southfield
Flex	Farmington Hills
Flex-N-Gate Corp.	Warren
Gentex Corp.	Zeeland
Gestamp North America	Troy
GKN Driveline	Auburn Hills
Goodyear Tire & Rubber Co.	Southfield
Grupo Antolin North America Inc.	Auburn Hills
HELLA Corporate Center USA Inc.	Plymouth
Hitachi Automotive Systems Americas Inc.	Farmington Hills
IAC Group	Southfield
Infineon Technologies North America Corp.	Livonia
Inteva Products	Troy
JATCO USA Inc.	Farmington Hills
Johnson Controls Inc.*	Plymouth
JTEKT Automotive Group Cos.	Plymouth
Kautex Textron North America	Troy
Keihin North America Inc.	Capac
Key Safety Systems Inc.	Sterling Heights
KIRCHHOFF Van-Rob	Troy
Lacks Enterprises	Grand Rapids
Lear Corp.	Southfield
Linamar Corp.	Livonia
Magna International Inc.	Troy
Magneti Marelli Holding USA	Auburn Hills
Mahle Industries Inc.	Farmington Hills
Mando America Corp.	Novi
Martinrea International Inc.	Auburn Hills
Metaldyne Performance Group Inc.**	Southfield
Mitsubishi Electric Automotive America Inc.	Northville
Mobis North America	Farmington Hills
Multimatic Inc.	Southfield
Nemak North America	Southfield
Nexteer Automotive	Saginaw
NHK International Corp.	Calumet
North America Lighting	Farmington Hills
Novelis Corp.	Novi
NSK Americas Inc.	Ann Arbor
NTN Bearing Corp. of America	Farmington Hills
Panasonic Automotive Systems Co. of America	Farmington Hills
Pioneer Automotive Technologies Inc.	Farmington Hills
Plastic Omnium Co.	Troy
Powertech America Inc.	Southfield
Rassini S.A. de C.V.	Plymouth
Robert Bosch	Farmington Hills
Samvardhana Motherson Group	Troy
Schaeffler Group USA Inc.	Troy
Shiloh Industries Inc.	Plymouth
Sumitomo Electric Wiring Systems Inc.	Farmington Hills
Superior Industries International Inc.	Southfield
Tenneco Inc.	Monroe
ThyssenKrupp North America Inc.	Southfield
TI Automotive Ltd.	Auburn Hills
TK Holdings Inc.	Auburn Hills
Tower Automotive Inc.	Livonia
Toyoda Gosei North America Corp.	Troy
Toyota Boshoku America Inc.	Novi
Trelleborg Automotive USA Inc.	South Haven
Valeo Inc.	Troy
Visteon Corp.	Van Buren Township
Webasto Roof Systems Inc.	Rochester Hills
Yanfeng U.S. Automotive Interior Systems II	Plymouth
Yazaki North America Inc.	Canton
ZF North America Inc.	Livonia

* Adient as of October 2016

** Acquired by American Axle & Manufacturing Holdings Inc. as of April 2017

• Entrepreneur Resources

Amherst Fund, LLC	Ann Arbor
Ann Arbor Angels	Ann Arbor
Ann Arbor SPARK	Ann Arbor
Arsenal Venture Partners	Ann Arbor
Augment Ventures	Ann Arbor
Automation Alley	Troy
Bamboo Detroit	Detroit
BELLE Michigan	Grosse Pointe Farms
Beringea	Farmington Hills
Blue Water Angels Investment Network	Midland
Capital Community Angel Investors	East Lansing
Central Michigan University Research Corp.	Mt. Pleasant
Chrysalis Venture	Ann Arbor
City of Grand Rapids	Grand Rapids
Eastern Michigan University Office of Tech Transfer	Ypsilanti
eLab Ventures	Ann Arbor
Endeavor Detroit	Detroit
Fontinalis Partners	Detroit
General Motors Ventures	Detroit
Great Lakes Angels	Bloomfield Hills
Growth Capital Network	Ann Arbor
Huron River Ventures	Ann Arbor
IncWell	Birmingham
Innovate Marquette SmartZone	Marquette
Innovation Institute at Henry Ford	Detroit
Invest Detroit	Detroit
Invest Detroit Ventures	Detroit
Invest Michigan	Detroit
Jackson Technology Park SmartZone	Jackson
Lakeshore Advantage	Zeeland
Lansing PROTO	Lansing
Lansing Regional SmartZone / LEAP	Lansing
Lawrence Technological University Collaboratory	Southfield
Ludlow Ventures	Detroit
Macomb-OU INCubator	Sterling Heights
MadDog Technology	Birmingham
Mercury Fund	Detroit
Michigan Angel Fund	Ann Arbor
Michigan Economic Development Corp.	Lansing
Michigan Research Institute	Ann Arbor
Michigan State University Conquer Accelerator	East Lansing
Michigan State University Spartan Innovations	East Lansing
Michigan State University Technologies	East Lansing
Midland SmartZone	Midland
MidMichigan Innovation Center	Midland
Mi-Light	Ann Arbor
MiQuest	Lansing
MTEC SmartZone	Houghton
MTRAC - Transportation - University of Michigan	Ann Arbor
Muskegon Angels	Muskegon
Muskegon Innovation Hub @ GVSU	Muskegon
New Enterprise Forum	Ann Arbor
North Coast Technology Investors	Midland
Northern Michigan Angels	Traverse City
Oakland County One Stop Shop Business Center	Waterford
OU INC - Rochester Hills Oakland University SmartZone	Rochester
Renaissance Venture Capital Fund	Ann Arbor
RPM Ventures	Ann Arbor
Sault Ste. Marie Advanced Resources & Technology, Inc.	Sault Ste. Marie
Seamless	Grand Rapids
Start Garden	Grand Rapids
Tech248	Waterford
Techstars Mobility	Detroit
Techtown Detroit	Detroit
Three Leaf Ventures	Ann Arbor
University of Michigan Center for Entrepreneurship	Ann Arbor
University of Michigan Office of Technology Transfer	Ann Arbor
University of Michigan Samuel Zell and Robert H. Lurie Institute for Entrepreneurial Studies	Ann Arbor
University of Michigan Zell Entrepreneurship and Law Program	Ann Arbor
Wakestream Ventures	Grand Rapids
Wayne State University Innovation Warriors/Blackstone Launchpad	Detroit
Western Michigan University Center for Entrepreneurship and Innovation	Kalamazoo
Western Michigan University Starting Gate	Kalamazoo
Wolverine Venture Fund	Ann Arbor



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AUTO MOBILITY

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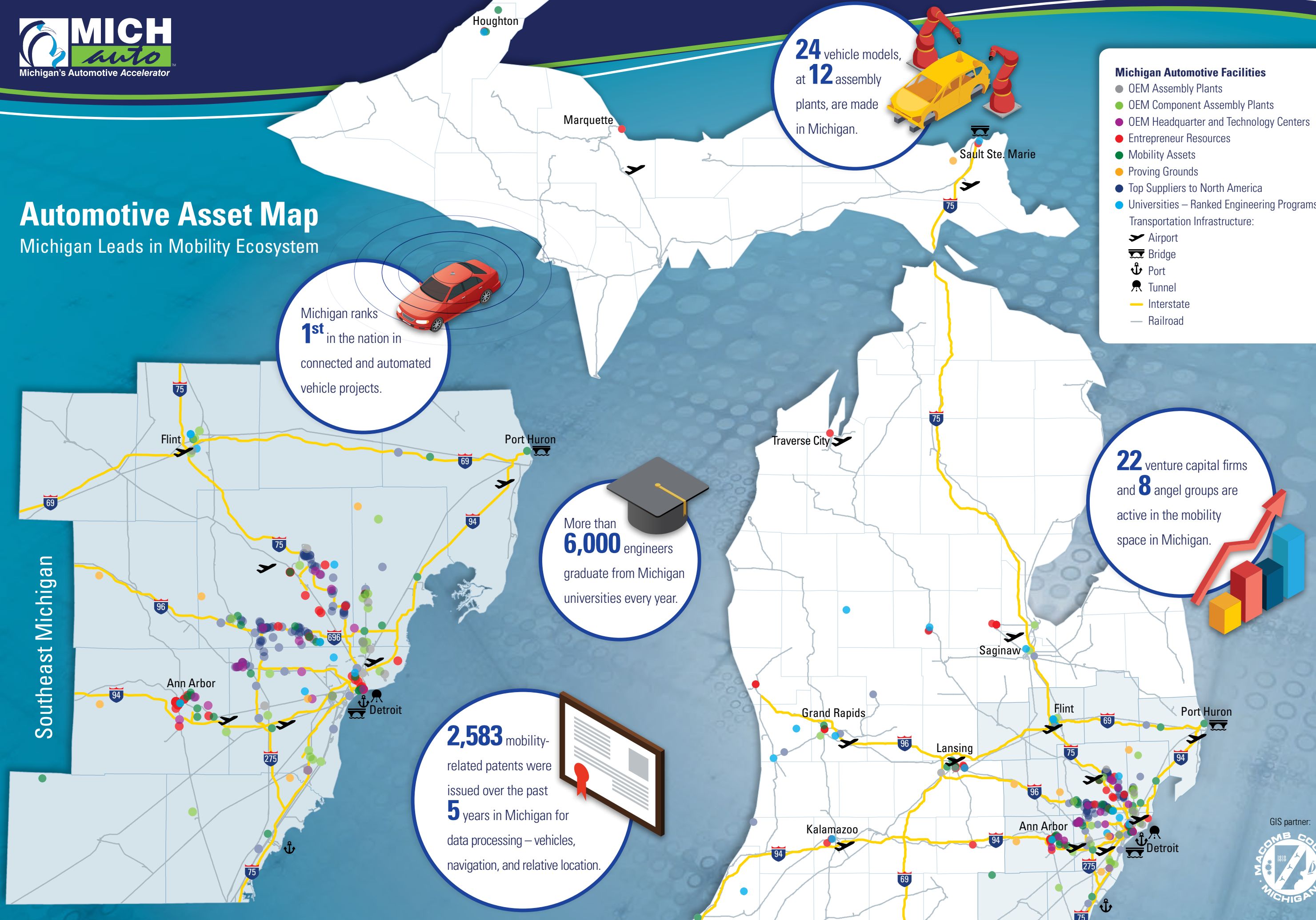
For updates on Michigan's automotive and mobility industry,
follow MICHauto on social media.

MICHIGAN IS AUTOMOBILITY

The Michigan is Auto Mobility report can be downloaded by visiting michauto.org.

For more information on MICHauto, please contact Glenn Stevens at gstevens@detroitchamber.com or [313.596.0323](tel:313.596.0323).

Automotive Asset Map Michigan Leads in Mobility Ecosystem



Michigan ranks **1st** in the nation in connected and automated vehicle projects.

More than **6,000** engineers graduate from Michigan universities every year.

2,583 mobility-related patents were issued over the past **5** years in Michigan for data processing – vehicles, navigation, and relative location.

24 vehicle models, at **12** assembly plants, are made in Michigan.

22 venture capital firms and **8** angel groups are active in the mobility space in Michigan.

- Michigan Automotive Facilities**
- OEM Assembly Plants
 - OEM Component Assembly Plants
 - OEM Headquarter and Technology Centers
 - Entrepreneur Resources
 - Mobility Assets
 - Proving Grounds
 - Top Suppliers to North America
 - Universities – Ranked Engineering Programs
- Transportation Infrastructure:
- ✈ Airport
 - 🌉 Bridge
 - ⚓ Port
 - 🚇 Tunnel
 - 🛣 Interstate
 - 🚊 Railroad

Mobility Industry at a Glance

The automotive industry is evolving rapidly and **Michigan is positioned to lead the world into the next generation of mobility.** Michigan has passed aggressive legislation for connected vehicle technology, along with commitments to investment in infrastructure through the Michigan Department of Transportation (MDOT). Private industry in Michigan continues to develop partnerships across mobility-related technology companies, in addition to leading the nation in mobility-related patents.



Michigan leads as the **1st** state in the nation to enact policies to:

- ✓ Legalize self-driving, ride-sharing vehicles
- ✓ Allow truck platoons
- ✓ No longer require drivers in automated vehicles
- ✓ Test and use on public roads
- ✓ Legalize testing of automated vehicles

Michigan ranks **No. 1** in the nation in connected and automated vehicle projects (49).

1st in mobility-related patents (data processing – vehicles, navigation, relative location), 2,583 patents awarded over the past five years in Michigan, followed by California with 1,468 patents issued.

5,000 connected and automated vehicles on the road by 2018 in Ann Arbor's Connected Vehicle Test Environment.

1st state in the nation to legalize self-driving vehicles, including ride-sharing services, on public roads. → → →

An average of **2,044** connected and automated vehicle-related monthly job postings in Michigan in 2016.

350+ miles of freeways and arterials equipped for connected vehicles in Michigan by 2019.

100+ roadside units (RSU) installed on Michigan roads.

Public Sector Commitments

Connected and Automated Vehicles

For over a decade, Michigan has led connected and automated vehicle research and projects in both the private and public sector. With the opening of federal test beds or progressive laws legalizing driverless vehicles on public roads, Michigan is the leader in next-generation mobility.



Michigan International Speedway (MIS) begins testing connected vehicle technology.



Detroit hosts the 2014 ITS World Congress.



Michigan Department of Transportation (MDOT), partners with General Motors Co., Ford Motor Co. and a University of Michigan consortium to deploy the Smart Corridor, the United States' first smart highway.



Mcity opens in Ann Arbor.



Michigan announces "Planet M" as initiative to align all of the state's assets in automated and connected vehicle technology under one banner.



American Center for Mobility (ACM) at Willow Run breaks ground on \$110 million redevelopment.



City of Detroit hires chief of mobility innovation.



Michigan Council on Future Mobility is formed, made up of business and policy leaders, to advocate for changes related to automated, driverless and connected vehicle technology policy.

2007

U.S. Department of Transportation Development and Test Environment in Novi opens.

MICHauto initially launched.

2009

Michigan hosts Cooperative Intersection Collision Avoidance System (CICAS) project.

2012

The \$25 million Safety Pilot Model Deployment project in Ann Arbor begins.

2013

The first legislation for driverless vehicles in Michigan passes.

Oakland County Connected Vehicle Task Force formed.

2014

The Detroit Test Bed opens.

U.S. Department of Transportation (USDOT) announces \$3 million federal TIGER grant for the Truck Parking Information and Management System (TPIMS) along I-94.

2015

Legislation passes to enable Michigan as a leader in automated vehicle testing - self-driving vehicles, including ride-sharing services on public roads.

2016

U.S. Army tests connected vehicles on I-69 in Michigan.

2017

Smart Belt Coalition is formed as a collaboration in the ongoing development of connected and automated vehicles.

2019

Michigan Department of Transportation (MDOT) expects to complete 350+ miles of equipped freeway and major arterial for connected vehicles.

Innovation Ecosystem

Leading the next-generation mobility initiatives in Michigan include not only automakers and the supplier network, but also a well-developed technology, startup and venture capital community.

Accelerators throughout the state provide services to entrepreneurs in mobility activities, while venture capital investments have seen significant growth over the past five years.

Startups and Accelerators



Venture Capital



22 venture capital firms and **8** angel groups are active in the mobility space in Michigan, another **46** provide entrepreneurial support.



Michigan continues to rank **No. 1** in research spending-to-venture capital investment ratio in the nation.



There are **141** venture-backed companies in Michigan, a **48%** increase in the past five years.

Source:



Tech Companies Investing in Michigan



Auto Meets Tech in Michigan

Michigan automakers are actively engaged in partnering with technology companies in research and development. Additionally, the **investment of technology companies in Michigan has accelerated over the past three years** with the announcements of new facilities and partnerships.



Techstars Mobility opened in Detroit as the first North American startup accelerator program to focus on mobility technologies and startups. Investments in 22 startups have raised \$19 million and are valued at more than \$100 million.



Ford Motor Co. announced the creation of Ford Smart Mobility LLC, a subsidiary formed to design, build, grow and invest in emerging mobility services.



Google announced the opening of an R&D center in Novi as part of its self-driving car project, Waymo.



General Motors Co. announced car-sharing brand, Maven.



FCA US LLC partnered with Google to make 100 self-driving Chrysler Pacifica hybrid minivans.



Toyota Research Institute opened a research and development enterprise in Ann Arbor, part of Toyota's \$1 billion investment in artificial intelligence, machine learning, robotics and material science.



General Motors Co. invested \$500 million in Lyft for a self-driving partnership.

SIEMENS

Siemens named Ann Arbor the company's first Center of Excellence for Intelligent Traffic Technology.



Uber announced plans to open a new technology facility in metro Detroit.



Google partnered with Roush to build driverless vehicles in Livonia.

Engineering Talent Pipeline

Michigan's universities and colleges feature **nationally ranked undergraduate and graduate engineering programs**, according to 2016 U.S. News & World Report, while powering Michigan's status as a top 10 state for degrees conferred.



Next-Generation Talent: K-12 and University Programs and Competitions

Square One Network Vehicle
Design Mobility Challenge
Ann Arbor

Intelligent Ground
Vehicle Competition
Oakland University

Shell Eco-marathon
Detroit

Formula SAE Michigan Competition
Michigan International Speedway
FIRST Robotics Global Championship
2018 in Detroit



123,000 total degrees were awarded by Michigan's education institutions in 2015.



The University of Michigan offers **19** top 10 ranked undergraduate (9) and graduate (10) engineering programs.



Michigan is ranked **10th** nationally for the total number of degrees conferred.



Kettering

UNIVERSITY

- **General Motors Mobility Research Center** is a 22-acre site that features a 3.5-acre test pad, serpentine road, dedicated 4G advanced wireless network, DSRC and other communication systems. It also offers research programs in autonomous vehicle systems, V2V and V2I communication, human-machine interface and mobile robotics.
- Labs include: **Advanced Power Electronics Lab** working in battery and battery management, and the **Brain-Inspired Intelligent Systems Lab** with research in artificial intelligence and intelligent mobile robotics.



- **Mobility Studio Initiative** is an integrated system of communication and control for autonomous vehicles and their environment. Research focuses on smart infrastructure and the management of autonomous vehicles, pedestrians and cyclists.
- **The Connected and Autonomous Networked Vehicles for Active Safety (CANVAS)** project is dedicated to the integration of mobility, safety and security in connected and autonomous vehicles. Research focuses on multi-modality sensing, sensor and data fusion, deep learning, biometrics and cybersecurity.



- **Keweenaw Research Center** features a 900-acre area vehicle proving ground, utilized for more than 60 years for vehicle testing and evaluation.
- **Michigan Tech Research Institute**, located in Ann Arbor, advances students from many universities through its internship program conducting research directly on connected and autonomous vehicles.
- **Michigan Tech Transportation Institute** was awarded as a **Beyond Traffic Innovation Center (BTIC)** by the USDOT to serve as a rural region center, convening decision-makers and coordinating research on next-generation mobility.
- **Institute of Computing & Cybersystems** researches V2V and consumer behavior-driving experiences in human factors and driver-assistive technologies for autonomous or semi-autonomous vehicles.
- **Advanced Power Systems Research** operates a fleet of 30 light-duty vehicles including all levels of electrification (HEV, PHEV, EREV, and EV) with connected and autonomous functions and real-time traffic modeling.



- The **College of Engineering** has labs focused on machine vision, artificial intelligence, cybersecurity, and ad-hoc communication. The **masters degree program in automotive engineering** offers electives in embedded systems, computer vision and mechatronics. Students can tailor their degree to concentrate on CAV.
- A new **\$75 million, 140,000 square foot robotic facility** will feature a three-story fly zone for autonomous aerial vehicles, an outdoor obstacle course for walking 'bots and high-bay garage space for self-driving cars. When completed in 2020, U of M will be one of an elite few universities with a dedicated robotics facility.



- The **Cyber-Physical Systems (CPS)** program is an interdisciplinary program between engineering (electrical, civil, biomedical, industrial), computer science, and College of Education to study the cyber and physical parts of systems. Domains include sensing and signal processing, cyber-physical security, connected and automated transportation and smart energy grids.
- **Smart Sensors and Integrated Microsystems (SSIM)** develops novel materials, methods and prototypes in the fields of robotics, energy and sensors. Projects include work on micro fuel cells, semiconductors in high-power devices such as hybrid vehicles, and remotely operated robots.



- The **Center for Advanced Vehicle Design and Simulation** offers a platform for collaboration between industry and academia to develop breakthrough technical solutions through applied research. Supporting labs include Alternative Fuel Research, Fuel Cell Evaluation and Research Center and Intelligent Fuzzy Controllers.
- The **Transportation Research Center for Livable Communities (TRCLC)** works to improve affordable and environmentally sustainable transportation options, including "smart" transportation technologies. Funded through a \$1.4 million grant from USDOT, the TRCLC, led by Western Michigan University, is a consortium of five universities that aims to address livable communities through transportation.

COLLEGE for Creative STUDIES

Offering undergraduate and graduate degrees in transportation design and certificate programs in automotive modeling, College for Creative Studies (CCS) places more design graduates into the transportation industry than any other school in the nation. CCS graduates are designers at every major car manufacturer and nearly all the Tier 1 auto suppliers.

MICHauto serves as the unified voice for the entire state of Michigan's automotive and mobility industries, providing a platform for various stakeholder groups to collaborate on matters related to **advocacy, awareness, business and talent attraction** and **next-generation mobility**.



Advocacy

Connects and engages key policymakers with Michigan-based automotive stakeholders.



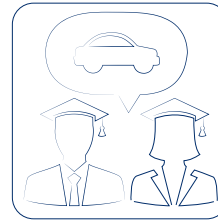
Mobility

Strengthens, protects and promotes Michigan's global leadership in next-generation mobility development.



Awareness

Promotes the importance of the automotive industry to Michigan's economy, and highlights the state's automotive assets.



Talent Attraction

Improves the perception of automotive careers by partnering with key businesses, universities and associations.



Business Attraction

Bolsters business attraction and retention efforts at the local and state levels to increase automotive investment in Michigan.

MICHIGAN IS AUTOMOBILITY

The Michigan is Auto Mobility report can be downloaded by visiting **michauto.org**.

For more information on locating or expanding automotive and mobility business in Michigan, please contact Glenn Stevens, executive director of MICHauto and vice president of automotive and mobility initiatives at the Detroit Regional Chamber, at **gstevens@detroitchamber.com** or **313.596.0323**.

Thank you

This report was developed in partnership with:





MICHIGAN IS AUTO MOBILITY

