

WELCOME TO

planetm

Mobility is a critical pursuit that will impact the world environmentally, economically and technologically.

It will help improve air quality and reduce fossil fuel consumption. It will lead to fewer, yet more sophisticated, vehicles and roadways. And it will provide a safer and more convenient mode of transportation for consumers and commerce alike.

That's why Michigan's Planet M is so important.

Michigan is at the epicenter for all things mobility. With all of the talent, resources and vision to make it a reality well before any other place in the world.

www.planetm.com

 @MichiganPlanetM

Where big ideas in mobility are born.

THE MICHIGAN ADVANTAGE

More than half of the world's population live in towns and cities, and by 2040, researchers project that two out of three people will live in urban environments. As residents change the way they live, travel and use services, many of the technologies that are changing the transportation industry will be conceptualized, tested, validated and created in Michigan.

The Planet M campaign was created to elevate Michigan as the hub of mobility innovations, leading to more business investment and jobs in the state.

Michigan's mobility assets include the established automotive foundation, talent and intellectual capital, connected vehicle projects and research and development including:

AN ESTABLISHED FOUNDATION

Michigan's leadership position in the auto industry provides the foundation to lead transportation innovations.

- Michigan is home to 375 automotive R&D centers
- 61 of North America's top 100 auto suppliers are headquartered in the state.
- 60 percent of the largest auto suppliers and 25 percent of all U.S. assembly plants are in Michigan.
- Michigan is ranked No. 1 nationally for the number of advanced automotive industry jobs.

INTELLECTUAL CAPITAL

Michigan produces the talent and innovation that will lead mobility innovations.

- Michigan has 15 universities and colleges with nationally ranked undergraduate engineering programs, four of which have nationally ranked graduate programs.
- Michigan has the highest concentration of engineers in the nation.
- 26 percent of all automotive patents are generated in Michigan, which is nearly three times as many as any other state.
- Michigan leads the nation in patents relating to navigation and smart mobility.
- University Research Corridor universities spend over \$60 million annually on automotive innovation-related R&D.

A CONNECTED STATE

Michigan has several projects and assets that are leading autonomous and connected vehicle testing.

- Michigan is one of 16 states that allow testing of fully autonomous vehicles and offers an all-weather environment, critical in testing autonomous technologies.
- Michigan is home to the largest deployment of freeway and surface street V2I technology in the United States. Eventually, 120 miles of southeastern Michigan roadway called the transportation triangle, (I-96, I-696, I-94 and US-23) will become a vehicle-to-infrastructure communication technology-enable corridor. Initial pilot applications being tested in the Transportation Triangle include:
 - » **Red light violation warning:** alerts drivers who are approaching an intersection that they will run a red light if they continue at their current speed, or if another vehicle is likely to run the red light.
 - » **Work zone warning/management:** provides real time, accurate location of lane closures due to road construction, and other related hazards such as slow or stopped vehicles.
 - » **Road weather management:** vehicle- and infrastructure-based road weather management solutions which can detect hazardous conditions like icy roads. Connected vehicle applications take this one step further by providing accurate road condition information to the driver through the use of mobile weather stations.
 - » **Pavement condition:** sensors detect and measure pavement conditions throughout our road network, mapping out and measuring pot holes and assessing overall pavement condition.

THE MICHIGAN ADVANTAGE

- By 2017, Michigan will be home to two permanent and purpose-built autonomous vehicle testing sites. Nowhere else in the U.S. has resources like these facilities.
 - » **Mcity**: a 32-acre connected and autonomous vehicle testing site that simulates urban and suburban environments. Mcity opened in 2015 and is in high demand.
 - » **The American Center for Mobility**: a 335-acre site which will provide additional testing and validation resources for the industry, including higher speeds and interaction with rail and flight.
www.acmwillowrun.org
- The University of Michigan Mobility Transformation Center brings together companies from around the world in industries ranging from insurance to telecommunications to big data, in addition to OEMs and suppliers, for one of the most wide ranging partnerships ever undertaken at an academic institution to develop and implement an advanced system of connected and autonomous vehicles in Ann Arbor by 2021.
- The Mobility Transformation Center has three major vehicle deployments in various stages of development and execution:
 - » **Connected Ann Arbor** (as many as 9,000 vehicles across 27 square miles in and around Ann Arbor)
 - » **Connected Southeast Michigan** (as many as 20,000 vehicles across southeast Michigan)
 - » **Connected and Automated Ann Arbor** (an advanced system of connected and automated vehicles, culminating in an on-demand mobility service in Ann Arbor)

RESEARCH AND DEVELOPMENT

Michigan's universities are home to programs and research groups that are in place to propel the industry.

Automotive Safety & Transportation Research group

- Four Michigan schools make up this research group, which partners with industry players like General Motors, Ford, Chrysler and General Dynamics Land Systems, as well as the Department of Defense and the National Institute of Health.
- Faculty from engineering programs are working with MDOT and the Federal Housing Administration on transportation research projects including:
 - » Passive safety
 - » Active safety; vehicle connectivity
 - » Behavioral Science Road and Pedestrian Safety

Cybersecurity programs

- Faculty members from Wayne State University's College of Engineering lead this educational and research-based program which focuses on enterprise security and connected/embedded security.
- Industry partners include Merit Network, Ford and General Motors.

Big Data and Business Analytics project

- More than 30 faculty members from five Michigan schools are involved.
- Industry and Federal support includes: Ford, Urban Science, VA, Loven Systems, General Dynamics Land Systems, General Motors, LexisNexis, Cloudera, SAS, Cleo, Comrise, MicroStrategy, and Apervi.

Next Generation Auto Research Area

- General Motors Foundations Automotive Research Area at Kettering University in Flint will be an electric and autonomous vehicle testing space which houses:
 - » Auto proving grounds
 - » Powertrain research lab
- This facility is also a chance for enhancements in the following areas:
 - » Crash and vehicle safety work through the mechanical engineering department
 - » GPS technology through the computer science department

THE INDUSTRY

In addition to the automotive industry, Michigan's key business sectors including defense, cybersecurity and aerospace strengthen its position as the hub for the next generation of transportation.

Michigan has taken a leading role in developing cybersecurity strengths in the state. In 2011, Governor Snyder launched the Michigan Cyber Initiative, creating an award-winning website to educate citizens, businesses and governments.

- Michigan's strength in cybersecurity makes our work in the automotive and defense industries stronger, leading to secure, connected infrastructure and autonomous vehicles.
- Michigan is home to the Michigan Cyber Command Center (MC₃), which is responsible for the coordination of combined efforts of cyber emergency response during critical cyber incidents in Michigan. Emphasis is placed upon prevention, response, and recovery from cyber incidents.

THE MICHIGAN ADVANTAGE

- The Michigan Cyber Range, which offers multiple hubs around Michigan for industry, academia and talent to run cyber exercises dedicated to mitigating risk and better securing mobility platforms for automotive, aerospace and robotics.

Michigan is a leader in the defense industry, home to seven military locations important to our nation's security and companies that are developing technologies for the industry.

- TARDEC is testing driverless military vehicle equipment on Michigan's smart roadways, which could allow for supply convoys to run continuously and cut down on dangerous combat situations for soldiers.
- The location was chosen for the testing because of its proximity to an international border crossing and to the Tank Automotive Research, Development and Engineering Center's headquarters at the U.S. Army Detroit Arsenal.

Michigan's aerospace is growing significantly due to the state's technology climate, operational cost, density of industry and educational system including:

- 600+ companies in Michigan doing work for the aerospace industry.
- The University of Michigan has the oldest aeronautic engineering program and consistently rates in the top two programs in the country.
- The Oscoda Wurtsmith Airport, a former military base with an 11,000-foot-runway capable of landing any commercial aircraft, where over 900 employees perform complex engine repair and overhaul, airframe and composites.

UPCOMING MOBILITY EVENTS

WORLD MOBILITY LEADERSHIP FORUM

September 28–29, 2016, Detroit
www.worldmobilityleadershipforum.com

The smart mobility revolution has begun. How big a change it makes depends on how we apply these new solutions to our shared global challenges.

Join Bill Ford, executive chairman of the Ford Motor Company, and other global mobility thought leaders for an exclusive, invitation-only discussion on global challenges and solutions that can address the world's needs.

NAIAS AUTOMOBILI-D

January 8–22, 2017, Detroit
www.naias.com/press/news/global-mobility-center-launches-in-detroit

AutoMobili-D is a dedicated exposition focused on the rapidly evolving global automotive and mobility landscape. Spearheaded by NAIAS, AutoMobili-D will run in conjunction with the 2017 auto show and will feature more than 100 companies, including automakers, tier one suppliers and tech start-ups.