

# ADVANCE MICHIGAN

Driving Opportunity Through Advanced Manufacturing



Advance Michigan is a partnership between Detroit, Flint, Pontiac, Lansing, and Ann Arbor and their surrounding communities.

Investing in Manufacturing Communities Partnership

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## 1. GEOGRAPHY AND KTS

In 2009, the American automotive industry experienced the worst year for U.S. sales in nearly 30 years. There were the bankruptcies of Chrysler and General Motors, along with scores of automotive suppliers. The firms that survived closed plants, shed workers, and restructured their operations. While the industry’s challenges were global, pain was felt most acutely in Michigan. As the U.S. automotive capital, Michigan suffered sharp reductions in employment, personal income, and economic output. In fact, half of the two million U.S. jobs lost during the

Private employment percentage change - transportation equipment (336)		
	2001-2009	2009-20012
US	-29.7	8.2
MI	-59.5	22.7
13 counties	-61.5	21.5

Source: CAR 2014 analysis

past decade were in Michigan.<sup>1</sup> The 13-county region in southeast Michigan that is the manufacturing center of state’s automotive industry was particularly hard hit.<sup>2</sup> The region’s transportation equipment sector alone lost over 140,000 jobs (25% of the nation’s total employment loss, and 77% of the state’s total). Investments dried up, capital evaporated, and many Michiganders were out of work.

As this region recovers, its leaders have come together seeking the Investing in Manufacturing Communities Partnership (IMCP) designation. The 13-county contiguous region consisting of Clinton, Eaton, Genesee, Ingham, Lapeer, Livingston, Macomb, Monroe, Oakland, St. Clair, Shiawassee, Washtenaw, and Wayne and the cities of Detroit, Pontiac, Lansing, Ann Arbor, and Flint have formed the *Advance Michigan* initiative to help rebuild and sustain their shared manufacturing future.

The 13 *Advance Michigan* counties share industrial supply chains, infrastructure and trade routes as part of a natural economic and labor market.<sup>3</sup> Thanks to a skilled workforce, unparalleled research, development, and advanced production capability, the region is capable of meeting global demand for automobiles, parts and components, as well as other advanced manufacturing products. Over 5.6 million people (more than half of Michigan’s population) live and work in this region and over \$36 billion (more than 53%) of the state’s manufacturing output is produced here.<sup>4</sup>



The IMCP opportunity comes at a critical point in *Advance Michigan’s* future. The designation will help catalyze and shift the regional economy quickly, providing crucial investment and technical support to ensure a ready workforce, accelerate research and development, and maximize market positioning for manufacturers and emerging technologies. *Advance Michigan* will achieve these goals by focusing on two primary key technologies and supply chain (KTS) areas tied to **automotive efficiency and safety**. Leveraging an extensive ecosystem associated with these KTS will diversify and further strengthen the region’s economy through application in other fields of manufacturing including aerospace/defense, energy, medical devices, and more. More specifically, the KTS will:

- **Lead Material and Emissions Improvements by Redefining Automotive Efficiency**—*Advance Michigan* is positioned to be the heart of the country’s manufacturing materials improvements. New vehicle system integration and manufacturing techniques focused on lightweight and other advanced materials (metals, composites, additive manufacturing, joining/welding, castings, stamping/forming, digital design and rapid prototyping, modeling-simulation-visualization, testing, diagnostics, and repair) already are underway in regional facilities. In addition, KTS-related investments will support new engine and transmission technology innovations, critical in meeting the 2016-2025 EPA and NHTSA fuel economy and CO<sub>2</sub>-emission standards.

- **Improve Safety through Connectivity and Design**—Connectivity (vehicle-to-vehicle and vehicle-to-infrastructure) provides benefits in increased convenience, less traffic congestion, improved fuel economy, reduced emissions, and greater vehicle safety. The development and integration of advanced electronics technologies, including lane and vehicle awareness sensors, feedback microprocessors, onboard calibration electronics, security and anti-theft functions, and vehicle-to-driver alerts, are fundamentally changing how people drive and improving the quality of the driving experience. In safety applications, these systems use cues such as sounds, lights, displays, and seat vibrations to alert drivers to the presence of various threats. When paired with other technology advancements (such as lightweight materials) they can support substantial improvements in personal mobility.

The *Advance Michigan* region is positioned to deliver results on these KTS due to the concentration of the automotive industry research and development and production in the region, the region's highly skilled workforce, world-class university and industrial laboratories, an established and robust manufacturing supply chain, and the infrastructure needed to connect everything together. State government has also shown strong support for advancement of the automotive industry. Governor Rick Snyder created an Automotive Office within the Michigan Economic Development Corporation (MEDC), indicating the importance of this industry to the Michigan economy. This office is charged with developing, implementing and executing a comprehensive strategic plan and road map to promote, retain and grow the automotive industry in Michigan. In 2013, the Governor signed Senate Bill 169 to permit automated vehicle testing on the state's public roads. Additionally, the construction and development of test facilities to simulate roads and driving conditions are currently underway in the *Advance Michigan* region.

In selecting these KTS, regional partners reviewed numerous existing strategic, regional, and industrial plans, consulted with industry experts, planners, and manufacturers, and contacted leading researchers and capital investors about their vision for the core technologies driving advanced manufacturing in the next decade. A diverse array of partners convened to develop this proposal, leveraging the State of Michigan's *Automotive Strategic Plan* and the Business Leaders for Michigan's *Global Center of Advanced Mobility Vision for Future, Competitive Assessment, and Recommended Actions* plan to integrate a vision, chart a path for moving forward, and capitalize on the potential of the IMCP regional designation.

## **2. ASSESSMENT AND IMPLEMENTATION STRATEGY**

### **2.1 WORKFORCE AND TRAINING**

Automotive manufacturing is undergoing rapid technological change, driven largely by more stringent fuel economy and emissions standards, as well as intense global competition. A recent review of the top job postings for the region's manufacturers found that 30% were related to computer technologies. At first glance, this might seem surprising for an industry that mass produces motor vehicles, but today's vehicles contain millions of lines of code to control a myriad of systems, and this will increase as advancements in powertrain and propulsion and connected and automated driving take hold. Vehicles today already are the most high-tech devices that consumers own. At the same time, manufacturers realize that use of new materials and processes to reduce the weight of vehicles is critical to improve vehicle efficiency. The evolution of vehicle technologies and related manufacturing processes requires that students and workers be educated and trained in new production systems. These vehicle advancements require investment and capacity building for education and training partners.

The state and regional economies depend heavily on the automotive industry, and the *Advance Michigan* region needs to upgrade its talent infrastructure, redevelop and attract a pipeline of younger workers, and reinvest in curriculum and training in the latest manufacturing technologies.

### 2.1.1 Skills and Current Capabilities of Workforce

Recruitment and training of sufficient candidates into in-demand fields is critical to the advancement of the identified KTS. *Advance Michigan's* skilled workforce is both a current asset and a vital need for the future. The region boasts close to 80,000 engineers and designers (the state leads the nation in engineering concentration), and over 120,000 skilled trades workers—but workforce demographics show that many of these workers will be eligible for retirement in the next 10 years. The region also is home to roughly 32,000 information technology workers that support connected and automated vehicle technologies and digital manufacturing. Skills and wages are enumerated in Appendix B-3, but the following is a summary of average wages for primary occupational areas:

Engineering	Median Hourly Wage	Skilled Trades	Median hourly wage	Technology	Median Hourly Wage
Mechanical Engineers	\$ 43.22	First-Line Supervisors Of Production And Operating Workers	\$ 30.98	Software Developers, Applications	\$ 37.95
Electrical Engineers	\$ 38.03	Inspectors, Testers, Sorters, Samplers, And Weighers	\$ 19.45	Computer Systems Analysts	\$ 36.79
Commercial And Industrial	\$ 34.46	Production Workers, All Other*	\$ 16.05	Computer User Support Specialists	\$ 21.24
Civil Engineers	\$ 32.41	Computer-Controlled Machine Tool Operators, Metal And Plastic	\$ 18.57	Database Administrators	\$ 36.44
Industrial Engineers	\$ 40.34	Electronics Engineering Technicians*	\$ 26.52	Computer Systems Engineers/Architects*	\$ 37.56
Manufacturing Engineers*	\$ 44.37	Welders, Cutters, And Welder Fitters*	\$ 17.83	Network And Computer Systems Administrators	\$ 34.36
Validation Engineers*	\$ 44.37	Machinists	\$ 22.37	Software Quality Assurance Engineers And Testers*	\$ 37.56
Chemical Engineers	\$ 44.09	Tool And Die Makers	\$ 26.35	Computer Programmers	\$ 32.50
Electronics Engineers, Except Computer	\$ 28.55	Computer Numerically Controlled Machine Tool Programmers, Metal And Plastic	\$ 23.91	Web Developers	\$ 26.37
Materials Engineers	\$ 40.05	Cutting, Punching, And Press Machine Setters, Operators, And Tenders, Metal And Plastic	\$ 16.17	Information Technology Project Managers*	\$ 37.56

Source: Bureau of Labor Statistics 2012

### 2.1.2 Short Versus Long-Term Training Needs

The *Advance Michigan* region faces both short and long-term talent shortages. To date, demand for workers outstrips supply, with hiring indicators demonstrating employers' difficulty in finding qualified workers. In 2012-13 there were 79,000 IT-related job postings, but only 5,300 new credentials were issued in the relevant fields (including, but not limited to, degrees). Respectively, the figures were 31,900 postings and 4,100 credentials granted in the skilled trades and 50,000 postings and 11,600 credentials issued for new engineers. Regardless of the region's investments in next-generation manufacturing, without proper workforce training investments, it will be difficult for the region to retain its automotive leadership position.

- **Short-Term.** In-demand short-term training opportunities include professional development for engineers, and occupational certifications for skilled trades, technicians and IT professionals. For example, an engineer might need to gain expertise in lightweight metals processes and techniques, or earn a Six-Sigma certification. A skilled trades worker may need a forklift operator's license, welding certificate, or commercial driver's license. IT workers may need to earn a project management, networking or information systems certification. These types of training are to augment existing skill sets.
- **Long-Term.** Engineering technology and related degree programs at the associate level are 1.5-2 year programs, and bachelor's degrees require at least 4 years. For skilled trades workers, apprenticeships and specialized training can take 3-to-5 years to master. For top-demand IT occupations, training is 4-6 months just to meet entry-level requirements. Acquiring these skills requires dedication of time and money, as well as reduced earnings while in school.

Unfavorable workforce demographics will affect the region's workforce in the next decade. The average

manufacturing worker in the *Advance Michigan* region is over age 50, and skilled trades workers are even older. To backfill retirement attrition, there is a need for pipeline development programs, including a focus on job-demand and career awareness. A listing of top-25 workforce skills for KTS-related information technology, skilled trades and engineering occupations is in Appendix B-3.

### **2.1.3 Current Institutions for Improving Capabilities**

*Advance Michigan* has the necessary educational infrastructure to support enhanced talent development related to the KTS, whether short or long-term. *Advance Michigan* partners have identified over 100 programs offered at the community colleges (all of which house advanced technology education centers) and 70 offered in the university system in degree-leading, certificate, and non-credit programs in the following areas: aerospace, composite and other materials, automation, manufacturing technology design, manufacturing technology machining, engineering technology systems, control robotics, software development, mechanical and electrical engineering, machining, maintenance, welding, and additive manufacturing. Examples include Mott Community College's MIT Fablab, where students design and create products using advanced 3D digital technology, rapid prototyping and laser-cutting techniques; Macomb Community College and Wayne State University's Center for Advanced Automotive Techniques (CAAT), funded by the National Science Foundation ATE program where students learn electric vehicle development technologies and soon will be learning lightweight and connected vehicle technologies; and Baker College's Photonics and Laser Technology Program, supported by the National Science Foundation ATE program, where students learn about lasers and their multiple-industry manufacturing applications.

Offerings at four-year institutions are equally impressive, including the University of Michigan's NASA Aeronautics lab, Advanced Lightweight Metals Manufacturing Innovation Institute (ALMMII), Software Systems Laboratory, Mechanical Behavior of Materials Lab; Wayne State University's Software Visualization Institute; Oakland University's Fastening and Joining Research Institute; and Lawrence Tech's Center for Innovative Materials Research and Innovative Materials Lab. In addition to institutions of higher education, there is a complex system of union and non-union apprenticeships tied to many manufacturing-related areas. Most recently, the State of Michigan launched the Michigan Advanced Technician Training (MAT2) program, with apprenticeships focusing on mechatronics (systems-based approach that aligns electrical and mechanical engineering technology principles); modeling, simulation and visualization; and information technology.

**Linkage to R&D.** There are strong ties between the community colleges and four-year degree programs, as well as linkages to industry research and development activities. These connections translate into practical, hands-on learning in the classroom. Students work and learn in an R&D-rich environment, and learn to apply advanced technologies in a vast number of labs, simulated learning environments, and through co-op and internship employment opportunities.

**Post-Secondary Feeder Programs.** *Advance Michigan* partners found numerous relationships between postsecondary institutions and their secondary counterparts. The region is home to at least 12 early or middle colleges, and articulation between K-12 and higher education institutions is extensive. Some K-12 programs have 40+ articulations with their four-year partners, ranging from career and technical education (CTE) to advanced placement and other programs. Every school district in the region has some form of CTE related to manufacturing and information technology, where talent needs are driven largely by the automotive industry and the broader manufacturing sector.

**Engagement of Workforce Boards and Other Partners.** Helping talent partners understand the implications of technology advancements are regional cluster and sector strategies, including the Michigan Academy for Green Mobility Alliance, which connects the region's Detroit Three Automakers and nearly 40 other manufacturers to the workforce development system, as well as community colleges and universities. The non-profit Center for Automotive Research (CAR) has a research track dedicated to future automotive employment and skill needs, and

disseminates the findings to education and training providers and state policymakers. Other sector strategies exist with special focus on new-product contract manufacturing, manufacturing skilled trades, and information technology, with workforce development and education partners interacting closely with employers. Each workforce board comprises a majority of employers, and all engage organized labor.

### 2.1.4 Talent System Gaps

In spite of positive trends, there are gaps in the talent system. Even with a strong underlying infrastructure and many outstanding education and training programs, there are rapid advancements being made in KTS that have not yet been integrated into existing programs. This is true for lightweight and alternative materials, as well as manufacturing and IT. Finally, there is the basic need for attracting and retaining skilled workers.

**Short and Long-Term Challenges.** In the short-run, there is need to better understand employer demand tied to the KTS so that partners may create professional development opportunities for incumbent workers, including modular education and training opportunities (e.g., stackable credentialing programs that allows workers to take short credit and modular credit courses while working full-time). In the mid-term, there is need for more education and training for current workers, particularly in skilled trades and IT. In the long-term, the challenge is developing a sufficient pipeline of students who will train for top-demand KTS occupations.

**Local Unemployment Rate for KTS.** Currently, the *Advance Michigan* region has 280,000 unemployed workers. Of these, 31,000 are manufacturing workers, 18,000 in professional services and technologies, and 2,400 in IT.<sup>5</sup> It is important to connect unemployed manufacturing and professional services/technologies workers to KTS-related training to support demand for their skills. It also is important to update the skills of available IT workers to support the most current programming languages and approaches industry demands.

**Support for Long-term Unemployed.** In the *Advance Michigan* region, long-term unemployed workers tend to suffer from lower education and skill levels than the current market demands. There are several programs within the region, such as Community Ventures, which offers incentives to employers to hire workers from under-served communities. Other efforts include strong wrap-around support services for workers looking to re-enter the workforce and update their technical skills.

### 2.1.5 Regional Talent Plan

To help address both short-term and long-term needs, talent partners will work closely with the Michigan Academy for Green Mobility Alliance (MAGMA), a cluster-strategy involving 30+ firms with related interests in advancing the KTS. To ensure alignment with R&D, partners also will work closely with the new lightweight metals institute funded by the Department of Defense through the ALMMII grant, the U.S. Department of Transportation’s connected vehicle pilot project at the University of Michigan Transportation Research Institute, And other relevant R&D initiatives. The table below shows the total proposed investments in workforce and talent activities, as well as the economic benefits of such an investment.<sup>6</sup>

Total Economic Benefits: Workforce and Training Activities							
Total Investment	New Earnings for Region's Workers	Incumbent Jobs Supported	Direct Jobs Created	Indirect and Induced Jobs Created	Total Jobs Both Supported and New Due to Investment	Average Earnings per Job	Investment to Jobs Multiplier (Jobs per \$million invested)
\$176,800,000	\$166,137,251	2,659	241	1,153	4,053	\$40,991	23

The additional tables include *Advance Michigan* plans to ensure that partners have the data and information needed to support better KTS-related investments, up-skill and re-skill incumbent workers, build institutional capacity to grow the future workforce, support career awareness and pipelines for youth into top-demand jobs, and re-engage long-term unemployed workers.

GOAL #1: Support improved data and workforce intelligence related to KTS		
Short term	<p>PLAN DESCRIPTION: Data and employer engagement are essential components of ensuring an employer-driven talent system. This effort would look to support workforce data and intelligence needs at the regional and state levels, including:</p> <ul style="list-style-type: none"> <li>• Surveys and executive interviews with employers to pinpoint near and long-term talent needs associated with the KTS</li> <li>• Assure additional investment in longitudinal tracking systems that would help determine the extent to which K-12 and higher education strategies are aligning with actual workforce needs</li> <li>• Research to understand how real-time job posting data correlates with actual hiring in the KTS (intention is to improve projection capabilities and support an early-warning system for hiring or downsizing events)</li> <li>• Enhanced talent bank/job exchange functionality</li> </ul>	<p>ANTICIPATED INVESTMENT: \$500,000 for employer engagement and surveys; \$1 million for longitudinal tracking and system enhancements; \$300,000 for real-time data correlation to postings</p> <p>ANTICIPATED OUTCOMES: Enhanced labor market information and creation of new projection mechanism to better estimate job and workforce needs in the near future (including an early warning system for future hiring/layoff events). Increased awareness of and participation in opportunities in manufacturing. Data will help define the most needed skills and jobs in manufacturing related to the KTS.</p>
	<p>TOTAL INVESTMENT: \$1,800,000</p>	<p>NEW EARNINGS FOR WORKERS: \$3,229,879</p>

GOAL #2: KTS-related training funds help incumbent workers to modernize and update skills		
Short term	<p>PLAN DESCRIPTION: Incumbent workers would be the focus for transitioning and upgrading skills related to lightweight and connected (efficient and safe) manufacturing methodologies. Examples related to lightweight materials might include new techniques and processes related to stamping/forming/cutting; joining and soldering; computer aided design and manufacturing; computer numeric control; material handling and safety; engineering technology systems and processes. Examples related to vehicle connectivity might include handling and installation of sensors; electronic repair and maintenance; troubleshooting and customer service; programming using modern languages; etc. Funding would support training as well as access to equipment, materials, and software.</p>	<p>ANTICIPATED INVESTMENT: \$20M/year allocated for incumbent worker training (waivers could allow more use of WIA dollars for training purposes). Funds matched by \$20 million/year Michigan New Jobs Training Program, \$9 million/year in Skilled Trades Training Fund, and employer matching funds.</p> <p>ANTICIPATED OUTCOMES: 4,000-5,700 trainees, jobs saved, salaries advanced.</p>
	<p>TOTAL INVESTMENT: \$49,000,000</p>	<p>NEW EARNINGS FOR WORKERS: \$80,500,282</p>

GOAL #3: Build capacity for education and training related to advances in lightweight and connected manufacturing systems		
Mid term	<p>PLAN DESCRIPTION: Regional community colleges and universities will develop aligned and articulated curriculum relating to efficient (lightweight) and connected (intelligent) manufacturing systems tied to transportation and other relevant sectors. Recommendations will be made for integration into K-12 CTE, career academy, early college, and other offerings. All products will be shared and made available to each college/university partner, with faculty training and professional development opportunities made jointly available.</p>	<p>ANTICIPATED INVESTMENT: \$25 million over three years (\$2-3 million for 10 community college; \$10 million for universities); the program would leverage a current statewide budget request for \$50 million for community college capacity building and \$100 million for university capacity building across multiple employment sectors.</p> <p>ANTICIPATED OUTCOMES: 3,300 workers trained in shorter-term programs (6 months and under), 825 in longer-term training (6 months to two years)</p>
	<p>TOTAL INVESTMENT: \$75,000,000</p>	<p>NEW EARNINGS FOR WORKERS: \$106,287,696</p>

<b>GOAL #4: Regional awareness and communication efforts promote manufacturing careers related to the KTS (especially engineers and technicians)</b>			
<b>Mid term</b>	PLAN DESCRIPTION: This initiative will be modeled after Connecticut Community College's Regional Center for Next Generation Manufacturing (RCNGM - <a href="http://nextgenmfg.org/">http://nextgenmfg.org/</a> ) and the former Lansing Area Manufacturing Partnership (LAMP). It will address the need for highly skilled manufacturing talent by providing programs and resources to educators and students interested in learning new technologies in manufacturing, particularly tied to efficient, safe, and connected manufacturing techniques.	ANTICIPATED INVESTMENT: \$9 million over three years	
		ANTICIPATED OUTCOMES: Tens of thousands of high school and middle school students in 13 counties (14-21 year olds) learn about KTS-related jobs; enrollments in related postsecondary education and training programs increase, along with secondary enrollment in Career & Tech Ed; increased youth employment in KTS-related fields	
	TOTAL INVESTMENT: \$9,000,000	NEW EARNINGS FOR WORKERS: \$7,539,923	TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 150

Two additional concepts are provided in Appendix B-6, including a youth career pipeline effort modeled after the Department of Labor’s Youth Career Connect effort and an initiative to connect long-term unemployed workers (including veterans) to the KTS, similar to the department’s *Ready to Work* initiative.

## 2.2 SUPPLIER NETWORK

Both the size of the automotive industry and the complexity of its products ensures that the industry must remain at the vanguard of advanced manufacturing. The industry is a huge consumer of goods and services from numerous other sectors, including raw materials, construction, machinery, legal, computers and semi-conductors, financial, advertising, and healthcare. The multiplier effects of the automotive industry in the *Advance Michigan* region are enormous with every job created or maintained supporting an additional 2.28 jobs in the region, every dollar of worker earnings creating \$0.96 in earnings for other workers throughout the region, and every dollar in sales generating \$0.77 in additional sales in other industries.<sup>7</sup>

### 2.2.1 Current Capability

**Key Firms in the KTS.** *Advance Michigan* is unique in that it is home to the full breadth of the manufacturing supply chain, including the Detroit Three corporate headquarters; corporate R&D centers for seven global automotive manufacturers (Chrysler, Ford, General Motors plus Hyundai, Kia, Nissan, Toyota) and over 370 supplier-owned R&D centers.<sup>8</sup> Over 1,000 equipment and parts manufacturers are located here, including headquarters of 40 of the world’s 60 largest automotive suppliers.<sup>9</sup> This region is also home to between half and three-fourths of all engineering and testing service firms in Michigan.<sup>10</sup>

**KTS Inside and Outside of the Region.** Michigan currently produces 22% of the vehicles in the nation (more than any other state, and all in plants located in the *Advance Michigan* region) and leads the nation in powertrain production (28% of U.S. engine and 21% of U.S. transmission output is produced in the region) at 12 assembly plants and 35 parts and component plants.<sup>11</sup> The *Advance Michigan* region produces 58% of automotive parts manufactured in the state. Industry spending on R&D—at almost \$14 billion each year comprises over 70% of the U.S. total auto R&D spending, and occurs almost entirely within the 13-county region (the supplier sector accounts for approximately 40% of this research spending). Automakers and suppliers have invested over \$15 billion in the *Advance Michigan* region since 2009, with over 85% of investments in manufacturing facilities. These, along with targeted investment from the Federal Government, has accelerated interest and spending in the KTS as manufacturers race to comply with current and future regulations and meet consumer needs.

Announced Automaker & Supplier Investment: 2009 - April 2014						
	New and retained jobs	Total Capital Investment	Manufacturing Investment	R&D Investment	Other Investment	Newly Announced April 2014 Investment in Advance Michigan
						New Jobs
13 County Region*	50,310	\$15,386,701,417	\$13,260,265,000	\$1,282,636,417	\$843,800,000	2,465
State of Michigan	68,563	\$18,979,621,417	\$16,693,085,000	\$1,432,636,417	\$853,900,000	
Rest of U.S.	133,323	\$46,188,911,588	\$44,212,263,000	\$1,022,348,588	\$954,300,000	
Canada	12,907	\$3,877,850,000	\$3,000,600,000	\$877,250,000	\$0	
Mexico	22,855	\$15,498,200,000	\$15,013,200,000	\$0	\$485,000,000	

\* Clinton, Eaton, Genesee, Ingham, Lapeer, Livingston, Macomb, Monroe, Oakland, St. Clair, Shiawassee, Washtenaw, Wayne  
Manufacturing Investment: Capital investment in production facilities.

R&D Investment: Capital investment in engineering, development, design demonstration facilities.

Other Investment: Capital investment in other types of facilities, such as logistics, headquarters and sales.

\*\*April 2014 Investment in Flint, Detroit, and Lansing from GM

The U.S. Council for Automotive Research (USCAR) is a national partnership among Chrysler, Ford and GM to strengthen the technology base of the U.S. auto industry through cooperative research and development, and is located in the *Advance Michigan* region. USCAR has several research teams (composites consortium, automotive metals, non-destructive evaluation, materials partnership, drive materials tech team) dedicated to accelerating technical development, providing a common message to the supply base, increasing the value of research investments, improving quality and reducing the cost for advanced technologies and processes.

**Supply Chain.** Due to the industry's high consumption of products from other economic sectors, the definition of the "industry" encompasses more companies and more types of industries than those included in the strictly defined NAICS (North American Industry Classification System) Codes for automotive firms (3361-3363). Many companies in other industries – such as those developing software or telecommunications, machinery, tooling, plastics, and engineering services – are also automotive suppliers, especially in Michigan. Many "traditional" automotive suppliers find that the auto industry's standards for precision and quality control enable them to branch into other demanding markets such as aeronautics or medical devices. A comprehensive listing of NAICS codes, including top-100 known automotive-industry suppliers, is included in Appendices A-2, C-1, and C-2.

**Trade and other Associations (and the roles they play).** Intensely competitive by nature, automakers strive to develop new innovations for strategic advantages over competitors, and product and process development innovations are closely guarded trade secrets. The *Advance Michigan* region is home to many industry organizations that foster networking opportunities outside of the formal work environment, study and promote workforce and skill needs of employers, and provide training and development services to the area's labor force. Many of these organizations also work towards fostering innovation by supporting high tech start-ups, helping designers and developers with R&D support (such as low-cost access to laboratory space), accelerating the speed-to-market for new products or processes, and developing new markets for existing products, services and processes. For example, the previously mentioned USCAR collaborative, as well as the Original Equipment Suppliers Association and Michigan Minority Supplier Development Council support companies headed by non-traditional leaders, and connect them with advanced technology business opportunities. The Michigan Manufacturers Association and Motion Control for Mechanical and Electric Motion Technologies, the Society for Automotive Engineers, the Society for Mechanical Engineers, the Design and Manufacturing Alliance, the Open Automotive Alliance, and Connected Vehicle Trade Association are all committed to bringing professionals together to foster networking opportunities while protecting the competitive nature of industry companies.

**How External Suppliers Can Support Internal Suppliers.** The *Advance Michigan* region has numerous large suppliers with facilities outside the region and even outside the United States. This global automotive network leverages the companies' knowledge and process experience and enhances their operations within the state. Additionally, Pure Michigan Business Connect (PMBC) is a public/private initiative developed by the MEDC that connects Michigan businesses to the purchasing departments of the state's larger companies. Through this

Business-to-Business network, Michigan companies are encouraged to increase their procurement spending within the state, supporting a local economic ecosystem.

**Shared Projects/Assets Across Firms.** Three prominent Michigan non-profits, the Michigan Manufacturing Technology Center (MMTC), the National Center for Manufacturing Sciences (NCMS), and the Center for Automotive Research (CAR) are collectively working on programs to enhance the capacity and expertise of the supply chain in the *Advance Michigan* region. InnoState is a 3-year, multi-agency, multi partner federal project awarded through the Advanced Manufacturing and Innovation Accelerator Challenge (JIAC). BioMaterials for the Automotive Sector is a 3-year, multi-agency, multi-partner federal project awarded through the Make it in America Challenge Grant. The Intel Voice of the Customer Project is focused on Michigan suppliers to resolve supply chain barriers in adopting digital manufacturing technologies such as modeling, simulation, and visualization. ALMMII is focused on lightweight metals and supply chain mapping/gap analysis. The MI Dept. of Transportation and U.S. DOT have multi-year engagements on connected and automated vehicle technologies focused on regulatory issues related to crash safety & analysis, materials development, and certification.

**Newly launched KTS products.** Central to the advancement of the KTS is the use of (1) high-strength, lightweight alternative materials (e.g., high-strength steel, aluminum, magnesium, titanium and metal and polymer composites utilizing low-cost carbon, natural, advanced glass, and aramid fibers); and (2) new materials either in the polymer base or new metal alloys for additive manufacturing (i.e., 3D printing). Additive manufacturing is an emerging process technology that is finding application in many industries (including medical, defense, aerospace), as well as in the automotive sector; and (3) propulsion materials (those suitable for advanced combustion, thermoelectric, and hybrid-drive systems, as well as exhaust and energy recovery).

### **2.2.2 Current Institutions for Improving Capability**

The Coalition for Automotive Lightweighting Materials (CALM) supports the cost-effective integration of mixed material in vehicles to achieve significant reductions in mass through the collaborative efforts of the material sectors and auto manufacturers. CALM is one of the many existing consortia convened by CAR. These consortia encourage pre-competitive and enabling technology development conversations in order to strengthen the U.S. automotive industry's competitive position in global markets. CAR is also under contract to convene MDOT's Connected Vehicle Working Group to address issues in this emerging technology area.

The region is also home to automotive economic development through thought leaders, such as Business Leaders for Michigan (the state's business roundtable), and many professional services and consulting practices who study industry challenges and opportunities. Finally, economic development organizations such as the Detroit Regional Chamber, Ann Arbor Spark, The Right Place, I-69 International Trade Corridor, Next Energy, Automation Alley, University Research Corridor and the MEDC are working in concert to develop the ecosystem of economic development around our automotive sector.

### **2.2.3 Short and Long-Term Gaps**

The automobile is a technologically sophisticated product. Designing, engineering, manufacturing, and testing of advanced automotive innovations require a high level of expertise, precision and scale. The development and integration of these technologies represent opportunities and challenges for companies in the *Advance Michigan* region. While there is a general lack of collaboration among the many entities supporting automotive manufacturing, the automotive sector presents an area of opportunity if coordination can be enhanced. The concepts outlined to enhance the supplier network and KTS capture the need to collaborate across organizations and to bring a combined knowledge to bear on the areas of lightweighting and connectivity in the auto sector in this region. One Michigan-based venture capital firm noted that it recently made 13 investments in the connected vehicle and infrastructure space, but none were in Michigan, indicating missed opportunity in the supply chain.

### 2.2.4 Supply Chain Plan

Advancing the region’s position in the KTS presents numerous job creation opportunities across the spectrum of manufacturing employment, including but not limited to: engineering, design (modeling, simulation and visualization), technicians; non-destructive testing (optical measurements) quality assurance (e.g., monotonic testing solution and corrosion), and production processes (joining, forming, and stamping; mechatronics; assembly; and industrial equipment manufacturing).

The job creation, economic competitiveness, and even national security potential in these areas is so great that the U.S. Department of Energy, U.S. Department of Defense, U.S. Department of Energy, U.S. Department of Transportation, National Institute of Standards and Technology (NIST), Center for Automotive Light weighting (NCAL), U.S. Department of Defense, Office of Naval Research (ONR) just released a solicitation for Innovation Manufacturing Institute (IMI), and the U.S. National Science Foundation, Division of Civil Mechanical and Manufacturing innovation, U.S. National Highway Traffic Safety Administration (NHTSA), National Science Foundation, and various national labs have also invested considerable resources to support them. These technologies also present opportunities to diversify the region’s manufacturing base to non-automotive industries including, aerospace-defense, green and alternative energy (e.g., wind turbines), and medical devices.

Total Economic Benefits: Supplier Network							
Total Investment	New Earnings for Region's Workers	Incumbent Jobs Supported	Direct Jobs Created	Indirect and Induced Jobs Created	Total Jobs Both Supported and New Due to Investment	Average Earnings per Job	Investment to Jobs Multiplier (Jobs per \$million invested)
\$43,000,000	\$38,077,824	435	77	294	806	\$47,243	19

GOAL#1: Incorporate an explicit focus on KTS within Pure Michigan Business Connect (PMBC) and within regional economic development and other non-profit partner groups.		
Short term	PLAN DESCRIPTION: PMBC, regional economic development partners and manufacturing focused non-profits have done extensive work helping Michigan firms connect with regional, state, national and even global suppliers. Funding should support this effort to allow for targeted focus on supplier linkages specific to the KTS, including lightweight materials, connectivity and other areas.	
	ANTICIPATED INVESTMENT: \$3,000,000 over three years  ANTICIPATED OUTCOMES: Short-term gaps filled in supply chain, local suppliers build capacity for domestic and global product and service delivery, more jobs	
	TOTAL INVESTMENT: \$3,000,000	NEW EARNINGS FOR WORKERS: \$2,778,479  TOTAL JOBS SUPPORTED AND NEW DUE TO INVESTMENT: 55

GOAL #2: Better understand KTS supply-chain within region through mapping and analysis		
Short term	PLAN DESCRIPTION: Work with MMTCC, the region’s Manufacturing Extension Partnership along with CAR, NCMS and other regional institutions to conduct an in-depth regional supply chain analysis and mapping, with a special focus on lightweight materials and connectivity. The project should help partners better understand where OEMs and major Tier 1 suppliers are sourcing their needs both inside and outside the region, whether certain capabilities outside of the region could be developed or attracted locally, and where new firm incubation is needed. to assess potential suppliers’ capability to participate in the KTS, understand the gaps they face, develop strategies to overcome them, and support strategies for overcoming them.	
	ANTICIPATED INVESTMENT: \$1,000,000 over three years  ANTICIPATED OUTCOMES: Better awareness of supply chain strengths, weaknesses, and opportunities; Pure Michigan Business Connect and other partners can use information to better target attraction efforts, including foreign direct investment.	
	TOTAL INVESTMENT: \$1,000,000	NEW EARNINGS FOR WORKERS: \$1,794,377  TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 30

GOAL #3: Build capacity for education and training related to advances in lightweight and connected manufacturing systems			
Mid term	<p>PLAN DESCRIPTION: Regional community colleges and universities will develop aligned and articulated curriculum relating to efficient (lightweight) and connected (intelligent) manufacturing systems tied to transportation and other relevant sectors. Recommendations will be made for integration into K-12 CTE, career academy, early college, and other offerings. All products will be shared and made available to each college/university partner, with faculty training and professional development opportunities made jointly available.</p>	<p>ANTICIPATED INVESTMENT: \$25 million over three years (\$2-3 million for 10 community college; \$10 million for universities); the program would leverage a current statewide budget request for \$50 million for community college capacity building and \$100 million for university capacity building across multiple employment sectors.</p>	
		<p>ANTICIPATED OUTCOMES: 3,300 workers trained in shorter-term programs (6 months and under), 825 in longer-term training (6 months to two years)</p>	
	TOTAL INVESTMENT: \$75,000,000	NEW EARNINGS FOR WORKERS: \$106,287,696	TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 2,351

GOAL #4: Fill gaps in KTS supply chain through a connectivity incubator & advanced manufacturing consortium			
Mid term	<p>PLAN DESCRIPTION: Create a regional incubator charged with linking local technology entrepreneurs to opportunities for new product and process development tied to vehicle connectivity, connected infrastructure, and related spinoffs like “go” technologies that move from the vehicle to personal use. Funds should support “pitch” and “demonstration” competitions; connections between start-up firms and OEMs, mining of available R&amp;D and technologies suitable for commercialization, and technical support for new firms. Resources also should be available to help firms (both within the region and beyond) become aware of market and supply-chain opportunities related to connectivity. The project could be a new venture or possibly housed in an already-existing regional incubator/business accelerator.</p>	<p>ANTICIPATED INVESTMENT: \$9 million over three years</p>	
		<p>ANTICIPATED OUTCOMES: Increased entrepreneurial activity related to KTS, new job creation, technology commercialization, supply-chain gap filling</p>	
	TOTAL INVESTMENT: \$9,000,000	NEW EARNINGS FOR WORKERS: \$7,193,089	TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 132

### 2.3 RESEARCH AND INNOVATION

Innovation thrives in the *Advance Michigan* region due to the clustering of original equipment manufacturers (OEMs) and their supplier networks, and the presence of world-class research universities. Michigan’s university and industry-based innovation outcomes rank favorably against top tier U.S. competitor regions and offer promise for continuing long-term growth. In 2011, Michigan ranked 13<sup>th</sup> in the nation for patents awarded and 8<sup>th</sup> in the industry-funded university R&D.<sup>12</sup> As noted, Michigan is the nation’s automotive R&D hub abundant R&D centers and related spending.<sup>13</sup>

#### 2.3.1 Current Capabilities

**University/Research Assets in KTS.** The region is home to University of Michigan (UM), Michigan State University (MSU), and Wayne State University (WSU), three of the nation’s leading research institutions which align to form the University Research Corridor (URC). In addition, Oakland University (OU), Kettering University, and Lawrence Technological University (LTU) among many other higher education institutions add diversity to the university research landscape. Over the past five years, Michigan’s university research institutions led improvements in safety, performance and fuel economy with over \$300 million invested in more than 1,400 auto-related research projects.<sup>14</sup> Indeed, a scan of these institutions’ R&D capabilities identified over 50 lab facilities and research projects related to the KTS. Examples of key programs include the soon-to-be launched ALMMII center at UM, which will focus on R&D tied to lightweight metals, with linkages to education and training to grow relevant talent. Other key initiatives include the UM Transportation Research Institute’s (UMTRI) creation of a connected vehicle testing area in Ann Arbor that simulates a full-scale connected transportation and vehicle system.

**Integration of R&D into Education and Training.** Michigan's university system integrates education and training into its R&D system, but could do more to ensure that all students have access to participate in R&D. For example, the majority of Flint's Kettering University students are engaged in work-study programs at automotive supplier and manufacturer locations and LTU's engineering students work hands on with companies and in labs from day one. MSU estimates that fully 25% of its undergraduate students (10,000) have significant research experience while engaged in their undergraduate curriculum and that 30-35% of undergraduate students (~13,000) participate in one or more internship or co-op experiences before graduation. WSU is deeply engaged in post-secondary career readiness, encouraging high school students to seek careers in science and engineering, and OU places strong emphasis on the connection of R&D activities with education, including a number of KTS-relevant doctoral programs.

**Incubator Space and Research Centers.** The region also is home to incubator space provided by several of the research universities and economic development organizations. For example, UM Venture Accelerator occupies 18,000 square feet of research space and offers laboratory and other resources to new entrepreneurs. The Lansing Economic Area Partnership (LEAP) and MSU collaborate to operate a Regional Incubator Network (RIN) of incubator/accelerator spaces that support both the public and the MSU student communities through projects like the Lansing Makers Network, a facility that melds technology, art, and culture, in new and exciting ways. The Chrysler Robotics Lab and the Chrysler Learning and Innovation Center are located at OU where research is conducted by the company as well as students and faculty within the university, a unique program where students are trained at the incubator by employers to supplement their education and research. WSU has a strong strategic partnership with TechTown in Detroit, located in close proximity to its campus, to promote and house sustainable technology businesses. Ann Arbor SPARK and NextEnergy also work closely with university partners to house and support new firms.

Each university employs business liaisons and has a business development center that helps firms, new and old, identify and leverage on-campus resources, including R&D expertise, labs, and other resources. In addition, the region is home to the Business Accelerator of Southeast Michigan (BANSEM), a partnership among economic developers at Ann Arbor SPARK, Automation Alley, TechTown, Macomb/OU Inc., and Velocity.

**Record of Supporting the Ecosystem for Small Business Development and Start-ups.** In the past five years, over 80 start-ups from students and professors came from *Advance Michigan* region universities. UM is home to the Great Lakes Trade Adjustment Technical Assistance Center, Eastern Michigan is the regional hub for the region's Small Business Technical Development Centers, many universities partner directly with Procurement Technical Assistance Centers, and all provide multiple supporting services to small businesses.

### **2.3.2 Current Institutions for Improving Capability**

**Alignment of R&D/Commercialization with KTS.** *Advance Michigan's* R&D and commercialization efforts align closely with the KTS, although that alignment is nascent, much like the technologies of focus.<sup>15</sup> In 2014, The U.S. Department of Transportation gave the "green light" to proceed with vehicle-to-vehicle communication technology. The agency's initiative is closely related to the work of UMTRI, which works with government and industry to lay the foundations for a commercially viable system of connected and automated vehicles. To support this, UMTRI conducted the Safety Pilot Model Deployment, the pilot study involving nearly 3,000 equipped vehicles operating in Ann Arbor that helped inform DOT's decision. During the past 15 months, more than 12 billion basic safety messages have been collected, and 60,000 interactions between participating vehicles have occurred. In support of ongoing development, the UM Board of Regents approved plans in October 2013 to proceed with the design of a unique environment for testing connected and automated vehicles. Current plans call for the facility to be completed by fall 2014, costing \$6.5 million. There also is a private effort to develop a connected and automated vehicle testing center at the site of the former GM Willow Run Assembly plant.

**Integration of Industry and Academia (including Federal Laboratories).** Automotive industry and academic research efforts are integrated, although further collaboration is an ongoing objective. Several of the research centers identified above are sponsored by and implemented in collaboration with industry (e.g., Chrysler Robotics Lab and Chrysler Learning Innovation Collaborative).

Examples of regional ties to national initiatives include the National Automotive Center (NAC), an element of the US Army Tank-Automotive Research Development and Engineering Center (TARDEC) in Macomb County. The NAC's role is to be the focal point for public-private mobility technology development. The Secretary of the Army chartered the NAC in 1993 to help facilitate joint efforts between industry, government and academia. Some of the NAC programs include the Hybrid Truck Users Forum, the Advanced Battery Initiative and the Advanced Vehicle Power Technology Alliance. TACOM is the primary DOD material facility in Michigan. The TACOM Life Cycle Management Command (LCMC) unites all of the organizations that focus on soldier and ground systems throughout the entire life cycle including Soldier Research, Development & Engineering Center, and the Edgewood Chemical Biological Center.

Recently, the National Aeronautics and Space Administration's Office of the Chief Technologist (OCT) teamed with the NASA Glenn Research Center in Cleveland, Ohio, to support a pilot in Southeast Michigan. The pilot will showcase NASA-developed technologies to organizations and individuals who could be interested in co-development, technology commercialization, or business development partnership.

**Robustness of Revenue Models.** Revenue models are robust when they utilize proven methods of generating revenue, institutional commitments, and flexibility to balance multiple objectives in creating agreements to make research and partnerships happen. Revenue models are not as clear for university research, especially industry sponsored programs. Often the IP earnings will go to the company and the university does not benefit financially. Sometimes a university has a large patent that brings in revenue for several years, however most university patents are not major revenue generators.

### 2.3.3 Short and Long-Term Gaps

Michigan's research and innovation strengths are mitigated by challenges, which *Advance Michigan* seeks to address. Years of economic decline and disinvestment have resulted in decreased standing for the state's industrial and university leaders. New technologies developed by Michigan's population of researchers and engineers have not been commercialized due to a lack of venture capital and entrepreneurial resources. Programs and tools designed to address these gaps are recent, and many innovators are unaware they exist. Private sector, government, and nonprofit supports for innovation are not yet coordinated as well as they need to be to deliver optimal results.

### 2.3.4 Research & Innovation Plan

*Advance Michigan* will provide support to the entire state as it seeks to showcase its R&D and innovation capacity. State leaders have developed an agenda for translating patent activity into entrepreneurship and economic growth by attracting venture capital and convening innovation conferences, competitions and research. The region offers a geographic center for these types of activities.

Total Economic Benefits: Research and Innovation							
Total Investment	New Earnings for Region's Workers	Incumbent Jobs Supported	Direct Jobs Created	Indirect and Induced Jobs Created	Total Jobs Both Supported and New Due to Investment	Average Earnings per Job	Investment to Jobs Multiplier (Jobs per \$million invested)
\$54,500,000	\$45,215,484	525	106	390	1,021	\$44,285	19

GOAL #1: Align university/industry R&D integrating strategies to make the system more sustainable			
Short term	<p>PLAN DESCRIPTION: Map university R&amp;D and tech transfer abilities and create a catalog of capabilities geared toward industry consumption. Engage with industry to map private-sector R&amp;D activity (where possible); identify opportunities for enhanced collaboration around KTS and raise awareness of university capacity. Expand university work-study opportunities through private sector partnerships as a means of encouraging more applied research. Create a model that continuously reinvests tech transfer funds into the university R&amp;D system to create new applied research dollars for industry.</p>	<p>ANTICIPATED INVESTMENT: \$3.5 million (\$500,000 for mapping; \$500,000 for industry engagement; \$500,000 to expand work-study options; \$2 million to create R&amp;D investment model leveraging tech-transfer returns)</p>	
		<p>ANTICIPATED OUTCOMES: Enhanced private&amp; public awareness of R&amp;D and commercialization activities tied to KTS (results in further R&amp;D collaborations, increased alignment of activities, and possibly greater tech transfer and commercialization activity); first-in-class reputation for R&amp;D (may attract and retain new firms and jobs in the region); further technology development; network of expert resources</p>	
	<p>TOTAL INVESTMENT: \$15,000,000</p>	<p>NEW EARNINGS FOR WORKERS: \$5,262,376</p>	<p>TOTAL JOBS SUPPORTED AND NEW DUE TO INVESTMENT: 88</p>

GOAL #2: Create an environment of collaborative R&D activity between public and private interests			
Short term	<p>PLAN DESCRIPTION: Facilitate KTS-related R&amp;D competitions that encourage multi-stakeholder collaboration; hold seminars and events to support networking, resource-sharing, and support; establish a strong economic development alliance that moves seamlessly between industry, community, and academia and supports both talent development and commercialization</p>	<p>ANTICIPATED INVESTMENT: \$15 million (\$10 million for collaborative R&amp;D competitions and related seminars, network development; \$5 million for economic development alliance)</p>	
		<p>ANTICIPATED OUTCOMES: Greater R&amp;D tied to KTS, with greater collaboration among industry, community, and academic partners; R&amp;D and economic development strategies more closely aligned, further attracting domestic and foreign investment, regional site selection, etc.</p>	
	<p>TOTAL INVESTMENT: \$15,000,000</p>	<p>NEW EARNINGS FOR WORKERS: \$11,988,482</p>	<p>TOTAL JOBS SUPPORTED &amp; NEW DUE TO INVESTMENT: 220</p>

GOAL #3: Grow KTS-related linkages between R&D and workforce development/ensure retraining and skill development opportunities for all Michigan workers as new technologies emerge			
Short term	<p>PLAN DESCRIPTION: Increase number of internships, co-ops, apprenticeships, and work/study programs that allow students to be included in company activities. Develop mechanisms for adapting new learning opportunities and connecting them with workers (allows integration of alternative learning options offered through four-year academic institutions).</p>	<p>ANTICIPATED INVESTMENT: \$1 million (\$500,000 for internship/co-op coordination; \$500,000 for integration of R&amp;D in student education); \$2 million for new opportunities plus \$500,000 for mapping training needs and \$10 million for university-led education and training efforts</p>	
		<p>ANTICIPATED OUTCOMES: Increase emphasis on R&amp;D as part of student education for both skilled trades and BA/MA level students. Increase number of students enrolling in skilled trades and engineering programs at research universities.</p>	
	<p>TOTAL INVESTMENT: \$13,500,000</p>	<p>NEW EARNINGS FOR WORKERS: \$26,311,879</p>	<p>TOTAL JOBS SUPPORTED &amp; NEW DUE TO INVESTMENT: 441</p>

Short term	GOAL #4: Support a sustainable strategy that would allow R&D facilities to annually apply for resources for new labs and updates		
	PLAN DESCRIPTION: Inventory the status of existing labs. Create a shared fund with federal dollars, industry dollars, and other private investment geared toward updates of labs in high demand KTS areas		ANTICIPATED INVESTMENT: \$20 million (\$250,000 for lab inventory and assessment; \$19 million fund for lab updates; \$750,000 for new funding and business models for lab updates.
			ANTICIPATED OUTCOMES: Better industry access to updated lab space and more flexible funding available to ensure the most innovative atmosphere possible.
TOTAL INVESTMENT: \$20,000,000		NEW EARNINGS FOR WORKERS: \$15,983,843	TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 272

## 2.4 INFRASTRUCTURE AND SITE DEVELOPMENT

### 2.4.1 Current Capability

**Quality of Existing Infrastructure.** With a historically well-established manufacturing base and the logistics infrastructure designed to accommodate it, Michigan’s industrial footprint provides small- and medium-sized manufacturers both accessibility and an inventory of building assets that are not available in many regions. The region is home to active land, air and water routes, and the 13-county region has dozens of sites classified by development partners as “ready to go” or “ready to repurpose” for industrial use.<sup>16</sup> In addition, the State of Michigan has established a new Logistics and Supply Chain Commission to provide infrastructure and policy guidance to state government and economic leaders. Increased collaboration between the state, *Advance Michigan*, and private enterprise will support further infrastructure and site development.

**Border Crossings.** Michigan is ranked first among all U.S. states for the most trucks crossing into or out of Canada and second for all truck crossings nationally in 2012.<sup>17</sup> Located on a crucial freight corridor, the *Advance Michigan* region is an integral piece of the "NAFTA Highway" route from Mexico to Canada. Manufacturing and logistics facilities located on the corridor regularly take advantage of existing freight routes and crossings including:

- **Ambassador Bridge & Detroit-Windsor Tunnel** (Detroit to Windsor)—the busiest land border crossing to Canada in North America and second busiest overall, accounting for 25% of all merchandise trade between the United States and Canada and over 5.7 million truck/passenger car entries annually.<sup>18</sup>
- **Bluewater Bridge** (Port Huron to Sarnia)—the third busiest land crossing to Canada in North America, accounting for nearly 2.7 million truck and passenger car entries annually.<sup>19</sup>
- **Michigan Central Railway Tunnel** (Detroit to Windsor)—a freight train railway tunnel under the Detroit River.
- **St. Clair Tunnel** (Port Huron- Sarnia)—a freight train railway tunnel under the St. Clair River.

These logistics assets accommodate U.S. trade with Canada that averages \$300 million daily through Detroit alone, and accounts for more than 50% of all U.S. trade with Canada.<sup>20</sup> These assets are heavily used by both business and the public.

**Air Transit/Cargo.** Airports in the *Advance Michigan* region offer nonstop flights to more than 160 destinations and allow the state to serve as one of the largest US air hubs to Asia. Detroit Metropolitan Airport is the 17<sup>th</sup> busiest passenger airport in the world<sup>21</sup> and when combined with the nearby Willow Run Cargo Airport is part of

an effort to create a master-planned, global logistics and supply chain hub and internationally competitive business environment referred to as *VantagePort*. This dual-airport system is surrounded by approximately 25,000 acres of developable land.<sup>22</sup> A permanent CEO has been hired to develop and lead efforts to promote Michigan's geographic access to worldwide markets. In 2013, the VantagePort region benefitted from \$660 million worth of new real and personal property investment and the creation of 974 new jobs.<sup>23</sup>

- **Bishop International Airport** (Flint) is the third busiest airport in Michigan, accommodating almost 1 million passengers per year<sup>24</sup> and supporting both commercial and general aviation. It is part of the I-69 corridor plan to develop 1,300 acres in the northern part of the region. VantagePort and Bishop are located along North America's busiest trade corridor with access to multiple Interstates, intermodal rail facilities, and major seaports.
- **Capital Region International Airport** (Lansing) is a full service international airport, with a co-located Federal Inspection Station and Foreign Trade Zone. Capital City processes between 400K and 650K passengers annually (including about 50K international passengers) and 45M pounds of cargo.<sup>25</sup>

**Rail.** Four of the seven Class I railroads operating in the region offer more than 3,600 miles of track and provide access to all North American markets.<sup>26</sup> **Highways.** The percentage of urban roads in poor condition in Michigan is 17%. Of all major roads in Michigan, 38% are rated as poor or mediocre quality.<sup>27</sup> The legacy infrastructure has sufficient *capacity* to serve existing and future KTS; but the condition and quality of road infrastructure is deteriorating so quickly that it deters private business investment in the region. Vulnerabilities due to decreased maintenance as a result of declining gas tax revenues, lack of state investment, and unusually harsh weather conditions have delayed or even cancelled maintenance and upgrades for many years, creating a backlog of repairs and needed rebuilds.<sup>28</sup> On the other hand, the region has been home to unique innovations in roadway systems, such as the UMTRI connected vehicle testing area in Ann Arbor.

**Water.** According to the US Army Corps of Engineers, in 2011, Michigan ranked 15th among U.S. states in total tonnage transported and 19th for total foreign tonnage imported and exported.

#### 2.4.2 Gaps

Recognizing the importance of the regional infrastructure, there are a number of improvements currently underway, proposed by both private and public entities. Some proposals focus on upgrading local roads and highways, while others focus on maximizing the region's unique assets. These include the proposed *New International Trade Crossing*, (which will provide a new Canadian border crossing, including a new customs and toll plaza), freeway upgrades (partly underway), and some major freight-handling facilities (e.g., more rail-truck intermodal capacity, more warehousing and sequencing space, and more cross-dock capacity). Still, many infrastructure needs remain:

- **Site Development and Demolition.** While the region has dozens of sites ready to repurpose (e.g., 46 RACER sites are in the region), many require remediation and restoration to bring them to market, necessitating resources for site cleanup (especially old industrial sites), specifications for new projects, facilities construction, and adjustment to brownfield policies related to re-use of old buildings. Meanwhile, over 15,000 residential properties have been identified in Detroit and Flint alone as abandoned and/or in need of demolition (respectively, 24% and 27% of Detroit and Flint homes are considered blighted, the highest rates in the nation, now exceeding hurricane-ravaged New Orleans). Removing blight (and many of the associated development challenges) can attract both talent and new investment and jobs, creating new opportunity for KTS-related development.
- **Intelligent Transportation Systems.** Integrating ITS deployments with infrastructure repair and upgrades can substantially improve the performance and sustainability of transportation system. Strategic deployment of ITS systems (including advanced connected vehicle infrastructure) will allow firms increased efficiency and dependable logistics practices.
- **Digital access – Broadband.** Firms need greater bandwidth to support increased big-data loads necessary and expected for growth. Many businesses will not invest in the region without increased bandwidth

capacity, and current businesses cannot expand to meet consumer and manufacturing expectations.

- **Air** and port strategies. There is lack of awareness and identification of assets such as VantagePort, which stand to be major focal points of development in the future.
- **Border Crossings.** Border crossings suffer from age, security concerns, congestion, and cost of new development.
- **Road Systems.** Road and maintenance and repair are high priority issues. The region faces branding and marketing challenges tied to its air freight metro area ranks second nationally in truck congestion (second only to Dallas).<sup>29</sup> This volume of truck traffic, combined with high freight loads and freeze-thaw cycles, puts large demands on highways and bridges in the region.
- **Public Transportation Systems.** Public transportation infrastructure is limited and poorly coordinated. Individuals without private transportation find it difficult to access jobs outside their immediate neighborhoods, creating a well-documented spatial mismatch between the workforce and job availability. Public transportation planning is generally decoupled from transportation infrastructure planning. There is need for considerable expansion and coordination to ensure true regional connectivity—including linkages to planned bus and rail projects.
- **Electricity Infrastructure.** Several sites lack access to a power supply necessary for modern manufacturing. The expense of updating the power grid can be high, and in some cases exceeds the cost of the facility purchase.
- **Water Systems.** Modern manufacturing processes often require intense water use. The *Advance Michigan* region has extensive natural water resources. However, building and maintaining the infrastructure needed to deliver water and properly treat wastewater can require substantial investment. Several potential redevelopment sites require updated or upgrading of the water supply infrastructure to accommodate modern industrial manufacturing while assuring environmental protection.

#### 2.4.4 Infrastructure and Site Development Plan

The following plan addresses top priorities for site development in the region, including industry-related blight elimination, which tends to lack notable investment. Other priorities include infrastructure upgrades that support industry-related transportation-distribution and logistics but also integrate technology for vehicle connectivity; enhanced broadband capacity for big-data needs associated with next-generation manufacturing; and focused development at sites (like VantagePoint) that are primed for KTS-related investment.

Total Economic Benefits: Infrastructure and Site Selection							
Total Investment	New Earnings for Region's Workers	Incumbent Jobs Supported	Direct Jobs Created	Indirect and Induced Jobs Created	Total Jobs Both Supported and New Due to Investment	Average Earnings per Job	Investment to Jobs Multiplier (Jobs per \$million invested)
\$5,577,510,000	\$4,371,570,783	32,139	7,867	30,575	70,581	\$61,937	13

GOAL #1: Eliminate blight and create more ready land for development supportive of KTS			
Short term	PLAN DESCRIPTION: Deconstruction of existing dilapidated infrastructure, beautification of vacant lands, industrial/commercial/residential redevelopment and rezoning.		ANTICIPATED INVESTMENT: \$500 million for demolition and re-zoning
			ANTICIPATED OUTCOMES: More land available for build to suit and removal of blight will increase property values
	TOTAL INVESTMENT: \$500,000,000	NEW EARNINGS FOR WORKERS: \$401,463,492	TOTAL JOBS SUPPORTED AND NEW DUE TO INVESTMENT: 6,166

GOAL #2: Make vehicle to infrastructure connectivity upgrades, while closing infrastructure maintenance funding gaps			
Short term	<p>PLAN DESCRIPTION: Develop expansion plan for intelligent vehicle systems. Initiate pilots to areas throughout Advance Michigan region, leading to full-scale technology deployment region wide (I-96, I-94, US-23).</p> <p>Develop monetization models for connected infrastructure to create new revenue streams for funding infrastructure maintenance gaps. Execute pilots to help build and coordinate the business model.</p>		<p>ANTICIPATED INVESTMENT: \$3 billion to close highway infrastructure funding gaps and \$2 billion for connectivity infrastructure</p>
			<p>ANTICIPATED OUTCOMES: Advancement in industry knowledge and investment, improved in highway safety features (better roads, less congestion, efficient travel); decreased highway fatalities in region, improved user driving experience on regional highways</p>
TOTAL INVESTMENT: \$5,000,000,000		NEW EARNINGS FOR WORKERS: \$3,909,721,502	TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 61,844

GOAL #3: Increase broadband infrastructure			
Short term	<p>PLAN DESCRIPTION: Maximize federal broadband investments by adding 2,287 miles of fiber-optic infrastructure; interconnect with local units and school districts to avoid duplication, and open public safety towers for use by Internet Service Providers; streamline the broadband build-out process by establishing a one-stop shop for approving all utility work permit clearances within state road rights-of-way.</p>		<p>ANTICIPATED INVESTMENT: \$30,000 per mile</p>
			<p>ANTICIPATED OUTCOMES: Provide the essential wholesale fiber links necessary to facilitate high-speed broadband deployment by incumbents as well as new broadband providers.</p>
TOTAL INVESTMENT: \$68,610,000		NEW EARNINGS FOR WORKERS: \$53,606,700	TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 824

GOAL #4: Prioritize infrastructure and policy initiatives that will increase the region’s competitive advantage by reducing cost, save time, and support value-added supply-chain investments.			
Short term	<p>PLAN DESCRIPTION: Invest in VantagePort – The Detroit Region Aerotropolis Development Corporation; creation of a public/private infrastructure entity to guide and manage the projects; establishment of a working group with core industry representatives.</p>		<p>ANTICIPATED INVESTMENT: \$1.25 million</p>
			<p>ANTICIPATED OUTCOMES: Identified strategies to implement infrastructure improvements; development of build-ready infrastructure improvement plans;</p>
TOTAL INVESTMENT: \$1,250,000		NEW EARNINGS FOR WORKERS: \$999,040	TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 18

## 2.5 TRADE AND INTERNATIONAL INVESTMENT

### 2.5.1 Current Capability

**Current Level and Recent Rate of Change in KTS Exports.** Michigan exported \$56.9B in products in 2012, and in 2013 that number increased to \$58.4B. The Gross Domestic Product ratio for *Advance Michigan* to the state is over 64%, meaning that most output is produced here, and likely most of the exports as well.<sup>30</sup> Between January 2003 and December 2013, the region attracted a total of 247 companies through 295 foreign direct investment

(FDI) projects. Total capital investment in KTS region for this timeframe was \$6.53B, with average investments at \$22.1M per project. The region created 27,726 total new jobs over the decade, averaging 39 jobs per project.

**International Firms and Investment Flow, Export and Import Figures.** Among investors, proximity to markets and skilled workforce are the top reasons identified for investment and location in the region. Automotive components lead the investment sector, with almost one-fifth of projects. Total job creation and capital investment in this sector was 7,675 jobs and \$1.48B, respectively. The region’s largest FDI projects originate in Italy. With an average project size of \$109.9M, this is five times larger than all other source countries. Detroit is the top destination city in Michigan for FDI accounting for almost 25% of all KTS projects tracked. Over the past decade total investments into Detroit resulted in the creation of 6,707 jobs and \$1.53B in capital investment, or 94 jobs and \$21.6 million investment per project.<sup>31</sup>

### 2.5.3 Institutions for Improving Export Capability and Support

The Detroit Regional Chamber, Automation Alley, and MEDC all provide targeted support to *Advance Michigan* firms looking to export products nationally and internationally. The MEDC Export Program was reinstated in October 2011 with strong support from the state, USDOC, and local partners. The state and local partners have provided matching investments for the region including STEP grant funding, re-opening of trade offices with four major import/export partners (China, Canada, Brazil and Mexico) and \$10M in match for the ALMMII.

### 2.5.4 Gaps

The identified projects provide a starting point for future growth, however, there continue to be barriers such as lack of awareness among potential small- and medium-sized exporters (SMEs) about the benefits of exporting and the opportunities that exist in foreign markets. Additionally, support is needed to help SMEs understand and work with international value chains. This unmet need is further complicated by threats to ongoing investments in international trade tools and strategies. There is limited State Trade and Export Program (STEP) funding to assist SMEs with trade mission reimbursement, further complicated by a small regional export staff (three total).

Regional challenges extend to the building of Michigan’s presence among potential trade partners. The state now has a lower economic standing, which global competitors have played upon as they seek to build trade opportunities for themselves. Thus, international perceptions of Michigan’s economic strength and return on investment, although improving, remain relatively poor, and resources to promote investment opportunities in Michigan are lacking. The region also lacks a well-funded investment system for the acquisition of foreign-owned entities, which could help meet value-chain needs in the region.

### 2.5.5 Trade & International Investment Plan

Total Economic Benefits: Trade and International Investment							
Total Investment	New Earnings for Region's Workers	Incumbent Jobs Supported	Direct Jobs Created	Indirect and Induced Jobs Created	Total Jobs Both Supported and New Due to Investment	Average Earnings per Job	Investment to Jobs Multiplier (Jobs per \$million invested)
\$45,000,000	\$31,714,169	427	76	289	792	\$40,043	18

GOAL #1: Attract skilled immigrants and facilitate their relocation transitions		
Short term	PLAN DESCRIPTION: Support and expand Global Talent Retention Initiative, Live.Work.Detroit, Intern Michigan and other efforts to recruit, retain and place foreign students in KTS jobs in Michigan. Support Global Detroit’s efforts to welcome and provide access to support services to the international community and immigrants. Possible investments include covering cost of visa sponsorships, funding support services for new immigrants, providing training on how to do business in the Southeast Michigan.	
	ANTICIPATED INVESTMENT: \$10 million ANTICIPATED OUTCOMES: double foreign student-graduates from Michigan and out-of state institutions that either stay in or move to Michigan for KTS jobs. Increase by 25% the number of immigrants moving to region for KTS jobs. Increase support services and training available to help immigrants to transition to employment .Increase number of immigrant-owned businesses that create jobs in the region.	
	TOTAL INVESTMENT: \$10,000,000	NEW EARNINGS FOR WORKERS: \$8,770,626

GOAL #2: Increase number and frequency of international trade missions, and increase cross border cooperation and trade with Canada.			
Short term	PLAN DESCRIPTION: Develop and implement a comprehensive plan that expands and coordinates the number and quality of trade missions, and other related activities. Develop and implement process for identifying and addressing issues and opportunities that arise out of trade missions. Leverage efforts to improve trade in KTS technologies and products with Canada including participation in bi-national conferences and economic development planning activities.		ANTICIPATED INVESTMENT: \$25 million (\$5 million for initial plan and process development; \$10 million for multiple years of trade missions, \$10 million for expanding trade with Canada.
			ANTICIPATED OUTCOMES: Double or triple the number of FDI companies with projects in the region; continuously improve number and quality of missions; increase the number of regional firms participating in international trade; facilitate more collaboration and business partnerships, increase the number of KTS jobs; and stimulate the economy.
	TOTAL INVESTMENT: \$25,000,000	NEW EARNINGS FOR WORKERS: \$15,366,588	TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 237

GOAL #3: Increase Foreign Direct Investment			
Short term	PLAN DESCRIPTION: Support implementation of MEDC Business Attraction and Export Plan, market and increase visibility of VantagePort and other TDL resources, and provide training to foreign companies on how to do business in Michigan.		ANTICIPATED INVESTMENT: \$10 million
			ANTICIPATED OUTCOMES: Double the number of foreign businesses doing business in Michigan, and triple the amount of investment from these and other businesses in KTS research, development and production.
	TOTAL INVESTMENT: \$10,000,000	NEW EARNINGS FOR WORKERS: \$7,576,955	TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 104

## 2.6 OPERATIONAL IMPROVEMENT AND CAPITAL ACCESS

### 2.6.1. Current Capabilities - Business Operational Costs and Capital Access

Reports show that the perception of national business leaders of Michigan’s business climate is changing for the better. Site Selection magazine has named Michigan the 8th most competitive state for achieving success in job creation and economic development, up from 16th in 2011. The State has made progress in reducing the cost of government in Michigan; in fact, Michigan’s corporate tax climate is up from the 2nd worst in the US to the 7th best, the greatest improvement in any state. Venture capital investment in Michigan in 2012 more than doubled from its 2011 level, but the overall investment level is low compared to the level of innovation in the region.

### 2.6.2. Energy Efficiency in Regional Manufacturing Operations

Many of the region’s current challenges stem from the burden of legacy infrastructures, which function both as assets and liabilities. With operational efficiency a key benchmark of industry competitiveness, the size, scale and operating cost of many of Michigan’s production facilities are barriers to repurposing land and buildings.

In response, Michigan has developed various programs to meet the needs of industry aimed at reducing energy costs and promoting energy efficiency. These initiatives are providing opportunities for energy-intensive companies to gain a competitive costs advantage and to reduce burden on utility companies to build new, capital-intensive generation sources. While these energy programs are promising, Michigan still experiences higher industrial rates than states that have energy-source generation advantages. In order to reduce the future cost of service to utility customers, Michigan passed an Energy Optimization (EO) standard that requires all gas and electric utilities in the state to implement programs to reduce overall energy usage by specified targets. These programs are available for all customer classes including commercial and industrial customers. Aggregate EO program expenditures of more than \$250 million by all gas and electric utilities for the commercial and industrial

sectors in the state since 2009 are expected to result in lifecycle savings to these customers of at least \$900 million. This means that for every \$1 spent on EO programs, these customers should expect to realize utility cost-of-service benefits of more than \$3.60. Benefits are in the form of avoided capital and operation costs associated with incremental utility generation or purchased power.

**Industry and energy partnerships.** More direct support and technical assistance programs to support energy-intensive manufacturers are provided by the University of Michigan's Industrial Assessment Center. This program, supported by the US Department of Energy and the State Energy Office, conducts energy audits for small and medium sized manufacturers to identify opportunities to improve productivity, reduce waste, and save energy. While these efforts can insure manufacturers and utility companies are operating more efficiently, challenges remain to fully utilize the potential of these efforts. For example, capital for energy efficiency upgrades that have been identified by energy audits is difficult to attain for these companies. Capital constraints and prioritization of internal capital spending leaves a substantial savings potential for companies to realize. Finally, Michigan still depends on energy sources that are imported to the state, such as coal and natural gas. Thus, increasing access to capital to implement cost-effective energy efficiency processes provides the best opportunity for Michigan's industries to remain competitive.

### **2.6.3 Sources of Capital and Infrastructure Support**

When looking at private investment support, one marker is the Michigan Venture Capital Association (MVCA), which conducts an annual study of the venture capital market in Michigan. Michigan ranks 15<sup>th</sup> nationally in venture capital investment as of 2012 (2013 study results will be published in May 2014). Michigan has invested approximately \$1 billion in this space over the last decade to help grow the venture market, which was previously very small. The Small Business Administration is another growth indicator, publishing regular reports on SBA loan volume for both 7(a) and 504 loans. Michigan currently ranks 6<sup>th</sup> nationally in SBA loan volume and 12<sup>th</sup> nationally in Gross State Product (GSP). Commercial bank activity in Michigan parallels economic expansion and contraction. As Michigan's economy contracted in the prior decade, many banks sold or moved headquarters operations out of Michigan. In spite of this, Michigan still has a strong and competitive banking environment with 7 banks over \$15 billion in assets, which have a significant presence in the state.

The state also has created several loan enhancement programs, like the collateral support and loan participation program that are designed to accelerate lending to businesses in Michigan, particularly base job creating businesses (most often found in the manufacturing sector). These programs have become a national model that helped lead to the formation of the State Small Business Credit Initiative, which has been critical in funding these programs over the last three years. This program, while small, enjoys large-scale participation and adoption by the banking community (roughly 50 institutions participating to date). The state has helped create and capitalize several new public-private mezzanine lenders designed to lend exclusively to high-growth, second-stage businesses in Michigan: "Grow Michigan" closed on \$30 million in 2013 with a target fund size of \$60 million by the summer of 2014, and now provides subordinated loans alongside senior bank loans. It has made loans to 14 different portfolio companies to date, and it has a pipeline of high quality deals that is 3 times its available capital. "Arctaris Michigan Partners" held a first close in 2013 of \$22.5 million and continues to raise funds from other investors, with a target fund size of over \$100 million. It will also make loans to high-growth MI businesses that are underserved by traditional bank lenders. These funds are helping to fill a previously unaddressed gap in Michigan's capital markets.

### **2.6.4 Business Cost Reduction Efforts**

Michigan Manufacturing Technology Center (MMTC) is *Advance Michigan's* Manufacturing Extension Partnership (MEP). MMTC offers firms cost identification and management strategies (activity-based costing, value-stream costing, total asset management, cost mentoring), supports lean process improvement (including Six-Sigma and other processes), quality management (reduce scrap and waste), sustainability management strategies (related ISO certification and other strategies). The Great Lakes Trade Adjustment Assistance Center (GLTAAC) also

supports productivity improvement, quality certification, and other cost-reduction efforts. (Several area community colleges also offer such services). As aforementioned, the Michigan’s Industrial Assessment Center is another critical partner in business cost reduction.

### 2.6.5 Gaps

While access to capital has improved for *Advance Michigan* companies, there remains a need for more resources. More growth in venture capital is required since the few firms that are located in Michigan are making investment deals in the state. Regarding credit access, strong regulatory collateralization requirements makes access to capital for small or new firms unattainable, and there is lack of access to capital for retrofitting and tooling upgrades.

- **Process improvement.** Programs like MMTC and GLTAAC provide value for SMEs looking to reduce costs, but they will need to specialize in the unique needs of KTS firms. Moreover, there can be a lack of awareness and resourcing surrounding the services they offer, limiting market penetration.
- **Utilities.** Regulatory restrictions and price controls increase costs for firms (limit price negotiation).

### 2.6.6 Capital Access and Operational Efficiency Plan

Total Economic Benefits: Capital Access							
Total Investment	New Earnings for Region's Workers	Incumbent Jobs Supported	Direct Jobs Created	Indirect and Induced Jobs Created	Total Jobs Both Supported and New Due to Investment	Average Earnings per Job	Investment to Jobs Multiplier (Jobs per \$million invested)
\$575,000,000	\$402,388,692	1,442	871	3,126	5,439	\$73,982	9

GOAL #1: Secure additional capital funding for the State Small Business Credit Initiative (SSBCI) and other loan programs to finance investment for new and existing KTS firms.			
Short term	<p>PLAN DESCRIPTION: Increase loan programs for working capital, mezzanine funding and specialized bridge capital sources to support companies that have long-job cycles and long-pay cycles. Create an advanced automotive venture capital fund that helps attract high end talent in KTS to region to develop new technologies and connect with OEMs and suppliers. These loan programs will form a stable public-private partnership with private lending institutions, and are an efficient way to increase access to capital for viable companies that were previously underserved.</p>		<p>ANTICIPATED INVESTMENT: SSBCI: \$50 million SBIC-backed state level funds: \$100 million State supported equity and mezzanine funding: \$75 million Bridge capital: \$50 million Advanced Automotive VC Fund: \$50 million</p> <p>ANTICIPATED OUTCOMES: SSBCI investment will get a return of \$ 6 of private investment for every \$1 and create thousands of jobs. The advance automotive venture capital fund will increase number of KTS innovations and speed up the cycle from development to application.</p>
	TOTAL INVESTMENT: \$325,000,000	NEW EARNINGS FOR WORKERS: \$201,841,687	TOTAL JOBS SUPPORTED AND NEW DUE TO INVESTMENT: 3,260

GOAL #2: Increase Advance Michigan's Manufacturing Extension Partnership, Great Lakes Trade Adjustment Assistance Office, University of Michigan's Industrial Assessment Center services and similar services aimed at reducing the cost of doing business for KTS firms.			
Short term	<p>PLAN DESCRIPTION: Develop and implement a plan that targets KTS firms, and fund services that reduce manufacturer's production costs by reducing waste management costs, enhancing efficiency and promoting resilience establishing mechanisms, and reducing energy costs to help firms measure and minimize life-cycle costs.</p>		<p>ANTICIPATED INVESTMENT: \$50 million</p> <p>ANTICIPATED OUTCOMES: Reduce cost of doing businesses, and increase efficiency and productivity. Increase production capacity and ability to diversify into related KTS industries. Create more opportunities for these companies to invest in KTS R &amp; D and production.</p>
	TOTAL INVESTMENT: \$50,000,000	NEW EARNINGS FOR WORKERS: \$39,961,608	TOTAL JOBS SUPPORTED & NEW DUE TO INVESTMENT: 734

GOAL #3: Increase regional and local efforts to help capitalize manufacturing energy efficiency			
Short term	<p>PLAN DESCRIPTION: As technologies evolve, well established manufacturing communities are becoming burdened with functionally obsolete facilities, and newer plants must continue to invest in efficiencies to remain competitive. To address the need for longer term, lower cost financing of efficiency upgrades including facilities and equipment, Michigan adopted the Property Assessed Clean Energy, or PACE. Capitalization of a revolving loan fund would provide trajectory for the newly adopted PACE program. This initiative will combine heat and power, commercial energy retrofits, water conservation and wastewater improvements. Reuse of mothballed plants and \$20,000,000 investment in efficiencies annually.</p>	<p>ANTICIPATED INVESTMENT: Current pipeline of ready projects: \$20,000,000. Private investors are willing to match every \$1 of public financing with \$9.</p>	
		<p>ANTICIPATED OUTCOMES: PACE financing unleashes energy efficiency and renewable energy projects on a scale otherwise not possible; improving commercial and industrial building stock; raising the tax base over time; making buildings healthier and more comfortable for employees and tenants, reducing turnover, sickness and absenteeism; reducing greenhouse gas emissions; and making U.S. manufacturers leaner and more competitive.</p>	
	TOTAL INVESTMENT:	NEW EARNINGS FOR WORKERS:	TOTAL JOBS SUPPORTED & NEW

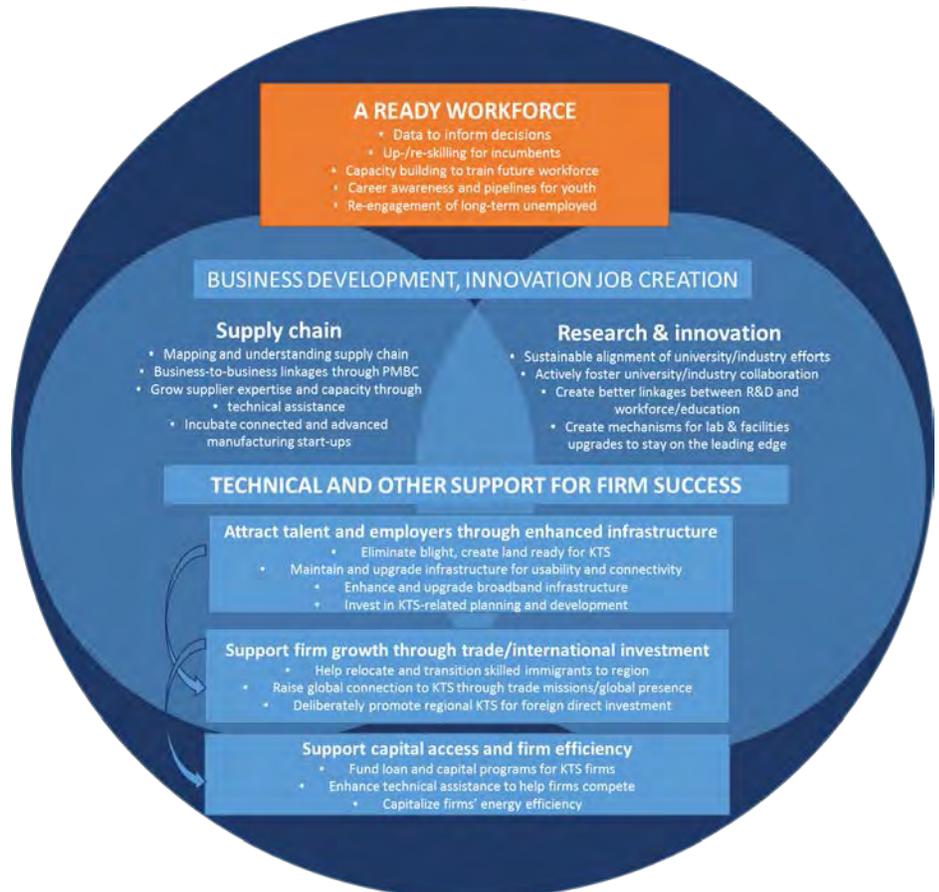
### 2.7 BONUS SECTION

As noted in the related section, 2.1, workforce and talent is the most critical need facing the KTS. As such, partners have opted to identify this area as the area for bonus points in the proposal.

### 2.8 INTEGRATED APPROACH

Multiple features of the *Advance Michigan* partnership will ensure that any of the above projects, when funded, will be fully integrated in support of the KTS. First, as noted in the below section, partners have identified a governance structure that will ensure that partners regularly identify opportunities for collaboration, awareness, and overall alignment of their efforts. This will occur in particular at the advisory board and executive committee levels. Second, the very nature of the projects are brought together under the goal of supporting the KTS. Partners have identified a goal of growing and supporting regional job development and employment, and all identified activities are woven together by that theme.

#### Integrated Approach to Growing Safe and Efficient Automotive Manufacturing and Related Jobs



## 3. CAPACITY

### 3.1 LEADERSHIP AND PARTNERSHIP

#### 3.1.1 Leadership Capacity

*Advance Michigan's* IMCP effort is led by the Wayne County Economic Development Growth Engine ("EDGE"), a sophisticated economic expansion and attraction program. A subdivision of Wayne County

Government, EDGE has captured billions in new investment in the past five years through partnerships, robust incentives and a dedication to the region's businesses and citizens. Representing the most populous county in Michigan, the footprint of Wayne EDGE encompasses 623 square miles. It also includes 34 cities, including the City of Detroit, nine townships, 41 public school districts and over 2 million people.

**Prior Leadership, Managing Local and Regional Partners, Attracting Investment.** As the largest county in Michigan (and one of the largest in the nation), Wayne County is devoted to regional collaboration. This includes investing substantially in partnerships to create a sustainable business ecosystem for county, City of Detroit, and other area residents. For example, Wayne EDGE is an active leader in the regional aerotropolis initiative, VantagePort, along with Washtenaw County, the Wayne County Airport Authority, the cities of Belleville, Romulus, Taylor, and Ypsilanti, and the townships of Van Buren, Huron, and Ypsilanti, Detroit Renaissance (now Business Leaders for Michigan), SEMCOG (covers a 7-county area in Southeast Michigan), Detroit Regional Chamber (covers a 9-county area in Southeast Michigan), NextEnergy, UPS, DTE Energy, and Walbridge. In 2012, the initiative resulted in over \$300 million in new industrial/manufacturing investment commitments and 800 jobs. In September 2013 it was announced that the VantagePort effort is the proposed site for a privately-funded connected vehicle research center.

EDGE also is a key partner in the Michigan Life Science Research and Innovation Center, launched through a combined \$4.5 million investment and now housed in the former Ann Arbor Pfizer facilities. The project, developed in partnership with the state of Michigan, Washtenaw County and Ann Arbor SPARK, has had over \$112 million in follow-on funding since the initial investment.

Further, EDGE is a founding member of TechTown, a cutting-edge business accelerator and research and office park that is home to an impressive list of companies, including Asterand, the leading global supplier of human tissue and human tissue-based research services. TechTown houses the county's Small Business Development Center, providing crucial support to new and growing firms. The county will receive a BEDI grant of \$2 million and a Section 108 Loan for \$2.1 million for the TechTown Innovation and Business Accelerator, which will complete TechOne, TechTown's economic development headquarters providing space for economic development projects. The total project cost is \$4.1 million. EDGE also was a leading catalyst and is a partner with NextEnergy, a research and business accelerator for alternative and renewable energy. These projects serve as evidence of regional cooperation, and leadership of substantial public and private investment in the greater Wayne County area.

EDGE has been a consistent supporter and partner of fully-integrated economic development strategies, including efforts that include economic and workforce development, education, entrepreneurship and more. One example includes the Southeast Michigan Workforce Innovations in Regional Economic Development (WIRED) initiative, which brought \$5 million in Department of Labor resources to a 10-county Southeast Michigan area. Other areas of support have included several multi-departmental federal investments, including two Jobs and Innovation Accelerator Challenge efforts and a "Making it in America" grant. EDGE also has been a strong partner in Opportunity Detroit Tech, a regional technology cluster strategy focused on information technology talent, as well as the Michigan Academy for Green Mobility Alliance (MAGMA), aimed at supporting talent for advanced-energy, lightweight, and connected vehicles. Most recently, EDGE supported a regional partnership between Wayne, Oakland and Macomb Counties. The partners launched a "Career Awareness and Readiness Incubator" model, which received a statewide collaboration award at the governor's March 2014 economic summit.

**Evidence of Capacity to Carry Out Planned Investment in Public Goods.** Wayne EDGE is the designated lead agency for numerous federal, state, local and private initiatives, including land bank and turbo incentives for new real estate development, Brownfield Redevelopment Tax Credits (state tax increment financing programs for the improvement of a qualified contaminated, blighted or functionally obsolete sites and facilities), the Michigan

Economic Growth Authority program (MEGA), and the Michigan Homeowner Assistance Nonprofit Housing Corporation (MHA) which is coordinated through the Michigan State Housing Development Authority (MSHDA). EDGE also administers Neighborhood Stabilization Program (NSP) funds as part of the Housing and Economic Redevelopment Act (HERA) and the Community Development Block Grant (CDBG) program, as well as the HOME Investment Partnerships (HOME) Program.

Wayne County, home to EDGE, annually reports \$90 to \$100 million in annual grant expenditures for over 150 federal projects, with individual grant funding ranging from \$10,000 to \$24 million. In FY 2013, EDGE managed over \$15 million in federal grant programs. EDGE operates under a line item budget, and IMCP and individual projects that follow would be assigned their own line items within an EDGE business unit. Contracts and purchase orders are issued only after revenue has been recognized. Expenditures are tracked and reported to the County Commission on a monthly basis, with extensive financial controls in place. When determining the strategic investment of limited resources including grant proceeds, tax abatements, and the commitment of tax increment financing, EDGE conducts public meetings to broadly determine areas of highest need, consults with the project owner and local community officials to establish project goals and projected outcomes, review sources and uses of funds, and define the funding gap, if any. Then actions are taken to overcome funding or performance gaps and to ensure processes remain on track. To support this process for *Advance Michigan*, EDGE and its staffing partners intend to integrate various quality assurance techniques, including clear understanding among partners of all goals and objectives, careful work-plan and work-flow development, regular review of metric-based performance, development of corrective action and continuous improvement plans, and recognition of success.

Depending on the funding source, additional qualified *Advance Michigan* partners may serve as fiduciary lead. For example, in the case of workforce development, EDGE has a strong relationship with Southeast Michigan Community Alliance (SEMCA). SEMCA is a multi-faceted non-profit designated by Wayne and Monroe counties to receive and administer State and federal funds (primarily workforce development and substance use disorders services), with an annual budget approximating \$60 million. Recently, SEMCA was nationally accredited by the Council on Accreditation (COA), having met the highest standards in management, fiscal administration, and quality improvement.

### **3.1.2 Partnership Structure**

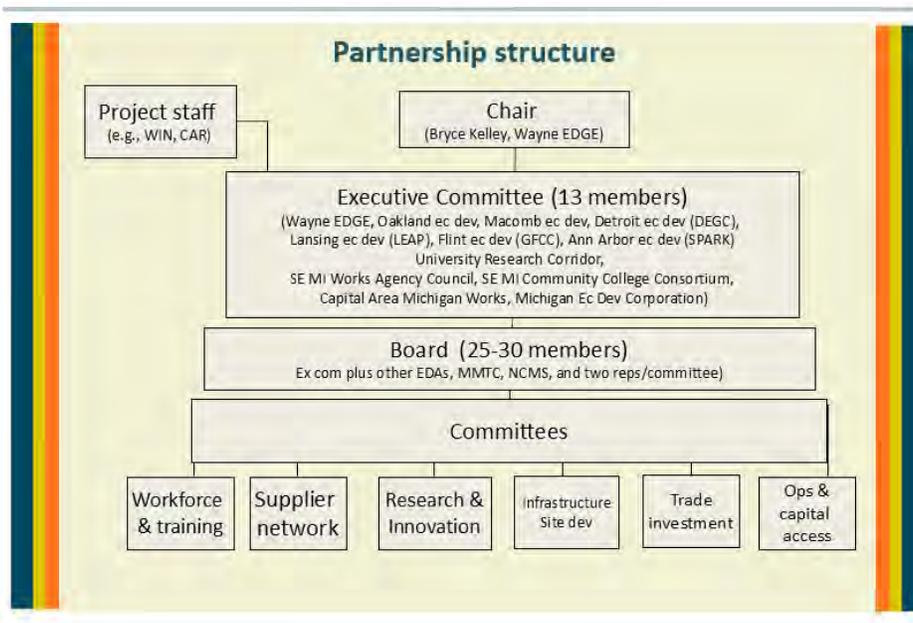
Through the engagement process, *Advance Michigan* partners agreed to a collaborative, inclusive and ongoing partnership structure, comprising an advisory board and executive committee. The advisory board will support the general strategy for *Advance Michigan*, along with initiative awareness and promotion; regional connections to other partners and initiatives; and attainment and reporting of outcomes. The executive committee will support these areas, as well as identification of new opportunities to advance via the IMCP designation, resourcing of initiatives above and beyond federal investment, and supporting authorization/approval to use the IMCP designation in federal competitive grant programs.

Mr. Bryce Kelley, director of Wayne EDGE, will chair *Advance Michigan*. Mr. Kelley has over 18 years of public sector management and over 32 years of experience in results-driven economic development for private and public entities. He is a proven consensus builder, negotiator, and successful budget administrator, and his selection for this role was unanimous among the *Advance Michigan* planning group. Mr. Kelley will receive staff support from the Workforce Intelligence Network (WIN). Lisa Katz heads WIN, a partnership among 9 community colleges and 7 workforce development agencies in 9 counties in Southeast Michigan. Ms. Katz has 20 years' experience supporting multi-stakeholder collaboration initiatives in Michigan and the United States, with efforts integrating talent, economic development, and entrepreneurship strategies. She has worked with communities experiencing strategic grant implementation and planning efforts, Base Realignment & Closure, transformative economic events, and a desire to support competitiveness. WIN will provide the partners with access to robust labor market and economic development data, and a strong communications and convening infrastructure.

Further, WIN will integrate *Advance Michigan* goals and objectives into its employer cluster strategies tied to green mobility and information technology. The Center for Automotive Research (CAR) also will support the effort leveraging the research staff’s extensive automotive industry expertise, knowledge of advanced automotive technologies, deep relationships with industry partners, and familiarity with the State’s automotive strategies from having partnered with the State of Michigan and Business Leaders for Michigan in developing the plans that helped shape this proposal. CAR researchers are experts in automotive manufacturing and trends, and frequently advise local, state and federal leaders. See biographies of lead staff in Appendix H-5.

The Executive Committee includes economic developers from *Advance Michigan*’s three largest counties and five target municipalities (Detroit, Flint, Pontiac, Lansing, and Ann Arbor). It also engages four-year higher education through a representative from the University Research Corridor (the region’s three research institutions—Michigan State University, University of Michigan, Wayne State University), as well as representatives from workforce development, the region’s community colleges, and the Michigan Economic Development Corporation. The Advisory Board further engages the state’s Manufacturing Extension Partnership (MMTC), the National Center for Manufacturing Sciences, and two representatives from each of six committees, which reflect the six target areas of the IMCP designation (Workforce and Talent, Supply Chain, Research and Innovation, Infrastructure and Site Development, Trade and International Investment, Operational Improvement and Capital Access). The committee members will be responsible for responding to relevant solicitations, overseeing funded activities (report outcomes to the executive committee and federal partners), engaging relevant partners for different key projects, promoting/raising awareness of their efforts, and identifying linkages/opportunity for collaboration both with other similar partners and partners involved in other committees.

Each of the partners that provided a letter of commitment have clearly identified the roles they are willing to play to support the *Advance Michigan* effort. These letters ensure (1) transparency of commitment, (2) that commitments are achieved as projects are identified and implemented as the designation unfolds, and (3) course corrections will occur to ensure a positive outcome will occur and to avoid instances of underperformance. See Appendix I-1 for a summary of commitments and Appendix I-2 for actual letters of commitment. In addition, partners received numerous letters of support (Appendix I-3), including labor, industry, utilities, financial institutions, small business support organizations, K-12 schools, and other key community leaders.



### 3.1.3 Partnership Capacity

Many of *Advance Michigan*’s government and economic development partners have years of experience managing grant-funded projects. For example, to the far west of the *Advance Michigan* geography is the Tri-County Regional Planning Commission (TCRPC), which has successfully managed and implemented federal and state funded planning and development projects for over 50 years. The TCRPC provides technical assistance, and creates and maintains functional networks of area municipalities

and agencies to implement regional planning activities. As a governmental membership organization, the TCRPC has involved the active participation of the Lansing region’s three counties and 75 municipalities in all aspects of

planning and development. Partners successfully administer over \$56 million in state and federal grants each year, complying with all federal, state, and local requirements for fund management and project implementation with no record of problems or concerns.

In 2012, the General Accounting Office recognized the Michigan Academy for Green Mobility Alliance (MAGMA), with the Southeast Michigan Community Alliance (SEMCA) as fiduciary, as an exemplary collaborative practice between workforce boards and employers. Leveraging a combination of Workforce Investment Act (WIA) formula funds, WIA set-aside funds, Recovery Act dollars, state grants and other funds, and employer cash and in-kind contributions, numerous benefits accrued from fall 2009 to 2012, including: over 800 workers trained in MAGMA-endorsed or supported courses with over \$4 million leveraged. The initiative served 15 companies in the summer and fall of 2011 alone, including Chrysler, Ford, and General Motors. The effort helped employers recognize the value of the local workforce system, and the system better aligned its services to meet the needs of employers.

The National Center for Manufacturing Sciences (NCMS) has supported roughly 350 multi-participation projects, has over 65 R&D agreements and MOUs, and has leveraged over \$1.2 billion in funding and saved the Department of Defense over \$1.4 billion in maintenance and readiness costs. This has resulted in NCMS partners receiving 10 Defense Manufacturing Excellence Awards, five R&D 100 awards, six Department of Commerce NIST ATP awards, and other accolades. Meanwhile, in the last five years, the University Research Corridor helped to launch 80 companies, made over \$300 million in R&D awards related to the KTS, and helped fund more than 1,400 individual R&D projects.

Community colleges also have had recent abundant success. For example, Macomb Community College successfully launched the Center for Advanced Automotive Technology (CAAT) thanks to a National Science Foundation grant. Since its inception, CAAT has funded numerous automotive technology education proposals and multiple programs in electric and hybrid/electric vehicle design and technology. This includes an Electric Vehicle Technician Certificate that has placed half of its second cohort of students in employment over a month before course completion. In just three years of operation the CAAT reached over 5,000 people through its general public and academic outreach education. Macomb CC also has successfully trained hundreds in defense industry occupations and is leading a new \$24.9 million training grant that will support efforts in seven other Michigan schools, including four in the *Advance Michigan* region, training over 2,700 individuals.

Also, within the past five years, Mott Community College has expended over \$272 million in federal dollars and \$25 million in grants from an array of funding sources. Macomb and Mott Community Colleges were invited to the American Reinvestment and Recovery Act High Performers meeting in Chicago for their partnership in a \$3.6 million Pathways out of Poverty Grant. Meanwhile, Washtenaw Community College has over 40 years of experience administering federal and state grant budgets with an office dedicated to grants accounting to ensure funds are available and transactions are made in compliance with funder regulations. This office reports directly to the college controller and currently manages the budgets for \$25 million worth of federal and state grants each year. In the case of these and other partners, the necessary financial, data, and filing systems are in place to accommodate the administration of future funding opportunities with strong, positive outcomes.

### **3.1.4 Readiness Of Institutions**

The IMCP designation will allow *Advance Michigan* partners to broaden their leadership and outreach to others, with a focus on the identified KTS. Supporting their success will be data and information, network development, industry expertise and other support provided through the *Advance Michigan* staff and the partners themselves, including WIN, CAR, MAGMA, MEDC, Pure Michigan Business Connect, and other subject matter experts. Appendix A-6 provides a comprehensive assessment, including readiness ratings created by regional partners, of the ecosystem related to the KTS. While the below table provides a top-line summary of the information, the aforementioned appendix provides critical information to IMCP proposal reviewers and regional stakeholders.

ECOSYSTEM ASSESSMENT SUMMARY		
Pillar	Strengths	Weaknesses
Workforce & talent	Infrastructure in place to educate and train workers in the KTS and a pool of engineering and other talent	Lack of interest/awareness from prospective workers and funding to build new program capacity
Supply chain	Extensive supply chain tied to the automotive industry, with deep R&D, design, manufacturing and other capabilities	Gaps in the KTS-specific supply chain, need for stronger focus on industry diversification leveraging the KTS
Research & innovation	Concentration of R&D activity from both the private sector and universities	Recent setbacks due to dwindling investment in critical areas, for example, labs and other capacity building tied to the KTS
Site development & infrastructure	Plenty of land and sites for development	Aging infrastructure (sometimes in complete disrepair) in need of serious re-investment and a weak public transportation infrastructure
Trade & international investment	Strong performance in exports and FDI	Need to clarify the market opportunities in the KTS, particularly given negative perceptions of the region due to the recent economic downturn and Detroit's municipal bankruptcy
Capital access & process improvement	Expertise in process improvement and improved access to capital and investment	Gaps in start-up investment and sometimes general capital access (especially for newer/smaller firms) tied to manufacturing, including in the KTS

Following over a decade of industry decline and general economic upheaval, it is not surprising that many indicators that partners identified are in need of substantial improvement. Yet the region has a solid base on which to build support for the KTS, and focused investment can help strengthen future outcomes, including job growth, innovation capacity, and the ability to help improve vehicle efficiency and safety.

### 3.2 GOAL SETTING AND EVALUATION

*Advance Michigan* partners developed comprehensive plans for each of the six pillars identified for the IMCP designation. Each pillar identifies short, medium and long-term goals that are presented above along with related goals, timeframes, metrics and outcomes. The plans can be found in Section 2, and also are summarized in Appendix G-1, complete with identified goals, objectives, metrics and evaluation criteria. Identified federal investments will support substantial state and local investment (both private and public), facilitate job growth and improve long-term income potential, and result in many other positive benefits for workers and the community.

To determine the extent to which identified outcomes are achieved, the partners will rely on high-quality data and rigorous evaluation methods. Both WIN and CAR have expertise in data tracking and assessment of macro-level outcomes. Moreover, each of the partners has experience tracking and reporting outcomes that adhere to federal, state and other requirements and reporting technologies.

As part of their commitment to *Advance Michigan*, partners signed an agreement form to support rigorous evaluation activities, whether this means self- or third-party evaluation. For education and training activities, this may include random assignment methodologies or before/after comparison models, based on the goals and needs of the funding departments. The evaluation method also can rely on primary interview, survey and focus-group data, as well as analysis of existing, publicly-available secondary data. Selected evaluation approach(es) may look to explore the quality of both process and outcomes tied to the targeted initiative(s), as well as the project cost/benefit and likelihood of sustainability. Conducting a “social network analysis” will allow partners to determine how well collaborative activity unfolded, how new partners were engaged and integrated into efforts, and how new ideas and innovations were brought into the project.

Where needed, evaluation partners will seek OMB clearance to comply with relevant aspects of the Paperwork Reduction Act. The evaluator will be expected to maintain the confidentiality of evaluation participants, regardless of the data collection method. As determined by the federal funders, the selection process for an evaluator will begin when announcement of a relevant funding award is made (and with guidance from the funding department). If self-evaluation is appropriate, WIN and CAR will work with Wayne EDGE to determine the most appropriate methodologies.

While several of the potential investments identified by partners are substantive, in some cases, they may include a combination of state, federal, private and other resources. Further, the scale is relative to the size of the

targeted geography, which represents the entire manufacturing footprint in the region, and, of course, the level of need. In all respects, outcomes and metrics are based on partner knowledge and experience—the partners are confident in their ability to achieve the goals (dependent on available investment and timeframes), and have demonstrated comparable success through past initiatives. Further, all proposals are subject to negotiation with the potential funding department(s).

## 4. COMMITMENT

### 4.1 COHESION, STRENGTH, AND BREADTH OF PARTNERSHIP

In developing the proposal for IMCP designation, Wayne EDGE, in partnership with the Workforce Intelligence Network and Center for Automotive Research, convened over 42 partners through eight formal work groups. The partners represented all 13 counties as well as workforce development, education (K-12, community college, four-year institutions), economic development, business acceleration, philanthropy, government (local, county, state), planning, infrastructure and transportation, human services, manufacturing extension, research and innovation, and venture finance and other capital. In addition, the partnership consulted with dozens of employers, including the Detroit Three automakers, suppliers, and other non-auto manufacturers.

Organizations consulted/engaged in IMCP	
10 community colleges	5 business accelerators
8 workforce development agencies	4 think tank/research institutions
5 four-year education institutions	20+ local, county, and state government organizations
3 K–12 partners	Manufacturing Extension Partnership
13 economic development organizations	3 venture capital and philanthropic organizations
2 regional chambers of commerce	2 industry cluster initiatives (green-mobility and IT)

Further, dozens of employers provided direct input and expressions of support for the effort, reflecting the level of stakeholder dialogue and involvement. The entire regional congressional delegation signed a joint letter of support, with others coming from the mayors of Detroit, Flint, Pontiac, Lansing and Ann Arbor, GM, Ford, Chrysler, United Auto Workers and others. In all, regional partners have secured over 160 letters of support and commitment.

The effects of the recession, changes in leadership, and the proliferation of global competition have reinforced in partners the need for collaboration. As such, they developed the proposed IMCP-designation strategy using a thoughtful process that emphasized input and inclusion.

Collaboration and partnership examples within the Advance Michigan region	
<b>Workforce Intelligence Network</b>	9 community colleges, 7 workforce development agencies—collaborating with economic development and 4-year and K-12 education—in 9 SE MI counties working to address regional talent gaps; 4 employer cluster strategies (engaging 70 employers in IT, advanced manufacturing, retail & hospitality, health care); formal partner MOUs signed; over 3500 workers trained; 4 million+ in grants secured; partnership building and network development
<b>I-69 Corridor</b>	35 Michigan counties and units of local government such as cities, townships, and villages which have engaged in inter-local agreements. These communities either have I-69 crossing their borders, or are in “geographical or economic proximity” thereto
<b>Lansing Area Economic Partnership</b>	Coalition of area leaders (Eaton, Ingham and Clinton counties) committed to building a prosperous and vibrant region where business can thrive; helps entrepreneurs start new businesses; helps existing businesses grow; and attracts new businesses to the region
<b>Region 10 Economic Development Partners</b>	Quarterly engagement of economic developers (business attraction and retention, talent partners) in Wayne, Oakland and Macomb Counties.
<b>Automation Alley</b>	Spanning over 7 counties, Automation Alley is a technology business association and business accelerator dedicated to growing the economy of Southeast Michigan and enhancing the region’s reputation around the world. Automation Alley offers talent and business development programs and services to tech-focused businesses of all sizes — from startups to large corporations — to help them grow and prosper.
<b>University Research Corridor</b>	A partnership among Michigan State University (East Lansing), University of Michigan (Ann Arbor), Wayne State University (Detroit) to transform, strengthen and diversify the state’s economy via invention, innovation and technology transfer, education of a work force prepared for the knowledge economy, and attraction of smart and talented people to the state

While *Advance Michigan* itself is new, team members have collaborated through other related initiatives. (See the related table above.) Partners will leverage these experiences and relationships to the benefit of the initiative.

### 4.2 CREDIBILITY AND SIZE OF INVESTMENTS AND MATCH

*Advance Michigan* partners have identified abundant resources in support of this proposal, ranging from human

resources and expertise to training and education dollars and lab space, facilities, equipment, etc. Further, they have agreed to a vision and shared set of outcomes, agreeing to collaborate, put regional interests above institutional ones, and pursue strategic goals and objectives to support jobs and prosperity in the region. The specific financial commitments of each *Advance Michigan* partner organization are summarized in Appendix I-1 with commitment letters following in Appendix I-2. The below table provides an overall summary of the commitments directly from partners:

Partner commitments	TOTAL	\$ Leveraged	In-Kind Support	Cash Commitment	Federal	Non-Federal
<b>Grand Total Without Direct Industry Investments</b>	<b>\$63,920,848</b>	<b>\$26,539,048</b>	<b>\$35,461,800</b>	<b>\$2,000,000</b>	<b>\$31,658,800</b>	<b>\$32,262,048</b>

In addition to the above, the following state budget items have been identified as in alignment with the proposed project concepts, for a total exceeding \$9 billion over five years. These dollars will be allocated regardless of federal investment, although grant and other funding would allow more direct alignment with the KTS:

ESTIMATED STATE BUDGET ALLOCATIONS IN SUPPORT OF KTS OVER 5 YEARS					
	Total funding per year	Estimate for 13-county area	Annual estimate for KTS	Over 5 years	
Michigan New Jobs Training Fund (2013)	\$50,000,000	\$27,500,000	\$17,875,000	\$89,375,000	
Skilled Trades Training Fund (2013)	\$10,000,000	\$5,500,000	\$3,575,000	\$17,875,000	
Michigan Advanced Technician Training (2014)	\$1,000,000	\$550,000	\$550,000	\$2,750,000	
Career Liaisons (2013)	\$600,000	\$206,000	\$206,000	\$1,030,000	
Community college state (2012)	\$283,506,318	\$175,694,306	\$70,277,722	\$351,388,612	
Community college local (2012)	\$523,243,064	\$363,048,402	\$145,219,361	\$726,096,804	
University funding (2012)	\$1,468,132,603	\$838,501,187	\$335,400,475	\$1,677,002,374	
Community revitaliation, biz development (2013)	\$10,000,000	\$5,500,000	\$3,575,000	\$17,875,000	
Regional prosperity initiative (proposed 2014)	\$5,000,000	\$1,500,000	\$975,000	\$4,875,000	
Debt financing for underserved communities (proposed 2014)	\$20,000,000	\$10,000,000	\$6,500,000	\$32,500,000	
Land bank (proposed 2014)	\$16,000,000	\$13,600,000	\$8,840,000	\$44,200,000	
PMBC (2013)	\$2,700,000	\$1,485,000	\$965,250	\$4,826,250	
Trade (2013)	\$3,200,000	\$1,760,000	\$1,320,000	\$6,600,000	
Automotive office (2013)	\$2,000,000	\$1,100,000	\$1,100,000	\$5,500,000	
Transportation (2013)	\$3,466,187,500	\$1,906,403,125	\$1,239,162,031	\$6,195,810,156	
<b>TOTAL</b>	<b>\$5,861,569,485</b>	<b>\$209,450,306</b>	<b>\$1,835,540,839</b>	<b>\$9,177,704,196</b>	

This is in addition to private investment, which in the past five years exceeded \$15 billion (including manufacturing, R&D and other investment) for the 13-county *Advance Michigan* region alone. See the related table on page 8 of the proposal. Appendix G-2 provides further detail on the methodology and multipliers used to identify economic benefits anticipated as a result of various investment—local, state, federal, private—identified in the plans in Section 2 of the proposal. Partners used standard and reasonable assumptions in identifying the following benefits that could result if all identified investments from all parties were made in the KTS.

Estimated Economic Benefits for Advance Michigan Manufacturing Plan						
IMCP Pillar	Total Investment	New Earnings for Region's Workers	Incumbent	Direct Jobs	Indirect and	Total Jobs Both Supported and New Due to Investment
			Jobs Supported	Created	Induced Jobs Created	
Workforce and Training Activities	\$176,800,000	\$166,137,251	2,659	241	1,153	4,053
Supplier Network	\$43,000,000	\$38,077,824	435	77	294	806
Infrastructure and Site Selection	\$5,577,510,000	\$4,371,570,783	32,139	7,867	30,575	70,581
Research and Innovation	\$54,500,000	\$45,215,484	525	106	390	1,021
Trade and International Investment	\$45,000,000	\$31,714,169	427	76	289	792
Capital Access	\$575,000,000	\$402,388,692	1,442	871	3,126	5,439
<b>Total Economic Benefits for Advance Michigan</b>	<b>\$6,471,810,000</b>	<b>\$5,055,104,203</b>	<b>37,627</b>	<b>9,238</b>	<b>35,827</b>	<b>82,692</b>

*Advance Michigan* is at a crossroads: with the right support—including collaboration and investment—the region can once again attain its prominence as a national leader in automotive-related talent, job creation, and innovation. An emphasis on efficiency and safety will help propel not only the region’s automotive base but has broad applications to numerous other industries. The result will be more jobs for southeast Michigan and more workers ready to fill those job. Also benefitting will be many other communities nationwide that are part of the broad supply chain on which this region relies: An investment in *Advance Michigan* is an investment in the future of *American* manufacturing, innovation, and workers.

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- <sup>1</sup> Source: Business Leaders for Michigan
- <sup>2</sup> Auto Map from CAR
- <sup>3</sup> See Appendices A-1, A-3, and D-1 for geography, labor shed, and transportation maps.
- <sup>4</sup> American Community Survey and Bureau of Economic Analysis
- <sup>5</sup> Bureau of Labor Statistics and Economic Modeling Specialists Inc.
- <sup>6</sup> This order will continue throughout the proposal with total economic benefits of the investments shown first then a breakdown of activities for that specific area. All multipliers used to estimate the economic benefits come from the Bureau of Economic Analysis RIMSII series and Economic Modeling Specialists Inc.
- <sup>7</sup> Economic Modeling Specialists Inc.
- <sup>8</sup> A top-100 list of key supplier firms (with map) can be found in Appendices C1 and C2.
- <sup>9</sup> Ibid.
- <sup>10</sup> Center for Automotive Research
- <sup>11</sup> Ibid.
- <sup>12</sup> Source: BLM 2013 Benchmarking Report
- <sup>13</sup> Reference CAR map with R&D centers
- <sup>14</sup> National Science Foundation and university research department reporting
- <sup>15</sup> The America Makes lightweight metals institute is an example of this with collaboration among UM, LTU, OU, WSU, MSU, and many schools across Ohio, Tennessee, Kentucky, and Indiana.
- <sup>16</sup> For purposes of this designation the terms “Ready to go” and “ready to repurpose” are defined as: 1. Requires no remediation, 2. Existing transportation infrastructure is accessible and in usable condition, 3. Appropriate Zoning is in place, 4. Utilities are present and ready to operate, 5. Site is accessible to workforce using multimodal transportation
- <sup>17</sup> See Appendix D-4 from BTS
- <sup>18</sup> Ibid
- <sup>19</sup> Ibid.
- <sup>20</sup> <http://www.detroitchamber.com/industry-clusters/global-logistics-2/>
- <sup>21</sup> Federal Aviation Administration
- <sup>22</sup> Business Leaders for Michigan
- <sup>23</sup> <http://www.businessleadersformichigan.com/storage/New%20Michigan%20booklet%202014.pdf>
- <sup>24</sup> Michigan Department of Transportation
- <sup>25</sup> Ibid.
- <sup>26</sup> Ibid.
- <sup>27</sup> Texas Transportation Institute; <http://mobility.tamu.edu/ums/> and Federal Highway Administration
- <sup>28</sup> For more detail on the effects of declining road quality in Michigan see <http://www.andersoneconomicgroup.com/Portals/0/upload/AEG-%20Michigans%20Roads%20-%20Cost%20of%20Doing%20Nothing.pdf>
- <sup>29</sup> Source: BLM 2013 Benchmarking Report
- <sup>30</sup> Unfortunately, regional export data is hard to obtain. The measure of GDP for the region is a good indicator of the production capacity and export potential of the area-however it may not paint a full picture of actual exports. Some reports place current export exports at upwards of 80%.
- <sup>31</sup> Appendix F-1 describes top foreign investment firms and their investments in the region.