



**MICHIGAN ECONOMIC
DEVELOPMENT CORPORATION**



2022

Engineering, Design, & Development Asset Map and Research Study

THOMAS P. MILLER & ASSOCIATES



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Michigan Manufacturing Technology Center

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Executive Summary

Industry Trends in the EDD Cluster

- In the state's EDD cluster, overall growth has largely plateaued since 2016.
- Shrinking subsectors have been supplanted by growth in specialized design subsectors.
- EDD industries are transitioning to environmentally sustainable products and processes.
- The EDD subclusters of engineering and design are characterized both by divisions of large corporations and a collection of smaller firms that employ relatively few people.
- Michigan's EDD cluster faces increasing competition from states around the country.

Talent Development Trends in the EDD Cluster

- Occupations that once relied heavily on mechanical engineering skills are shifting towards electrical engineering as the sector continues to move towards automation.
- Despite a robust system of 4-year universities with a focus on the EDD cluster, Michigan's stagnant population growth is presenting problems for maintaining a healthy workforce and talent pipeline for meeting employers' needs.
- While EDD talent pipelines across the country have shown to be lacking to meet industry demand, some of Michigan's competitor states have been more successful in attracting talent.

Local Economic Development and Industry Leaders Perspectives

- » Heavy emphasis on the Detroit metro area, the automotive industry, and large production companies has left behind regional and/or subindustries within the cluster.
- » Michigan would benefit from stronger workforce reskilling programs, specifically with 2-year programs that are accessible to workers.
- » Engineering programs need to be more responsive to industry trends, such as the growing need for more electrical engineering/electro-mechanical/mechatronic skills.
- » Stakeholder engagement efforts were limited by a lack of collaboration/cooperation between industry leaders and economic development entities, resulting in the EDD Cluster Analysis focusing too much on feedback provided by a relatively small number of regional economic development entities and not enough input from industry leaders.

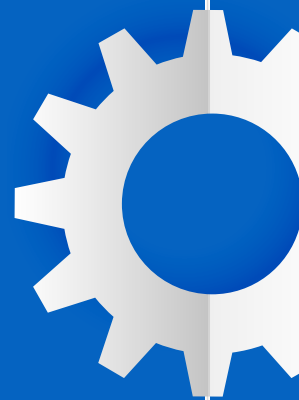
Recommendations for MEDC in Further Developing the EDD Cluster

- 1 Facilitate the Creation of a Statewide EDD Cluster Sector Partnership with the Long-term Goal of Scaling this Model to Regions throughout Michigan
- 2 Enhance 21st Century talent pipelines and training programs at the regional level
- 3 Focus on Building Trust and Collaboration between MEDC and the full EDD Cluster, including industry subclusters and regions around the state.
- 4 Increase Support for EDD Subclusters Beyond the Automotive Industry
- 5 Allocate Resources to Incentivize/Facilitate Growth among EDD Cluster Small Businesses
- 6 Prioritize Worker Retention and Attraction for EDD Cluster
- 7 Develop Programs to Aid in the Growth of Regional Populations



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Introduction



Project Overview

In May 2021, the Michigan Economic Development Corporation (MEDC) released a request for proposal soliciting responses from professional consulting firms to complete an ‘Engineering, Design, and Development Asset Map and Research Study.’ MEDC selected Thomas P. Miller and Associates (TPMA or “the project team”), an Indianapolis-based consulting firm, to complete the study.

The Engineering, Design, and Development (EDD) cluster that is the focus of the following study was one of six core industry-clusters identified in MEDC’s 2019 Comprehensive Strategic Plan as having potential to create long-term economic opportunities for the state. These six clusters are:

- » Advanced Manufacturing
- » Medical Device Technology
- » Mobility and Automotive Manufacturing
- » Professional & Corporate Services
- » Tech
- » Engineering, Design and Development

Drawing clear boundaries around each of these core clusters is challenging as there is substantial overlap among the six. The EDD cluster, however, is unique in that it serves and crosses over into all the other five. As such, this cluster has been central to the history of the state’s economy and is poised to continue to serve these core industries and play a vital role in the next generation of Michigan’s economy. In 2021, Michigan’s EDD cluster:

- » Had the highest concentration of EDD industries of any state in the country
- » Generated \$16.5 billion in Gross Regional Product (GRP)
- » Employed approximately 116,000 workers throughout the state, which is nearly double the national average for a region of similar size
- » Earned an annual average of \$125,000 per job

It is for these reasons that MEDC identified the EDD cluster as the focus of this analysis. With an eye on charting the existing EDD infrastructure throughout the state and identifying any gaps and areas of opportunity for the cluster moving forward, MEDC requested a well-connected asset map to guide strategic planning efforts and better understand how the EDD industry cluster can support economic growth across the state.

Project Methodology

Working with a steering committee consisting of MEDC leadership, TPMA commenced the project in October 2021. TPMA developed the following project plan, which will be outlined in more detail in ensuing sections of the study.

Phase One:

Document Review

The project team collected and reviewed state and regional plans and reports to gain further context around current planning efforts, areas of concurrence, and regional priorities. The review helped the project team establish an understanding of any current or ongoing initiatives and would further inform the strategy for stakeholder engagement.

Phase Two:

Statewide EDD Industry Cluster Inventory and Assessment

Next, the project team conducted an analysis of the EDD cluster in the state. This included an inventory of current operations that fall into the nine identified EDD industry NAICS codes as provided by MEDC. The nine EDD NAICS codes are outlined in the next section.

The project team also conducted an analysis of current and future workforce demand related to the EDD cluster. Historical workforce patterns and recent employment trends were analyzed using data sources like Economic Modeling Specialists, Inc. (EMSI), Bureau of Labor Statistics, and Bureau of Economic Analysis. The team analyzed emerging employment patterns, required skills, and wage and salary trends. The team took inventory of statewide jobs related the EDD industry, the distribution of employment supported by the EDD industry and analyzed the concentration of EDD related jobs relative to the rest of the nation. The team analyzed the educational and work requirements for the largest occupations supported by the EDD cluster, including emerging employment opportunities and the skills, credential, and certifications required for individuals to obtain employment in emerging EDD related occupations.

Finally, TPMA developed an EDD industry asset map using ArcGIS Online (AGOL) for interactive use by MEDC stakeholders. EDD industry cluster businesses, support services, and education/training organizations have been mapped to display their concentration and spatial relationships in a statewide view.

Phase Three: Stakeholder Engagement

With assistance from MEDC, TPMA consultants conducted focus groups, interviews, and circulated a survey to solicit input from economic development and industry professionals throughout Michigan. Information derived from these processes has informed the SWOT analysis, and consequently the recommendations provided at the conclusion of the report.

The stakeholder engagement for this study consisted of three components:

- » a survey designed to collect information on EDD cluster assets across the state
- » three focus groups with a collection of industry leaders, economic and workforce development professionals, and experts in postsecondary education
- » one-on-one interviews with individuals who were unable to attend our focus group sessions

Phase Four: Competitor Analysis and Value Chain

Using the information collected through data analysis and stakeholder engagement sessions, the project team conducted a competitor analysis. The objective of the competitor analysis was to understand how Michigan and its EDD cluster related to both its Midwest peers and the top-performing EDD states in the country. Available data on these competitor states are presented along with some best practices to elucidate how some of the most competitive states developing in the EDD cluster.

Next, two value chains provide visual representations of the talent pipeline that supports the EDD cluster workforce and the connections between EDD-connected industries.

Phase Five: SWOT Analysis

Using the information collection in the targeted industry research and stakeholder engagement, TPMA conducted a SWOT analysis to inform the final report and recommendations. Careful consideration of Strengths, Weaknesses, Opportunities and Threats related to the EDD industry ecosystem helped develop a series of actionable recommendations that considered:

- » Existing and growing demand for the product or service rendered by the industry;
- » Appropriately trained workforce at the right wage rate;
- » Access and affordability of industry inputs (i.e. supply chain);
- » Access to end user markets including both commercial and consumer;
- » Ease of doing business within the state;
- » State and regional competition;
- » Regional and local enthusiasm to pursue industry opportunities.

Phase Six: Recommendations

TPMA developed recommended actions that address key findings of the SWOT. These recommendations include specific actions related to:

- » Creating strong methods of collaboration within EDD cluster industries
- » Developing a more responsive and robust approach to education and workforce training
- » Establishing a more active relationship between MEDC, regional economic development partners, and a more representative spectrum of the EDD cluster
- » Incentivizing population and workforce attraction and retention throughout the EDD cluster and the State of Michigan

Defining the EDD Cluster

It can be difficult to draw distinct boundaries around the EDD cluster due to its overlap with so many others. It covers a wide variety of industries and activities ranging in engineering from mechanical to chemical to civil; in design from industrial to graphic to software; in development from R&D in life sciences to social sciences and beyond. Each of these fields may easily be argued to exist within other industries or clusters. As such, the first step in performing this study was to arrive at a concrete definition from which to perform this analysis.

The project team developed the following definition for the EDD industry cluster:

Planning, managing, and providing scientific research and professional and technical services (e.g. physical science, social science, and engineering) including laboratory and testing services, design, and research and development services.

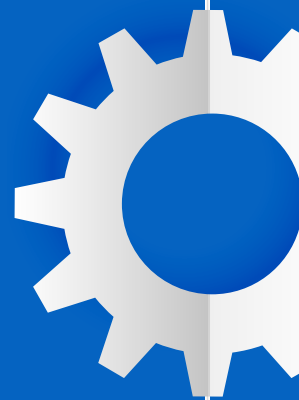
To arrive at this definition, the project team began with the sub-clusters and individual industry groups identified by MEDC in the 2019 Comprehensive Plan. For a more detailed description of the industry codes and subclusters, see the Appendix at the conclusion of this report.





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Michigan Engineering, Design, & Development Cluster Analysis



Cluster Data Analysis

EDD Industry Overview

To begin to understand the current state of the EDD cluster in Michigan, it is important to evaluate the size of each respective industry within the cluster. Figure 1 displays the number of jobs in each of the nine EDD industries. Businesses in the Engineering Services industry employ almost as many workers as those of any other EDD industry combined. The relative strength of this sector, combined with the two related sectors of Testing Laboratories and Research and Development in Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) speaks to the prowess of engineering in the state, bolstered by a collection of 4-year universities and the legacy of the automotive industry. This chart also demonstrates the gap between engineering sectors and the rest of the industries in Michigan's EDD cluster.

Viewing the current jobs numbers across the EDD cluster does paint the full picture, however. Table 1 below juxtaposes these 2021 counts to general trends in each sector, demonstrating which sectors are projected to grow or shrink in the ten-year window from 2016 to 2026. While jobs in engineering are expected to stay relatively steady, the testing laboratory industry is projected to show continued losses. Many of these industries dropped significantly between 2016 and 2017. Some recovered while others did not. Some sectors have grown substantially in the past few years, however, and are expected to show significant job growth, such as Specialized Design Services.

Michigan EDD Total Jobs (2020)

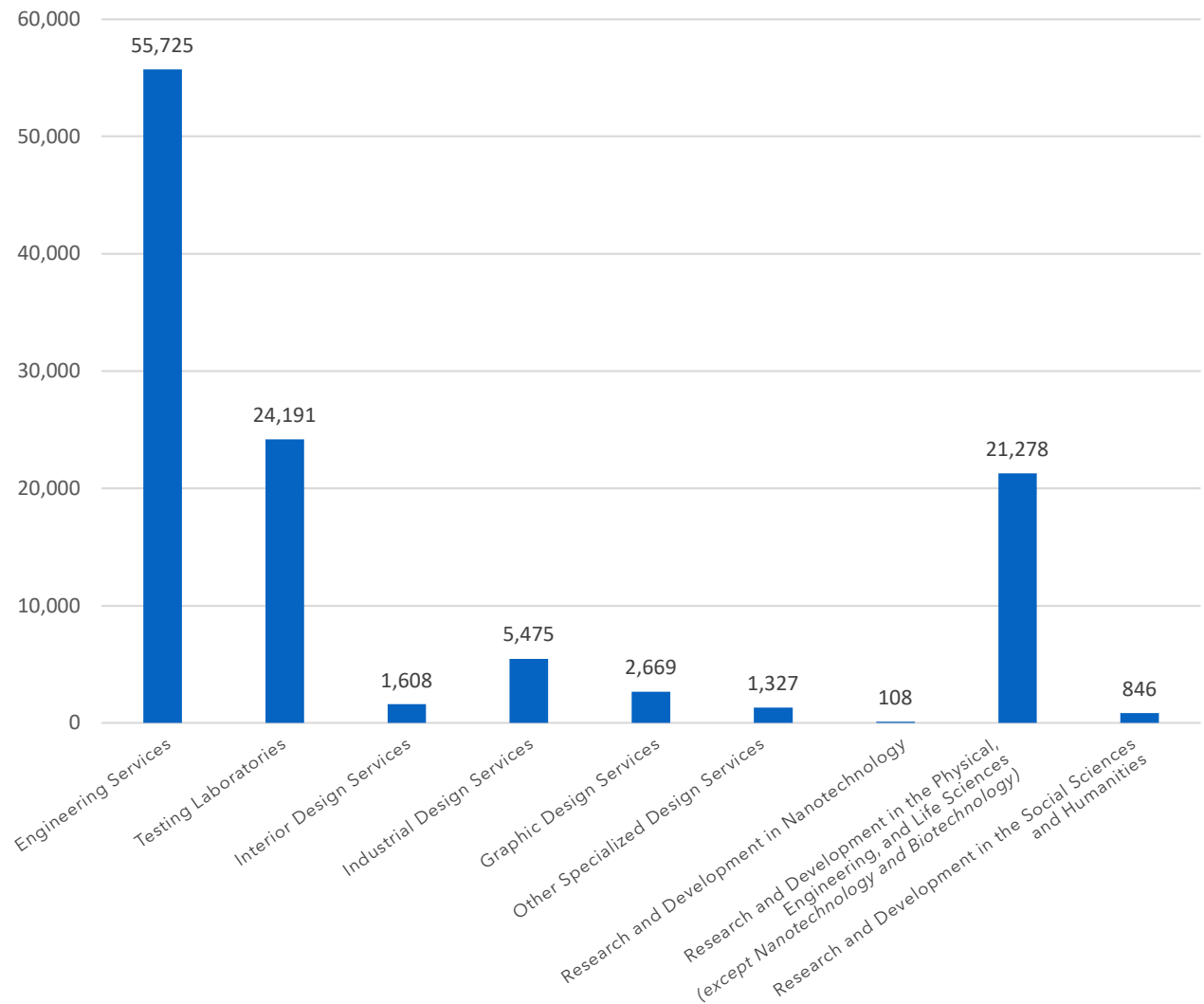


Figure 1: EDD Industries by Total Jobs. Source: EMSI 2022.



NAICS	Description	2021 Jobs	2016 - 2021 % Change	2021 - 2026 % Change (Proj.)
541330	Engineering Services	56,743	2.62%	0.94%
541380	Testing Laboratories	24,761	-12.82%	-2.43%
541410	Interior Design Services	2,013	7.02%	4.92%
541420	Industrial Design Services	5,619	1.85%	10.29%
541430	Graphic Design Services	3,169	0.57%	-1.45%
541490	Other Specialized Design Services	1,470	147.89%	41.50%
541713	Research and Development in Nanotechnology	122	-75.98%	17.21%
541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	21,855	-2.41%	-0.92%
541720	Research and Development in the Social Sciences and Humanities	967	13.10%	7.14%

Table 1: 2016-2026 Projected Job Change by Industry. Source: EMSI 2022.

Industry Cluster Historical Trend

As a whole, the EDD cluster has seen considerable growth in Michigan over the last twenty years, more than recovering from the 2008 economic recession. In 2010, the cluster employed fewer than 75,000 workers in the state; since then, nearly 42,000 jobs have been added in Michigan, bringing the total to 116,000 for 2022.

Top EDD Occupations

In addition to the job counts by industry, it is also useful to analyze the types of occupations and wages that are most common across the EDD cluster. Mechanical engineers are the most common occupation, and one of the highest earning (of those ranked below). In 2021, 14,000 mechanical engineers found employment in Michigan; the median hourly earnings for the occupation were \$43.38.

Architectural and engineering managers and civil engineers are the next most common occupations - the 4,374 jobs in Michigan earn a median hourly wage of \$64.63. Next highest are civil engineers with 4,278 employed within the state earning a median hourly wage of \$37.49. Across EDD sectors, engineering positions comprise many of the EDD industry cluster’s jobs, as do general and project managers.

Over the past few years, there has been a noticeable shift in EDD sectors jobs from Mechanical and Civil Engineers towards the broader classification of “All Other Engineers.” This second group includes jobs titles like Mechatronics Engineers, AI Engineers, Automation Engineers, Robot Operators, Innovation Engineers, and many others. The project team expects job classification systems to catch up to trends in these fields, but for the present this shift would seem to support anecdotal evidence of a shift from mechanical engineering skills to mechatronic, automation, and other electrical-engineering-related skills in the field.

EDD Cluster Historical Trend

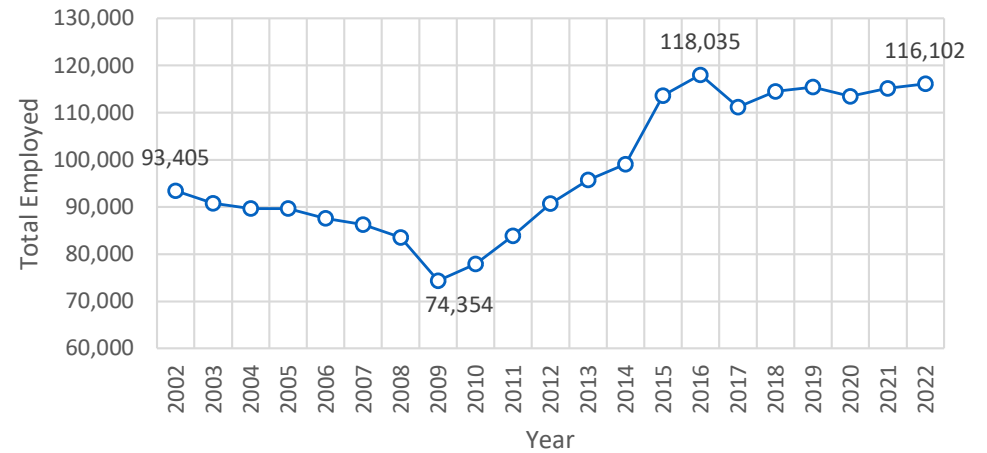


Figure 2: EDD Cluster Job Trends 2002-2022. Source: EMSI 2022.

Top EDD Occupations by Total Employed

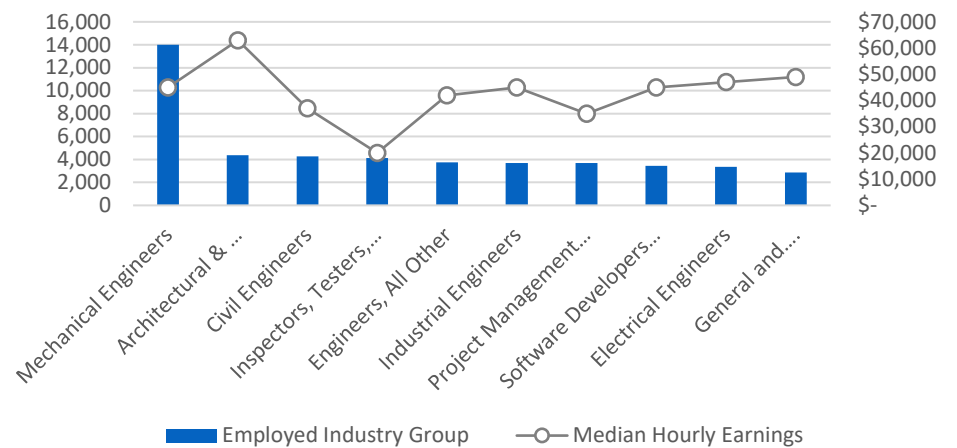


Figure 3: Top EDD Occupations in 2020 with Median Hourly Wages. Source: EMSI 2022.



SOC	Description	Employed in Industry Group (2020)	Change (2016 - 2026)	% Change (2016 - 2026)	Median Hourly Earnings
17-2141	Mechanical Engineers	14,000	(1,913)	(12%)	\$43.38
11-9041	Architectural and Engineering Managers	4,374	413	11%	\$64.63
17-2051	Civil Engineers	4,278	(586)	(11%)	\$37.49
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	4,131	(686)	(16%)	\$17.60
17-2199	Engineers, All Other	3,754	1,019	40%	\$42.07
17-2112	Industrial Engineers	3,684	(300)	(7%)	\$44.33
13-1198	Project Management Specialists and Business Operations Specialists, All Other	3,682	2,277	159%	\$34.88
15-1256	Software Developers and Software Quality Assurance Analysts and Testers	3,434	104	3%	\$43.12
17-2071	Electrical Engineers	3,342	(294)	(8%)	\$44.55
11-1021	General and Operations Managers	2,869	196	7%	\$47.87

Table 2: EDD Cluster Occupation Trends 2016-2026. Source: EMSI 2021.

Top Growing EDD Occupations

Between 2016 and 2026, project management specialists and business operations specialists are projected to see the most job growth of all EDD occupations; an increase of 2,277 workers is projected within the ten-year timeframe. The “All Other Engineers” occupations mentioned in the previous section are expected to add more than 1,000 jobs in the next five years. The occupations that follow are a mixture of management, design, and physical scientist positions.

Top Growing EDD Occupations

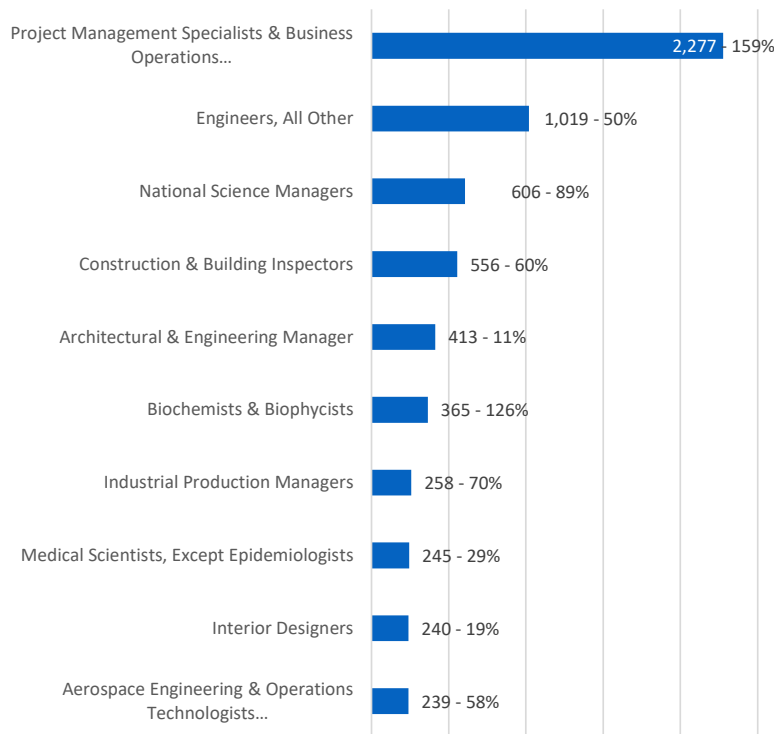
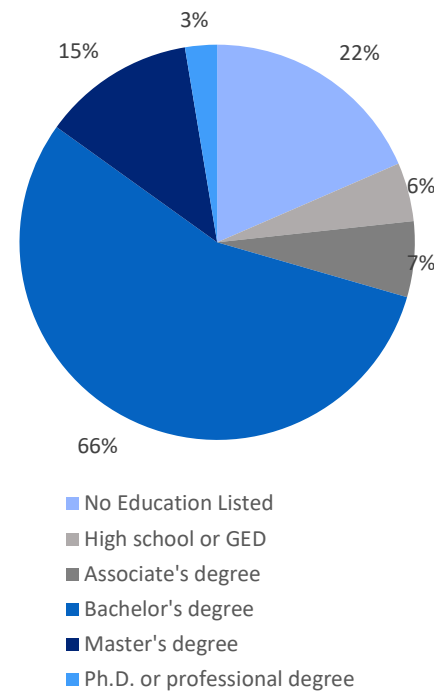


Figure 4: Top Growing EDD Cluster Occupations 2016-2026. Source: EMSI 2021.

Educational & Experiential Requirements

In analyzing job postings made by businesses that fall under the EDD industry cluster, the educational and experiential requirements for EDD positions can be measured. Only 13% of jobs require less than a bachelor’s degree; 84% require a bachelor’s degree, at minimum. Nearly 20% of postings listed a master’s or doctorate degree as a requirement. Of all job postings, only 13% welcome applicants with less than a year of experience. More commonly, positions require 2-6 years of related experience (42%).

Education Level Required for EDD Postings



Experience Required for EDD Postings

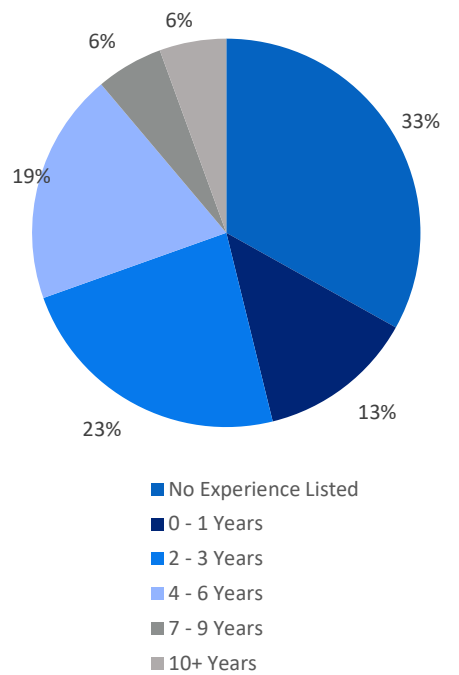


Figure 5: Education and Experience Requirements for EDD Occupations. Source: EMSI 2021.

Top Hard Skills & Qualifications

The same job postings analyzed above provide information about the most highly demanded hard skills. As the graph below indicates, about 40% of EDD job postings mention an engineering-related skillset. Electrical, mechanical, and civil engineers are in the highest demand. Additionally, many computer and software skillsets are popular; computer-aided design, AutoCAD, and computer science, and software development skills all make the list.

These data provide further evidence of the shift from a more traditional mechanical engineering skillset towards one that is focused on electrical engineering and other skills needed to work in Industry 4.0.

The top qualifications, too, indicate a high demand for engineering-related skills. Between January 2019 and July 2021, 2,283 job postings expressed an interest in applicants with a professional engineer, licensed professional engineer, or engineer in training qualification. Project manager and planning qualifications are popular, as are LEED Accredited professionals, who are proficient in sustainable design, construction, and operations.

Top Hard Skills

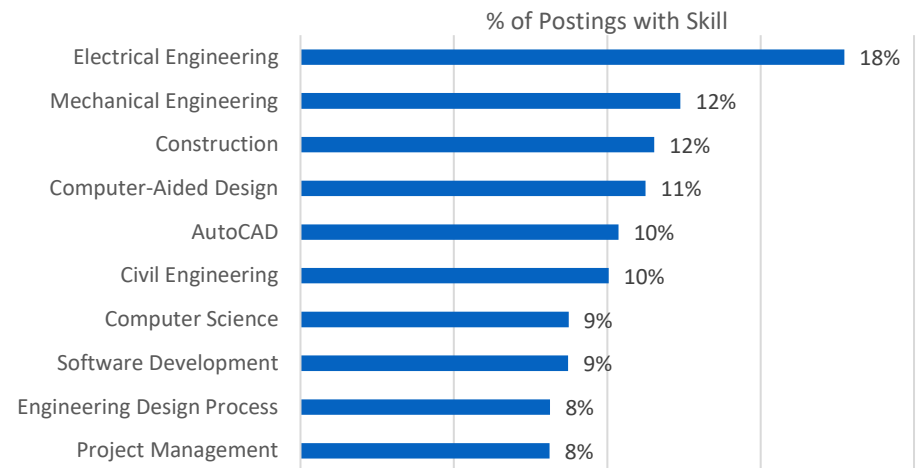


Figure 6: Top Hard Skills Requested for EDD Occupations. Source: EMSI 2021.

Top Qualifications

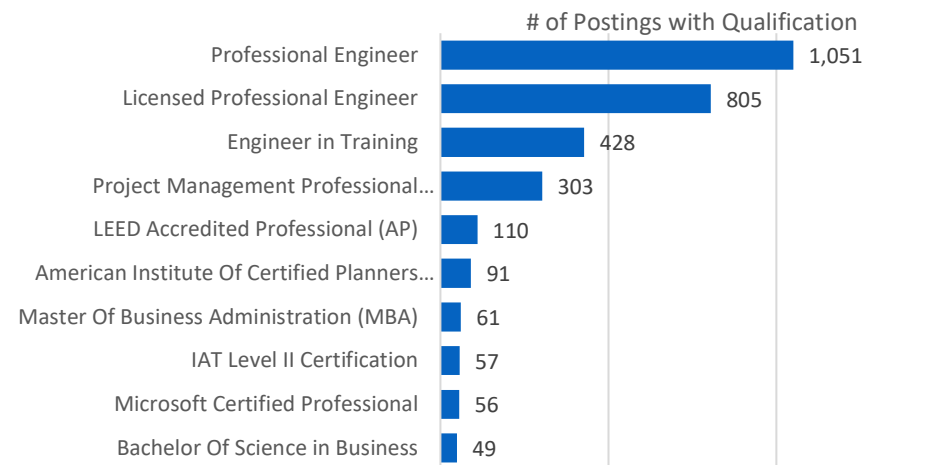


Figure 7: Top Qualifications Requested for EDD Occupations 2019-2021. Source: EMSI 2021.

Top Hiring Companies

There are hundreds of EDD-related companies that operate within Michigan. In the graph below, the top hiring companies are listed, as measured by the total number of unique job postings made between January 2019 and July 2021. General Dynamics Corporation tops the chart, having posted more than 1,200 jobs. Leidos Holdings, Inc. and Tata Technologies, Inc. follow, posting 881 and 773 jobs, respectively.

Top EDD Hiring Companies (January 2019 - July 2021)

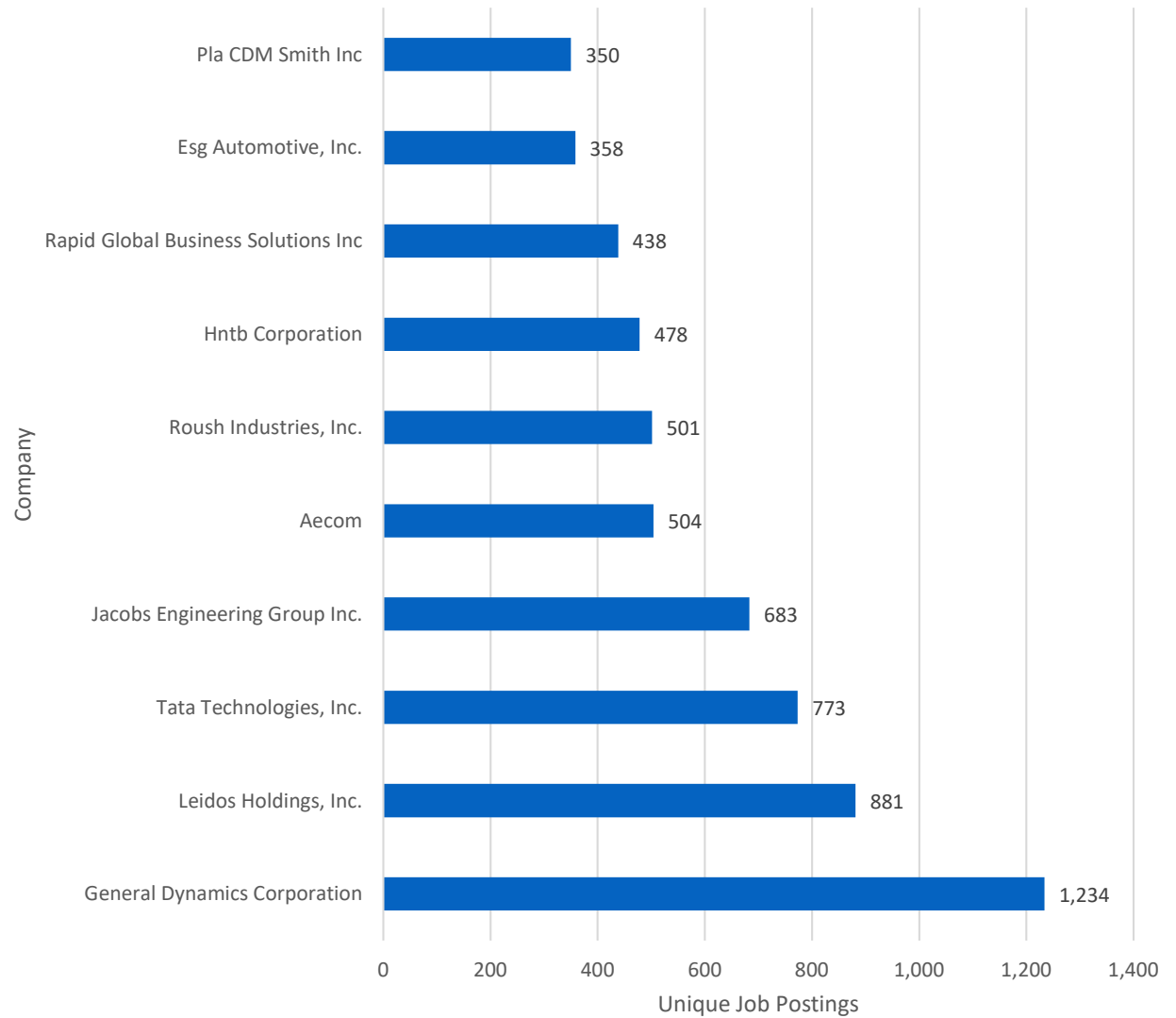


Figure 8: Top Hiring Companies for EDD Occupations 2019-2021. Source: EMSI 2021.

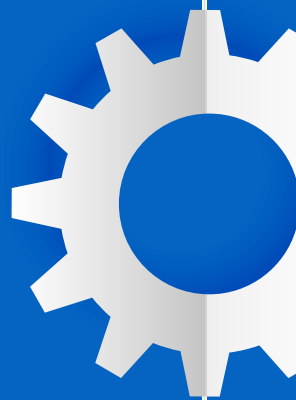






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Asset Map



After a thorough and comprehensive inventory and analysis of the state's EDD industry cluster, sub-clusters, and supporting resources, the project team developed an asset map to help MEDC drive strategic decision making related to growing the EDD cluster. The project team relied on an extensive process, including desktop research, historical document review, one-on-one interviews, surveys, focus groups, and data collection and analysis performed with proprietary data sources to compile the cluster asset map. The asset map includes the following components:



[Interactive Engineering, Design, and Development Asset Map](#)



[Engineering, Design, and Development Statewide Inventory](#)

Talent Development

- » 4-Year Higher Education Institutions
- » 2-Year Higher Education Institutions
- » Other Higher Education Institutions
- » K-12 Education
- » Public Workforce Development Systems
- » Other

Growth and Support Services

- » Trade or Membership Associations
- » Economic Development Corporation/Alliance
- » Business Support Services
- » Workforce Boards
- » Mentorship Networks
- » Incubators
- » Government Entities
- » Nonprofit Organizations

EDD Businesses

- » Engineering Services
- » Interior Design Services
- » Industrial Design Services
- » Graphic Design Services
- » Other Design Services
- » R&D in Physical, Engineering, or Life Sciences
- » R&D in Nanotechnology
- » Testing Laboratories
- » Other



Stakeholder Engagement

Introduction

With assistance from MEDC, the project team conducted focus groups, interviews, and circulated a survey to solicit input from economic development and industry professionals throughout Michigan. Information derived from these processes have informed the SWOT analysis, and consequently the recommendations provided at the conclusion of the report.

Methodology

The stakeholder engagement for this study consisted of three components:

- » a survey designed to collect information on EDD cluster assets across the state
- » three focus groups with a collection of industry leaders, economic and workforce development professionals, and experts in postsecondary education
- » one-on-one interviews with individuals who were unable to attend our focus group sessions

TPMA worked with the project team at MEDC to identify and solicit participation from stakeholders across the state. The intention was to engage with representatives from a variety of industries, regions, and connections to the EDD cluster. In total, over 50 individuals from across the state participated in at least one component of the engagement strategy for this study. The results from these interactions are briefly summarized in the 'Findings' section below and are expanded upon throughout the SWOT analysis.

Stakeholder Engagement Participation

As a general note, the project team had relatively little participation from entities representing the greater Detroit metro area or major industry sectors for the stakeholder engagement component of this report.

The survey for this project was circulated to 181 contacts provided by MEDC. Of the 42 survey respondents, only seven could be said to represent some aspect of the Greater Detroit metro area (the same number as responded from the Upper Peninsula): The Wayne County Economic Development Corporation, the Michigan Manufacturing Technology Center (MMTC), the Troy Chamber of Commerce, Automation Alley, Oakland County Michigan Works!, the City of Novi, and Consumers Energy. Of these, only three indicated a willingness to participate further in this study and only two accepted an invitation to attend a focus groups.

One of the three focus groups had a strong presence from EDD industry as representatives from ABL and FEV participated. This session was also attended by representatives from Michigan's Research Corridor and the College for Creative Studies. The other two focus groups were attended by economic development professionals representing the Traverse City area and the Northern Lakes region.

As a result of the level of participation and the representative who participated, the findings provided below are undoubtedly skewed towards the concerns of a small section of Michigan's economic development landscape and the EDD cluster.

Findings

Local Leaders' Perspectives

One important objective of the stakeholder engagement sessions was to get a better understanding of the EDD cluster as it exists in the different regions and industries throughout Michigan, not just around the existing epicenters of the Detroit and Grand Rapids areas and the well-established automotive industry. Fortunately, stakeholders from a variety of regions and professions participated in the process, each providing a unique perspective on the EDD cluster's future.

Detroit's focus has historically been on the automotive industry; much of the city's identity is connected to its success in designing and producing cars. The automobile industry is one that connects to the EDD cluster; however, many local leaders indicated that there might be more potential in pursuing growth in other industries, especially throughout more rural areas of the state. Other industries, such as freshwater technology, marine mobility, digital health, environmentally sustainable architectural design, and many others were noted to be promising industries that historically have fallen outside of the scope of MEDC's support.

In addition, focus group participants and interviewed stakeholders communicated that MEDC remains too focused on large production companies and plants and large-scale projects. As such, there is not much support for smaller companies, which make up a large component of EDD companies. These companies comprise a significant portion of EDD businesses within the state, and to overlook them when providing support is to neglect a large, important part of the cluster.

Hurdles and Challenges to Growth

Many of the primary challenges in the way of growing the EDD cluster noted by participants were skills related. The state of the cluster, and the broader economy within which it operates, is changing; employers demand workers with different skillsets than have been demanded in the past. For example, as the cluster begins to integrate more automation into their production processes, workers must be prepared to operate alongside automated technologies. Similarly, workers with experience with electrical engineering, and not only mechanical engineering, are required as automobiles become increasingly electronic. To keep up with shifting employer demands, workforce training pipelines must be adjusted.

Stakeholders commented on the need for stronger reskilling programs. While Michigan is home to several prominent 4-year institutions, there are not enough 2-year workforce training programs accessible to workers. More specifically, it could be useful to invest in training pipelines that cross train workers in electrical, electro-mechanical, and mechatronics skills so they're more able to fill 21st century engineering positions. The stronger the workforce, the more successful business retention, expansion, and attraction efforts will be.

The development of such pipelines is especially important at this time, as many acknowledged the increasing competitiveness of other states that are developing the EDD cluster. Participants commented on the success seen in states like California and Florida and attributed much of their success to the fact that they're able to attract talent. Population growth in Michigan has been relatively stagnant over the last several years, and that stagnation could be having an adverse effect on the state's ability to develop clusters that require a highly skilled workforce.

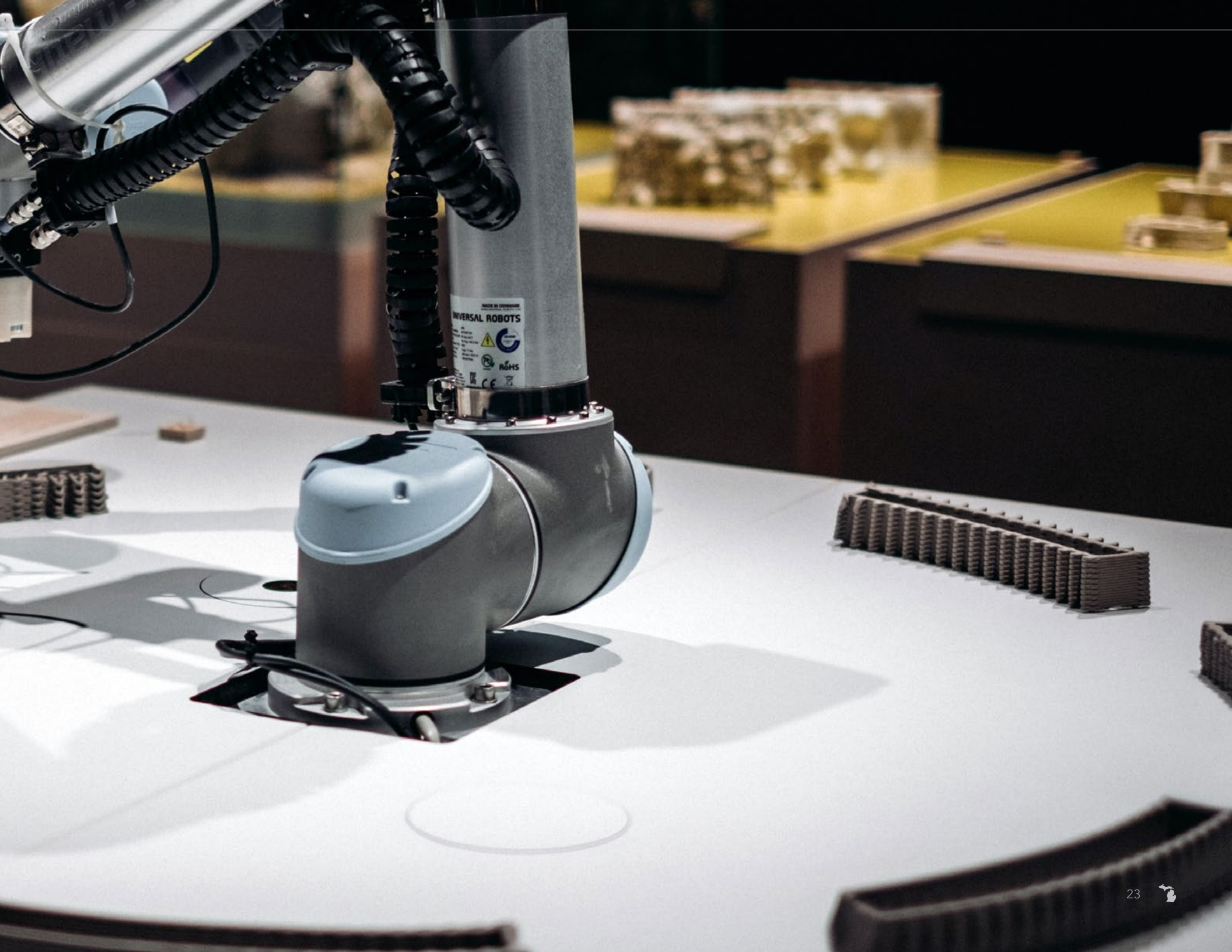
Optimizing Resources

The most common suggestion throughout the stakeholder engagement sessions was that Michigan needed to create a talent attraction campaign that can support the EDD cluster and other targeted industries. To attract talent is to attract business, and many participants expressed an inability to attract new businesses to their regions without an adequate workforce to support them. The talent issue is one of the first that needs to be addressed. A focused approach to talent attraction and population growth is crucial. More specifically, some stakeholders expressed interest in leveraging the successful Pure Michigan tourism attraction campaign to attract talent.

A resource cited to have untapped potential was freshwater; Michigan's contact to four of the five great lakes presents a unique opportunity for the EDD cluster. Stakeholders in the Traverse City and Northern Lakes regions, in particular, mentioned the opportunity for Michigan to establish itself as a center for innovation in the freshwater industry. Academic resources in these regions are beginning to focus on freshwater research with investments such as the Traverse City Fresh Water Research & Innovation Center. If these continue to be built out, this industry could contribute to the growth of the EDD cluster in attracting new business, growing talent, and establishing the state as an innovative leader in the field.

Finally, many participants expressed enthusiasm about their individual, regional efforts to further develop the economy. However, they also acknowledged an opportunity for greater collaboration with their statewide colleagues and expressed that their work could be further reaching if stronger collaborative networks existed. Communication between economic development professionals, state agencies, educational institutions, and private industry will be crucially important for the ongoing development of the cluster in Michigan, and this communicative framework is one that needs to be built out intentionally in order to be successful.

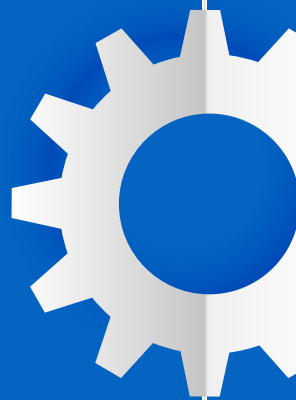






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Strengths, Weaknesses, Opportunities, & Threats



- » Highest EDD Concentration in U.S.
- » Natural Environment and Quality-of-Life Assets
- » Talent and Innovation Assets



- » Poor Regional Connectivity
- » Inadequate Workforce Training Pipelines
- » Lack of Support for Small Businesses



- » Potential in Adjacent Industries and Clusters
- » Local Talent Pools
- » Growing Demand for Environmentally Sustainable Solutions



- » Stagnant Population Growth
- » Growing Number of Competitive States
- » Dynamic Nature of EDD Cluster



Strengths

Highest EDD Concentration in U.S.

As one stakeholder put it, Michigan has “a history and a legacy of engineering and design.” It makes sense, then, that the state has the highest concentration of engineering, design, and development jobs in the country. With a location quotient of 1.98, jobs in the EDD cluster are nearly twice as common in Michigan than in other states throughout the country. Collectively, the industries of Engineering Services, Testing Laboratory, and Research & Development (in the Physical, Engineering, and Life Sciences) employ more than 20,000 workers in the state. Many workers who find employment in these industries earn relatively high annual wages, as their skillsets are typically more advanced.

Moreover, the EDD cluster is growing in the state, which could indicate promising potential in years to come. Since 2009, the total number of jobs in the EDD cluster has increased in Michigan, and more continue to be added on an annual basis. In the last year and a half, thousands of jobs have been posted by Michigan’s EDD businesses.

Much of the success of the EDD cluster can be linked to the rich engineering ecosystem in which the legacy automotive industry and educational resources have grown in response to one another through collaborative efforts and nearly unparalleled success throughout decades of development in Michigan. The University Corridor, in particular, has created a rich environment for the development and placement of engineers throughout the state.

The state’s long history of prominence in the engineering, design, and development industries prepares it to capitalize on nationwide trends toward more sophisticated EDD systems. The local growth of the cluster proves that much of the infrastructure and resources required for continued growth already exist within the state; at present, the cluster requires the fine-tuning of specific strategies that can target areas for improvement in the cluster’s development plan. Ultimately, if the state can adapt its approach to address 21st century challenges, it can even further establish itself as a global leader in the EDD industry cluster.

Talent and Innovation Assets

People drive the economy, and Michigan is home to many world-renowned educational institutions. Michigan State University and the University of Michigan, the two largest universities in the state, have spectacular training programs and produce invaluable research studies on an annual basis. A variety of other 4-year institutions are located in the state, with each focusing on its specific training niche. Colleges and universities are wellsprings of innovation and creative thinking, which is exactly what is needed to bolster an industry cluster as dynamic as the EDD cluster.

In addition, there are many economic development hubs throughout the state that are proactively pursuing emerging industry opportunities. Several large-to-mid-sized cities are dispersed throughout the state, each with its own resources and talent pools. The diversity of the state, in its natural resources, people, and regional economic opportunities, is a major strength. All the moving pieces need to be coordinated, however, to maximize the potential of independent economic actors.

A plethora of educational institutions, anchor institutions, economic development agencies, and other community-driven organizations are spread throughout the state. If properly organized, these existing assets can help bolster the EDD cluster in Michigan, as well as the broader economy within which it operates.



Photo Credit 1 University of Michigan College of Engineering

Natural Environment and Quality-of-Life Assets

Michigan is renowned throughout the United States for its beautiful natural environment. Pure Michigan, the state's tourism attraction campaign, has largely been hailed as a success in marketing its valuable natural assets and attracting visitors to spend time exploring some of the many attractions. Access to trails, lakes, forests, or other natural amenities are immensely important for talent attraction, tourist attraction, and ultimately business attraction.

Moreover, many businesses have shifted to a hybrid or remote working environment in recent years. As a result, many professionals have the options reside in a broader geographical area than ever before. Michigan is well-positioned to take advantage of these workplace shifts and could capitalize on the trend toward remote work.

The state's natural assets are not only valuable for tourism or talent attraction - many business expansion and attraction opportunities are connected to the natural environment. Michigan has the longest freshwater coastline in the United States. Surrounded by four of the five great lakes, the state is home to nearly 3,300 linear miles of freshwater coastline¹.

Innovations in freshwater technology hold great potential in Michigan. The state's access to the Great Lakes creates an opportunity for engineering, development, or design efforts that specifically relate to freshwater. Marine mobility and autonomous vehicles, industrial water use, and many other industries are largely dependent upon access to large bodies of water, and Michigan could be a prime location for the development or settlement of businesses in any of them. Of course, environmental stewardship should be a priority when considering industry attraction. Emerging EDD businesses and industries that seek to create environmentally conscious solutions should be targeted in attraction efforts. These businesses can use Michigan's freshwater assets to develop of technologies that make the rest of the world more efficient, responsible users of freshwater.

Economic development professionals in northern parts of the state have begun to pursue opportunities connected to the freshwater coast, but stronger support from the state could allow regional economies to make the most of the unique industry cluster development opportunity afforded by the natural environment.

1 <https://www.michigan.gov/egle/about/organization/water-resources/coastal-management/michigans-resilient-coast#:~:text=Michigan%20is%20surrounded%20by%20four,states%20and%202%20Canadian%20provinces>

Weaknesses

Poor Regional Connectivity

Despite the efforts of many strong economic development agencies, educational institutions, and employers throughout the state, the EDD industry cluster is underperforming in some important areas. While some of the industries included in the cluster are competitive and growing, others employ a very small share of the workforce within the state. This is likely due, in part, to the disjointed efforts of key stakeholders dispersed throughout Michigan.

Many stakeholders commented on an overdependence on Detroit's regional economy. It is reasonable to expect economic happenings in Detroit to heavily influence the state's developmental direction. The city is, in some industries, a national powerhouse; the automotive industry, for example, has been closely connected to the city's identity for more than a century. However, Michigan is much larger than Detroit. Some regions are not in a position to prioritize the automotive industry, and state support which only advances the development of that particular industry might not be helpful for local or regional economies.

Resultantly, some regions are pursuing agendas that appear to be disconnected from the agenda pursued in Detroit or at the state level. Because of the misalignment, these regions have a more difficult time securing funding to pursue economic development projects and are less involved in statewide efforts to bolster the economy. Their growth occurs at a slower rate, and their ability to capitalize on emerging opportunities is decreased.

To maximize the efficiency and productivity of the state economy, actors throughout the state must be coordinated in their efforts to grow the EDD cluster. While many organizations are making progress toward specific, regional objectives, the overall productivity of the state is diminished without an intentional effort to increase collaboration and unite the efforts of various stakeholders.

Inadequate Workforce Training Pipelines

One of the strengths listed above was the existence of valuable talent and innovation assets within the state. There are, of course, a handful of anchor educational institutions that train thousands of well-trained, highly skilled workers every year. Many stakeholders acknowledged that there are plenty of four-year colleges and universities in Michigan that benefit the cluster, but that a wider variety of workforce training options could be made available to workers.

More specifically, the provision of more 2-year, associate degree programs could be helpful for increasing the employability of Michigan workers. In addition, other non-traditional training options could be explored. Career and Technical Education (CTE) programs, which are provided to K-12 students, are becoming more popular as a means of preparing young workers for employment after graduation from high school. Centers for Excellence, too, can provide prospective workers with the skillsets required to enter into the EDD workforce. Non-traditional training options are more flexible than 4-year programs, cheaper, and are typically more adaptable to shifting employer demand.

Without sufficient access to training resources, Michigan workers will not be prepared to find employment in the EDD cluster. As a result, businesses are less likely to expand or settle in the state; the working population will not be enough to support their operations. Stakeholders expressed exactly this concern: that they're not confident in their ability to attract new businesses to their region because they don't have the workforce to staff them.

These anecdotal reports are backed by recent studies in economic development. A Brookings study from 2019 notes that 95% of company executives surveyed by Area Development rated the availability of skilled labor as "important" or "very important" in site selection.² Until the talent shortage is addressed, business retention, expansion, and attraction efforts are less likely to succeed.

² https://www.brookings.edu/wp-content/uploads/2019/10/2019.10.15_Brookings-Metro_Talent-driven-economic-development_Parilla-Liu.pdf

Lack of Support for Small Businesses

As the EDD cluster is such a broad group, businesses and projects of many sizes operate within it. While the high-emplying, high-earning, large businesses are important to support and retain within the community, resources must also be made available for small businesses in the state. Emerging businesses grow into larger, anchor institutions, and their retention is crucial for the long-term sustainability of the cluster.

Collectively, small businesses make up a significant portion of the EDD cluster in Michigan. One stakeholder reported that nearly 80% of Michigan businesses in the design industry employed five employees or fewer. Small engineering consultancies are sprinkled throughout the state and play an important role in the function of the entire cluster. Often, these businesses are susceptible to ebbs and flows of regional economic conditions and the provision from guidance or resources from the state can enable them to flourish into larger, more self-sustaining businesses.

Significant capital investments in the development of new facilities, while important, cannot be the primary determinant of whether a business receives financial support. Grants and other funding opportunities are not readily available for businesses that aren't making large investments in land or facility development. Because small to medium-sized businesses do not have the same financial and human resources as larger institutions, they are more likely to need and utilize funds for retraining or upskilling, and support for the development of such programs can be hard to find.³

³ <https://www.brookings.edu/testimonies/the-small-business-workforce-challenge-causes-impacts-and-solutions/>



Opportunities

Develop Adjacent Industries and Clusters

The EDD cluster is embedded in a vast network of industries that connect, overlap, and support each other in the broader economy. It can be difficult to identify its parameters, as so many industries which might appear to be disconnected are, in reality, integral to the operations of the EDD cluster. Because of the connective nature of the economy within which the cluster operates, a focus on developing adjacent industries or clusters could greatly increase growth of engineering, development, and design operations within Michigan.

The MEDC has identified five industry clusters, in addition to the EDD cluster, that hold promise for development in years to come. In creating synergistic strategies for overcoming barriers to the development of several of clusters simultaneously, the state can more effectively support their growth. For example, a better-supported advanced manufacturing industry will complement the growth of the biomedical device industry, as there is overlap between the two industries. To earn the greatest return on investment, one industry should be supported in such a way that its growth will contribute to that of another, adjacent industry.

In addition, a framework for deliberately connecting adjacent industries should exist. Forums, networking efforts, or collaborative initiatives could be pursued in order to ensure the benefits of an investment made in one industry cluster are carried over into another. Inter-dependency is critical for growth in the 21st century, and Michigan can help build its own economy by ensuring the proper framework exists for collaboration and cooperation between key stakeholders.

Local Talent Pools

Pools of local talent exist throughout the state, and the intentional incorporation of such talent into the development of the EDD cluster could be important. Independently, educational institutions do important research and development; however, their inclusion in the growth of the EDD cluster could help overcome workforce gaps and encourage innovation within the cluster.

One way to incorporate local talent into the development of the cluster is through employer-educator partnerships. For example, Munson Medical Center and Michigan State University have partnered together to capitalize on an opportunity in digital health; the delivery of rural healthcare through digital services is a niche market to be entered, and both the university and private industry alike have recognized that a partnership will enable both to take fuller advantage of the opportunity. Such partnerships combine resources with talent, and the result is an initiative which spurs economic growth.

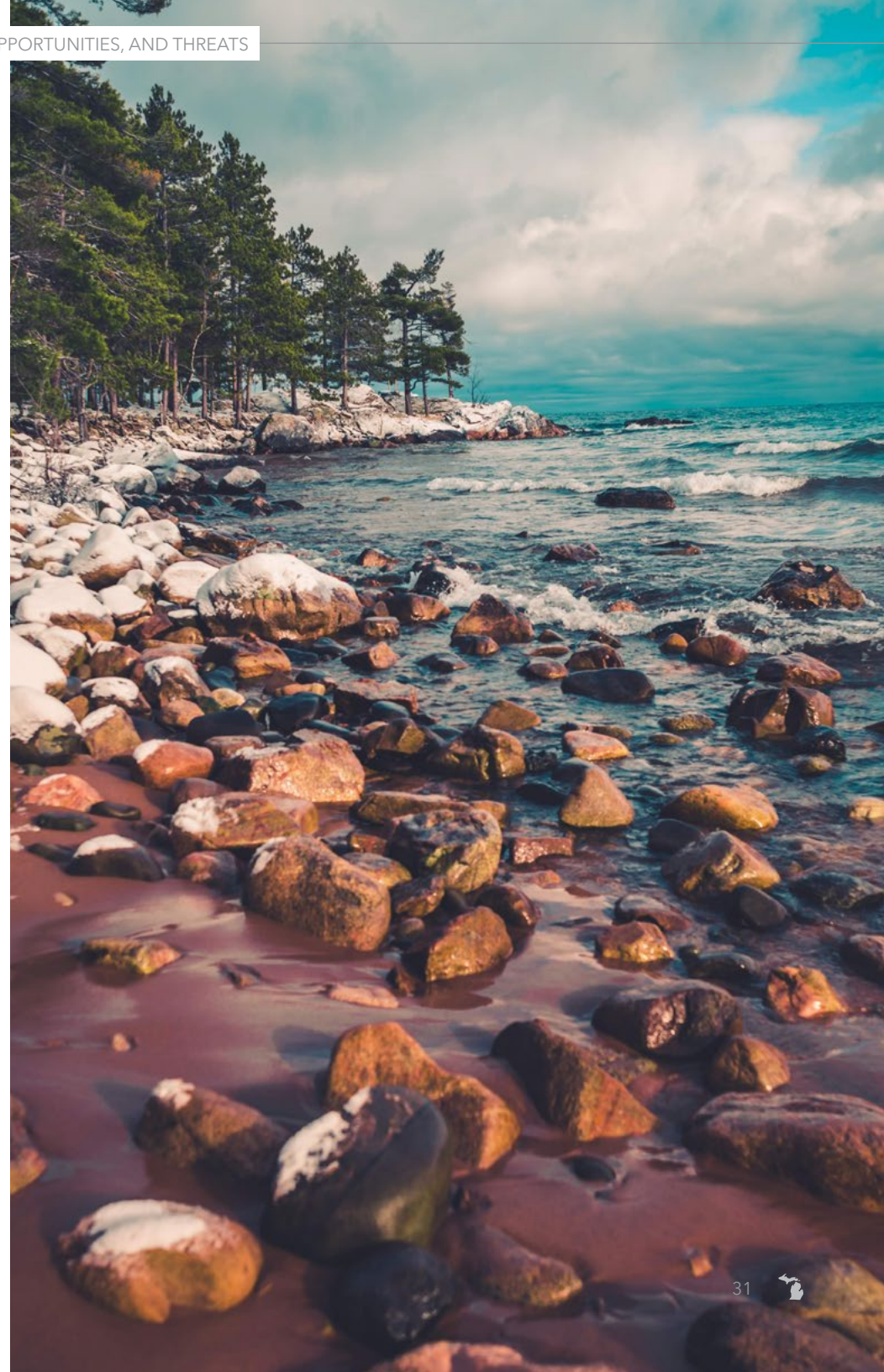
Similarly, talent providers could align their training services with some of the state's economic development objectives and existing assets. For example, Michigan is home to the longest freshwater coastline in the country. Many economic development professionals want to create an industry cluster that focuses on this natural asset. Educational institutions, then, could create programs that prepare students or workers specifically for work in the freshwater industry cluster. The benefits of doing so would be two-fold. First, employers would have access to a more capable talent pool. Second, educational institutions would be able to create a niche program that would attract students from across the country who are interested in the field; a program focused on freshwater technology, for example, might be hard to find elsewhere. Therefore, the deliberate structuring of educational pipelines could also serve talent attraction efforts.

Growing Demand for Environmentally Sustainable Solutions

Stewardship of the natural environment is becoming increasingly important in the 21st century. Industries, businesses, and individuals alike are being forced to adapt with the changing climate and its consequences. With these environmental challenges, however, comes an opportunity to anticipate the demand for newer, cleaner solutions to modern problems and proactively meet the demand for those solutions.

Environmentally sustainable technologies are used in many ways in the EDD cluster. For example, the future of the automobility industry seems to be focused more intensely on the production of vehicles that utilize greener energy, like electric vehicle batteries or hydrogen fuel cells. As the markets shift and demand increases for these vehicles, so will the demand for their parts. As Michigan's automobility businesses focus on the research and development of greener technologies, they'll be better positioned to capitalize on related economic trends in the future.

Similarly, the design industry will be forced to adapt. Standard practices in a variety of industries, from architecture to clothing design, will change as the preservation of the natural environment becomes prioritized. Business leaders, students, and economic development professionals alike can challenge themselves to understand what the world will look like decades from now and begin to develop the systems to meet future demand. For example, we could see increases in the demand for buildings constructed with biomaterials, or for clothing items created out of more sustainably sourced fabric materials; the better Michigan can anticipate and prepare for these market shifts, the better the economy will be able to keep up with environmental changes. Ultimately, the natural environment affects every aspect of the economy, and more sustainable environmental practices will lead to a more sustainable, faster-growing EDD cluster.



Threats

Stagnant Population Growth

Many stakeholders cited stagnant population growth as one of the most significant barriers to the growth of the EDD cluster. This particular issue is revisited in the competitor analysis, where there is seen to be a correlation between percent population change over the last ten years and competitiveness in the EDD cluster over the last five years. If steady population growth is an important part of the cluster's development within the state, a stagnant population could pose a threat to the efforts to expand the cluster.

Population growth, and more specifically talent attraction, can be supplemented by talent retention efforts. As has been mentioned in previous sections of the analysis, Michigan is home to some of the strongest educational institutions in the world. Many students move out of state after graduating, however, and do not continue to contribute to the state's economy after college. The retention of these graduates could help increase the state's population and improve local talent pools.

In order to support population growth, some barriers to such growth need to be addressed. For example, infrastructure in rural parts of the state could be improved, increasing residents' access to amenities outside of their communities. In addition, a stronger emphasis could be placed on improving the K-12 public school systems in rural areas. Families consider school systems in choosing a location to settle down, and sub-par public schools could have an adverse effect on a population growth strategy.

Lastly, many stakeholders believe the solution to the problem is simply a stronger marketing strategy. Some cited Traverse City's "Michigan's Creative Coast" website as a best practice for attracting both workers and residents alike.⁴ The state has much to offer, and a population growth or talent retention and attraction strategy could be primarily about presenting all of the existing assets to the right groups of people.

⁴ <https://michiganscreativecoast.com/>

Growing Number of Competitive States

Ultimately, to understand the future of the EDD cluster in Michigan, its change must be measured against national trends. To gauge the competitiveness of the state, the best metrics for measuring progress are not necessarily those which measure the historical growth of the cluster within the state, but the growth of the cluster compared to other states around the country. In the competitor analysis to follow, it can be seen that many states, like California, Texas, Florida, North Carolina, and Maryland are outperforming Michigan in developing the EDD cluster.

There are several reasons why this might be the case, and many are outlined in following sections. One important correlation to restate, however, is the one between population growth and competitiveness. The most competitive states in the EDD cluster have also experienced substantially faster population growth. The importance of building the population to support the growth of the cluster is reflected in the sentiments of stakeholders as well as the quantitative data.

Other states have different tax structures and offer a variety of incentives to attract new industry to the area. Workforce training opportunities might be more readily available in these states, or the financial conditions might be more suitable for the establishment of an emerging EDD business. As Michigan continues to develop the cluster, an eye must be kept on its competitors; many other states could be points of reference for best practices in economic development, population attraction, or industry attraction. The competitor analysis provides an overview of some of the most significant characteristics of national competitors, but the analysis should continue beyond this report. The EDD cluster is a dynamic one, and the ability to adapt with the competition will continue to be a necessity for success in growing any of the EDD industries.

Dynamic Nature of EDD Cluster

As mentioned in the previous section, the EDD cluster is a dynamic, ever-changing industry cluster whose attraction requires a nuanced and adaptable strategy. Such strategies can be difficult for large state agencies to manage, as they often lack the mobility to adapt with volatile markets. Therefore, this dynamic element of the cluster must be considered when creating strategy to support its growth.

Technology is changing faster than ever, and workers and businesses are adapting with it. 21st century workers look different than they did in 20-30 years ago. For example, many engineering firms require workers with more than the traditional mechanical engineering skillset; electrical engineering is becoming increasingly important. Some educational institutions are adapting to meet employer demand for newly skilled workers. Michigan State University, for example, offers “mechatronics” training, which combines classical mechanical engineering material with electrical engineering elements.

Support for the EDD cluster will likely look different than economic development support has looked in the past. The development of a large plant which employs hundreds of workers in the short-term will not necessarily be as impactful as would be the provision of a software training program which would prepare workers for employment in a variety of positions. In the northern part of the state, stakeholders reported hundreds of jobs currently posted for software developers and technology specialists. New, similar trends can be observed throughout the state. An inability to capitalize upon those could threaten the future of the cluster.

A strategy for the development of the EDD cluster must be adaptable and flexible, and inflexibility in meeting the changing needs of the cluster will only limit the growth of the cluster in Michigan.



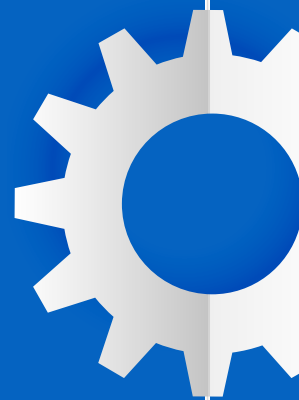


MICHIGAN ECONOMIC
DEVELOPMENT CORPORATION

Competitor Analysis

Introduction

To understand the State of Michigan's competitiveness in the EDD cluster relative to other states, a competitor analysis has been informed. First, quantitative data have been analyzed for regional and national competitors. Regional competitors include Illinois, Indiana, Kentucky, Ohio, and Wisconsin. National competitors were identified using a shift share analysis; those with the highest competitive effect (as measured by Economic Modeling Specialists, Inc. (EMSI)) were deemed to be the most competitive within the country and have been used as benchmarks for Michigan. Next, five best practices are summarized. These best practices are intended to help explain some of the success other states have seen in developing the EDD cluster. Collectively, the findings of this competitor analysis help inform the recommendations provided at the conclusion of this report.



Quantitative Analysis

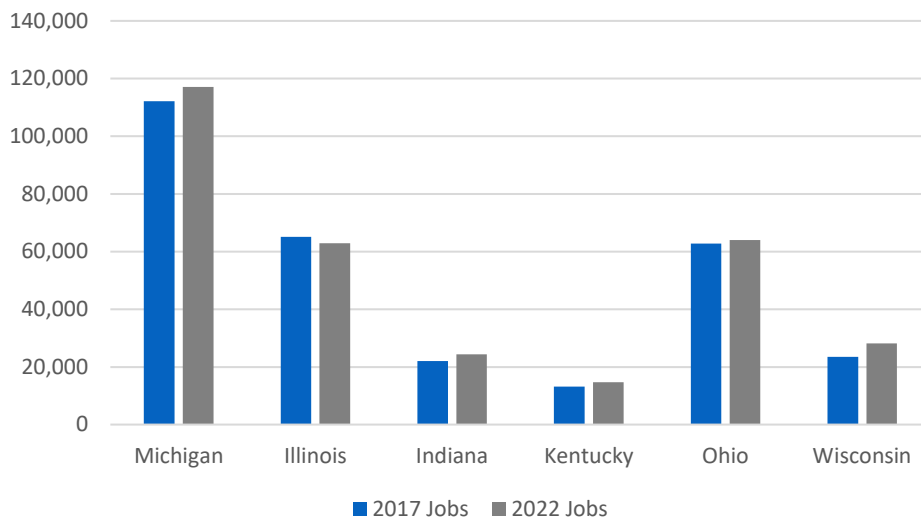
Jobs & Growth

A simple metric for measuring the competitiveness of the Michigan in the EDD cluster is to compare job growth across competitor states. Regionally, it can be seen that Michigan added more EDD jobs than any other state. Between 2017 and 2022, the state added nearly 5,000 EDD jobs; in 2022, more than 117,000 workers were employed in the cluster. Michigan employs nearly twice as many workers in the EDD cluster than the state with the next largest presence of EDD workers, Ohio.

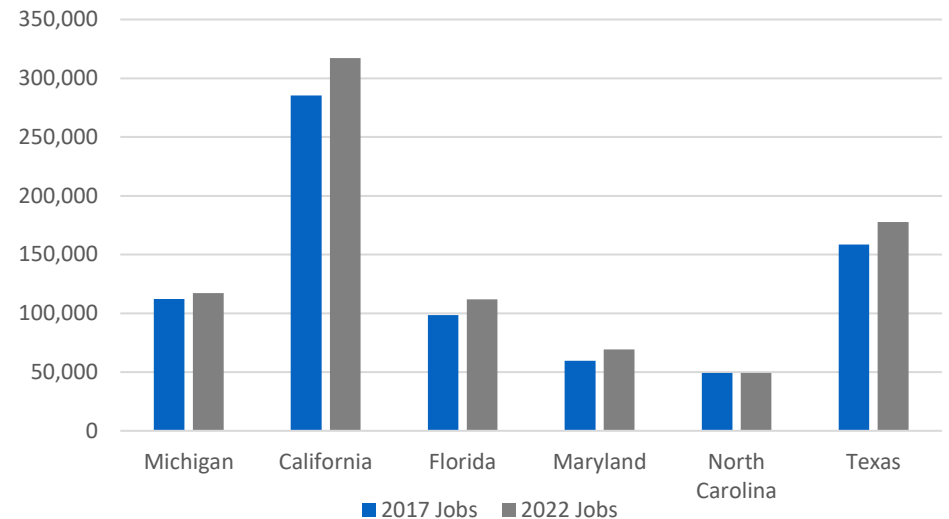
When compared to national competitors, however, Michigan's performance is less spectacular. Compared to the most competitive states in the country, Michigan added the fewest EDD jobs between 2017 and 2022. California added the most, increasing from 285,000 to 317,000 over the 5-year period. It is important to note that while Michigan added fewer jobs than some of its national competitors, it still employs more workers in the cluster than Florida, Maryland, and North Carolina.

Simple job growth, however, is not always good metric for the comparison of different regions. Differences in total population and existing cluster size can make growth happen more quickly in some states than in others. Therefore, it is often more accurate to measure the percent of job change experienced by the cluster over a period. In the graph below, the percent change in job growth in the EDD cluster in Michigan is compared to its regional and national competitors. Michigan saw more growth than its regional competitors in the last five years, but only by .42 percentage points. Its national competitors saw a much larger increase in EDD jobs and grew by nearly 13% between 2017 and 2022.

Michigan & Midwest Competitors: Job Growth



Michigan & National Competitors: Job Growth

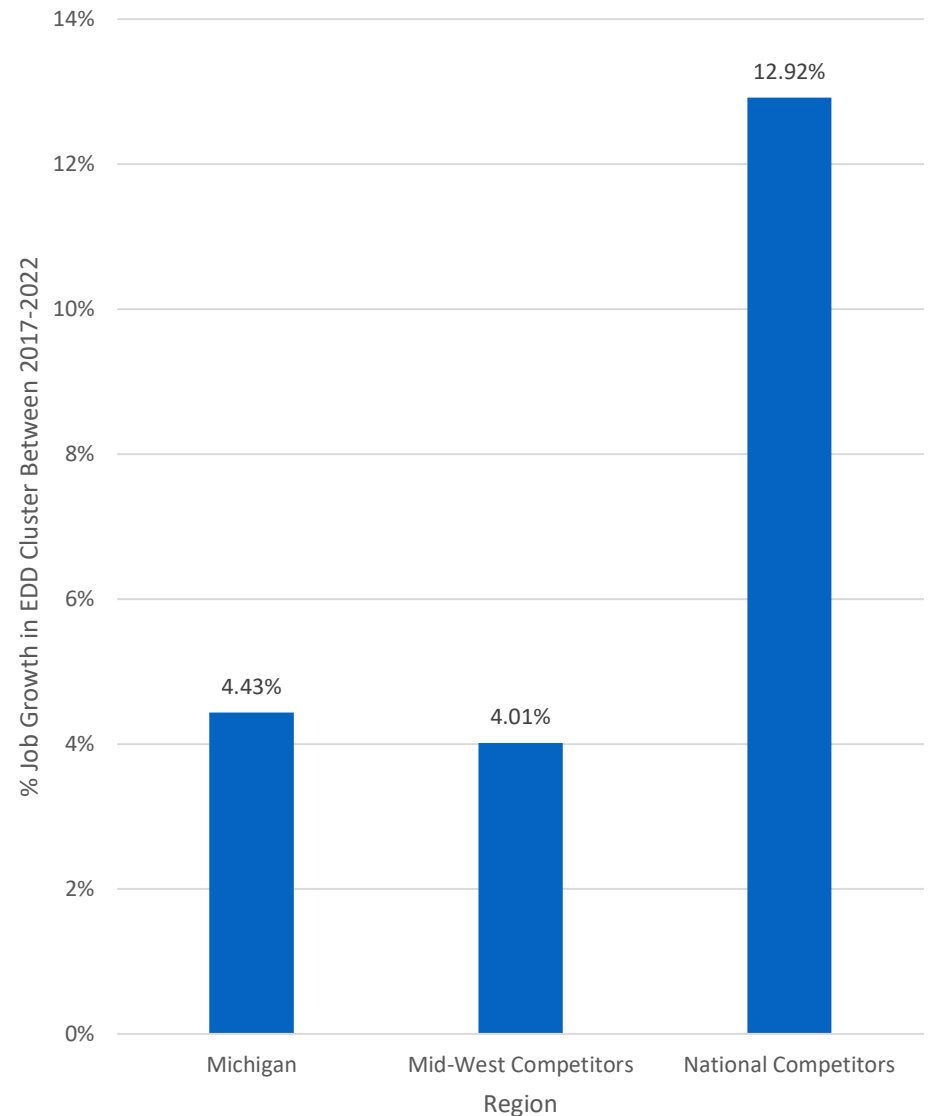


Industry Cluster Concentration

One measure of cluster competitiveness is its concentration within the state. In order to measure this cluster concentration, the location quotient is used to compare the concentration of EDD industries across states. In the graph below, Michigan is seen to have the highest location quotient when compared to its regional and national competitors. In other words, EDD jobs in Michigan are nearly two times as concentrated than in any other state in the analysis.

This indicates an opportunity for Michigan; because such a large portion of its jobs are related to EDD industries, the state can more easily adapt to industry changes and can more effectively compete with EDD initiatives in other states.

2017-2022 % Job Change

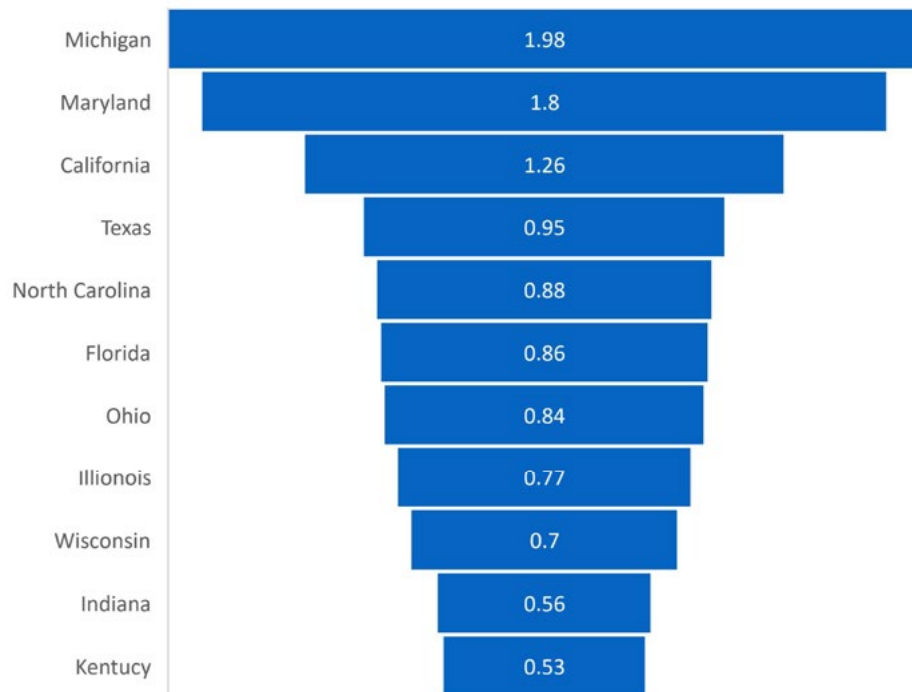


Population Growth

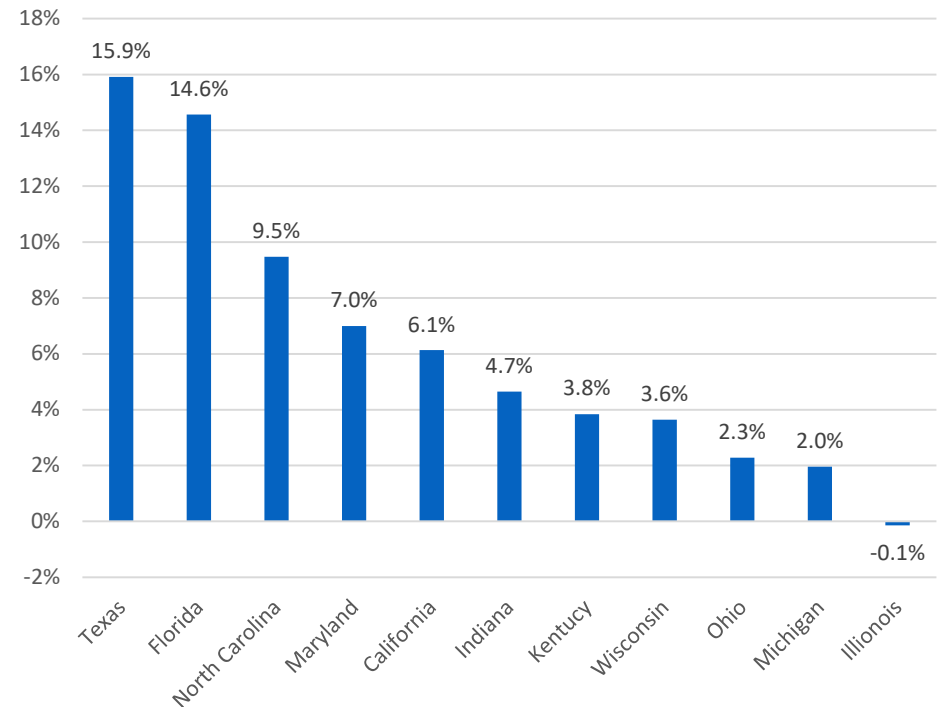
One of the most significant contributors to competitiveness within any given region is its population. A growing population indicates a healthy economy; if resources are readily available to residents and the community is a pleasant place to live and work, the population will grow. Regions with healthy, growing populations are able to more effectively compete in business expansion and attraction efforts because their workers are typically better prepared to meet the needs of employers.

In the graph below, it can be seen that the most competitive states in the country in the EDD cluster have also seen substantial population growth. The highest-performing EDD states have grown more quickly than any of the midwestern states, and the industry cluster has grown with the population. This correlation could be an important one to consider in crafting a strategy to expand the EDD cluster in the state of Michigan. Industry growth is reliant upon a well-trained, skillful population, and attempts on the state's part to grow the population could support the effort to support engineering, design, and development businesses within the state.

Industry Cluster Concentration



Population % Change (2010-2020)



Shift Share Analysis

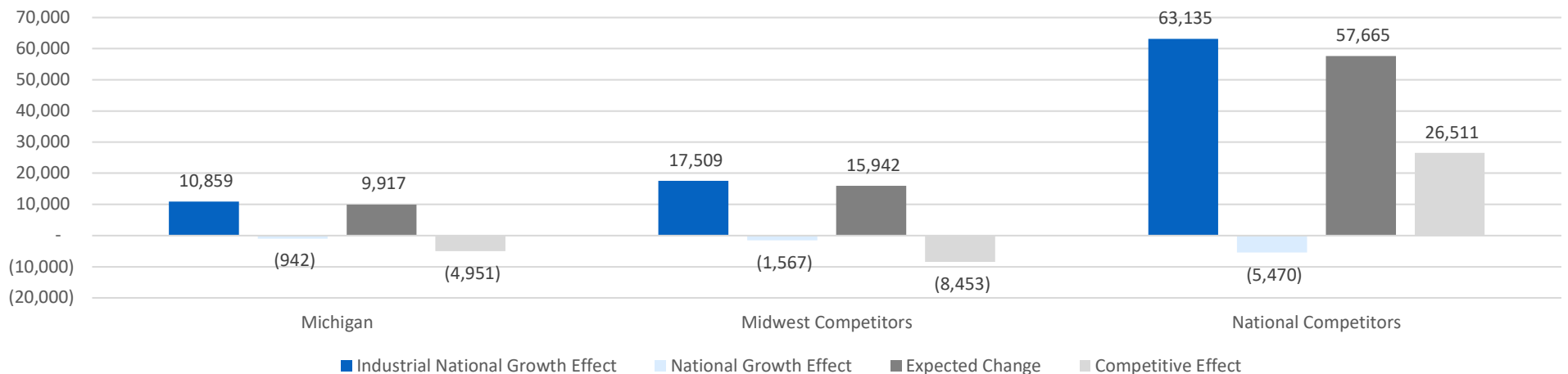
A shift share analysis can be used to understand the competitiveness of industries within a specific region. First, national and regional trends are measured for the industry of focus and compared to trends in the broader economy in order to predict the growth of the industry within the region. Then, job change over a specified period of time is compared to predicted growth in order to determine whether the industry is overperforming or underperforming in the region. If the region is overperforming and has added more jobs in the industry than expected, it can be concluded that there is some regional advantage to which the growth can be attributed; conversely, if the region is underperforming, there is likely some regional limitation which is having an adverse effect on industry growth.

There are four components of a shift share analysis: industrial mix effect, national growth effect, expected job change, and competitive effect. The industrial mix effect and national growth effect are added together to predict the number of jobs added within the specified timeframe; the sum of the two yield the expected job change.

The competitive effect figure is the product of the analysis and is ultimately used to determine whether the region holds some advantage over its competitors in the cluster. To measure the competitive effect, actual job growth in the last five years (2016-2020) is compared to expected job growth within the same period. Simply put, the competitive effect is the net difference between expected and actual job change. If job growth has outpaced projections, the competitive effect is positive; if job growth has fallen short of projections, the competitive effect is negative.

In the graph below, it can be seen that Michigan is less competitive than its regional and national competitors in the last five years. Between 2016 and 2020, the state was projected to add about 9,900 jobs; in reality, it only added about 5,000 jobs. Because the state added fewer jobs than would be expected (based on national economy and industry trends), it underperformed in the cluster. On average, Michigan’s regional partners also underperformed, and added nearly 8,500 fewer jobs than they were projected to over the five-year period. National competitors, though, vastly outpaced projections and added about 26,500 more jobs than expected. The high performance of these competitive states is likely attributable to some initiative or advantage unique to their region.

Shift Share Analysis



Best Practices

Liberty, North Carolina:

Toyota Motor Battery Factory

In 2021, Toyota Motor announced its plan to build the United States' first battery plant in North Carolina, introducing a new electric vehicle supply chain to the state and the country. As many nations throughout the world make efforts to move away from oil-fueled vehicles and toward electric vehicle (EV)-driven transportation systems, the demand for supporting technologies and manufacturing plants is increasing. As such, the North Carolina Economic Investment Committee recognized an opportunity to attract a major employer to the state, which will create jobs, support existing EV businesses in the state, and stimulate growth in the local economy.

Toyota Motors is cited to have prioritized a few key characteristics in selecting a site for the battery factory. Highly developed infrastructure, a highly capable population, and a strong workforce development ecosystem were among the most important qualities of North Carolina that resulted in its selection by company. Toyota Motors intends to invest nearly \$1.3 billion into its factory, which could dramatically improve the economy of the area in which it is developed.⁵ North Carolina perceived an opportunity to

leverage its strengths to attract a significant private investment and created an incentives package which indicated to Toyota Motors their willingness to ensure the company got the most out of the local economy and population.

This incentives package, valued at \$438.7 million, includes:⁶

- » \$79.1m Jobs Development Investment Grant
- » \$40m from the Golden Leaf Foundation
- » \$135m for site preparation work
- » \$10-15m (estimated) for transportation improvements and training initiatives
- » No cost conveyance of property at the Greensboro Randolph megasite
- » 20-year property tax reduction from the county and water and sewer service installation valued at \$31.8m from the city

The incentives package can be seen to target

for improvement the areas of the economy required by Toyota Motors for the development of the battery plant; ultimately, access to a highly skilled, local workforce is a necessity, as well as infrastructure to support plant operations. A carefully designed incentives package sends a variety of signals to a private investor; most importantly, the package above demonstrates that North Carolina understands the areas in which its economy could be improved, understands why those improvements are crucial for the success of Toyota Motor's plant, and is willing to make an investment up-front to create jobs and opportunity in the region.

⁵ <https://www.yahoo.com/video/toyota-tm-build-1st-us-124512443.html>

⁶ <https://smartincentives.org/state-incentive-packages-land-ev-projects/>

Licking County, Ohio: Intel Semiconductor Chip Production Facility

Intel Corporation, or Intel, is an American multinational corporation based out of Santa Clara, California. At the beginning of 2022, Intel made the decision to build two new semiconductor chip factories in Licking County, Ohio. This project, which includes a \$20 billion capital investment by Intel, is slated to be the largest economic event in Ohio's history.

The overwhelming majority of semiconductors are produced outside of the United States, and hundreds of thousands of manufacturing jobs have left the country in recent years. In order to strengthen the industry within the state, Ohio offered Intel an incentives package valued at more than \$2 billion, which will help Intel directly create 3,000 high-tech jobs while supporting local industries and businesses which are projected to add tens of thousands of workers in occupations like consultants, contractors, and suppliers.⁷

The state's incentive package will include:

- » \$600 million in direct cash
- » \$691 million in infrastructure spending
- » \$650 million (estimated) in job creation tax credits

The cash portion of the incentive is an "onshoring incentive grant," which is conditional on Intel building two fabrication plants and can be clawed back should Intel not deliver. Infrastructure funding will support the development of new water lines, roadways, and a cutting-edge water reclamation facility. To earn tax credits, Intel must file annual reports on the site's full-time employees. In addition to the incentives listed above, JobsOhio (the state's unique private economic development corporation) is offering \$150 million in grant funding, which will be committed to economic development and workforce training projects.⁸

Intel's semiconductor chip factories will have an immediate impact on the economy; the company will instantly become an anchor institution in the community that drives the local economy. Ohio's decision to offer such a robust incentives package is an investment, which takes into consideration the existing strengths of the community, as well as emerging national or global trends to be capitalized upon.

⁷ <https://www.jobsohio.com/intel-in-ohio/>

⁸ <https://www.dispatch.com/story/business/2022/01/28/ohio-release-details-incentive-package-intel-chip-plants/9253570002/>





Carlsbad, California: **Life in Action Talent Attraction Campaign**

Carlsbad, CA is located about 35 miles north of San Diego; although the city sits in proximity to a bustling urban hub, it wasn't receiving as much attention as other popular California tech destinations, like Silicon Valley. Despite being home to the second-largest life sciences cluster in the United States, the city felt that its talent attraction efforts were falling short; they weren't attracting enough workers to keep up with high-skill job postings.

In 2012, the city began working on the Life in Action campaign, which included the launch of a talent initiative, website, and brand that would promote the city as an optimal destination for skilled professional workers. After 18 months of research, public engagement, and discussions with local industry leaders, the city produced a website that unified the local brand and advertised Carlsbad as "innovative, entrepreneurial, and home to smart talent."

In order to understand the talent pools to which the city was most well-prepared to market, consultants researched local business assets and featured their work in the newly created website. The site was intended to look completely different from government sites; the objective was to appeal to mid- and senior-level professionals between the ages of 20 and 40 years old. In addition to the local businesses that were spotlighted on the website, quality-of-place amenities like shops, nature centers, and recreational facilities were featured in the report. The consultant firm sought to market the entire Carlsbad lifestyle, which is increasingly becoming a necessity for the attraction of younger talent.⁹

Visitors to the Life in Action website can peruse current job postings, explore local business websites, and become connected to entrepreneurial resources. On the same website, coworking spaces are listed, restaurants are advertised, and the work/life balance is noted to be the "cultural norm" within the city.¹⁰

Innovative, forward-thinking workers are the primary drivers of emerging economic trends. Many cities and regions throughout the country have identified people to be the most important contributors to economic development and have centered their business expansion and attraction strategies around talent development. In Carlsbad, top-tier workers are drawn to the city, and up-and-coming business professionals are given the resources to disrupt the economy in a positive way. As a result, the city is more able to attract growing businesses that are developing solutions to tomorrow's challenges; therefore, the city is more likely to have long-term economic success.

⁹ <https://aboutdci.com/2014/07/carlsbad-talent-attraction-campaign-showcases-the-california-citys-life-in-action/>

¹⁰ <https://carlsbadlifeinaction.com/>

Michigan: Pure Michigan

In 2008, Governor Jennifer M. Granholm established the Michigan Promotion Program, which committed \$60 million to a marketing campaign focused on bolstering the state's tourism and business attraction efforts; \$45 million of those funds were dedicated to the Pure Michigan tourism campaign. The funds were transferred from the state's 21st Century Jobs Trust Fund and allowed the state to access new markets and a new audience.¹¹

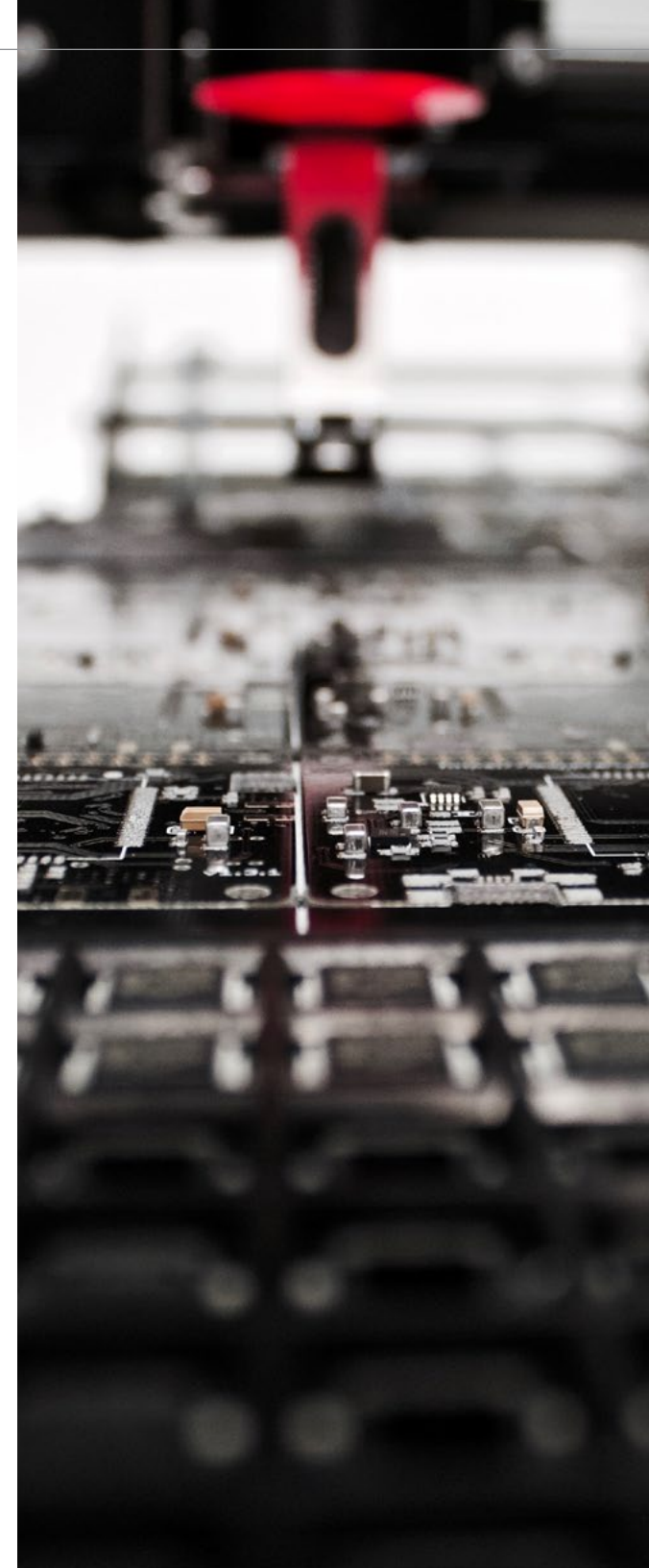
Michigan is home to many assets that distinguish the state from other regional, or even national, competitors in many industries. The Pure Michigan campaign targets tourism, specifically, and markets the state as a destination; visitors can experience in beautiful natural environments, world-class cities, and charming, small towns all within the same state.

A variety of marketing strategies are employed through the Pure Michigan campaign. In January 2022, the Michigan Economic Development Corporation made a press release outlining marketing strategies for the new year. These included clever TV commercials, billboard advertisements, and design-wrapped double-decker bus in downtown Chicago. The objective is to attract individuals of a variety of regions, lifestyles, and interests.

The Pure Michigan tourism attraction campaign is largely considered to be a massive business and industry attraction success. In 2011 alone, the campaign is reported to have generated more than 3 million trips, nearly \$1 billion in visitor spending, and a ROI of \$4.90 for every tax dollar spent.¹² Ultimately, this tourism-focused attraction campaign is an excellent model for other campaigns that can be built out to address other gaps in the state economy. In particular, a similar campaign could be carried out to increase talent attraction in Michigan, which would support the growth of a variety of industries.

¹¹ https://web.archive.org/web/20080422042635/http://michigan.gov/gov/0,1607,7-168-23442_21974-190126--,00.html

¹² <https://www.usnews.com/news/best-states/articles/2018-10-22/the-impact-of-the-pure-michigan-tourism-campaign#:~:text=The%20original%202006%20%22Pure%20Michigan,for%20every%20tax%20dollar%20spent.>



Milwaukee, Wisconsin: Water Technology Industry Cluster

Situated in the southeastern corner of the State of Wisconsin, on the shore of Lake Michigan, the City of Milwaukee has developed an expertise in an industry cluster that leverages its natural assets, local talent, and economic strengths. Milwaukee's water technology cluster has established itself as an international authority on the development of innovative solutions to the world's most pressing water challenges.

Lake Michigan is a valuable asset, and the city has capitalized on the available natural resources to develop a high-performing water technology cluster. In 2018, a study by the Brookings Institute featured the cluster as one of five national best practices in industry cluster development.¹³ The five traits determined to be critical to the cluster's success in Milwaukee were that the state is:

- » Focused on establishing a robust ecosystem, not quick job gains;
- » Industry-driven, university-fueled, government-funded;
- » Placing a collective big bet on a unique opportunity;
- » Championed by passionate, dedicated leaders, and;
- » Anchored by a physical center.

Importantly, some of Milwaukee's unique regional assets were utilized to support the cluster. First, the city took a 'shared technology' approach, which allowed it to invest in the development of highly complex technologies that advance the cluster, and other connected industries, within the region. The understanding of the interrelatedness of the water technology cluster and other, separate industries through a shared dependence on advanced technology was enough to justify an investment; as a result, the water technology and other supporting industries saw growth. The Brookings article cites the intense involvement of local firms in the creation of the cluster made it possible for region to prioritize its support, even when it was a small, up-and-coming cluster with unrealized potential.

Collaboration between industry experts, local and state governments, and academic institutions was critical for the development of the cluster. The state provided \$50 million to establish the first School of Freshwater Sciences at University of Wisconsin Milwaukee, which symbolized a joint effort on the part of several institutions. This program provided a talent pipeline which prepared the workforce to meet business needs and helped attract interested young, interested talent to the region.

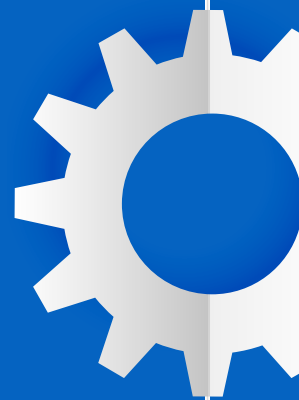
Lastly, the city decided it was in the best interest of the cluster to assign an individual, or a group of individuals, the sole task of developing the water technology cluster within Milwaukee. In 2009, the Water Council was incorporated as a 501(c)(3). Its mission is focused on economic development and investment generation, and its primary members are water technology companies, academic institutions, and government organizations. As of 2018, the Water Council employed 11 full-time staff, had 185 members, and a 22-person board. In 2017 its operating budget was \$2.84 million. The Water Council's work in the water technology cluster is an excellent example of the benefits of utilizing local assets to capitalize on international economic trends.

13 https://thewatercouncil.com/wp-content/uploads/Brookings-Metro_Rethinking-Clusters-Initiatives_Full_Report_7-25-18.pdf



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Value Chain

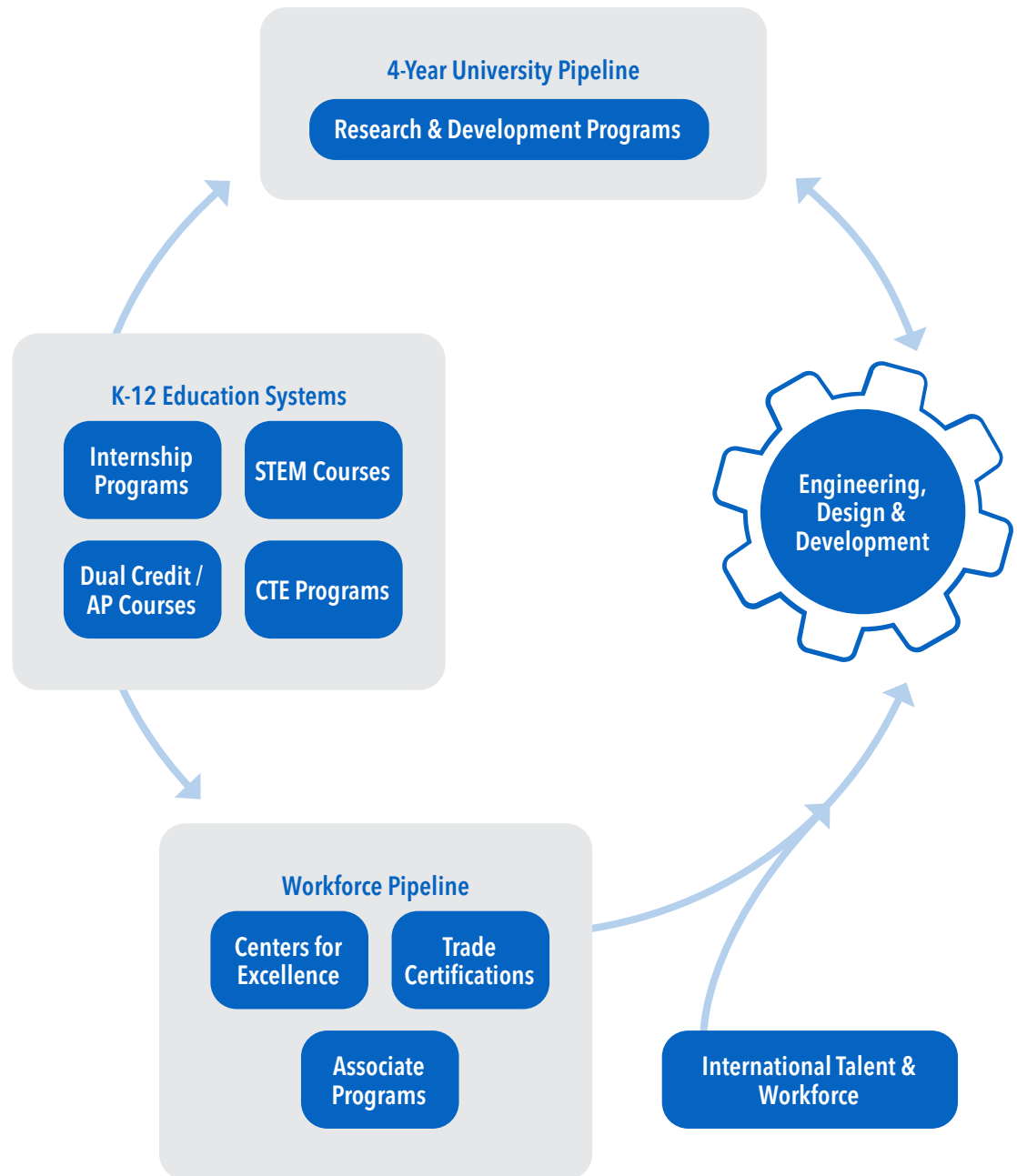


Education Pipelines

It could be noted that the value chain below looks different than other, more traditional value chains. This is due, in part, to the fact that the EDD industry cluster is unlike other clusters in the sense that its boundaries are less clearly defined. In a traditional manufacturing industry value chain, for example, an extensive graphic illustrating inputs, supply, and outputs could be constructed. Because of the diversity of the EDD cluster's industries, such a graphic would be enormously complicated, probably to the point of uselessness.

Instead of trying to construct a traditional input-output value chain, a simple breakdown of an important EDD input is provided in the educational training pipeline. The most important input required for the growth of the EDD cluster is talent; as can be seen in the education pipeline graphic, there are a few pathways taken by cluster workers.

Training starts in K-12 education systems; students become exposed to the cluster through STEM coursework, as well as CTE programs, internships, or other hands-on experiences. After graduating, some students pursue a traditional 4-year university track. The research and development programs at these universities are often engaged in ongoing relationships with industry leaders throughout the state, as a collaboration between the two benefits both parties. Other workers enter into the workforce immediately after high school and acquire their EDD skillsets through Centers for Excellence, trade schools, or associate degree programs. In addition, some talent is supplied to the cluster by the international talent market.



Industry Connections

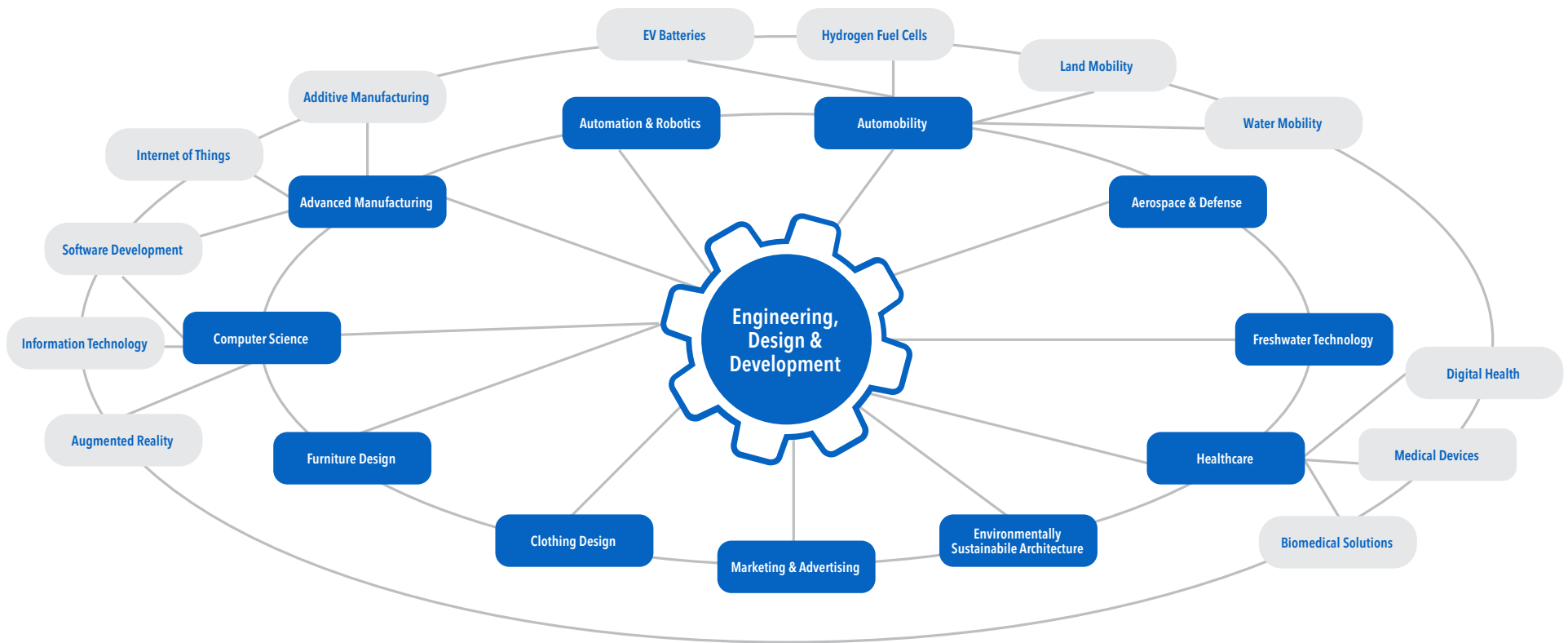
In any economic environment, industry clusters are inextricably interconnected; all provide and benefit from the support systems created by the larger economic network. The value chain, then, describes the connective framework that unites industries or industry clusters that sometimes appear to be unrelated. As the state of Michigan focuses its efforts on growing the engineering, design, and development cluster, it is important to consider the industry connections that exist within the broader context of the statewide economy.

In the graphic on the following page, some of the most important industry connections are illustrated in a value chain framework. Because the focus of this report is the EDD cluster, these three industries are located at the center of the framework; however, although the only connections illustrated above are those between the EDD cluster and the other relevant industries, it is important to note that many of the peripheral industries are also connected to each other. Therefore, to support any of the industries highlighted above is to support the entire cluster, as most are interconnected in more complicated ways than can be demonstrated clearly in a graphic. In a similar vein, it can be difficult to distinguish between connections to the individual engineering, design, or development industries; therefore, the identified industries above are connected simply to the entire EDD cluster.

An objective of the stakeholder engagement sessions was to identify where the greatest opportunities for the EDD cluster exist in Michigan; one important outcome of these sessions was the identification of supporting industries with potential for growth within the state. Some clusters are important for supporting the growth of the EDD cluster; others are supported by the growth of the EDD cluster. In many cases, the relationships are symbiotic; the growth of one industry supports the growth of other, connected industries.

Some of the industries above were identified as having potential because of national or global trends. For example, the nationwide adoption of advanced manufacturing technologies, like additive manufacturing, automation, and robotics in many sectors results in an elevated demand for the technologies that support those industries. Similarly, the healthcare environment has changed dramatically in the last couple of years; therefore, the demand for updated medical devices, digital health services, and more advanced biomedical solutions is rising rapidly. Industry and economic development professionals recognized in many of these trends an opportunity for Michigan and the EDD cluster; in building out the EDD cluster in the state, Michigan will be more able to support these trends and capitalize on shifting economic conditions.

In addition, some of the industries above were identified because of the existing assets or advantages of the state's economy. For example, some economic development professionals expressed great interest in the development of the freshwater technology industry; as the state with the most amount of freshwater coastline in the country, Michigan is uniquely positioned to develop technologies that capitalize on freshwater resources. Similarly, the state is already established as hub for automobility; therefore, can leverage its strong reputation in continuing to attract and grow mobility businesses. Understanding the existing assets within an economy are crucial for developing an action plan. Some of the assets described above, along with those included in the asset map, uniquely position Michigan to compete for business in emerging markets.



Many of the industries illustrated in the graphic above are very forward-thinking, and in some cases are hard to define. For example, the development of the environmentally sustainable architecture industry will require innovative solutions and systems which might not fit nicely into the definition of an existing industry class. This industry, and other similar industries, might not yet have data which support their growth or potential, but their demand can be deduced from other economic trends. As the prioritization of green solutions becomes more important in every aspect of the economy, architecture and design should be prepared to adapt. Michigan is home to many strong educational institutions that are typically well-suited to meeting challenges that require innovative solutions, and these colleges and universities could play a vital role in the development of these up-and-coming industries or clusters.

Ultimately, the industries identified above are part of an important value chain that must be taken into consideration while building out the EDD cluster; many of the most active industries in Michigan are interconnected, and the support of the broader economic environment will be important for the growth of specific clusters. The industries identified above, some of which exist in new, forward-thinking sectors with yet unrealized potential, are being targeted by some of the most well-connected and experienced economic development and industry professionals in the state. Their input, in the form of this value chain, provides context for other areas of the EDD cluster assessment and is ultimately used to help inform the recommendations at the end of the report.

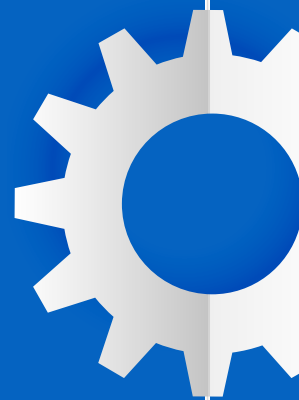


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Economic Development Strategy

Recommendations

The recommendations that follow are separated into two main focus areas: creating a stronger, more robust, and better-connected EDD Cluster throughout the state and expanding strategies for growth and retention for EDD cluster small businesses and regional populations. With each focus area are specific recommendations, each with its own set of steps for implementation. The individual steps for implementation can be found in the Implementation Matrix at the conclusion of this section.



Focus Area 1: Creating a Stronger, More Robust, and Better-Connected EDD Cluster throughout the State

Rationale

Despite the best efforts of the project team and the MEDC, there are many local governments, community organizations, industry leaders, and other stakeholders whose perspectives are absent from this report. Moving forward, addressing challenges related to access the vast network of stakeholders in the EDD cluster should be at the top of the priority list for the MEDC. A targeted effort to improve the accessibility of their network should be made at the state level, and regional coalition-building should be supported, as well. Recommendations for accomplishing this include:

- » Facilitate the creation of a statewide EDD Cluster Sector Partnership with the long-term goal of scaling this model to regions throughout Michigan
- » Enhance 21st Century Talent Pipelines and Training Programs at the Regional Level
- » Focus on building trust and collaboration between MEDC and the full EDD Cluster
- » Increase support for EDD subclusters beyond the automotive industry

The project team believes that the successful implementation of the first recommendation, to create a statewide EDD Cluster Sector Partnership, is an important step in accomplishing the other recommendations in this focus area. A statewide or regional EDD sector partnership(s) would likely have the goals and capacity to work towards improving workforce and talent pipelines, creating a greater collaborative effort within the EDD industries cluster, and build out more robust support systems for smaller subclusters, among other targets.

Should MEDC choose not to pursue the creation of a statewide or regional EDD sector partnership(s), the remaining recommendations in this section should be targets for the MEDC itself.

In either case, a priority for the MEDC should be to ensure that up-to-date contact information is kept for regional economic development corporations, top employers, community development agencies, and leading educational institutions, perhaps through a Customer Relationship Management (CRM) system. With a more accessible network, future studies will be able to gather the insights of stakeholders throughout the state more effectively.

The MEDC should support regional efforts to build coalitions, as well. Support can be given to these organizations in the form of financial resources, trainings on network management, access to data management systems, or other resources. Strong regional networks make the state's job easier; if the state can contact their regional points of contact and count on them to be tuned in to their region's stakeholders, there are fewer people to be contacted by the MEDC.

Best Practices

[Worksource Georgia HDCI Sector Partnership](#)

Worksource Georgia has put together a step-by-step guide for launching a statewide sector partnership that focuses on the importance of regional initiatives. From pre-planning to strategic planning to implementation to lessons learned, the guide provides a useful best practice resource regardless of prior experience with these kinds of partnerships.

[Detroit Regional Partnership](#)

The Detroit Regional Partnership already has established a focus on multiple EDD-related industries. The best practices they have established, in addition to the familiarity between this partnership and the MEDC, can serve as an effective model for other regional partnerships or a statewide EDD sector partnership.

[Partnership for Regional Economic Performance \(PREP\)](#)

Pennsylvania's PREP was created to support regional coordination in economic development efforts. This partnership aims to provide superior customer service to the business community and a comprehensive, efficient statewide economic delivery strategy. PREP provide grants to regional networks of economic development service providers to maintain a coordinated and client-focused delivery system.

[Kentucky Federation of Advanced Manufacturing Education \(KY FAME\)](#)

In Louisville, General Electric had to confront a significant barrier in expanding its operations: a significant labor shortage. The KY FAME consortium was created to connect employers and workers and help fill labor gaps. The program allows qualified high school students participate in a paid apprenticeship program which combines coursework on fabrication, electricity, and related topics with practical work experience on the plant floor.

[Cleveland Water Alliance](#)

The Cleveland Water Alliance is a nonprofit organization that aims to "better utilize the economic and job-creating potential of Lake Erie while also urging greater care of [their] valuable, natural asset." This organization is encouraging innovation in water technology with their "Internet of H2O" competition, bringing together software and freshwater engineering sectors to develop a "Smart Lake" strategy for Lake Erie.

[St. Louis Agriculture Technology Cluster](#)

As explained in the Brookings Institute study that highlighted this case study as a best practice, the development of a robust economic ecosystem around an emerging industry cluster is a necessity for long-term success. In St. Louis, BioSTL, the Danforth Plant Science Center, and the St. Louis Economic Development Partnership, have focused on the agricultural technology cluster to spur dynamism in the region.

Additional Resources

[National Skills Coalition Sector Partnership Policy Toolkit](#)

[Next Generation Sector Partnership Training Guide](#)

Focus Area 2: Expand Strategies for Growth and Retention for EDD Cluster Small Businesses and Regional Workforce

Rationale:

Numerous reports from regional stakeholders around the state noted difficulty in maintaining the industries, businesses, and workers that are central to their local economies due to shrinking populations around the state. Small business and regional workforce sustainability is critical to keeping the entire state competitive and a leader in the EDD cluster. Recommendations for this focus area are:

- » Allocate resources to incentivize and facilitate growth for EDD Cluster small businesses
- » Prioritize worker retention and attraction for EDD Cluster industries
- » Develop programs to aid in the growth of regional workforces

Many engineering firms and a vast majority of design businesses employ fewer than five people, and these small businesses are critical to the strength of the EDD cluster. To better support existing small businesses across the state, the project team encourages MEDC to allocate financial resources to regional partners, such as Pure Michigan Business Connect (PMBC), to bolster their business retention and expansion (BRE) outreach activity. Strong regional BRE outreach programs allow local and regional economic development practitioners to provide direct support to small businesses operating within the EDD cluster. MEDC should aim to increase collaboration with regional partners to promote programs such as the Capital Access Program, Equity funding opportunities, and SSBCI funding sources. Finally, MEDC should continue to promote programs such as the buyer and supplier matchmaking program, export and international trade assistance, and government contracting and bid targeting assistance. A more targeted campaign aimed at small EDD cluster companies will pay dividends, as these companies can utilize the tools available to them to expand, grow, and support larger businesses in the various target industry value chains.

As the state's premier economic development organization, MEDC should prioritize population retention and growth by continuing to allocate resources and focusing efforts to stabilize the population and support growth across Michigan. It was noted in numerous stakeholder engagement sessions that a stagnant state population is having a detrimental impact on the labor force, as well as business attraction and retention efforts across all industries, including those included in the EDD cluster. The data support these assertions, as the national competitor states that are outperforming Michigan in the EDD cluster are also seeing much greater population growth.

The project team encourages MEDC to consider how to support communities across the state with population retention and growth initiatives. This could include a multitude of approaches, including more intentional funding to help communities address quality of life, investing in local or rural infrastructure, and developing local and regional comprehensive plans.

In addition to the provision of more intentional regional support, the project team encourages MEDC to develop and execute an integrated marketing campaign to attract new residents to the state. Further, workforce and business attraction campaigns can be targeted toward international markets. Numerous stakeholders suggested that attracting international talent and companies should be a central component growing the state's population and the EDD cluster. International talent is leading the way in some of the fastest-growing and front-line technology fields.

In summary, a growing, skilled population will be critical for future efforts to expand the EDD cluster in the state of Michigan. In order to ensure the population and workforce keeps up with employer demand in the cluster, MEDC can: (1) leverage existing assets in a resident attraction campaign, (2) ensure regional communities are supported in growing their respective populations, and (3) focus on attracting international talent and expertise, where possible.

Best Practices

[Grenada, Mississippi Economic Development District](#)

The Grenada County Economic Development District (GCEDD) has made business retention and expansion a priority for the last eight years; as a result, they've help local businesses create more than 2,000 new jobs. To support local businesses, the GCEDD offers training, leadership and mentorship programs, incentive programs, and research focused on improving the local business environment. Roundtable events, surveys, and targeted incentive programs are important components of their well-rounded business retention and expansion strategy.

[Illinois Department of Commerce Clearinghouse](#)

The Illinois Department of Commerce has created a clearinghouse of information for entrepreneurs navigating the process of starting or maintaining a new business. This one-stop resource provides links to other state resources which can be useful for entrepreneurs, like Small Business Development Centers (SBDCs), Procurement Technical Assistance Centers, International Trade Centers, and more.

[Boise Valley Economic Partnership](#)

Idaho has seen the fastest population growth of any of the United States for the last five years. Boise Valley, in particular, is working to attract talent to live and work in the region. To do so, they're working with local technology companies to launch recruitment initiatives, they've created a website, and they collaborate with other regions in the state to collectively market Idaho as a residential destination.

[Greater Houston Partnership](#)

The Greater Houston Partnership was created in 1840 to market the Houston region as one of the best places in the country to live, work, and build a business. Their website advertises workforce development and employment opportunities and provides resources for individuals interested in relocating to Houston. Its strongest industries are advertised, as well as its strong culture of art and outdoor recreation.



Implementation Matrix

1. Creating a Stronger, More Robust, and Better-Connected EDD Cluster Throughout the State

Recommendation	Implementation	Best Practices
1.1. Facilitate the Creation of a Statewide EDD Cluster Sector Partnership with the Long-Term goal of Scaling this Model to Regions throughout Michigan	1.1.1 Research statewide and/or regional sector partnership models across the nation	Worksource Georgia HDCI Sector Partnership
	1.1.2 Identify and engage employers and training providers on the concept of EDD partnership(s)	
	1.1.3 Identify funding sources to support creation of partnership(s)	
	1.1.4 Create working group for subclusters beyond the automotive industry	Next Generation Sector Partnership Training Guide
	1.1.5 Create working group for regional priorities within a statewide partnership and look to scale model to develop possibilities for regional partnerships in the EDD cluster where appropriate	Detroit Regional Partnership
1.2 Enhance 21st Century Talent Pipelines and Training Programs at the Regional Level	1.2.1 Engage businesses across the EDD cluster to better understand workforce training needs, specifically in the growth areas of Industry 4.0, automation, engineering, bioengineering, etc.	
	1.2.2 Research EDD industries training best practices, specifically training offered through technical schools, community colleges, and non-traditional educational institutions	
	1.2.3 Develop regular channels for communication between employers and training providers to ensure training methods can continue to adapt with the needs of these evolving industries	Kentucky Federation of Advanced Manufacturing Education (KY FAME)
	1.2.4 Conduct a Workforce Needs Assessment to determine and prioritize gaps in talent pipeline and training needs	
1.3 Focus on Building Trust and Collaboration between MEDC and the full EDD Cluster	1.3.1 Research and assess CRM systems designed for economic development purposes with the end goal of statewide implementation to better track outreach visits and key contact information	
	1.3.2 Create EDD cluster advisory network with regularly scheduled outreach to allow MEDC to continue to stay informed about needs and changes to these industries	
	1.3.3 Convene Economic Development Collaboratives to build consensus around more effective statewide collaboration	
	1.3.4 Engage regional and local economic development agencies across the state to better understand resource and support needs	

Recommendation	Implementation	Best Practices
1.4 Increase Support for EDD Subclusters Beyond the Automotive Industry	1.4.1 Explore emerging technology and green/sustainable industry sectors for investment opportunities to become a national leader in emerging and sustainable markets	St. Louis Agriculture Technology Cluster
	1.4.2 Engage EDD cluster businesses to better understand opportunities in adjacent industries	
	1.4.3 Research funding opportunities for green/sustainable industries such as freshwater initiatives, sustainable design, etc.	Cleveland Water Alliance

2. Expand Strategies for Growth and Retention for EDD Cluster Small Businesses and Regional Workforce

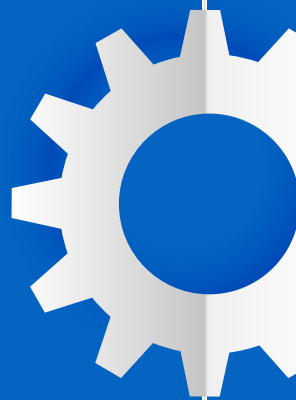
Recommendation	Implementation	Best Practices
2.1 Allocate Resources to Incentivize/Facilitate Growth among EDD Cluster Small Businesses	2.1.1 Engage the statewide SBDC network to better understand current programs and resources offered to EDD-focused businesses	
	2.1.2 Survey Economic Development Collaborative partners to understand current incentives, programs, and resources offered to EDD cluster small businesses	
	2.1.3 Work with state legislature to explore possible creative incentives and financial resources to support EDD cluster small businesses around the state	Grenada, Mississippi Economic Development District
	2.1.4 Develop marketing campaign to ensure EDD cluster small businesses are aware of current and future statewide initiatives and financial resources	Illinois Department of Commerce Clearinghouse
2.2 Prioritize Worker Retention and Attraction for EDD Cluster	2.2.1 Leverage success of the Pure Michigan campaign to focus on talent attraction, potentially focusing on green industries/EDD cluster and the university corridor as fitting the "Pure Michigan" framework	Greater Houston Partnership
	2.2.2 Work with universities to identify international students in EDD fields of study and create pathways to citizenship and employment pipelines	
	2.2.3 Investigate options for tuition subsidies or reimbursement for graduates within EDD industries	
2.3 Develop Programs to Aid in the Growth of Regional Populations	2.3.1 Engage Economic Development Collaboratives to better understand funding needs to address quality of life improvements, including infrastructure, housing, planning, etc.	
	2.3.2 Investigate options to incentivize worker and/or small business relocation to Michigan's less populous regions	Boise Valley Economic Partnership
	2.3.3 Investigate options for tuition subsidies or reimbursement for graduates who remain within certain regions for a set period of time	





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Appendix



EDD Industries

The industries that make up the EDD industry cluster, as defined and codified by the North American Industry Classification System (NAICS), are:

NAICS Code 541380 - Testing Laboratories

This industry comprises establishments primarily engaged in performing physical, chemical, and other analytical testing services, such as acoustics or vibration testing, assaying, biological testing (except medical and veterinary), calibration testing, electrical and electronic testing, geotechnical testing, mechanical testing, nondestructive testing, or thermal testing. The testing may occur in a laboratory or on-site.

NAICS Code 541330 - Engineering Services

This industry comprises establishments primarily engaged in applying physical laws and principles of engineering in the design, development, and utilization of machines, materials, instruments, structures, processes, and systems. The assignments undertaken by these establishments may involve any of the following activities: provision of advice, preparation of feasibility studies, preparation of preliminary and final plans and designs, provision of technical services during the construction or installation phase, inspection and evaluation of engineering projects, and related services.

NAICS Code 541410 - Interior Design Services

This industry comprises establishments primarily engaged in planning, designing, and administering projects in interior spaces to meet the physical and aesthetic needs of people using them, taking into consideration building codes, health and safety regulations, traffic patterns and floor planning, mechanical and electrical needs, and interior fittings and furniture. Interior designers and interior design consultants work in areas, such as hospitality design, health care design, institutional design, commercial and corporate design, and residential design. This industry also includes interior decorating consultants engaged exclusively in providing aesthetic services associated with interior spaces.

NAICS Code 541420 - Industrial Design Services

This industry comprises establishments primarily engaged in creating and developing designs and specifications that optimize the use, value, and appearance of their products. These services can include the determination of the materials, construction, mechanisms, shape, color, and surface finishes of the product, taking into consideration human characteristics and needs, safety, market appeal, and efficiency in production, distribution, use, and maintenance. Establishments providing automobile or furniture industrial design services or industrial design consulting services are included in this industry.

NAICS Code 541430 - Graphic Design Services

This industry comprises establishments primarily engaged in planning, designing, and managing the production of visual communication to convey specific messages or concepts, clarify complex information, or project visual identities. These services can include the design of printed materials, packaging, advertising, signage systems, and corporate identification (logos). This industry also includes commercial artists engaged exclusively in generating drawings and illustrations requiring technical accuracy or interpretative skills.

NAICS Code 541490 - Other Specialized Design Services

This industry comprises establishments primarily engaged in providing professional design services (except architectural, landscape architecture, engineering, interior, industrial, graphic, and computer systems design).

NAICS Code 541713 - Research and Development in Nanotechnology

This U.S. industry comprises establishments primarily engaged in conducting nanotechnology research and experimental development. Nanotechnology research and experimental development involves the study of matter at the nanoscale (i.e., a scale of about 1 to 100 nanometers). This research and development in nanotechnology may result in development of new nanotechnology processes or in prototypes of new or altered materials and/or products that may be reproduced, utilized, or implemented by various industries.

NAICS Code 541715 - Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)

This U.S. industry comprises establishments primarily engaged in conducting research and experimental development (except nanotechnology and biotechnology research and experimental development) in the physical, engineering, and life sciences, such as agriculture, electronics, environmental, biology, botany, computers, chemistry, food, fisheries, forests, geology, health, mathematics, medicine, oceanography, pharmacy, physics, veterinary and other allied subjects.

NAICS Code 541720 - Research and Development in the Social Sciences and Humanities

This industry comprises establishments primarily engaged in conducting research and analyses in cognitive development, sociology, psychology, language, behavior, economic, and other social science and humanities research.



Statewide EDD Stakeholder Survey

1. Company/Organization/Institution
2. Which of the following best describes your company, organization, or institution?
3. What is the community that you serve? List the town, city, county, counties, or region that you primarily engage with and serve in your work.
4. What are the top industries within the community that you serve? Select up to 5 industries.
5. List 5 of the largest employers within the community that you serve.
6. What are the prominent engineering companies, firms, nonprofits, and trade associations in your community?
7. What are the prominent design companies, firms, nonprofits, and trade associations in your community that support engineering and development (i.e. interior design, industrial design, graphic design, or any other form of specialized design that supports engineering and development)?
8. What are the prominent research and development companies, firms, nonprofits, and trade associations in your community?
9. What are your community's key workforce development, higher education, and other talent pipeline programs that prepare individuals for careers in engineering, design services, and research and development?
10. Based on the assets you identified above, list the EDD collaboration and EDD partnerships within your community. Which EDD businesses and institutions work together and collaborate? Examples may include partnerships and collaboration between engineering firms, design services, and research and development business and institutions.
11. Have you undertaken an exhaustive review of the assets in your community related to EDD?
12. Would you be willing to share that collection of EDD assets with us?
13. Do you have additional information and resources about the EDD cluster/partners, talent pipelines, and community assets that you would be willing to share? Examples may include a directory of businesses by industry, a spreadsheet of EDD services, or information about talent pipelines.
14. As part of this project, TPMA is conducting virtual focus groups and one-on-one interviews with stakeholders throughout the state to learn more about the EDD cluster, sector partnerships, and the future of the cluster. Would you be willing to participate in a focus group or interview during the month of February?
15. To contact you about a future focus group and/or interview, please provide your contact information:

Document Review

The project team reviewed the following documents:

- » I-69 Thumb Region website
- » Advantage Oakland Website & Oakland Bay Future Inc. Website
- » Central Upper Peninsula CEDS
- » Clinton County Catalyst website
- » Cornerstone Alliance Strategic Plan
- » Cornerstone Alliance Website
- » Detroit Economic Growth Corporation
- » Detroit Regional Partnership | Interactive Business Case
- » Discover Northeast Michigan Website
- » Eastern Upper Peninsula CEDS
- » Economic Outlook 2021-2021
- » Flint & Genesee Group website
- » Flint and Genesee Chamber of Commerce website
- » Genesee County's Forward Together: A Shared Vision for Economic Prosperity
- » Grand Traverse Economic Development Corporation Website
- » Great Lakes Bay Regional Alliance Website
- » Huron County Economic Development Corporation website
- » Lake Shore Strategic Plan
- » Lansing Economic Area Partnership's website
- » Lenawee County Economic Development Toolbox
- » Livingston County Economic Action Plan
- » Macomb County Planning and Economic Development
- » Michigan Economic Development Corporation Economic Overview
- » Michigan Works! Northeast Consortium Website
- » Middle Michigan Development Corporation website
- » Middle Michigan Development Corporation: 2020 Annual Report
- » Northeast Michigan Prosperity & Resiliency CEDS
- » Northeast Michigan Regional Prosperity Initiative (2015-2025)
- » Northwest Lower Michigan CEDS
- » Northwest Michigan Works! Website
- » Oakland County Economic Development: Advantage Oakland
- » Otsego County Alliance Website
- » Right Place Manufacturing Leadership Summit 2021: Taking XR from COOL to TOOL
- » Saginaw County: 2020 Economic Report
- » Saginaw Future Inc. Website
- » SEMCOG CEDS
- » SEMCOG Economic Development Strategy
- » Shiawassee Economic Development Partnership website
- » Southwest Michigan First Website
- » The Right Place 2020 Annual Report
- » The Right Place: 2020-2022 Regional Plan
- » The Right Place: Investment Campaign 2019-2023
- » The Right Place: West Michigan Overview
- » Tri-County Regional Planning Commission website
- » Tuscola County Economic Development Corporation website
- » University of Michigan Website & Engineering School Strategic Plan
- » UP Michigan Works! Website
- » Wayne County Economic Development
- » West Michigan Economic Development Website
- » Western Upper Peninsula CEDS
- » WorkLive UP Website





Document Review

Date: December 2021

Submitted to:
Michigan Economic Development Corporation

Document Review Overview

This Document Review includes findings from a review of local, county, and regional development plans, reports, and websites with the ultimate goal of providing further context around current planning efforts, areas of concurrence, and regional priorities. Thomas P. Miller & Associates (TPMA) conducted desktop research, reviewed existing reports and documents, and synthesized findings to create the following deliverable. Given that TPMA is tasked with researching the Engineering, Design, and Development (EDD) cluster for this overall project, the research team identified EDD assets, partners, talent pipelines, and training programs. This document is organized by the ten regions MEDC has identified on its map of Business Development Managers.

This Document Review is not meant to be a comprehensive compilation of all assets, initiatives, and stakeholders; nor is it meant to capture all EDD assets within a region. Rather, it is a brief overview of key components that counties, regions, and economic development partners have highlighted and prioritized and that fall within and outside of the EDD cluster. This initial overview serves as a foundation upon which TPMA will use to conduct further research on the EDD and adjacent clusters, engage stakeholders, and create an EDD cluster asset map.

Upper Peninsula Region

Counties: Alger, Baraga, Chippewa, Dickinson, Delta, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, and Schoolcraft

REGIONAL VISION

The region seeks to create an ecosystem of well-trained development professionals that build a culture of entrepreneurship and innovation.

REGIONAL OVERVIEW

The region is home to education institutions, international business, and economic development assets.

HIGH PRIORITY INDUSTRIES

- 1) Advanced Manufacturing
 - a. The U.P. is home to a variety of "made in America" manufacturers that make products from printed circuit boards to helicopters.
- 2) Defense and Aerospace
 - a. Over 17 engineering firms and advance manufacturers in the Upper Peninsula design, prototype, and manufacture for aerospace projects.
- 3) Technology and Engineering
 - a. Michigan Tech and the business community is leveraging over \$150 million to grow their capacity to design, develop, and deliver human-centered innovations.
- 4) Medical Devices
 - a. The U.P. produces medical products such as orthopedic pins and surgical instruments, printed circuit boards, and other diagnostic equipment.

MAJOR EMPLOYERS

- 1) Lake Superior State, Sault Ste. Marie
- 2) Michigan Technological University, Houghton
- 3) Northern Michigan University, Marquette

ANCHOR INSTITUTIONS

- 1) Invest UP, Marquette
- 2) Lake Superior State, Sault Ste. Marie
- 3) Michigan Technological University, Houghton
- 4) Northern Michigan University, Marquette

Documents Reviewed

- Central Upper Peninsula CEDS
- Eastern Upper Peninsula CEDS
- UP Michigan Works! Website
- Western Upper Peninsula CEDS
- WorkLive UP Website

Key Economic Development Partners

- UP Michigan Works!
- WorkLiveUP

Key Economic Development Goals

- Attract and retain cutting-edge industries
- Grow the number of available jobs

EDD CLUSTER

Assets & Partners

- InvestUP
- MTEC SmartZone
- Michigan Manufacturing Technology Center

Talent Pipelines and Training Programs

- Lake Superior State
 - Home to 9 engineering and technology programs.
- Michigan Technological University
 - Research initiatives include Atmospheric and Space Sciences, Energy and Sustainability, Robotics and Mechanics, Ocean Sciences, and many more.
 - Home to 12 undergraduate and 29 graduate engineering programs, 2 computing- and artificial intelligence-related degree programs, and a Medical Micro-Device Engineering Research Lab
- Northern Michigan University
 - Home to 8 engineering programs.

Northwest Region

Counties: Antrim, Benzie, Charlevoix, Emmet, Grand Traverse, Kalkaska, Leelanau, Manistee, Missaukee, Wexford

REGIONAL VISION

The region seeks to build a stronger community by enhancing quality of life, talent, business, and community development.

REGIONAL OVERVIEW

The region has growing industries and employers that have the potential to attract EDD-related businesses.

HIGH PRIORITY INDUSTRIES

- 1) Manufacturing
 - a. Region exported \$1.3 billion in 2016
 - b. Fastest growing industry that provides the 5th most jobs of all industries in the region
- 2) Agriculture, Forestry, Fishing and Hunting
 - a. Northwest Michigan Agriculture and Food System Sector Alliance has been influential in creating partnerships between farmers, businesses, government officials, and other key stakeholders.
- 3) Health Care and Social Assistance
 - a. This is the second most quickly growing industry in the region (after manufacturing)

MAJOR EMPLOYERS

- 1) Atlas Space Operations, Traverse City
- 2) Britten Banners, Garfield Township
- 3) Hagerly, Traverse City
- 4) Munson Medical Center, Traverse City
- 5) Tyson Foods, Multiple Locations

ANCHOR INSTITUTIONS

- 1) Grand Traverse EDC, Traverse City
- 2) North Central Michigan College, Petoskey
- 3) Northwestern Michigan College, Traverse City



Documents Reviewed

- Grand Traverse Economic Development Corporation Website
- Michigan Economic Development Corporation Economic Overview
- Northwest Lower Michigan CEDS
- Northwest Michigan Works! Website

Key Economic Development Partners

- Networks Northwest, Traverse City
- Northern Lakes Economic Alliance, Boyne City
- Northwest Michigan Works!
- Northern Nexus
- Thrive North

Key Economic Development Goals

- Attract, develop, and retain businesses
- Develop talent and workforce

EDD CLUSTER

Assets & Partners

- Global Trade Alliance of Northern Michigan

Talent Pipelines and Training Programs

- North Central Michigan College
 - Offers a variety of programs in computing, mechanical engineering, and natural sciences.
- Northwestern Michigan College
 - Offers an Associate of Science in Engineering, as well as other EDD-related courses

Northeast Region

Counties: Alcona, Alpena, Cheboygan, Crawford, Iosco, Montmorency, Ogemaw, Oscoda, Otsego, Presque Isle, and Roscommon

REGIONAL VISION

The region seeks to provide current and future generations with a vibrant, sustainable, and prosperous community.

REGIONAL OVERVIEW

While not as densely populated as other regions, the region has several economic development partners that are strengthening local communities and economies.

HIGH PRIORITY INDUSTRIES

- 1) Health Care and Social Assistance
 - a. Industry is expected to grow by more than 10% in the next 5 years
 - b. More than 1,400 establishments employed around 14,000 workers in this industry in 2018
- 2) Manufacturing
 - a. The northeast region is home to more than 330 manufacturing establishments which employ more than 7,200 workers
 - b. Northeast Michigan's Regional Prosperity Initiative identifies advanced manufacturing as the top target industry
- 3) Energy, Efficiency, and Renewables
 - a. Water transportation industry is expected to grow by more than 20% in the next 5 years
 - b. Talent attraction strategies have been developed to support growth of this industry.

MAJOR EMPLOYERS

- 1) CRST International, Multiple Locations
- 2) Michael Foods, Multiple Locations
- 3) United Farmers' Cooperative, Multiple Locations

ANCHOR INSTITUTIONS

- 1) Alpena Community College, Alpena
- 2) Kirtland Community College, Grayling
- 3) Ostego Memorial Hospital, Ostego
- 4) North Central Michigan College, Cheboygan
- 5) North Central Michigan College Gaylord Center, Gaylord
- 6) Soliant Health, Multiple Locations



Documents Reviewed

- Discover Northeast Michigan Website
- Michigan Works! Northeast Consortium Website
- Northeast Michigan Prosperity & Resiliency CEDS
- Northeast Michigan Regional Prosperity Initiative (2015-2025)
- Otsego County Alliance Website

Key Economic Development Partners

- Discover Northeast Michigan, Gaylord
- Michigan Works! Northeast Consortium
- Otsego County Economic Alliance, Gaylord

Key Economic Development Goals

- Support target industries
- Attract and develop talent
- Increase inter-regional collaboration

EDD CLUSTER

Assets & Partners

- Discover Northeast Michigan
- Kirtland Community College
- Otsego County Economic Alliance

Talent Pipelines and Training Programs

- Alpena Community College
 - Variety of Associate in Science and Bachelor of Science degrees in EDD-related fields, such as Pre-Engineering, I.T., and Electrical Systems Technology.
- Kirtland Community College
 - Offers an Associate in Science and Arts, an Associate in Applied Science, STEM-related certificates, and other EDD-related courses to prepare students for other, more intensive training or academic programs.

West Michigan Region

Counties: Allegan, Barry, Ionia, Kent, Lake, Mason, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, Osceola, and Ottawa

REGIONAL VISION

The region seeks to become a community that is resilient, productive, and equitable.

REGIONAL OVERVIEW

West Michigan has a total population of just over 1.6 million. A primary focus of the region is growing its manufacturing industry.

HIGH PRIORITY INDUSTRIES

- 1) Manufacturing
 - a. This industry makes up 20% of all industries in the region with 149,213 manufacturing jobs.
 - b. The sub-cluster of advanced manufacturing includes 2,500+ manufacturers and \$6.3 billion in annual exports.
- 2) Health Care and Social Assistance
 - a. This industry makes up 13% of industries in the region and includes 98,020 jobs.
- 3) IT & Communications
 - a. The industry has a regional growth rate of 26.6% (national growth rate is 21.4%).
 - b. The employment costs are 23% below the national average.

MAJOR EMPLOYERS

- 1) Gerber Products, Fremont
- 2) Meijer Inc. Grocery, Grand Rapids
- 3) Perrigo, Grand Rapids
- 4) Spectrum Health, Grand Rapids

ANCHOR INSTITUTIONS

- 1) Calvin University, Grand Rapids
- 2) Grand Rapids Community College, Grand Rapids
- 3) Hope College, Holland
- 4) Mercy Health Saint Mary's Healthcare, Grand Rapids
- 5) Muskegon Community College, Muskegon
- 6) Spectrum Health, Grand Rapids



Documents Reviewed

- Lake Shore Strategic Plan
- Right Place Manufacturing Leadership Summit 2021: Taking XR from COOL to TOOL
- The Right Place 2020 Annual Report
- The Right Place: West Michigan Overview
- The Right Place: Investment Campaign 2019-2023
- The Right Place: 2020-2022 Regional Plan
- West Michigan Economic Development Website

Key Economic Development Partners

- The Right Place, Grand Rapids
- West Michigan Economic Development

Key Economic Development Goals

- Talent attraction
- Grow as a hub for manufacturing

EDD CLUSTER

Assets & Partners

- Lakeshore Advantage
- Th3rd Coast Digital Solutions
- The Right Place
- West Michigan Economic Development

Talent Pipelines and Training Programs

- Calvin University
 - The University offers degrees in biomedical engineering, chemical engineering, civil and environmental engineering, electrical and computer engineering, and mechanical engineering.
- Grand Rapids Community College
 - GRCC offers 10 academic pathways that contain a total of 85 associate and certification programs. Key academic pathways include art, architecture, and mechanical design; computer information systems; manufacturing and applied technology; and math, science, and engineering.

East Central Michigan Region

Counties: Arenac, Bay, Clare, Gladwin, Gratiot, Isabella, Midland, and Saginaw

REGIONAL VISION

The region seeks to be a development driver for businesses and communities and a leader in STEM education and talent pipelines.

REGIONAL OVERVIEW

East Central Michigan is home to over 561,000 residents. The region prides itself on its education initiatives, specifically its robust STEM ecosystem.

HIGH PRIORITY INDUSTRIES

- 1) Manufacturing
 - a. Manufacturing focus areas include automotive, specialty, medical, chemical, and advanced manufacturing.
 - b. Dow Chemical's presence in the region has created one of the largest chemical manufacturing clusters globally.
- 2) Agribusiness
 - a. In Bay County, over 50% of land is used for farming and food processing. Michigan Sugar Company is the third largest beet sugar processor in the U.S.
 - b. Saginaw County has over 1,250 farms and is third in Michigan for corn and soy production.
- 3) Health Care and Social Services
 - a. The region has a vast array of over 1,500 health care and social service providers.
 - b. The region employs over 52,000 in this industry.

MAJOR EMPLOYERS

- 1) Dow Chemical, Midland
- 2) GM Powertrain, Bay City
- 3) Garber Management Group, Saginaw
- 4) Hemlock Semiconductor, Hemlock
- 5) Nexteer Automotive, Saginaw

ANCHOR INSTITUTIONS

- 1) Central Michigan University, Mt. Pleasant
- 2) McLaren Healthcare, Bay City
- 3) Michigan State University, Midland
- 4) Mid-Michigan Health, Midland



Documents Reviewed

- Bay Future Inc. Website
- Great Lakes Bay Regional Alliance Website
- Middle Michigan Development Corporation website
- Middle Michigan Development Corporation: 2020 Annual Report
- Saginaw County: 2020 Economic Report
- Saginaw Future Inc. Website

Key Economic Development Partners

- Bay Future Inc., Bay City
- Great Lakes Bay Michigan Works!, Multiple Locations
- Great Lakes Bay Regional Alliance
- Middle Michigan Development Corporation, Mt. Pleasant
- Saginaw Future Inc., Saginaw

Key Economic Development Goals

- Supporting business retention and growth
- Business attraction
- Talent attraction

EDD CLUSTER

Assets & Partners

- Dow Chemical
- Great Lakes Bay Regional STEM Initiative
- MiCareerQuest Middle Michigan

Talent Pipelines and Training Programs

- Saginaw Valley State University
 - The University offers several degree options in electrical engineering, geographic information systems, graphic design, and mechanical engineering.
- STEM Pipeline
 - The region has a robust STEM pipeline that provides training for in-demand STEM careers. One key initiative is MiCareerQuest Middle.



East Michigan Region

Counties: Genesee, Huron, Lapeer, Sanilac, Shiawassee, St. Clair, and Tuscola

REGIONAL VISION

The region seeks to become a top community in the state by enhancing jobs, talent, the economy, and quality of life.

REGIONAL OVERVIEW

The region's 854,000 residents enjoy over 51,000 acres of recreational land. The robust high priority industries have the potential to further collaborate with EDD partners.

HIGH PRIORITY INDUSTRIES

- 1) Manufacturing
 - a. Flint and Genesee area has over 300 manufacturing companies that employ over 13,000 people.
 - b. In 2021, the region launched its Industry 4.0 initiative.
- 2) Agribusiness
 - a. Huron County is ranked number one in Michigan for acres of sugarbeets, dry edible beans, and wheat.
 - b. Tuscola County is first in the state for acres of organic farms.
- 3) Transportation and Distribution
 - a. The region has leading transportation and distribution companies that work throughout the state.
 - b. By 2030, the region's total freight volume will be 71.7 million tons, a 35% increase from 2009.

MAJOR EMPLOYERS

- 1) General Motors, Flint
- 2) Huron Inc, Lexington
- 3) Indian Trails, Owosso
- 4) Machine Tool & Gear Inc, Corunna

ANCHOR INSTITUTIONS

- 1) Ascension Genesys Hospital, Grand Blanc
- 2) McLaren Health Care Corporate Office, Grand Blanc
- 3) Mott Community College, Flint & Lapeer
- 4) University of Michigan- Flint, Flint



Documents Reviewed

- Flint and Genesee Chamber of Commerce website
- Flint & Genesee Group website
- Genesee County's Forward Together: A Shared Vision for Economic Prosperity
- Huron County Economic Development Corporation website
- I-69 Thumb Region website
- Shiawassee Economic Development Partnership website
- Tuscola County Economic Development Corporation website

Key Economic Development Partners

- Flint & Genesee Group, Flint
- Huron County Economic Development Corporation, Bad Axe
- Shiawassee Economic Development Partnership, Owosso
- Tuscola County Economic Development Corporation, Caro

Key Economic Development Goals

- Facilitate economic growth
- Build a strong business community
- Support K-12 career preparation programs and adult talent development

EDD CLUSTER

Assets & Partners

- Davison Tool Engineering, LLC.
- Martin Structural Consultants
- Marksmen Engineering Inc.
- Townley Engineering, LLC
- Row Professional Services Company

Talent Pipelines and Training Programs

- Baker College
 - The College of Information Technology and Engineering offers 10-degree programs.
- University of Michigan- Flint
 - The College of Innovation and Technology offers bachelor's degree programs in cybersecurity, digital manufacturing technology, and I.T. and informatics.

South Central Region

Counties: Clinton, Eaton, and Ingham

REGIONAL VISION

The region seeks to develop a sustainable economy, natural resources, transportation, and infrastructure.

REGIONAL OVERVIEW

The region has seen 8 years of population growth. Education is a primary focus, as the region produces 18,000 college graduates annually.

HIGH PRIORITY INDUSTRIES

- 1) AgTech and Food Innovation
 - a. This industry has brought over \$555 million in private investment and created over 300 jobs
- 2) Insurance Services and InsurTech
 - a. 7% projected growth in industry from 2017-2022
- 3) MedTech, Accelerator and Life Sciences
 - a. \$1.5 billion in recent or ongoing investment in medical research, manufacturing, and healthcare
 - b. Lansing is one of the leading orthopedic manufacturing hubs in the United States

MAJOR EMPLOYERS

- 1) AgroLiquid, St. Johns
- 2) Dart Container Corporation, Mason and Holt
- 3) Dewpoint Inc, Lansing
- 4) Glanbia Nutritionals, St. Johns
- 5) Peckham, Lansing
- 6) Proliant Dairy, St. Johns
- 7) Vertafore, East Lansing

ANCHOR INSTITUTIONS

- 1) Central Michigan University, Lansing
- 2) Great Lakes Christian College, Lansing
- 3) Lansing Community College, Lansing
- 4) McLaren Health Care, Lansing
- 5) Michigan State University, East Lansing
- 6) Olivet College, Olivet
- 7) Sparrow Health System, Lansing



Documents Reviewed

- Clinton County Catalyst website
- Lansing Economic Area Partnership's website
- Tri-County Regional Planning Commission website

Key Economic Development Partners

- Clinton County Catalyst, Dewitt
- Lansing Economic Area Partnership, Lansing
- PROTO InsurTech, Lansing

Key Economic Development Goals

- Facilitate economic growth
- Enhance infrastructure and transportation networks.

EDD CLUSTER

Assets & Partners

- East Lansing Technology Innovation Center
- MSU Innovation Center

Talent Pipelines and Training Programs

- Michigan State University
 - MSU is a hub for research and had \$725 million in research expenditures in 2019.
 - MSU's College of Engineering offers 11 bachelor of science degrees and graduate programs in 11 disciplines.
 - The College of Agriculture & Natural Resources and Food-Related Programs is a top-rated program for supply chain and packaging.
- Central Michigan University
 - CMU offers degrees in computer, electrical, and other fields of engineering and technology.



Southwest Region

Counties: Branch, Berrien, Cass, Calhoun, Kalamazoo, St. Joseph, and Van Buren

REGIONAL VISION

Deliver economic development solutions that grow employment opportunities, increase the tax base, and add to the economic vibrancy of the region.

REGIONAL OVERVIEW

The region seeks to emphasize growth, talent attraction, and inter-state collaboration with its neighbors.

HIGH PRIORITY INDUSTRIES

- 1) Medical Devices
 - a. Within the 120-mile radius of Kalamazoo, Michigan is a robust industry that supports the local medical device community, which includes Stryker Corporation's global headquarters.
- 2) Life Sciences
 - a. The region is home to life science legacies; collaborative networks supporting complex biological, organic, and pharmacological research; and a cadre of clinical and contract research organizations.
- 3) Design
 - a. Sharpie Pens, Graco Strollers, and Coleman Outdoor Gear are just a few of the amazing and innovative products that are designed by companies located in the region.

MAJOR EMPLOYERS

- 1) Abbott Laboratories, Sturgis
- 2) Bendix, Kalamazoo
- 3) Bosch, Multiple Locations
- 4) Charles River Laboratories, Mattawan
- 5) Whirlpool Corporation, Multiple Locations

ANCHOR INSTITUTIONS

- 1) Berrien County Government, Berrien County
- 2) D.C. Cook Nuclear Plant, Bridgman
- 3) Lakeland Regional Health Systems, Multiple Locations
- 4) LECO Corporation, St. Joseph



Documents Reviewed

- Cornerstone Alliance Website
- Cornerstone Alliance Strategic Plan
- Southwest Michigan First Website

Key Economic Development Partners

- Cornerstone Alliance
- Southwest Michigan First

Key Economic Development Goals

- Business Attraction and Retention
- Inclusive Talent and Workforce Development
- Small Business and Entrepreneurial Growth

EDD CLUSTER

Assets & Partners

- MIX
- Kinexus Group
- Stryker Corporation

Talent Pipelines and Training Programs

- Western Michigan University's Richmond Institute for Design and Innovation
 - Students at Western Michigan University's Richmond Institute for Design + Innovation complete more than 125 credit hours over four years of hands-on industrial design education in 28,000 square feet of dynamic, open and collaborative workspace.
- Lake Michigan College
 - The college offers several degree programs including engineering, engineering technology, energy technology, and applications development.

Southeast Region

Counties: Hillsdale, Jackson, Lenawee, Livingston, Monroe, and Washtenaw

REGIONAL VISION

The region seeks to promote regional cooperation and dialogue, enhance the region's economic vitality and quality of life, and help move the region and state forward.

REGIONAL OVERVIEW

The region is home to many assets, including the University of Michigan and a concentration of manufacturing companies.

HIGH PRIORITY INDUSTRIES

- 1) Education, Healthcare, and Social Assistance
 - a. The healthcare and social assistance industry has grown by more than 10% since 2010
 - b. The University of Michigan has been rated number one in research volume among public research universities in the U.S. As of 2019, its research expenditures were \$1.62 billion.
- 2) Manufacturing
 - a. The region is home to many manufacturing firms including TI Automotive, TAC Manufacturing, Great Lakes Industry, Inc., and JSP
- 3) Defense
 - a. Industry has grown by more than 100% in the last 10 years

MAJOR EMPLOYERS

- 1) Toyota Motors, Multiple Locations
- 2) Terumo Cardiovascular Group, Ann Arbor
- 3) Cline AI, Ann Arbor

ANCHOR INSTITUTIONS

- 1) University of Michigan, Ann Arbor
- 2) University of Michigan Health & Hospital, Ann Arbor
- 3) Washtenaw County Government, Washtenaw County



Documents Reviewed

- Livingston County Economic Action Plan
- Lenawee County Economic Development Toolbox
- SEMCOG Economic Development Strategy
- SEMCOG CEDS
- University of Michigan Website & Engineering School Strategic Plan

Key Economic Development Partners

- Ann Arbor SPARK
- Michigan Manufacturing Technology Center

Key Economic Development Goals

- Develop a talented workforce
- Ensure DEI reaches across the region

EDD CLUSTER

Assets & Partners

- SPARK East Innovation Center
- University Research Corridor

Talent Pipelines and Training Programs

- University of Michigan at Ann Arbor
 - Michigan Engineering is home to 11 top-ranked departments that collaborate within the nation's number one public research institution – The University of Michigan.
- The Workforce Intelligence Network for Southeast Michigan (WIN)
 - WIN is a partnership of 10 community colleges and 6 Michigan Works! agencies in southeast Michigan. It helps to cultivate a comprehensive and cohesive talent system to ensure employers' success.



Detroit Metro Region

Counties: Macomb, Oakland, and Wayne

REGIONAL VISION

The region seeks to build a collaborative business network and become one of the most innovative and diverse communities in the country.

REGIONAL OVERVIEW

The region is home to a robust manufacturing network specializing in automobiles, small consumer goods, and heavy equipment.

HIGH PRIORITY INDUSTRIES

- 1) **Automobility in Detroit**
 - a. The Detroit region is home to the worldwide headquarters of three OEMs and 20 OEMs maintain a significant presence here.
 - b. Today, the Detroit region is home to the highest concentration of Mechanical and Industrial engineering talent anywhere in the nation.
- 2) **Automotive Research and Manufacturing in Macomb**
 - a. 1,600 businesses with ties to manufacturing
 - b. 66,000 manufacturing jobs
- 3) **Defense and Aerospace in Oakland**
 - a. At least 85 Oakland County-based companies offer products and services for defense and homeland security.

MAJOR EMPLOYERS

- 1) DTE Energy, Multiple Locations
- 2) Ford Motor Co., Dearborn
- 3) FCA US LLC, Auburn Hills
- 4) General Motors Co. Detroit
- 5) Illitch Holdings, Detroit

ANCHOR INSTITUTIONS

- 1) Beaumont Health, Southfield
- 2) Henry Ford Health System, Detroit
- 3) University of Michigan-Dearborn, Dearborn
- 4) Wayne State University, Detroit



MICHIGAN ECONOMIC
DEVELOPMENT CORPORATION

Documents Reviewed

- Advantage Oakland Website & Oakland Economic Outlook 2021-2021
- Detroit Regional Partnership | Interactive Business Case
- Detroit Economic Growth Corporation
- Macomb County Planning and Economic Development
- Oakland County Economic Development: Advantage Oakland
- Wayne County Economic Development

Key Economic Development Partners

- Detroit Economic Growth Corporation
- Detroit Regional Partnership
- Macomb County PED
- Oakland County PCD
- Wayne County EDGE

Key Economic Development Goals

- Attract and retain diverse talent
- Grow as a hub for innovation

EDD CLUSTER

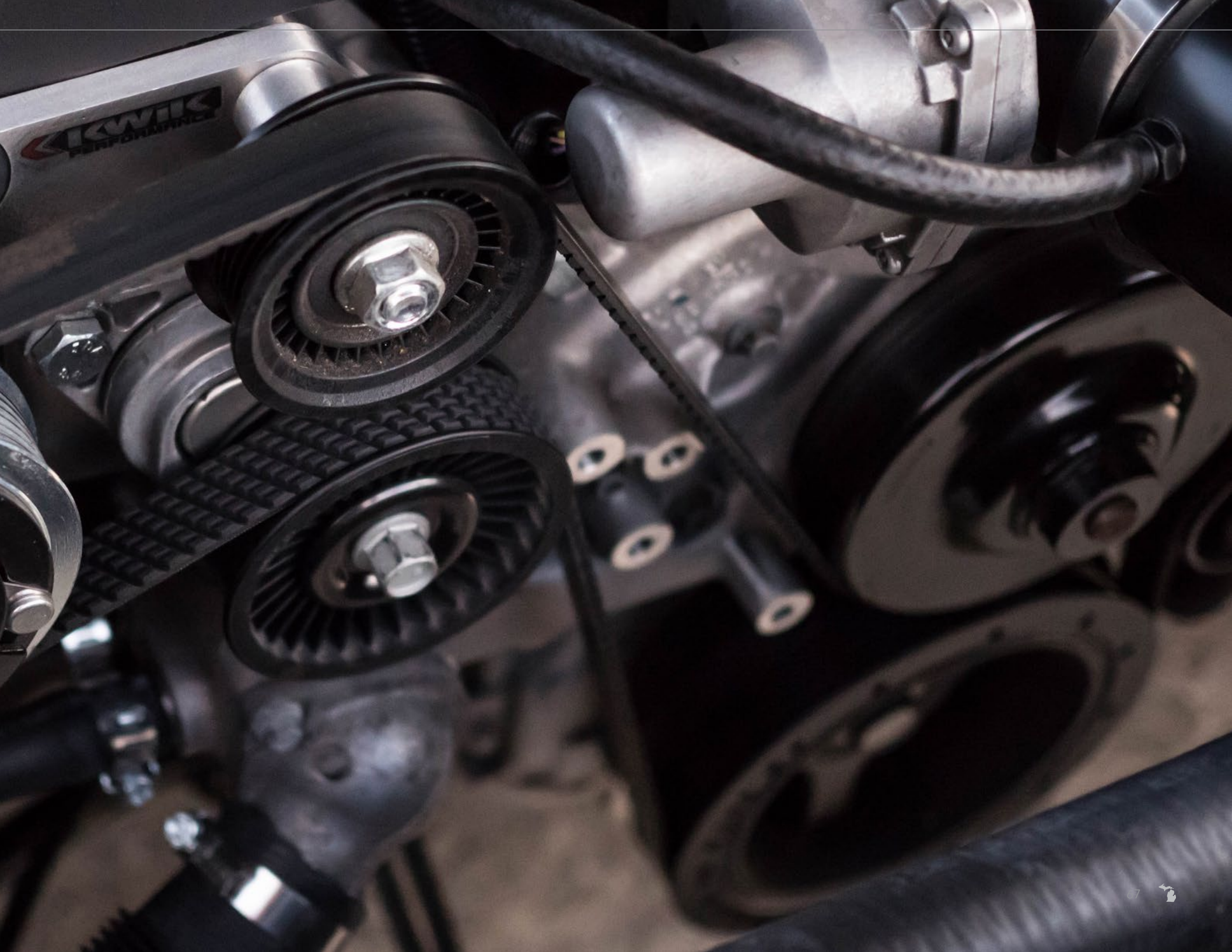
Assets & Partners

- Automation Alley
- Macomb-Oakland University INCubator
- Michigan Automated Systems Collaborative (MASC)

Talent Pipelines and Training Programs

- Post-Secondary Institutions
 - Companies located in the Detroit Region can quickly tap into the extensive higher-education pipeline to meet their talent needs. Within a 5-hour drive of Detroit there are more than 700 post-secondary institutions with 573,062 degrees conferred by program in 2019, including:
 - 28,613 Engineering Degrees
 - 13,946 Engineering Technology and Related Degrees
 - 2,294 Information Science Degrees
 - 1,262 Graphic Design Degrees





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