



# EAST CENTRAL INDUSTRY DIVERSIFICATION STRATEGY

A REGIONAL PROFILE AND INDUSTRY  
DIVERSIFICATION STRATEGY FOR EAST CENTRAL WISCONSIN

January 2015

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## 1.0 Introduction

The study area included within the Oshkosh Defense Industry Diversification Initiative (Calumet, Fond du Lac, Outagamie, Waupaca, and Winnebago County) represents one of the most dynamic and prosperous regional economies in Wisconsin. It is home to one of the largest concentration of manufacturing workers per capita in the United States, as well as a number of large industry sectors and firms with both historical and contemporary international reputations for quality and innovation. The regional economy also boasts a significant measure of economic diversity, both across major industry sectors within key sub-sectors. It is the home to a number of well-regarded educational institutions and communities that boast a high standard of living. The combined strength of these regional assets provides the upper Fox River Valley region with a bright possible future of prosperity and growth.

The region also faces a number of considerable challenges, both as a consequence of its record of success, as well as in sharing many of the same characteristics of both Wisconsin as a whole and its Midwestern neighbors. The region has faced a series of unanticipated and unprecedented challenges within its manufacturing base over the course of the last three decades. First, a large wave of consolidation swept through the paper industry, resulting in a number of mill closures. Second, and more recently, changes in the nation's defense posture resulted in the expiration of a series of large vehicle contracts with Oshkosh Corporation's Defense Division. Each of these, along with a number of other cyclical changes has tested the resiliency of the manufacturing sector and regional economy at large.

The region has largely survived these challenges and has restructured its economy to a large degree while building on traditional strengths. The current changes in defense-related manufacturing have presented a further opportunity for a measured consideration of the region's strengths and key assets. An opportunity has been presented to consider a reasoned approach to industry diversification while ensuring that the region retains its productive capacity to respond to potential defense-related needs in the future.

The region contains a robust network of economic and workforce development professionals who have long considered the question as to what the right mix of industries and services should be in the regional economy. This question has also guided the orientation of services provided to the region's business community and labor force. While there has historically been some consensus as to the proper focus, these networks have also tended to be fragmented by parochial interests. A number of the previous studies referenced in this strategy make mention to the degree of geographic and political fragmentation that exists within the region.

The diversification strategy offered within this document builds upon the foundation of a great deal of work previously conducted in the region and offers new insights into the significant opportunities for industry diversification and economic growth that may be capitalized upon through increased regional collaboration. Regional approaches are indeed essential in addressing many of the critical drivers that affect the potential for change. These drivers will be discussed within the context of a sampling of the growth opportunities



available and range from workforce availability and orientation to crafting a more significant and cohesive regional identity. Finding collaborative means to affect these drivers may ultimately shape the region's economic future.

The strategy document proceeds in four sections. The first section presents a high-level demographic and economic profile of the study area. The second section identifies the targeted industry sectors and growth opportunities identified by previous studies of the region in an attempt to synthesize an understanding of overlapping interests and priorities. The third section presents a series of key drivers that influence three case studies representing plausible growth opportunities in manufacturing supply chain and market diversification, aviation and aeronautics, and information technology. The strategy concludes with a case study analysis of four best practices related to the key drivers. A series of recommendations for future analysis and consideration will also be presented.

## 2.0 Background Profile

### 2.1 Demographic Profile

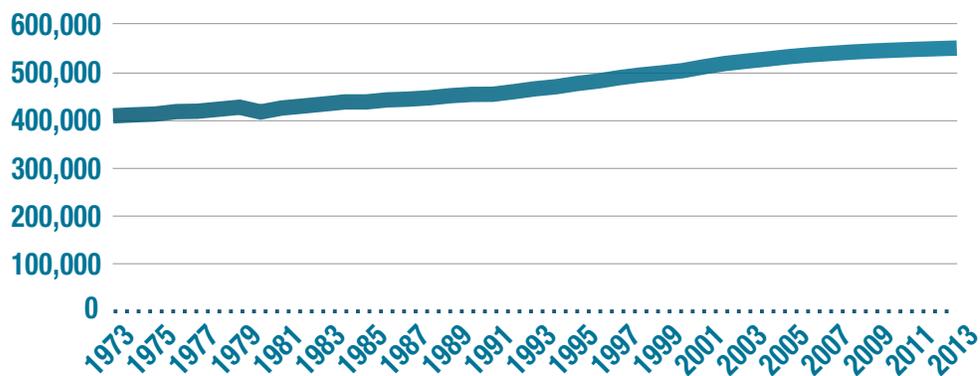
The study area encompassed in this strategy is comprised of five counties in East Central Wisconsin – Calumet, Fond du Lac, Outagamie, Waupaca, and Winnebago. The region is part of one of the most demographically and economically dynamic corridors in the state, and the center of one of the most manufacturing-dense areas in the United States. The counties comprise the south-central portion of the eighteen-county New North economic development region and are home to a large number of key industries and stakeholders.

#### 2.1.1 Population Growth

The region has experienced a period of significant population growth over the past forty years, growing at an annualized rate of one percent since 1973. Over that same time period, the region added more than 140,000 new residents, or more than 35 percent of its current population level. This again compares quite favorably to statewide growth over the same period of 26 percent. The region's rapid population growth has been driven by a combination of historical factors, including the availability of ample employment opportunities in the region's principal industry sectors, a pattern of urbanization supported by the expansion of the region's transportation network, and a dynamic and growing real estate market. Growth over this period has expanded the region's urban footprint to the extent that many stretches of U.S. Highway 41 show few gaps between municipalities stretching from Kaukauna to Fond du Lac.



## Study Area Population Growth 1973-2014



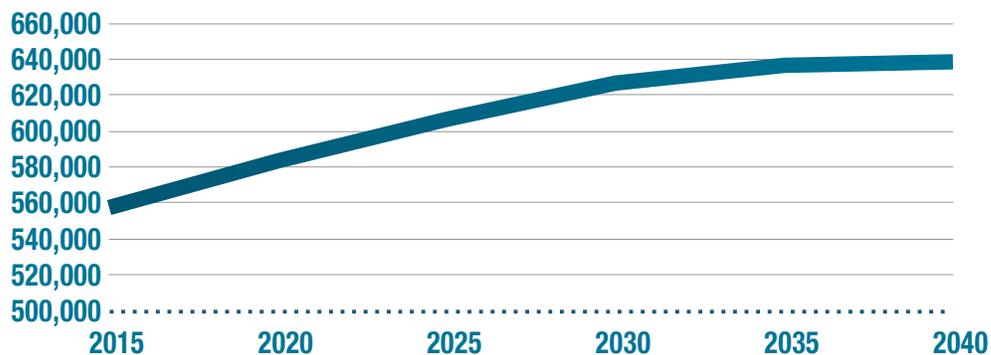
Source: Wisconsin Department of Administration Demographic Services Center

The pace of population growth in the study area has slowed significantly over the course of the past five years. While young families continue to move into the area to take advantage of employment opportunities, the effects of the real estate market crash of 2008 and 2009 has slowed the pace of migration into the region. Annualized population growth after 2008 decreased from 0.5% to an average of 0.3%, or 1,500 new residents. This pales in comparison to the previous twenty years, as the region added an average of nearly 4,800 residents each year with a high of 7,955 in 2001. The effects of the most recent economic slowdown have largely left the region, yet it is anticipated that population growth will continue to be sluggish.

The Wisconsin Department of Administration's Demographic Services Center has released population projections extending to 2040 for all counties in Wisconsin. This forecast suggests that the study region's population will grow by a mere 14.5 percent over the next twenty-five years, or at an annualized growth rate of a mere 0.6 percent. This presents a slight improvement over more recent growth, but yields only an additional 81,000 new residents. The principal cause for this more modest forecast is the result of a profound demographic shift that has occurred in many of the states of the Northeast and Upper Midwest United States.



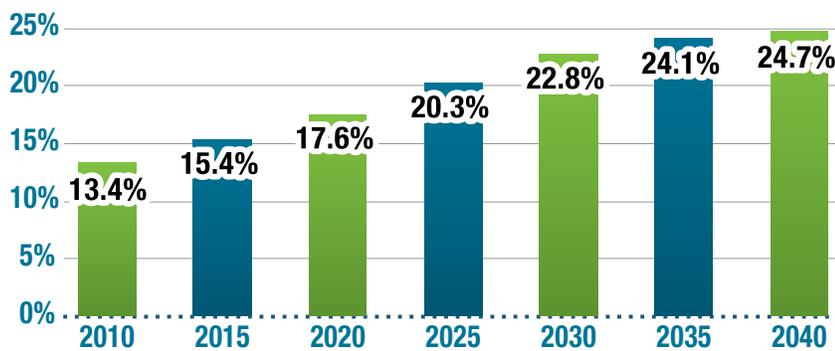
## Population Growth 2015-2040



Source: Wisconsin Department of Administration Demographic Services Center

The region's population has aged significantly over the past fourteen years, with the median age of each county increasing by between four and six years since 2000. This is consistent with an aging trend that has characterized population dynamics in a number of Midwestern states over the last several decades. The erosion in the region's median age is likely to continue, as the two components of population change – natural increase and net migration both slow considerably after 2020, and the share of the region's population over the age of 65 increases markedly.

## Share of Population 65 and Older



Source: Wisconsin Department of Administration Demographic Services Center



## 2.2 Economic Profile

### 2.2.1 Industry Composition

The five-county study area encompassed in this industry diversification strategy represents a regional economy that produces more than \$23 billion in annual impact. This represents 8.7 percent of Wisconsin's Gross Domestic Product, which is consistent with both the region's relative land area and population. It is also an economy that is among the most dynamic in the state and Upper Midwest. This dynamism has historically fostered significant economic prosperity as well as a sense of resiliency when presented with challenges. A number of significant opportunities for future growth exist within the region's industry base, as well as in further diversification.

The region's industry base is dominated by a strong manufacturing presence, though this strength is shared by a number of industry sectors. It is home to over 12,200 establishments employing more than 266,000 individuals. The region also shares a key characteristic found throughout much of Wisconsin and the Upper Midwest. It is home to a large number of relatively small firms. Seventy-five percent of all firms in the region employ fewer than 50 individuals, and 95 percent employ fewer than 250. This again speaks to the breadth and diversity of the region's employer base. It also presents unique challenges and opportunities when considering the means of fostering greater diversification.

The study area has experienced significant industry transitions over the course of the past two decades. Traditional manufacturing industries, such as paper manufacturing have both been subject to global competition and consolidation, and have modernized in an effort to remain competitive. A number of notable firms have succumbed to the weight of rising costs and globalization and have closed or have changed ownership. The impact of these transitions can be observed in a comparison of the region's industry composition in 1990 and at present.

Manufacturing assumed a dominant position in 1990, representing nearly one in every three jobs in the region. This employment concentration is roughly three times the national average at the time. This also masks a significant level of diversification within the region's manufacturing base, which was dominated by employment in paper manufacturing (8.6 percent), food processing (2.8 percent), and machinery manufacturing (6.9 percent) at the time. The transportation equipment manufacturing sector (2.8 percent), printing (2.0 percent), and fabricated metal products manufacturing (2.0 percent) are also prominently represented. The other most prominent industry sectors include education and health services (15.9 percent), and the aggregate sector of trade, transportation, and utilities (19.5 percent). Employment in both of these sectors is roughly equivalent to state and national averages.

Two notable trends can be seen in the comparison of the industry composition in 2014 with the same from twenty-four years prior. The first and most significant is the decrease in manufacturing employment share



to 23.1 percent. This decrease in significance occurred as a result of the loss of a net of 4,900 manufacturing positions while total industry employment increased by more than 62,000 net jobs. This suggests a gradual transition of the regional economy away from an overly dominant manufacturing position towards a more diversified economy. This conclusion is merely relative, however.

The most significant changes in the region’s manufacturing base over this period include the loss of nearly 6,800 positions in paper manufacturing (3.8 percent of total employment) and 2,200 machinery manufacturing positions (4.4 percent). Other manufacturing sectors have experienced significant employment growth, including fabricated metal products manufacturing (2,200 positions), and food processing (1,700 positions). The transportation equipment manufacturing sector, which includes Oshkosh Corporation and many of its suppliers, experienced an increase of nearly 1,000 positions over this period, though employment in this sector reached a high point in 2010, when it employed more than 2,300 individuals than at present.

## 2.2.2 Industry Strengths

The most common means of determining the relative significance of a local industry sector is through the calculation of location quotients (LQ). Simply speaking, a location quotient compares the concentration of employment in any given industry with the same concentration nationally. The indicator identifies those industries that may have a competitive advantage or significant influence in the local economy for any industry quotient greater than one. The industry sectors with the highest relative location quotients are presented below.

INDUSTRY SECTOR	LOCATION QUOTIENT
Paper manufacturing	11.43
Printing and related support activities	4.78
Machinery manufacturing	4.47
Animal production and aquaculture	4.01
Plastics and rubber products manufacturing	3.77
Educational services	3.30
Food manufacturing	2.30
Fabricated metal product manufacturing	2.04
Wood product manufacturing	1.96
Textile mills	1.94

*Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages*

This analysis reinforces much of what is commonly known about the region’s industrial strengths. The paper industry maintains a traditionally dominant position despite decades of change. Durable goods manufacturing is equally prominent, with machinery, plastic and rubber products, fabricated metal products,





Much of the focus of the analysis of the greater Green Bay regional economy contained in the study suggests that the region's economic resiliency can be traced to the presence of a few dominant manufacturing sectors – most notably paper manufacturing – and the presence of a number of key supplier industries that provide production and employment stability more generally. This narrative has also been true throughout the study area, where the paper industry has played a historically significant role. However, it can also be argued that the transportation equipment manufacturing sector, which benefited significantly from U.S. Department of Defense contracting activity over the last decade, played a similar role.

## 2.2.4 Income Dynamics

The five-county study area again represents a regional economy that generates more than \$23 billion in annual economic impact. It is also home to a population that benefits from nearly \$23 billion in total personal income. This represents a coincidental symmetry as both figures are estimated independently, but it does suggest that the region does represent a significant consumer base. Personal income dynamics vary by county and are affected by a number of factors, including relative wage rates and population growth.

Average annual wages across all industries in the study area do vary both by geography and industry throughout the five-county area. Calumet County reported the lowest regional annual average wage in 2013 of \$33,734, while Winnebago County reported one of the highest all industries annual average wage in the state at \$46,186. For the sake of comparison, we will consider wage dynamics throughout the study area, as a whole.

The average annual wage paid by all employers in the region in 2013 was \$41,695. This is slightly lower than the state average of \$42,792, and significantly lower than the national average of \$49,808. This disparity has remained relatively consistent historically owing both to the disparity in industry composition between regions, as well as a relatively lower cost of living in the study area. Average wages vary significantly across industry sectors, and we see that a number of sectors, including construction manufacturing, and professional and business services have annual average wages that exceed the state average, but only construction wages exceed the national average.



	Study Area	Wisconsin	United States	2011-2013 Percentage change
Total, All Industries	\$41,695	\$42,792	\$49,701	4.6%
Natural Resources & Mining	\$33,425	\$34,056	\$57,070	7.5%
Construction	\$54,010	\$53,398	\$53,181	7.3%
Manufacturing	\$54,935	\$53,099	\$61,102	4.9%
Trade, Transportation, Utilities	\$32,418	\$36,532	\$41,761	1.8%
Information	\$48,226	\$58,360	\$86,787	18.9%
Financial Activities	\$51,595	\$59,735	\$80,731	5.3%
Professional & Business Services	\$51,252	\$50,725	\$64,623	12.9%
Education & Health Services	\$41,889	\$44,460	\$44,976	0.4%
Leisure & Hospitality	\$12,155	\$15,538	\$20,413	5.1%
Other Services	\$21,446	\$24,649	\$32,844	5.8%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Personal income is very highly impacted by changes in wages and salaries within the five-county study area, comprising more than 80 percent of total income. However, there are a number of other income components, such as investment interest and transfer payment receipts that are also considered. The most common measure of aggregate personal wealth in any region is measured on a per-capita basis. The 2013 per capita personal income of the study area is \$41,463, a mark that lags slightly behind the Wisconsin statewide average of \$43,244, but is higher than the national average of \$40,948. The regional average masks a number of significant local dynamics as presented here.

### 3.0 Shared Regional Interests

There has been significant attention paid to the future trajectory of the greater Fox Valley economy, and by extension the Northeast Wisconsin economy over the last decade. A general recognition has emerged that the traditional strengths in advanced manufacturing and food processing, coupled with growth in the financial services and food processing industries has built the region into a prosperous and resilient economy. This, in and of itself represents a viable economic development strategy, given the divergent growth trends in manufacturing employment locally as opposed to nationally, for example. However, regional leaders have long expressed concern that the region does not possess some of the assets that have made other aspirational regions successful. Much of this conversation typically revolves around the desire for a stronger entrepreneurial base or the development of a high-technology industry cluster. To this end, a number of studies have been commissioned by the region's economic and workforce development stakeholders to provide an external perspective on the region's prospects.



### 3.1 Northeast Wisconsin Economic Opportunity Study

The first and most extensive study of the region at large was initiated in 2003 at the request of the Bay Area and Fox Valley Workforce Development Boards to commission an economic opportunities analysis of Northeast Wisconsin. Initial work was performed by the University of Wisconsin – Extension and the East Central Wisconsin Regional Planning Commission on two phases of research which culminated in the publication of the Northeast Wisconsin Economic Opportunity Study. This study, conducted by NorthStar Economics (now NorthStar Consulting) serves both as the founding document for the New North, Inc., but also as the basis of many of the discussions regarding economic development collaboration locally.

The timing of the initial study was precipitated by the recognition that outsourcing and consolidation activities in manufacturing had a profound impact on the region. Similarly, the report points to a weak recognition of a regional identity among key stakeholders. As such, a regional collaboration model built on the premise of “old and new economic opportunities” is recommended.

#### Old Economy

The Old Economy was based upon a competitive cost race to the bottom to secure and hold markets. The competition has become so fierce that it has constricted community wealth and the means to supply government services and maintain a high quality of life. Northeast Wisconsin needs to abandon this economic development model.

#### New Economy

The New Economy is based upon knowledge and abundance theory, the concept that collaboration will grow the pie sufficiently large enough to serve an ample piece to everyone. A skilled workforce is imperative in this economic model. Creativity and innovation coupled with entrepreneurship and risk capital generate high value-added products. These products yield higher margins, better pay, and more community wealth. Northeast Wisconsin needs to embrace this economic development model.” (NEW EOS, 1)

The Economic Opportunity Study also references two observations that are consistent with more recent perspectives on the state of economic development and collaboration in the region.

There is a disconnect between the existing economic views and mindsets in Northeast Wisconsin and the factors required to ensure economic prosperity in the New Economy. Much of the region remains in an economic development construct that is a cost race to the bottom. Moreover, the region looks to big business and government as the primary drivers of the economy and shies away from free markets, when, in fact, most jobs are created by small businesses and the very engines of growth in the New Economy – brain power, risk capital, entrepreneurship, and technological innovation – are all free market based. (NEW EOS, 1)



This same perspective is referenced in later work, as well as in the perspectives of the business and provider networks surveyed throughout the development of the current plan. The region is built upon the strength of a number of traditional industries while operating in a small business mindset. The study also points to the dangers of fragmentation within the region.

There is large frustration in Northeast Wisconsin with the number and disparate activities of governmental units. The parochialism that permeates the region is costly and, at times, counterproductive. NEW lacks a common vision of its economic future and a collaborative operating model. (NEW EOS, 2)

As such, the report recommends the formation of a number of collaborative structures to guide development in industry cluster development, innovation and entrepreneurship, and regional competitiveness. The formal structure of the New North, Inc. and its board is paralleled by the Northeast Wisconsin Regional Economic Partnership, an association of the region's local economic and community development professionals. Each organization represents membership in an eighteen county region, of which the study area represents a smaller sub-region. The Economic Opportunity Study recognizes the importance of the sub-regional arrangements because of the economic diversity and disparate scope of service providers within the region.

### 3.2 Ignite Fox Cities: A Blueprint for Economic Prosperity

The second most prominent regional analysis conducted since the formation of the New North was commissioned by the Fox Cities Chamber of Commerce and Industry in 2011. The Chamber sought to assess the competitive capacity of the Appleton MSA, which encompasses the majority of its membership area, as well as the communities of Menasha and Neenah in northern Winnebago County. The study was conducted during a period of strategic repositioning by the Chamber and led to the formation of the Fox Cities Regional Economic Partnership.

The study, as conducted by Garner Economics, LLC differs from the approach of the Economic Opportunity Study as the principal objective is to provide a quantitatively-driven analysis of regional competitiveness from the perspective of site locators. This initial analysis was then validated by two means – first a series of stratified focus groups, and second by a benchmark analysis of two target communities. In the end, the analysis suggests that the region may be viewed as a marginal location for additional business activity and growth largely because a number of key factors, ranging from access to markets to access to capital may be viewed as neutral, at best. Of particular concern to the study was again the lack of a coordinated economic development program. It was further recommended that the Fox Cities Chamber of Commerce and Industry assume a leadership position in coordinating economic development activities in its market.

The Ignite Fox Cities report includes a number of specific recommendations for targeted growth industries, ranging from high-value business services to food processing. These optimal targets are included in the study's appendix. It is important to note here that each of the five target industries identified in the Ignite



Fox Cities report had been previously referenced in the Economic Opportunity Study. This suggests the presence of a growing consensus around plausible growth targets. It is also important to note that each of the studies was preceded by a period of economic recession, but the circumstance in which the work was performed was markedly different.

### 3.3 Business and Industry Cluster Analysis and Recommendations for the Oshkosh Area

The final prominent regional analysis conducted in recent years was commissioned by the Oshkosh Chamber of Commerce in 2012. The study, referred to generally as the Oshkosh Cluster Study was conducted by Economic Growth Advisors, and NorthStar Consulting Group, who was involved in the execution of the Northeast Wisconsin Economic Opportunity Study. The Oshkosh study was commissioned, in part in response to the ongoing layoffs occurring at Oshkosh Defense, as well as to identify targeted objectives for a revitalized economic development work plan.

The study area in consideration included an eight-county area that encompasses the entirety of the current study area, but includes Green Lake and Waushara County in the southwest, and Brown County to the northeast. The analysis was conducted in Fall 2012 and Spring 2013 and included survey research, structured interviews, and data analysis components. The result was again the formation of a number of development strategies, ranging from cluster-based growth to site-based initiatives.

The analysis again recommends the pursuit of cluster-based development in three key areas – information technology, manufacturing, and aviation and aeronautics. The analysis further recommends strategies focused towards entrepreneurs, emerging, or “second-stage” growth firms, and middle market firms. There is no attempt to prioritize any of these strategies, though again the recommendations align closely with those referenced in previous studies.

The Oshkosh Cluster Study also calls for the formation of a number of collaborative structures to leverage existing local and state resources. It is particularly strong in its recommendation for regional supply chain, entrepreneur, and talent development networks. Much of this work has again influenced future work in the region, including the work currently underway as part of the ORDIDI grant.

### 3.4 Other Notable Studies

A number of other notable local and regional analyses of the study area have been conducted over the past decade. This body of work ranges from the comprehensive planning documents prepared by each county and municipality to the Community Economic Development Strategy (CEDS) documents prepared by the East Central Wisconsin Regional Planning Commission (ECWRPC) for the U.S. Economic Development Administration (EDA). Each of these plans is of critical importance to the execution of the regional industry diversification strategy as they represent the assets and priorities of the region’s governmental jurisdictions.



Similarly, ECWRPC has collaborated with the Bay Lake Regional Planning Commission and Newmark Knight Frank on the formation of a Global Trade Strategy (2012) for the region, as funded by the EDA. The study identifies ten key manufacturing industry clusters that have significant export potential in the region. The study concludes with a series of five major implementation goals, including:

1. Increase capacity of economic development professionals to better assist companies seeking to expand into global markets.
2. Develop a strategy framework to identify, prioritize and engage companies that could benefit from services aimed at encouraging global trade.
3. Track, document and publicize impact of the global trade outreach initiative.
4. Create a clearinghouse of data driven, internal market opportunity analysis for Wisconsin industries, products and businesses.
5. Actively promote infrastructure and policy initiatives at the local and state level that would benefit global trade in Northeast Wisconsin.

The current industry diversification strategy recognizes that the promotion of export markets is of critical importance to the region and will hopefully enhance the recommendations identified in this study.

Two final studies of note were commissioned by the Fond du Lac Chamber of Commerce in 2008 and 2011 and conducted by Marian University. Concerns about future labor availability and the aging of the workforce prompted the Chamber to commission a series of Retirement and Departure Intentions Surveys, which attempt to both forecast the level of retirement activity among the region's largest industry sectors, as well as the assess the ability of the prospective labor force to fill the resulting vacancies. The most recent study suggests that Fond du Lac County may face as many as 12,000 unfilled positions in the next ten-to-fifteen years. It is the concern over these unmet needs that form the basis for one of the first key drivers in the proposed strategy.

### 3.5 Other Future iQ Partners Work in the ORDIDI Process

The Future iQ Partners project team possesses a great deal of knowledge and experience in building regional economies and collaborative partnerships. This includes substantial experience working in Northeast Wisconsin and understanding the unique dynamics that influence business decisions and affect cooperative relationships. A number of surveys were conducted as part of this process to help the project team identify the current state of collaboration in the region and gain perspective as to where the stakeholders of the region see themselves.

A series of three surveys were conducted in September and October, 2014. The first two surveys were administered to a number of business leaders and economic and workforce development professionals to



both identify the state of collaboration, but also the extent to which the layoffs at Oshkosh Defense had affected the regional economy. The results of these surveys are summarized in our Regional Survey Analysis report for this project, but there are a number of highlights that influence this strategy, including:

- 70% of business owners and 95% of service providers are at least somewhat optimistic about the future of the regional economy, with a majority either being “optimistic” or “very optimistic.”
- A number of industry sectors, including energy, food processing, health care, and manufacturing were identified as possessing significant growth potential.
- The region’s service providers generally see themselves as meeting the region’s needs, but agree that there is significant overlap between providers.
- 93% of business owners and a significant majority of service providers believe that further collaboration is needed to grow the regional economy.
- More than half of the business leaders surveyed believe that the region’s service providers could collaborate more effectively, a conclusion confirmed by the service providers themselves.

These survey results paint the picture of a region that is eager to embrace its economic future, but is not entirely certain as to the direction. There is agreement that the region’s economic and workforce development professionals will play an important role in realizing that future, yet there are significant challenges to overcome to reduce duplication and fragmentation.

The final survey conducted in this process was again administered to the region’s economic and workforce development stakeholder community as part of a social network mapping process. Respondents were asked to both identify their own organization and to identify those individuals and organization with which they collaborate most frequently in a variety of areas. The respondents were finally asked to measure the depth of these relationships along a continuum from networking to collaboration. The full result of this exercise can be explored at <http://foxvalleynetwork.com> using the access code “ECWRPC.”

Two key findings again emerged through this mapping exercise. The first is that, while there is a solid core of key collaborators in the region, there are a number of key actors that are largely disconnected from this network. This fragmentation crosses functional areas, such as workforce development and entrepreneurship support, as well as across geographies, with Outagamie and Winnebago County being the strongest connected. Second, there are a number of areas – most notably community, economic, and workforce development that have well-developed stakeholder networks. There are others, such as entrepreneurship support and industry cluster development that require significant future development. The growth robust networks in each of these areas will be critical to the execution of the strategies identified in this plan.



## 4.0 Industry Diversification Strategy Drivers

The industry diversification strategy presented here recommends the development of regional strategies in three key areas:

- Advanced Manufacturing Supply Chain and Market Development with a focus on Fabricated Metal Products Manufacturing and Food Processing
- Information Technology Talent and Market Development
- Aviation/Aerospace Industry Cluster and Brand Identity Development

Each of these industry sectors has been identified in previous research, as well as through conversations conducted over the last several months with key stakeholders. They are consistent with the existing composition of the regional capacity, and even modest forecasts for its prospective growth. They are also suitable targets for an industry diversification as they build on existing strengths and allow for the alignment of regional assets to address critical challenges.

There are a number of key economic and regional drivers which will influence success in the promotion of any of proposed strategies. The following drivers have been identified through conversations with regional stakeholders, as well as independent research carried out over the last several months. The drivers are not necessarily exclusive to one or more of the proposed industry targets, but will be discussed in this context.

### Advanced Manufacturing

- The Impact of an Aging Workforce
- Supply Chain Constraints Due to Lack of Significant Primary Producers
- Succession Planning for Mid-Market, Family-Owned Firms

### Information Technology

- Talent Development
- Entrepreneurial Support for Start-Ups
- Infrastructure Issues Around Broadband Access

### Aviation/Aerospace Industry

- Industry Cluster Development in Aviation
- Infrastructure Coordination in Aviation
- Brand Identity in Aviation



In addition, there are two secondary drivers that have been identified by previous analysis and the business perspective studies that bare mention as they have the potential to impact the economy at large – access to resources including developable land and fresh water, and changes in domestic energy markets. Each of these drivers can be utilized as a local driver to spur expansion and attraction of new business in a number of key manufacturing and service sectors. Their impacts will be discussed throughout the strategy, but will be regarded as supplemental to the primary conversation.

It is also important to note that development in any of the three target industries has the potential to profoundly impact the region’s defense-related manufacturing infrastructure. The diversification strategies proposed here were intentionally designed to ensure that key productive capabilities would be repurposed to maintain the potential to meet future needs as they arise. To this end, much of the conversation regarding diversification of the transportation equipment manufacturing industry sector specifically will be left for the other entities – the New North and Wisconsin Manufacturing Extension Partnership – that are actively conducting work in this area through the ORDIDI project.

Similarly, the discussion regarding the information technology and aviation/aerospace clusters will be respectful of the work currently being performed by the University of Wisconsin Oshkosh Business Success Center and Explorer Solutions under contract to the City of Oshkosh in each of these areas. The intent of the proposed strategy is to identify what we at Future IQ Partners view as the most critical factors which would benefit from a regional solution in each of these industries, not the specific direction that either should take.

## 4.1 Advanced Manufacturing Supply Chain and Market Diversification

The prominence of the manufacturing sector in the Fox Valley region has been demonstrated throughout this strategy as well as a number of previous analyses. It serves as the historical foundation of much of the prosperity of the region and continues to account for more than a quarter of all regional employment and economic output. It is also an industry sector that is subject to a great degree of generalization which belies the diversity that exists between producers and processes. Two industry sub-sectors that demonstrate this diversity are fabricated metal products manufacturing and food processing.

The fabricated metal products manufacturing sector includes a wide variety of firms, ranging from large finished goods producers such as Brenner Tank in Fond du Lac, Jay Manufacturing in Oshkosh, or Walker Forge in Clintonville to any number of small fabrication and machine shops scattered throughout the region. Many of these firms have developed the proprietary processes that are the hallmark of manufacturing in the region and the source of much of the innovation that has occurred historically. These firms also demonstrate the flexibility and adaptability that are the hallmark of advanced manufacturing. The sector accounts for \$438 million in annual output and has grown by an average of 3.3 percent per year over the last decade, reaching a high of 15.9 percent annualized growth in 2011. This suggests the potential for significant competitive growth, a finding that has been confirmed in the Ignite Fox Cities and Oshkosh Cluster Report. The Northeast Wisconsin Global Trade Strategy Analysis suggests that the broader region could export an



additional \$4.8 million annually in this sector.

Similar trends can be observed in the food processing industry. This industry sector was repeatedly mentioned by business leaders surveyed in this process as having significant prospects for future growth. There is a significant concentration of 95 firms in the region, with at least four – Nestle USA, McCain Foods, Earthgrain Baking Companies, and Sturm Foods having facilities employing at least 500 workers. More than one-quarter of all firms in this sector employ at least one-hundred workers – a concentration that is significantly greater than the manufacturing sector as a whole. The sector accounts for at least \$243 million in annual output and has grown by one percent annually. Additionally, the farms in the region generate an average of \$278 million annually, suggesting that the industry sector again possesses significant growth potential. The food processing industry was again noted as a growth target in the Ignite Fox Cities study. The Northeast Wisconsin Global Trade Strategy analysis suggests that the broader region possessed the potential to export and additional \$35.7 million annually in the sector.

Growth in each of these sectors hinges on a few key factors. The first is labor availability. The second is a more closely integrated supply chain and market diversification strategy. The third is the uncertainty regarding succession among a number of the small, family-owned firms in each sector. Each of these drivers will be explored in brief.

#### 4.1.1 Workforce Availability in Advanced Manufacturing

The prominent employment position of manufacturing region has certainly eroded over the course of the last quarter century. This is generally true throughout many of the industry's sub-sectors, though the decline has been somewhat uneven. Employment in both the fabricated metal products manufacturing and food processing industry sectors have both increased by approximately three percent between 2011 and 2014 with employment in both industry sectors, whereas food processing employment nationally has decreased slightly. Employment growth in fabricated metal products manufacturing nationally is actually more than twice the area rate (6.6 percent). Employment in each of these sectors eclipsed pre-recessionary levels locally by the end of 2012, or nearly eighteen months before the manufacturing sector as a whole recovered.

Labor utilization in both sub-sectors varies by process. Large food processors have been far more likely to invest significant capital resources in automation equipment than their smaller counterparts. The same is generally true in the fabricated metal products arena, though automation in the industry has been slowed due to the complex nature of many production processes, such as high tolerance welding. As such, both sectors have traditionally been dependent on the availability of skilled labor, which the region has typically provided with ease.

Labor availability throughout the manufacturing sector has tightened significantly over the last five years due to a number of demographic and economic factors. The most prominent cause is the aging of the



employed population. Manufacturing employment has traditionally been defined by long worker tenure and employer loyalty. This has changed to some extent over the last several decades. However, the region does have a slightly higher share of unionized firms (18 percent) than the nation (11 percent), which again promotes longer worker tenure. As a consequence, a number of firms now find themselves facing the potential for a significant number of worker exits due to retirement in the next five to ten years.

The stability of the older manufacturing workforce has come largely at the expense of the younger workers who are expected to eventually replace them. The three most recent economic recessions affected young manufacturing workers (those under the age of 25) more profoundly than their older counterparts, largely due to seniority norms. Similarly, those older workers who were displaced during the most recent economic recession were, on average three times more likely to be hired into another manufacturing position than their younger colleagues. As a consequence, the share of young manufacturing workers in the region has remained relatively stable at around 10 percent while the number of older workers has increased to more than 22 percent of the employed population.

At the same time, manufacturers in many sectors, including fabricated metal products and food processing have required higher skills sets among new hires as a consequence of modernization efforts. These skill sets are more likely to be found in younger workers due to their greater comfort and familiarity with technology. However, these same potential workers have largely been discouraged from seeking employment in the industry due to the experience of their peers. Demand for these younger workers has increased significantly over the last five years and has therefore created intense competition for their services. Of a number of manufacturers surveyed by the Northeast Wisconsin Manufacturing Alliance in October 2014, seventy-one percent reported experiencing difficulty in meeting hiring needs.

A number of organizations, led by the Northeast Wisconsin Manufacturing Alliance and including the Fond du Lac, Fox Cities, and Oshkosh Chambers of Commerce have all recognized the extent of this issue and have developed strategies to attempt to both improve the image of manufacturing locally and to attract more young people to consider career opportunities in the industry. The need is especially acute in Fond du Lac County, where a 2011 survey suggested that as many as thirty-five percent of workers intend to retire in the next five-to-ten years. The identification of regional strategies to address these potential shortages is of critical importance as the lack of available labor may result in the loss of as much as \$210 million annually throughout the study area.

## 4.1.2 Supply Chain and Market Diversification

The concept of industry diversification has been broadly promoted as both an economic growth and stability strategy in a number of venues, including the current analysis. Diversification at the regional level is intended to foster a mix of firms whose growth may or may not be tied to changes in the broader economic cycle. Diversification can take many forms at the industry or firm level as it is generally advised that any



particular firm not depend on the business of a single customer to protect from potential economic shock. Two such approaches include supply chain and market diversification. Each of these strategies and their related concerns can be applied to the two principal industry sectors here.

Analysts in the area have generally viewed the supply chain in the food processing industry to be fairly well-integrated locally. This view largely comes from a traditional understanding of the cheese making industry, where local producers were able to secure their milk supplies from a number of family-owned farms located within miles of the nearest plant. While this supply chain model can still be seen today on a drive through any of the region's rural areas, it does not necessarily apply to the largest local producers.

Many of the food processors in the area are considered secondary producers in that they either convert primary inputs produced elsewhere, such as producing sliced or shredded cheese, or they use multiple ingredients in the production of a finished good such as a frozen pizza. As a consequence, these large processors depend on a large number of primary producers for inputs and draw upon national supplier markets. This suggests that a great share of the potential economic impact of the industry is not captured locally.

An opposite pattern may be observed in the secondary metal products manufacturing industry. Many of the primary inputs, though not necessarily all come from local sources, such as Waupaca Foundry. Similarly, much of the productive capacity to perform all the intermediary steps in production from treating to shaping to finishing is available locally. Most of the output from this industry sector – as much as 80 percent – is exported outside of the region. At the same time, a number of firms in other manufacturing sectors ranging from machinery to transportation equipment manufacturing source products similar to those produced in the fabricated sector from firms outside of the region. This creates a misaligned supply chain where the provision of needed inputs by local firms may result in significant costs savings to the finished good producer and generate significant retained economic impact.

Examples of efforts to align these supply chains more effectively can be seen in the North Coast Maritime Manufacturing Alliance and Wisconsin Wind Works. A number of possible incentives may exist to promote additional activity in this area.

### 4.1.3 Succession Planning for Mid-Market, Family-Owned Firms

The region's advanced manufacturing base contains a large number of family-owned firms. The importance of these mid-market firms is clearly evident nationally, as a 2013 Deloitte study found that the more than 5.5 million firms nationally accounted for more than half of the nation's Gross Domestic Product and more than three-quarters of all new jobs created since 2010 (Deloitte, 2). Similar figures are not specifically available for the study area, though we do know that 75 percent of all manufacturing firms in the study area employ fewer than fifty workers. Ninety-two percent of these firms are either family-owned or sole proprietorships. Finally, these firms have accounted for 60 percent of employment growth between 2009 and 2013.



Non-farm proprietors' income accounted for \$122 million of regional economic output in 2013 and has increased by seventeen percent since 2010 to near pre-recessionary level. This growth lags behind state (19.2 percent) and national growth (22.5 percent) over the same period. Self-proprietor income also comprises a lower share of total personal income locally than nationally (6.2 percent compared to 9.3 percent). This disparity was recognized as a hindrance to entrepreneurial growth in both the Northeast Wisconsin Economic Opportunity Study and the Ignite Fox Cities report.

The role of small, family-owned firms has been of great historic importance to the region's manufacturing base. The region is filled with stories of the role that many prominent families have played in the growth of its most prominent employers. Many in the region believe that the next Kimberly Clark or Oshkosh Corporation can be found among the ranks of these firms.

The challenge faced by many of these firms is no different than that long faced by the dwindling number of small farmers throughout the region. Sixty-six percent of the firms surveyed in a 2013 Deloitte survey reported being at most one generation removed from the founder of the company. It is suspected that a higher percentage of regional firms fall under this category. Many of the small firms operating in the area opened since the 1960's. This suggests that a significant number of these firms' owners either are or will be actively seeking to either transfer control or ownership of the firm to a successor.

The chances that a family will retain control of a family-owned firm decreases significantly with each successive generation. Sixty-two percent of owners surveyed nationally expressed pessimism that their firm will remain in their control past the current ownership. Similarly, only one-third of all family-owned businesses remain in family control after the third generation of ownership, and only four percent retain control into the fourth generation. More viable regional strategies must be developed to promote effective succession within these firms in order to maximize their potential.

## 4.2 Information Technology Industry Development

Information Technology-related growth strategies have been the objective of most economic development professionals since the growth of Silicon Valley in the 1970's. The IT sector offers a number of advantages in that it represents the potential for high economic growth with relatively low capital costs, especially as compared to most manufacturing industries. Similarly, it is recognized that information technology plays a role in a wide variety of industry sectors ranging from manufacturing to insurance, and finance to health care. Given the diversity of needs in the region, stakeholders have recently started to explore the demand for information technology talent and the potential for future industry development.

Both the Ignite Fox Cities and Oshkosh Cluster Study analyses mention Information Technology as a high potential-growth target. The Ignite Fox Cities report groups most conventional IT fields with a variety of other sectors under the broad heading of High Value Business Services, whereas the Oshkosh Cluster Study is more explicit. The region does contain a significant number of existing Information Technology firms, with



more than sixty such firms operating in the five-county area. Only two of these firms – Omni Resources and Skyline Technologies employed more than 50 individuals in 2012, though a number of others, including Dealer Fire and Intergen in Oshkosh have joined their ranks in the past two years. This suggests that the region has significant potential for future growth. The professional, technical, and scientific services industry sector, which includes most information technology firms accounts for \$761 million in regional output annually.

There is a certain degree of tension that exists within the dialogue over the potential for information technology growth in the region, principally in conversations of talent development. The stakeholders in the region generally agree that it lags in talent development in the field – a fact that has been recognized throughout the state. However, demand for this talent is shared between existing industries that depend on the availability of skilled workers as well as a new generation of entrepreneurs to build the regional market. This speaks to a generational tension within the future potential workforce that is generally more attracted to highly innovative and entrepreneurial firms. Meeting the talent needs of both of these interests will be of vital importance.

The creation of a new round of future developers, programmers, and entrepreneurs also depends on the presence of a supportive entrepreneurial climate. This has been recognized as a distinct challenge in the region for some time, as noted by each of the major regional analyses. A number of possible recommendations have been offered, yet none have generated much traction to date. Building a regional solution to support entrepreneurial growth is a second key driver in this industry.

The final key driver affecting growth in the Information Technology sector relates to the state of the region's data infrastructure. A number of studies have pointed to relatively low data transfer speeds and gaps in regional service as a final major barrier to growth in this sector. This forms a third possible driver requiring a regional collaborative solution.

#### **4.2.1 Information Technology Talent Development**

The availability of skilled talent in Information Technology professions in the study area has recognized as a distinct challenge for the past decade. A number of groups, beginning with an information technology user's group formed by the New North in 2008 have explored demand for services in the field as it has been frequently noted that the region lacks in the capacity to both develop and retain skilled talent. Similarly, these conversations routinely point to the demand for talent as one of the most significant barriers to innovation and entrepreneurship in the industry. There is some disagreement as to the actual level of demand for information technology workers in the area, but there is also consensus that the region does not possess the assets to meet these needs regardless of the level.

Demand for information technology talent can be divided into three key areas. First, in the most general sense, the Wisconsin Department of Workforce Development has projected that employment in computer and mathematical occupations will increase by 16.5 percent or approximately 360 positions between 2010



and 2020, rising to a total employment level of slightly more than 2,500 workers. Growth of this type has remained relatively stable over the past twenty years and largely reflects the demands of traditional industries who utilize information technology services in their operations. A second and broader perspective of information technology talent demand is to consider employment growth in the information industry sector as a whole. This industry sector blends traditional industries such as printing and telecommunications with more computer-based forms of information technology. The 2013 Oshkosh Cluster Study forecasted that employment in this sector will increase by 21.7 percent or more than 1,270 positions by 2035. This estimate is consistent with the more narrow first definition, but does not speak to the true magnitude of demand.

The final means of forecasting demand for information technology talent in the region is to consider all occupations that require some form of computer skill. A 2013 analysis by the Georgetown University Center on Education and the Workforce estimated that nearly 63 percent of all positions will require some form of computer training. Applying this ratio to occupational projections from the Wisconsin Department of Workforce Development, we can estimate that more than 13,000 new positions in the region will require some type of computer skill by 2020. These positions will be found in every industry sector and will vary by intensity and experience. While many of the needed skills will be gained by experience, a more robust training infrastructure will be needed to meet the diverse needs of the future workforce.

An ongoing analysis of the region's information technology training capacity conducted by the Northeast Wisconsin Educational Resources Alliance and a committee of business leaders convened by the New North has discovered that the region does not possess either a baccalaureate degree program in many of the cutting edge fields of information technology such as data analytics or cybersecurity, or a comprehensive regional solution to meet the overwhelming needs for talent in this field. A majority (93 percent) of the region's most promising high school talent in the field leaves the region to seek education elsewhere, including Madison and Milwaukee, and a slim portion of those students (12 percent) return to the region upon graduation. The region has some experience in building successful collaborative degree platforms, such as the recently launched Engineering Technology programs. Still, a more comprehensive training solution is needed.

## 4.2.2 The Entrepreneurial Climate

Each of the major studies conducted in the region over the last ten years has pointed to the lack of a supportive entrepreneurial climate as one of the principal barriers to economic growth. This climate extends to include both tactical support for the development of new business ideas as well as ongoing financial and operational support for so-called "second stage" growth companies. These issues are not unique to the study area or the Northeast Wisconsin region as a whole, but are rather experienced throughout the state, with the exception of smaller pockets of entrepreneurial activity in Madison and Milwaukee.



The state of Wisconsin has historically ranked very low in assessments of entrepreneurial quality. The Kauffman Foundation ranked the state 29th in its 2010 New Economy Index. A 2013 ranking by Fast Company found Wisconsin in 33rd place for innovation. A June 2014 ranking of small business support gave the state the grade of a C-. The lack of an entrepreneurial climate is routinely noted in rankings of overall business climate in a number of publications. This comes despite the presence of a number of highly innovative manufacturing firms and a number of highly-regarded research universities.

The state, and by extension the region have a history of being highly innovative and entrepreneurial, especially in the development of manufacturing processes. However, much of this innovation occurred over the course of the past century, and the models used in the late nineteenth and early twentieth century have not transferred to today. The region does maintain a number of large research and development enterprises, including those located within Plexus and Kimberly-Clark. However, little of this work has generated spin-off industries that resulted in additional commercialization. Finally, the region does not benefit from the presence of a large research university in the same way as the Madison and Milwaukee markets.

As such, the challenge of building a supportive entrepreneurial climate in the region is largely concerned with building the proper infrastructure to entice and foster innovators who were largely trained outside of the region. This represents a possible, but more difficult development path.

The two most critical factors cited in earlier work in relation to entrepreneurial climate are access to early stage capital and the creation of shared industry incubator space. The Ignite Fox Cities study found that each of three Access to Capital indicators ranked 'neutral,' at best. Similarly, the Oshkosh Industry Cluster Study recommended the promotion of an "Angels on the Water" venture capital fund. Efforts have been underway within the region since the publication of the Oshkosh Industry Cluster Study to address both of these issues, but it is generally conceded that the region does not have the critical mass needed to support the synergistic development of a large number of information technology entrepreneurs.

Finally, it is understood that much of the challenge in attracting and fostering entrepreneurship and innovation in the region is in the building of a culture and awareness of the region as a viable market. One of the unique aspects of information technology innovation cited in a number of recent studies is the fact that entrepreneurs are not place bound in the same way as other more capital-intensive industries. As such, strategies which promote a high quality of life in addition to a supportive entrepreneurial climate may prove successful.

### 4.2.3 Data Infrastructure Quality and Access

One of the most critical capital infrastructure issues facing the development of a viable information technology industry sector in the Fox Valley region is the quality of and access to the data infrastructure. Access speeds have long been an issue in the region as it does not possess a high-speed access pipeline to



the internet in the same way as other markets, such as Madison and Milwaukee. Similarly, while the region does possess a number of high-volume data users, there has been little recent capital investment to increase the speed of access.

A preliminary analysis of broadband access among the nation's metropolitan areas in 2013 found that the Oshkosh-Neenah MSA ranked 160th and Appleton ranked 191st in terms of total access quality. The Fond du Lac MSA ranked 242nd. This illustrates the difficulty that new entrepreneurs may face in accessing quality data streams to aid in development. The State of Wisconsin, as a whole ranked 22nd in terms of total access and 27th in high-speed access.

The Wisconsin Public Service Commission has further identified a band of high volume broadband access that extends from Green Bay through Fond du Lac, but does not connect with either the Madison or Milwaukee markets. ([http://wisconsindashboard.org/console/broadband\\_map](http://wisconsindashboard.org/console/broadband_map)) This creates bottlenecks at either end of the data pipeline meaning that services produced in the region face more difficulty reaching the online world at large.

These issues are more severe in the region's more rural areas, where broadband access is both slower and largely unavailable. As a consequence, only a few areas in the region – most notably Appleton and Oshkosh currently possess the infrastructure needed to attract and host a large data user, such as a data center. This has been identified as an objective in both the Northeast Wisconsin Economic Opportunity Study and the Oshkosh Cluster Study. However, it is unlikely that a development of this magnitude would occur without significant infrastructure investments.

Two countervailing factors exist and were identified through a survey of business owners that may enhance development prospects in this area. The first is the availability, quality, and relatively low price of energy in the region. This is of critical importance to firms in a number of industries, including information technology. Many business owners also point to the availability and relatively low cost of quality water sources as another potential driver of future growth. Each of these factors, coupled with a favorable seasonal weather climate may make the area attractive to large data customers and spur additional private infrastructure investment in the future. However, it is widely recognized that some form of public effort will be needed to spark this activity.

### 4.3 Aviation and Aerospace Industry Cluster Development

The five-county study area possesses a long history of innovation in experimental aircraft and aviation. Oshkosh is home to the Experimental Aircraft Association (EAA), whose museum and annual AirVenture event bring hundreds of thousands of enthusiasts to the area. It is also home to a number of local and regional airports, the largest of which is Outagamie Regional Airport (ATW) in Appleton. Further, the region is home to a number of aerospace manufacturers, the largest of which include Gulfstream Aerospace Services in Appleton, and Basler Turbo Conversions and Sonnex Aircraft in Oshkosh.



The presence of these and a number of other regional assets have prompted stakeholders in the economic development community to consider the creation of an aviation and aerospace industry cluster to be focused in Oshkosh. A number of activities are currently underway to foster this development, including the formation of an Aviation Industrial Park adjacent to Whitman Field in Oshkosh, and the commissioning of an Aerospace Industry Cluster Study by the City of Oshkosh to be conducted by Explorer Solutions. This work has generated a number of plausible industry development opportunities for consideration, including the development of an innovative cluster, the formation of a maintenance hub, and a number of tourism-based opportunities.

The current study recognizes the value of the ongoing work and will not make value judgments as to the most viable of these alternative strategies. Rather, Future iQ Partners recognizes the presence of three key regional drivers that may impact the successful development of this cluster. These include the definition and organization of a new industry cluster model, the coordination of existing infrastructure, and the branding of the industry. We will consider each of these challenges in brief.

### 4.3.1 Industry Cluster Development

There are a number of divergent opinions among economists and business experts as to how industry clusters develop. The most common model suggests that a cluster develops through the process of agglomeration where a number of related industries develop naturally around some shared resource or geography. A local example of an agglomerated or natural industry cluster can be found in the region's paper manufacturing and printing industries. Industry clusters of this type generally take the longest to develop, but are also considered the most durable.

More recent models of industry cluster development have recommended the development of integrated supply chains of vertically-integrated firms in some type of production process. Development of this type requires the presence of a large end producer who utilizes a variety of high-volume inputs in its processes. This activity then spurs the attraction or formation of supplier firms to meet this large producer's needs. Activity of this type developed around the Oshkosh Corporation's Defense Division in the fulfillment of its recent vehicle contracts. Supply chain development may lead to a greater level of innovation than natural clusters as there is a greater competitive incentive inherent among the potential local supplier base. Clusters of this type may be spurred through targeted regional incentives, but again require the presence of a large end producer.

The final type of cluster development model commonly applied calls for the creation of a specialized cluster of firms who all participate in a narrowly-defined industry space. This may be organized around common processes, such as additive manufacturing or advanced prototyping, or common services, such as lithographic or offset printing. This final type seems to be the most viable for the development of a local aerospace cluster as it requires that firms only provide services in the aerospace industry more generally, not that they either collaborate locally or supply a local producer.



The challenges associated with talent and entrepreneurial climate development identified in both the case of advanced manufacturing and information technology also apply here as the region does not possess a specialized training infrastructure targeted at an aerospace workforce, nor does it promote a large number of aviation or aerospace-related start up industries. Many of the same recommendations previously suggested in these driver areas may also be applied here.

### 4.3.2 Aviation Infrastructure Alignment

The Fox Valley region possesses a number of local and regional airports that provide local commuter, regional and national passenger, and freight services throughout the region and more broadly. The largest such airport is Outagamie Regional Airport, located in Appleton. Local airports are also located at Whitman Field in Oshkosh and in Fond du Lac. These airports serve a vital role in the formation of any industry cluster model, yet none is of sufficient size and volume to act as the nexus driver for development. This deficiency has been recognized in a number of regional reports and was the subject of a benchmarking study prepared by Explore Solutions in its work. This diversification recognizes the need for additional alignment of the infrastructure in the region, but will defer to the other ongoing work to make specific recommendations in this area.

### 4.3.3 Aviation/Aerospace Industry Cluster Brand Identity

The final driver affecting development of an aviation and aerospace industry cluster in the Fox Valley Region is the creation of an industry brand identity. This is of critical importance to this process as the formation of an effective brand will foster additional awareness of the productive and innovative capacities of the region, as well as to spur additional investment in the industry. The brand that is developed will ultimately depend on the development alternative that the region decides to pursue.

The region possesses a very strong brand in the form of the EAA and its history of amateur innovation. However, it is uncertain as to how this brand might be effectively translated to an industry identity. More clear linkages need to be drawn between the innovations championed by the EAA and the development of commercial solutions. The involvement of the EAA and its Executive Board in this process will be of vital importance to ensure that its existing brand identity and capital are maintained.



## 5.0 Recommended Strategies and Driver Case Studies

A number of plausible and tested strategies exist in order to address the challenges presented above. Many of these are currently being considered in some form in the region, though a more universal commitment will be required in order to maximize success.

### 5.1 Advanced Manufacturing Strategic Recommendations

In order to ensure the availability of the skilled workforce required in the advanced manufacturing industry sector, we recommend the following:

- **The creation of a regional talent development partnership to include the Northeast Wisconsin Manufacturing Alliance, the region's Chambers of Commerce, and other stakeholders to share best practices and coordinate strategy.** The focus of this group, which may not be exclusive to the study area, will be to craft a comprehensive series of career exploration events and work experiences for students in Grades 6 through 12. These events will be coupled with actionable curriculum and will be tracked over time in alignment with the adoption of the state's Academic and Career Planning model in 2017.
- **The promotion of regional skills-based competitions for high school students, similar to the Skills USA model, with support from regional employers.** These events will again focus on the demonstration of skills currently in demand by employers. Incentives for participation will be given in the form of scholarships to the region's technical colleges.
- **The development of a strategy to revitalize work experiences for graduating high school and returning college students.** The idea of the summer job was a hallmark of the manufacturing industry over the past fifty years. Recent changes in labor organization and workflow have largely eliminated these opportunities. The region should consider the creation of a rotating internship model which will allow interested students to gain work experience in a variety of roles or across a variety of employers.
- **The development of an adult internship model to both utilize the knowledge of retiring workers and expose career changers to industry possibilities.** The Northeast Wisconsin Manufacturing Alliance has considered a mentorship model where retiring workers' wages are subsidized in order to train new workers. This model could be expanded regionally to create a series of internships for jobseekers who are considering a career change in manufacturing. This one-on-one experience would build confidence in skill sets and would be accompanied by directed career counseling to identify transferable skill sets and career opportunities.

The diversification of the region's supply chain networks is also of critical importance to many sectors of advanced manufacturing, including food processing and fabricated metal products manufacturing. We recommend the following strategies to enhance the viability of these industries:

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- **Expand existing manufacturing directory and supply chain mapping efforts to include all manufacturing sectors.** A number of regional efforts have attempted to organize key industries or assets through directory-based exercises. Examples include the New North's Wisconsin Wind Works project, the North Coast Maritime Manufacturing Alliance, and the New North's ongoing work in organizing defense-related manufacturers. The scope of these efforts is necessarily narrow in order to maximize buy-in. Regional business leaders should meet to identify three to five other industry sectors that could be organized and marketed in a similar manner in the next five years. These efforts should be supported by the region's Chambers of Commerce, economic development professionals, and agencies such as the Wisconsin Economic Development Corporation.
  - **The formation of a series of supply chain networks, consisting of purchasing, operations, and sales representatives from regional firms.** Organizations such as the North Coast Maritime Manufacturing Alliance recognized that supply chain development can most effectively occur by engaging those staff whose responsibility it is to source goods and services. By connecting the purchasing staff of large, end producers with sales representatives of local firms that may represent needed goods or processes, the region can facilitate additional beneficial relationships. Networks of this nature have existed in the region in the past, but have not been active for some time. Similarly, the purchasing staff of several related firms may be able to share common needs and lead to the formation of a common purchasing pool. A similar model could be developed in the food processing industry, bringing together producers and processors.
  - **Promote a regional purchasing incentive, similar to the "Buy America" program.** A number of states, including Michigan, Ohio, and Pennsylvania offer refundable tax credits for manufacturers who purchase goods from in-state suppliers. This incentive structure could be modified to reward local firms who transfer supply contracts from an out-of-market firm to a local supplier. This would require action at the state level.
  - **Development of a regional agribusiness training program.** The region's technical colleges (Fox Valley Technical College and Moraine Park Technical College) should collaborate with Lakeshore Technical College in the development of a regional agribusiness training program. Course offerings in a number of agriculture-related fields exist, but the region does not yet have a program that focuses on the marketing and logistics of agricultural commodities. The development of such a program could assist regional producers in getting their goods to market in a more efficient manner.

The final and least-defined challenge facing development and diversification in the region's advanced manufacturing base is ensuring the ownership succession of the region's many family-owned businesses. We recommend the pursuit of the following two strategies:

- **The formation of a regional family-based business council to discuss challenges specific to these firms.** This council could be facilitated and sponsored by First Business Bank and the University of



Wisconsin Oshkosh's Wisconsin Family Business Forum. Each of these organizations has taken an interest in succession issues in the past year. A companion organization comprised of the children of family-based business owners should also be created under the leadership of the Chambers of Commerce young professionals programs. It is believed that the formation of these organizations will create a forum to share common concerns and promote interest in this vital segment of the economy.

- **Organize a pool of regional banks to create a fund to finance gap funding for succession transfers.** In many instances ownership of a family-based firm or sole proprietorship is not transferred due to a lack of financing on the part of the succeeding generation. This has increasingly become the case as second generation owners are being considered for transfer at a younger age. Regional banks should convene to develop innovative solutions to this challenge and the region should consider means of incentivizing these transfers through a refundable credit or forgivable loan that rewards firms that stay in the area and under family ownership for some period of time.

## 5.2 Information Technology Strategic Recommendations

The development of a viable information technology sector in the region largely depends on the creation of a number of key assets. As such, the level of regional effort required may be significantly greater than that required for growth in other industries, such as advanced manufacturing. None of the drivers presented here represent challenges that are necessarily insurmountable. Rather, they will require creative solutions in order to ensure success.

The development of a talent pipeline to meet the needs of existing users of information technology services and to promote entrepreneurial growth in the region will require the formation of a number of regional strategies, including:

- **A regional Innovation Academy model should be created to encourage youth career exploration.** A pilot program of this sort has recently been launched through the leadership of CESA 6 and a number of firms. The Innovation Academy model would allow students in Grades 6-12 the ability to earn course credit through participation in a series of after school career exploration events. This model would include company tours, conversations with local entrepreneurs, and hands-on “coding camps.” The academy would also encourage independent exploration through sponsorship of such events as robot challenges and Lego Mindstorm leagues, which are currently hosted by many local schools. The creation of a regional model will increase the engagement of the business community and begin to foster an image of innovation.
- **The region should support the development of a series of collaborative degree programs in in-demand Information Technology fields, including Cybersecurity, Data Informatics, and Automation and Robotics.** This model would be built upon the structure created by the Northeast Wisconsin Educational Resources Alliance's Engineering Technology collaborative degree programs. Demand in



each of these areas is currently underserved by the region's higher education system and represent areas of potential regional competitiveness.

- **Advocate for the creation of a tuition or student loan forgiveness program for promising Information Technology students who either return to or remain in the area.** This recommendation may build upon a statewide model currently under consideration that rewards new graduates who fill in-demand positions and remain in the area for a minimum of five to ten years. This will ensure that more promising high school graduates return to the area, and will create a needed base of young entrepreneurs.

The Fox Valley region also faces a significant challenge in fostering a more supportive entrepreneurial climate. The following strategies are recommended to address this need:

- **Support and sponsor the creation of a regional business plan competition for students of local technical colleges and universities.** This model could be built upon other successful models sponsored by Marquette University, the University of Wisconsin Madison, and the Governor's Business Plan competition by offering a financial award for the most creative, commercially viable, and innovatively promising business idea. A number of categories could be developed in this process, both by institution type, industry segment, and those plans which represent collaborations between students and faculty members. Support for this competition could come from private and public philanthropic sources, state agencies such as the Wisconsin Economic Development Corporation or Wisconsin Entrepreneurs' Network. In addition to the standard cash award, this competition would differ in that the winners would also be paired with mentors and advisors from the local business community and may be given incubator space, if available. This would spur both creation and commercialization of more innovative ideas.
- **Support the creation of a network of regional business and innovation incubators.** It is generally recognized that entrepreneurs who are encouraged to collaborate with other like-minded individuals are generally more successful than those who operate in isolation. The region should consider the development of a number of such co-working spaces through the formation of a series of Centers for Excellence. These centers will promote collaboration and innovation by providing development and testing facilities and access to capital advisors. The work currently underway at the University of Wisconsin Oshkosh should serve as the basis for this model, which could be built out in the next three to five years.
- **Develop a venture capital network akin to the "Angels on the Water" model.** The region's large banks should collaborate to sponsor an annual venture capital forum which would serve to connect prospective entrepreneurs with local and regional angel investors and 4490 fund IT investors. Smaller examples of this type of event have been hosted sporadically in the region, though no routine, collaborative model has developed. Similar events have been hosted in a number of markets, including Madison and Milwaukee and proven successful. The region might also consider developing a more substantive partnership with innovation organizations such as Gener8tor.



The final challenge related to the development of a regional information technology sector is the development of a more extensive and reliable data infrastructure. The following strategies are recommended here:

- **The region's business leaders should strongly advocate for the implementation of the Wisconsin Public Service Commission's LinkWisconsin Initiative.** The Region 5 recommendations, which can be found at <http://wisconsindashboard.org/region-5> outline a number of strategic investments in the region and call for the formation of a number of collaborative solutions. Stakeholders in the region should assume a leadership role in shaping and promoting these efforts.
- **The region's economic development organizations should create a regional utility marketing portfolio.** The marketing effort should make better use of utility availability and pricing data, which was noted as a deficiency in the Ignite Fox Cities report to present a value proposition for a large data center in the area. This may come through the attraction of a new operator or the expansion of existing local operations. The citing of a facility of this sort will incentivize additional investment in the area and spur further capital development. The region's professionals should partner with NEWREP and the New North on this initiative.

### 5.3 Aerospace and Aviation Strategic Recommendations

There are a number of significant challenges associated with the development of a regional aviation and aerospace industry cluster. There are a number of key assets that already exist in the region to be utilized, as well as a number of stakeholders that are currently assisting in the development of the sector. The region's strong manufacturing base and reputation for quality coupled with the EAA's history of innovation may lead to the formation of a strong brand identity so long as these stakeholders effectively collaborate.

The following strategies are recommended in industry cluster development in this area:

- **The development of an industry cluster requires the presence of a strong local champion.** The region's stakeholders should organize behind the efforts of AeroInnovate to both identify target industry opportunities and support entrepreneurial development. The region should also engage the EAA in this effort. An annual meeting of stakeholders should be scheduled along the lines of an industry expo. This will bring interested firms together in order to build a more cohesive industry identity.
- **The region should develop a more effective talent development pipeline.** The region's technical colleges must continue to work closely with the region's aviation manufacturers to identify critical skillsets and to consider the possible formation of an industry-specific training certification, similar to the Maritime Manufacturing Technology program developed by UW – Marinette County and Northeast Wisconsin Technical College.

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- **The industry champion should also develop an effective marketing strategy to highlight the productive capabilities in other related regional industries.** A number of natural linkages exist between aviation manufacturing and the metals, plastics, and composite materials industries. There are a number of local firms that are considered innovators in the use of these materials. These productive capacities should be more effectively marketed to large aircraft manufacturers and other firms.

It is also important that the region's aviation infrastructure be aligned to maximize service and promote further development. It is recommended that:

- **The East Central Wisconsin Regional Planning Commission should convene a regional airport committee.** This committee would bring together the directors of the region's airports to consider shared issues and opportunities. The agenda of this group would be determined on the basis of the recommendations of the Explorer Solutions study.

Finally, it is recognized that the creation of a brand identity is essential to the development of a prospective industry cluster. We recommend that:

- **The region's stakeholders should fully embrace the recommendations of the Explorer Solutions report.** All alternatives should be explored with the purpose of brand identity creation around a specific opportunity. A funding model to implement the recommendations should also be established within a year of delivery.
- **Aerolnnovate should work with the EAA in brand identity development.** The prospective brand should recognize both the region's manufacturing heritage as well as its history with experimental aircraft innovation.

## 5.4 Industry Driver Case Studies

### 5.4.1 North Coast Marine Manufacturing Alliance Purchasing Managers Subcommittee

Northeast Wisconsin has witnessed the creation of a number of industry partnerships and associations over the past decade. Much of this organization work has occurred in two primary industry sectors – health care and manufacturing. What is most notable about the resilient organizations that have formed in these two sectors is the strong role of business interests in both constituting the majority of their respective memberships, and in driving the strategic direction of the organizations. In fact, a number of organizations, including the Northeast Wisconsin Manufacturing Alliance and the North Coast Marine Manufacturing Alliance are especially unique in that they represent forms of private-public partnerships, which are far more unusual than the reverse.



There are a number of key advantages to the formation of a private-sector led industry partnership. First, the participating businesses are more likely to shape a pragmatic strategic organizational focus as they are self-interested in its success. Second, business leaders tend to be more articulate and persuasive in presenting the value proposition of participation to other business leaders and can therefore more effectively increase the organization's membership. Third, an organizational structure centered on industry participation also requires strategic investment, which frees organization resources from development needs to meet more tangible goals. Finally, it is important to recognize that industry-led advocacy organizations tend to hold a higher standing with elected officials than their public-sector driven counterparts.

One especially salient example of industry-led work in the region has been the formation and activity of the North Coast Marine Manufacturing Alliance (NCMMA). The Alliance formed through the engagement of seven large shipbuilders in Northeast Wisconsin. While the leaders of these firms have collaborated informally for several years, shared concerns over cost structures and workforce availability led to the creation of a formal organizational structure in 2010. The Alliance's formation also coincided with the award of a major U.S. Navy production contract to Marinette Marine Corporation.

It is again important to note that the strategic scope of the NCMMA is generally limited to two key topics – workforce development and supply chain development. The Alliance's supply chain development activities are especially instructive in relation to the current diversification strategy. One of the most active subcommittee's in the Alliance is comprised of the purchasing managers of many of the member firms. The subcommittee was among the first formed, and has a significant material effect on the shape and profitability of the region's supplier base.

The purchasing manager subcommittee started its work through a mapping exercise to identify common needs and common suppliers. This coordination of resources created the justification for common purchasing pools for a number of goods. It also identified key gaps that could be filled through the identification or development of new regional suppliers to meet these needs. Finally, the mapping exercise also presented the opportunity to open Alliance membership to an associate class comprised of current and potential suppliers and the planning of a number of “matchmaking” events which link end customers with suppliers. In every instance, the capacity and targets were identified and confirmed by the Purchasing Managers rather than other Alliance Members.

It is recommended that a similar model be introduced as part of the proposed diversification strategy. The region's stakeholders should use the results of the New North's supply chain development work to identify two or three targeted markets whose needs could be met through a number of regional suppliers. The major end producers in these markets should then be engaged to participate in an asset and opportunity mapping exercise similar to that conducted by the NCMMA. A possible example may involve the other transportation equipment manufacturers with significant regional operations, such as Caterpillar, John Deere, and Peterbilt. The region's economic development stakeholders could then foster dialogue between these end customers



and a well-defined network of potential regional suppliers. These conversations should occur at the procurement level, rather than among executives. This will spur the potential for clearly-defined objectives and realized cost savings. For comparison, it is estimated that the actions of the NCMMA's purchasing manager subcommittee have saved member firms at least \$500,000. Savings and additional business of this magnitude or greater is certainly possible.

### 5.4.2 The Kalamazoo Promise

One of the priorities identified through the scenario planning think tank process and other prior research suggests that the Fox Valley region needs to identify and foster a strategy aimed at the development and retention of young talent. The need to shape this priority is especially acute in a number of high technology and emerging fields in health care, information technology, and manufacturing. The region does not possess a local research university on the par of institutions located in Madison, Milwaukee, or other large markets. As a consequence, local high school students that are interested in seeking training in any of a number of fields in Computer Science, Engineering, or Healthcare Technology are required to attend these out-of region institutions to continue their studies. These students are also far more likely to secure employment and remain in these markets after graduation. The Fox Valley region needs to develop a strategy to incentivize the return of its best and brightest to meet the employment needs of local firms.

One viable option worthy of consideration is the development of a hybrid approach based on the Kalamazoo Promise model. The region shares many of the same characteristics that prompted the community leaders in Kalamazoo, Michigan to develop the initiative in 2005. Both regions are of similar relative size and both share a strong concentration of manufacturing employment. While the manufacturing employment losses in Kalamazoo far outpace those experienced in Oshkosh and elsewhere over the last three years, it is suggested that the acute job loss experienced throughout the defense-related supply chain could galvanize support for a more innovative approach.

The basic tenets of the Kalamazoo Promise model, which has been replicated by communities of all sizes in eleven states stresses the role of community investment and expanding educational access. In short, the Kalamazoo Promise was established through a sustaining philanthropic gift to provide tuition assistance to all students graduating from Kalamazoo Public Schools to attend a two or four-year public or private institution of their choice within the State of Michigan. No regard is given either for the student's academic standing or family income, but rather is tied to the length of enrollment in the district. Similarly, students are held to rather lenient academic standards to maintain eligibility while enrolled. As such, it represents one of the largest community-based higher education commitments, and one of the most altruistic.

A total of 3,831 students have become eligible for funding throughout the first eight years of the initiative again representing a significant investment. Similarly, the experience of the Kalamazoo Promise has prompted a number of other communities, including Denver, Colorado and Pittsburgh, Pennsylvania to



consider the adoption of a similar model. There is some disagreement within the research community as to what, if any impact the Promise model has had in communities that have pursued it, but there is some consensus to suggest that the true magnitude of the program's impact will not be felt for some time.

Rather, what the Kalamazoo Promise and other community-based scholarship programs offer is the beginning of a framework for a possible solution for the Fox Valley region. Any possible solution must be based on a strong civic investment. The region does have a large number of private donors and community-based philanthropic foundations that could organize to fund a similar effort. These organizations already share a culture of collaboration that could be leveraged to foster additional buy-in.

Similarly, the Kalamazoo Promise example demonstrates the possibility of the development of a place-based strategy. The Fox Valley region may consider two options in this regard. First, the region may pursue an assistance model similar to the Kalamazoo design that is targeted towards the region's resident student population. An approach of this type will incentivize more students to consider postsecondary education options throughout the region and outside of it. Such a program could also offer additional incentives for attendance at local institutions, or those students who choose to attend a two-year technical college program as opposed to a four-year university program, for example. An initiative of this type would require a significant and sustainable public investment, and may or may not increase educational attainment in the region. This is largely due to the fact that it will not alter students' attendance patterns or would a program of this type require the participating student to return to the region at any point.

The second and perhaps more viable solution for the region to develop a leveraged talent development and attraction model would be to look to a place-based alternative to the student loan forgiveness programs offered by a number of large employers and the federal government in areas of occupational need. Specifically, programs of this type may subsidize tuition costs upfront or reimburse them in some fashion following graduation for students who both receive degrees in areas of perceived local need and make some commitment to remain employed by and live in the region for a suitable period of time. Models of this sort are fairly common in the financial, health care, and technology sectors, but are less common in a place-based perspective.

Priority could be given based off of industry needs determined through an established advisory council model, such as the Northeast Wisconsin Manufacturing Alliance or emerging Information Technology committee. Similarly, priority for acceptance could be extended to graduates of high schools throughout the region. By embracing a place-based strategy, the region would recognize that the young talent that participates in the program would still be afforded a sense of mobility both among communities and employers. Similarly, participating employers could be asked to contribute to the program both on the basis of the number and tenure of active participants.

The pursuit of a place-based community scholarship or loan forgiveness program in the Fox Valley region would further enable the education community to leverage additional capacity and resources outside of



the region. This would enable these institutions to focus on their existing strengths while meeting broader employer needs. It would also demonstrate a commitment to the attraction, development, and retention of young professionals in the region. This represents another strong asset that would contribute to the quality of life of the region and provide significant reputational benefits.

### 5.4.3 Ohio Additive Manufacturing Consortium

One of the challenges that the Fox Valley region faces, as identified in the recommendations above is in forming and defining two new industry clusters in information technology and aerospace and aviation. The region does have significant concentrations of information technology workers, but few traditional information technology firms, such as software developers. Similarly, the region has a history of development in the aviation industry as evidenced by the influence of the Experimental Aircraft Association, but has had little direct involvement in the business side of the industry until relatively recently. As such, it will be important for the stakeholders in the region to give serious consideration to both the character of the clusters they wish to develop, and the dimensions along which they wish to define them.

One possible model to consider is the industry association model wherein firms with a shared customer base or shared processes organize in order to build shared markets and capacity. A recent example of this type of development occurring in Wisconsin has been the development of a cluster around freshwater technology production in and around Milwaukee, as organized into the Milwaukee Water Council. The Council itself is comprised of leaders from academia, government, and the private sector. Much of the innovation that has come out of the partnerships formed to date have focused on the development of high value added product lines and innovative practices. This mirrors closely the ambitions of the leaders seeking to develop a similar industry cluster in the aerospace industry in the region.

Another, and perhaps more closely aligned example, as evidenced by the priorities coming out of the ongoing analysis of the aerospace and aviation industry as part of the ORDIDI process is the Ohio Additive Manufacturing Consortium (<http://ewi.org/additive-manufacturing-consortium/>). The processes and technologies related to Additive Manufacturing have applications throughout a number of key manufacturing sectors, ranging from plastic products to advanced metal fabrication processes in the automotive and electronics industry. Many of the firms in the Fox Valley region currently utilize some aspect of additive manufacturing, ranging from 3D printing to rapid prototyping. Fox Valley Technical College also offers significant training and research capacities in this field through its Fab Lab. Many of the same capacities and customers prompted a group of manufacturers operating in a corridor stretching from Columbus to Youngstown, Ohio to connect in 2010.



The Consortium, or AMC, as currently comprised of fifteen large national members, ranging from Lockheed Martin and GE Aviation to NASA and a number of other aerospace interests. The consortium's formation benefited both from the presence of a large number of aerospace-related firms interested in applying additive manufacturing processes, as well as active economic development communities in Central and Northeast Ohio that recognized the potential of organizing around this competitive advantage.

A closely-related and perhaps more prominent entity is the America Makes: National Additive Manufacturing Innovation Institute, located in Youngstown, Ohio ([http://manufacturing.gov/nnmi\\_pilot\\_institute.html](http://manufacturing.gov/nnmi_pilot_institute.html)). The Institute, founded in 2012 by a consortium led by the National Center for Defense Manufacturing and Machining through the National Network for Manufacturing Innovation initiative. The Institute serves as a national clearinghouse for research advances and best practices and is the industry champion in raising the profile of additive manufacturing. It currently has ninety-five member firms and represents a second example of an effective public-private partnership formed around the promise of Additive Manufacturing.

It is believed that a similar consortium model could develop on a smaller scale within the Fox Valley. The potential application of additive manufacturing in large-scale aviation and other manufacturing processes has been well-established. The regional organization could look to partner with America Makes to promote applications of additive process in small craft manufacturing, and among the mid-size firms that define the metal fabrication industry in the region. Similarly, Fox Valley Technical College should continue to work to expand its development and training offerings to support the expansion of the use of this technology in the region. There is still considerable market space for additional organization in the additive manufacturing field. The Fox Valley region is well-positioned to make its mark.

## 6.0 Conclusion

The Fox Valley region possesses significant potential for future economic growth. It is host to a vibrant and collaborative industry mix, a wealth of educational, economic development, and workforce development resources, and a highly-skilled and engaged workforce. These and other characteristics have defined the region's economic character for the past century and have contributed to a high level of prosperity and quality of life.

The region also faces a number of potential challenges. The region's population continues to age, though not quite as quickly as the state, as a whole. As a consequence, a number of large employers are already experiencing difficulty in meeting their workforce needs. The region's industry mix also tends to emphasize those traditional industries that are more labor-dependent. This further emphasizes the need for future talent development and heightens the magnitude of this constraint.



The region is also host to a number of firms that have built upon a history of innovation. Some of these firms, such as Plexus, Bemis, and Kimberly-Clark continue this legacy, while others have shifted their focus to profit through production. The region has demonstrated that it has the capacity to support innovation and entrepreneurship and is again challenged to foster that commitment.

The recommendations presented here are just that – recommendations. They represent the perspective of a body of prior work in the region as well as observations gleaned through Future iQ Partners work in the region. We recognize that significant resources may be required to implement many of the proposed strategies, we are equally confident that the region’s stakeholders have the capacity to both foster and align these resources to shape a collaborative, pragmatic, and strategic future.

## 7.0 Acknowledgements

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## 8.0 More Information

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