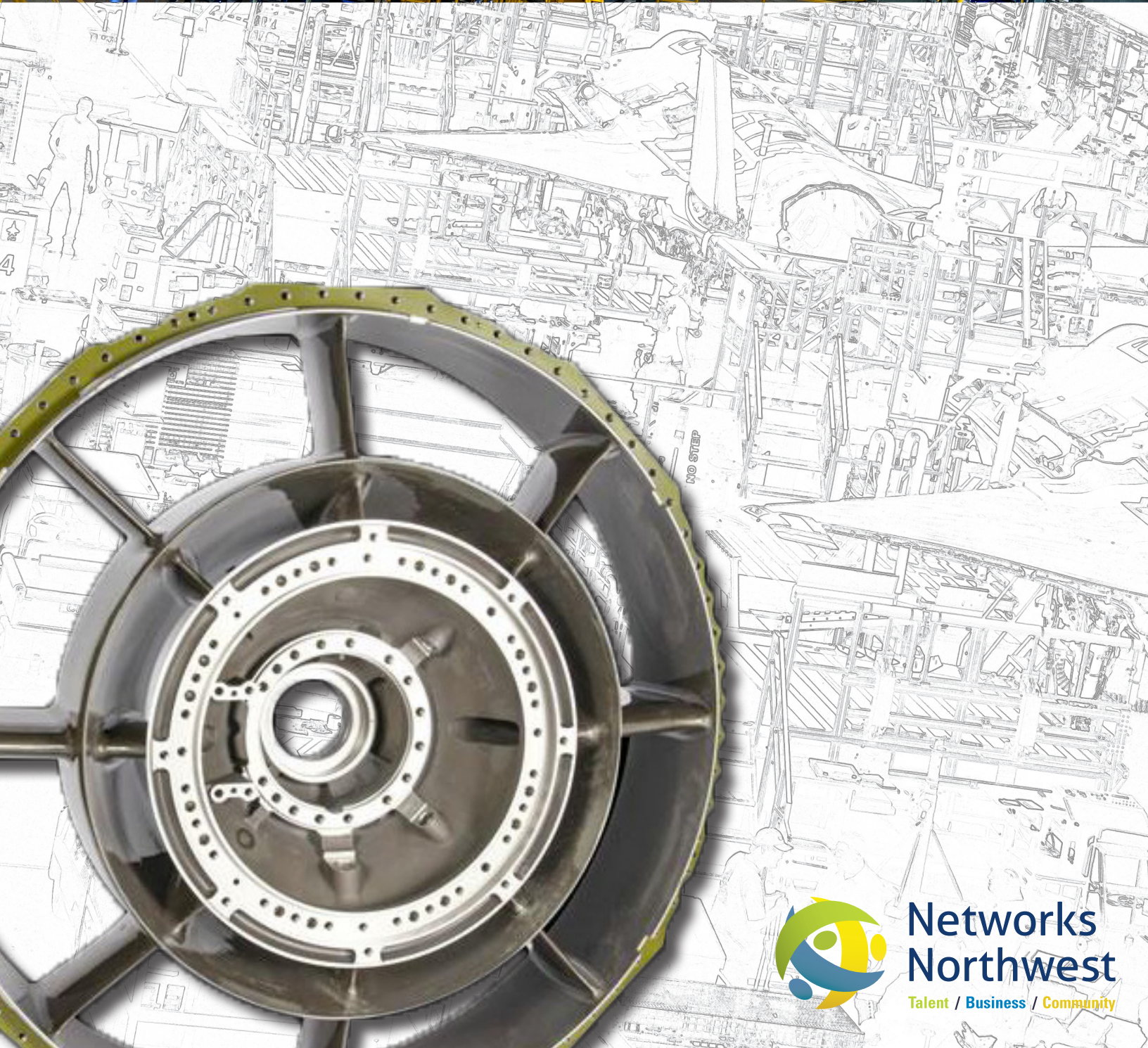




State of Department of Defense Contracting in Northwest Michigan

County Level Benchmarks for FY2013 – FY2017



**Networks
Northwest**

Talent / Business / Community

ACKNOWLEDGEMENTS

Networks Northwest would like to thank all of the people who gave their time and resources towards the development of the State of Department of Defense Contracting in Northwest Michigan report and Northwest Michigan Defense Industry Analysis survey.

Prepared by:



PO Box 506
Traverse City, MI 49685-0506
www.networksnorthwest.org

Project Consultant:
Scott Gest
Econometrics, Environmental, and Large Data Analytics Consulting

WITH FUNDING FROM:

Financial assistance for this report was provided by:



The Michigan Defense Center is an operation of the Michigan Economic Development Corporation focused on the support, protection and growth of Michigan's defense and homeland security missions and the Michigan businesses that support our nation's security and our military's safety.

The Michigan Defense Center is the State of Michigan's lead voice on the defense and homeland security economy and guides the state's policies and programs to protect and grow this important sector of the economy. The MDC acts as a liaison between the state and defense interests in the federal government, defense agencies, the defense industry, academia and the defense community and supporting organizations.



EXECUTIVE SUMMARY 4

INDUSTRY ANALYSIS 7

 Methodology 7

 Brookings Institute Advanced Industries Group 7

 Employment & Wages Time Series Data. 9

 Department of Defense Contract Awards Data 9

 County Comparisons Methodology. 9

 Map 1 — Annual DoD Contracts for All Industries by County 10

 Map 2 — Annual DoD Contracts for Brookings 50 Advanced Industries by County 12

 Map 3 — Annual DoD Contract Amount per Worker by County 14

 Map 4 — Annual DoD Contracts per Worker by County 16

 Patent Issues 19

NORTHWEST MICHIGAN SURVEY OF COMPANIES 20

NORTHWEST MICHIGAN COUNTY ANALYSIS 27

 Antrim County Datasheets 28

 Benzie County Datasheets 30

 Charlevoix County Datasheets 32

 Emmet County Datasheets 34

 Grand Traverse County Datasheets 36

 Kalkaska County Datasheets 38

 Leelanau County Datasheets 40

 Manistee County Datasheets 42

 Missaukee County Datasheets 44

 Wexford County Datasheets 46

MICHIGAN PROSPERITY REGIONS ANALYSIS 48

END NOTES 49

EXECUTIVE SUMMARY

The Research Goal of the following study was to benchmark Department of Defense contracting performance for Northwest Michigan (Antrim, Benzie, Charlevoix, Emmet, Grand Traverse, Kalkaska, Leelanau, Manistee, Missaukee and Wexford) with a focus on high-technology Industry activity by comparing them to US counties with similar sized workforces. The study also includes a survey of Northwest companies to gage their capacity and interest in seeking opportunities to increase DOD contract activity.

The study used industry employment and wage data, patent filings, and historical DOD contract data for all counties in the US from 2013 to 2017. Following are key points from the research with implications for economic development policy.

KEY POINTS

- ➔ Most of the Northwest Michigan Counties, except Benzie and Wexford, are under performing in total DoD contracts for all industries in relation to their respective comparison groups. According to an analysis of the 5-year average of DoD contracts from FY2013-FY2017, only Wexford County is performing better than its comparison group for Brookings 50 Advanced Industries (B50) DoD contracts. Of the ten Northwest Michigan counties, three counties had no significant Brookings 50 Advanced Industries DoD contract activity. Other than Wexford, the remaining six counties' Brookings 50 Advanced Industries activity ranged from 2% (Grand Traverse) to 74% (Antrim) of their respective comparison group activity. Grand Traverse County's under performance is of note as its workforce comprises 41% of the total Northwest Michigan workforce and 68% of the Brookings 50 Advanced Industries workforce.

On average Northwest Michigan Counties have more Brookings Advanced Industry firms with lower average per worker wages compared to their comparison groups. Grand Traverse County's average per worker wage for Brookings Advanced Industry employees fell to 92.9% of its comparison group in 2017. This would indicate that workforce economics is not a contributing factor for the DoD contract under performance when compared to its peer group.

Northwest Michigan's workforce is growing at an average annual rate of 1.7% with Grand Traverse County averaging 2.5% growth. However, the Brookings 50 Advanced Industries workforce growth is relatively flat.

Chart 1 — Northwest Michigan Workforce Levels

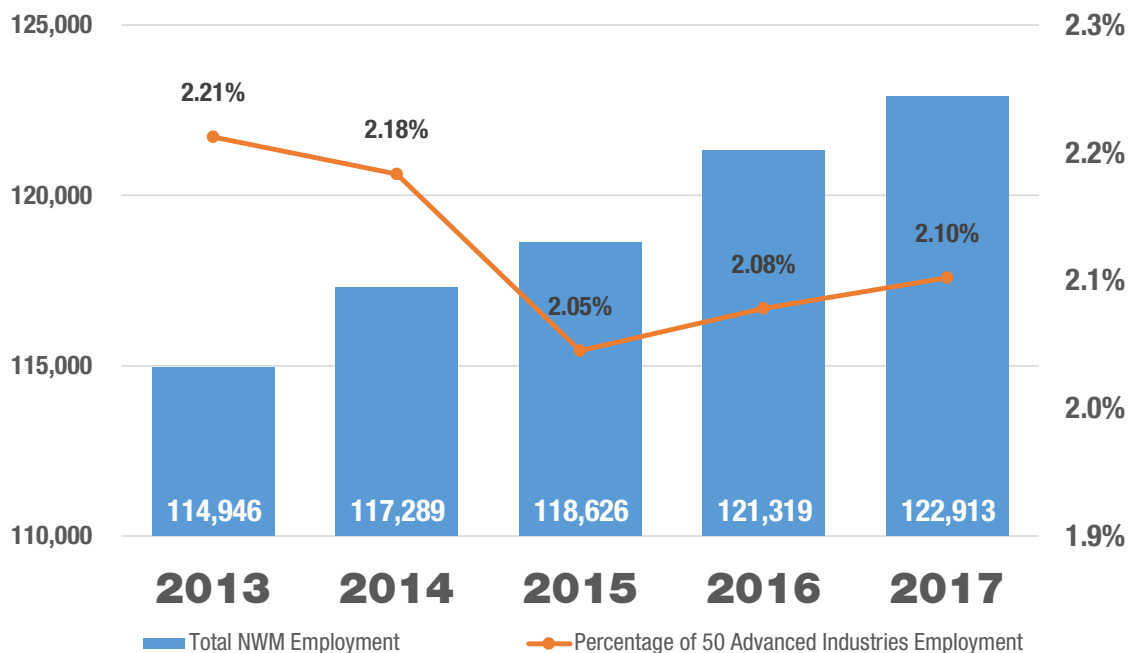
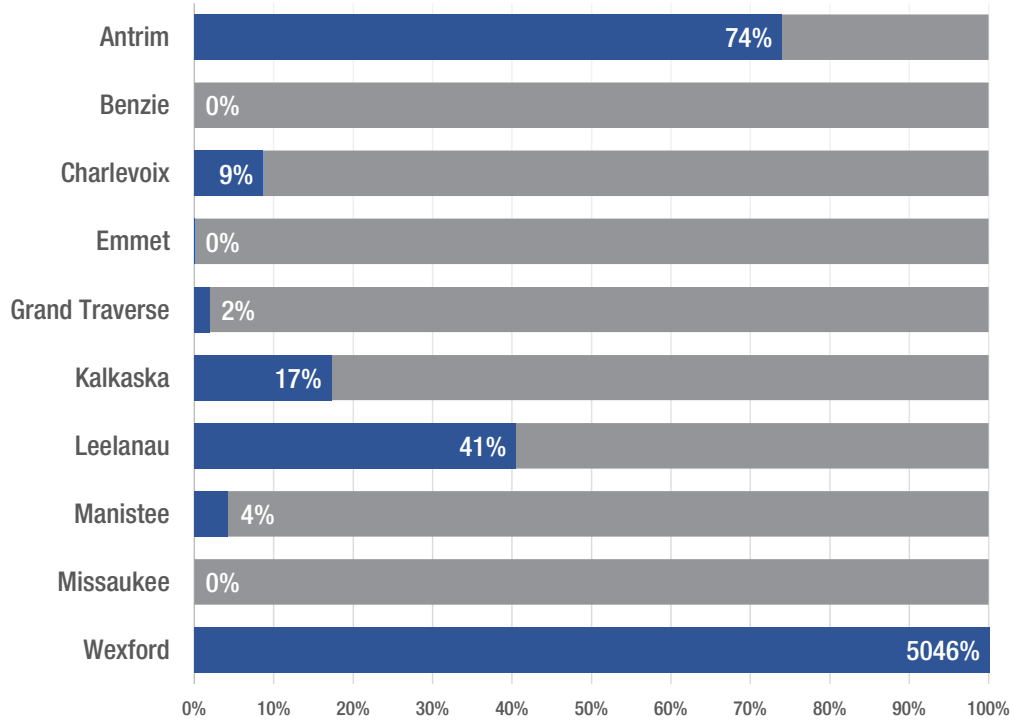


Chart 2 — Brookings 50 Advanced Industries DoD Contracts
 [As a Percentage of the respective County's Comparison Group]



The analysis of all industry DoD contracts indicates greater under performance for each of the Northwest Michigan Counties except for Benzie and Wexford counties with most counties at less than 5% of the DoD contracting level of average peer counties. Average per worker wages for each of the Northwest Michigan counties compared to their peers range from 85% (Antrim) to 126% (Kalkaska) with most falling within +/-10%, indicative of competitive workforce wages.

Thirty-two Northwest Michigan firms contracted with the DoD in FY2017 with 53% of the firms located in and around Traverse City. Of the 32 firms, 25 of them are classified as Brookings 50 Advanced Industries. The top three firms in total FY2017 DoD contract awards represents 94.2% of the total amount of Northwest Michigan DoD contracts of \$121,854,662. With the large percentage of contract amounts held by just three firms, the impact of the loss of these contract relationships would negatively impact the local and regional economies.

Chart 3 — Average Per Worker Wages
 [As a Percentage of the respective County's Comparison Group]

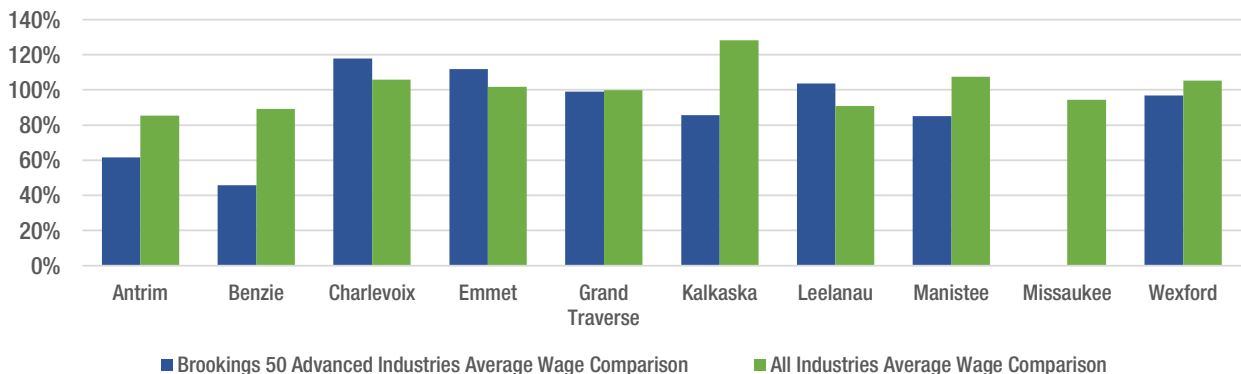
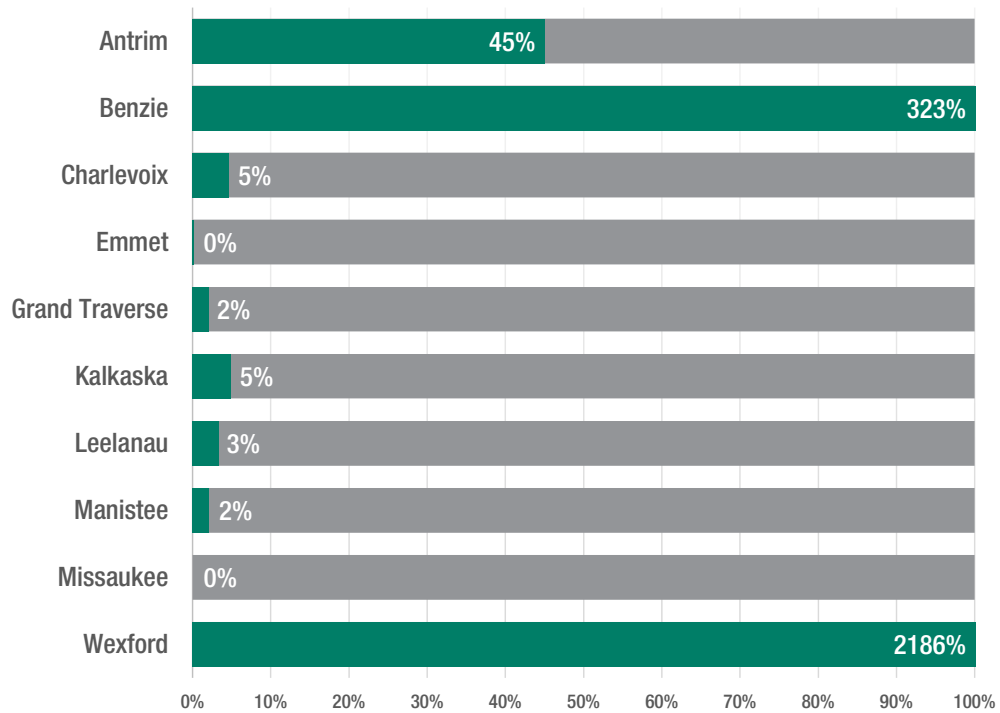


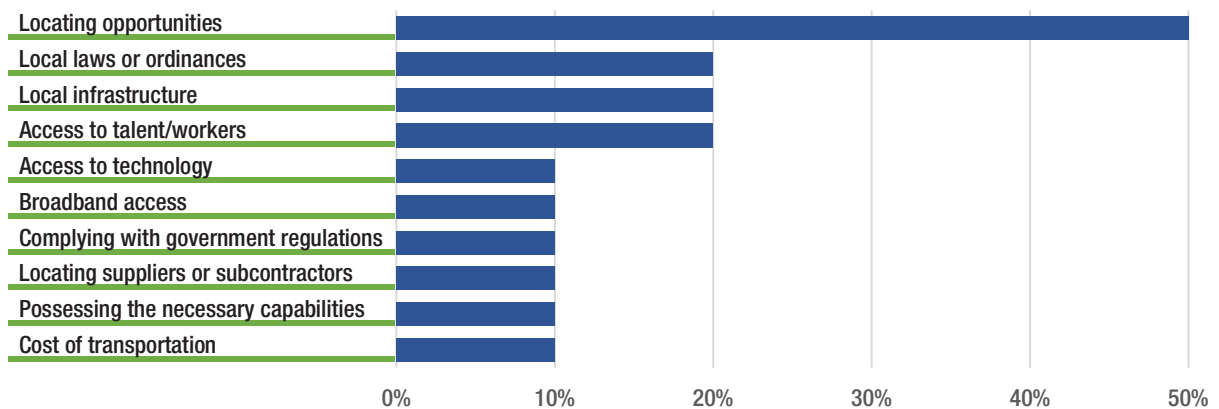
Chart 4 — All Industries DoD Contracts
 [As a Percentage of the respective County's Comparison Group]



The percentage of Northwest Michigan firms that contracted with the DoD in FY2017 is 0.35%. The percentage for firms classified as the Brookings 50 Advanced Industry group is 4.64%.

- ➔ The survey indicates that Northwest Michigan firms possess advanced manufacturing technology and equipment and would like to build additional capacity. Respondents to the survey of Northwest Michigan business stated the need for increased workforce skills, access to capital geared to advanced manufacturing, growth in the areas advanced manufacturing cluster, assistance to market local capacity to the national DoD supply chain, and assistance with the DoD contracting processes.
- ➔ When survey participants were asked what barriers they have in working with the DoD, 73% indicated locating opportunities as a barrier. Of the respondents not currently doing business with the DoD, 50% listed locating opportunities as a significant or large barrier to their stated goal of entering into DoD contracting.

Chart 5 — Barriers to Entry into DoD Contracting
 % Of Respondents Not Currently DoD Contracting rating Barrier as Significant



INDUSTRY ANALYSIS

This report's analysis focuses on labor force data to determine current performance and ascertain growth potential for Department of Defense contracting for Northwest Michigan. Other measures of economic potential such as Gross Domestic Product (GDP) by Industry that are published for the state and federal levels by the Department of Commerce's Bureau of Economic Analysis are not available at the county level. Economic output data, including county level estimated GDP, are available from commercial sources. However, they estimate data based on proprietary models using public data that has been suppressed to protect the confidentiality of reporting companies when the number of companies reporting in a geographic area is small. The suppression of public data can cause large margins of error in these models or rural areas. Due to the potential for large errors in estimating industry level economic output, these commercial data sources were not used in the report.

METHODOLOGY

The Quarterly Census of Employment and Wages (QCEW) program publishes a quarterly count of employment and wages reported by employers covering more than 95 percent of U.S. jobs, available at the county, MSA, state and national levels by industry. QCEW produces a comprehensive tabulation of data on the number of establishments, monthly employment and quarterly wages for workers covered by State unemployment insurance (UI) laws and Federal workers covered by the Unemployment Compensation for Federal Employees (UCFE) program.¹ Major exclusions from UI coverage include self-employed workers, most agricultural workers on small farms, all members of the Armed Forces, elected officials in most states, most employees of railroads, some domestic workers, most student workers at schools, and employees of certain small nonprofit organizations.

The QCEW program contains data for industries based on the The North American Industry Classification System (NAICS). The NAICS System is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. Table 1 contains an example of the NAICS hierarchy structure.

Table 1 — Example of NAICS Industry Classification Hierarchy

Level	NAICS Code	Title
Sector	31-33	Manufacturing
Subsector	336	Transportation Equipment Manufacturing
Industry Group	3364	Aerospace Product and Parts Manufacturing
NAICS Industry	33641	Aerospace Product and Parts Manufacturing
National Industry	336412	Aircraft Engine and Engine Parts Manufacturing

QCEW data is aggregated to many different levels, starting at the 6-digit NAICS industry level, to higher industry levels (NAICS industry groups, sectors, and supersectors), and to various geographic levels (County, Metropolitan Statistical Area, State, and national). At the county level, the QCEW program publishes establishment, employment, and wage data down to the 6-digit NAICS industry level, if disclosure restrictions are met. Establishment counts and wage data are available quarterly and annually. Employment data are available monthly and annually.

In order to ascertain the level of high-technology and advanced industry activity in the area, the Brookings Institute Advanced Industries Group was used to filter QCEW data and analyze the high-technology workforce existing at the county level.

BROOKINGS INSTITUTE ADVANCED INDUSTRIES GROUP

The Brookings Institute Advanced Industries Group (BI50) dataset defines advanced industries as, "the set of industries employing specialized labor who draw on scientific and technical knowledge, on the one hand, and deploy that knowledge to research and develop new products and processes, on the other."² Brookings further defines industries as advanced, "if a greater share of their workforce is STEM oriented than the U.S. average (21 percent) and their R&D spending is at least \$450 per worker, which is the 78th percentile of spending per worker. This identifies 50 advanced industries out of the 287 four-digit industries with comparable data."³ A list of the 50 industries comprising the Brookings Advanced Industries can be found in Table 2 on page 8.

Table 2 — Brookings Institute 50 Advanced Industries

4-Digit NAICS Code	Category	Industry Title (Abbreviated)
3241	Manufacturing	Petroleum and Coal Products
3251	Manufacturing	Basic Chemicals
3252	Manufacturing	Resins and Synthetic Rubbers, Fibers, and Filaments
3253	Manufacturing	Pesticides, Fertilizers, and Other Agr. Chemicals
3254	Manufacturing	Pharmaceuticals and Medicine
3259	Manufacturing	Other Chemical Products
3271	Manufacturing	Clay Products
3279	Manufacturing	Other Nonmetallic Mineral Products
3311	Manufacturing	Iron, Steel, and Ferroalloys
3313	Manufacturing	Aluminum Production and Processing
3315	Manufacturing	Foundries
3331	Manufacturing	Agr., Construction, and Mining Machinery
3332	Manufacturing	Industrial Machinery
3333	Manufacturing	Commercial and Service Industry Machinery
3336	Manufacturing	Engines, Turbines, and Power Trans. Equipment
3339	Manufacturing	Other General Purpose Machinery
3341	Manufacturing	Computers and Peripheral Equipment
3342	Manufacturing	Communications Equipment
3343	Manufacturing	Audio and Video Equipment
3344	Manufacturing	Semiconductors and Other Electronic Components
3345	Manufacturing	Navigation, Measurement, and Control Instruments
3346	Manufacturing	Magnetic and Optical Media
3351	Manufacturing	Electric Lighting Equipment
3352	Manufacturing	Household Appliances
3353	Manufacturing	Electrical Equipment
3359	Manufacturing	Other Electrical Equipment and Components
3361	Manufacturing	Motor Vehicles
3362	Manufacturing	Motor Vehicle Bodies and Trailers
3363	Manufacturing	Motor Vehicle Parts
3364	Manufacturing	Aerospace Products and Parts
3365	Manufacturing	Railroad Rolling Stock
3366	Manufacturing	Ship and Boat Building
3369	Manufacturing	Other Transportation Equipment
3391	Manufacturing	Medical Equipment and Supplies
3399	Manufacturing	Other Miscellaneous
2111	Energy	Oil and Gas Extraction
2122	Energy	Metal Ore Mining
2211	Energy	Electric Power Generation, Trans., and Distribution
5112	Services	Software Publishers
5152	Services	Cable and Other Subscription Programming
5172	Services	Wireless Telecommunications Carriers
5179	Services	Other Telecommunications
5174	Services	Satellite Telecommunications
5182	Services	Data Processing and Hosting
5191	Services	Other Information
5413	Services	Architecture and Engineering
5415	Services	Computer Systems Design
5416	Services	Mgmt., Scientific, and Technical Consulting
5417	Services	Scientific Research and Development
6215	Services	Medical and Diagnostic Laboratories

EMPLOYMENT & WAGES TIME SERIES DATA

The analysis used the annual QCEW datasets for historical data for all counties in the US for the years 2013 to 2017. The employment and wage by industry provided by the QCEW was used to look at how the 10 counties of Northwest Michigan (Prosperity Region 2) are performing against the sets of similar counties.

DEPARTMENT OF DEFENSE CONTRACT AWARDS DATA

USAspending.gov is the official source for spending data for the U.S. Government. It contains Congressional appropriations to the federal agencies and their contracts for goods and services. The data contains contracts to vendors down to local communities and businesses.

The Federal Funding Accountability and Transparency Act of 2006 (FFATA) was signed into law on September 26, 2006. The legislation required that federal contract, grant, loan, and other financial assistance awards of more than \$25,000 be displayed on a publicly accessible and searchable website to give the American public access to information on how their tax dollars are being spent. In 2008, FFATA was amended by the Government Funding Transparency Act, which required prime recipients to report details on their first-tier sub-recipients for awards made as of October 1, 2010. The transparency efforts of FFATA were expanded with the enactment of the Digital Accountability and Transparency Act (DATA Act) Pub. L. 113-101 on May 9, 2014. The purpose of the DATA Act, as directed by Congress, is to:

- Expand FFATA by disclosing direct agency expenditures and linking federal contract, loan, and grant spending information to federal agency programs
- Establish government-wide data standards for financial data and provide consistent, reliable, and searchable data that is displayed accurately
- Simplify reporting, streamline reporting requirements, and reduce compliance costs, while improving transparency
- Improve the quality of data submitted to USAspending.gov by holding agencies accountable.

Many sources of information support USAspending.gov, linking data from a variety of government systems to improve transparency on federal spending for the public. Data is uploaded directly from more than a hundred federal agencies' financial systems. Data is also pulled or derived from other government systems. Contract award data is pulled into USAspending.gov daily from the Federal Procurement Data System Next Generation (FPDS-NG), which is the system of record for federal procurement data; Financial Assistance award data is loaded in from the Federal Assistance Broker Submission system (FABS). Entities receiving awards directly from federal agencies submit data on their sub-awards to the FFATA Sub-award Reporting System (FSRS). And businesses that are required to report their Highly Compensated Executives data do so to the System for Award Management (SAM).

Federal agencies submit contract, grant, loan, direct payment, and other award data at least twice a month to be published on USAspending.gov. Federal agencies upload data from their financial systems and link it to the award data quarterly. This quarterly data must be certified by the agency's Senior Accountable Official before it is displayed on USAspending.gov.⁴

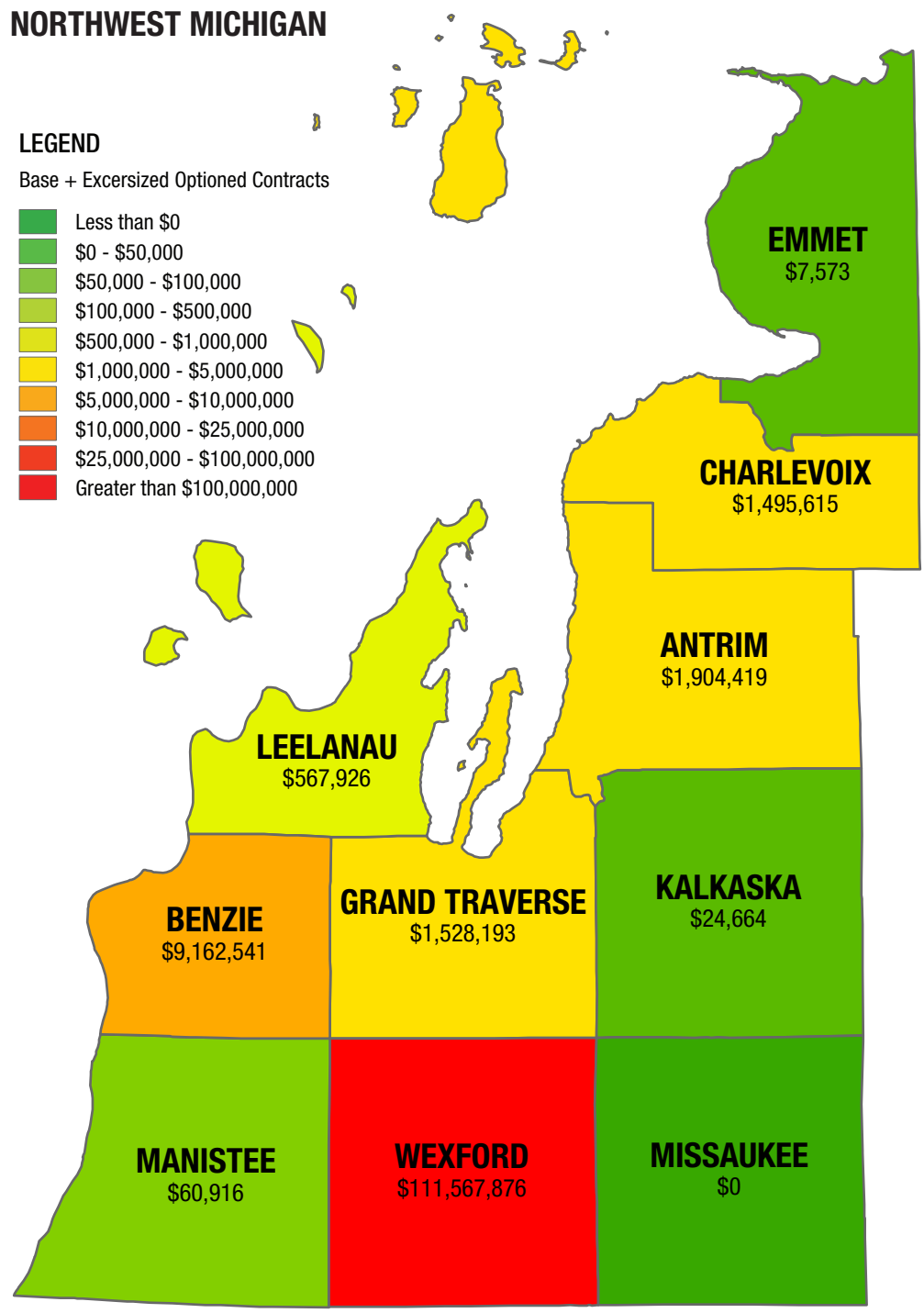
This report assembled and analyzed archive data from USAspending.gov Award Data Archive. Archive data for Department of Defense contracts for FY13 thru FY17 (5-years) was used to analyze all US counties to create comparisons for Northwest Michigan counties.

COUNTY COMPARISONS METHODOLOGY

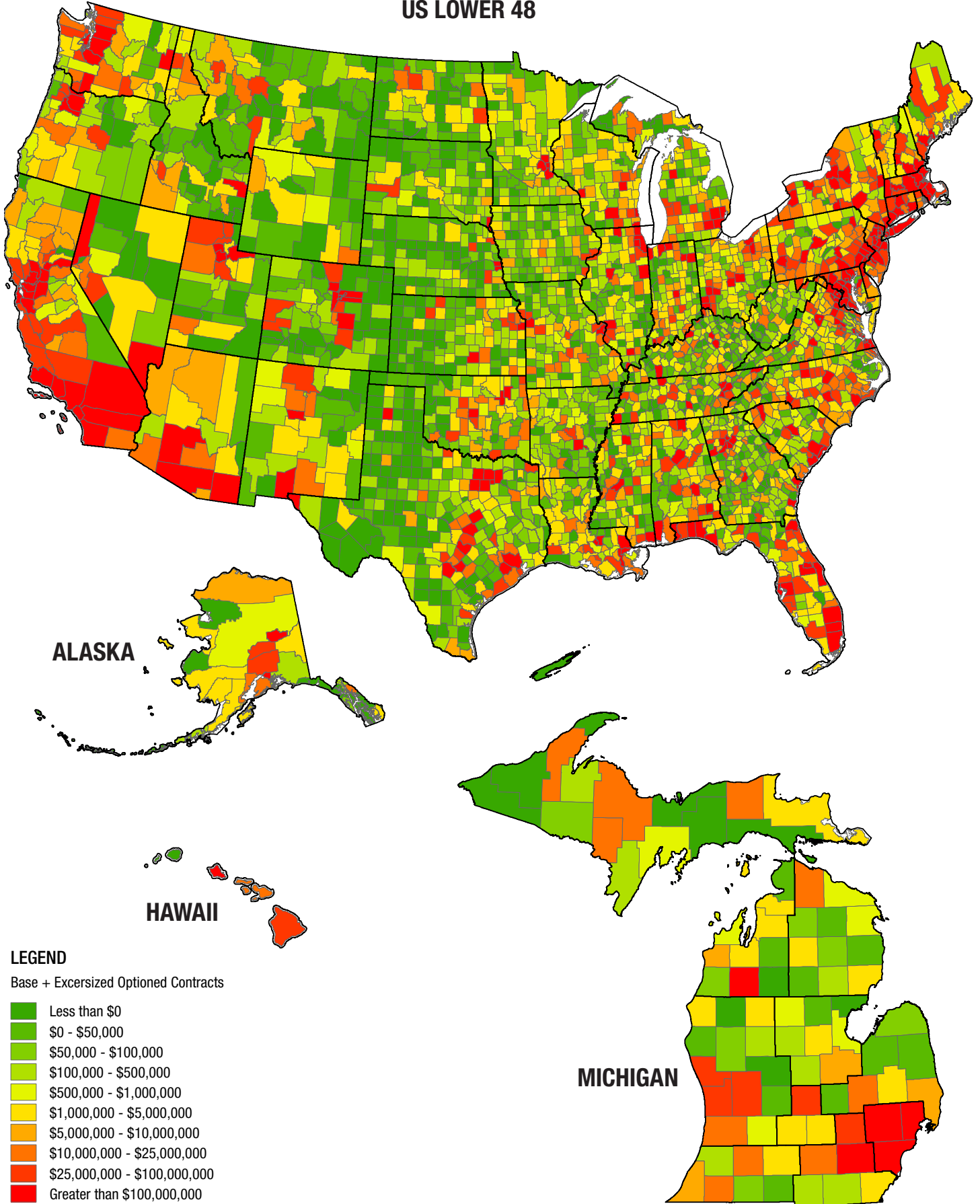
QCEW and DoD Contract Awards from USAspending.gov data was compiled for all 50 states and the District of Columbia at the county level for 2013 to 2017. Comparison sets were selected for each of the 10 Northwest Michigan counties based on their respective rank of their 2017 total QCEW workforce size. The comparison sets are comprised of closest ranked counties (+/- 50) using the total number of employees. Each of the 10 comparison sets was then used to generate an unweighted average for each comparison group datapoint for use in the analysis for each NWM county.

Map 1 — Annual DoD Contracts for All Industries by County
 [5-Year Average: 2013-2017]

These maps depict Northwest Michigan, The Lower 48, Alaska, Hawaii, and Michigan's Department of Defense contracts for Base and Excersized Options dollar value for All Industries. The best performing Northwest Michigan county is Wexford, with a 5-year average of \$111,567,876 annually for 2013-2017. Ranking 236 out of the 3,179 counties in the US.

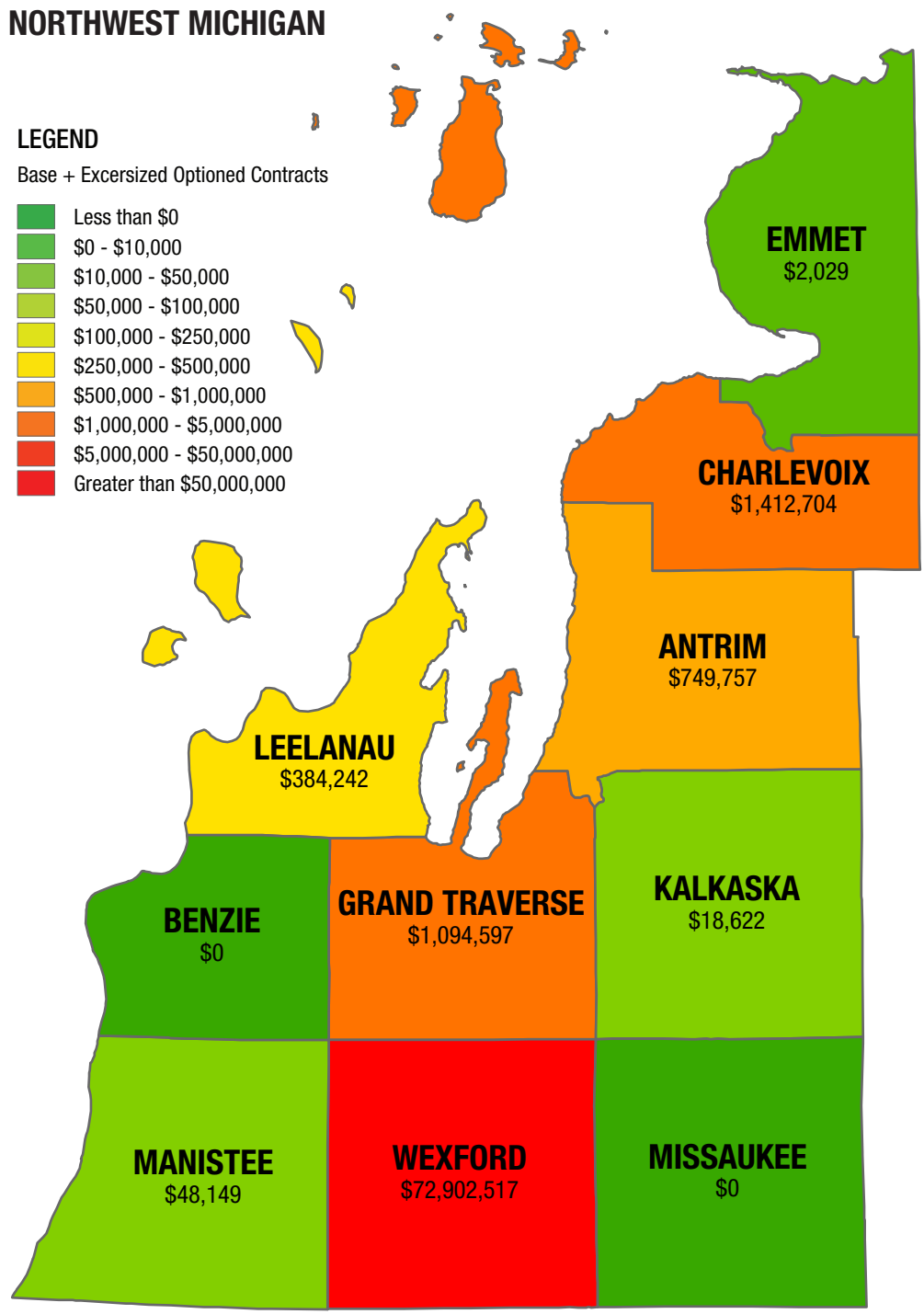


US LOWER 48

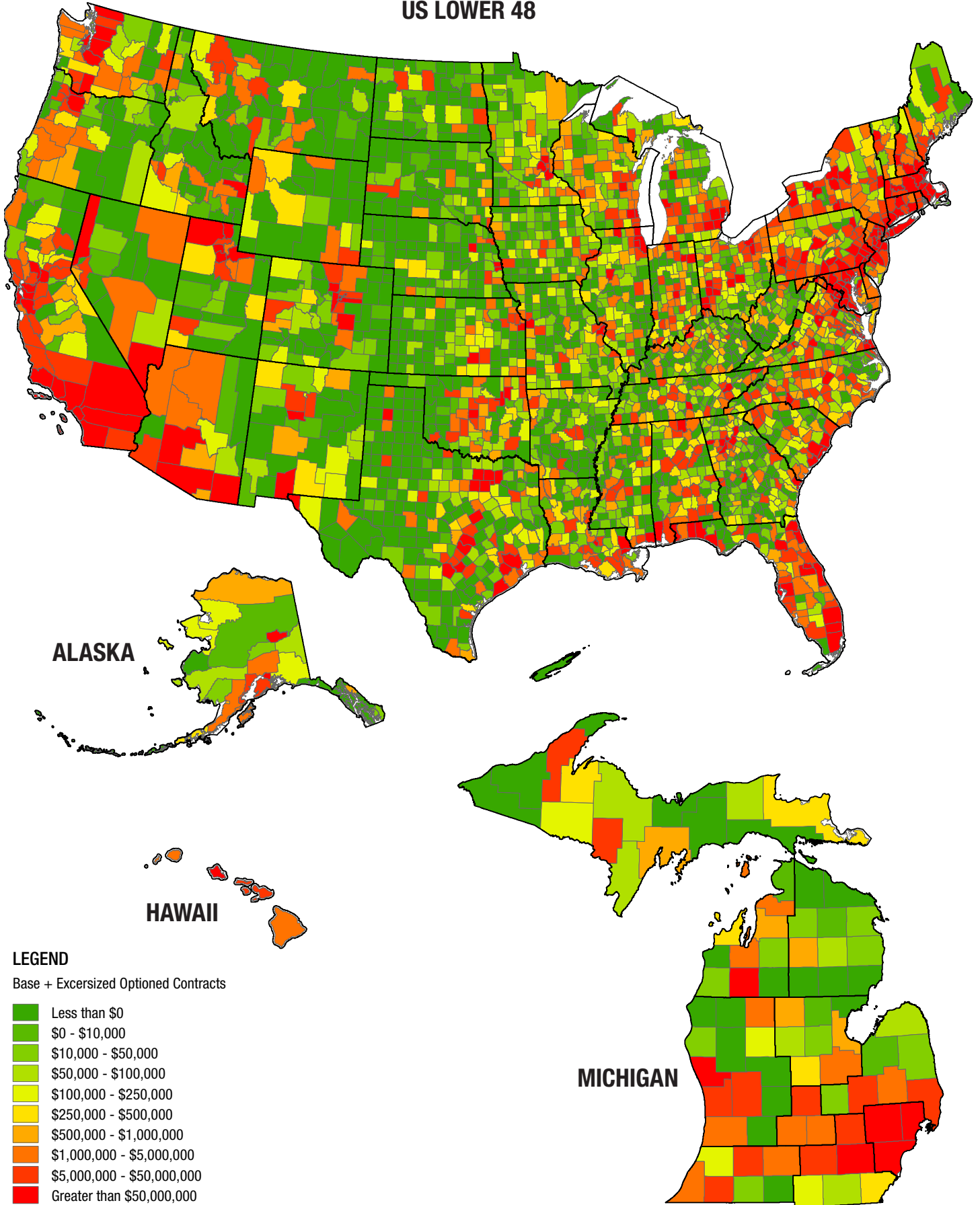


**Map 2 — Annual DoD Contracts for Brookings 50 Advanced Industries by County
[5-Year Average: 2013-2017]**

These maps depict Northwest Michigan, The Lower 48, Alaska, Hawaii, and Michigan's Department of Defense contracts for Base and Excersized Options dollar value for the the Brookings 50 Advanced Industries. The best performing Northwest Michigan county is Wexford, with a 5-year average of \$72,902,517 annually for 2013-2017. Ranking 195 out of the 3,179 counties in the US.

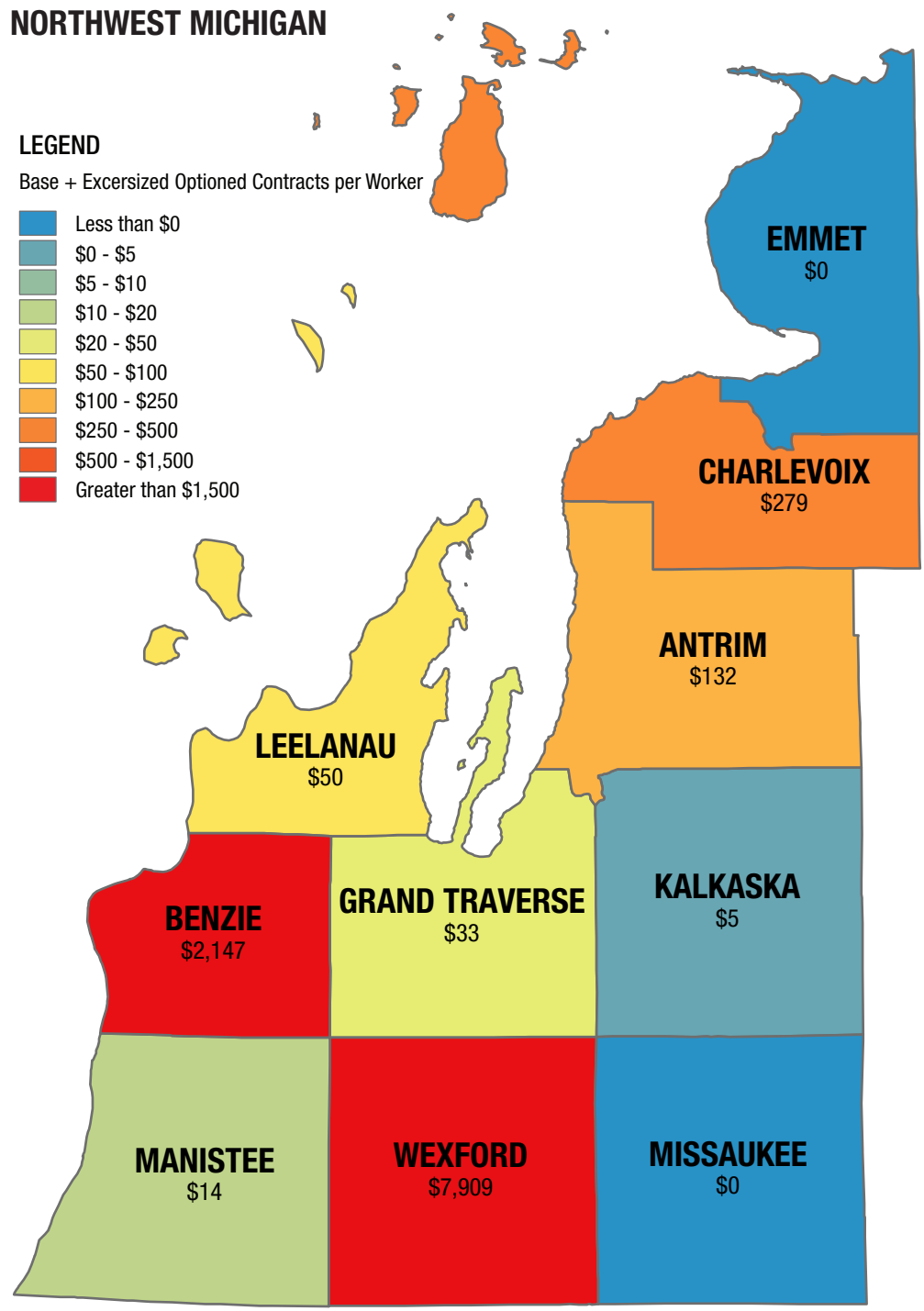


US LOWER 48

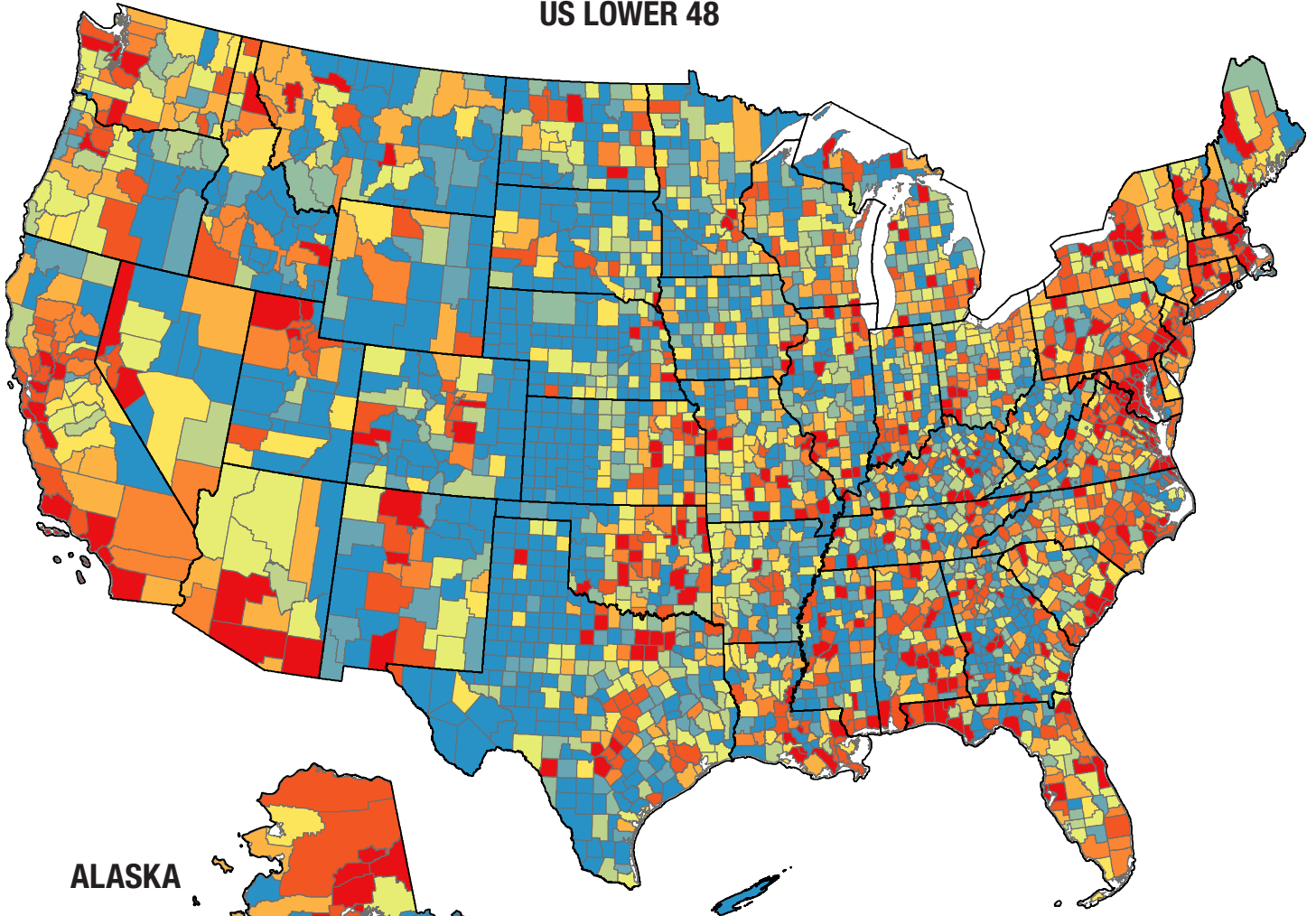


Map 3 — Annual DoD Contract Amount per Worker by County
[All Industries 2017]

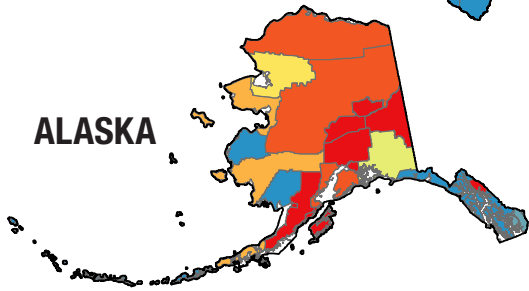
These maps depict Northwest Michigan, The Lower 48, Alaska, Hawaii, and Michigan's Department of Defense contracts for Base and Excersized Options dollar value per worker for All Industries. The best performing Northwest Michigan county is Wexford, with an average of 7,909 per worker for 2017. Ranking 73 out of the 3,179 counties in the US. Benzie's \$2,147 ranked 237.



US LOWER 48



ALASKA



HAWAII

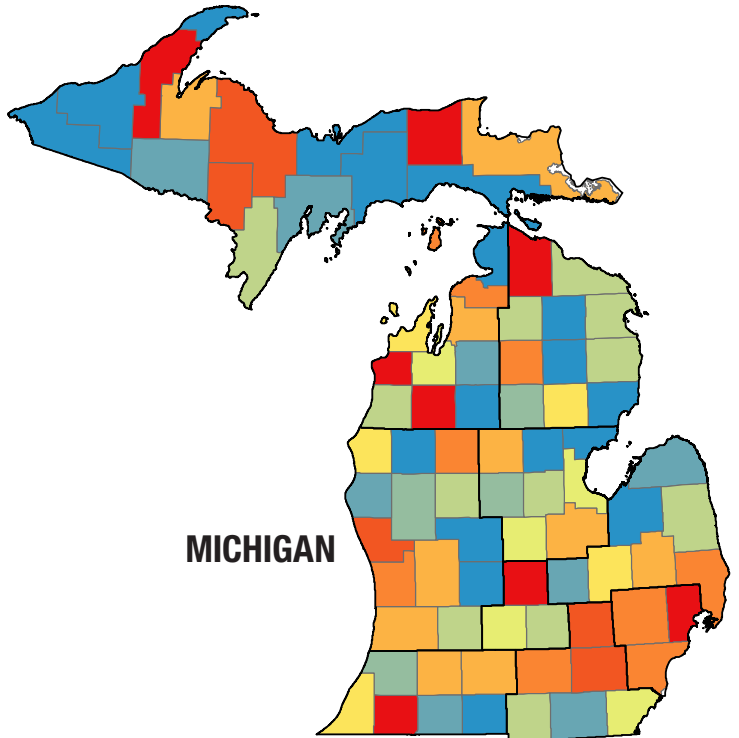


LEGEND

Base + Excersized Optioned Contracts per Worker

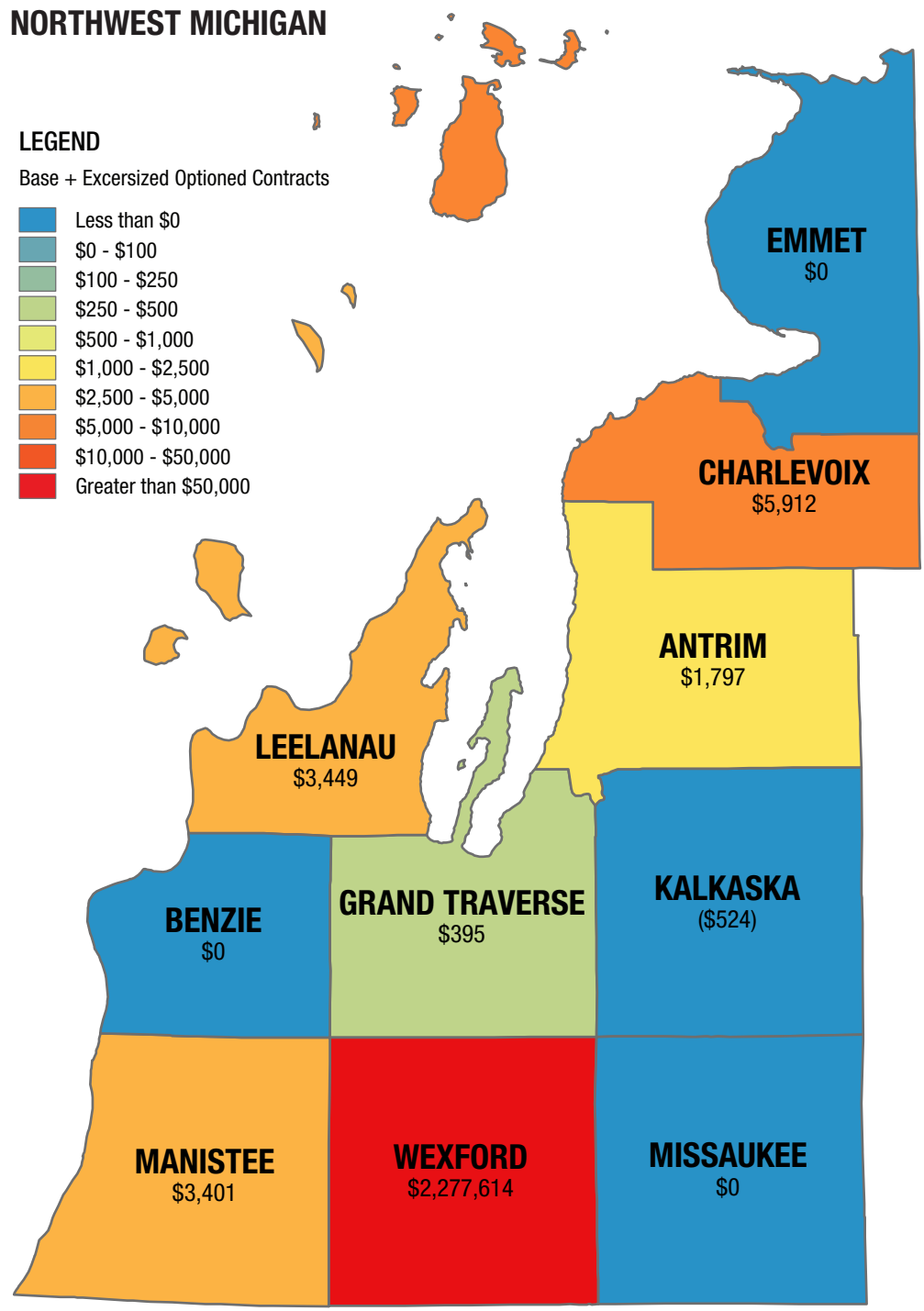
- Less than \$0
- \$0 - \$5
- \$5 - \$10
- \$10 - \$20
- \$20 - \$50
- \$50 - \$100
- \$100 - \$250
- \$250 - \$500
- \$500 - \$1,500
- Greater than \$1,500

MICHIGAN

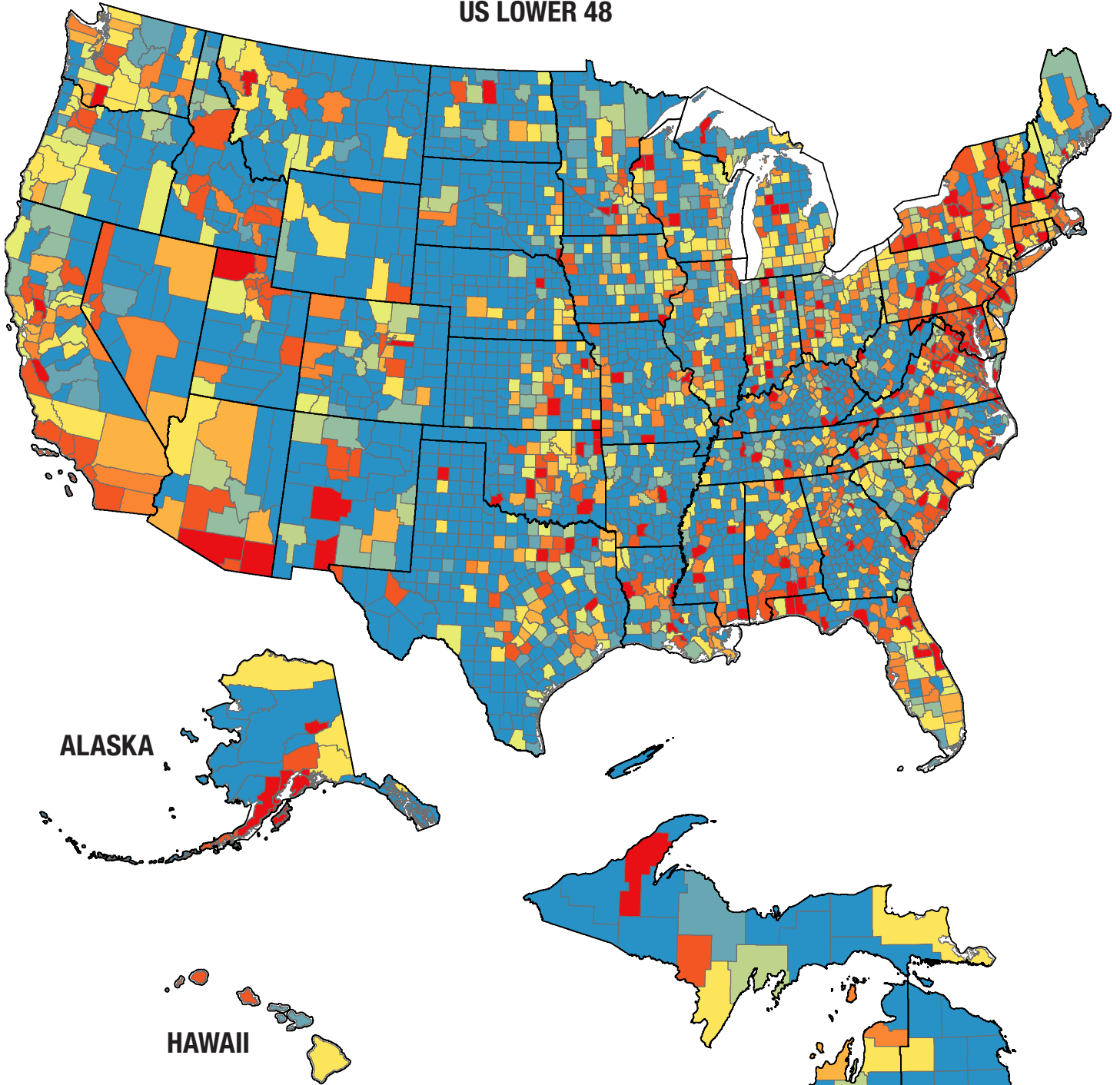


Map 4 — Annual DoD Contracts per Worker by County
 [for Brookings 50 Advanced Industries and Associated Workforce 2017]

These maps depict Northwest Michigan, The Lower 48, Alaska, Hawaii, and Michigan's Department of Defense contracts for Base and Excersized Options dollar value per worker for the the Brookings 50 Advanced Industries. The best performing Northwest Michigan county is Wexford, with an average of \$2,277,614 per worker for 2017. Ranking 11 out of the 3,179 counties in the US.



US LOWER 48



LEGEND

Base + Exercised Optioned Contracts

- Less than \$0
- \$0 - \$100
- \$100 - \$250
- \$250 - \$500
- \$500 - \$1,000
- \$1,000 - \$2,500
- \$2,500 - \$5,000
- \$5,000 - \$10,000
- \$10,000 - \$50,000
- Greater than \$50,000

MICHIGAN

Table 3 — US County Rankings of DoD Annual Contracting Amount: All Industries

Geographic Area	2017 DoD Contract Amount	5-Year Average (2013 thru 2017)	US County Ranking of DoD Contracts* (5-Year Average)	US County Ranking of Total Workforce* (5-Year Average)
Antrim County	\$699,178	\$1,904,419	1,092	1,953
Benzie County	\$9,108,787	\$9,162,541	690	2,126
Charlevoix County	\$2,908,311	\$1,495,615	1,164	1,406
Emmet County	\$0	\$7,573	2,552	966
Grand Traverse County	\$1,671,302	\$1,528,193	1,157	492
Kalkaska County	\$18,475	\$24,664	2,335	2,182
Leelanau County	\$324,686	\$567,926	1,437	1,786
Manistee County	\$102,709	\$60,916	2,085	1,704
Missaukee County	\$0	\$0	2,656	2,339
Wexford County	\$107,451,858	\$111,567,876	236	1,211

* County Rankings from 1 to 3,179 (Largest = 1)

Table 4 — US County Rankings of DoD Annual Contracting Amount: Brookings 50 Advanced Industries

Geographic Area	2017 DoD Contract Amount	5-Year Average (2013 thru 2017)	US County Ranking of DoD Contracts* (5-Year Average)	US County Ranking of Brookings 50 Workforce* (5-Year Average)
Antrim County	\$66,489	\$749,757	924	1,749
Benzie County	\$0	\$0	2,076	1,941
Charlevoix County	\$2,831,642	\$1,412,704	793	871
Emmet County	\$0	\$2,029	2,059	1,292
Grand Traverse County	\$702,050	\$1,094,597	845	475
Kalkaska County	-\$2,095	\$18,622	1,815	2,228
Leelanau County	\$289,737	\$384,242	1,056	1,450
Manistee County	\$91,819	\$48,149	1,597	1,973
Missaukee County	\$0	\$0	2,076	2,604
Wexford County	\$75,161,274	\$72,902,517	195	1,755

* County Rankings from 1 to 3,179 (Largest = 1)

PATENT ISSUES

The United States Patent and Trademark Office (USPTO) is the federal agency for granting U.S. patents and registering trademarks and provides a search able database of patent filings. Annual patents per county data is available for all US states and territories.

Table 5 — Patent Activity

Geographic Area	Previous 10-Years of Issued Patents as of 2015	Patents per Worker 2015 Employment	US Rank of Patents per Worker	US Rank of DoD Contract Amount Per Patent
Antrim County	34	0.6698%	395	1,290
Benzie County	16	0.3974%	713	462
Charlevoix County	58	0.5650%	466	1,222
Emmet County	71	0.4013%	705	2,168
Grand Traverse County	139	0.2876%	986	1,411
Kalkaska County	17	0.4442%	626	1,804
Leelanau County	23	0.3672%	777	1,292
Manistee County	7	0.1008%	2,027	1,814
Missaukee County	7	0.2134%	1,281	2,169
Wexford County	32	0.2477%	1,124	74

NORTHWEST MICHIGAN SURVEY OF COMPANIES

Networks Northwest conducted an online survey of Northwest Michigan companies regarding capacity and interest in contracting with the Department of Defence. Of the 23 respondents, 52% are currently doing business with the Department of Defense. The year these companies started doing business with DoD range from as far back as 1955 to as recently as 2015. The average of the companies reporting their estimated annual 2016 contract value is approximately 19 million dollars. The only respondent not interested in contracting with the DoD indicated market focus as the factor. The Survey results are summarized in the following survey charts and data.

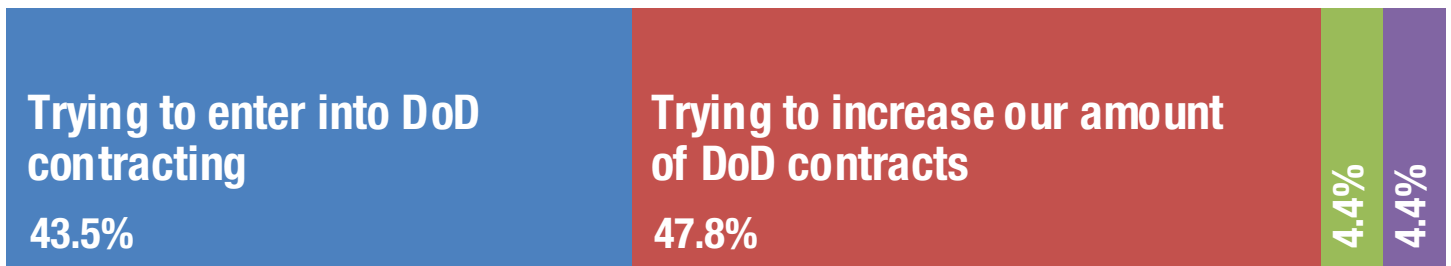
Survey Chart 1 — Percentage of Companies acting as prime contractor, subcontractor or both that are currently contracting with the DoD



23.6%

Average DoD work as a percentage of total production

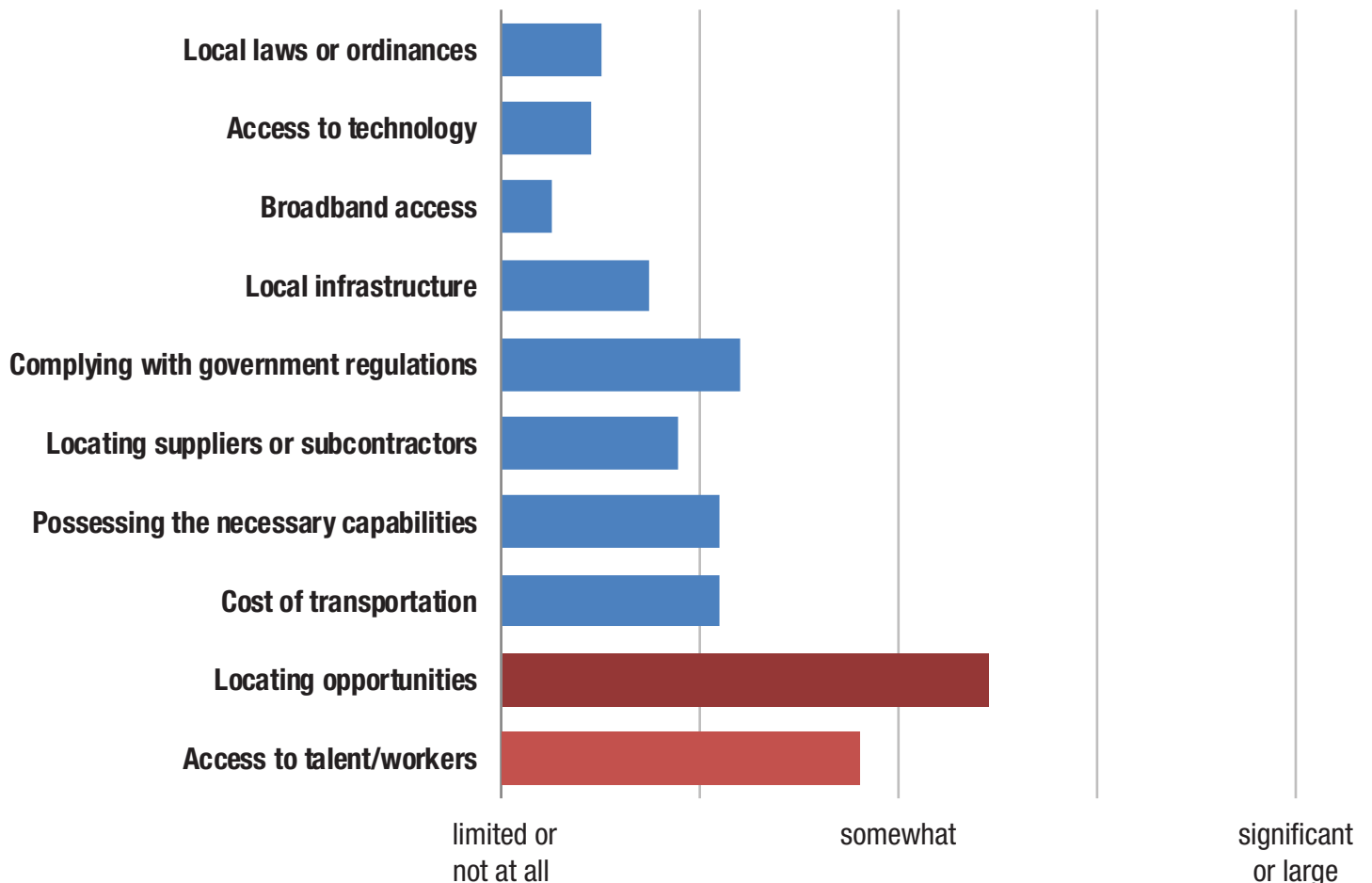
Survey Chart 2 — Which answer best describes your current goal for working with the DoD?



- Focused on performing on our current DoD contracts
- Not interested in working with the DoD

Survey Comment: “If we could get to the right people (technical/engineering procurement) who can understand our product line (where it goes and what it can do) as well as understand our other capabilities and where and how it fits within the DoD needs, that would help us get some momentum.”

Survey Chart 3 — Barriers to working with the DoD



Additional Barriers:

- ◆ DoD funding
- ◆ Simply unfamiliar with procurement process and finding opportunities.
- ◆ Figuring out how to get written into specifications.
- ◆ For SMEs, limitations of staff time and knowledge for DOD contracting.
- ◆ Finding bid documentation
- ◆ Access to capital to fund additional equipment.

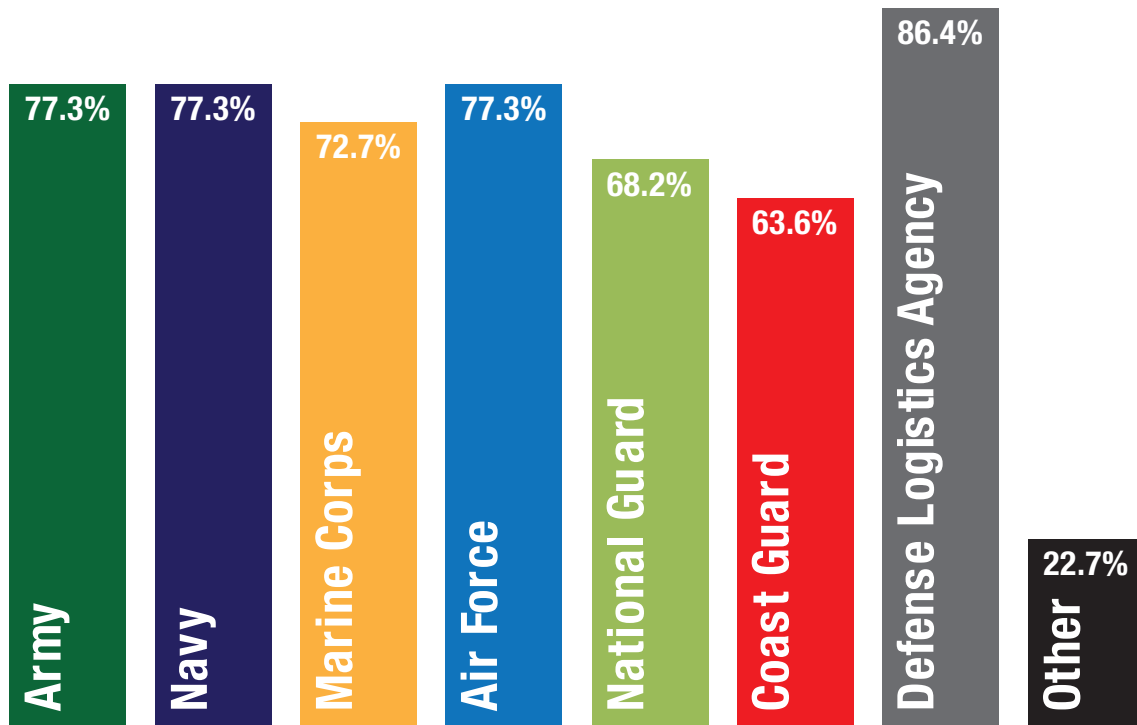
56.5%

Survey participants are doing business with other Federal Agencies

OTHER FEDERAL AGENCIES THAT SURVEY PARTICIPANTS CONTRACT WITH:

- ◆ U.S. Forest Service
- ◆ U.S. Fish & Wildlife Service
- ◆ U.S. Border Patrol
- ◆ U.S. Department of the Interior - National Park Service
- ◆ U.S. Marshals Service
- ◆ General Services Administration
- ◆ Department of Justice
- ◆ Department of Homeland Security
- ◆ Department of Veteran's Affairs
- ◆ National Aeronautics and Space Administration
- ◆ National Oceanic and Atmospheric Administration

Survey Chart 4 — Percentage of companies selecting each agency to focus on

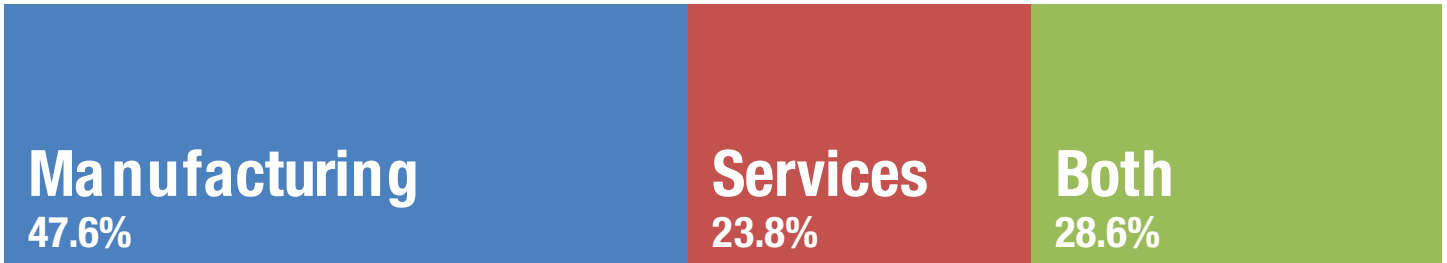


Other: Army Corps of Engineers, Special Operations Command, Aerospace

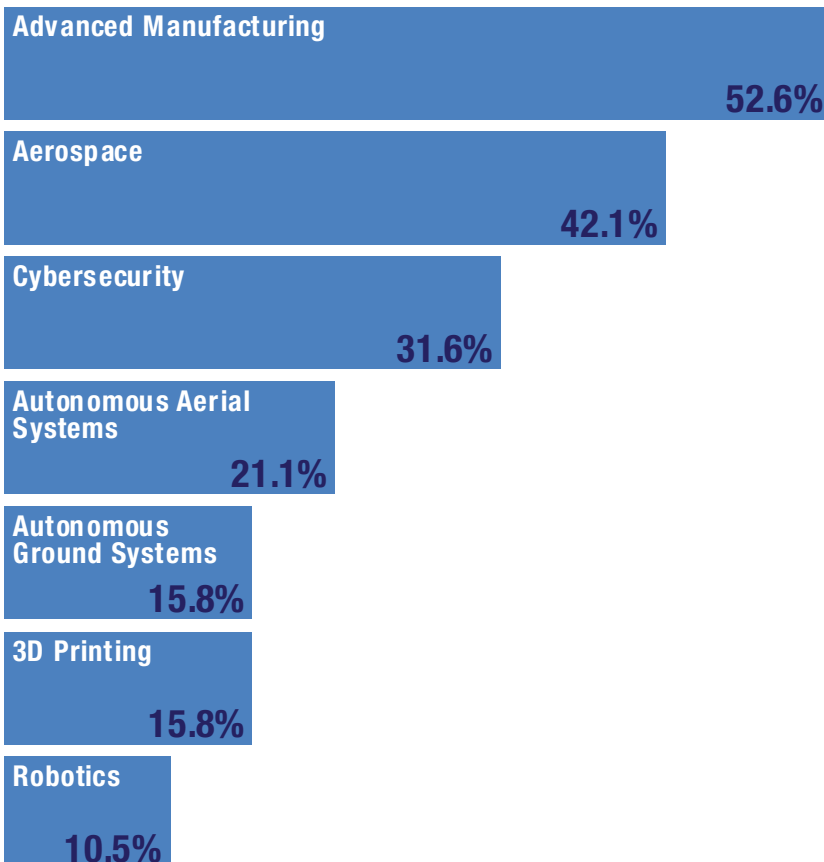
47.8%

Percentage of Survey participants currently exporting

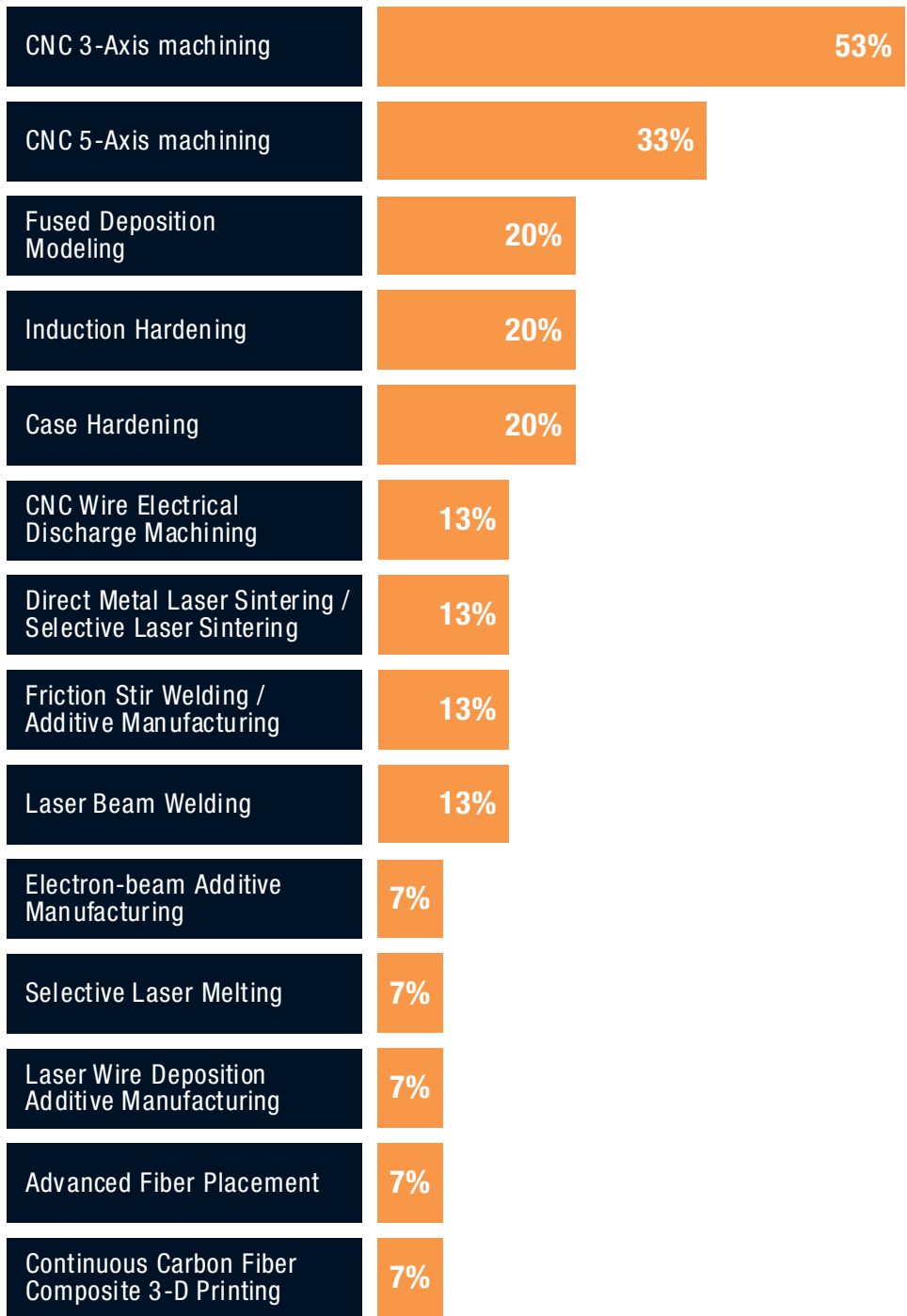
Survey Chart 5 — Business Type



Survey Chart 6 — Percentage of companies having capabilities in each field



Survey Chart 7 — Percentage of companies having surveyed technologies



Other capacities: extensive machining, hot press bonding, aluminum cleaning & etching, robotic welding, quality lab for testing, prototyping facilities, automated fabric cutting machinery, automated sewing machines, laser cutting, metal forming, CNC tube bending, CNC panel forming, TIG welding, CNC 4-Axis machining, precision turning - hydromats, CNC and Swiss style lathes

INFRASTRUCTURE

- Access to capital
- Additional equipment
- Additive printer for prototypes
- Affordable air travel
- Affordable DoD procurement assistance and skilled personnel
- Broadband
- Certifications
- Lower energy costs
- Facilities space/expansion
- Finding qualified/skilled people
- Additional equipment to increase capacity
- State of the art technology and equipment
- Strategic use of robotics
- Transportation

TALENT

- CADD Operator
- CNC Lathe/Mill Programmers and Operators
- Designer
- Electricians
- Entry Level Employees
- Experienced Engineers (electrical, mechanical, computer/software, fluid dynamics, Radio Frequency)
- Fabricator
- General Production
- Government Procurement Professional
- Graphic Design (Auto Desk)
- Industry Experienced Sales Representative
- IT - Network Engineering
- Marketing
- Painter
- Process Support Specialists
- Proposal Writing
- Sales
- Skilled Sewists
- Systems Engineers
- Technical Support
- Technicians (refrigeration, robotics/automation, modern CNC equipment repair)
- Welders

Survey Participant Comments

The following comments were given when survey participants were asked what would make the single biggest impact on your ability or desire to do more work with the DoD.

“Finding qualified people, so we could keep our lead times down.”

“We really need to find a connection with the engineering staff that are engaged in the design of military equipment. That would be amazing.”

“Simple, streamlined contracting procedures and ways and means to demonstrate capabilities/get buyers to our facility.”

“Access to capital/grants to pay for certifications and expand to accommodate the requirements of small to large contracts.”

NORTHWEST MICHIGAN COUNTY ANALYSIS

The analysis of the Department of Defense contract history of the 10-Counties of Northwest Michigan are contained on pages 28 through 47. This analysis used the USASpending.gov fiscal year archives together with the Bureau of Labor Statistics Quarterly Census of Employment and Wages and the United States Patent and Trademark Office Patent filing data to compare each of the Northwest Michigan Counties to other US counties based on similar industry workforce sizes. The following charts illustrate the underlying database that was created for the county analysis.



Antrim County Data

2013 2014 2015 2016 2017

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	24	24	21	22	25
	All Industries	547	528	521	518	518
	Brookings 50 Advanced Industries / All Industries	4.39%	4.55%	4.03%	4.25%	4.83%
Employment Level	Brookings 50 Advanced Industries	43	31	35	35	37
	All Industries	5,008	5,071	5,076	5,204	5,293
	Brookings 50 Advanced Industries / All Industries	0.86%	0.61%	0.69%	0.67%	0.70%
Total Annual Wages	Brookings 50 Advanced Industries	\$1,617,800	\$963,196	\$1,444,870	\$1,405,854	\$1,504,987
	All Industries	\$168,475,855	\$148,243,497	\$155,836,928	\$162,225,925	\$168,475,855
	Brookings 50 Advanced Industries / All Industries	0.96%	0.65%	0.93%	0.87%	0.89%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$37,623	\$31,071	\$41,282	\$40,167	\$40,675
	All Industries	\$33,641	\$29,234	\$30,701	\$31,173	\$31,830
	Brookings 50 Advanced Industries / All Industries	111.84%	106.28%	134.47%	128.85%	127.79%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$268,991	\$3,377,699	\$4,411	\$31,197	\$66,489
	All Industries	\$3,146,591	\$4,644,843	\$748,196	\$283,286	\$699,178
	Brookings 50 Advanced Industries / All Industries	8.55%	72.72%	0.59%	11.01%	9.51%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$11,208	\$140,737	\$210	\$1,418	\$2,660
	All Industries	\$5,752	\$8,797	\$1,436	\$547	\$1,350
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$6,256	\$108,958	\$126	\$891	\$1,797
	All Industries	\$628	\$916	\$147	\$54	\$132

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	23	24	24	24	26
	All Industries	543	542	546	548	550
	Brookings 50 Advanced Industries / All Industries	4.30%	4.36%	4.46%	4.45%	4.67%
Employment Level	Brookings 50 Advanced Industries	52	51	43	36	37
	All Industries	7,108	7,157	7,218	7,246	7,277
	Brookings 50 Advanced Industries / All Industries	1.00%	0.82%	0.71%	0.71%	0.88%
Total Annual Wages	Brookings 50 Advanced Industries	\$3,233,919	\$3,452,698	\$2,926,418	\$2,114,038	\$2,062,429
	All Industries	\$272,193,949	\$252,527,213	\$259,488,776	\$262,909,607	\$272,193,949
	Brookings 50 Advanced Industries / All Industries	1.19%	1.37%	1.13%	0.80%	0.76%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$62,223	\$67,225	\$68,501	\$59,063	\$56,083
	All Industries	\$38,293	\$35,286	\$35,950	\$36,285	\$37,405
	Brookings 50 Advanced Industries / All Industries	162.49%	190.52%	190.54%	162.78%	149.93%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$947,404	\$1,107,527	\$1,022,547	\$777,777	\$1,211,124
	All Industries	\$4,093,216	\$3,862,014	\$4,108,736	\$4,410,393	\$4,656,193
	Brookings 50 Advanced Industries / All Industries	23.15%	28.68%	24.89%	17.64%	26.01%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$40,556	\$46,797	\$41,991	\$31,904	\$47,120
	All Industries	\$7,541	\$7,123	\$7,519	\$8,044	\$8,465
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$18,229	\$21,564	\$23,936	\$21,730	\$32,934
	All Industries	\$576	\$540	\$569	\$609	\$640

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	102.74%	101.41%	86.24%	90.24%	97.27%
	All Industries	100.78%	97.38%	95.35%	94.48%	94.17%
Employment Level	Brookings 50 Advanced Industries	82.74%	60.36%	81.93%	97.79%	100.61%
	All Industries	70.45%	70.86%	70.32%	71.82%	72.74%
Total Annual Wages	Brookings 50 Advanced Industries	50.03%	27.90%	49.37%	66.50%	72.97%
	All Industries	61.90%	58.70%	60.06%	61.70%	61.90%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	60.47%	46.22%	60.26%	68.01%	72.53%
	All Industries	87.85%	82.85%	85.40%	85.91%	85.09%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD-Value	Brookings 50 Advanced Industries	28.39%	304.98%	0.43%	4.01%	5.49%
	All Industries	76.87%	120.27%	18.21%	6.42%	15.02%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	27.64%	300.74%	0.50%	4.44%	5.64%
	All Industries	76.28%	123.51%	19.10%	6.80%	15.95%
DOD-Value Per Worker	Brookings 50 Advanced Industries	34.32%	505.28%	0.53%	4.10%	5.46%
	All Industries	109.11%	169.74%	25.89%	8.94%	20.64%

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Antrim County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Antrim County Data

		2013	2014	2015	2016	2017	
Antrim County, Michigan	United States Patent and Trademark Office [USPTO]						
	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	4	4	4	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	34	34	34	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$3,146,591	\$4,644,843	\$748,196	\$283,286	\$699,178
	USPTO and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$786,648	\$1,161,211	\$187,049	NA	NA
DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$92,547	\$136,613	\$22,006	NA	NA	

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Antrim County Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	2	2	2	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	20	20	21	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$4,093,216	\$3,862,014	\$4,108,736	\$4,410,393	\$4,656,193
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$1,670,393	\$1,756,900	\$1,900,290	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$204,845	\$190,104	\$197,861	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Antrim County / Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	163.24%	181.97%	185.00%	NA	NA
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	170.15%	167.36%	163.73%	NA	NA
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	76.87%	120.27%	18.21%	6.42%	15.02%
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	47.09%	66.09%	9.84%	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	45.18%	71.86%	11.12%	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Antrim County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Benzie County Data

2013 2014 2015 2016 2017

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	22	22	19	22	25
	All Industries	460	449	438	437	439
	Brookings 50 Advanced Industries / All Industries	4.78%	4.90%	4.34%	5.03%	5.69%
Employment Level	Brookings 50 Advanced Industries	18	20	20	23	27
	All Industries	4,011	4,046	4,026	4,139	4,243
	Brookings 50 Advanced Industries / All Industries	0.45%	0.49%	0.50%	0.56%	0.64%
Total Annual Wages	Brookings 50 Advanced Industries	\$460,941	\$541,440	\$506,025	\$523,269	\$671,254
	All Industries	\$137,673,932	\$120,121,784	\$125,636,722	\$131,445,568	\$137,673,932
	Brookings 50 Advanced Industries / All Industries	0.33%	0.45%	0.40%	0.40%	0.49%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$25,608	\$27,072	\$25,301	\$22,751	\$24,861
	All Industries	\$34,324	\$29,689	\$31,206	\$31,758	\$32,447
	Brookings 50 Advanced Industries / All Industries	74.61%	91.19%	81.08%	71.64%	76.62%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries					
	All Industries	\$9,491,779	\$9,608,728	\$4,760,583	\$12,842,826	\$9,108,787
	Brookings 50 Advanced Industries / All Industries	NA	NA	NA	NA	NA
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	\$20,634	\$21,400	\$10,869	\$29,389	\$20,749
DOD-Value Per Worker	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	\$2,366	\$2,375	\$1,182	\$3,103	\$2,147

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	20	20	21	21	22
	All Industries	464	462	465	467	470
	Brookings 50 Advanced Industries / All Industries	4.36%	4.41%	4.50%	4.52%	4.77%
Employment Level	Brookings 50 Advanced Industries	31	28	36	22	27
	All Industries	5,658	5,700	5,727	5,749	5,747
	Brookings 50 Advanced Industries / All Industries	0.54%	0.57%	0.73%	0.54%	0.71%
Total Annual Wages	Brookings 50 Advanced Industries	\$1,558,947	\$1,485,415	\$1,913,688	\$1,285,776	\$1,715,377
	All Industries	\$209,782,535	\$195,700,125	\$200,658,890	\$204,764,251	\$209,782,535
	Brookings 50 Advanced Industries / All Industries	0.74%	0.76%	0.95%	0.63%	0.82%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$49,743	\$52,567	\$52,601	\$59,476	\$63,411
	All Industries	\$37,080	\$34,334	\$35,039	\$35,615	\$36,504
	Brookings 50 Advanced Industries / All Industries	134.15%	153.10%	150.12%	167.00%	173.71%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$670,083	\$1,227,056	\$984,120	\$1,705,858	\$1,167,739
	All Industries	\$2,058,638	\$2,704,434	\$3,267,955	\$3,262,807	\$2,893,189
	Brookings 50 Advanced Industries / All Industries	32.55%	45.37%	30.11%	52.28%	40.36%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$33,128	\$60,144	\$47,001	\$80,756	\$52,150
	All Industries	\$4,440	\$5,850	\$7,025	\$6,983	\$6,160
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$21,381	\$43,424	\$27,050	\$78,907	\$43,167
	All Industries	\$364	\$474	\$571	\$568	\$503

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	108.77%	107.83%	90.74%	104.15%	111.65%
	All Industries	99.22%	97.12%	94.15%	93.53%	93.46%
Employment Level	Brookings 50 Advanced Industries	57.43%	70.78%	54.97%	106.39%	99.81%
	All Industries	70.90%	70.98%	70.30%	71.99%	73.83%
Total Annual Wages	Brookings 50 Advanced Industries	29.57%	36.45%	26.44%	40.70%	39.13%
	All Industries	65.63%	61.38%	62.61%	64.19%	65.63%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	51.48%	51.50%	48.10%	38.25%	39.21%
	All Industries	92.57%	86.47%	89.06%	89.17%	88.89%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD-Value	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	461.07%	355.30%	145.67%	393.61%	314.84%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	464.71%	365.84%	154.73%	420.85%	336.85%
DOD-Value Per Worker	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	650.34%	500.53%	207.21%	546.76%	426.42%

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Benzie County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Benzie County Data

		2013	2014	2015	2016	2017	
Benzie County, Michigan	United States Patent and Trademark Office [USPTO]						
	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	5	-	-	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	17	16	16	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$9,491,779	\$9,608,728	\$4,760,583	\$12,842,826	\$9,108,787
	USPTO and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$1,898,356	NA	NA	NA	NA
DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$558,340	\$600,545	\$297,536	NA	NA	

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Benzie County Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	1	1	1	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	10	10	11	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$2,058,638	\$2,704,434	\$3,267,955	\$3,262,807	\$2,893,189
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$1,512,787	\$2,049,454	\$2,641,597	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$200,490	\$257,692	\$304,800	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Benzie County / Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	367.42%	0.00%	0.00%	NA	NA
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	165.56%	152.46%	149.23%	NA	NA
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	461.07%	355.30%	145.67%	393.61%	314.84%
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	125.49%	NA	NA	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	278.49%	233.05%	97.62%	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Benzie County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Charlevoix County Data

2013 2014 2015 2016 2017

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	47	45	41	38	43
	All Industries	826	810	789	778	771
	Brookings 50 Advanced Industries / All Industries	5.69%	5.56%	5.20%	4.88%	5.58%
Employment Level	Brookings 50 Advanced Industries	420	423	417	432	479
	All Industries	9,640	10,004	10,265	10,353	10,435
	Brookings 50 Advanced Industries / All Industries	4.36%	4.23%	4.06%	4.17%	4.59%
Total Annual Wages	Brookings 50 Advanced Industries	\$32,013,215	\$32,103,153	\$32,363,983	\$31,823,933	\$34,522,249
	All Industries	\$444,466,367	\$388,065,942	\$414,578,045	\$441,387,137	\$444,466,367
	Brookings 50 Advanced Industries / All Industries	7.20%	8.27%	7.81%	7.21%	7.77%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$76,222	\$75,894	\$77,611	\$73,667	\$72,072
	All Industries	\$46,106	\$38,791	\$40,388	\$42,634	\$42,594
	Brookings 50 Advanced Industries / All Industries	165.32%	195.65%	192.17%	172.79%	169.21%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$1,070,815	\$336,955	\$1,537,133	\$1,286,975	\$2,831,642
	All Industries	\$1,106,208	\$419,946	\$1,610,521	\$1,433,089	\$2,908,311
	Brookings 50 Advanced Industries / All Industries	96.80%	80.24%	95.44%	89.80%	97.36%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$22,783	\$7,488	\$37,491	\$33,868	\$65,852
	All Industries	\$1,339	\$518	\$2,041	\$1,842	\$3,772
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$2,550	\$797	\$3,686	\$2,979	\$5,912
	All Industries	\$115	\$42	\$157	\$138	\$279

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	98	100	103	105	108
	All Industries	1,712	1,721	1,735	1,753	1,762
	Brookings 50 Advanced Industries / All Industries	5.71%	5.83%	5.91%	5.97%	6.14%
Employment Level	Brookings 50 Advanced Industries	404	436	452	472	486
	All Industries	23,518	23,807	24,280	24,567	24,733
	Brookings 50 Advanced Industries / All Industries	1.98%	2.18%	2.58%	2.62%	2.80%
Total Annual Wages	Brookings 50 Advanced Industries	\$24,606,492	\$27,816,835	\$28,760,027	\$30,775,365	\$31,943,712
	All Industries	\$1,001,210,907	\$895,571,045	\$940,393,606	\$967,010,789	\$1,001,210,907
	Brookings 50 Advanced Industries / All Industries	2.46%	3.11%	3.06%	3.18%	3.19%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$60,854	\$63,829	\$63,626	\$65,187	\$65,763
	All Industries	\$42,572	\$37,618	\$38,732	\$39,362	\$40,482
	Brookings 50 Advanced Industries / All Industries	142.95%	169.68%	164.27%	165.61%	162.45%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$35,333,143	\$12,157,254	\$5,871,573	\$5,674,844	\$22,634,172
	All Industries	\$53,712,695	\$29,985,047	\$17,272,343	\$21,445,637	\$38,716,118
	Brookings 50 Advanced Industries / All Industries	65.78%	40.54%	33.99%	26.46%	58.46%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$361,390	\$121,233	\$57,206	\$54,191	\$209,246
	All Industries	\$31,372	\$17,425	\$9,954	\$12,235	\$21,971
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$87,383	\$27,896	\$12,990	\$12,020	\$46,597
	All Industries	\$2,284	\$1,259	\$711	\$873	\$1,565

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	48.07%	44.87%	39.95%	36.29%	39.75%
	All Industries	48.24%	47.07%	45.47%	44.39%	43.75%
Employment Level	Brookings 50 Advanced Industries	103.87%	97.06%	92.25%	91.50%	98.61%
	All Industries	40.99%	42.02%	42.28%	42.14%	42.19%
Total Annual Wages	Brookings 50 Advanced Industries	130.10%	115.41%	112.53%	103.41%	108.07%
	All Industries	44.39%	43.33%	44.09%	45.64%	44.39%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	125.25%	118.90%	121.98%	113.01%	109.59%
	All Industries	108.30%	103.12%	104.28%	108.31%	105.22%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD-Value	Brookings 50 Advanced Industries	3.03%	2.77%	26.18%	22.68%	12.51%
	All Industries	2.06%	1.40%	9.32%	6.68%	7.51%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	6.30%	6.18%	65.54%	62.50%	31.47%
	All Industries	4.27%	2.98%	20.51%	15.06%	17.17%
DOD-Value Per Worker	Brookings 50 Advanced Industries	2.92%	2.86%	28.38%	24.78%	12.69%
	All Industries	5.02%	3.33%	22.05%	15.86%	17.80%

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Charlevoix County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Charlevoix County Data

		2013	2014	2015	2016	2017	
Charlevoix County, Michigan	United States Patent and Trademark Office [USPTO]						
	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	7	4	4	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	55	53	58	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$1,106,208	\$419,946	\$1,610,521	\$1,433,089	\$2,908,311
	USPTO and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$158,030	\$104,987	\$402,630	NA	NA
DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$20,113	\$7,924	\$27,768	NA	NA	

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Charlevoix County Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	12	12	12	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	84	88	93	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$53,712,695	\$29,985,047	\$17,272,343	\$21,445,637	\$38,716,118
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$4,638,402	\$2,494,596	\$1,464,999	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$636,406	\$339,236	\$186,305	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Charlevoix County / Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	60.45%	33.28%	33.93%	NA	NA
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	65.17%	59.96%	62.56%	NA	NA
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	2.06%	1.40%	9.32%	6.68%	7.51%
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	3.41%	4.21%	27.48%	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	3.16%	2.34%	14.90%	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Charlevoix County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Emmet County Data

2013 2014 2015 2016 2017

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	47	51	47	48	53
	All Industries	1,423	1,384	1,362	1,382	1,394
	Brookings 50 Advanced Industries / All Industries	3.30%	3.68%	3.45%	3.47%	3.80%
Employment Level	Brookings 50 Advanced Industries	137	135	117	118	116
	All Industries	17,846	17,848	17,694	17,637	17,880
	Brookings 50 Advanced Industries / All Industries	0.77%	0.76%	0.66%	0.67%	0.65%
Total Annual Wages	Brookings 50 Advanced Industries	\$8,430,025	\$8,793,026	\$8,220,087	\$8,479,650	\$8,621,460
	All Industries	\$723,017,037	\$636,362,974	\$665,027,948	\$684,972,546	\$723,017,037
	Brookings 50 Advanced Industries / All Industries	1.17%	1.38%	1.24%	1.24%	1.19%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$61,533	\$65,134	\$70,257	\$71,861	\$74,323
	All Industries	\$40,514	\$35,655	\$37,585	\$38,837	\$40,437
	Brookings 50 Advanced Industries / All Industries	151.88%	182.68%	186.93%	185.03%	183.80%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$4,086	(\$29)			
	All Industries	\$8,336	\$14,194	\$190		
	Brookings 50 Advanced Industries / All Industries	49.02%	-0.20%	NA	NA	NA
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$87	(\$1)	NA	NA	NA
	All Industries	\$6	\$10	\$0	NA	NA
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$30	(\$0)	NA	NA	NA
	All Industries	\$0	\$1	\$0	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	42	43	43	44	46
	All Industries	870	870	873	877	879
	Brookings 50 Advanced Industries / All Industries	4.85%	4.92%	4.95%	4.99%	5.22%
Employment Level	Brookings 50 Advanced Industries	111	116	114	112	117
	All Industries	11,513	11,639	11,721	11,781	11,870
	Brookings 50 Advanced Industries / All Industries	1.23%	1.29%	1.27%	1.28%	1.54%
Total Annual Wages	Brookings 50 Advanced Industries	\$6,231,133	\$7,077,058	\$7,143,354	\$7,134,919	\$7,352,273
	All Industries	\$460,164,643	\$421,088,413	\$434,777,184	\$442,376,318	\$460,164,643
	Brookings 50 Advanced Industries / All Industries	1.35%	1.68%	1.64%	1.61%	1.60%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$56,212	\$61,087	\$62,759	\$63,925	\$62,728
	All Industries	\$39,968	\$36,179	\$37,095	\$37,549	\$38,766
	Brookings 50 Advanced Industries / All Industries	140.64%	168.85%	169.18%	170.25%	161.81%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$3,384,362	\$3,741,833	\$2,312,980	\$1,660,244	\$1,515,070
	All Industries	\$4,567,424	\$5,128,249	\$3,455,059	\$3,006,756	\$3,546,907
	Brookings 50 Advanced Industries / All Industries	74.10%	72.97%	66.94%	55.22%	42.72%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$80,164	\$87,483	\$53,556	\$37,903	\$33,000
	All Industries	\$5,248	\$5,896	\$3,958	\$3,429	\$4,036
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$30,531	\$32,299	\$20,321	\$14,875	\$12,926
	All Industries	\$397	\$441	\$295	\$255	\$299

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	111.33%	119.24%	108.83%	109.58%	115.44%
	All Industries	163.51%	159.11%	156.01%	157.60%	158.62%
Employment Level	Brookings 50 Advanced Industries	123.59%	116.53%	102.79%	105.72%	98.97%
	All Industries	155.00%	153.34%	150.97%	149.70%	150.63%
Total Annual Wages	Brookings 50 Advanced Industries	135.29%	124.25%	115.07%	118.85%	117.26%
	All Industries	157.12%	151.12%	152.96%	154.84%	157.12%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	109.47%	106.62%	111.95%	112.42%	118.48%
	All Industries	101.37%	98.55%	101.32%	103.43%	104.31%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD-Value	Brookings 50 Advanced Industries	0.12%	0.00%	NA	NA	NA
	All Industries	0.18%	0.28%	0.01%	NA	NA
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	0.11%	0.00%	NA	NA	NA
	All Industries	0.11%	0.17%	0.00%	NA	NA
DOD-Value Per Worker	Brookings 50 Advanced Industries	0.10%	0.00%	NA	NA	NA
	All Industries	0.12%	0.18%	0.00%	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Emmet County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Emmet County Data

		2013	2014	2015	2016	2017	
Emmet County, Michigan	United States Patent and Trademark Office [USPTO]						
	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	12	2	2	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	73	69	71	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$8,336	\$14,194	\$190		
	USPTO and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$695	\$7,097	\$95	NA	NA
DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$114	\$206	\$3	NA	NA	

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Emmet County Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	4	4	4	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	32	33	34	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$4,567,424	\$5,128,249	\$3,455,059	\$3,006,756	\$3,546,907
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$1,046,054	\$1,143,385	\$861,632	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$142,732	\$154,613	\$101,354	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Emmet County / Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	274.83%	44.59%	49.88%	NA	NA
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	228.13%	208.03%	208.28%	NA	NA
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	0.18%	0.28%	0.01%	NA	NA
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	0.07%	0.62%	0.01%	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	0.08%	0.13%	0.00%	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Emmet County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Grand Traverse County Data

2013 2014 2015 2016 2017

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	279	281	270	266	267
	All Industries	3,229	3,191	3,216	3,239	3,297
	Brookings 50 Advanced Industries / All Industries	8.64%	8.81%	8.40%	8.21%	8.10%
Employment Level	Brookings 50 Advanced Industries	1,744	1,810	1,724	1,778	1,777
	All Industries	45,803	47,248	48,330	49,926	50,470
	Brookings 50 Advanced Industries / All Industries	3.81%	3.83%	3.57%	3.56%	3.52%
Total Annual Wages	Brookings 50 Advanced Industries	\$111,926,897	\$116,511,628	\$111,136,052	\$114,512,224	\$113,314,550
	All Industries	\$2,174,257,040	\$1,879,753,668	\$1,995,942,955	\$2,089,036,796	\$2,174,257,040
	Brookings 50 Advanced Industries / All Industries	5.15%	6.20%	5.57%	5.48%	5.21%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$64,178	\$64,371	\$64,464	\$64,405	\$63,767
	All Industries	\$47,470	\$39,785	\$41,298	\$41,843	\$43,080
	Brookings 50 Advanced Industries / All Industries	135.20%	161.80%	156.09%	153.92%	148.02%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$574,576	\$831,936	\$1,969,490	\$1,394,935	\$702,050
	All Industries	\$860,631	\$1,196,681	\$2,133,468	\$1,778,880	\$1,671,302
	Brookings 50 Advanced Industries / All Industries	66.76%	69.52%	92.31%	78.42%	42.01%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$2,059	\$2,961	\$7,294	\$5,244	\$2,629
	All Industries	\$267	\$375	\$663	\$549	\$507
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$329	\$460	\$1,142	\$785	\$395
	All Industries	\$19	\$25	\$44	\$36	\$33

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	197	201	208	214	219
	All Industries	3,193	3,221	3,281	3,339	3,395
	Brookings 50 Advanced Industries / All Industries	6.17%	6.25%	6.35%	6.40%	6.44%
Employment Level	Brookings 50 Advanced Industries	1,520	1,558	1,663	1,679	1,775
	All Industries	48,093	49,021	50,427	51,051	51,646
	Brookings 50 Advanced Industries / All Industries	4.36%	4.50%	4.77%	4.84%	5.13%
Total Annual Wages	Brookings 50 Advanced Industries	\$93,645,909	\$99,445,238	\$108,379,779	\$110,400,218	\$121,897,600
	All Industries	\$2,225,983,204	\$1,987,328,626	\$2,097,711,684	\$2,142,393,207	\$2,225,983,204
	Brookings 50 Advanced Industries / All Industries	4.21%	5.00%	5.17%	5.15%	5.48%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$61,591	\$63,813	\$65,187	\$65,759	\$68,666
	All Industries	\$46,285	\$40,541	\$41,599	\$41,965	\$43,100
	Brookings 50 Advanced Industries / All Industries	133.07%	157.40%	156.70%	156.70%	159.32%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$134,059,082	\$18,953,015	\$21,031,489	\$36,321,406	\$64,195,966
	All Industries	\$175,843,981	\$31,226,851	\$32,185,565	\$46,528,185	\$75,688,400
	Brookings 50 Advanced Industries / All Industries	76.24%	60.69%	65.34%	78.06%	84.82%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$680,910	\$94,115	\$101,013	\$169,897	\$293,434
	All Industries	\$55,063	\$9,695	\$9,810	\$13,936	\$22,291
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$88,171	\$12,162	\$12,650	\$21,634	\$36,162
	All Industries	\$3,656	\$637	\$638	\$911	\$1,466

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	141.71%	139.54%	129.68%	124.42%	122.04%
	All Industries	101.11%	99.07%	98.02%	97.01%	97.10%
Employment Level	Brookings 50 Advanced Industries	114.70%	116.15%	103.69%	105.90%	100.10%
	All Industries	95.24%	96.38%	95.84%	97.80%	97.72%
Total Annual Wages	Brookings 50 Advanced Industries	119.52%	117.16%	102.54%	103.72%	92.96%
	All Industries	97.68%	94.59%	95.15%	97.51%	97.68%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	104.20%	100.87%	98.89%	97.94%	92.87%
	All Industries	102.56%	98.14%	99.28%	99.71%	99.95%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD-Value	Brookings 50 Advanced Industries	0.43%	4.39%	9.36%	3.84%	1.09%
	All Industries	0.49%	3.83%	6.63%	3.82%	2.21%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	0.30%	3.15%	7.22%	3.09%	0.90%
	All Industries	0.48%	3.87%	6.76%	3.94%	2.27%
DOD-Value Per Worker	Brookings 50 Advanced Industries	0.37%	3.78%	9.03%	3.63%	1.09%
	All Industries	0.51%	3.98%	6.92%	3.91%	2.26%

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Grand Traverse County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Grand Traverse County Data

		2013	2014	2015	2016	2017	
Grand Traverse County, Michigan	United States Patent and Trademark Office [USPTO]						
	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	15	24	24	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	126	130	139	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$860,631	\$1,196,681	\$2,133,468	\$1,778,880	\$1,671,302
	USPTO and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$57,375	\$49,862	\$88,894	NA	NA
DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$6,830	\$9,205	\$15,349	NA	NA	

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Grand Traverse County Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	33	34	33	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	258	268	280	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$175,843,981	\$31,226,851	\$32,185,565	\$46,528,185	\$75,688,400
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$5,349,265	\$905,898	\$965,283	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$681,747	\$116,655	\$115,033	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Grand Traverse County / Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	45.63%	69.62%	71.98%	NA	NA
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	48.85%	48.56%	49.68%	NA	NA
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	0.49%	3.83%	6.63%	3.82%	2.21%
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	1.07%	5.50%	9.21%	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	1.00%	7.89%	13.34%	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Grand Traverse County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Kalkaska County Data

2013 2014 2015 2016 2017

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	19	19	17	19	19
	All Industries	335	332	321	320	314
	Brookings 50 Advanced Industries / All Industries	5.67%	5.72%	5.30%	5.94%	6.05%
Employment Level	Brookings 50 Advanced Industries	25	12	-	-	4
	All Industries	3,580	3,904	3,827	3,890	4,084
	Brookings 50 Advanced Industries / All Industries	0.70%	0.31%	0.00%	0.00%	0.10%
Total Annual Wages	Brookings 50 Advanced Industries	\$1,279,640	\$486,913	-	-	\$302,141
	All Industries	\$195,841,398	\$176,873,660	\$172,367,824	\$176,501,809	\$195,841,398
	Brookings 50 Advanced Industries / All Industries	0.65%	0.28%	0.00%	0.00%	0.15%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$51,186	\$40,576	NA	NA	\$75,535
	All Industries	\$54,704	\$45,306	\$45,040	\$45,373	\$47,953
	Brookings 50 Advanced Industries / All Industries	93.57%	89.56%	NA	NA	157.52%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$4,745		\$65,088	\$6,750	(\$2,095)
	All Industries	\$4,745		\$68,688	\$6,750	\$18,475
	Brookings 50 Advanced Industries / All Industries	100.00%	NA	94.76%	100.00%	-11.34%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$250	NA	\$3,829	\$355	(\$110)
	All Industries	\$14	NA	\$214	\$21	\$59
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$190	NA	NA	NA	(\$524)
	All Industries	\$1	NA	\$18	\$2	\$5

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	13	14	14	13	14
	All Industries	329	327	327	326	325
	Brookings 50 Advanced Industries / All Industries	4.06%	4.17%	4.20%	4.13%	4.34%
Employment Level	Brookings 50 Advanced Industries	36	27	24	6	4
	All Industries	3,759	3,813	3,833	3,842	3,864
	Brookings 50 Advanced Industries / All Industries	0.78%	0.63%	0.63%	0.21%	0.18%
Total Annual Wages	Brookings 50 Advanced Industries	\$2,319,276	\$1,811,344	\$1,966,218	\$478,456	\$261,395
	All Industries	\$147,333,650	\$134,789,955	\$139,071,682	\$141,607,807	\$147,333,650
	Brookings 50 Advanced Industries / All Industries	1.57%	1.34%	1.41%	0.34%	0.18%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$65,266	\$67,963	\$81,021	\$74,842	\$63,368
	All Industries	\$39,199	\$35,346	\$36,287	\$36,859	\$38,133
	Brookings 50 Advanced Industries / All Industries	166.50%	192.28%	223.28%	203.05%	166.18%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$135,933	\$56,566	\$178,270	\$90,586	\$78,350
	All Industries	\$472,348	\$500,086	\$447,442	\$532,049	\$561,543
	Brookings 50 Advanced Industries / All Industries	28.78%	11.31%	39.84%	17.03%	13.95%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$10,204	\$4,146	\$13,007	\$6,732	\$5,557
	All Industries	\$1,438	\$1,529	\$1,370	\$1,631	\$1,728
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$3,825	\$2,122	\$7,346	\$14,170	\$18,994
	All Industries	\$126	\$131	\$117	\$138	\$145

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	142.63%	139.27%	124.04%	141.21%	134.77%
	All Industries	101.97%	101.54%	98.26%	98.11%	96.64%
Employment Level	Brookings 50 Advanced Industries	70.35%	45.03%	0.00%	0.00%	96.97%
	All Industries	95.25%	102.37%	99.86%	101.25%	105.70%
Total Annual Wages	Brookings 50 Advanced Industries	55.17%	26.88%	0.00%	0.00%	115.59%
	All Industries	132.92%	131.22%	123.94%	124.64%	132.92%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	78.43%	59.70%	NA	NA	119.20%
	All Industries	139.56%	128.18%	124.12%	123.10%	125.75%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD-Value	Brookings 50 Advanced Industries	3.49%	NA	36.51%	7.45%	-2.67%
	All Industries	1.00%	NA	15.35%	1.27%	3.29%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	2.45%	NA	29.44%	5.28%	-1.98%
	All Industries	0.99%	NA	15.62%	1.29%	3.40%
DOD-Value Per Worker	Brookings 50 Advanced Industries	4.96%	NA	NA	NA	-2.76%
	All Industries	1.05%	NA	15.37%	1.25%	3.11%

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Kalkaska County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Kalkaska County Data

		2013	2014	2015	2016	2017	
Kalkaska County, Michigan	United States Patent and Trademark Office [USPTO]						
	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	4	1	1	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	20	20	17	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$4,745		\$68,688	\$6,750	\$18,475
	USPTO and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$1,186	NA	\$68,688	NA	NA
DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$237	NA	\$4,040	NA	NA	

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Kalkaska County Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	1	1	0	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	6	6	6	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$472,348	\$500,086	\$447,442	\$532,049	\$561,543
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$777,985	\$788,868	\$911,154	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$85,053	\$89,187	\$80,828	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Kalkaska County / Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	658.82%	157.75%	203.64%	NA	NA
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	360.13%	356.69%	307.10%	NA	NA
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	1.00%	NA	15.35%	1.27%	3.29%
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	0.15%	NA	7.54%	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	0.28%	NA	5.00%	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Kalkaska County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Leelanau County Data

2013 2014 2015 2016 2017

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	27	30	28	28	32
	All Industries	663	663	660	672	679
	Brookings 50 Advanced Industries / All Industries	4.07%	4.52%	4.24%	4.17%	4.71%
Employment Level	Brookings 50 Advanced Industries	88	77	72	78	84
	All Industries	6,167	6,214	6,263	6,412	6,487
	Brookings 50 Advanced Industries / All Industries	1.43%	1.24%	1.15%	1.22%	1.29%
Total Annual Wages	Brookings 50 Advanced Industries	\$5,573,809	\$5,579,989	\$4,913,510	\$4,313,541	\$4,403,525
	All Industries	\$229,299,732	\$201,407,827	\$211,934,873	\$220,885,575	\$229,299,732
	Brookings 50 Advanced Industries / All Industries	2.43%	2.77%	2.32%	1.95%	1.92%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$63,339	\$72,467	\$68,243	\$55,302	\$52,423
	All Industries	\$37,182	\$32,412	\$33,839	\$34,449	\$35,348
	Brookings 50 Advanced Industries / All Industries	170.35%	223.58%	201.67%	160.53%	148.31%
		USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]				
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$358,619	\$605,763	\$469,069	\$198,021	\$289,737
	All Industries	\$811,922	\$1,004,976	\$502,799	\$195,247	\$324,686
	Brookings 50 Advanced Industries / All Industries	44.17%	60.28%	93.29%	101.42%	89.24%
		QCEW and USASpending Data Analysis				
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$13,282	\$20,192	\$16,752	\$7,072	\$9,054
	All Industries	\$1,225	\$1,516	\$762	\$291	\$478
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$4,075	\$7,867	\$6,515	\$2,539	\$3,449
	All Industries	\$132	\$162	\$80	\$30	\$50

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	36	36	37	37	38
	All Industries	787	786	789	792	791
	Brookings 50 Advanced Industries / All Industries	4.56%	4.64%	4.75%	4.69%	4.82%
Employment Level	Brookings 50 Advanced Industries	115	111	108	109	84
	All Industries	10,063	10,207	10,275	10,256	10,314
	Brookings 50 Advanced Industries / All Industries	1.29%	1.30%	1.30%	1.38%	1.29%
Total Annual Wages	Brookings 50 Advanced Industries	\$6,615,281	\$6,653,185	\$6,536,302	\$6,841,216	\$5,113,717
	All Industries	\$401,580,323	\$374,723,985	\$385,086,349	\$386,092,119	\$401,580,323
	Brookings 50 Advanced Industries / All Industries	1.65%	1.78%	1.70%	1.77%	1.27%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$57,353	\$59,939	\$60,479	\$62,692	\$60,857
	All Industries	\$39,905	\$36,712	\$37,479	\$37,647	\$38,935
	Brookings 50 Advanced Industries / All Industries	143.72%	163.27%	161.37%	166.53%	156.30%
		USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]				
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$1,008,010	\$825,834	\$750,105	\$1,146,977	\$1,011,361
	All Industries	\$158,752,710	(\$83,740,740)	\$3,052,415	\$2,986,327	\$3,384,107
	Brookings 50 Advanced Industries / All Industries	0.63%	-0.99%	24.57%	38.41%	29.89%
		QCEW and USASpending Data Analysis				
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$28,112	\$22,634	\$20,016	\$30,864	\$26,508
	All Industries	\$201,680	(\$106,597)	\$3,869	\$3,770	\$4,278
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$8,739	\$7,440	\$6,941	\$10,511	\$12,036
	All Industries	\$15,775	(\$8,204)	\$297	\$291	\$328

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	75.30%	82.22%	74.71%	75.35%	83.87%
	All Industries	84.23%	84.40%	83.66%	84.83%	85.84%
Employment Level	Brookings 50 Advanced Industries	76.29%	69.37%	66.62%	71.48%	99.97%
	All Industries	61.28%	60.88%	60.96%	62.52%	62.89%
Total Annual Wages	Brookings 50 Advanced Industries	84.26%	83.87%	75.17%	63.05%	86.11%
	All Industries	57.10%	53.75%	55.04%	57.21%	57.10%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	110.44%	120.90%	112.84%	88.21%	86.14%
	All Industries	93.18%	88.29%	90.29%	91.51%	90.79%
		USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]				
DOD-Value	Brookings 50 Advanced Industries	35.58%	73.35%	62.53%	17.26%	28.65%
	All Industries	0.51%	-1.20%	16.47%	6.54%	9.59%
		QCEW and USASpending Data Analysis				
DOD-Value Per Establishment	Brookings 50 Advanced Industries	47.25%	89.21%	83.70%	22.91%	34.16%
	All Industries	0.61%	-1.42%	19.69%	7.71%	11.18%
DOD-Value Per Worker	Brookings 50 Advanced Industries	46.63%	105.74%	93.87%	24.15%	28.66%
	All Industries	0.83%	-1.97%	27.02%	10.46%	15.25%

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Leelanau County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Leelanau County Data

		2013	2014	2015	2016	2017	
Leelanau County, Michigan	United States Patent and Trademark Office [USPTO]						
	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	7	3	3	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	18	20	23	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$811,922	\$1,004,976	\$502,799	\$195,247	\$324,686
	USPTO and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$115,989	\$334,992	\$167,600	NA	NA
DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$45,107	\$50,249	\$21,861	NA	NA	

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Leelanau County Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	4	5	4	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	33	35	37	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$158,752,710	(\$83,740,740)	\$3,052,415	\$2,986,327	\$3,384,107
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$36,237,032	(\$17,173,394)	\$690,740	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$4,749,013	(\$2,387,396)	\$83,378	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Leelanau County / Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	159.78%	61.52%	67.89%	NA	NA
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	53.85%	57.02%	62.83%	NA	NA
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	0.51%	-1.20%	16.47%	6.54%	9.59%
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	0.32%	-1.95%	24.26%	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	0.95%	-2.10%	26.22%	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Leelanau County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Manistee County Data

2013 2014 2015 2016 2017

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	26	27	25	26	24
	All Industries	564	543	529	532	532
	Brookings 50 Advanced Industries / All Industries	4.61%	4.97%	4.73%	4.89%	4.51%
Employment Level	Brookings 50 Advanced Industries	18	19	14	22	27
	All Industries	6,850	6,797	6,945	7,163	7,097
	Brookings 50 Advanced Industries / All Industries	0.26%	0.28%	0.20%	0.31%	0.38%
Total Annual Wages	Brookings 50 Advanced Industries	\$841,711	\$888,890	\$801,270	\$1,114,307	\$827,856
	All Industries	\$282,624,747	\$245,284,054	\$258,812,011	\$271,001,538	\$282,624,747
	Brookings 50 Advanced Industries / All Industries	0.30%	0.36%	0.31%	0.41%	0.29%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$46,762	\$46,784	\$57,234	\$50,650	\$30,661
	All Industries	\$41,259	\$36,087	\$37,266	\$37,834	\$39,823
	Brookings 50 Advanced Industries / All Industries	113.34%	129.64%	153.58%	133.88%	76.99%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$6,449	\$88,418	\$6,971	\$47,090	\$91,819
	All Industries	\$30,849	\$88,986	\$27,511	\$54,526	\$102,709
	Brookings 50 Advanced Industries / All Industries	20.90%	99.36%	25.34%	86.36%	89.40%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$248	\$3,275	\$279	\$1,811	\$3,826
	All Industries	\$55	\$164	\$52	\$102	\$193
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$358	\$4,654	\$498	\$2,140	\$3,401
	All Industries	\$5	\$13	\$4	\$8	\$14

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	20	20	21	21	22
	All Industries	464	462	465	467	470
	Brookings 50 Advanced Industries / All Industries	4.36%	4.41%	4.50%	4.52%	4.77%
Employment Level	Brookings 50 Advanced Industries	31	28	36	22	27
	All Industries	5,658	5,700	5,727	5,749	5,747
	Brookings 50 Advanced Industries / All Industries	0.54%	0.57%	0.73%	0.54%	0.71%
Total Annual Wages	Brookings 50 Advanced Industries	\$1,558,947	\$1,485,415	\$1,913,688	\$1,285,776	\$1,715,377
	All Industries	\$209,782,535	\$195,700,125	\$200,658,890	\$204,764,251	\$209,782,535
	Brookings 50 Advanced Industries / All Industries	0.74%	0.76%	0.95%	0.63%	0.82%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$49,743	\$52,567	\$52,601	\$59,476	\$63,411
	All Industries	\$37,080	\$34,334	\$35,039	\$35,615	\$36,504
	Brookings 50 Advanced Industries / All Industries	134.15%	153.10%	150.12%	167.00%	173.71%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$670,083	\$1,227,056	\$984,120	\$1,705,858	\$1,167,739
	All Industries	\$2,058,638	\$2,704,434	\$3,267,955	\$3,262,807	\$2,893,189
	Brookings 50 Advanced Industries / All Industries	32.55%	45.37%	30.11%	52.28%	40.36%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$33,128	\$60,144	\$47,001	\$80,756	\$52,150
	All Industries	\$4,440	\$5,850	\$7,025	\$6,983	\$6,160
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$21,381	\$43,424	\$27,050	\$78,907	\$43,167
	All Industries	\$364	\$474	\$571	\$568	\$503

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	128.54%	132.34%	119.40%	123.08%	107.18%
	All Industries	121.65%	117.45%	113.71%	113.86%	113.26%
Employment Level	Brookings 50 Advanced Industries	57.43%	67.24%	38.48%	101.76%	99.81%
	All Industries	121.08%	119.25%	121.27%	124.59%	123.50%
Total Annual Wages	Brookings 50 Advanced Industries	53.99%	59.84%	41.87%	86.66%	48.26%
	All Industries	134.72%	125.34%	128.98%	132.35%	134.72%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	94.01%	89.00%	108.81%	85.16%	48.35%
	All Industries	111.27%	105.11%	106.36%	106.23%	109.09%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD-Value	Brookings 50 Advanced Industries	0.96%	7.21%	0.71%	2.76%	7.86%
	All Industries	1.50%	3.29%	0.84%	1.67%	3.55%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	0.75%	5.44%	0.59%	2.24%	7.34%
	All Industries	1.23%	2.80%	0.74%	1.47%	3.13%
DOD-Value Per Worker	Brookings 50 Advanced Industries	1.68%	10.72%	1.84%	2.71%	7.88%
	All Industries	1.24%	2.76%	0.69%	1.34%	2.87%

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Manistee County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Manistee County Data

		2013	2014	2015	2016	2017	
Manistee County, Michigan	United States Patent and Trademark Office [USPTO]						
	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	2	-	-	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	7	7	7	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$30,849	\$88,986	\$27,511	\$54,526	\$102,709
	USPTO and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$15,424	NA	NA	NA	NA
DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$4,407	\$12,712	\$3,930	NA	NA	

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Manistee County Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	1	1	1	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	10	10	11	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$2,058,638	\$2,704,434	\$3,267,955	\$3,262,807	\$2,893,189
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$1,512,787	\$2,049,454	\$2,641,597	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$200,490	\$257,692	\$304,800	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Manistee County / Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	146.97%	0.00%	0.00%	NA	NA
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	68.17%	66.70%	65.29%	NA	NA
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	1.50%	3.29%	0.84%	1.67%	3.55%
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	1.02%	NA	NA	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	2.20%	4.93%	1.29%	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Manistee County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Missaukee County Data

2013 2014 2015 2016 2017

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	10	9	10	11	10
	All Industries	308	309	325	345	345
	Brookings 50 Advanced Industries / All Industries	3.25%	2.91%	3.08%	3.19%	2.90%
Employment Level	Brookings 50 Advanced Industries	-	-	-	-	-
	All Industries	2,998	3,150	3,280	3,309	3,338
	Brookings 50 Advanced Industries / All Industries	0.00%	0.00%	0.00%	0.00%	0.00%
Total Annual Wages	Brookings 50 Advanced Industries	-	-	-	-	-
	All Industries	\$113,392,203	\$96,725,136	\$106,095,323	\$106,561,553	\$113,392,203
	Brookings 50 Advanced Industries / All Industries	0.00%	0.00%	0.00%	0.00%	0.00%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	\$37,823	\$30,706	\$32,346	\$32,204	\$33,970
	Brookings 50 Advanced Industries / All Industries	NA	NA	NA	NA	NA
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries					
	All Industries					
	Brookings 50 Advanced Industries / All Industries	NA	NA	NA	NA	NA
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	NA	NA	NA	NA	NA
DOD-Value Per Worker	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	NA	NA	NA	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	7	7	7	7	8
	All Industries	216	215	214	214	212
	Brookings 50 Advanced Industries / All Industries	3.28%	3.32%	3.33%	3.30%	3.54%
Employment Level	Brookings 50 Advanced Industries	7	6	5	5	0
	All Industries	2,438	2,441	2,426	2,412	2,406
	Brookings 50 Advanced Industries / All Industries	0.19%	0.16%	0.14%	0.14%	0.01%
Total Annual Wages	Brookings 50 Advanced Industries	\$392,666	\$361,726	\$331,571	\$317,570	\$8,301
	All Industries	\$87,648,844	\$83,669,458	\$84,932,104	\$85,174,680	\$87,648,844
	Brookings 50 Advanced Industries / All Industries	0.45%	0.43%	0.39%	0.37%	0.01%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$60,160	\$65,326	\$67,938	\$58,492	\$67,977
	All Industries	\$35,958	\$34,280	\$35,007	\$35,313	\$36,433
	Brookings 50 Advanced Industries / All Industries	167.31%	190.57%	194.07%	165.64%	186.58%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$244,477	\$245,478	\$377,174	\$383,633	\$557,917
	All Industries	\$822,355	\$881,288	\$1,060,211	\$1,115,503	\$1,217,773
	Brookings 50 Advanced Industries / All Industries	29.73%	27.85%	35.58%	34.39%	45.81%
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$34,551	\$34,473	\$52,768	\$54,346	\$74,363
	All Industries	\$3,814	\$4,105	\$4,945	\$5,211	\$5,744
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$37,456	\$44,332	\$77,283	\$70,660	\$4,569,045
	All Industries	\$337	\$361	\$437	\$462	\$506

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	141.33%	126.39%	139.90%	155.83%	133.29%
	All Industries	142.83%	143.93%	151.59%	161.18%	162.73%
Employment Level	Brookings 50 Advanced Industries	0.00%	0.00%	0.00%	0.00%	0.00%
	All Industries	122.99%	129.06%	135.19%	137.19%	138.75%
Total Annual Wages	Brookings 50 Advanced Industries	0.00%	0.00%	0.00%	0.00%	0.00%
	All Industries	129.37%	115.60%	124.92%	125.11%	129.37%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	105.19%	89.58%	92.40%	91.19%	93.24%
USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
DOD-Value	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	NA	NA	NA	NA	NA
QCEW and USASpending Data Analysis						
DOD-Value Per Establishment	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	NA	NA	NA	NA	NA
DOD-Value Per Worker	Brookings 50 Advanced Industries	NA	NA	NA	NA	NA
	All Industries	NA	NA	NA	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Missaukee County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Missaukee County Data

		2013	2014	2015	2016	2017	
Missaukee County, Michigan	United States Patent and Trademark Office [USPTO]						
	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	2	-	-	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	5	5	7	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries					
	USPTO and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	NA	NA	NA	NA	NA
DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	NA	NA	NA	NA	NA	

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Missaukee County Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	0	1	0	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	4	4	4	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$822,355	\$881,288	\$1,060,211	\$1,115,503	\$1,217,773
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$1,752,856	\$1,579,820	\$2,187,915	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$197,894	\$206,519	\$242,245	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Missaukee County / Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	426.30%	0.00%	0.00%	NA	NA
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	120.32%	117.17%	159.94%	NA	NA
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	NA	NA	NA	NA	NA
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	NA	NA	NA	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	NA	NA	NA	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Missaukee County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Wexford County Data

2013 2014 2015 2016 2017

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	35	36	37	38	41
	All Industries	800	788	773	785	779
	Brookings 50 Advanced Industries / All Industries	4.38%	4.57%	4.79%	4.84%	5.26%
Employment Level	Brookings 50 Advanced Industries	50	34	27	35	33
	All Industries	13,043	13,007	12,920	13,286	13,586
	Brookings 50 Advanced Industries / All Industries	0.38%	0.26%	0.21%	0.26%	0.24%
Total Annual Wages	Brookings 50 Advanced Industries	\$2,302,586	\$1,740,109	\$1,508,316	\$1,800,674	\$1,851,041
	All Industries	\$527,164,453	\$476,176,013	\$481,880,352	\$496,898,148	\$527,164,453
	Brookings 50 Advanced Industries / All Industries	0.44%	0.37%	0.31%	0.36%	0.35%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$46,052	\$51,180	\$55,864	\$51,448	\$56,092
	All Industries	\$40,417	\$36,609	\$37,297	\$37,400	\$38,802
	Brookings 50 Advanced Industries / All Industries	113.94%	139.80%	149.78%	137.56%	144.56%
		USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]				
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$71,397,689	\$89,407,462	\$64,861,771	\$63,684,387	\$75,161,274
	All Industries	\$108,608,995	\$128,265,218	\$115,854,032	\$97,659,277	\$107,451,858
	Brookings 50 Advanced Industries / All Industries	65.74%	69.71%	55.99%	65.21%	69.95%
		QCEW and USASpending Data Analysis				
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$2,039,934	\$2,483,541	\$1,753,021	\$1,675,905	\$1,833,202
	All Industries	\$135,761	\$162,773	\$149,876	\$124,407	\$137,936
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$1,427,954	\$2,629,631	\$2,402,288	\$1,819,554	\$2,277,614
	All Industries	\$8,327	\$9,861	\$8,967	\$7,351	\$7,909

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	23	23	23	24	25
	All Industries	555	553	556	559	560
	Brookings 50 Advanced Industries / All Industries	4.10%	4.13%	4.21%	4.23%	4.45%
Employment Level	Brookings 50 Advanced Industries	46	36	28	33	34
	All Industries	7,397	7,438	7,515	7,568	7,589
	Brookings 50 Advanced Industries / All Industries	0.81%	0.58%	0.48%	0.60%	0.80%
Total Annual Wages	Brookings 50 Advanced Industries	\$2,170,028	\$1,851,426	\$1,469,135	\$1,967,111	\$1,941,370
	All Industries	\$280,800,791	\$258,504,581	\$266,527,345	\$271,796,177	\$280,800,791
	Brookings 50 Advanced Industries / All Industries	0.77%	0.72%	0.55%	0.72%	0.69%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	\$46,942	\$51,799	\$53,318	\$60,133	\$57,450
	All Industries	\$37,960	\$34,756	\$35,467	\$35,915	\$37,003
	Brookings 50 Advanced Industries / All Industries	123.66%	149.04%	150.33%	167.43%	155.26%
		USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]				
DOD Contracts Base & Exercised Options Value (DOD-Value)	Brookings 50 Advanced Industries	\$1,445,814	\$1,567,444	\$1,474,658	\$1,384,409	\$1,352,103
	All Industries	\$4,894,975	\$4,552,730	\$5,121,217	\$5,560,356	\$5,390,351
	Brookings 50 Advanced Industries / All Industries	29.54%	34.43%	28.80%	24.90%	25.08%
		QCEW and USASpending Data Analysis				
DOD-Value Per Establishment	Brookings 50 Advanced Industries	\$63,628	\$68,563	\$62,977	\$58,553	\$54,278
	All Industries	\$8,827	\$8,233	\$9,207	\$9,942	\$9,627
DOD-Value Per Worker	Brookings 50 Advanced Industries	\$31,276	\$43,854	\$53,518	\$42,320	\$40,012
	All Industries	\$662	\$612	\$681	\$735	\$710

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]				
Establishments	Brookings 50 Advanced Industries	154.03%	157.47%	158.01%	160.72%	164.59%
	All Industries	144.27%	142.50%	138.97%	140.36%	139.13%
Employment Level	Brookings 50 Advanced Industries	108.16%	95.12%	97.99%	106.99%	97.66%
	All Industries	176.32%	174.88%	171.93%	175.56%	179.03%
Total Annual Wages	Brookings 50 Advanced Industries	106.11%	93.99%	102.67%	91.54%	95.35%
	All Industries	187.74%	184.20%	180.80%	182.82%	187.74%
Average Annual Per Worker Wage	Brookings 50 Advanced Industries	98.10%	98.80%	104.78%	85.56%	97.64%
	All Industries	106.47%	105.33%	105.16%	104.14%	104.86%
		USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]				
DOD-Value	Brookings 50 Advanced Industries	4938.23%	5704.03%	4398.43%	4600.11%	5558.84%
	All Industries	2218.79%	2817.33%	2262.24%	1756.35%	1993.41%
		QCEW and USASpending Data Analysis				
DOD-Value Per Establishment	Brookings 50 Advanced Industries	3206.01%	3622.28%	2783.59%	2862.19%	3377.46%
	All Industries	1537.99%	1977.13%	1627.87%	1251.30%	1432.73%
DOD-Value Per Worker	Brookings 50 Advanced Industries	4565.67%	5996.37%	4488.75%	4299.51%	5692.27%
	All Industries	1258.38%	1611.01%	1315.81%	1000.42%	1113.45%

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Wexford County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

Wexford County Data

		2013	2014	2015	2016	2017	
Wexford County, Michigan	United States Patent and Trademark Office [USPTO]						
	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	3	1	1	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	32	32	32	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$108,608,995	\$128,265,218	\$115,854,032	\$97,659,277	\$107,451,858
	USPTO and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$36,202,998	\$128,265,218	\$115,854,032	NA	NA
DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$3,394,031	\$4,008,288	\$3,620,438	NA	NA	

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Wexford County Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	2	2	2	Data Not Available	Data Not Available
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	20	21	21	Data Not Available	Data Not Available
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	\$4,894,975	\$4,552,730	\$5,121,217	\$5,560,356	\$5,390,351
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	\$1,993,518	\$2,016,780	\$2,298,857	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	\$241,285	\$221,817	\$243,638	NA	NA

		U.S. Bureau of Labor Statistics: Quarterly Census of Employment and Wages [QCEW]					
Wexford County / Comparison Group *	Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	122.18%	44.30%	44.89%	NA	NA
	10 Previous Years of Cummulative Utility Patents Issued to U.S. Resident By Inventors By County	All Industries	157.74%	155.91%	152.24%	NA	NA
	USASpending.gov [Program of the The Federal Funding Accountability and Transparency Act of 2006]						
	DOD Contracts Base & Exercised Options Value (DOD-Value)	All Industries	2218.79%	2817.33%	2262.24%	1756.35%	1993.41%
	QCEW and USASpending Data Analysis						
	DOD-Value Per Patent	All Industries	1816.04%	6359.90%	5039.64%	NA	NA
	DOD-Value Per 10 Years of Cummulative Patent Issues	All Industries	1406.65%	1807.03%	1485.99%	NA	NA

* Comparison Group is comprised of the Average of the +/- 50 Closest Ranked Counties to Wexford County, Michigan based on their Brookings 50 Advanced Industries Employment Level (Unweighted)

MICHIGAN PROSPERITY REGIONS ANALYSIS

Table 6 — MI Prosperity Regions DoD Contracting: All Industries

Prosperity Region		2017 DoD Contract Amount	5-Year Average (2013 thru 2017)	DoD Contracts per Employee (QCEW) (5-Year Average)	DoD Contracts per Establishment (QCEW) (5-Year Average)	Average Annual Wage (QCEW) (5-Year Average)
1	Upper Peninsula Prosperity Alliance	\$66,964,711	\$75,271,308	\$678	\$9,281	\$38,463
2	Northwest Prosperity Region	\$122,285,307	\$126,311,761	\$1,061	\$13,984	\$39,890
3	Northeast Prosperity Region	\$24,240,543	\$20,389,579	\$350	\$3,962	\$35,129
4	West Michigan Prosperity Alliance	\$230,471,656	\$222,513,276	\$324	\$7,196	\$45,362
5	East Central Michigan Prosperity Region	\$14,627,853	\$9,422,286	\$44	\$787	\$44,159
6	East Michigan Prosperity Region	\$25,782,493	\$32,037,550	\$129	\$2,116	\$41,648
7	South Central Prosperity Region	\$122,270,059	\$106,545,870	\$520	\$11,734	\$48,872
8	Southwest Prosperity Region	\$51,710,183	\$44,057,318	\$148	\$2,588	\$46,824
9	Southeast Michigan Prosperity Region	\$186,872,440	\$204,608,645	\$516	\$10,182	\$50,737
10	Detroit Metro Prosperity Region	\$2,591,127,484	\$2,195,650,412	\$1,276	\$25,286	\$58,828

Table 7 — MI Prosperity Regions DoD Contracting: Brookings 50 Advanced Industries

Prosperity Region		2017 DoD Contract Amount	5-Year Average (2013 thru 2017)	DoD Contracts per Employee (QCEW) (5-Year Average)	DoD Contracts per Establishment (QCEW) (5-Year Average)	Average Annual Wage (QCEW) (5-Year Average)
1	Upper Peninsula Prosperity Alliance	\$26,315,086	\$23,975,183	\$13,490	\$69,695	\$69,753
2	Northwest Prosperity Region	\$79,140,915	\$76,607,675	\$30,316	\$144,434	\$65,145
3	Northeast Prosperity Region	\$1,263,088	\$1,041,138	\$1,853	\$5,526	\$53,478
4	West Michigan Prosperity Alliance	\$147,933,889	\$127,834,012	\$2,718	\$58,537	\$64,505
5	East Central Michigan Prosperity Region	\$7,010,693	\$4,873,147	\$888	\$5,884	\$67,407
6	East Michigan Prosperity Region	\$17,938,209	\$14,701,401	\$1,534	\$19,019	\$57,144
7	South Central Prosperity Region	\$15,344,305	\$26,698,082	\$3,365	\$39,124	\$67,033
8	Southwest Prosperity Region	\$38,856,344	\$31,557,103	\$2,110	\$34,271	\$66,105
9	Southeast Michigan Prosperity Region	\$123,242,211	\$132,505,630	\$3,191	\$67,695	\$77,226
10	Detroit Metro Prosperity Region	\$2,208,251,638	\$1,893,038,672	\$7,285	\$250,409	\$86,021

END NOTES

1. The Bureau of Labor Statistics (BLS) of the U.S. Department of Labor; “The Quarterly Census of Employment and Wages (QCEW) program homepage”; <https://www.bls.gov/cew/home.htm>; August 2018
2. Brookings Institute; “Data and Methods Appendix for America’s Advanced Industries: What They Are, Where They Are, Why They Matter”; By Jonathan Rothwell and Siddharth Kulkarni; January 2015
3. Brookings Institute; “Data and Methods Appendix for America’s Advanced Industries: What They Are, Where They Are, Why They Matter”; By Jonathan Rothwell and Siddharth Kulkarni; January 2015
4. USASpending.gov; “About USASpending.gov”; <https://www.usaspending.gov>; August 2018
5. Geocoding of DoD Contract Recipients used zip codes and the zip code geo-centroid to assign a county code. Due to the large size of the DoD contract database, the higher resolution geocoding resulting from using street addresses was beyond the scope and resources of this study.

Networks  Northwest
Talent / Business / Community

Networks Northwest | PO Box 506 | Traverse City, MI 49685-0506
networksnorthwest.org