

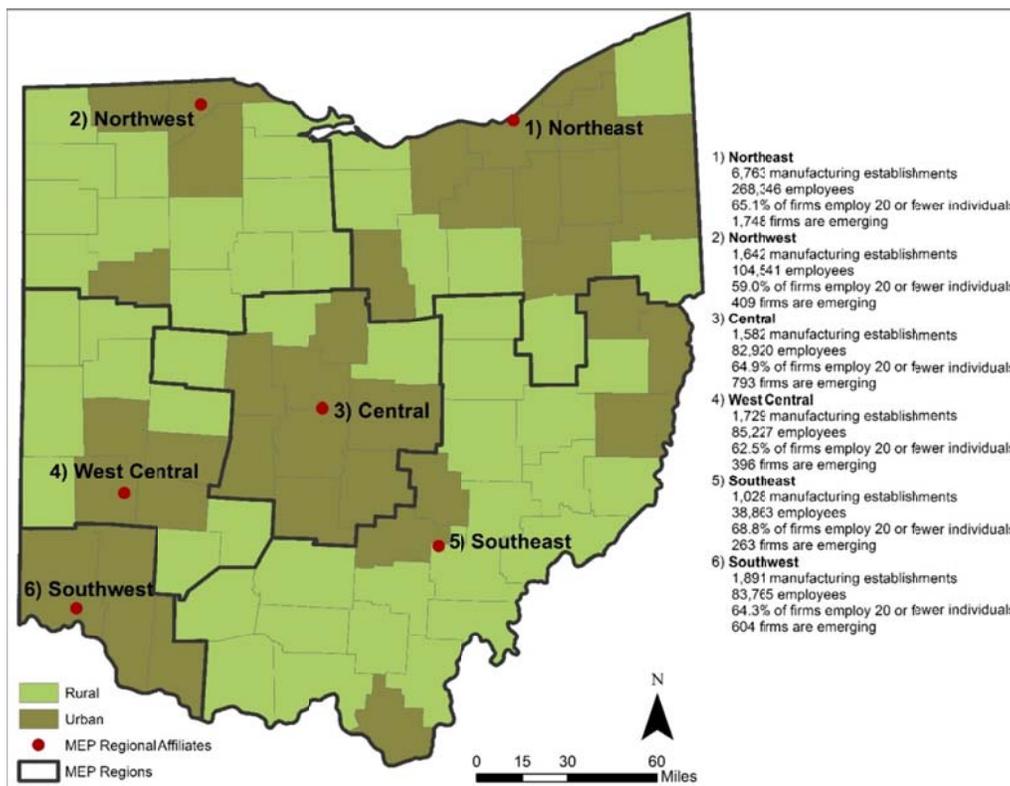
## Appendix C – Market Segmentation Analysis: Ohio Manufacturing Sector (Excerpt)

Ohio presents a challenging and exciting environment in which to serve and enhance the growth and competitiveness of small and medium sized manufacturers. As many marketers and economists know, Ohio is in many ways a microcosm of the US economy: its geography ranges from easy-to-access urban areas with up-to-date highway and transportation systems to small, rural enclaves embedded in mountain towns far from a major airport or four-lane highway; its manufacturing enterprises encompass suppliers and major producers of aircraft engines and automobiles, innovators in biotechnology and medical devices, as well as wood producers and craft brewers.

Ohio MEP's six-region approach is designed to align with Ohio's primary metropolitan and rural labor market areas in order to: 1) better configure service delivery to meet each region's need; promote partnerships between Ohio MEP and regional complementary service providers; and 3) improve small and rural manufacturers' access to Ohio MEP services by bringing services physically closer and resourcing the service providers for effective delivery.

Figure 1 below depicts the six Ohio MEP regions and their associated market segment statistics. This map also shows the counties included in each of the six service regions with dark green indicating that the county is classified as urban and light green indicating rural.<sup>1</sup>

**Figure 1. Ohio MEP Regions with Affiliated Centers and Regional Statistics, 2014**



<sup>1</sup> NIST MEP uses the 2013 Rural-Urban Continuum Codes maintained by the U.S. Department of Agriculture to make the assignment. Those scoring values of 1 to 3 on the index are considered to be urban and those with scores of 4 and above are labeled rural.

Table 4 below lists the number and distribution of manufacturing jobs and establishments across the State of Ohio by Ohio MEP region.

**Table 4: The Distribution of Manufacturing Jobs and Establishments by Region**

Region	Manufacturing Jobs	Distribution of Manufacturing Jobs	Manufacturing Establishments	Distribution of Manufacturing Establishments	Average Employment
Central	82,920	12.5%	1,582	10.8%	52
Northeast	268,346	40.4%	6,763	46.2%	40
Northwest	104,541	15.8%	1,642	11.2%	64
Southeast	38,863	5.9%	1,028	7.0%	38
Southwest	83,765	12.6%	1,891	12.9%	44
West Central	85,227	12.8%	1,729	11.8%	49
<b>Ohio Total</b>	<b>663,662</b>	<b>100.0%</b>	<b>14,635</b>	<b>100.0%</b>	<b>45</b>

Source: Quarterly Census of Employment and Wages; excludes multiple county and statewide establishments

The greatest concentration is in the Northeast region, with 268,000 jobs in nearly 7,000 establishments, followed by the Northwest region, with 105,000 jobs in 1,642 establishments. The Central, Southeast, and West Central regions have between 83,000 and 85,000 jobs and between 1,500 and 1,900 establishments. The Southeastern (Appalachian) region has the smallest average employment size, with 38 employees, while the largest is in the Northwestern corner of the state, with an average size of 64 employees. The size distribution of Ohio's manufacturing firms is detailed later in this Section.

Each region is characterized by a distinctive cluster of industries, as shown in Table 5 below.

**Table 5: Industry Specialization in the Ohio Manufacturing Extension Partnership Regions, Ranked by the Gross Domestic Product [GDP] Location Quotient**

Region	Industry Description	GDP Location Quotient	Number of small manufacturing companies*	Total Number of Manufacturing Establishments	JobsOhio Priority Industry
Central	Dairy Product Manufacturing	5.79	4	11	Food Processing
	Paint, Coating, and Adhesive Manufacturing	4.05	5	19	Polymers and Chemicals
	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	3.69	8	NA	Polymers and Chemicals
Northeast	Forging and Stamping	3.97	78	146	
	Paint, Coating, and Adhesive Manufacturing	3.93	37	76	Polymers and Chemicals
	Steel Product Manufacturing from Purchased Steel	3.86	20	59	Advanced Manufacturing
Northwest	Glass and Glass Product Manufacturing	6.25	9	19	Advanced Manufacturing
	Household Appliance Manufacturing	6.18	0	NA	Advanced Manufacturing
	Other Nonmetallic Mineral Product	5.40	15	26	Advanced Manufacturing
Southeast	Clay Product and Refractory Manufacturing	8.49	10	22	
	Other Leather and Allied Product Manufacturing	8.44	5	NA	
	Sawmills and Wood Preservation	4.39	36	54	
Southwest	Aerospace Product and Parts Manufacturing	4.15	14	33	Aerospace & Aviation
	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	3.94	16	29	Polymers and Chemicals
	Textile & Fabric Finishing & Fabric Coating Mills	3.29	NA	NA	
West-Central	Metalworking Machinery Manufacturing	5.55	105	158	
	Household Appliance Manufacturing	5.14	NA	NA	Advanced Manufacturing
	Animal Food Manufacturing	3.58	11	21	Food Processing

Sources: Moody's Economy.com and U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

\* Number of manufacturing establishments with employment under 20

NA identifies suppressed data

Table 5 lists the three industries in each Ohio MEP region with the highest Location Quotient (LQ), the number of manufacturing companies in that industry with fewer than 20 employees and the total number of companies in that industry, and indicates if the industry is one identified by JobsOhio as a priority industry for economic development attraction (see Appendix H) .

LQ is a measure of industrial specialization. LQs are calculated using data on Gross Domestic Product (GDP) by industry. The region's share of GDP generated by a specific industry is divided by the share of the nation's GDP that originates from the same industry. If the GDP shares are the same in the region and in the nation then the resulting ratio is 1.00; if the region has a greater share of its GDP coming from the industry then the ratio will be greater than 1.00, and if it is less the ratio will be smaller than 1.00. The higher the LQ, the more specialized the region is in that particular industry.

The Southeast (Appalachian) Region has the highest LQs in the state, exemplified by two traditional, slow-growing, industries: the clay products industry has an LQ of 8.49, with 22 manufacturing enterprises – nearly half employ fewer than 20 people; the other is the leather industry, with an LQ of 8.44. Both are small relative to others in the state, but their LQ shows their importance to the Southeast. Neither is in a JobsOhio targeted industry; however, the oil and gas industry, which is a JobsOhio priority industry, is extremely active in the region due to the presence of shale oil and natural gas deposits. Ohio MEP complements JobsOhio's activities by making it possible to reach very small, isolated or underrepresented manufacturers in these segments.

As shown in Table 6 below, over 544,000, or more than 80%, of the state's manufacturing workers are employed in traditional durable goods industries. Many of these industries are directly served by the specializations of the Ohio MEP's regional lead organizations and by their sub-recipients, as discussed in the next Section.

**Table 6: Private Sector Average Job Growth in Ohio during the Recovery was 6.8%; the Average for Ohio's Core Manufacturing Industries was 10.7%**

Manufacturing Sector	2010	2011	2012	2013	2014*	Growth Rate
Transportation equipment	96,359	100,187	105,818	111,030	117,232	21.7%
Fabricated metal products	94,078	99,700	103,443	102,272	102,641	9.1%
Machinery	66,461	70,827	73,991	75,606	77,449	16.5%
Food manufacturing	53,614	54,525	56,233	57,010	56,857	6.0%
Plastics and rubber products	50,782	51,616	52,972	53,935	54,737	7.8%
Chemical manufacturing	43,138	43,202	44,081	43,568	43,246	0.3%
Primary metal	37,054	39,040	39,739	38,908	38,726	4.5%
Electrical equipment and appliances	25,503	26,421	27,634	27,633	27,805	9.0%
Nonmetallic mineral products	24,525	24,838	25,362	25,260	25,314	3.2%
<b>Total</b>	<b>491,514</b>	<b>510,356</b>	<b>529,273</b>	<b>535,222</b>	<b>544,006</b>	<b>10.7%</b>

Source: Quarterly Census of Employment and Wages Published by Cleveland State University; Powered by dataZoa

\*2014 data are preliminary.

Transportation equipment is the state's largest manufacturing industry. It includes automotive and aerospace production and their large and intermingled supply chains. This is followed by the fabricated metal industry and the machinery industries.

From 2010 to 2014, the time period that roughly covers the recovery from the Great Recession, the 9 industries listed in Table 6 had a job growth rate of 10.7%, contrasted with an overall private sector job creation rate of 6.8%.

### Size of Manufacturing Enterprises

Ohio MEP offers services to all manufacturing firms in the state, but places a special emphasis on very small manufacturers and those located in disadvantaged and isolated areas such as rural counties and low-income central city neighborhoods.

Table 7 provides data on the distribution of manufacturing enterprises in Ohio by employment size. Six size classes are defined – from those enterprises employing 20 or fewer people to those employing more than 500. Fewer than 10% of all manufacturing jobs in the state are in firms that employ 20 or fewer, while 26% of all manufacturing jobs are in 183 plants that employ more than 500 people. Additionally, many of the small and ultra-small plants are connected to larger factories through supply chain relationships. Ohio MEP maintains relationships with enterprises of all sizes up and down the supply chain, which allows the program to deliver to these very small enterprises not just academically inspired guidance but informed, real-world intelligence and expertise.

**Table 7: Distribution of Manufacturing Establishments and Jobs by Employment Size**

<b>Establishment Size</b>	<b>Number of Establishments</b>	<b>% of Total</b>	<b>Number of Jobs</b>	<b>% of Total</b>
20 and less	9,404	64.3%	64,681	9.7%
21 to 50	2,513	17.2%	81,762	12.3%
51 to 100	1,247	8.5%	88,772	13.4%
100 to 250	985	6.7%	149,307	22.5%
251 to 500	313	2.1%	107,783	16.2%
501 and more	173	1.2%	171,358	25.8%
<b>Totals</b>	<b>14,635</b>	<b>100.0%</b>	<b>663,662</b>	<b>100.0%</b>

Source: Quarterly Census of Employment and Wages, Excludes multiple county and statewide establishments

Table 8 is similar to the previous table; but illustrates the distribution of establishments by Ohio MEP region.

**Table 8: The Distribution of Manufacturing Establishments and Employment Size by Region**

<b>Regional Affiliate</b>	<b>Establishment Size</b>	<b>20 and less</b>	<b>21 to 50</b>	<b>51 to 100</b>	<b>100 to 250</b>	<b>251 to 500</b>	<b>501 and more</b>	<b>Totals</b>
Central	Number of Establishments	1,027	254	127	106	41	27	1,582
	% of Regional Total	64.9%	16.1%	8.0%	6.7%	2.6%	1.7%	100%
Northeast	Number of Establishments	4,405	1,177	568	443	112	58	6,763
	% of Regional Total	65.1%	17.4%	8.4%	6.6%	1.7%	0.9%	100%
Northwest	Number of Establishments	969	292	160	132	54	35	1,642

	% of Regional Total	59.0%	17.8%	9.7%	8.0%	3.3%	2.1%	100%
Southeast	Number of Establishments	707	162	65	66	21	7	1,028
	% of Regional Total	68.8%	15.8%	6.3%	6.4%	2.0%	0.7%	100%
Southwest	Number of Establishments	1,215	330	158	128	40	20	1,891
	% of Regional Total	64.3%	17.5%	8.4%	6.8%	2.1%	1.1%	100%
West Central	Number of Establishments	1,081	298	169	110	45	26	1,729
	% of Regional Total	62.5%	17.2%	9.8%	6.4%	2.6%	1.5%	100%

Source: Quarterly Census of Employment and Wages

Table 9 below has two sections. Both analyze the distribution of establishments by employment size across the Ohio MEP regions:

**Table 9: The Geographical Distribution of Manufacturing Enterprises by Employment Sizes**

Establishment Size	Central	Northeast	Northwest	Southeast	Southwest	West Central	Total
20 and less	10.9%	46.8%	10.3%	7.5%	12.9%	11.5%	100.0%
21 to 50	10.1%	46.8%	11.6%	6.4%	13.1%	11.9%	100.0%
51 to 100	10.2%	45.5%	12.8%	5.2%	12.7%	13.6%	100.0%
100 to 250	10.8%	45.0%	13.4%	6.7%	13.0%	11.2%	100.0%
251 to 500	13.1%	35.8%	17.3%	6.7%	12.8%	14.4%	100.0%
501 and more	15.6%	33.5%	20.2%	4.0%	11.6%	15.0%	100.0%
<b>Totals</b>	10.8%	46.2%	11.2%	7.0%	12.9%	11.8%	100.0%

Ratio of a Region's Share of Manufacturing Establishments in a Size Class to the Region's Share of all

Establishment Size	Central	Northeast	Northwest	Southeast	Southwest	West Central
20 and less	1.01	1.01	0.92	1.07	1.00	0.97
21 to 50	0.94	1.01	1.04	0.92	1.02	1.00
51 to 100	0.94	0.99	1.14	0.74	0.98	1.15
100 to 250	1.00	0.97	1.19	0.95	1.01	0.95
251 to 500	1.21	0.77	1.54	0.96	0.99	1.22
501 and more	1.44	0.73	1.80	0.58	0.89	1.27
<b>Totals</b>	1.00	1.00	1.00	1.00	1.00	1.00

The first row displays the distribution of very small manufacturing establishments, those employing 20 or less, across the state's regions. The second row displays the distribution of establishments employing between 21 and 50 employees.

The lower section divides each cell in a row by the proportion of manufacturing establishments of all size categories located in the Ohio MEP region. If a cell has a ratio that is greater than 1.0 the region has a disproportionately large share of establishments of that size located in that

region. For example, the Central region has 44% more very large establishments (having more than 500 jobs) than if manufacturing firms were distributed proportionately across the regions.

The complexity of Ohio's manufacturing economy illustrated in the segmentation above informs a nuanced service development and delivery strategy that corresponds to the unique attributes and needs of each region. The resulting high-level strategy for each region is summarized below:

#### Southeast – Dominated By Small Manufacturers

Approximately one-quarter of the manufacturing establishments in the Southeast have 50 jobs or fewer, accounting for nearly 10,000 positions. It is a region with only 29 larger employers (those with 251 jobs or more) and it is highly underrepresented in very large plants with more than 500 jobs. Providing affordable, accessible services to very small and rural manufacturing establishments is the focus of MEP in this region.

#### Central, West Central, and Northwest – Land of the Larger Establishments

The automotive supply chain and food processing dominate the Northwest and Central regions of Ohio, along with appliances and fertilizer manufacturing. The West Central region adds metalworking machinery into the mix. There are a total of 173 very large (more than 501 positions) manufacturing establishments in the state and more than half of them (88%) are in this quadrant. They also have a higher than expected share of plants with 251-500 positions. Understanding and serving the supply chains for the key industries is essential to MEP success in these areas.

#### Northeast and Southwest – Concentrated and Distinctly Middle-Market

These regions have high concentrations of manufacturing jobs. The Northeast has 6,700 manufacturing establishments, 46.2% of all in the state, and 268,000 jobs – 40.4% of the state's total. The Southwest has nearly 84,000 jobs in 1,900 plants. The distribution of manufacturing establishments in the Cincinnati-centered Southwest is largely proportional to its share of manufacturers in the state (Toyota and other very large manufacturers are located across the border in Northern Kentucky). Northeast Ohio (Cleveland-Akron-Youngstown) is underrepresented in the number of large and very large establishments. The sheer numbers of establishments in these regions demand a highly structured approach to client service. Both the program metrics and the performance incentives of the affiliates must drive a market penetration strategy that can reach all corners of each region.

#### The Challenge of Small Manufacturing Employers: 0-20 and 21-50

22% of Ohio's manufacturing workers are employed in small enterprises (those employing 50 people or less) and they are spread across the state. There are 9,404 manufacturing establishments with 20 or fewer jobs, employing nearly 65,000 people. Another 82,000 positions are in 2,500 plants that employ between 51-100 people. This fraction employed in the two smallest categories of establishments is nearly equal to the number in factories employing between 100-250 people. The difference is that there are slightly fewer than 1,000 middle-market employers, but nearly 12,000 small factories. Being able to reach 12,000 establishments is a logistical challenge and drives up the cost of serving this segment of the market. It takes a team and a highly coordinated economic development system – one with many doors that can deliver consistent services. Recognizing this challenge, Ohio MEP employs a funding and match formula that allocates additional resources to small and harder-to-reach manufacturers.

### Emerging Manufacturing Firms

A leading component of Ohio's economic development strategy has been fostering the emergence and growth of companies that represent the foundation for the 21<sup>st</sup> century economy. NIST MEP defines emerging manufacturing establishments as those that have been in business for five years or less. Dun & Bradstreet reports this type of life-cycle information, which we view as indicative but not definitive. The data used for the analysis included all manufacturing establishments listed as starting in 2010 or later, which marks the start of the recovery from the Great Recession. The results are presented in Table 10 below.

**Table 10: Emerging Manufacturing Establishments in Ohio**

Ohio Emerging Manufacturing Companies, 2014			
Region	# of Emerging Manufacturing Companies	Regional Distribution of Emerging Mfg. Companies	% of all Companies in a Region
Central	793	19%	22%
Northeast	1,748	41%	15%
Northwest	409	10%	14%
Southeast	263	6%	16%
Southwest	604	14%	17%
West Central	396	9%	14%
<b>Total</b>	<b>4,213</b>	<b>100%</b>	<b>16%</b>

Dun & Bradstreet identified 4,213 manufacturing companies as having been founded between 2010 and 2014. The region surrounding Interstate-71, sometimes called the 3C Corridor (Cincinnati-Columbus-Cleveland), appears to be the focus of emerging manufacturing activity. Nearly half (1,748 or 41%) of the total were located in Northeast Ohio, with the next largest locations in Columbus-centered Central Ohio (793 plants accounting for 19% of the total), and in the Southwest with 604 establishments, or 14% of the statewide total.

The reported distribution of emerging establishments differed from that of all manufacturing establishments and more closely tracked the distribution of manufacturing jobs:

- Central and Southwest Ohio had the largest positive differences in the distribution of startup manufacturing plants and the distribution of manufacturing jobs. The Central part of the state accounted for 19% of emerging firms and 12.5% of existing manufacturing employment.
- The Southwest region was responsible for 14% of the emerging manufacturing establishments and 12.6% of employment.
- The regions with the largest differentials were the Northwest (-5.8 percentage point differential) and West Central (-3.8 percentage point differential). These are also the regions that are most dependent on very large manufacturing plants.