

Linking Regional Economic Clusters with Targeted Urban Places: Cluster Analysis

Bookman Associates, Inc.

CapraroConsulting.com



mass | economics



Context: Project Goals

Project Goal: Identify most promising industrial corridors based on regional growth clusters (and pilot methodology)

Project Methodology

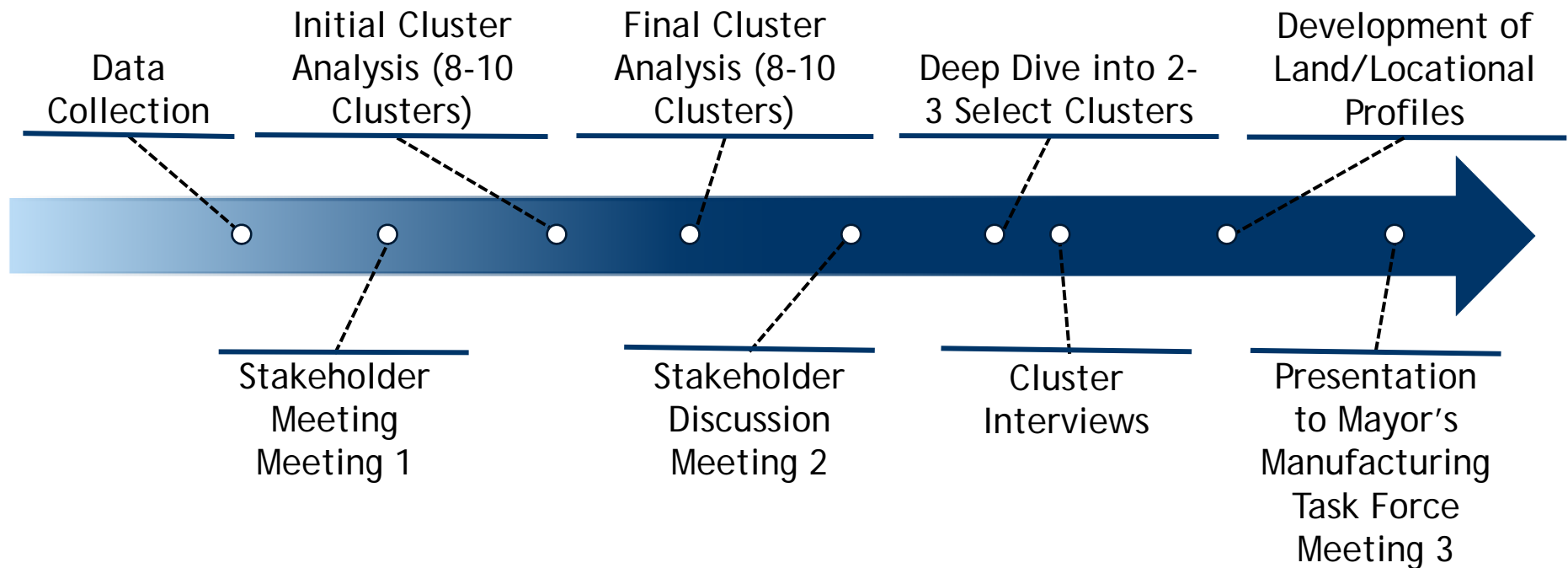
- Identify urban growth opportunities within 2 or 3 of the strongest regional growth clusters
- Create land/location profiles for the urban growth opportunities within these clusters
- Comment and advise on the industrial district selection process

Next Steps

- Match land/location profiles to available land data to inform the industrial district selection process
- Subsequent work to identify particular site uses and specify site-level work (e.g., creating clean-up plans, attracting developers and firms) will be critical to ensuring the successful development of Indianapolis's industrial land

Work is illustrative: *NOT* about finding the “*best*” clusters or site uses

Context: Project Status



Cluster Selection: Methodology

- Identified a broad list of ~8 clusters using existing cluster studies, economic development websites, and client feedback
- Established cluster and sub-cluster definitions (i.e., identification of industry codes) using a variety of sources
- Gathered relevant data for each cluster and sub-cluster (e.g., employment, output, wages, job requirements, and training)
- Grouped ~15 metrics into four categories - Cluster Growth, Urban Contribution, Job Quality, and Job Accessibility
- Ranked clusters and sub-clusters across each of the four categories and overall using both weighted and unweighted criteria

Note that the goal is to identify strong target clusters for integrating land and economic development strategies. The following analysis in no way reflects a recommendation on the best clusters for economic development.

Cluster Selection: Grid

Report/Website	Traded Clusters											Local Clusters ²		
	Advanced Manufacturing	Biosciences	Technology	Transportation, Distribution and Logistics	Clean Energy	Motorsports	Sports Business	Defense and Aerospace	Fashion	Sports	Business and Financial Services	Local Business-to-Business (B2B)	Healthcare	Food
Battelle	X	X	X					X ¹						
Indy Partnership Competitive Assessment	X	X	X	X	X									
Indy Partnership Website	X	X	X	X	X	X	X							
Develop Indy Website	X	X	X	X	X	X		X	X	X				X
Indiana Cluster Study (Marion County Strengths)				X							X	X ⁴		
Hire Up Indy	X ³	X	X	X	X								X	

Notes: ¹Included as part of Advanced Manufacturing; ²Local Clusters have been included here given that they can provide significant job and wealth creation opportunities; however, they are typically not included in cluster studies, which are usually focused on traded clusters. Note that the food cluster can be both local (e.g., food retail) and traded (e.g., food manufacturing) in nature; ³Note that the Hire Up report also includes Manufacturing (in addition to Advanced Manufacturing); ⁴Business and Financial Services is one component of Local B2B.



Cluster Selection: Broad List of Clusters

- Advanced Manufacturing (including the Defense and Aerospace sub-cluster)
- Biosciences
- Clean Energy
- Technology
- Local B2B
- Motorsports (Industrial Component Only)
- Transportation, Distribution, and Logistics (TDL)
 - Distribution and Electronic Commerce
 - Transportation and Logistics
- Food Manufacturing and Distribution

Cluster Selection: Details

Cluster	Sub-Clusters	Source
Advanced Manufacturing	<p>Defense and Aerospace; Construction and related machinery; Electric lighting and wiring equipment; Electrical components and accessories; Electrical industrial equipment; Household and office equipment; Industrial Chemicals; Measuring and controlling devices; Metalworking machinery; Miscellaneous industrial machinery; Motor vehicles and equipment; Plastics materials and synthetics; Soaps, cleaners, and other chemical products</p> <p><i>Note: Defense and Aerospace has also been analyzed separately.</i></p>	Battelle Report (2000) - Updated from SIC to NAICS codes
Biosciences	Agricultural Feedstock and Chemicals; Bioscience-Related Distribution; Drugs and Pharmaceuticals; Medical Devices and Equipment; Research, Testing, and Medical Laboratories	BioCrossroads
Clean Energy	<p>Agriculture and Forestry; Engineering, Legal, Research and Consulting; Equipment Dealers and Wholesalers; Government Administration; Green Manufacturing; Renewable Power Generation</p> <p><i>Note: Analysis captures some non-Clean Energy employment. Further research would be required to estimate the percentage of employment that is specifically related to Clean Energy.</i></p>	<p>Delta Institute</p> <p>www.delta-institute.org/sites/default/files/NAICS_Codes_for_Green_Industries.pdf</p>
Technology	<p>Communications and media equipment; Communications services; Communications wholesale and repair; Computer and office equipment; Electric lighting and wiring equipment; Electrical components and accessories; Software and data processing</p>	Battelle Report (2000) - Informatics cluster, updated from SIC to NAICS codes

Note: Full NAICS cluster and sub-cluster definitions are available by contacting the Indianapolis office of the Local Initiatives Support Corporation

Cluster Selection: Details (continued)

Cluster	Sub-Clusters	Source
Local B2B	Facilities Management; HR Services; Local Transportation and Logistics; Local Trucking; Other Business Services; Professional Services; Real Estate; Rental and Leasing; Repair and Servicing; Warehousing and Storage; Waste; Wholesale (Auto, Construction, Consumer and Business, Energy/Chemical, Food, Healthcare, Other Industrial, and Support)	Mass Economics Definition
Motorsports	Team / Testing	Charlotte Motorsports Report (2006) - Industrial component http://charlotteusa.com/images/uploads/CharlotteUSA_Motorsports_Report_2006.pdf
TDL - Distribution and Electronic Commerce	Distribution of Transportation Equipment and Supplies; Electronic and Catalog Shopping; Rental and Leasing; Warehousing and Storage; Wholesaling (Agricultural and Construction Machinery, Wholesaling of Apparel and Accessories, Wholesaling of Farm Material and Supplies, Wholesaling of Food Products, and Wholesaling of Other Merchandise)	Institute for Strategy and Competitiveness http://clustermapping.us
TDL - Transportation and Logistics	Air Transportation; Ground Transportation Support Activities; Specialty Air Transportation	Institute for Strategy and Competitiveness http://clustermapping.us
Food Manufacturing and Distribution	Manufacturing-Food, Manufacturing-Drink, Manufacturing-Other (e.g., food packaging), Distribution-Food, Distribution-Other	Mass Economics Definition

Note: Full NAICS cluster and sub-cluster definitions are available by contacting the Indianapolis office of the Local Initiatives Support Corporation

Cluster Selection: Metrics - Overview

Cluster Growth

- Cluster growth trajectories, including national cluster/sub-cluster growth and regional projected growth in output and employment

Urban Contribution

- Role of urban-based cluster activity within regional cluster, including cluster/sub-cluster strength in Marion County, the county's contribution to regional employment, and levels of "urbanization" (i.e., performance of city-based industries)

Job Quality

- Provision of quality jobs, including cluster/sub-cluster average wage levels and the extent of on-the-job training

Job Accessibility

- Creation of opportunities for residents, including accessibility of jobs to residents with lower-educational levels

Land Use

- Fit with building availability, based on building and site size requirements, as well as locational preferences
- *Note that Land Use metrics will be incorporated into the next round of analysis*

Cluster Selection: Metrics (Unweighted)

Cluster Growth

- US Job Growth % (2003-12)
- Projected Regional Job Growth % (2012-22)
- Projected Regional Job Growth Absolute (2012-22)
- Weighted Output Growth 2012-22
- Projected Output per Employee Growth % (2012-22)

Urban Contribution

- Marion County - Location Quotient (2012)
- Marion County - Location Quotient Growth (2003-12)
- Marion County - Employment (2012)
- Projected Ratio of County-to-Regional Jobs (2022)
- Percent of Cities Outperforming Region

Job Quality

- Average Wage in the US (2012)
- Average Wage in the Indianapolis Region for those with less than or equal to a High School Degree and those with less than or equal to an Associate Degree (2012)
- County-to-US Wage Differential
- Percent of jobs providing Medium or Long-term On-the-Job Training (2012)

Job Accessibility

- Percent of jobs requiring equal to or less than a High School Degree and less than or equal to an Associate Degree (2022)

Land Use

- Average Estimated Building Square Footage ('000 sq. ft.)
- Average Site Size (acres)
- Average floor-to-area ratio (FAR)
- Other locational attributes (e.g., distance from residential, proximity to highways)
- Variation in Employment Size Categories (as proxy for site selection flexibility)

Cluster Selection: Metrics (Weighted)

Cluster Growth

- US Job Growth % (2003-12)
- Projected Regional Job Growth % (2012-22)
- **Projected Regional Job Growth Absolute (2012-22)**
- Weighted Output Growth 2012-22
- Projected Output per Employee Growth % (2012-22)

Bold = Weighted more heavily in analysis

Urban Contribution

- Marion County - Location Quotient (2012)
- Marion County - Location Quotient Growth (2003-12)
- Marion County - Employment (2012)
- **Projected Ratio of County-to-Regional Jobs (2022)**
- **Percent of Cities Outperforming Region**

Job Quality

- Average Wage in the US (2012)
- **Average Wage in the Indianapolis Region for those with less than or equal to a High School Degree and those with less than or equal to an Associate Degree (2012)**
- County-to-US Wage Differential
- **Percent of jobs providing Medium or Long-term On-the-Job Training (2012)**

Job Accessibility

- Percent of jobs requiring equal to or less than a High School Degree and less than or equal to an Associate Degree (2022)

Land Use

- Average Estimated Building Square Footage ('000 sq. ft.)
- Average Site Size (acres)
- Average floor-to-area ratio (FAR)
- Other locational attributes (e.g., distance from residential, proximity to highways)
- Variation in Employment Size Categories (as proxy for site selection flexibility)

Cluster Selection: Rankings (Unweighted)

Cluster	Cluster Growth - Rank	Urban Contribution - Rank	Job Quality - Rank	Job Accessibility - Rank	Overall Rank
Biosciences	5	1	1	7	1
Technology	1	2	5	10	2
Local B2B	3	3	10	3	3
TDL (Distribution and Electronic Commerce)	2	9	6	4	4
Food Manufacturing and Distribution	7	7	7	1	5
Defense and Aerospace	10	4	2	7	6
Advanced Manufacturing	8	8	3	5	7
Motorsports	8	10	4	2	7
TDL (Transportation and Logistics)	6	5	9	5	9
Clean Energy	4	6	7	9	10

Cluster Selection: Rankings (Weighted)

Cluster	Cluster Growth - Rank	Urban Contribution - Rank	Job Quality - Rank	Job Accessibility - Rank	Overall Rank
Biosciences	5	1	1	7	1
Technology	1	3	5	10	2
Local B2B	3	4	10	3	3
Food Manufacturing and Distribution	7	7	6	1	4
Defense and Aerospace	10	2	2	7	4
TDL (Distribution and Electronic Commerce)	2	9	7	4	6
Advanced Manufacturing	9	8	2	5	7
Motorsports	8	10	4	2	7
TDL (Transportation and Logistics)	6	5	9	5	9
Clean Energy	4	6	8	9	10

Cluster Selection: Top Six Clusters



Biosciences



Defense and
Aerospace



Food
Manufacturing
and Distribution



Local B2B



Technology



TDL
(Distribution
and Electronic
Commerce)

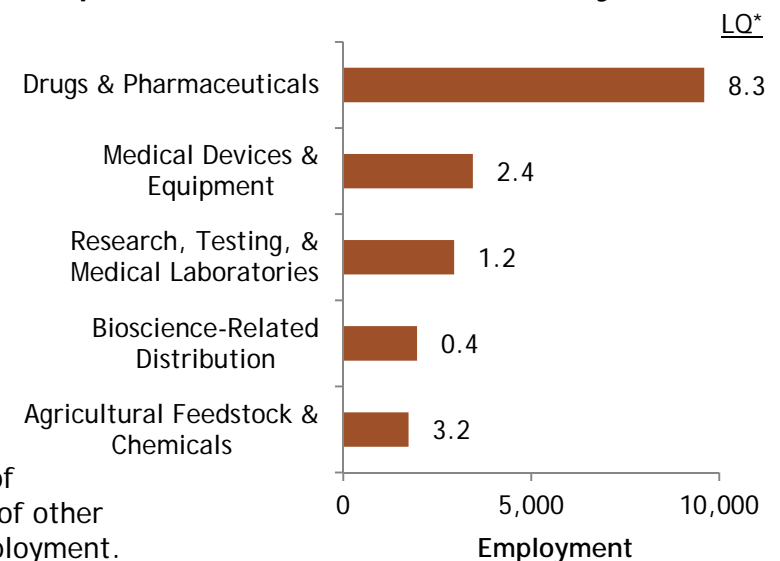
Cluster Highlights: Biosciences

Highlights

- City-based cluster activity benefits from close proximity to Eds & Meds, including anchors such as IU Health University Hospital
- 40% projected growth in output per employee over the next decade, ranking it 2nd among target clusters
- Strong biosciences cluster in Marion County, which accounts for nearly 80% of the cluster's regional employment
- Provides the highest wages of all target clusters, both on average and for workers with lower levels of educational attainment
- Ranks very low terms of job accessibility

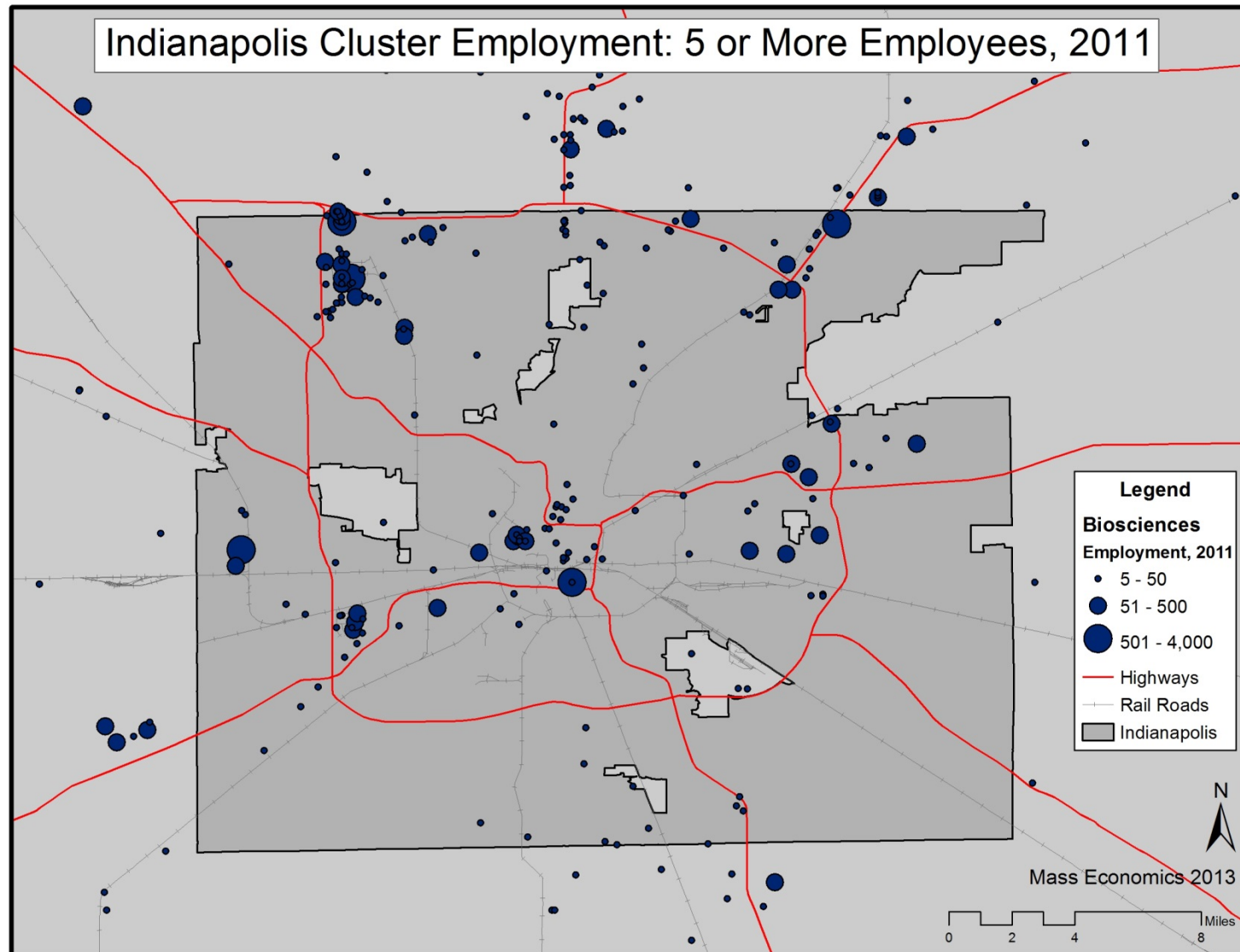


Top Sub-Clusters - Marion County (2012)



Note: *The location quotient, or LQ, is a measure of an area's relative share of employment in particular industries, clusters, or sub-clusters relative to that of other areas. An LQ greater than one represents a higher-than-average share of employment.
Source: IBRC, U.S. Census Bureau, Bureau of Labor Statistics, Mass Economics Analysis

Cluster Highlights: Biosciences



Source: IBRC, National Establishment Time Series Data, Mass Economics Analysis

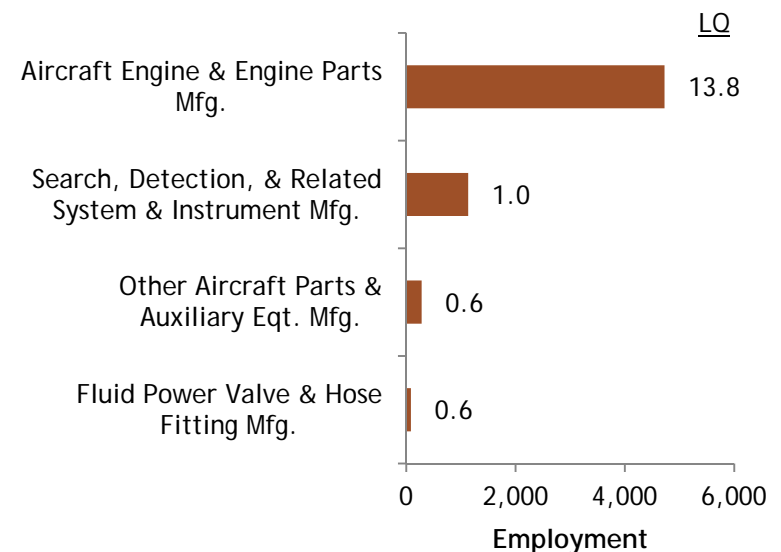
Cluster Highlights: Defense and Aerospace

Highlights

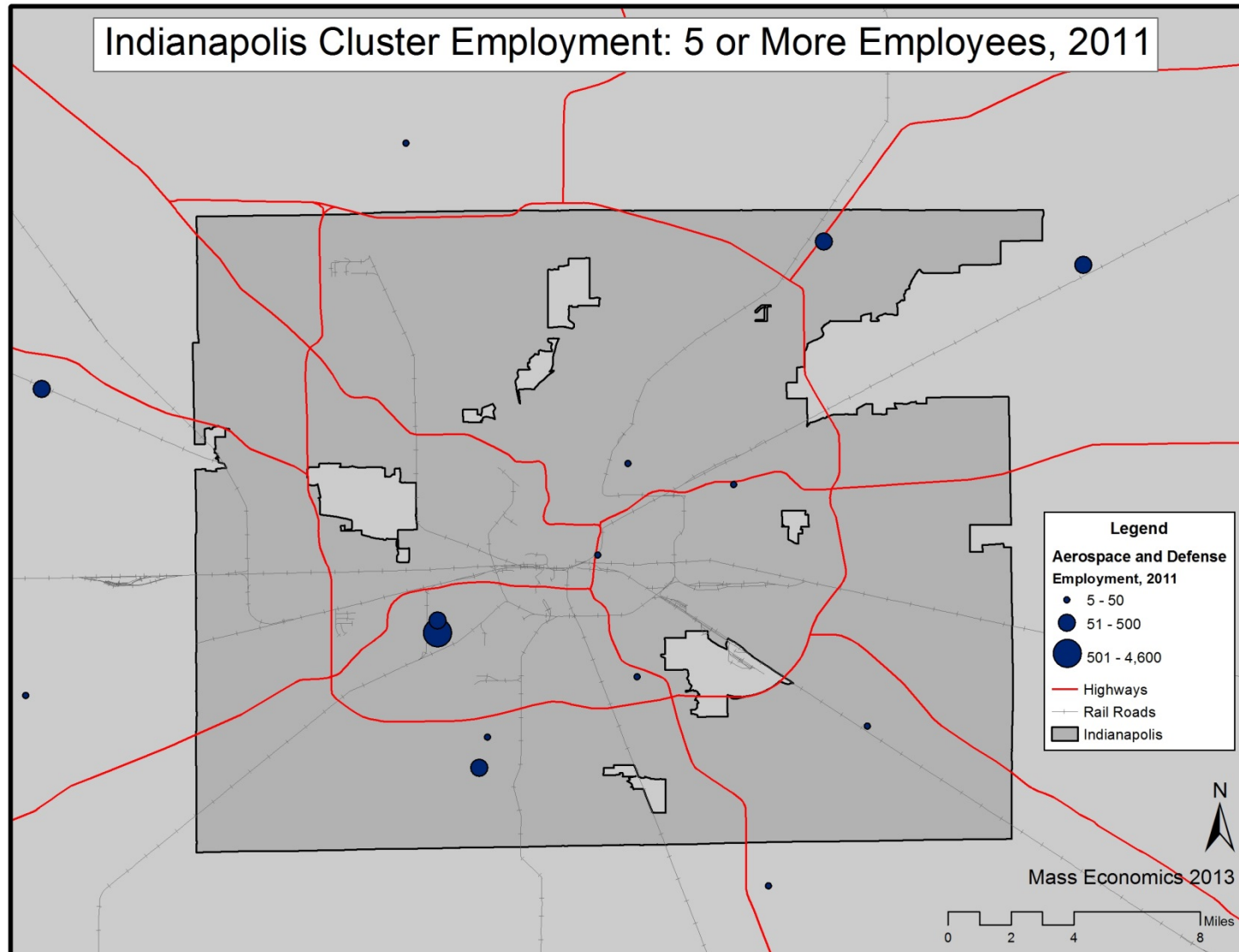
- Defense and Aerospace accounts for ~40% of Marion County's Advanced Manufacturing employment
- As a cluster, it would rank last among target clusters in job and output growth
- However, Defense and Aerospace is a strength in Marion County. It has the highest location quotient among target clusters (1.8) and 94% of region's employment in the cluster is in Marion County
- Wages rank highly among target clusters although job accessibility ranks fairly low
- Nearly $\frac{3}{4}$ of the cluster's employment is in Aircraft Engine and Engine Parts Manufacturing



Top Industries - Marion County (2012)



Cluster Highlights: Defense and Aerospace



Source: IBRC, National Establishment Time Series Data, Mass Economics Analysis

Cluster Highlights: Food Manufacturing and Distribution

Highlights

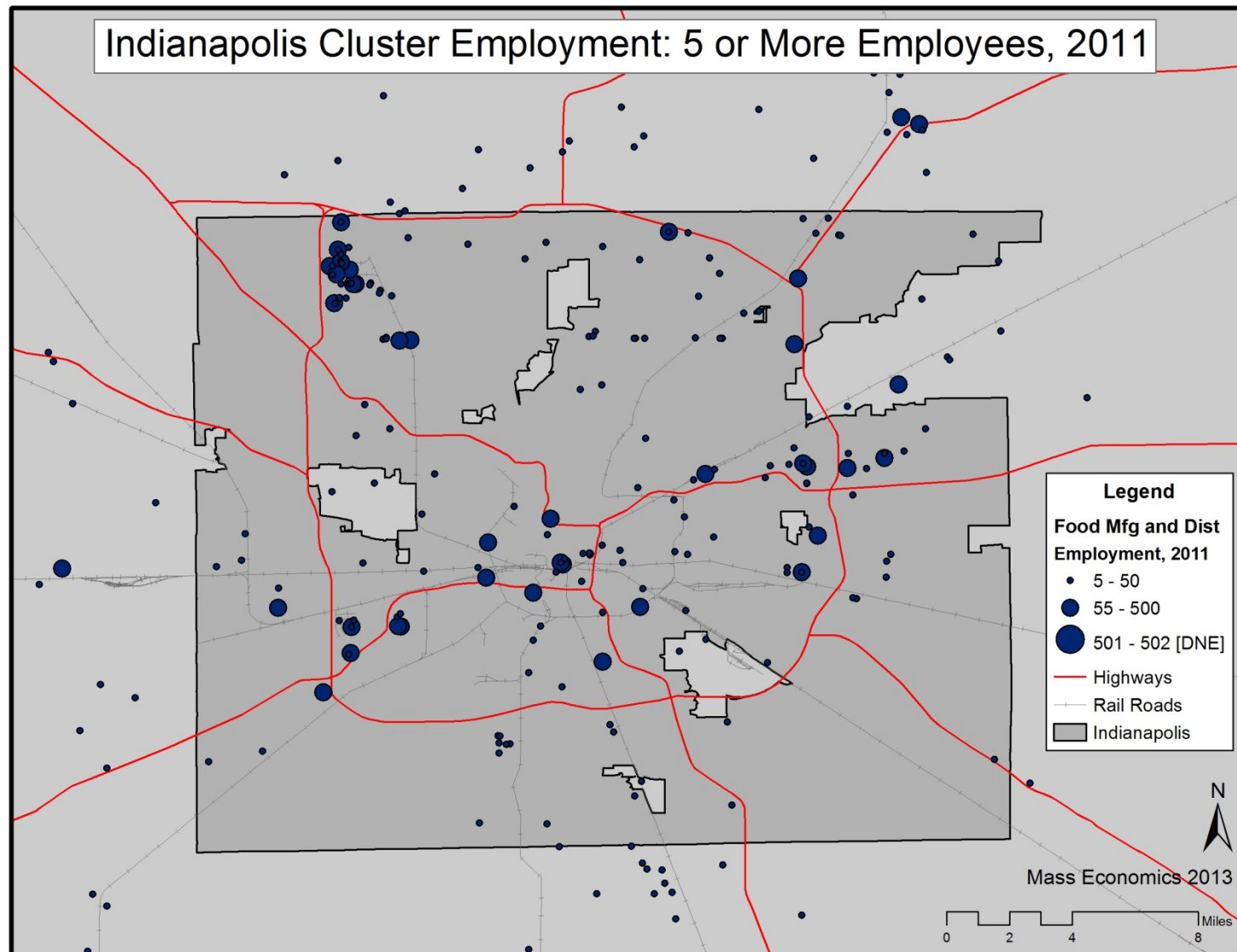
- Current trends support the growth of local/urban food manufacturing and distribution and are creating new opportunities and business models
- Provides opportunities for entrepreneurship and can have many other secondary benefits (e.g., health)
- Only 1K new jobs regionally over the next decade; however, efforts to develop local food clusters and support food entrepreneurship may spur further growth
- High percentage of cities have outperformed their respective regions over the past decade
- Food jobs are highly accessible, ranking 1st among target clusters, and pay fairly well



Top Sub-Clusters - Marion County (2012)



Cluster Highlights: Food Manufacturing and Distribution



Source: IBRC, National Establishment Time Series Data, Mass Economics Analysis

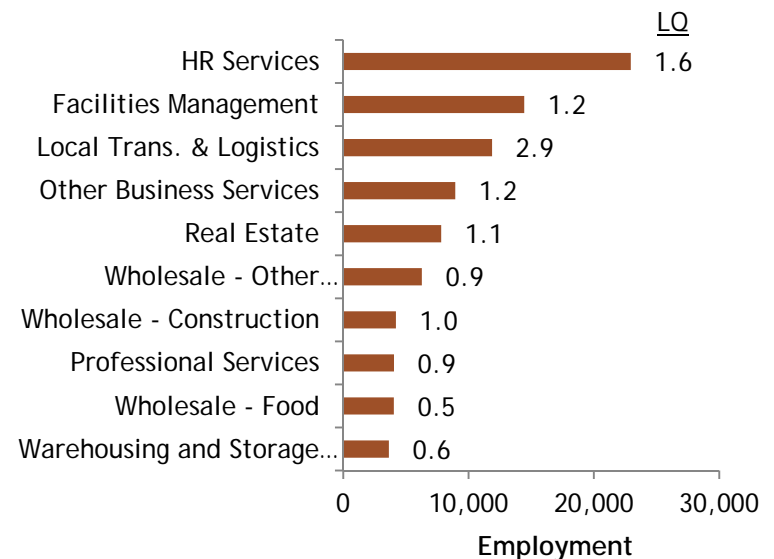
Cluster Highlights: Local B2B

Highlights

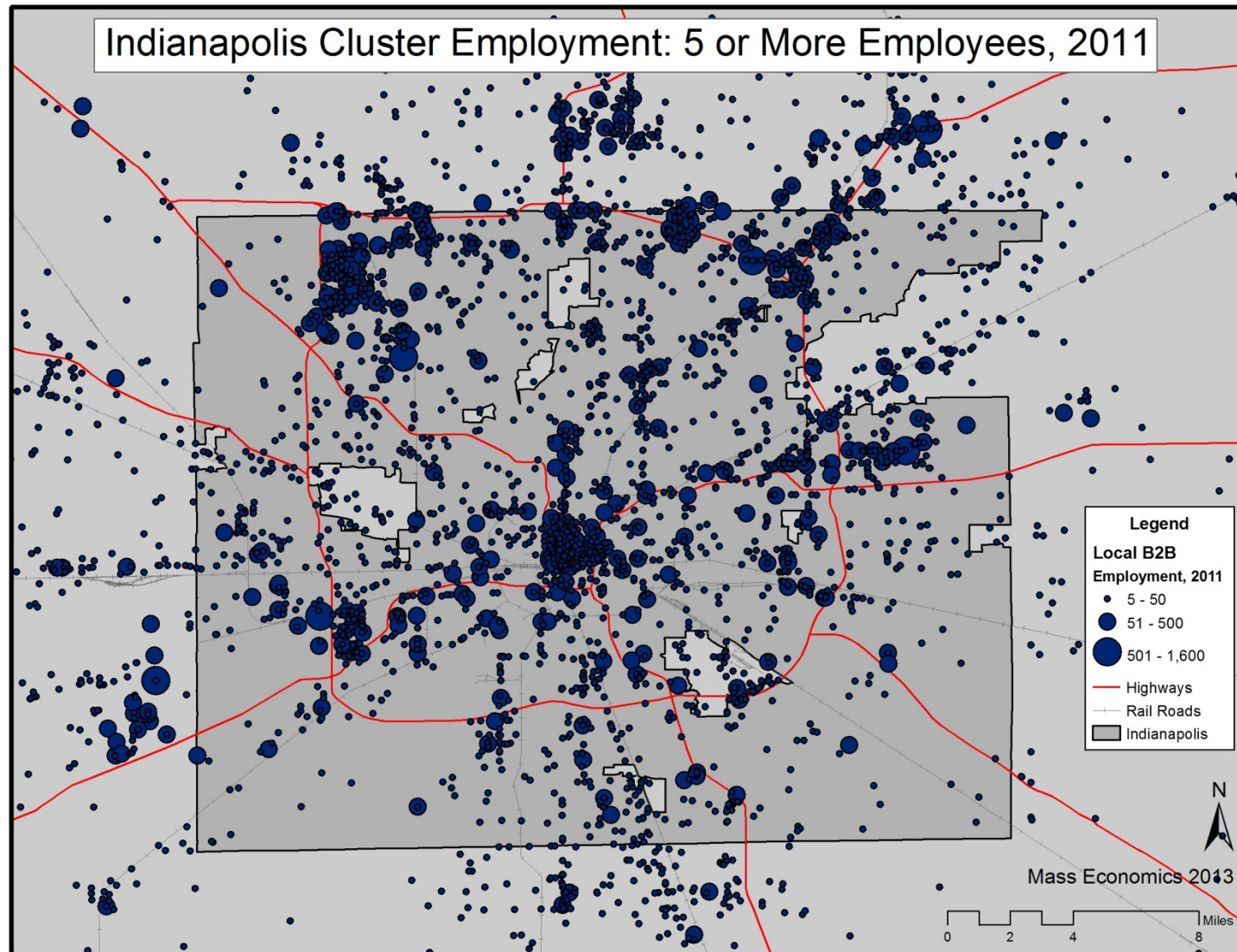
- Supports the overall business environment by providing goods and services to other businesses
- Provides opportunities for entrepreneurship and minority-owned businesses
- 21K new jobs regionally over the next decade, ranking it 1st among all clusters and nearly 6x the next largest cluster
- Two of every three Local B2B jobs in the region are located in Marion County
- Cluster wages are relatively low overall but certain sub-clusters (e.g., professional services, waste) offer fairly high wages
- High levels of job accessibility



Top Sub-Clusters - Marion County (2012)



Cluster Highlights: Local B2B



Source: IBRC, National Establishment Time Series Data, Mass Economics Analysis

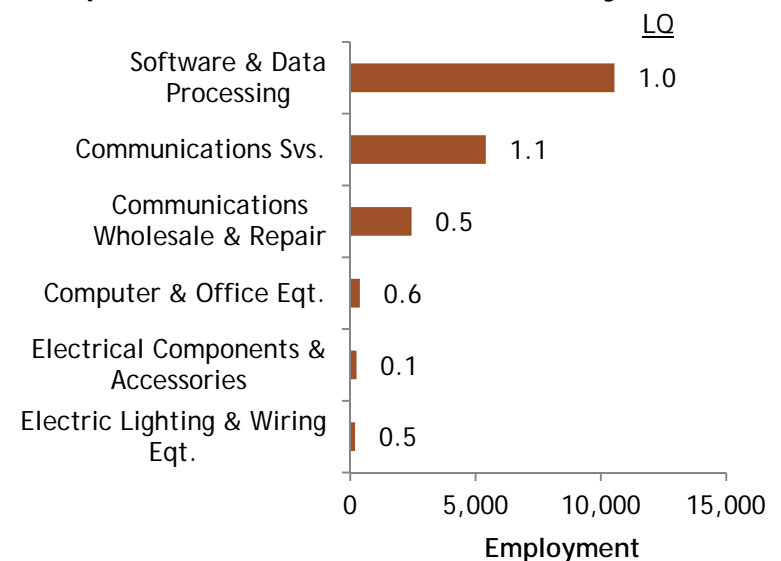
Cluster Highlights: Technology

Highlights

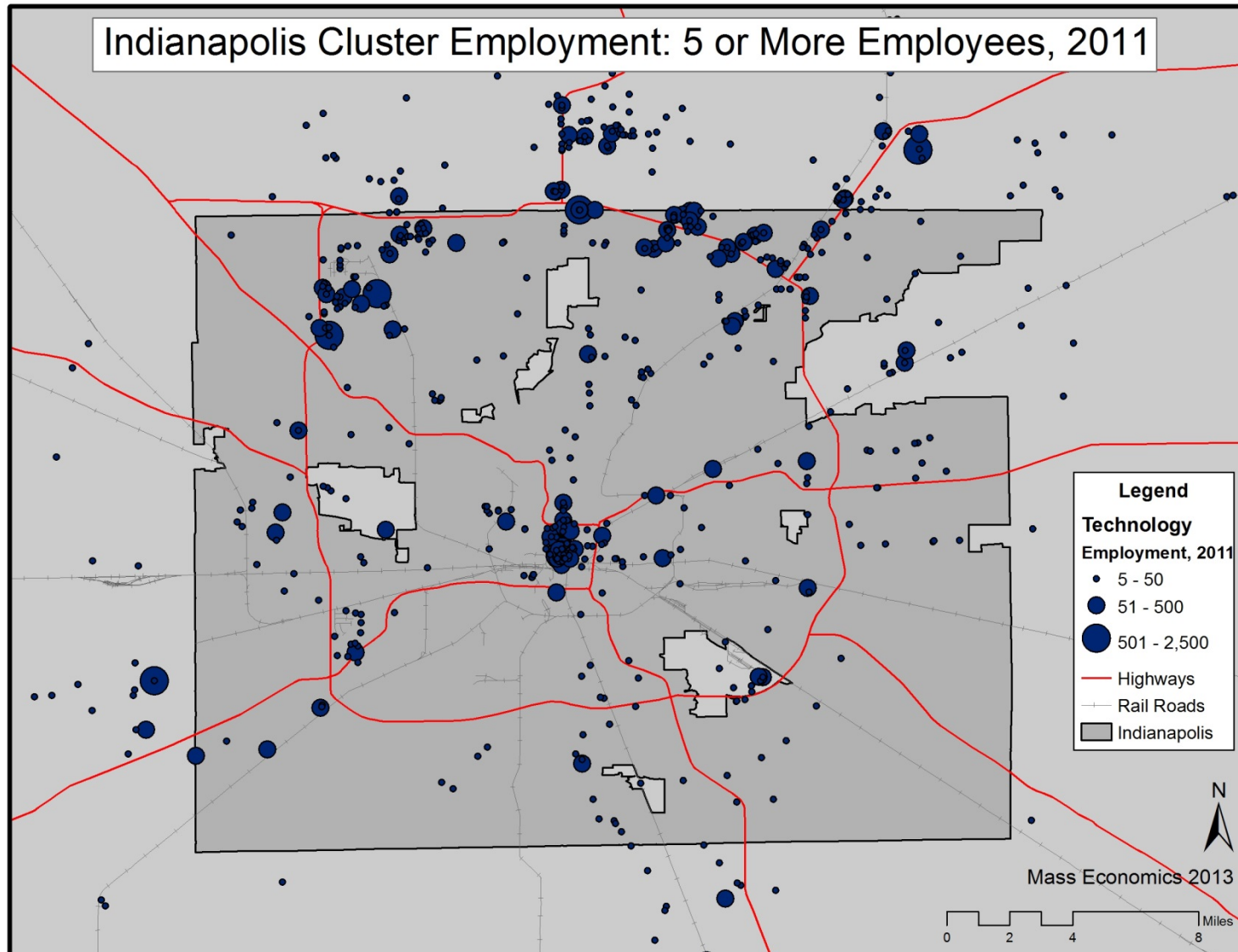
- 3.8K new jobs regionally over the next decade, ranking it 2nd among all clusters
- 51% projected growth in output per employee over the next decade, ranking it 1st among target clusters
- Relative share of Marion County's total employment is average but growing the fastest among target clusters
- Cluster in which cities are outperforming their regions to the greatest extent
- Average wages rank in the middle but accessibility is the lowest among target clusters



Top Sub-Clusters - Marion County (2012)



Cluster Highlights: Technology



Source: IBRC, National Establishment Time Series Data, Mass Economics Analysis

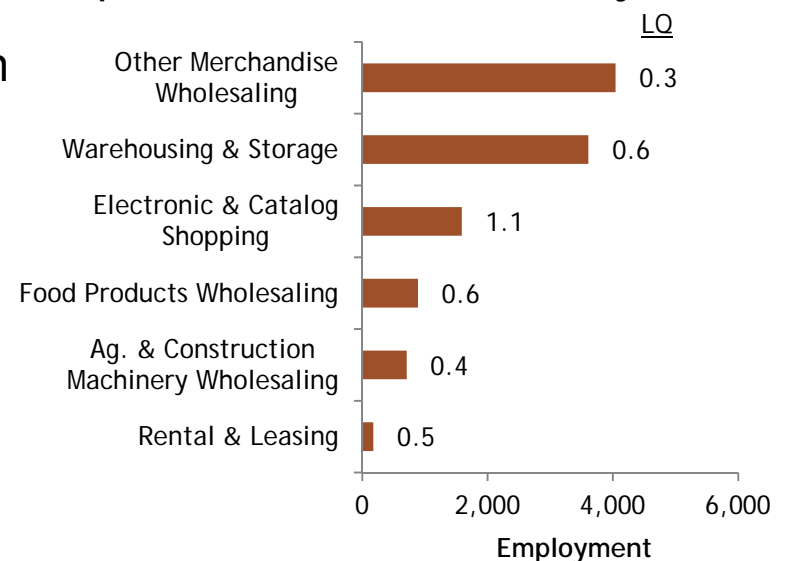
Cluster Highlights: TDL (Distrib. and Electronic Commerce)

Highlights

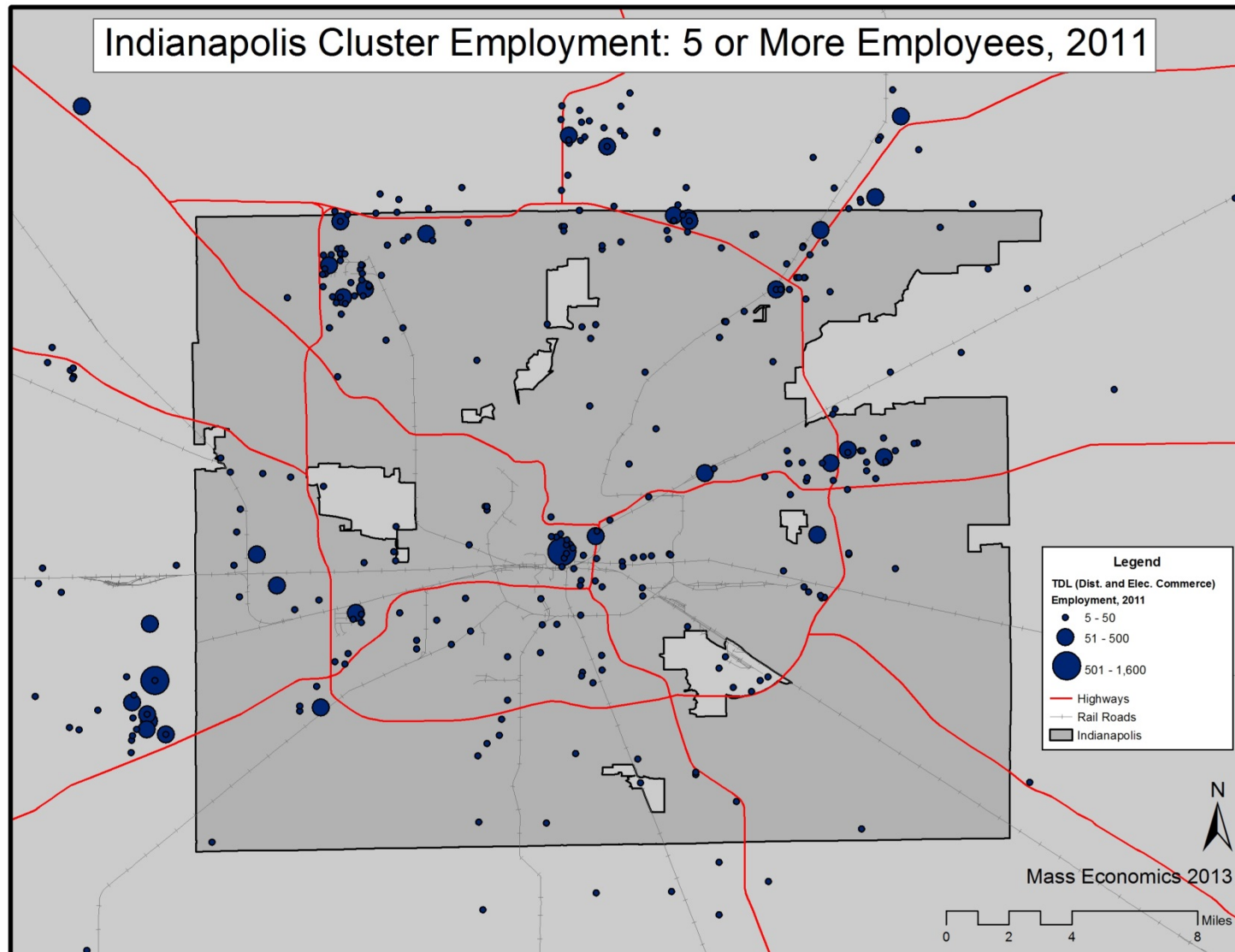
- Consists primarily of wholesalers that buy, hold in inventory, and/or distribute goods
- 3.6K new jobs regionally over the next decade, ranking it 3rd among target clusters
- 32% projected growth in output per employee over the next decade, which also ranks 3rd among target clusters
- Most regional activity is located outside of Marion County; the County has a strength in Electronic and Catalog Shopping but employment in this sub-cluster is down 22% since 2003
- Wages and accessibility are average compared to other target clusters; however, there is wide variation by sub-cluster with a number of industries that provide highly accessible, well-paying jobs



Top Sub-Clusters - Marion County (2012)



Cluster Highlights: TDL (Distrib. and Electronic Commerce)



Source: IBRC, National Establishment Time Series Data, Mass Economics Analysis

Cluster Prioritization: Considerations

- Selection of a Representative Sample
- Performance across Criteria (Cluster Growth, Urban Contribution, Job Quality, Job Access)
- Land Considerations
 - Highway access will be critical to certain clusters (e.g., TDL firms are likely to require clear access to highways)
 - Site/building quality will be important to firms in certain clusters (e.g., Biosciences, Defense and Aerospace)
 - For larger sites, it may be possible to attract a group of firms that may benefit from co-location (e.g., electrical contractors)
 - Zoning, labor availability, and other factors will also be important to many firms in making decisions on where to locate

Appendix: Rankings Data: Sources

Data	Metrics	Sources
Employment Data	Jobs, Projected Jobs, Job Growth, Location Quotient	<ul style="list-style-type: none"> - Indiana Business Research Center - Bureau of Labor Statistics - Quarterly Census of Employment and Wages - Bureau of Labor Statistics - Projections
Output Data	Output, Projected Output, Output Growth	<ul style="list-style-type: none"> - Bureau of Labor Statistics - Employment and Output by Industry
Wages	Average Wages, Average Wages by Educational Attainment	<ul style="list-style-type: none"> - Indiana Business Research Center - Bureau of Labor Statistics - Quarterly Census of Employment and Wages - U.S. Census - Quarterly Workforce Indicators
Education and Training	Education Requirements, On-the-Job Training	<ul style="list-style-type: none"> - Bureau of Labor Statistics - Education and Training Data
Firm Data	Firm Metrics (not shown here), Cluster Maps	<ul style="list-style-type: none"> - Indiana Business Research Center - National Establishment Time Series Data

Appendix: Rankings Data: Clusters

Cluster	Cluster Growth				
	US - Job Growth % (2003-12)	Region - Job Growth % (2012-22)- Proj.	Region - Job Growth Abs. (2012-22)- Proj.	Weighted Output Growth 2012-22	Output per Employee Growth (2012-22)
Advanced Manufacturing	-14%	-3%	(796)	32%	38%
Biosciences	4%	5%	1,332	41%	35%
Clean Energy	11%	15%	2,221	33%	19%
Technology	12%	13%	3,767	51%	45%
Local B2B	6%	13%	20,749	35%	21%
Motorsports	-19%	4%	626	29%	28%
TDL (Distribution and Electronic Commerce)	10%	13%	3,635	38%	28%
TDL (Transportation and Logistics)	-4%	5%	321	32%	40%
Food Manufacturing and Distribution	3%	6%	1,070	28%	24%
Defense and Aerospace	4%	-6%	(426)	21%	28%

Appendix: Rankings Data: Clusters (continued)

Cluster	Urban Contribution				
	County - LQ (2012)	County - LQ Growth (2003-12)	County - Number of Jobs (2012)	Ratio County-to-Region Jobs (2022)-Proj.	Percent of Cities Outperforming Region
Advanced Manufacturing	0.8	-25%	16,213	64%	39%
Biosciences	1.8	-17%	19,705	81%	44%
Clean Energy	0.6	0%	10,351	72%	43%
Technology	0.8	10%	19,330	67%	56%
Local B2B	1.0	1%	105,898	67%	42%
Motorsports	1.0	-24%	10,961	60%	33%
TDL (Distribution and Electronic Commerce)	0.4	-23%	11,380	42%	48%
TDL (Transportation and Logistics)	1.6	-19%	6,449	92%	41%
Food Manufacturing and Distribution	0.5	-5%	10,696	62%	53%
Defense and Aerospace	1.8	7%	6,237	94%	36%

Appendix: Rankings Data: Clusters (continued)

Cluster	Job Quality				Job Accessibility		
	Average Wage - US (2012)	Average Indy Region Wage =<HS (2012)	Average Indy Region Wage =<AD (2012)	County-to-US Wage Differential	Percent with Medium or Long-term On-the-Job Training (2012)	Percent Requiring =<HS Degree (2022)	Percent Requiring =<AD Degree (2022)
Advanced Manufacturing	\$ 67,860	\$ 69,737	\$ 81,271	\$ 17,577	47%	40%	70%
Biosciences	\$ 69,284	\$ 88,874	\$ 99,992	\$ 39,507	40%	35%	65%
Clean Energy	\$ 68,590	\$ 45,428	\$ 53,493	\$ (94)	25%	31%	61%
Technology	\$ 66,460	\$ 50,595	\$ 62,428	\$ 5,637	26%	28%	59%
Local B2B	\$ 39,450	\$ 32,013	\$ 39,141	\$ 2,960	25%	42%	72%
Motorsports	\$ 59,643	\$ 54,454	\$ 65,671	\$ 1,998	46%	43%	73%
TDL (Distribution and Electronic Commerce)	\$ 45,783	\$ 38,676	\$ 47,668	\$ 6,885	29%	41%	72%
TDL (Transportation and Logistics)	\$ 35,786	\$ 37,073	\$ 42,047	\$ 22,025	31%	37%	71%
Food Manufacturing and Distribution	\$ 45,214	\$ 40,555	\$ 46,871	\$ 4,976	35%	45%	75%
Defense and Aerospace	\$ 83,842	\$ 80,807	\$ 91,661	\$ 11,422	37%	35%	66%

Appendix: Sub-Cluster Selection: Rankings (Unweighted)

Top 30 Sub-Clusters

Sub-Cluster	Cluster	Cluster Growth - Rank	Urban Contribution - Rank	Job Quality - Weighted Average	Job Accessibility - Weighed Average	Overall Rank
Medical Devices & Equipment	BioScience	8	16	5	33	1
Wholesaling of Food Products	TDL (Distribution and Electronic Commerce)	5	9	52	19	2
Motor vehicles and equipment	Advanced Manufacturing	28	47	1	11	3
Software and data processing	Technology	2	3	14	68	3
Drugs & Pharmaceuticals	BioScience	23	4	4	59	5
Wholesale - Energy / Chemical	Local B2B	16	26	19	37	6
Agricultural Feedstock & Chemicals	BioScience	63	18	2	16	7
Waste	Local B2B	31	21	41	8	8
Wholesale - Food	Local B2B	3	23	48	28	9
Facilities Management	Local B2B	20	11	68	9	10
HR Services	Local B2B	9	7	67	27	11
Distribution-Food	Food	4	30	53	25	12
Equipment Dealers & Wholesalers	Clean Tech	13	35	22	43	13
Wholesale - Construction	Local B2B	27	23	21	42	13
Wholesale - Healthcare	Local B2B	18	26	12	58	15
Wholesale - Support	Local B2B	1	32	30	54	16
Rental and Leasing (TDL)	TDL (Distribution and Electronic Commerce)	18	37	31	31	16
Electrical components and accessories (AM)	Advanced Manufacturing	47	50	9	14	18
Warehousing and Storage (TDL)	TDL (Distribution and Electronic Commerce)	11	44	63	2	18
Wholesaling of Agricultural and Construction Machinery	TDL (Distribution and Electronic Commerce)	14	61	8	37	18
Wholesale - Other Industrial	Local B2B	10	42	22	47	21
Wholesaling of Other Merchandise	TDL (Distribution and Electronic Commerce)	6	49	14	52	21
Bioscience-Related Distribution	BioScience	17	40	10	56	23
Warehousing and Storage (B2B)	Local B2B	11	45	62	5	23
Engineering, Legal, Research & Consulting	Clean Tech	6	14	38	66	25
Local Transportation and Logistics	Local B2B	54	1	64	6	26
Manufacturing-Drink	Food	58	10	46	13	27
Rental and Leasing (B2B)	Local B2B	34	17	59	18	28
Team/Testing	Motorsports	46	38	13	31	28
Aircraft and spacecraft	Advanced Manufacturing	65	5	6	53	30

Source: IBRC, Census Bureau, Bureau of Labor Statistics, Mass Economics/RW Ventures Analysis

Appendix: Sub-Cluster Selection: Rankings (Weighted)

Top 30 Sub-Clusters

Sub-Cluster	Cluster	Cluster Growth - Rank	Urban Contribution - Rank	Job Quality - Weighted Average	Job Accessibility - Weighed Average	Overall Rank
Motor vehicles and equipment	Advanced Manufacturing	25	48	1	11	1
Medical Devices & Equipment	BioScience	16	31	5	33	1
Wholesaling of Food Products	TDL (Distribution and Electronic Commerce)	11	5	51	19	3
Drugs & Pharmaceuticals	BioScience	20	4	4	59	4
Software and data processing	Technology	1	7	17	68	5
Agricultural Feedstock & Chemicals	BioScience	65	13	3	16	6
Wholesale - Food	Local B2B	3	22	45	28	7
Wholesale - Energy / Chemical	Local B2B	18	26	19	37	8
Waste	Local B2B	26	29	41	8	9
Facilities Management	Local B2B	13	17	68	9	10
Wholesale - Support	Local B2B	2	23	30	54	11
Rental and Leasing (TDL)	TDL (Distribution and Electronic Commerce)	21	27	31	31	12
Equipment Dealers & Wholesalers	Clean Tech	14	32	23	43	13
Distribution-Food	Food	4	33	52	25	14
Electrical components and accessories (AM)	Advanced Manufacturing	44	49	8	14	15
Manufacturing-Drink	Food	54	6	42	13	15
HR Services	Local B2B	5	20	66	27	17
Soaps, cleaners, and other chemical products	Advanced Manufacturing	48	28	22	22	18
Rental and Leasing (B2B)	Local B2B	34	10	58	18	18
Wholesaling of Other Merchandise	TDL (Distribution and Electronic Commerce)	9	44	15	52	18
Wholesaling of Agricultural and Construction Machinery	TDL (Distribution and Electronic Commerce)	15	60	9	37	21
Renewable Power Generation	Clean Tech	51	1	25	45	22
Team/Testing	Motorsports	39	41	11	31	22
Industrial Chemicals	Advanced Manufacturing	57	24	2	40	24
Wholesale - Healthcare	Local B2B	19	34	12	58	24
Warehousing and Storage (TDL)	TDL (Distribution and Electronic Commerce)	8	50	63	2	24
Wholesale - Other Industrial	Local B2B	10	42	25	47	27
Local Transportation and Logistics	Local B2B	53	2	64	6	28
Warehousing and Storage (B2B)	Local B2B	7	51	62	5	28
Wholesale - Construction	Local B2B	32	29	24	42	30

Source: IBRC, Census Bureau, Bureau of Labor Statistics, Mass Economics/RW Ventures Analysis

Appendix: Rankings Data: Sub-Clusters

Top 30 Sub-Clusters (In Weighted and Unweighted Rankings)

Sub-Cluster	Cluster	Cluster Growth				
		US - Job Growth % (2003-12)	Region - Job Growth % (2012-22)- Proj.	Region - Job Growth Abs. (2012-22)- Proj.	Weighted Output Growth 2012-22	Output per Employee Growth (2012-22)
Aircraft and spacecraft	Advanced Manufacturing	4%	-6%	(426)	21%	28%
Electrical components and accessories (AM)	Advanced Manufacturing	-24%	-4%	(30)	35%	39%
Industrial Chemicals	Advanced Manufacturing	-8%	-12%	(54)	25%	42%
Motor vehicles and equipment	Advanced Manufacturing	-30%	6%	426	42%	34%
Soaps, cleaners, and other chemical products	Advanced Manufacturing	-13%	-12%	(95)	39%	59%
Agricultural Feedstock & Chemicals	BioScience	-4%	-14%	(263)	22%	40%
Bioscience-Related Distribution	BioScience	-1%	1%	39	43%	32%
Drugs & Pharmaceuticals	BioScience	-8%	5%	470	41%	35%
Medical Devices & Equipment	BioScience	10%	0%	(17)	47%	48%
Engineering, Legal, Research & Consulting	Clean Tech	28%	22%	2,200	38%	13%
Equipment Dealers & Wholesalers	Clean Tech	-1%	11%	148	43%	32%
Renewable Power Generation	Clean Tech	-42%	-12%	(0)	27%	44%
Distribution-Food	Food	10%	19%	1,306	42%	31%
Manufacturing-Drink	Food	5%	-1%	(20)	9%	10%
Facilities Management	Local B2B	14%	15%	2,906	32%	15%
HR Services	Local B2B	16%	26%	8,669	39%	10%
Local Transportation and Logistics	Local B2B	4%	-1%	(90)	30%	21%
Rental and Leasing (B2B)	Local B2B	-6%	14%	224	38%	22%
Warehousing and Storage (B2B)	Local B2B	29%	17%	1,827	33%	24%
Waste	Local B2B	16%	24%	661	21%	-1%
Wholesale - Construction	Local B2B	-5%	1%	33	43%	32%
Wholesale - Energy / Chemical	Local B2B	-7%	11%	156	43%	32%
Wholesale - Food	Local B2B	9%	20%	1,163	43%	32%
Wholesale - Healthcare	Local B2B	-3%	4%	140	43%	32%
Wholesale - Other Industrial	Local B2B	-1%	7%	632	43%	32%
Wholesale - Support	Local B2B	32%	29%	842	43%	32%
Team/Testing	Motorsports	-19%	4%	626	29%	28%
Rental and Leasing (TDL)	TDL (Distribution and Electronic Commerce)	14%	26%	68	41%	11%
Warehousing and Storage (TDL)	TDL (Distribution and Electronic Commerce)	30%	17%	1,787	33%	24%
Wholesaling of Agricultural and Construction Machinery	TDL (Distribution and Electronic Commerce)	1%	10%	136	43%	32%
Wholesaling of Food Products	TDL (Distribution and Electronic Commerce)	11%	11%	103	43%	32%
Wholesaling of Other Merchandise	TDL (Distribution and Electronic Commerce)	9%	9%	667	43%	32%
Software and data processing	Technology	33%	32%	4,707	60%	26%

Source: IBRC, Census Bureau, Bureau of Labor Statistics, Mass Economics/RW Ventures Analysis

Appendix: Rankings Data: Sub-Clusters (continued)

Top 30 Sub-Clusters (In Weighted and Unweighted Rankings)

Sub-Cluster	Cluster	Urban Contribution				
		County - LQ (2012)	County - LQ Growth (2003-12)	County - Number of Jobs (2012)	Ratio County-to-Region Jobs (2022)-Proj.	Percent of Cities Outperforming Region
Aircraft and spacecraft	Advanced Manufacturing	1.8	7%	6,237	94%	36%
Electrical components and accessories (AM)	Advanced Manufacturing	0.8	-31%	409	49%	48%
Industrial Chemicals	Advanced Manufacturing	0.6	-4%	408	89%	40%
Motor vehicles and equipment	Advanced Manufacturing	0.6	-55%	3,036	42%	55%
Soaps, cleaners, and other chemical products	Advanced Manufacturing	0.8	7%	704	90%	25%
Agricultural Feedstock & Chemicals	BioScience	3.2	-13%	1,739	89%	40%
Bioscience-Related Distribution	BioScience	0.4	23%	1,964	55%	41%
Drugs & Pharmaceuticals	BioScience	8.3	-23%	9,600	98%	50%
Medical Devices & Equipment	BioScience	2.4	2%	3,450	67%	38%
Engineering, Legal, Research & Consulting	Clean Tech	0.8	3%	7,109	73%	41%
Equipment Dealers & Wholesalers	Clean Tech	0.9	4%	1,075	80%	25%
Renewable Power Generation	Clean Tech	0.0	N/A	2	200%	86%
Distribution-Food	Food	0.4	-11%	4,390	65%	57%
Manufacturing-Drink	Food	2.1	-8%	1,646	93%	57%
Facilities Management	Local B2B	1.2	8%	14,449	72%	36%
HR Services	Local B2B	1.6	22%	22,944	68%	37%
Local Transportation and Logistics	Local B2B	2.9	13%	11,873	87%	52%
Rental and Leasing (B2B)	Local B2B	1.8	-13%	1,360	85%	50%
Warehousing and Storage (B2B)	Local B2B	0.6	-27%	3,648	33%	50%
Waste	Local B2B	0.8	-1%	1,704	61%	67%
Wholesale - Construction	Local B2B	1.0	-2%	4,206	78%	26%
Wholesale - Energy / Chemical	Local B2B	1.1	6%	1,135	80%	28%
Wholesale - Food	Local B2B	0.5	-9%	4,032	69%	59%
Wholesale - Healthcare	Local B2B	0.5	30%	2,151	66%	42%
Wholesale - Other Industrial	Local B2B	0.9	-22%	6,273	66%	16%
Wholesale - Support	Local B2B	0.3	-3%	2,078	71%	63%
Team/Testing	Motorsports	1.0	-24%	10,961	60%	33%
Rental and Leasing (TDL)	TDL (Distribution and Electronic Commerce)	0.5	-4%	178	69%	75%
Warehousing and Storage (TDL)	TDL (Distribution and Electronic Commerce)	0.6	-28%	3,609	34%	50%
Wholesaling of Agricultural and Construction Machinery	TDL (Distribution and Electronic Commerce)	0.4	-10%	710	51%	0%
Wholesaling of Food Products	TDL (Distribution and Electronic Commerce)	0.6	58%	890	96%	63%
Wholesaling of Other Merchandise	TDL (Distribution and Electronic Commerce)	0.3	-36%	4,043	56%	48%
Software and data processing	Technology	1.0	30%	10,541	71%	72%

Source: IBRC, Census Bureau, Bureau of Labor Statistics, Mass Economics/RW Ventures Analysis

Appendix: Rankings Data: Sub-Clusters (continued)

Top 30 Sub-Clusters (In Weighted and Unweighted Rankings)

Sub-Cluster	Cluster	Job Quality					Job Accessibility		
		Average Wage - US (2012)	Average Indy Region Wage =<HS (2012)	Average Indy Region Wage =<AD (2012)	County-to-US Wage Differential	Percent with Medium or Long-term On-the-Job Training (2012)	Percent Requiring =<HS Degree (2022)	Percent Requiring =<AD Degree (2022)	
Aircraft and spacecraft	Advanced Manufacturing	\$ 83,842	\$ 80,807	\$ 91,661	\$ 11,422	37%	35%	66%	
Electrical components and accessories (AM)	Advanced Manufacturing	\$ 39,020	\$ 68,142	\$ 84,333	\$ 16,662	48%	46%	75%	
Industrial Chemicals	Advanced Manufacturing	\$ 78,322	\$ 72,267	\$ 88,645	\$ 13,769	57%	40%	71%	
Motor vehicles and equipment	Advanced Manufacturing	\$ 57,458	\$ 79,874	\$ 95,863	\$ 45,816	64%	46%	76%	
Soaps, cleaners, and other chemical products	Advanced Manufacturing	\$ 65,478	\$ 45,633	\$ 57,127	\$ (10,810)	56%	44%	73%	
Agricultural Feedstock & Chemicals	BioScience	\$ 71,579	\$ 75,587	\$ 85,143	\$ 25,195	54%	45%	75%	
Bioscience-Related Distribution	BioScience	\$ 65,706	\$ 47,433	\$ 65,331	\$ 19,521	38%	34%	65%	
Drugs & Pharmaceuticals	BioScience	\$ 66,581	\$ 137,889	\$ 143,432	\$ 70,495	41%	35%	63%	
Medical Devices & Equipment	BioScience	\$ 76,979	\$ 58,237	\$ 78,527	\$ 15,994	57%	41%	73%	
Engineering, Legal, Research & Consulting	Clean Tech	\$ 59,974	\$ 45,674	\$ 54,898	\$ 9,248	17%	28%	58%	
Equipment Dealers & Wholesalers	Clean Tech	\$ 62,248	\$ 47,613	\$ 56,172	\$ 630	43%	39%	71%	
Renewable Power Generation	Clean Tech	\$ 105,295	\$ 81,471	\$ 93,156	\$ (105,295)	0%	37%	71%	
Distribution-Food	Food	\$ 49,676	\$ 39,040	\$ 46,488	\$ 418	26%	44%	73%	
Manufacturing-Drink	Food	\$ 52,033	\$ 39,918	\$ 43,684	\$ (8,360)	40%	46%	76%	
Facilities Management	Local B2B	\$ 22,698	\$ 20,911	\$ 23,011	\$ 1,155	12%	47%	77%	
HR Services	Local B2B	\$ 25,330	\$ 18,874	\$ 23,251	\$ 2,049	22%	43%	73%	
Local Transportation and Logistics	Local B2B	\$ 21,503	\$ 25,111	\$ 31,201	\$ 10,816	17%	48%	78%	
Rental and Leasing (B2B)	Local B2B	\$ 48,927	\$ 32,987	\$ 41,439	\$ (2,731)	22%	44%	75%	
Warehousing and Storage (B2B)	Local B2B	\$ 29,475	\$ 30,615	\$ 33,808	\$ 7,785	11%	49%	78%	
Waste	Local B2B	\$ 33,952	\$ 41,402	\$ 46,920	\$ 22,444	28%	48%	77%	
Wholesale - Construction	Local B2B	\$ 53,159	\$ 46,634	\$ 57,148	\$ 9,130	42%	39%	71%	
Wholesale - Energy / Chemical	Local B2B	\$ 58,290	\$ 51,280	\$ 63,681	\$ 3,781	35%	41%	72%	
Wholesale - Food	Local B2B	\$ 52,469	\$ 40,387	\$ 48,516	\$ (2,677)	28%	43%	73%	
Wholesale - Healthcare	Local B2B	\$ 76,187	\$ 48,610	\$ 66,893	\$ 6,444	39%	33%	65%	
Wholesale - Other Industrial	Local B2B	\$ 46,441	\$ 45,633	\$ 57,034	\$ 12,757	45%	38%	70%	
Wholesale - Support	Local B2B	\$ 29,613	\$ 42,840	\$ 53,934	\$ 23,922	50%	35%	66%	
Team/Testing	Motorsports	\$ 59,643	\$ 54,454	\$ 65,671	\$ 1,998	46%	43%	73%	
Rental and Leasing (TDL)	TDL (Distribution and Electronic Commerce)	\$ 73,553	\$ 47,196	\$ 55,121	\$ (5,980)	38%	41%	73%	
Warehousing and Storage (TDL)	TDL (Distribution and Electronic Commerce)	\$ 29,074	\$ 30,615	\$ 33,808	\$ 8,104	11%	49%	78%	
Wholesaling of Agricultural and Construction Machinery	TDL (Distribution and Electronic Commerce)	\$ 57,424	\$ 49,434	\$ 59,992	\$ 17,868	55%	40%	72%	
Wholesaling of Food Products	TDL (Distribution and Electronic Commerce)	\$ 45,493	\$ 38,349	\$ 47,539	\$ 1,648	25%	45%	74%	
Wholesaling of Other Merchandise	TDL (Distribution and Electronic Commerce)	\$ 48,520	\$ 46,068	\$ 60,704	\$ 21,540	45%	35%	66%	
Software and data processing	Technology	\$ 72,659	\$ 57,558	\$ 67,958	\$ 9,746	18%	25%	54%	