

3-2020

## **Good Jobs: Employment and Wages in Groups of Regional Industrial Drivers**

Iryna Lendel  
*Cleveland State University, [i.lendel@csuohio.edu](mailto:i.lendel@csuohio.edu)*

Merissa Piazza  
*Cleveland State University, [m.c.piazza83@csuohio.edu](mailto:m.c.piazza83@csuohio.edu)*

Iryna Demko  
*Cleveland State University, [i.demko@csuohio.edu](mailto:i.demko@csuohio.edu)*

Matthew Ellerbrock  
*Cleveland State University, [m.ellerbrock@csuohio.edu](mailto:m.ellerbrock@csuohio.edu)*

Emily Forsee

Follow this and additional works at: [https://engagedscholarship.csuohio.edu/urban\\_facpub](https://engagedscholarship.csuohio.edu/urban_facpub)



Part of the [Urban Studies and Planning Commons](#)

**How does access to this work benefit you? Let us know!**

---

### **Repository Citation**

Lendel, Iryna; Piazza, Merissa; Demko, Iryna; Ellerbrock, Matthew; and Forsee, Emily, "Good Jobs: Employment and Wages in Groups of Regional Industrial Drivers" (2020). *All Maxine Goodman Levin School of Urban Affairs Publications*. 0 1 2 3 1669.

[https://engagedscholarship.csuohio.edu/urban\\_facpub/1669](https://engagedscholarship.csuohio.edu/urban_facpub/1669)

This Report is brought to you for free and open access by the Maxine Goodman Levin School of Urban Affairs at EngagedScholarship@CSU. It has been accepted for inclusion in All Maxine Goodman Levin School of Urban Affairs Publications by an authorized administrator of EngagedScholarship@CSU. For more information, please contact [library.es@csuohio.edu](mailto:library.es@csuohio.edu).



**Levin.**  
PUBLIC SERVICE. LEADERSHIP. CHANGE.

Prepared for:  
**THE GEORGE GUND FOUNDATION**

Prepared by:  
*Research Team Led by*

**Iryna V. Lendel, Ph.D.**

March 2020

***GOOD JOBS:***  
**EMPLOYMENT AND**  
**WAGES IN GROUPS OF**  
**REGIONAL INDUSTRY**  
**DRIVERS (GRIDS)**

**CENTER FOR**  
**ECONOMIC**  
**DEVELOPMENT**

1717 Euclid Avenue Cleveland, Ohio 44115  
[levin.urban.csuohio.edu/ced](http://levin.urban.csuohio.edu/ced)

This page left intentionally blank

### About the Study Team

**Iryna V. Lendel, Ph.D.**, is the Director of the Center for Economic Development and a Research Associate Professor at the Maxine Goodman Levin College of Urban Affairs at Cleveland State University. Dr. Lendel was the principal investigator for this project. She is an economist with vast experience conducting academic and applied economic research analyzing regional and urban economic development. Her research portfolio includes projects on industry analyses, regional clusters, multiple economic impact studies, as well as state and regional science and innovation policies. She serves in an advisory capacity in national and state economic development organizations and is an assistant editor of *Economic Development Quarterly*.

**Merissa C. Piazza, Ph.D.**, is a Program Manager at the Center for Economic Development and specializes in economic development, survey research, and metrics and indicators. Dr. Piazza is an economist with extensive experience conducting applied research and academic studies. Her research portfolio includes projects analyzing entrepreneurship, high-growth firms, the adoption of technologies in industries, and the navigation of industry workforce development issues.

**Iryna Demko, Ph.D.**, is a Research Associate at the Center for Economic Development. Dr. Demko holds her Ph.D. degree in Agricultural, Environmental, and Resource Economics from Penn State University. She has co-authored several reports at the Center on agriculture, economic impact, workforce development, economic development, and industry analysis. She is an expert on food systems, organic agriculture, and economic impact analysis.

**Matthew B. Ellerbrock** is a Research Assistant at the Center for Economic Development. He has contributed to several studies at the Center involving economic impact analyses as well as economic development and workforce development in Northeast Ohio. Matt is completing a Master of Arts in Environmental Studies from Cleveland State University's Levin College of Urban Affairs and holds an Urban Geographic Information Systems (GIS) Certificate from the College. His expertise is in descriptive and impact analysis.

**Emily Forsee** is a Graduate Research Assistant for the Center for Economic Development. Her role in this project was to help write, edit, and create visual elements. Emily is a Master of Public Administration student at the Maxine Levin College of Urban Affairs at Cleveland State University with a focus on Public Policy. Her research has centered on issues of poverty, including policy analysis of government support programs such as SNAP and Medicaid, quantitative research of eviction law, and extends to functions of government such as campaign finance and assessment measures.

### Acknowledgments

This research was supported by the George Gund Foundation and the U.S. Department of Commerce Economic Development Administration (EDA).

This page left intentionally blank

## TABLE OF CONTENTS

Introduction .....	1
Grids Generating Good Jobs .....	1
GRIDs Employment and Supply Chain .....	4
GRID Workforce Needs .....	6
Global Economic Forces .....	8
Economy .....	8
Coronavirus .....	8
Automation .....	10
Conclusion .....	11
Appendix .....	12

## LIST OF TABLES & FIGURES

Figure 1. All NEO GRIDs - Average Wage, 2017 .....	2
Figure 2. Top 20 Industries Gaining Employment in NEO.....	4
Table 1. Northeast Ohio Job Postings related to GRID .....	7
Table A1. Top 20 Industries Gaining Employment in the Cleveland MSA .....	12
Table A2. Top 20 Industries Gaining Employment in the Akron MSA .....	13
Table A3. Top 20 Industries Gaining Employment in the Canton MSA .....	14
Table A4. Top 20 Industries Gaining Employment in the Youngstown MSA.....	15
Table A5. All Cleveland MSA GRID - Average Wage, 2017 .....	16
Table A6. All Akron MSA GRID – Average Wage, 2017 .....	17
Table A7. All Canton MSA GRID - Average Wage, 2017.....	18
Table A8. All Youngstown MSA GRID - Average Wage, 2017 .....	18

## INTRODUCTION

Talent attraction and workforce development are urgent topics in Northeast Ohio, as many companies are finding it challenging to locate and attract necessary workers for open jobs. This dilemma spans across sectors: from the manufacturing industry finding appropriately skilled labor to professional services finding experienced IT staff. This research analyzes employment dynamics among Northeast Ohio (NEO) industries, so policymakers and economic development practitioners can utilize our findings and design programs to improve the economic conditions in the region.

This report builds on The Center for Economic Development's prior work, which identified NEO's Groups of Regional Industry Drivers (GRIDs). These sectors are industries with strong productivity, growing output, high regional specialization, and local competitive advantage. GRID industries connect via supply chains; thus, GRIDs identification focuses on classifying industries that contribute the most to wealth creation.<sup>1</sup> The following report discusses the jobs that are created by GRIDs and their supply chain industries to put forward a relevant discussion on these industries' futures.

## GRIDS GENERATING GOOD JOBS

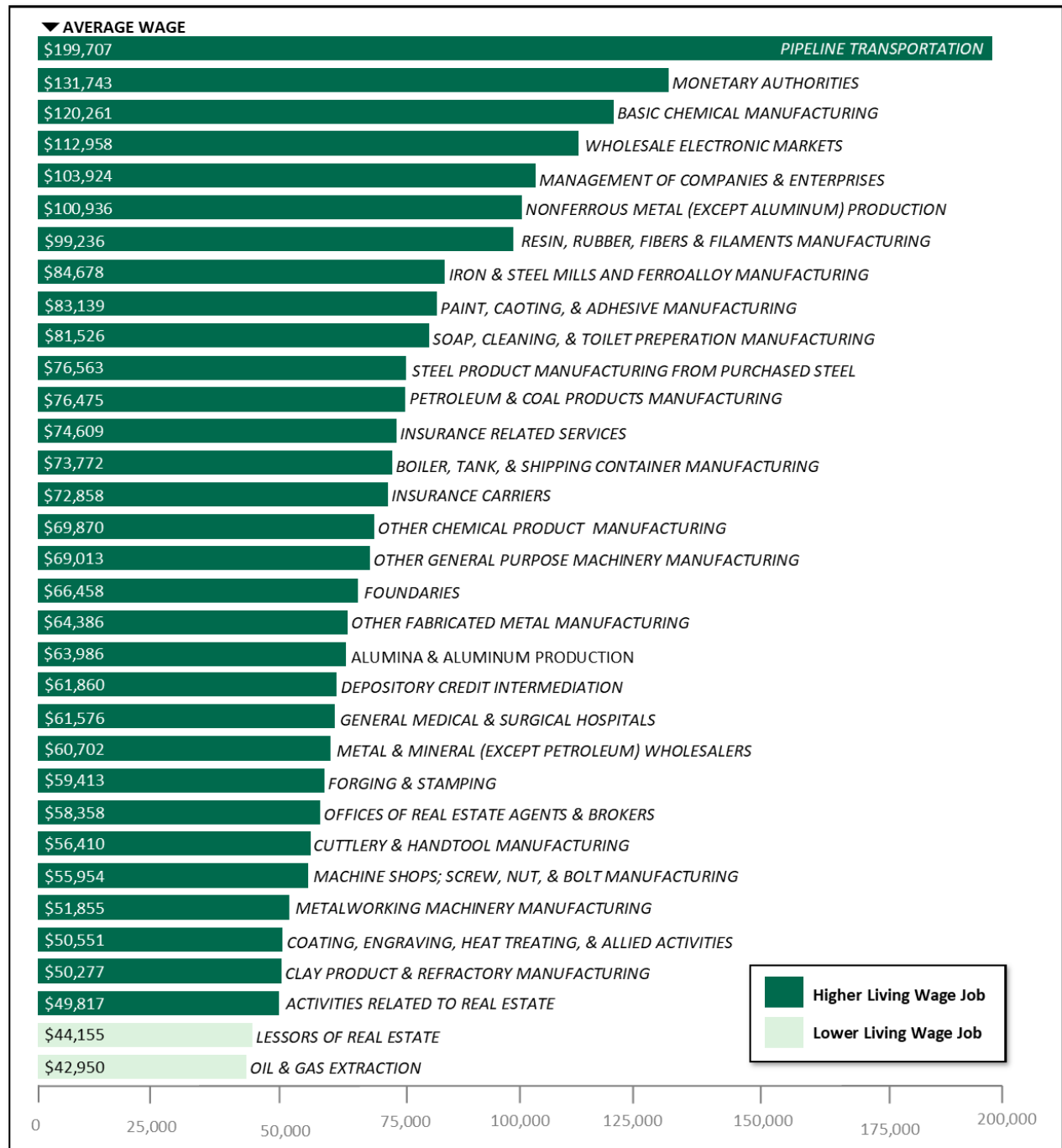
GRIDs are critical economic drivers for NEO's economy: they grow rapidly, are highly productive, and contribute significantly through regional supply chains. However, the question posed in this report is, "do they provide *good jobs*?" It is essential for the prosperity of NEO that these industries not only generate jobs themselves, but they pay high-enough wages to support families and generate healthy consumer spending that further drives regional growth. Some industries intrinsically employ higher-skilled workers who (based on market forces) earn more money. While not everyone can make a six-figure income, to have an equitable and growing economy, industries must pay a living wage to meet the "good job" standard. Many industries generate stable jobs, but GRIDs wealth-creating capabilities set them apart. In addition to generating significant output, most of these industries pay higher wages than both the regional living and median wages, demonstrating their capacity to create good jobs.<sup>2</sup> Figure 1 displays regionally specialized industries and their average annual wages compared to NEO's living wage.

---

<sup>1</sup> For more information see Lendel, I., Piazza, M., & Demko, I. (2018). Northeast Ohio Front Runners: Groups of Regional Industry Drivers (GRID). *Urban Publications*. Retrieved from [https://engagedscholarship.csuohio.edu/urban\\_facpub/1585](https://engagedscholarship.csuohio.edu/urban_facpub/1585)

<sup>2</sup> For more information see Lendel, I., Piazza, M., & Demko, I. (2018). Northeast Ohio Front Runners: Groups of Regional Industry Drivers (GRID). *Urban Publications*. Retrieved from [https://engagedscholarship.csuohio.edu/urban\\_facpub/1585](https://engagedscholarship.csuohio.edu/urban_facpub/1585)

**Figure 1. All NEO GRIDs - Average Wage, 2017**



Source: Moody's Analytics, Center for Economic Development



## NEO Wages:

- In total, there are thirty-three GRIDs in NEO, with thirty-one paying higher wages than NEO's living wage of \$49,663 for a family of three.
- Of the thirty-one, twenty are in the *Growing Legacy Manufacturing* GRID.
- The highest-paid workers are in *Basic Chemicals Manufacturing*, which pays \$120,216, or four and a half times higher than NEO's living wage.
- Six additional industries pay, on average, more than twice the regional living wage.
- Only two GRID industries had an average annual wage less than the region's living wage: *Lessors of Real Estate* (\$44,155) and *Oil and Gas Extraction* (\$42,950). The top twenty job-growing industries in the Cleveland Metropolitan Statistical Area (MSA)<sup>3</sup> added nearly 32,000 jobs to the region's economy over five years (See Appendix Table A1).
- Four GRID industries accounted for a quarter of the added jobs:
  - *Agencies, Brokerages, and Other Insurance Related Activities* (2,840 jobs),
  - *General Medical and Surgical Hospitals* (2,780 jobs),
  - *Wholesale Electronic Markets and Agents and Brokers* (1,390 jobs), and
  - *Management of Companies and Enterprises* (1,000 jobs).
- GRID industries in the Cleveland MSA paid higher wages than the average wage in the group.

## Regional Wages:

- Ultimately, the top twenty job-growing industries in the Cleveland, Akron, Canton, and Youngstown economies accounted for sizable employment (Tables A2-A4, respectively).
- In the Akron MSA, four GRID industries (*General Medical and Surgical Hospitals*, *Insurance Carriers*, *Management of Companies and Enterprises*, and *Agencies, Brokerages, and Other Insurance-Related Activities*) paid a higher than the living wage in this region.
- *General Medical and Surgical Hospitals* also recorded the largest employment growth in the Akron MSA (1,460 jobs) with an annual wage above the regional living wage of \$58,333 (Table A6).
- Except for the *Petroleum and Coal Products Manufacturing* industry in the Canton MSA, the job-growing industries in the Canton and Youngstown MSAs lacked GRID industries and, on average, paid wages lower than their region's living wage employment (See Appendix Tables A7 and A8).

---

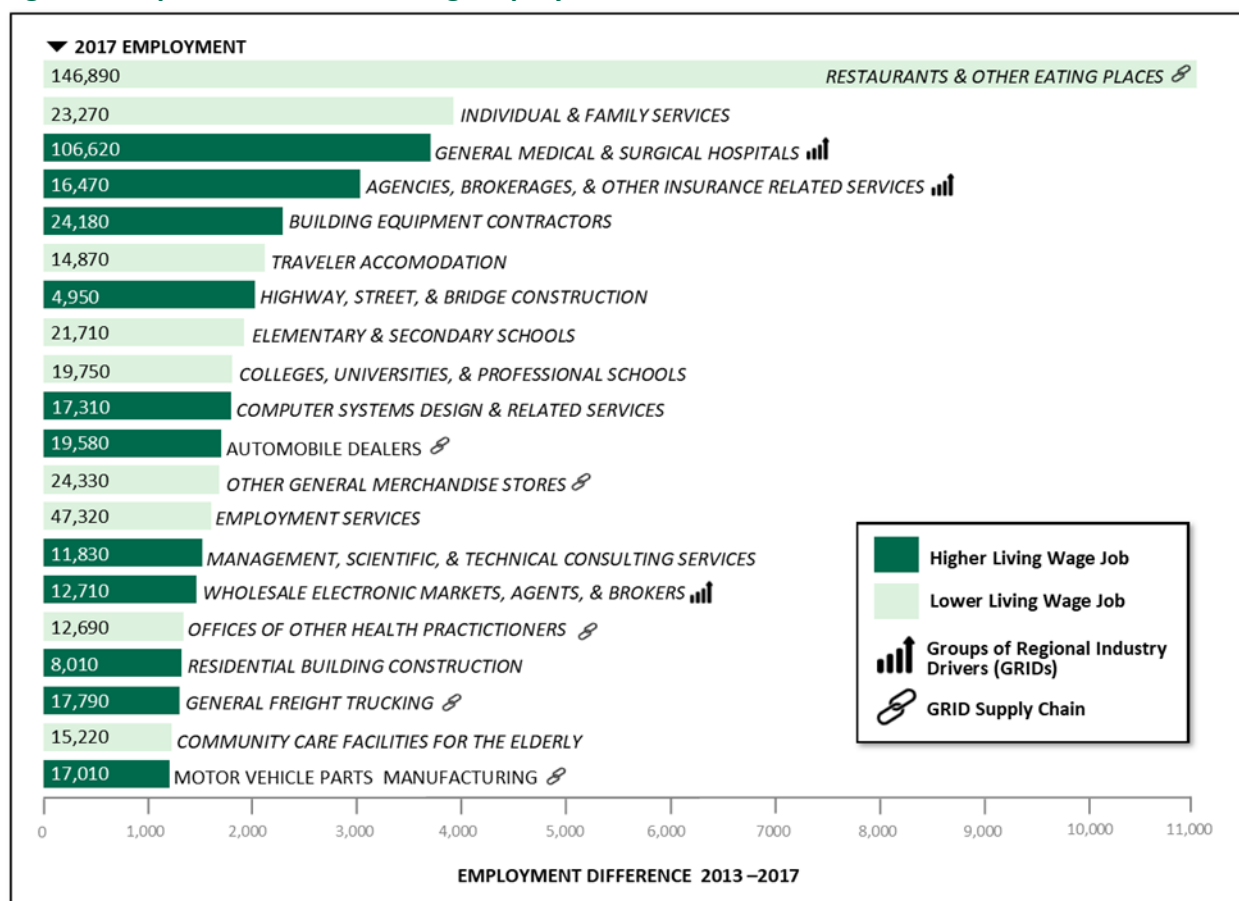
<sup>3</sup> A Metropolitan Statistical Area is the labor market of a given region. The Cleveland MSA consists of a 5-county region of Cuyahoga, Geauga, Lake, Lorain, and Medina Counties.

## GRIDs Employment and Supply Chain

GRID industries indirectly contribute to employment by supporting other industries through purchases from their supply chain.<sup>4</sup> Overall, GRID supply chain industries added 90,030 total employees over the last five years in NEO.

- Among the top twenty job-growing industries (Figure 2), six were industries in the GRID supply chain, adding 18,100 jobs to their workforce between 2013 and 2017.
- During this period, *Restaurants and Other Eating Places* recorded the most substantial employment growth in the region: 11,030 jobs, representing 12% of total employment growth. However, this industry, on average, paid an annual wage of \$17,103 in NEO, only one-third of the regional living wage.

**Figure 2. Top 20 Industries Gaining Employment in NEO**



Source: Moody's Analytics, Center for Economic Development

<sup>4</sup> This analysis was conducted for industries employing at least 250 people regionally. Employment change was ranked from 2013 to 2017, and the top twenty growing industries were examined.

During the same time, the **Professional Services** GRID captured almost 70% of total GRID employment in NEO.

- For every ten jobs created by this GRID, there were thirteen additional jobs created in the economy, an average of seven jobs in the supply chain companies and an additional six jobs in consumer industries through the spending of salaries and wages.

The industries in the **Growing Legacy Manufacturing** GRID are capital-intensive, which means they purchase a substantial volume of products and services from companies building, repairing, and maintaining equipment. Thus, these companies become a supply chain *indirectly* hiring workers in service to GRIDs. Spending on machinery and materials injects billions into the economy and creates many jobs.

- On average, for every job created in *Growing Legacy Manufacturing* GRID, two additional jobs are created: one through the supply chain (indirect job) and one through worker spending (induced jobs). Overall, these indirect and induced jobs almost tripled the jobs created by this GRID, equating to 295,707 jobs in the region.

The **Oil and Gas** GRID was the smallest of these industries, representing 0.2% of the entire NEO workforce (3,160 jobs).<sup>5</sup> Like manufacturing, this GRID is capital-intensive, requiring significant investment in equipment and materials to initiate operations. Northeast Ohio businesses gained from the *Oil and Gas* GRID through supply and customer purchases, a benefit apparent in other NEO GRID industries such as *Professional Services* and *Growing Legacy Manufacturing*. Industries in this GRID are both growing rapidly and have large multipliers.

- In addition to the 3,160 workers employed by the *Oil and Gas* GRID, supply chain companies secured 18,945 people, while consumer-demand industries created 14,208 jobs due to local income spending. Overall, the *Oil and Gas* industry impacted the total NEO employment by 36,312 people.

---

<sup>5</sup> Note that the *Oil and Gas* GRID in NEO was started by companies from other states with expertise in oil and gas development (e.g., Texas, Oklahoma, and Louisiana). The bulk of workers of these companies started developing the Utica shale as transient employees assigned to work in Ohio while maintaining legal residence in their home states. For the first few years of Utica development, this resulted in dramatically undercounted actual employment in Oil and Gas GRID industries. As oil and gas development has gained regional traction, this GRID engaged local labor and established regional branches and new companies in Ohio. These new businesses have benefited the NEO economy from these additional jobs (some workers relocated and settled, while some were employed from within NEO).

## GRID WORKFORCE NEEDS

By the end of 2017, the U.S. experienced a seventeen-year low unemployment rate of 4.1%, with many months in 2018 declining below 4%.<sup>6</sup> Despite this record-low unemployment, U.S. businesses reported 5.8 million job openings in 2017, according to U.S. Labor Department data, nearing a record high.<sup>7</sup> The Federal Reserve Bank of Philadelphia surveyed regional companies in 2017 and found that 52% said they could not find workers with required skills, up from 27% in 2011.<sup>23</sup> A May 2018 report from Team NEO found that the region's three sectors of focus (healthcare, manufacturing, and information technology) had a total shortage of 39,000 workers calculated from the difference between 2015 certifications issued and 2016 industry needs.<sup>8</sup> Also, a more recent Team NEO report from December 2018 projects that Northeast Ohio will add just 20,700 jobs across all occupations through 2023.<sup>9</sup> This alarming report also notes that more than one million additional replacement workers will be needed over the same five years due to retirements and turnover. Table 1 displays the current state of workforce demand in NEO, examining the top job openings for the region from Ohio Means Jobs for both professional services and manufacturing.<sup>10</sup> Overall, a majority of the top occupations listed in these two industry categories are GRID occupations.

The current workforce conversation stretches beyond job growth and wages; both encumbered jobs and job openings illustrate the labor market's demand and how the current labor force (i.e., supply) is not meeting that demand. Millions of open and unfilled jobs emphasize this unmet demand, even as there is a labor force looking for work. There are many reasons employers have a hard time finding the right candidate, but businesses and policymakers point to the skills-mismatch phenomena, or the misalignment of the workers' qualifications to employer's needs, as the reason it is increasingly more challenging to find workers for specific positions.

---

<sup>6</sup> United States Bureau of Labor Statistics. (2019). Labor force statistics from the current population survey [Data table]. *U. S. Bureau of Labor Statistics*. Retrieved from <https://data.bls.gov/timeseries/lms14000000>

<sup>7</sup> Harker, P.T. (2018). Forward: The evolving U.S. labor market. In *Investing in America's workforce* (pp. 1-2). United States Federal Reserve System. Retrieved from <https://www.investinwork.org/Book>

<sup>8</sup> Team NEO. (2018). Aligning opportunities in Northeast Ohio [PDF]. *Cleveland Plus*. Retrieved from <https://www.clevelandplus.com/teamneo/wp-content/uploads/sites/2/2019/03/AligningOpportunities2018-FINAL.pdf>

<sup>9</sup> Team NEO. (2018). Northeast Ohio to add 20,700 jobs over the next five years. *Cleveland Plus*. Retrieved from <https://www.clevelandplus.com/teamneo/news-press-and-updates/northeast-ohio-occupation-opportunities/>

<sup>10</sup> OhioMeansJobs. (2019). Help wanted online job postings - Occupational focus: Top jobs in Northeast Ohio [PDF]. Retrieved from <http://ohiolmi.com/asp/omj/reports/O201902J02.pdf>

**Table 1. Northeast Ohio Job Postings related to GRID**

	GRID Occupation	Top Jobs Postings in Northeast Ohio	Feb 2019 Job Posts	Risk of Automation
Professional Services	X	Registered Nurses	2,973	Low
	X	Licensed Practical and Licensed Vocational Nurses	457	Low
	X	Physicians and Surgeons, All Other	381	Low
	X	Family and General Practitioners	229	Low
		General and Operations Managers	329	Low
	X	Medical and Health Services Managers	299	Low
	X	Sales Agents, Financial Services	431	Medium
	X	Loan Officers	179	Medium
	X	Financial Analysts	149	Medium
		Purchasing Agents, Except Wholesale, Retail, and Farm Products	149	Medium
	X	Financial Managers, Branch or Department	269	Medium
		<b>Total</b>	<b>5,845</b>	<b>-</b>
Manufacturing	X	First-Line Supervisors of Production & Operating Workers	542	Low
	X	Inspectors, Testers, Sorters, Samplers, & Weighers	90	Low
	X	Sales Reps, Wholesale & Manufacturing, Except Technical & Scientific	431	Medium
	X	Sales Reps, Wholesale & Manufacturing, Technical & Scientific	345	Medium
	X	Computer-Controlled Machine Tool Operators, Metal and Plastic	68	Medium
	X	Production Workers, All Other	339	High
	X	Machinists	226	High
	X	Helpers--Production Workers	181	High
	X	Assemblers and Fabricators, All Other	113	High
	X	Welders, Cutters, and Welder Fitters	90	High
		<b>Total</b>	<b>2,425</b>	<b>-</b>

Source: Ohio Means Jobs, Team NEO, Center for Economic Development

Locally, multiple organizations in NEO have reported on the difficulty in finding skilled labor, a challenge to employers across the nation have expressed in recent years, especially in manufacturing and *Professional Services* industries. Many attribute this to a skills mismatch between the skills employers need and the skills individuals possess. Industries are seeking an estimated 40,000 credentialed workers to fill positions in NEO.<sup>11</sup> Some economists argue that the skills mismatch is exaggerated and that employers should be more attractive to talent by paying more, offering better benefits, and allowing for more flexible hours.<sup>12</sup> While this may be true, it is especially difficult for smaller businesses that operate on tighter margins and function as price-takers in the manufacturing market to raise wages.

<sup>11</sup> Team NEO. (2018). Aligning opportunities in Northeast Ohio [PDF]. Retrieved from <https://www.clevelandplus.com/teamneo/wp-content/uploads/sites/2/2019/03/AligningOpportunities2018-FINAL.pdf>

<sup>12</sup> Burtless, G. (2014, July 29). Unemployment and the “skills mismatch” story: Overblown and unpersuasive. *Brookings*. Retrieved from <https://www.brookings.edu/opinions/unemployment-and-the-skills-mismatch-story-overblown-and-unpersuasive/>

In addition to skills mismatch, there are many other reasons for the unmet labor demand, including immigration, low wages, inclusion problems, transit access, and issues surrounding criminal justice.<sup>13</sup> Barriers to entry in the labor force such as incarceration, addiction, child-care costs, unstable housing situations, or poor transportation access might all contribute to a lower participation rate. A study by the Center on the Greater Cleveland Regional Transit Authority found that previously unserved areas that gained transit access saw an increase of 3% in employment and a decrease of 13% in poverty within a decade.<sup>14</sup>

## GLOBAL ECONOMIC FORCES

### Economy

Before the Covid-19 pandemic, specific GRID industries were of particular note in NEO, including *Professional Services*, *Growing Legacy Manufacturing*, and *Oil and Gas* sectors. Several factors play a role in the employment demands of these industries. The first influential element is the overall economy, especially as it relates to COVID-19 business closing and recovery; market uncertainty regarding national policies on trade and tariffs can stifle many of these industries. These policy changes can have a devastating regional effect in addition to stalling growth both nationally and internationally. The Brookings Institution estimated the effect of tariffs on U.S. workers and industries, finding that tariffs could affect thousands of jobs in many Northeast Ohio counties.<sup>15</sup> Brookings projected that counties like Ashtabula, with 4.9% of its industries (1,429 jobs) dependent on manufactured and agricultural goods, may be severely affected by the tariffs, while others, like Cuyahoga, would face minimal disruption because of their smaller reliance on these goods (0.6% of industries; 3,974 jobs).

### Coronavirus

Much of the global economy faces a significant decline in consumption spending and outputs as the globe temporarily shuts down to contain the virus. This slow-down will affect most industries, but the Bureau of Economic Analysis expects three categories of sectors to be most impacted and to expect sharp declines in the weeks ahead: *transportation*, *restaurant*, and *food and accommodation* services. Before the outbreak, Americans spent \$2.1 trillion on these services (making up approximately 14% of the U.S. economy) that have now shuttered in recent days to manage the spread of the virus.<sup>16</sup> Some sectors, such as *grocery* and the *health care* industry, will experience higher spending, based upon consumption and national need, but the

---

<sup>13</sup> Hanks, A. (2018, June 26). The skills gap myth does not explain what's happening to work. *Forbes*. Retrieved from <https://www.forbes.com/sites/angelahanks/2018/06/26/the-skills-gap-myth-does-not-explain-whats-happening-to-work/#aa903c052826>

<sup>14</sup> Lendel, I., Pasha, O., Sohrabian, D., & Ellerbrock, M. (2019). GCRTA economic impact and contributions to local economy: Main findings [PDF]. *Urban Publications*. Retrieved from [https://engagedscholarship.csuohio.edu/urban\\_facpub/1593/](https://engagedscholarship.csuohio.edu/urban_facpub/1593/)

<sup>15</sup> Muro, M., Whiton, J., & Maxim, R. (2018, Apr 9) How China's proposed tariffs could affect U.S. workers and industries. *Brookings Institution*. Retrieved from <https://www.brookings.edu/blog/the-avenue/2018/04/09/how-chinas-tariffs-could-affect-u-s-workers-and-industries/>

<sup>16</sup> Irwin, N. (2020, March 17). One Simple Idea That Explains Why the Economy Is in Great Dan. Retrieved March 17, 2020, from <https://www.nytimes.com/2020/03/17/upshot/coronavirus-economy-crisis-demand-shock.html>



economy will not adjust to these dramatic shifts quickly. Additionally, it is difficult to use the tools of past economic emergencies because the laws of supply and demand have never been tested on this scale in the global economy, particularly when a requirement of the crisis itself is to limit demand for many industries at once.<sup>17</sup>

Further, this crisis dramatically highlights the dire situation low-wage American workers were in before Covid-19 hit the economy. Already, fifty-three million people were employed in low-wage jobs, earning a median income of \$10.22 an hour, the majority without health insurance, or any sick or paid time off.<sup>18</sup> Many of these workers, who depend upon the spending of GRID industries and supply-chain spending, will be the most hard-hit by Covid-19 economic impacts. Only time will tell if federal and state government stimulus packages will aid in the loss of earnings. The ripple effects of this consumption contraction will include evictions and foreclosures, utility shut offs, a rise in homelessness, and financial impacts that can affect households for many subsequent months.

Thus far, unemployment policy has been expanded to include more workers. In mid-March, the U.S. Department of Labor released a report that indicated a sharp rise (70,000) in initial week-to-week unemployment claims, which is more dramatic than any week-to-week increase that was seen during the 2008 financial crisis or since.<sup>19</sup> This sharp spike reflects what is unusual about this recession, where generally the approach towards the peak in job loss are more gradual and happens over a period of months, not weeks. For NEO, manufacturing is of importance to its economic stability and will suffer a direct impact from Covid-19 due to staffing and demand shortages, and supply chain disruption. A recent survey conducted by the National Association of Manufacturers reports that 80% of manufacturers expect Covid-19 to impact their business negatively, and one third have already had their supply chains disrupted due to the pandemic.

Already, companies have reported trying to mitigate such circumstances by staggering shifts, limiting visitors, and halting operations so they can install barriers between workers and spread out machinery.<sup>20</sup> Like service sectors, manufacturing is especially susceptible to slow-downs and stoppages because it is not able to transition to remote work. Looking at the countries first hit by Covid-19 for predictive modeling, we can observe that China's manufacturing sector declined by 13.5% from January to February 2020.

---

<sup>17</sup> Irwin, N. (2020, March 17). One Simple Idea That Explains Why the Economy Is in Great Dan. Retrieved March 17, 2020, from <https://www.nytimes.com/2020/03/17/upshot/coronavirus-economy-crisis-demand-shock.html>

<sup>18</sup> Ross, M., & Bateman, N. (2020, March 13). Coronavirus makes it impossible to ignore the economic insecurity built into our labor market . Retrieved March 18, 2020, from [https://www.brookings.edu/blog/the-avenue/2020/03/13/coronavirus-makes-it-impossible-to-ignore-the-economic-insecurity-built-into-our-labor-market/?utm\\_campaign=Brookings+Brief&utm\\_source=hs\\_email&utm\\_medium=email&utm\\_content=84809588](https://www.brookings.edu/blog/the-avenue/2020/03/13/coronavirus-makes-it-impossible-to-ignore-the-economic-insecurity-built-into-our-labor-market/?utm_campaign=Brookings+Brief&utm_source=hs_email&utm_medium=email&utm_content=84809588)

<sup>19</sup> U.S. Department of Labor (2020, March 19). Retrieved from <https://www.dol.gov/ui/data.pdf>

<sup>20</sup> Tita, B., & Hufford, A. (2020, March 17). Coronavirus Pushes Factories to Stagger Shifts, Separate Workers. Retrieved March 17, 2020, from [https://www.wsj.com/articles/u-s-factories-work-around-coronavirus-impact-11584447707?mod=hp\\_lead\\_pos3](https://www.wsj.com/articles/u-s-factories-work-around-coronavirus-impact-11584447707?mod=hp_lead_pos3)

## Automation

Many industries, including manufacturing, are looking to automation to mitigate labor shortages of skilled workers, while increasing productivity and decreasing costs. Automation is the future reality for many industries globally. As in previous periods of innovation, which decreased labor forces while increasing productivity (i.e., assembly lines, mechanized agriculture, etc.), it is critical not to fear what is to come. Instead, preparation and adaptation are the keys to surviving the future. McKinsey & Company asserts that the U. S. economy possesses ample potential for automation, estimating that up to 78% of predictable physical work, 65% of data processing and collection, and about 25% of unpredictable physical work could be automated.<sup>21</sup> Meanwhile, expertise in creativity, critical thinking, attention to detail, and problem-solving were identified as essential “soft skills” that will increase in demand.<sup>22</sup> Preparing workers to be nimble, adaptable, and aware of these changes is crucial since 75 to 375 million workers worldwide will be impacted by automation.<sup>23</sup>

Technology advancements and the changing nature of business represent the third factor. Northeast Ohio has found itself at the forefront of driving businesses’ investment in future technologies, as well as training future workforces. Launched in 2018, the Internet of Things<sup>24</sup> Collaborative between Case Western Reserve University, Cleveland State University, and the Cleveland Foundation, seeks to create industry, workforce, business, and university connections to drive innovation and create systemic change.<sup>25</sup> Bill Koehler, CEO of Team NEO, decreed that “Looking ahead, we see tremendous opportunities in our largest sector, manufacturing, as companies look to adopt technologies related to the Industrial Internet of Things (IIoT) and 3D printing.”<sup>26</sup>

---

<sup>21</sup> McKinsey & Company. (n.d.). The technical potential for automation in the US. Retrieved from <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet>

<sup>22</sup> World Economic Forum. (2018). The future of jobs report 2018. Retrieved from [www3.weforum.org/docs/WEF\\_Future\\_of\\_Jobs\\_2018.pdf](http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf)

<sup>23</sup> McKinsey Global Institute (2017). Jobs lost, jobs gained: workforce transition in a time of automation. *McKinsey & Company*.

<sup>24</sup> The “Internet of Things (IoT)” represents the connection of all things to the internet. It is a strong force to increase innovation and productivity in businesses.

<sup>25</sup> For more information see <http://iotcollaborative.org/>

<sup>26</sup> Team NEO. (2019). Team NEO and economic development network achieve strong results. Retrieved from <https://www.clevelandplus.com/teamneo/news-press-and-updates/regional-collaboration-yields-6300-new-jobs-manufacturing-advances-in-2018/>



## CONCLUSION

The creation of jobs has always been the cornerstone of economic development practice; however, job *quality* is also essential to examine when thinking about the long-term growth of a region. This report builds on the Center's previous work identifying Groups of Regional Industry Drivers (GRIDs). GRID industries have strong productivity, growing output, regional specialization, and competitive advantage. This report analyzes the employment dynamics of different groups of industries (both GRID and non-GRID) in NEO to give stakeholders tools to determine which industries produce "good jobs," defined as those that pay a living wage and are growing in the region. We estimate that the living wage in NEO is \$49,663 for a family of three. Many jobs available in NEO GRIDs provide this living wage, supplying more evidence to support the continued cultivation of these industries on a regional level. Growth strategies should identify ways for individuals to leverage skills at their current place of employment and capitalize on incumbent worker training to follow a career pathway to a better job.

Nonetheless, the "skills mismatch" predicament can hinder GRID growth, and solutions are currently unfolding in workforce development programs to tackle this problem. Input from local stakeholders and multiple national surveys all point to a divide between the skills employers are looking for versus the credentials and experience the employment pool can provide. Automation is often observed as a potential concern in employment sectors; in reality, it is already a fact of life in multiple industries. This report finds that automation should not be feared. Instead, stakeholders should adapt and prepare for the future work environment that is fast approaching. Most employers are not looking to replace their workforce with automation, but instead, look to improve productivity. Policymakers and business leaders must be aware of this shift and plan accordingly to prevent further skills mismatch due to automation.

While Northeast Ohio has many barriers ahead in providing good jobs, including remedying the skills mismatch and automation preparation, evidence indicates that multiple public and private stakeholder organizations have confronted these challenges head-on with proven techniques. However, navigating the oncoming economic challenges brought about by the global Covid-19 pandemic may prove to be the biggest obstacle for employers in the immediate future. Throughout this endeavor, Northeast Ohio's Growing Regional Industry Drivers will provide policymakers demonstrably exceptional conduits toward improving both productivity and output while providing a living wage to workers.

## APPENDIX

**Table A1. Top 20 Industries Gaining Employment in the Cleveland MSA**

GRID	NAICS code	Industry Name	Emp Diff (2013-2017)	Emp 2017	Average Wage 2017	Higher or Lower Living Wage
	7225	Restaurants and Other Eating Places	5,860	70,980	\$17,706	L
X	5242	<i>Agencies, Brokerages, and Other Insurance Related Activities</i>	2,840	10,720	\$78,076	H
X	6221	<i>General Medical and Surgical Hospitals</i>	2,780	64,390	\$68,949	H
	5613	Employment Services	2,280	29,200	\$33,289	L
	6113	Colleges, Universities, and Professional Schools	1,810	14,530	\$48,136	L
	6241	Individual and Family Services	1,740	12,870	\$25,280	L
	5415	Computer Systems Design and Related Services	1,540	13,160	\$96,963	H
	5416	Management, Scientific, and Technical Consulting Services	1,470	8,890	\$79,085	H
X	4251	<i>Wholesale Electronic Markets and Agents and Brokers</i>	1,390	8,890	\$105,828	H
	6111	Elementary and Secondary Schools	1,340	14,880	\$17,018	L
	7211	Traveler Accommodation	1,310	7,640	\$27,861	L
	6213	Offices of Other Health Practitioners	1,020	5,970	\$43,071	L
X	5511	<i>Management of Companies and Enterprises</i>	1,000	30,480	\$109,540	H
	5239	Other Financial Investment Activities	830	2,710	\$152,768	H
	3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	820	4,140	\$61,011	H
	6233	Community Care Facilities for the Elderly	810	7,010	\$27,065	L
	6244	Child Day Care Services	800	7,250	\$22,169	L
	4411	Automobile Dealers	740	9,360	\$49,717	L
	4529	Other General Merchandise Stores	730	9,680	\$20,631	L
	7113	Promoters of Performing Arts, Sports, and Similar Events	720	2,710	\$58,882	H

Note: Living Wages in the Cleveland MSA are \$51,958 for a family of 3.

Source: Moody's Analytics, Center for Economic Development

**Table A2. Top 20 Industries Gaining Employment in the Akron MSA**

GRID	NAICS code	Industry Name	Emp Diff (2013-2017)	Emp 2017	Average Wage 2017	Higher or Lower Living Wage
X	6221	General Medical and Surgical Hospitals	1,460	16,850	\$58,333	H
	7225	Restaurants and Other Eating Places	1,400	24,390	\$16,828	L
X	5241	Insurance Carriers	1,150	4,640	\$60,793	H
	6241	Individual and Family Services	1,140	3,660	\$24,213	L
	2373	Highway, Street, and Bridge Construction	1,070	1,630	\$34,847	L
	2382	Building Equipment Contractors	1,050	4,730	\$71,312	H
X	5511	Management of Companies and Enterprises	840	17,250	\$101,356	H
	5617	Services to Buildings and Dwellings	830	5,060	\$21,124	L
	3121	Beverage Manufacturing	740	950	\$19,532	L
	5613	Employment Services	660	8,210	\$27,508	L
	4841	General Freight Trucking	540	4,550	\$55,038	H
	5413	Architectural, Engineering, and Related Services	530	3,040	\$64,217	H
	6111	Elementary and Secondary Schools	530	3,320	\$23,218	L
	4529	Other General Merchandise Stores	500	3,470	\$24,407	L
	5191	Other Information Services	480	590	\$16,447	L
	4413	Automotive Parts, Accessories, and Tire Stores	450	2,660	\$31,855	L
	4411	Automobile Dealers	440	3,650	\$53,171	H
X	5242	Agencies, Brokerages, and Other Insurance Related Activities	430	2,410	\$66,618	H
	4921	Couriers	380	1,210	\$47,446	L
	2362	Nonresidential Building Construction	350	1,120	\$76,726	H

Note: Living Wages in the Akron MSA are \$52,541 for a family of 3.

Source: Moody's Analytics, Center for Economic Development

**Table A3. Top 20 Industries Gaining Employment in the Canton MSA**

GRID	NAICS code	Industry Name	Emp Diff (2013-2017)	Emp 2017	Average Wage 2017	Higher or Lower Living Wage
	7225	Restaurants and Other Eating Places	1,560	15,670	\$16,261	L
	5613	Employment Services	630	2,560	\$29,269	L
	2373	Highway, Street, and Bridge Construction	400	930	\$73,512	H
	5617	Services to Buildings and Dwellings	320	2,420	\$27,002	L
	5414	Specialized Design Services	290	740	\$26,741	L
	4244	Grocery and Related Product Wholesalers	280	1,290	\$60,378	H
	4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	260	730	\$74,430	H
	5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	260	940	\$42,988	L
	2362	Nonresidential Building Construction	250	1,450	\$68,976	H
	2361	Residential Building Construction	240	980	\$41,363	L
	6241	Individual and Family Services	220	2,150	\$20,773	L
	3116	Animal Slaughtering and Processing	200	1,830	\$38,460	L
	5411	Legal Services	190	1,030	\$52,260	H
	6214	Outpatient Care Centers	190	1,310	\$61,760	H
	2382	Building Equipment Contractors	170	2,350	\$52,656	H
	6111	Elementary and Secondary Schools	170	1,060	\$9,879	L
	5611	Office Administrative Services	160	630	\$71,748	H
	5619	Other Support Services	160	410	\$19,079	L
	7121	Museums, Historical Sites, and Similar Institutions	160	410	\$29,626	L
X	3241	Petroleum and Coal Products Manufacturing	150	550	\$15,922	L

Note: Living Wages in the Canton MSA are \$51,043 for a family of 3.

Source: Moody's Analytics, Center for Economic Development

**Table A4. Top 20 Industries Gaining Employment in the Youngstown MSA**

NAICS code	Industry Name	Emp Diff (2013-2017)	Emp 2017	Average Wage 2017	Higher or Lower Living Wage
7225	Restaurants and Other Eating Places	1,150	15,170	\$15,832	L
6232	Residential Mental Retardation, Mental Health and Substance Abuse Facilities	580	2,280	\$23,174	L
6241	Individual and Family Services	460	2,200	\$16,817	L
4529	Other General Merchandise Stores	420	2,680	\$21,224	L
6213	Offices of Other Health Practitioners	330	2,010	\$32,539	L
6242	Community Food and Housing, and Emergency and Other Relief Services	220	340	\$33,572	L
7211	Traveler Accommodation	220	1,010	\$16,592	L
7139	Other Amusement and Recreation Industries	200	1,230	\$9,323	L
4411	Automobile Dealers	170	1,990	\$46,859	L
2383	Building Finishing Contractors	160	990	\$56,026	H
4441	Building Material and Supplies Dealers	160	1,550	\$27,377	L
6244	Child Day Care Services	160	1,170	\$17,523	L
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	140	460	\$60,266	H
6114	Business Schools and Computer and Management Training	140	290	\$11,657	L
8133	Social Advocacy Organizations	140	460	\$44,638	L
3261	Plastics Product Manufacturing	130	950	\$36,928	L
4236	Electrical and Electronic Goods Merchant Wholesalers	130	400	\$50,249	L
4541	Electronic Shopping and Mail-Order Houses	130	350	\$80,439	H
6211	Offices of Physicians	130	3,980	\$63,154	H
6214	Outpatient Care Centers	110	1,470	\$82,066	H

Note: Living Wages in the Youngstown MSA are \$50,752 for a family of 3.

Source: Moody's Analytics, Center for Economic Development

**Table A5. All Cleveland MSA GRID - Average Wage, 2017**

NAICS code	Industry Name	Average Wage 2017	Higher or Lower than Cleveland Living Wage
7112	Spectator Sports	\$200,472	H
5211	Monetary Authorities - Central Bank	\$151,340	H
3251	Basic Chemical Manufacturing	\$136,972	H
3314	Nonferrous Metal (except Aluminum) Production and Processing	\$114,876	H
5511	Management of Companies and Enterprises	\$109,540	H
4251	Wholesale Electronic Markets and Agents and Brokers	\$105,828	H
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	\$100,666	H
3312	Steel Product Manufacturing from Purchased Steel	\$97,083	H
3311	Iron and Steel Mills and Ferroalloy Manufacturing	\$95,093	H
3241	Petroleum and Coal Products Manufacturing	\$93,619	H
3353	Electrical Equipment Manufacturing	\$88,628	H
3255	Paint, Coating, and Adhesive Manufacturing	\$87,509	H
3259	Other Chemical Product and Preparation Manufacturing	\$80,289	H
3222	Converted Paper Product Manufacturing	\$79,924	H
5242	Agencies, Brokerages, and Other Insurance Related Activities	\$78,076	H
5241	Insurance Carriers	\$75,449	H
3315	Foundries	\$74,268	H
3339	Other General Purpose Machinery Manufacturing	\$73,495	H
5221	Depository Credit Intermediation	\$71,825	H
6221	General Medical and Surgical Hospitals	\$68,949	H
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	\$66,877	H
5312	Offices of Real Estate Agents and Brokers	\$65,281	H
3321	Forging and Stamping	\$60,870	H
3329	Other Fabricated Metal Product Manufacturing	\$58,995	H
7113	Promoters of Performing Arts, Sports, and Similar Events	\$58,882	H
3335	Metalworking Machinery Manufacturing	\$55,293	H
5313	Activities Related to Real Estate	\$53,312	H
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	\$52,851	H
2111	Oil and Gas Extraction	\$51,145	L
3322	Cutlery and Handtool Manufacturing	\$51,072	L
3328	Coating, Engraving, Heat Treating, and Allied Activities	\$49,532	L
5311	Lessors of Real Estate	\$48,975	L

Note: Living Wages in the Cleveland MSA are \$51,958 for a family of 3.

Source: Moody's Analytics, Center for Economic Development

**Table A6. All Akron MSA GRID – Average Wage, 2017**

NAICS code	Industry Name	Average Wage 2017	Higher or Lower than Akron Living Wage
4251	Wholesale Electronic Markets and Agents and Brokers	\$132,570	H
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	\$105,095	H
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	\$101,846	H
5511	Management of Companies and Enterprises	\$101,356	H
3221	Pulp, Paper, and Paperboard Mills	\$78,332	H
3332	Industrial Machinery Manufacturing	\$72,115	H
2382	Building Equipment Contractors	\$71,312	H
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	\$70,444	H
3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	\$69,830	H
5242	Agencies, Brokerages, and Other Insurance Related Activities	\$66,618	H
3322	Cutlery and Handtool Manufacturing	\$62,419	H
3259	Other Chemical Product and Preparation Manufacturing	\$61,682	H
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	\$61,665	H
3261	Plastics Product Manufacturing	\$61,480	H
5241	Insurance Carriers	\$60,793	H
6221	General Medical and Surgical Hospitals	\$58,333	H
5312	Offices of Real Estate Agents and Brokers	\$56,770	H
3262	Rubber Product Manufacturing	\$55,680	H
4841	General Freight Trucking	\$55,038	H
3315	Foundries	\$53,867	H
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	\$50,045	L
5221	Depository Credit Intermediation	\$49,996	L
3335	Metalworking Machinery Manufacturing	\$47,702	L
5313	Activities Related to Real Estate	\$46,965	L
5311	Lessors of Real Estate	\$41,870	L
2111	Oil and Gas Extraction	\$29,435	L

Note: Living Wages in the Akron MSA are \$52,541 for a family of 3.

Source: Moody's Analytics, Center for Economic Development

**Table A7. All Canton MSA GRID - Average Wage, 2017**

NAICS code	Industry Name	Average Wage 2017	Higher or Lower than Canton Living Wage
3312	Steel Product Manufacturing from Purchased Steel	\$73,216	H
3315	Foundries	\$72,428	H
3261	Plastics Product Manufacturing	\$46,639	L
2111	Oil and Gas Extraction	\$44,286	L
4441	Building Material and Supplies Dealers	\$33,148	L
5313	Activities Related to Real Estate	\$32,318	L
5312	Offices of Real Estate Agents and Brokers	\$27,817	L
5311	Lessors of Real Estate	\$18,402	L

Note: Living Wages in the Canton MSA are \$51,043 for a family of 3.

Source: Moody's Analytics, Center for Economic Development

**Table A8. All Youngstown MSA GRID - Average Wage, 2017**

NAICS code	Industry Name	Average Wage 2017	Higher or Lower than Youngstown Living Wage
3241	Petroleum and Coal Products Manufacturing	\$131,781	H
3314	Nonferrous Metal (except Aluminum) Production & Processing	\$102,588	H
3313	Alumina and Aluminum Production and Processing	\$67,215	H
3312	Steel Product Manufacturing from Purchased Steel	\$64,311	H
5313	Activities Related to Real Estate	\$42,346	L
5311	Lessors of Real Estate	\$35,370	L
2111	Oil and Gas Extraction	\$31,570	L

Note: Living Wages in the Youngstown MSA are \$50,752 for a family of 3.

Source: Moody's Analytics, Center for Economic Development