

Northern Illinois Coordinated Workforce Report

An Analysis on Manufacturing Middle
Skills in the Northern Illinois Region

Spring 2019



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Acknowledgments

The **Region 1 Planning Council (RPC)** is a special-purpose regional government agency that coordinates governmental collaboration, research, planning, and fund development. The RPC was the primary party responsible for the creation of this report. **Jay Fieser**, Economic Development Planner at R1PC was the project lead. **Margaret Campbell** and **Dhawal Kataria**, Metropolitan Planners, assisted with the final layout and graphical elements of this report.

To create The Northern Illinois Coordinated Workforce Report, the RPC has partnered with economic development, workforce development, and educational institutions from across the region.

In addition to our three main partners of **Rock Valley College**, the **Rockford Area Economic Development Council**, and **The Workforce Connection**, this report has relied heavily on the cooperation of regional stakeholders and business leaders. We would like to express appreciation for **Growth Dimensions**, **The Greater Freeport Partnership**, **Highland Community College**, and **Business Employment Skills Team, Inc (BEST Inc.)** for their assistance with employer outreach, as well as general support. We look forward to continuing our work to improve the quality of our region's workforce.

Labor market data was provided by Chmura Economics & Analytics' JobsEQ Software Service. JobsEQ helps economic developers to identify unique workforce characteristics within their community and provide quality data by describing current industry and demographic trends, and targeted occupation and labor market information. The service was integral for analyzing middle-skills projections and jobs posting data for our region.

The team would also like to individually thank the work of our survey conductors, **Faith Miller** and **Jaleesa Woodfork**, for their assistance in the business outreach portion of the study. The team would also like to thank **Thomas Bona** for his contributions to the initial stages of the report.

Rock Valley College (RVC) is a comprehensive two-year community college in Rockford, Illinois which provides high-quality education and lifelong learning for residents in their district. RVC has taken the charge on bringing middle-skills into the regional conversation, since long before the proposal of this study. Recognizing that the findings in this report will directly inform RVC's offerings and programs, we have worked closely with our local community college partner.

The Rockford Area Economic Development Council (RAEDC) is the economic development organization which collaborates with regional stakeholders to cultivate opportunities for primary job growth that increase the economic well-being throughout Winnebago County. RAEDC is the primary funder of this study, through their the **Rockford! Leadership Council**. The Leadership Council's Emerging Opportunity Fund invests in projects which focus on shaping public opinion on sensitive issues related to the region's capacity to grow, or other efforts to remove difficult barriers to growth. We are thankful for their continued partnership, assistance with business outreach, and general patience with the project.

The Workforce Connection (TWC) is one of 22 local workforce boards established by the Governor of the State of Illinois pursuant to the federal Workforce Innovation and Opportunity Act (WIOA). Utilizing Federal and State funds, TWC provides a system for individuals to get employed and also works with employers to find skilled workers and access other services, including education and training for their current workforce in Boone, Stephenson, and Winnebago Counties. TWC is committed to providing a workforce that meets the needs of the business community. The recommendations in this report keep in mind the strategies outlined in the local and regional Workforce Innovation and Opportunity (WIOA) plans.

Executive Summary

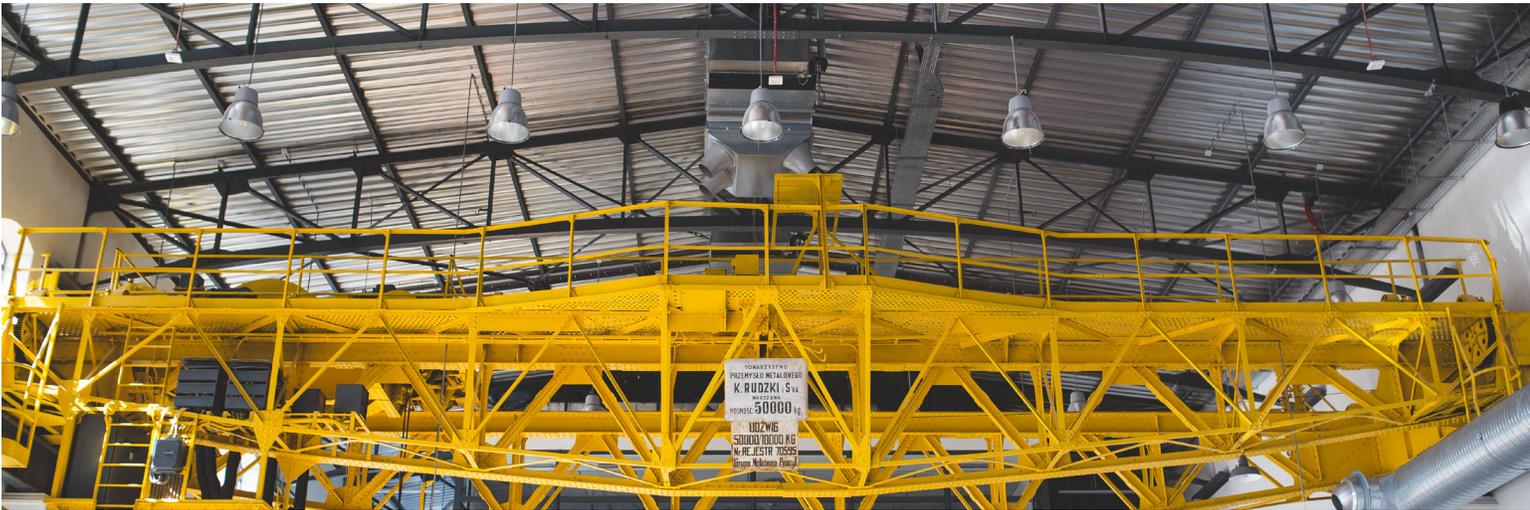
Northern Illinois has been seeing a decline in unemployment rates and an increase in labor-force participation since the end of the 2008 recession. While problems of unemployment and underemployment still exist throughout the region, state, and country, a common workforce issue that still needs attention is on the employer side – employers find it hard to fill open positions with skilled workers qualified to excel in those positions. Increasingly, these positions are the **“middle-skill” jobs, which require more than a high-school degree, but less than a bachelor’s degree.** These include associate degrees, postsecondary certificates, apprenticeships, etc. Despite these jobs comprising nearly half of all U.S., Illinois, and Northern Illinois jobs, as well offering decent wages and career advancement, employers in national studies have consistently reported difficulty in filling these positions as well as keeping workers in them.

This skills gap represents a market failure which decreases the competitiveness of industry, keeps profit and wages low, and in turn, the quality of life and health of communities suffers as well. Employers, while still a

primary source of job training for new positions, aren’t alone in the responsibility of finding qualified individuals. Educational, and workforce organizations consistently look to correct the skills-gap through both tried-and-true programs such as adult education and employer outreach, but also through innovative targeted skills programs. While these programs in their various forms can be used post-hire through business services or contracted in-house classroom training, recommendations in this report will focus on employability, or programs which prepare the workforce to enter and thrive in positions traditionally classified as “middle-skill” prior to employer training.

In 2018, business, workforce, educational, and public sector leaders came together to examine the prevalence of middle-skills in the region and present a way to move forward with meeting the skills needs within the region. The middle-skills information and recommendations within this report will be the first step towards a greater regional effort to develop a workforce that meets the evolving needs of industry and will allow businesses to continue growing and thriving in our region.

Middle-skills jobs will continue to be a major focus as Northern Illinois grows its economy. While this report focuses primarily on middle-skills jobs in the manufacturing industry, we hope that this report will be a springboard into examining other major regional industries, reaching out to those businesses, creating similar programs to fill their needs.



Report Structure

This report uses many public and private data sources. Inconsistencies among nominal data points of similar purposes are due to differing methodologies, timeframes, and definitions from their respective sources. All data should be interpreted within the context of which it appears.

Section I gives an overview of our region's economic climate using public economic, demographic, and employment data for the Northern Illinois Region. Additionally, jobs-market data is now more sophisticated and can better inform business leaders, educators, and workforce program providers about the hiring, skill, and certification challenges faced by businesses. This data is highlighted in Section I of the report, where these challenges are applied to jobs-posting data for middle-skills occupations. While this information is useful for tailoring workforce and education programs generally, actual employer outreach can drill down on the specific and direct needs businesses have when it comes to the skills of their labor and employment pool.

Section II consists of employer outreach, in the form of an employer survey targeting the manufacturing industry. Both the data analysis and employer survey found that there is a pronounced need for middle-skills in the Northern Illinois Region, and that there are general skills throughout the manufacturing industry that middle-skills employees consistently lack.

Section III provides examples of current skills-based workforce initiatives, as well as an overview of a critical core manufacturing skills curriculum which, through the community college system, will provide the labor-force with the specific skills outlined by employers, as well as credentials to show their readiness to enter the industry. This section will also present recommendations for the next steps.

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Section I

A Regional Focus

This Regional Workforce Study focuses on a 4-county area encompassing the Northern Illinois counties of Boone, Ogle, Stephenson, and Winnebago (Fig. 1). Designated as a Combined Statistical Area, the region, also referred to as the Northern Stateline Economic Development Region (EDR) has a total estimated population of 450,869.¹ Winnebago County, which contains much of the Rockford metropolitan area (Rockford MSA) makes up the majority of that population with approximately 288,896 people within its borders. The other counties of Boone, Ogle, and Stephenson make up the remaining population. Though these counties are smaller and more rural in nature, they house many of the region's major manufacturing employers and are

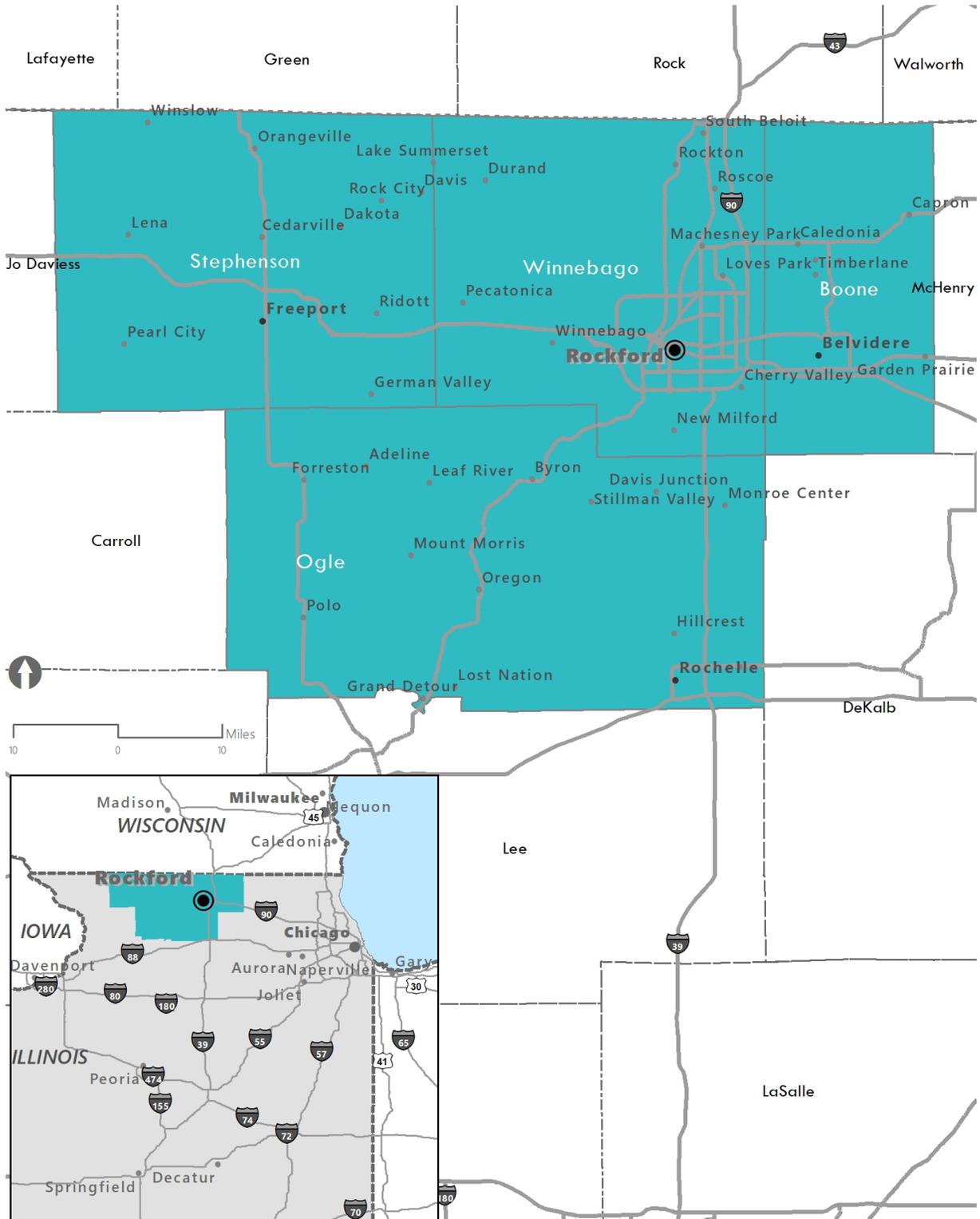


essential to any regional workforce analysis. The Freeport micropolitan statistical area (μ SA) is in Stephenson County, while the Rochelle μ SA is in Ogle County.

While this study could focus solely on Winnebago County, or simply the City of Rockford and its surrounding municipalities, labor is not beholden to a singular location – employees can easily live in one community and commute to another for work. Likewise, an employee can get training or certification in one location and their skills could be utilized at any employer in the region within reasonable commuting distance. It is for reasons such as these that we have chosen to focus on the EDR, herein referred to as the 4-county region or Northern Stateline region.

Recognizing the regional nature of middle-skill promotion, this study is supported by and has collaborated with economic development, educational and workforce partners from across the four counties. These partners include the Rockford Area Economic Development Council, Rock Valley College, and the Workforce Connection in Winnebago County; the Greater Freeport Partnership and Highland College in Stephenson County; BEST, Inc. in Ogle County; and Growth Dimensions in Boone County.

Figure 1: Study Area, or the 4-county Northern Stateline Economic Development Region



Employment

There are approximately 8,614 business establishments within the region (Table. 1).² Of those, 823 establishments, or 9.5% are classified as manufacturing. However, of those employed within the region’s private sector, employees in manufacturing industry make up 24.5%, or nearly a quarter of the total regional private-sector employment (Tables 2 and 3). So while manufacturing businesses make up a small portion of businesses, they employ a large portion of the region’s workforce.

While the focus of this report is on the manufacturing sector, the 4-county region has a diverse economy with a total labor force of 224,876 who work in varying industries.³ Though labor force numbers have declined over the past

Table 1: Private-sector manufacturing establishments

Industry	Boone	Ogle	Stephenson	Winnebago	Total
Manufacturing	72	66	70	615	823
Total	853	955	969	58,37	8,614

Source: Illinois Department of Employment Security

Table 2: Private-sector manufacturing employment

Industry	Boone	Ogle	Stephenson	Winnebago	Total
Manufacturing	8,913	3,017	3,348	24,078	39,356
Total	17,251	13,238	15,258	115,075	160,822

Source: Illinois Department of Employment Security

Table 3: Percent private-sector employees in the regional manufacturing sector

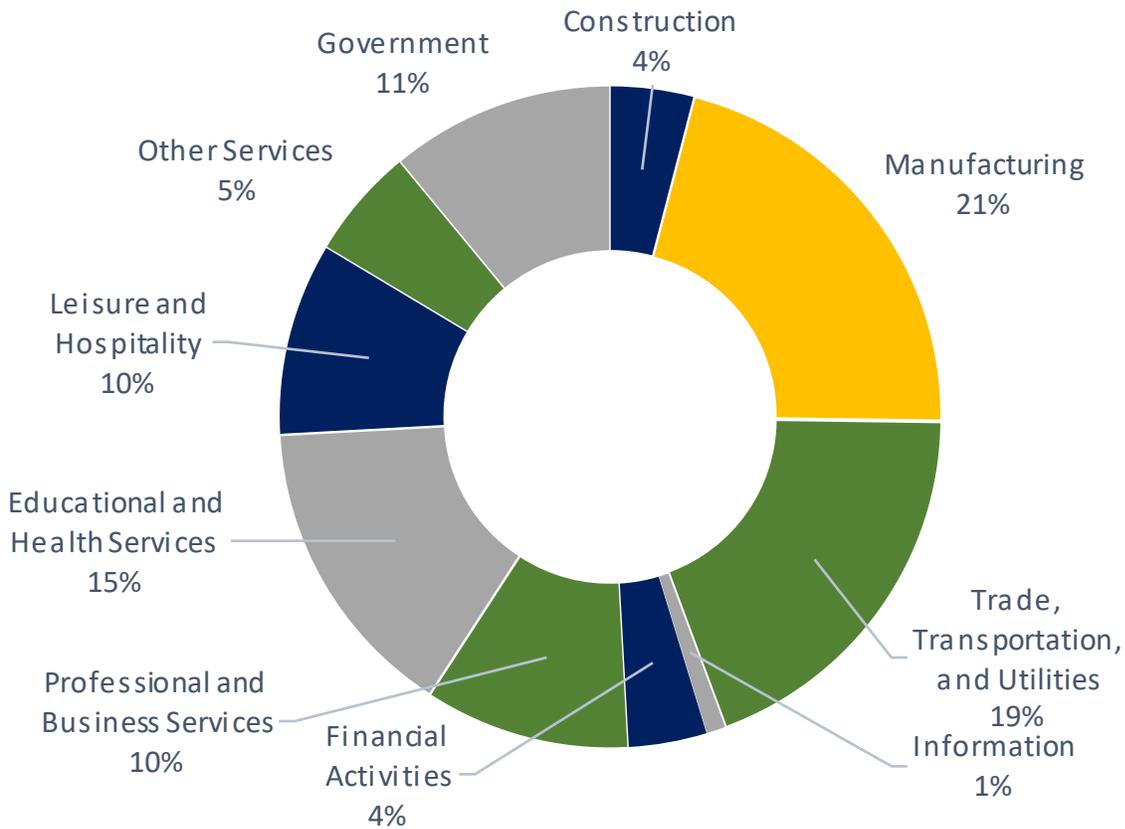
Employment	Boone	Ogle	Stephenson	Winnebago	4-County
% Manufacturing Employment	51.7%	22.8%	21.9%	20.9%	24.5%

Source: Illinois Department of Employment Security

decade, the proportion of those working in manufacturing has remained at 21% of both public and private sector workers (Fig. 2)

Again, that proportion of manufacturing employees is 24.5% among only the private-sector. It should be noted that the employment in transportation and trade industries has remained stable as well, and the education and health industries have seen the most employment growth since 2008.

Figure 2: 4-County Industry Employment Breakdown



Source: Illinois Department of Employment Security, July 2018

The share of manufacturing workers in our region remaining stable and as a large proportion of our workforce, while labor force numbers have declined suggests that the manufacturing industry is still strong in this region. It is also notable that while manufacturing has declined nationally, it still remains the most important industry within the Northern Illinois region.

With nearly one in five workers in the 4-county region working in the manufacturing industry, the industry itself consists of multiple clusters of related industries. These clusters are what makes a region uniquely competitive within the national and international economy. Within the Rockford MSA, these competitive clusters are primarily within the manufacturing industry- automotive manufacturing, metalworking technology, production technology, and aerospace vehicles make up some of the top traded clusters.⁴ The two largest clusters by employment in the Rochelle Micropolitan Area are distribution and e-commerce, and production technology. The largest traded cluster in the Freeport Micropolitan Area is Food Processing.

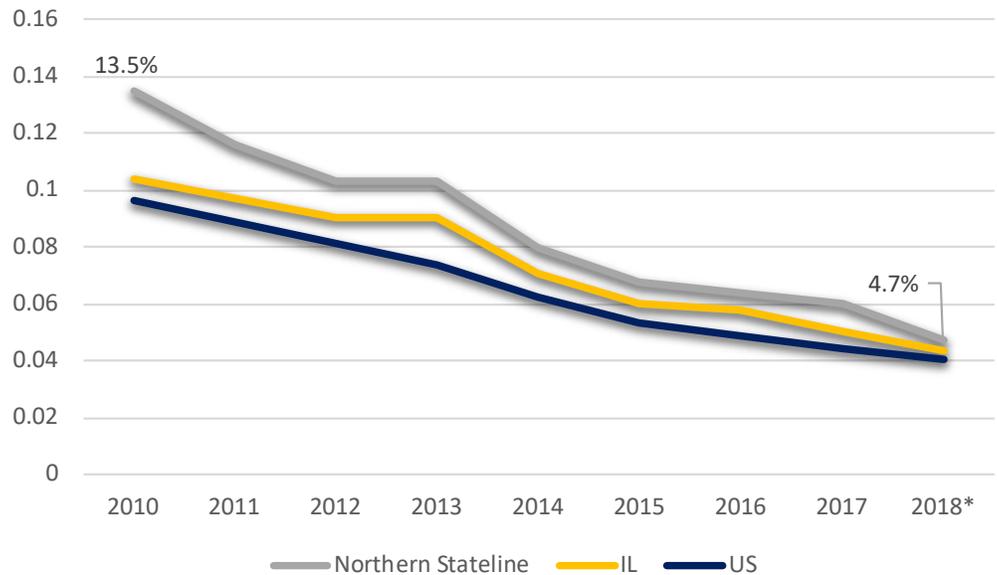
Cluster analysis can be an early step to inform economic developers, education and workforce training providers what kind of jobs we should be training the workforce for. All partners should keep abreast of the issues that would directly affect performance of the regions' clusters.

Unemployment

More jobs are being filled, and the Northern Stateline EDR's unemployment rate has been steadily decreasing since 2010. Preliminary estimates at the time of writing from the Illinois Department of Employment Security has the region's unemployment rate at 4.7%, compared to the state's 4.4% and the national estimate of 4.1% (Fig. 3). Though the region's unemployment is slightly higher than the state and nation, the size of that gap has since decreased since the 2008 recession and is the lowest it has been since.

This trend in unemployment is hopeful, but like many similar communities, the Northern Stateline region faces problems that will greatly affect the workforce in the near future. An aging workforce and a lack of workers to replace those retiring workers is often cited as a major challenge facing the economic future. While this trend is not unique to the 4-County region, our region does have a large portion of workers in the 55-59 and 60-61 age groups making up our workforce (Fig. 4). These proportions have also been steadily rising while the younger workers have remained relatively in stasis. Losing workers due to retirement is burdensome on all industries, but can be especially pronounced in manufacturing industries, where the skills and industry knowledge built up over years of work is often not easily replaced. Ensuring that our region is prepared as this older generation phases out of the workforce, taking with them their institutional knowledge and skills, will

Figure 3: Unemployment Trends in the EDR, State and Nation



Source: Illinois Department of Employment Security, LAUS tables

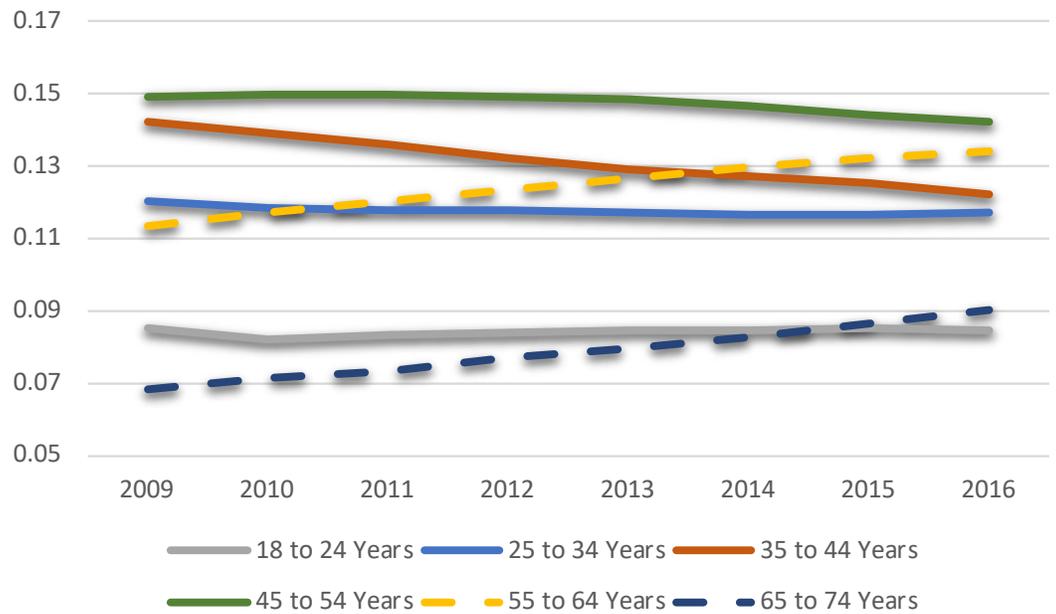
*2018 point reflects average unemployment from Jan.-Oct. 2018

be pivotal going forward. Educational and workforce providers will need to look to prepare newer generations with the knowledge, skills, and abilities that remain necessary for legacy jobs.

Additionally, our unemployment issues may just as well be skills issues, since many unemployed individuals may only need a slight skills realignment to re-enter a changing workforce. Strategies to combat unemployment should be focused on realigning the skills of the workforce to our changing economic environment.



Figure 4: Trends of Working Age Groups in the 4-County Region



Source: ACS 5-year Estimates 2012-2016

Table 4: Regional unemployment rates and median earnings by educational attainment

Unemployment Rates	Educational Attainment	Median Earnings
18.2%	Less than High School Graduate	\$19,644
8.3%	High school graduate or GED	\$30,831
6.1%	Some college or Associate Degree	\$33,974
3.5%	Bachelor’s degree or higher	\$49,236/\$61,533**

Source: ACS 5-year Estimates

**Bachelor’s (\$49,236) and Graduate (\$61,533)

Education levels also have impacts on unemployment and median earnings. Table 4 shows differences between earnings and unemployment between different educational levels in the region. The gaps are to be expected – having a higher level of education attainment equates to a higher median earning and a lower likelihood to be unemployed. However the gap between the earnings for a high school graduate and earnings for someone with some college or an associates degree is not as large as other areas in the country. This could be for a number of reasons. One reason is possibly due to a supply issue, where employers are forced to hire those without their preferred level of education

and still pay them at the level of an associates. Additionally, having some college or associates degree may not necessarily mean that an individual has the specific skills required for their industry. Despite this narrower gap, it could be that jobs held by employees at or higher than the employers' preferred education levels are more stable than those with an educational mismatch with the job.

Through employer input by way of our survey, we hope to better answer some of these questions. The roles that education and skills levels play within a company in this region and why they are valued will help educational and training providers promote their programs and show added value to regional employers.

Education

Table 5 shows the breakdowns in educational attainment in 2011 and 2016. For many other regions with an urban area, over half of the population has some sort of 2-year degree or more. However, the Northern Stateline region has a higher proportion of its population with just a high school degree, or some college (likely referring to certifications or other training). While these changes appear small, there is a trend towards associates degrees and “some college,” while the proportion of bachelors and graduate/professional degrees has remained static.

This makes sense, given the notion that industry growth in the region may be trending more towards “middle-skills” needs. The proportion of those with just a high school diploma, or no diploma at all has also decreased. This trend highlights the notion that middle-skill positions with educational requirements past a high school degree typically pay a lot more and are more secure than their low-skill counter parts, and students in the region are often encouraged to pursue such pathways.

Again, a regional focus on middle-skills would be aligned with these educational trends by supporting jobs that could be filled with those with an industry recognized certification, while also giving those with just a high school degree a path forward into the workforce. Middle-skill jobs will offer an opportunity for higher wages and opportunities for career advancement with the certifications aligned with High Priority Occupations (HPOs).

Table 5: Educational Attainment of the 4-County Region

Education Level	2011	2016
No HS Diploma	13%	12%
High School Graduate, GED, or Equivalent	36%	34%
Some college, no degree	23%	24%
Associate's Degree	8%	9%
Bachelor's Degree	13%	13%
Graduate or professional Degree	7%	7%

Source: ACS 5-year Estimates 2012-2016

Jobs Postings

A common way to measure current employment demand is to look at job postings data. Table 6 displays the top fifteen job postings by occupation in the 4-County Northern Stateline region in 2017. Ads closed signify jobs that are filled out of the total ads posted. Table 7 shows the annual jobs postings in the four-county region in 2017 by occupation. While many of the top job postings by occupation are Retail Salespersons, manufacturing-related occupations appear throughout the general job posting tables. Machine Operators are also the most common job specifically called out by title in job postings in 2017. Certifications listed in job ads, however, are almost entirely focused on the Healthcare sector (Table 8). Hospitals and other healthcare institutions may be more likely to include specific certification requirements in their job postings. As a whole, few job postings appear to call out the certification needs. This could be for a number of reasons:

- 1) employees can be trained or certified after accepting a position or as part of the employer training process
- 2) employers do not know what certifications are needed, or do not want to limit their job applicant pool with specificities
- 3) the certification is not common enough to warrant its inclusion in a job posting, or
- 4) the jobs search data query has trouble identifying common certifications, especially for production industries.

Regardless of the reason, this lack of information remains a challenge for workforce and education providers who would like to provide certifications or training tailored to certain occupations, as well as for our employers who need specific skills prior to hire.

Table 6: Jobs Postings by Title in the Northern Stateline Region

Job Postings by Job Title in Northern Stateline Region		
Job Title	Ads Closed	Total Ads
Machine Operator	164	187
Sales Associate	115	152
Babysitter	137	147
Customer Service Representative	124	144
Cashier	89	138
Assistant Manager	68	127
Assembler	111	120
Administrative Assistant	104	113
Maintenance Technician	94	108
Receptionist	87	102
Sales Representative	95	100
Laborer	90	91
Production Supervisor	70	87
Retail Sales Associate	78	82
Store Manager	52	82

Source: JobsEQ 2017 Annual Postings

Table 7: Jobs Postings by Occupation in the Northern Stateline Region

Jobs Postings by Occupation in Northern Stateline Region		
Occupation	Ads Closed	Total Ads
Retail Salespersons	1,736	2,218
Heavy and Tractor-Trailer Truck Drivers	1,526	1,878
First-Line Supervisors of Retail Sales Workers	829	1,198
Registered Nurses	865	1,083
Sales Representatives, Services, All Other	792	926
Customer Service Representatives	761	890
Maintenance and Repair Workers, General	733	864
Laborers and Freight, Stock, and Material Movers, Hand	706	777
Combined Food Preparation and Serving Workers, Including Fast Food	417	667
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	501	590
Production Workers, All Other	515	585
First-Line Supervisors of Production and Operating Workers	491	572
Medical Secretaries	456	532
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	477	514
Computer User Support Specialists	432	485

Source: JobsEQ 2017 Annual Postings

Table 8: Certifications in Job Postings in the Northern Stateline Region

Certificate Name	Ads Closed	Total Ads
<i>Certification in Cardiopulmonary Resuscitation (CPR)</i>	506	620
<i>Basic Life Support (BLS)</i>	307	374
<i>Class A Commercial Drivers License (CDL-A)</i>	278	358
<i>Certified Nursing Assistant (CNA)</i>	264	320
<i>Commercial Drivers License (CDL)</i>	114	140
<i>Certified Medical Assistant (CMA)</i>	93	115
<i>Licensed Practical Nurse (LPN)</i>	78	103
<i>First Aid Certification</i>	81	98
<i>HAZMAT</i>	63	84
<i>The American Registry of Radiologic Technologists (ARRT) Certification</i>	68	84
<i>Emergency Medical Technician (EMT)</i>	40	50
<i>Advanced Cardiac Life Support Certification (ACLS)</i>	38	49
<i>Registered Nurse (RN)</i>	36	43
<i>Medical Assistant Certification (MA)</i>	31	36
<i>National Phlebotomy Association Certified Phlebotomist</i>	27	36

Source: JobsEQ 2017 Annual Postings

Job postings directly related to the study’s middle-skills definition of occupations requiring more than a high-school degree and less than a four-year, or long-term occupational training (Table 9) can be filtered out as well.

The top occupational job postings under our middle-skills definition closely resemble the job postings for the full range of occupations. Based on job-posting analytics, it appears that these are the types of jobs that employers are consistently seeking to fill.

While jobs posting data is useful and help to make inferences about labor demand, there is still the potential for inaccuracies about employer demand, due to the nature of query-based jobs posting analytics.

Middle-Skill Jobs and Preliminary Analysis

Our employer survey, though based on a small sample of manufacturing employers within the region helps to determine employer demand for middle-skills. More specifically, the survey will shed light on the demand for certifications and training at a level beyond jobs posting data.

After literature review of middle-skills studies and similar reports to this one, there appears to be no agreed-upon definition of middle-skills or the occupations that qualify as middle-skills occupations for the purpose of analyzing relevant occupational data. Different middle-skills studies will use different techniques for classifying jobs into low, middle, and high skill groupings. Table 9 illustrates this issue by displaying three different methodologies, based on different employment data sets, commonly used to group jobs into skill levels.⁵

The **National Skills Coalition** methodology is based on the Bureau of Labor Statistics' (BLS) occupational groupings. They are divided into types of jobs based on *typical* educational and training levels of workers in those jobs.

- The BLS itself has a database of occupation descriptions called **O*NET**. This database classifies jobs by zones based on typical education, experience, and training necessary for those occupations. When comparing occupations within Job Zone 3 to our list of occupations, it appears that this methodology for classifying middle-skills is the one that became most similar to our own.
- **ACT** bases their middle-skills study definitions on their WorkKeys skill assessment program, which is used by Workforce Boards throughout the country. Certain occupations will have a “skills” status based on education requirements and WorkKeys assessments. While WorkKeys is an accepted method for workforce trainers to determine their own programs, it was too difficult to both use this data, and tie it to job projections.

Table 9: Various Definitions of Middle-skills

National Skills Coalition		O*NET	ACT
Method of Classifying Jobs	Occupational Category	Education, Experience, and Necessary Training	Level of Education and WorkKeys Skills Level
High Skills	<ul style="list-style-type: none"> Professional/technical Managerial 	Job Zones 4 and 5 - Considerable to extensive preparation needed	<ul style="list-style-type: none"> At least a bachelor's degree WorkKeys score of 6+
Middle-skills	<ul style="list-style-type: none"> Clerical Sales Construction Installation/repair Production Transportation / material moving 	Job Zone 3 - Medium Preparation Needed	<ul style="list-style-type: none"> Associate degree, postsecondary award, or on-the-job experience WorkKey score of 5 (sometimes 6)
Low Skills	<ul style="list-style-type: none"> Agriculture Service 	Job Zones 1 and 2; Little, no, or some preparation needed	<ul style="list-style-type: none"> On-the-job training (short, moderate, long) WorkKeys score of 4

Source: Achieve.org

While useful in their own contexts, these definitions differ in their specificity and their ability to be used as comparisons with workforce and jobs data. Complicating the issue further, not all jobs within an occupation may require a “middle-skills level of experience,” regardless of definition. This is another reason why a manufacturing employer survey was commissioned as part of this report - to get an idea of middle-skills demand in the region straight from the employers who may need them.

In order to project middle-skills needs on a regional level, a common definition of middle-skills for the Northern Stateline Region had to be reached which could be used with available employment data. In order to calculate middle-skills projections in the Rockford area, we primarily analyzed occupations (by SOC code), which had specific education and training requirements, but required less than a bachelor's degree. While this can never be a perfect representation due to factors such as differing



requirements between singular organizations, varying definitions of an occupation by organization, etc., we felt that aligning our middle-skills definition to occupations with the BLS job zone definitions, as other studies have done, would be the appropriate. Occupations requiring some sort of moderate to long term on-the-job experience were also included in our definition, mirroring part of the ACT definition for middle-skill jobs.

The following will serve as the Northern Stateline Middle-skills definition. An occupation is a middle-skill occupation if it fulfills one or more of these criteria:

- 1. Requires more than a high-school, but less than a 4-year degree**
- 2. Requires some kind of vocational training or certification**
- 3. Requires moderate to long term on-the-job experience**
- 4. Requires previous work experience in a related field**

No definition of middle-skills based on occupational requirements is perfect, but this definition presents the best way forward given data availability on employment projections from the Illinois Department of Employment Security (IDES) and other labor market analytics tools.

Further Examining of the National Skills Coalition Middle- skills Estimates

While it may seem like the majority of jobs would have at least one of our four qualifiers for middle-skill jobs, for most states, and in the country, these account for around half of total jobs. The National Skills Coalition, using their definition, found that in 2015, 53% of the jobs in the United States classified as middle-skill, and projected between 2014 and 2024, 48% of job openings will be at the middle-skill level. 53% of jobs in Illinois are classified as middle-skill as well, but 50% of job openings in that same timeframe will be at the middle-skill level. (Figures 5 and 6)

From our analysis on middle-skill job growth using employment projections (pages 23-26), and our employer survey results, it is clear that differing definitions help to shape the narrative surrounding the need for middle-skill jobs. It is easy to show that the majority of jobs are middle-skills level, however the conversations must revolve around the importance of these jobs.

Figure 5: NSC Estimates for Illinois Jobs 2014

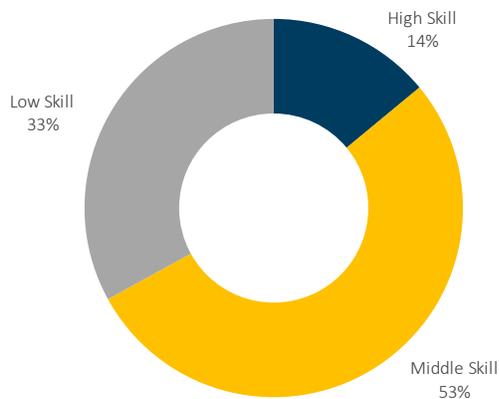
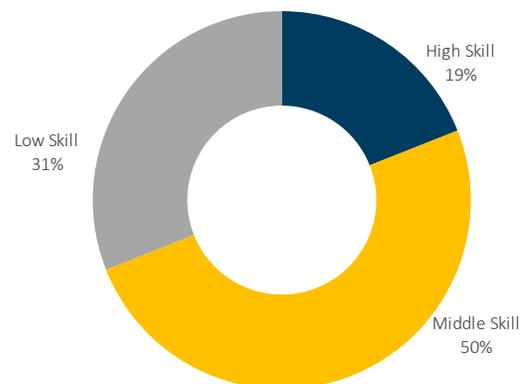


Figure 6: NSC Projections for Illinois Jobs 2024



43.4%

occupations in the region are Middle-skills

39.2%

openings in the region will be Middle-skills

Using our Northern Stateline Definition for middle-skills, occupations could be classified as a “common middle-skills occupation,” then queried into employment projections tables to answer the question “out of the current and forecasted jobs in the region, how many of those jobs are middle-skill?” By summing occupational middle-skill numbers, we can derive a total for all middle-skill occupations.

We ran two models that accomplish that. The first from JobsEQ includes the entire 4-county region and uses the forecasting modeling provided by JobsEQ, based on historical trends in occupational employment, wages, LQ (comparative advantage), unemployment, and job postings. This results in a fairly conservative forecast of middle-skills employment. For our region, 84,575 of the 194,756, or **43.4% of total jobs** classify as middle-skill. **39.2% of total openings** within the next five years are forecasted to be in middle-skill occupations (Tables 10 and 11).

The second table is the same methodology, but uses 10-year employment projections from the Illinois Department of Employment Security (IDES). These projections are based on US Department of Labor methodology and result in a much more positive outlook on job growth. Public IDES employment projection data is also only available on the Local Workforce Investment Area geography, meaning this reflects Boone, Stephenson, and Winnebago County employment, but not Ogle. Regardless of the differing projections and geography, IDES estimates that **41.3%** of jobs in the three-county region classify as middle-skills, and openings in middle-skills occupations will account for **36.6% of total openings** in the next ten years (Tables 12 and 13).

Table 10: Occupation Snapshot of Middle-skills Occupations in the Northern Stateline Region.

Four Past Quarters Ending with 2018q3

Title	Empl	Avg Ann Wages	LQ	Unempl	Unempl Rate	Online Job Ads
Middle-skills Occupations	84,575	\$42,200	1.15	3,734	4.0%	4,541
Total - All Occupations	194,756	\$44,400	1.00	-	-	10,433

Source: JobsEQ

Table 11: Occupation Snapshot of Middle-skills Openings in the Northern Stateline Region.

Five-Year Forecast

Title	Empl	Avg Ann % Change	Total New Demand	Exits	Transfers
Middle-skills Occupations	2,406	0.6%	39,175	17,047	24,888
Total - All Occupations	6,067	0.6%	99,933	44,570	60,127

Source: JobsEQ

Table 12 Occupation Snapshot of Middle-skills Occupations in the Local Workforce Area 3.

10-year Projection of Employment and Change

Title	Employment		Change	
	2014	2024	2014-2024	
	Estimated	Projected	Net	Percent
Middle Skills Occupations	74,370	78,503	4,133	5.6%
All Occupations	180,223	191,175	10,952	6.1%

Source: Illinois Department of Employment Security

Table 13: Occupation Snapshot of Middle-skills Occupations in the Local Workforce Area 3.

10-year Projection of Openings

Growth		
2014-2024 Openings		
Growth	Replacement	Total
507	1,531	2,038
1,284	4,285	5,569

Source: Illinois Department of Employment Security

41.3%

occupations in the region are Middle-skills

36.6%

openings in the region will be Middle-skills

From this analysis, it seems that middle-skills do in fact make up a large portion of the Northern Stateline economy, and that this trend will continue, not only from potential growth in the industries, but from replacement of the current workforce. They will continue to offer long-term opportunities for workers in the region.

Despite all of this data, we still need to know what specific middle-skills jobs, requiring more than a high school degree, but less than a bachelor's degree, specific certifications, or moderate-to-long-term training, are needed by employers in the region. In the following section, the employer survey seeks to learn from manufacturing companies within the 4-County Northern Stateline Region and answer questions about which certifications and jobs should be investing in order to prepare the region so that it can succeed in the future.



Section II

Survey Overview

Between September and November, the Region 1 Planning Council conducted the employer survey targeting businesses within the 4-county area. The survey was made up of manufacturing business contacts provided to the RPC from the four Economic Development Corporations within the Boone, Winnebago, Ogle, and Stephenson Counties, as well as other contacts provided by business leaders. The business representative contacted was often an HR Manager, Plant Supervisor, or in some cases, an Executive. The request to our economic development partners was that companies were manufacturing industries as defined by the North American Industry Classification System (NAICS), which have a physical presence within the region. In total, our business list consisted of 370 manufacturing companies within the Northern Illinois Region. Of those companies, we managed to get 80 responses, for a 21% response rate. The average size of the companies surveyed was 153 employees, while the median size was 56. The respondents represented a wide range of production occupations, of varying workforce sizes, and economic output, and represented a sound and statistically significant representation of manufacturing business environment within the Northern Illinois Region.

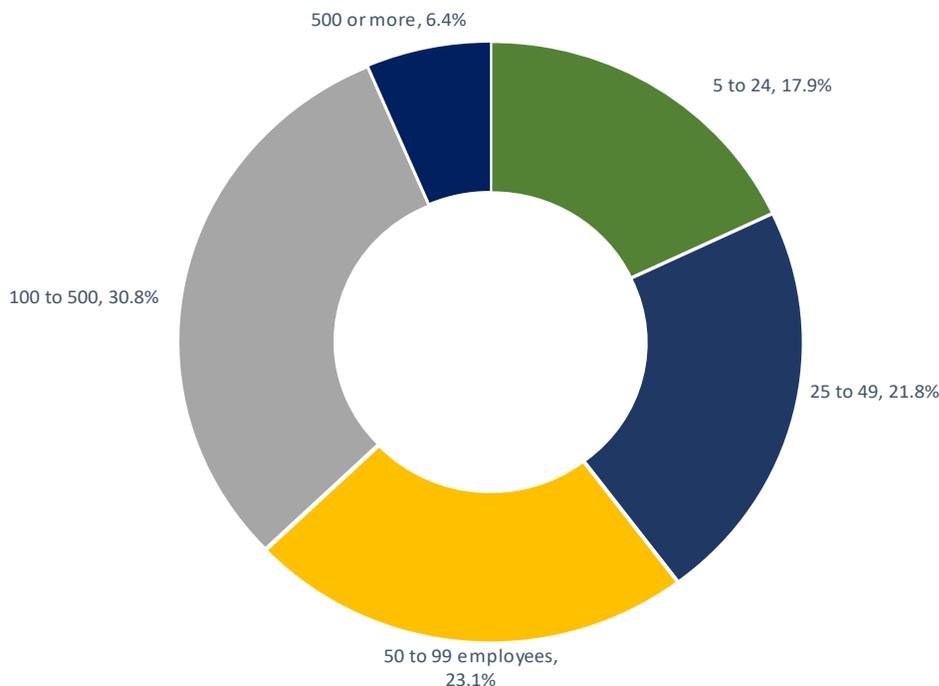
An employer survey was important to this process because the definition of middle-skills can vary greatly, and any analysis of employment numbers, projections, etc. would be limited by assumptions of a definition of middle-skills jobs that do not actually reflect jobs, but occupations. As mentioned in Section I, this semantic problem is persistent among many existing analyses on middle-skills that do not include an element of employer outreach. So

while the data presented in Section I is still valuable in showing the demand and importance of middle-skills in the region, it does not tell the entire story. For example, not every production job posting is for a job that classifies as middle-skill. A production job may be classified as a middle-skill by generic definitions, but a specific posting may require an engineering degree, or nothing at all.

Because of the focus of this study, the businesses targeted were those in manufacturing or production-related fields. Our assumption was that these companies would be those whose employees were largely made up of those requiring or having middle-skills. This was not entirely the case, as some employers reported hiring more low-skill employees, or high-skill engineers depending on the size and function of the company. Despite this, we feel that we received an accurate representation of middle-skill needs and details related to those needs, directly from companies that benefit from those skills.

The survey consisted of 15 questions asking companies about their current and future hiring trends. Though some questions were similar to employer surveys conducted by workforce and economic development institutions, the heart of the survey consisted of questions directly asking about a companies’

Figure 7: Employment Size of Companies Surveyed



Hiring Trends

typical needs for employee skill-levels. Companies were asked about their current and future skill-level needs and estimates of their future openings among those skill-levels. Companies were also asked to detail qualifications, abilities, and general soft skills that were lacking in their organizations among their applicants. A copy of the survey instrument can be found in **Appendix A**

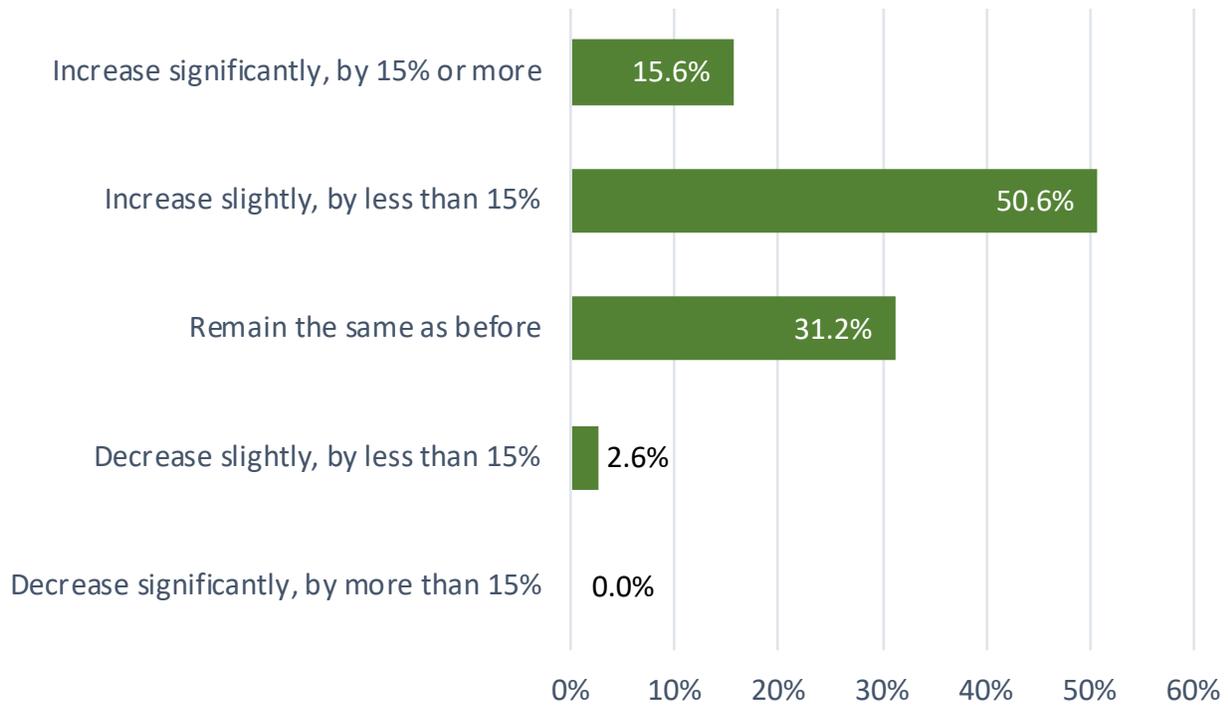
When asked about employment level changes within the next year, half (50.6%) of the respondents reported that they planned on *increasing their employment* slightly, and a portion (15.6%) reported that they expected a *significant increase*. In employment projection surveys for other regions, the reports for an unchanging employment level are usually around 50%, but for this region the *remain the same* responses were much less (31.1%). The reports of decreasing employment were still negligible, though it would be understandable to assume employers would not want to report employment contractions.

The survey also had a question asking about the past year's turnover rates. The numbers varied greatly depending on the size and output of the business. Despite this, an average turnover rate of 12.9% of those surveyed seemed to be in the correct ballpark. The rates varied from as low as 0% to as high as 70%. Turnover rates are consistently monitored internally by workforce development partners, so it would be useful to see how this changes in the future. If the reasons for employee turnover is directly related to the needs addressed in this report, then turnover will serve as a benchmark for programmatic success.

Average
turnover rate
of **12.9%**

Regional employment trends can be difficult to predict, especially in the manufacturing sector, which by nature can be more impacted by external macro-economic shocks and booms than local or non-traded industries. However, the fact that many of Northern Illinois' manufacturers seem to expect to increase their employment, rather than keep it the same may speak to the general health or optimism for the manufacturing industry in the region.

Figure 8: Future Hiring Expectations of Companies Surveyed



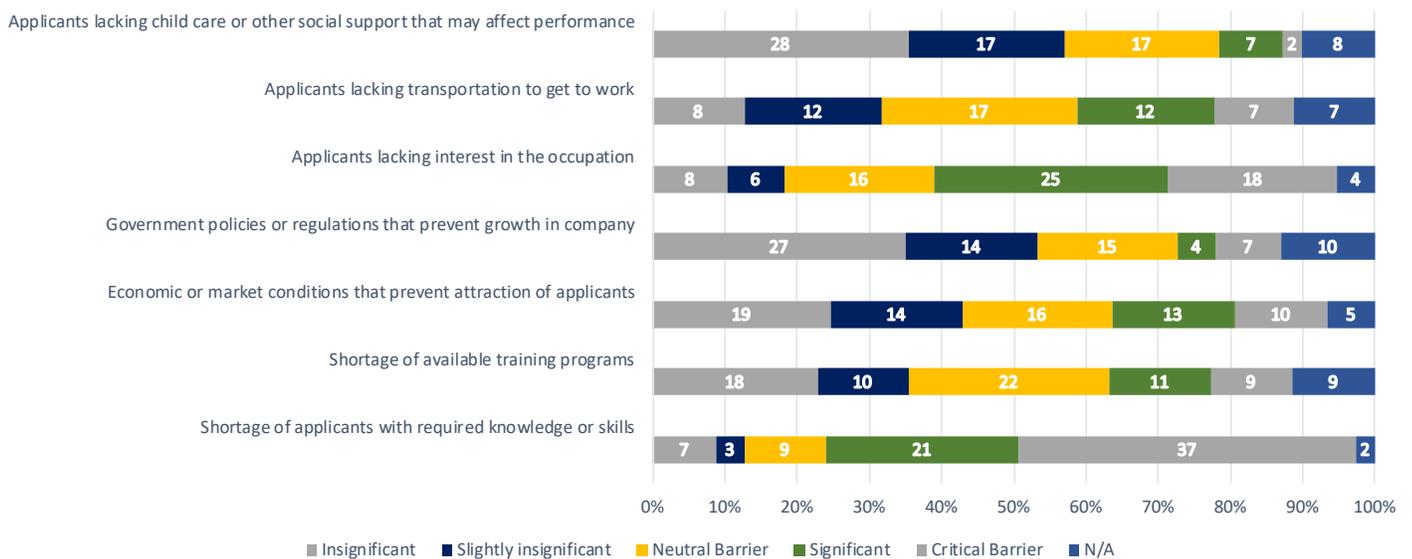
65% of employers expect to increase their employment levels

Barriers to Expanding Employment

Employers were surveyed about their perceived barriers to expanding employment. Unsurprisingly, the top critical barrier cited was the *shortage of applicants with required knowledge or skills* (48%). **This answer alone can help to justify any steps taken to fill the skills gap**; employers feel that finding talent that meets the knowledge or skills needs of their organization is difficult. This specific question of “Do your applicants have the required skills for your positions” needs to be continuously asked in order to monitor the effectiveness of *any* future upskilling programs. Reaching out to employers with this question can workforce and educational partners be more responsive in the implementation and improvement of their programs

The second most cited barrier was *applicants lacking interest in the occupation* (23%). Similar responses were also mentioned in the open ended inquiries into soft-skills needed. Applicants, and often even new hires don't have any desire to work or an interest in the field. This is also an issue that could be unique to the manufacturing industry and middle-skill jobs in general. Much has been done in the Northern Illinois region to introduce the young, upcoming labor force to the diverse manufacturing field and dispel some of the long-standing negative assumptions about the industry. This is an ongoing battle and should, again, be monitored closely to determine the effectiveness of manufacturing industry informational efforts.

Figure 9: Barriers to Expanding Employment





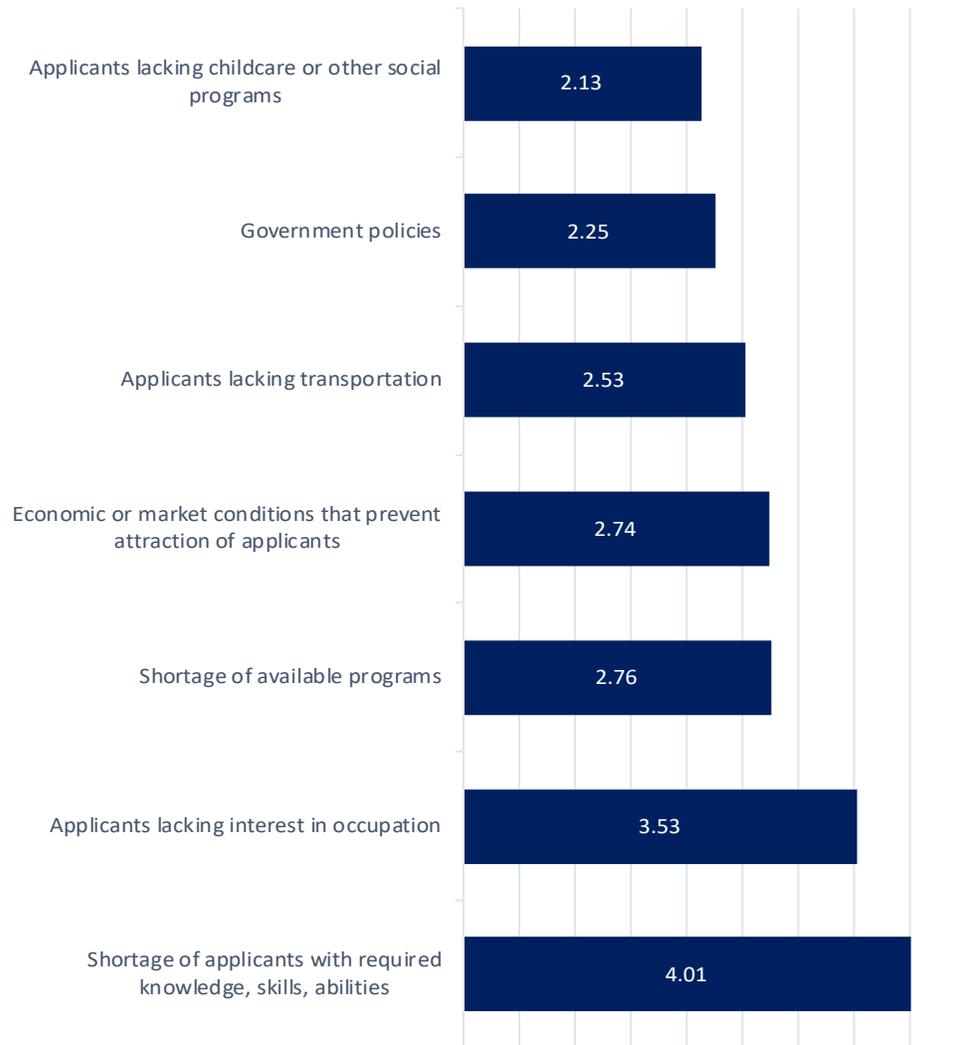
Other listed barriers did not seem as significant, though there may be enough to justify further examination. *Lacking transportation to work* and *Economic and market conditions* seemed to generally be more important than the answers of *lacking child care/social support* or *government policies or regulations that prevent growth*. *Economic and market conditions* seemed to be a polarizing barrier, as there some cited it as either a critical barrier or insignificant. Regardless, such barriers do have an impact on expanding employment, and should still be acknowledged and addressed both internally and through workforce partnerships. A shortage of applicants with the required knowledge and skills still seems to be the most important and pervasive barrier pressing manufacturing industries in Northern Illinois.W

There were also an area on this question where employers could fill out other pressing barriers that they have been facing when trying to increase their employment levels. Some of these could be classified as one of the provided categories, or also appeared in a future soft-skills question, but the fact that they were specifically called out highlights how important they are to employers. These *other barriers* are listed below.

- Lack of skilled trades, or not qualified for position: Called out or similar language used **7 mentions**
- Lack of attendance: **3 mentions**
- Lacking desire to work: **3 mentions**
- Failing a drug test or pre-application physical: **2 mentions**
- Not willing to work required hours: **2 mentions**
- Lack of knowledge of available jobs
- Lack of motivation
- No pride in work
- Size of applicant pool is small
- High turnover
- Welfare benefits outweigh employment benefits
- Outsourcing
- Low pay

Employers were also asked to rank the criticality of their barriers they chose using a five-point scale with five being the most critical barrier. Since the most critical barrier by far was a *shortage of workers with required knowledge, skills, or abilities*, this had the highest weighted average. However, *Applicants lacking an interest in the occupation*'s average was comparable, and a *shortage of available training programs* and *economic or market conditions* have a significant average ranking as well.

Figure 10: Importance of Barriers

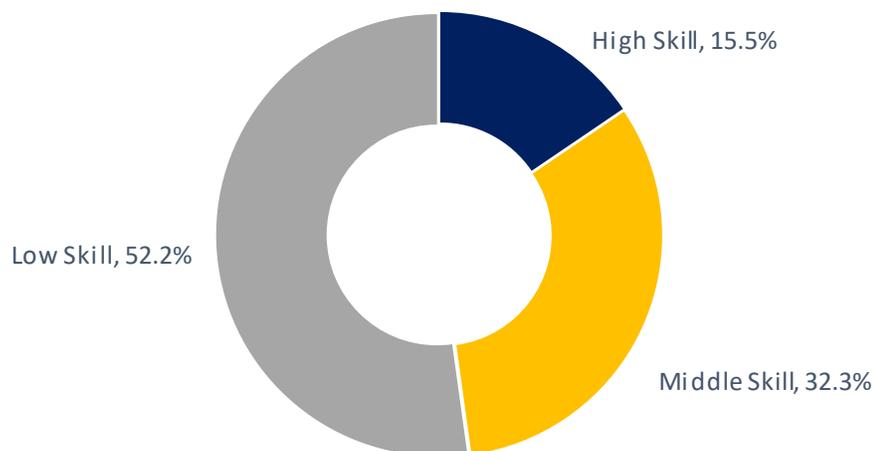


Skill-Level Needs

Employers were asked about their breakdown of future skill needs within their organizations. This breakdown among the surveyed manufacturers was that 15.5% of their employees were high-skill, or required a 4-year degree or more; 32.3% of their employees were middle-skill, requiring more than a high school but less than a four-year degree; and 52.2% were low skill, or required a high school degree or less. These locally reported estimates differed greatly to the National Skills Coalition's 2015 estimates for the state of Illinois (Page 22). When comparing the two estimates, it appears as though middle-skills and low-skills needs are reversed in our sample. This is because, as outlined in Section I, NSC's methodology for defining middle-skills differs from ours. Additionally, our sample is only of manufacturers, when NSC estimates are based off of all employment in all industries. The projected 10 year estimates from 2014-2024 are also shown, where NSC predicts that in Illinois the share of low-skill and middle-skill jobs will decrease in favor high-skill jobs. Whether or not this projection will be the case in Northern Illinois region as well will remain to be seen.

The same skills-breakdown question was also asked for their 1-year future estimates, as well as their 3-year estimates (figures 12 and 13). In one year the

Figure 11: Reported Current Skill Level Needs



surveyed employers estimated they would need to hire or replace 352 high-skill employees, 585 middle-skill employees, and 1264 low-skill employees. In three years those employers estimated needing to hire 402 high-skill employees, 701 middle-skill employees, and 1722 low skill employees. When proportioned out, both projections seemed to favor low-skill workers. Because we asked this question in terms of a raw number estimate of new and replacement hires, this is likely due to the inherent higher turnover for lower-skill employees when compared to middle or high-skill employees. While this study is focused primarily on employers' middle-skill needs, the importance of low-skill positions and the prevalence of high turnover rates should not be ignored, since replenishing low-skill positions can be a major source of frustration among businesses. In an ideal future, all ends of the skill-spectrums can be supported by our region's educational workforce professionals.

Based on our survey sample of manufacturers, middle-skills jobs do present a large portion of the manufacturing workforce. Other industries with a high portion of middle-skills positions such as transportation and logistics, healthcare (via nurses, medical tech, assistants, etc.), and food processing may have similar needs and should be examined in the future. Because analysis has not been done at the regional level prior to this survey, we would suggest that questions asking about middle-skills be continued among those who regularly administer workforce-related surveys in order to keep track of skill-level trends in the region.

Going forward, organizations which collect workforce surveys should implement a regional approach and collaborate with regional Economic Development Organizations and other WIOA providers.

Figure 12: Reported Skill Level Needs in 1-year

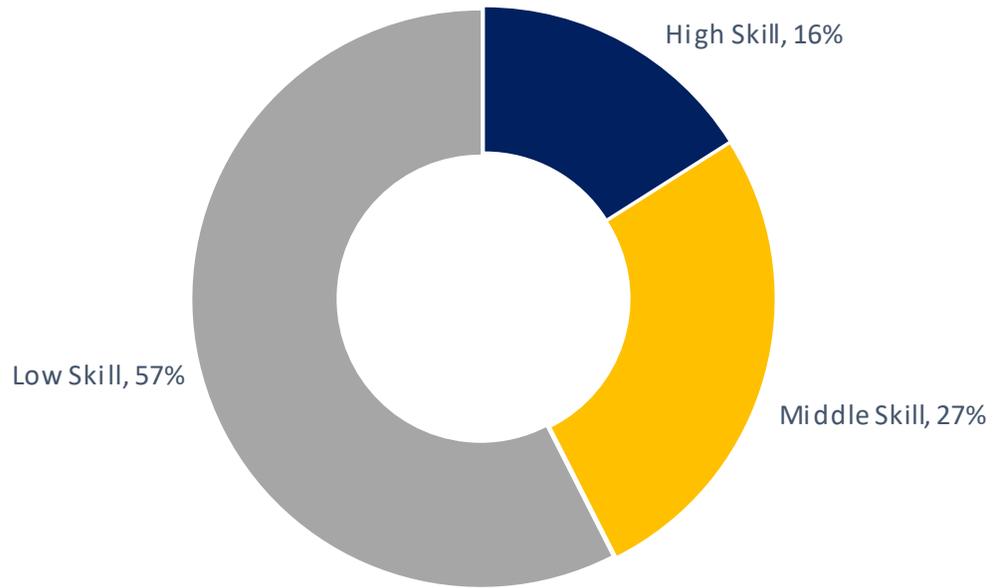
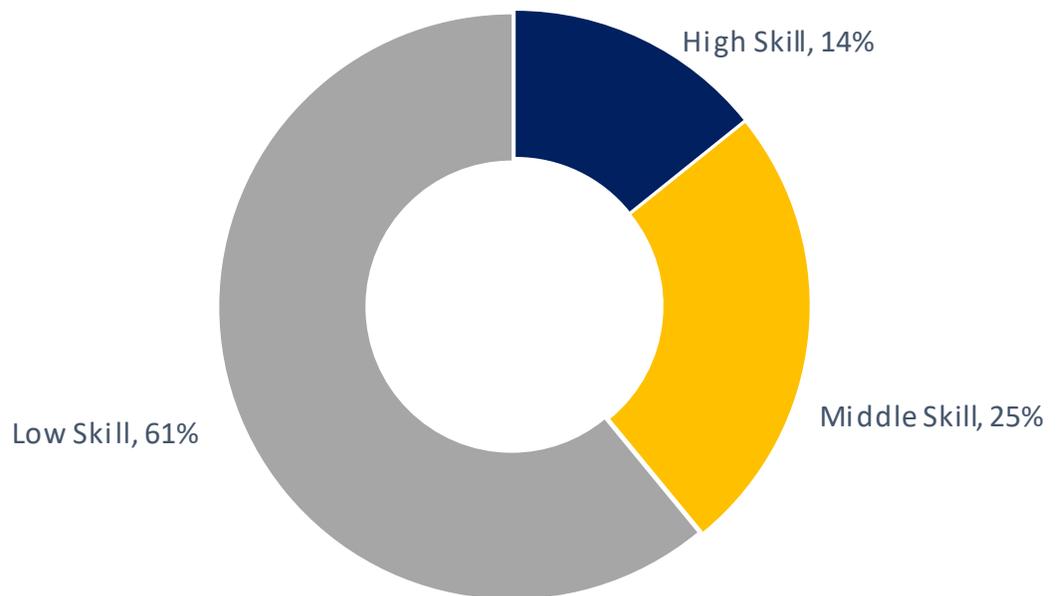


Figure 13 Reported Skill Level Needs in 3-years



Most Important Occupations Requiring Middle-skills

In order to determine the specific job titles requiring middle-skills, we simply asked employers to write down their most important occupation requiring middle-skills, then their second and third most important, if applicable. For each of those categories, employers were asked to estimate how many replacement and new hires would be required in those occupations within the next three years. A brief text analysis was performed to determine the most mentioned positions by keyword, and their corresponding new and replacement hires (table 14).

Machinists (23 mentions) were the most mentioned position requiring middle-skills that employers needed, followed by *Operators* (19), and *CNC* (13). Given that often machinists, operators, and CNC users can refer to more-or-less the same thing, this need is likely more than what is represented here. Welders were also listed as an important occupation, as well as maintenance workers.

Table 14: Reported Most Important Middle-skills Occupations in their Company

Occupations	Most Important	Total Mentions
<i>Machinist</i>	18	23
<i>CNC</i>	11	13
<i>Operators</i>	10	19
<i>Welders</i>	7	11
<i>Maintenance</i>	7	12
<i>Quality Control</i>	3	7
<i>Sales</i>	3	4
<i>Electricians</i>	3	5
<i>Toolmakers</i>	2	5

Again, *machinists*, *operators*, and *CNC* had the highest number of replacement and new workers expected (table 15). These are in high demand because the largest employers reported these as their most important occupations. However, they were all among the most mentioned occupations as well, so the importance of these occupations stands. *Maintenance technicians* appeared to be a position that will require many replacements, though few new hires. The same goes for *welders*. Maintenance technicians and welders are likely positions where either turnover is high, or are

positions where a set number of employees is stable and does not require expansion as often. The higher numbers across the board for replacement workers also highlights the fact that employers know that given the aging workforce, finding good replacement workers can be more vital than adding new employees. *Electricians* appear to be in demand by the few businesses who mentioned them. Other positions mentioned with a small amount of replacement and new workers expected included *platers, finishers, supervisors, vehicle technicians, and office assistants*. It should also be noted that not every respondent reported a need for expected new or replacement hires in their most important position requiring middle-skills.

Table 15: Reported Replacements for Middle-skills Occupations in their Company

Occupations	Replacement	New
<i>Machinist</i>	92	78
<i>Electricians</i>	50	41
<i>Maintenance</i>	43	3
<i>CNC</i>	33	15
<i>Welders</i>	33	13
<i>Quality Control</i>	16	10
<i>Operators</i>	10	5
<i>Toolmakers</i>	4	7
<i>Sales</i>	2	3

Certification and Skill Needs for Middle-skill Occupations

Manufacturing employers were asked about corresponding certifications for their listed priority middle-skill positions. These ranged from short answers of specific credentials to long descriptions of all of the skills and certifications an employee in that position may need. Because of this variance, a text analysis was used again to pull out key words and themes among responses. Unlike the occupation needs text analysis, certain keywords were combined for ease of analysis. For example, CAD skills and certifications here also include machining skills, and Mathematics also includes mentions of computation.

Because Machining and CNC Operators were the most cited middle-skill needed by our survey sample, it is no surprise that the most mentioned certification/skill was for CNC as well. 27.9% of respondents listed CNC as their important skill requirement. (Table 16). Reading skills (10.3%) were commonly listed as the most important, often in the context of reading

measurements, blueprints, routings, and also instructions. Likewise, Mathematics skills (8.8%), measurements (7.4%) and CAD/blueprints (4.4%) themselves were also mentioned in tandem with each other. While these may seem like very basic skills, the fact that they even show up in these tables is notable and shows that these foundational skills are necessary for success within the manufacturing industry.

Table 16: Reported Middle-skill Needs in their Company

Keyword	% Ranked Most	% Ranked Next Most
	Important	Important
<i>CNC</i>	27.9%	13.6%
<i>Reading</i>	10.3%	13.6%
<i>Mathematics</i>	8.8%	6.8%
<i>Welder</i>	8.8%	18.2%
<i>Measurement</i>	7.4%	9.1%
<i>Computer</i>	7.4%	2.3%
<i>Control</i>	7.4%	6.8%
<i>Associates</i>	5.9%	6.8%
<i>CAD/blueprints</i>	4.4%	2.3%
<i>Maintenance</i>	4.4%	9.1%
<i>Forklift</i>	2.9%	4.5%
<i>Previous Experience</i>	2.9%	4.5%
<i>Repair</i>	2.9%	9.1%
<i>Safety</i>	1.5%	0.0%
<i>Leadership</i>	0.0%	4.5%
<i>Accounting</i>	0.0%	4.5%

Welding certifications or skills, while not topping the list of most important middle-skill needs, were the second most mentioned certification need (22.1%) in this group of questions, second only behind CNC (39.7%) (Table 17). Again, the core foundational skills of reading, mathematics, and measurements topped the list of most mentioned skills and certifications. Maintenance (14.7%) and Repair (10.3%) were also commonly mentioned certification and skill needs and seem to reflect the constant need for machine servicers and repairmen within the manufacturing industry. Quality Control (13.2%) was the other certification/skill need that topped 10%.

Associate's degrees, while often thought as less of a certification or skill, was mentioned by 11.8% of respondents. Previous Experience (7.4%) was also mentioned. These two things, in tandem with the rest of the common keywords, mean that generally employers want a variety of signals that an employee can be successful. Employers want credentials plus experience and education. **Credentials are not effective on their own.** Thus, any stackable credentials should not be a sole qualification, but be a means to supplement or show experience and/or education within a field.

Some industry specific skill and certification needs were called out as well. For example, various American Welding Society specification codes D1.1, D14.4, and D17.1 were specifically mentioned. Journeyman Machining certifications were also specifically called out, as well as certifications from the American Society for Quality (ASQ). Other answers were non-specific, where employers are asking for any sort of machining or manufacturing certificate. It appears as though larger organizations were more likely to call out specific skills or documented certifications than the smaller ones. Certain training programs that already exist in the region can help employees earn these specific credentials, however, it is important to note that while we may suggest a new form of training within this report, there also exist tried-and-true means to obtain certifications which employers already seek out.

Educators and workforce providers have the flexibility to create robust programs by building specific certifications or skills into that program. Relationships with employers can help to determine what those specific certifications or skills may be.



Table 17: Reported Documented Certification Needs in their Company

Keyword	% Total Mentioned
<i>CNC</i>	39.7%
<i>Welder</i>	22.1%
<i>Reading</i>	19.1%
<i>Mathematics</i>	14.7%
<i>Measurement</i>	14.7%
<i>Maintenance</i>	14.7%
<i>Quality Control</i>	13.2%
<i>Associates</i>	11.8%
<i>Repair</i>	10.3%
<i>Computer</i>	8.8%
<i>Forklift</i>	7.4%
<i>Previous Experience</i>	7.4%
<i>Leadership</i>	7.4%
<i>CAD/blueprints</i>	5.9%
<i>Accounting</i>	4.4%
<i>Safety</i>	2.9%

Methods for Training in Middle-Skill Occupations

It is important to determine what the most common practices for training employees in the manufacturing field are, so that any programs or systemic workforce changes that target middle-skills can either supplement current employee training practices, or fill in areas where employee training may fall short. On the survey, we asked employers to check listed training methods from a list that they currently use for their most important occupations that consistently require filling (table 18).

Across all industries, the most common training method is on-the-job training (OJT), so it is no surprise that it was the most reported training method by surveyed employers (Fig. 14).

Realistically, no workforce or educational program can replace traditional OJT, where the most important parts of a position and specific company procedures can be learned. **Any program that targets middle-skills should look to supplement or work in tandem with the training that employees will receive OJT as well as any other training methods specific to a company.**

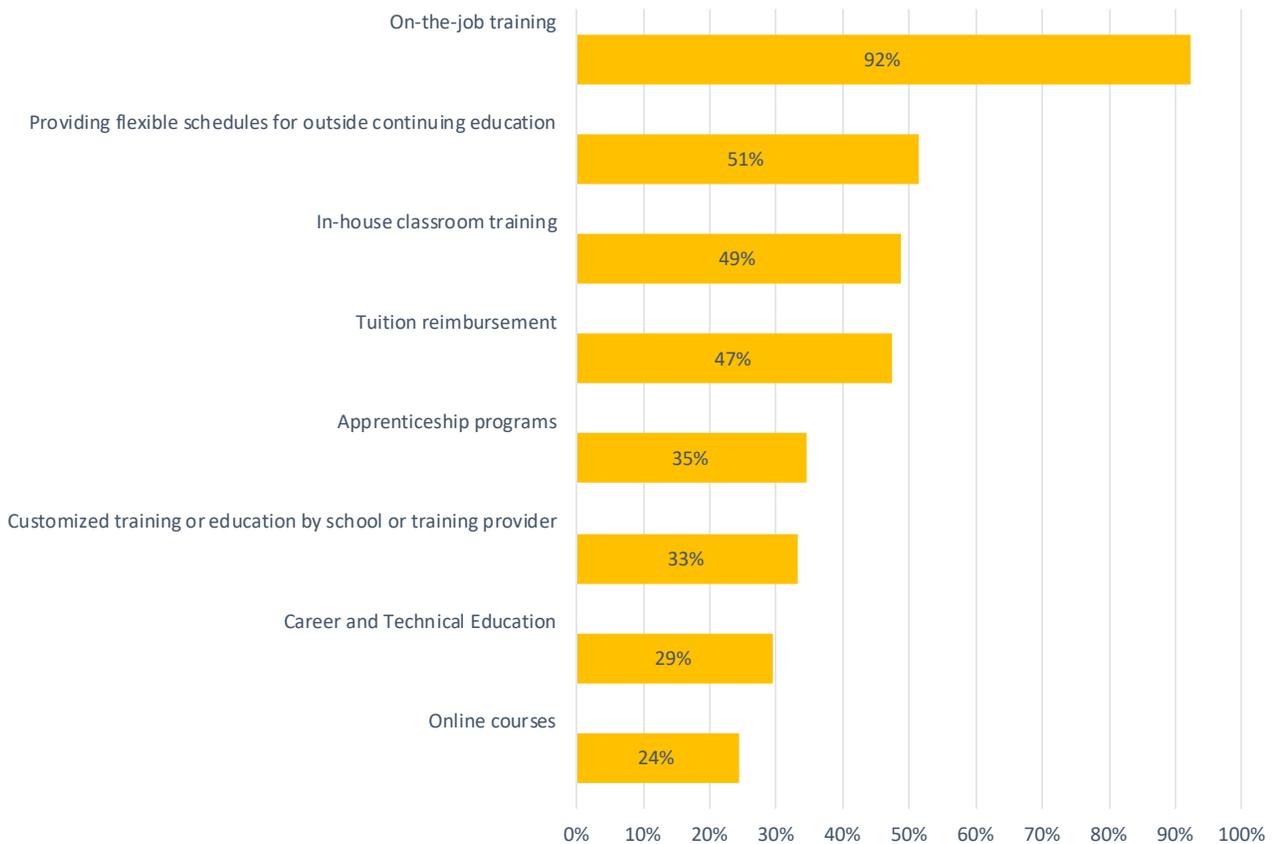
Table 18: Survey Definitions for Training Methods

In-house classroom training	Instructor-led classroom training that occur on- or off-site and are facilitated by trainers who are either employees themselves or outside specialists. Training sessions themselves could be a variety of styles or a mix, such as lecture-style, or exercise focused.
On-the-job training	Employee training at the place of work while he or she is doing the actual job. This is often supervisory and/or hands-on training. It may or may not be supported by in-house classroom training. An outside specialist or experienced employee may serve as the trainer.
Apprenticeship programs	Employer-driven “learn-while-you-earn” model, which combines on-the-job training with job-related instruction for credentialing in the field. Apprentices may be new hires, or current employees who need skill upgrades.
Customized training or education by school or training provider	This refers to training done by local public-private workforce providers. The Workforce Connection would be the primary institution in this region. They provide career services and workforce training and up-skilling.
Career and Technical Education	Also known as: Vocational Training. Hands-on courses and programs, usually at a career or technical college, which emphasize a single skill or trade with the goal of obtaining credentials to go into a specific field. Are often combined with apprenticeships.
Tuition reimbursement	Employer reimburses the cost of attending higher education and upskilling for current or future employees at physical locations, or online.
Online courses	Employee takes online courses provided by educational institutions or training providers in order to obtain a credential. Employers may reimburse fees associated with courses (in which case, check tuition reimbursement as well)
Provide flexible schedule for outside continuing education	Employer supports employee upskilling by allowing flexible working hours. This is separate from the employer supporting employee upskilling through financial means.

Other than on-the-job training, the responses to the other training methods were varied. In-house classroom training, which may coincide with OJT training was used by about half of the respondents. Interestingly, *providing flexible schedules for continuing education* (51%) and *tuition reimbursement* (47%) were also chosen by about half of the respondents. This could speak to employers' confidence in the regional educational system for certifications or other credentials. On the other hand, responses that were meant to signify traditional workforce board programs such as vocational, or customized training programs were not as heavily selected. Though these tailored workforce programs may be successful among employers who have used them, some programs are fairly new, having been implemented after the adoption of the Illinois Stateline WIOA Plan in 2017.

Employers not reporting use in a program because it is untested would apply regardless of where the program is housed. Because of this, training methods should be continually promoted, monitored and improved, especially as new programs that target middle-skills are implemented.

Figure 14: Methods Used to Train for Middle-skills Positions



Soft Skills or Other Skill Needs

In order to gauge shortcomings of job applicants that were not only about typical hiring barriers or specific manufacturing related-skills and certifications, we asked a question related to soft skills shortages. Workplace success is not just reliant on having the technical and experiential knowledge in a field, but also how one interacts with others and carries themselves in the workplace. We wanted to assess some of the soft skills that manufacturing employers found most important for their middle-skill positions. While a little over half of the respondents had input on this question, the soft skills that were mentioned are useful for workforce training and education partners to see what other types of training outside of traditional hard skills training would be useful for regional employers.

Instead of listing some of the common soft-skill problems often seen in the workplace, we decided to ask about soft-skills and other skills needs in an

open-ended format. These skill shortcomings applied to those middle-skill positions that employers listed as being the most crucial to their organization. A text analysis to pull out key themes from employers' open ended responses (table 19).

Lack of attendance or punctuality (58.1%) was by far the most mentioned soft skill or other shortcoming among employees in middle-skill positions. This is no surprise, as many analyses of workplace soft skills, for any industry, show a similar finding. It was noted in some responses that this is a trend that not only affects

employers' low skill positions, but middle-skill positions as well, where soft-skills issues may be less expected. Responses involving a *lack of desire to work, work ethic, or lack of ambition* and *communication skills* were both mentioned by a quarter of respondents. *Leadership, group skills, and interpersonal skills* were also a recurring theme.

Interestingly, responses involving a *lack of skilled trades, not qualified, or not enough trainings* were also mentioned by nearly a quarter of respondents, despite other questions in the survey focusing on this issue. This just highlights the idea that some employers are not getting the qualified workers they require for their positions.

These skill-level responses, coupled with input related to barriers to hiring, turnover rates, training methods, and what an ideal worker would have when



Table 19: Most Mentioned Soft Skills Shortages among Middle-skills Workers

Key Themes	% Mentioned
<i>Lack of attendance</i>	58.1%
<i>Lacking desire to work, ethic, ambition</i>	25.6%
<i>Communication</i>	25.6%
<i>Lack of skilled trades, not qualified, not enough training</i>	23.3%
<i>Leadership, group, team skills, interpersonal skills</i>	14.0%
<i>Responsibility, dependability</i>	9.3%
<i>Not willing to work required hours</i>	9.3%
<i>Failing drug test or pre-application physical</i>	2.3%
<i>Lack of knowledge of the available jobs</i>	2.3%
<i>Language barriers</i>	2.3%

they start work, will help to meet the end goals of a larger workforce planning effort. Through this survey, educational institutions, as well workforce and economic development organizations can better understand what specifically employers need from their employees, and how these organizations can meet the needs of manufacturing employers in a way that adds value and increases efficiency. Middle-skills shortages are just one facet of an ever growing workforce challenge. However, adapting to a changing economy, business environment, and demographic shifts is not a new concept to the Northern Illinois Region. Through the work we have gathered here, programs can be tailored to not just show that the region is responding to these changes, but that it is adapting and laying the foundations for a strong workforce system. In the following section, some current programs that tackle the middle-skills gap will be examined, as well as outlining a potential program aimed at directly addressing some of the critical core manufacturing skills outlined within the survey.

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Section III

Recommendations and Ways Forward

So far, this report has looked at the middle-skills shortage in the region's manufacturing industry, both by looking at data, and by actually talking to employers about their workforce. While demonstrating that there is need is important, there must also be a means to address those needs and move the region's workforce forward.

The following section will give a few brief examples of some initiatives within the community which seek to address a middle-skills gap. We will also suggest a specific initiative, for now called the Critical Core Manufacturing Skills, which will help to address the pressing needs highlighted by manufacturers in our survey. Finally, we will offer next step suggestions

The purpose of this study is not to create a whole new workforce system to provide workers with the skills they need. Many existing institutions, initiatives, and programs in the region already accomplish those goals. Instead our goal is to help determine how we can better address the middle-skills needs of our own regional employers in Northern Illinois. We seek to build upon the successes of existing middle-skills related initiatives in the region through our recommendations within this section.

Examples of Existing Middle-skills Initiatives

National Certificates

The ACT National Career Readiness Certificate (ACT NCRC) is an assessment-based credential powered by ACT WorkKeys. This is an evidence-based credential that measures essential workplace skills and is generally thought of as a reliable predictor of workplace success. There are various assessments from ACT, but a platinum level proficiency requires high scores in three subjects: Applied Math, Graphic Literacy, and Workplace Documents are required for the Certificate. The ACT NCRC Certificate is granted by the Workforce Connection, as well as through some of the regional K-12 schools – often taken in a students’ junior or senior year. The NCRC is a general measure of workplace skills. It is used successfully for workers in the region, and throughout the nation. While the NCRC will continue to be a valuable determinate of a worker’s basic skills, regional manufacturers may benefit from a credential that is more tailored to the specific manufacturing needs within Northern Illinois.

Likewise, manufacturing-focused programs such as Certified Production Technician (CPT) certifications from Manufacturing Skills Standards Council (MSSC) or credentials from the National Institute for Metalworking Skills (NIMS), while more specific and industry focused than ACT, are still fairly general in that they are not tied to unique needs from manufacturers. While they may address similar skills that other certification programs might, these programs are not tailored to the regions’ specific needs and employer environment.

Other traditional “middle-skills pathways” exist as well. The following are just a few examples of programs which provide workers with middle-skill education and training opportunities.

Apprenticeships and Work-Based Learning

Apprenticeships are training programs which combine paid, on-the-job experience with classroom instruction. Students’ work is supervised by skilled journeypersons, and their work is supplemented by weekly classes at Rock Valley College. These types of programs have been increasingly popular within workforce training narratives, and for good reason – they provide a pathway into the workforce which students and employers alike can be confident in. RVC offers a Tool & Die/Precision Machinist apprenticeship certificate program, as well an Electrician Apprenticeship that leads either to an Associates of Applied Science degree or Electrician Apprenticeship Certificate.

Associate Degrees

Since it is the degree that often fills the higher-education space between high school and a four-year college, associate degrees may be thought of as the “most traditional” middle-skill designation. Associate degrees, like their four-year counterparts are often necessary for certain positions in order to show a level of aptitude, both generally and in the field. However, as we have seen, for certain middle-skills positions, particularly in the manufacturing field, associates degrees are not the only qualifier for success anymore. Training, supplemented by credentials and certifications appear to be more important to manufacturing employers. This is not to say that Associate’s degrees do not have a place. Degrees of any kind still are one of best ways to show employers a general level of aptitude and general education past a high-school level. Our recommendations for certifications do not aim to replace the need for associates degrees. Certifications can act as a supplement to them, or an alternative for those who may not want to, or have the means to pursue an associate degree.

High-School Programs

One example of an existing middle-skills initiative is the Pathways model within the regional K-12 schools. Rock Valley College has committed to developing nine pathways in their regional high schools. These nine pathways include advanced manufacturing, aviation, business/entrepreneurship, digital technology, healthcare, logistics and supply chain management, mechatronics, pre-engineering, and public safety. These pathways were chosen based on regional workforce demands. Pathways provide high school students the opportunity to enroll in dual and articulated credit courses in their high schools, increasing student access to higher education. As a result of pathways, students can graduate high school with 3 to 15+ college credits on their transcripts. Likewise, through the implementation of transitional courses in pathways, students are also able to graduate high school being college ready in math and reading, reducing the need for remedial coursework in college. Additionally, stackable credentials will be into each pathway, providing students the opportunity to earn a livable wage while further continuing their education.

Other Initiatives

The Workforce Connection is the primary workforce board within the Northern Illinois region and will continue to advance workforce initiatives and connect businesses with the employees they need. It is also understood that community colleges have a role in closing the middle-skills gap as well. Community colleges are flexible in creating and restructuring their programs, or curricula to meet changing regional workforce situations. While many regions have community college or technical school systems that focus on granting 2-year degrees, many are likewise rooted in a community and take an active role in employer outreach and tailoring programs to meet the needs of the regional workforce. This is the role of a comprehensive community college, to provide 2-year transfer degrees and career and technical degrees aligned to high priority occupations. In the Northern Illinois region, Rock Valley College recognizes their role in workforce development and has been increasingly involved in such initiatives – this report being among them.

These are just some examples of present initiatives being used to address the skills-gap in Northern Illinois. They should continue to be utilized by the workers of the region. The next subsection deals with the themes of the survey and one suggestion of a way to implement the findings into a value-added program that directly address the middle-skill needs of employers. It should exist in conjunction with other initiatives.

Survey Themes

Any recommendations related to our workforce system must be demand-driven in order to reflect our own unique workforce environment. In other similar surveys, employers in many fields and across geographies consistently report not finding applicants with the required skills for the position. Additionally, job-markets are dynamic, differ across geographies. As businesses change, so do the skills they are looking for. It is for these reasons that we embarked on the employer survey. We wanted to get a sense of what regional manufacturers are actually looking for, and to what extent, so that any future middle-skill program can align with the specific needs of regional manufacturers.

Those needs were seen in the survey. Employers confirmed our suspicions that middle-skills needs are indeed present in this region, and will continue to be in demand as more workers retire and companies continue to grow in tandem with the regional economy. It could even be argued, that the analysis on economic and middle-skills data in Section I, coupled with the employer survey in Section II, shows that middle-skills are at a relatively higher

concentration in this region, and any systemic planning revolving around upskilling the workforce will have a heightened benefit of economic and social mobility here.

The high demand for CNC operators and Machinists we saw in our sample is a reflection of the regional manufacturing industry. The skills and the credentials that accompany them are incredibly important for the regional economy with little signs from employers of scaling back these positions. Because of this, many employers listed these skills as their pressing need and as skills that they have trouble filling due to skill shortages of applicants. This is one need that is not new to educational, workforce, and public sector stakeholders. Individuals can receive specific certifications in CNC and Machining, and those are available, but quite a lot of these skills are obtained on the job. **However, if an individual does not have the basic manufacturing, measurement, or quality control skills, then their success in even learning CNC and Machining skills are hindered. It is providing these core skills where the regional workforce system can be improved.**

Another important theme among survey responses was the need for soft-skills, or non-technical personal/interpersonal traits and life skills. The need for soft-skills is important regardless of sector, industry, occupation, and employment level, so it was no surprise that these were highlighted by employers surveyed. Because of their broad application, soft skills should be gained through general employment experience. However, manufacturers find that many of their middle-skill workers lack them nonetheless. Some specific needs such as basic attendance and work ethic were common among the employers, while others cited skills like leadership and the ability to work cooperatively as pressing needs among their workforce. One possible immediate recommendation is for soft-skills refresher sessions to be included into training programs.

While many organizations have business outreach in order to likewise determine the needs of employers to inform their own workforce training, apprenticeship, and career services, our recommendations are structured around making sure workers in the Northern Illinois region have both specific and generalizable skills that will help them succeed in the regional workforce. Specific skills will help ensure that a worker has the skills required by employers and that they can immediately succeed and add value to an organization, while general skills will allow workers to keep up with changing employment demands and adapt to the economy as business' specific needs change.

Critical Core Manufacturing Skills (CCMS)

This study has examined the regional need for middle-skills, both through public and jobs-posting analysis and through a survey to manufacturing employers directly asking about their own middle-skill needs. This analysis has shown that the region does have a shortage of middle-skill workers. To compound the problem, employers are lacking in finding workers that are qualified or have the right skills for the job.

We have also examined programs that are designed to increase the skills of the workforce and provide credentials to show that workers who obtain them have the general skills needed in today's workplace. However, many of these credentials are general and not tailored towards the specific needs of manufacturers in our region.

A Critical Core Manufacturing Skills Curriculum (CCMSC) can achieve that. This is a program proposed by Rock Valley College in which students can earn a certificate or portfolio of course completions and demonstrations of aptitude which show that they are proficient in **the specific skills demanded by regional employers**. The curriculum would consist of a collection of artifacts from completion of tailored hard and soft skill courses, which in sum will make up either a singular critical core manufacturing skills certification, or a portfolio of core in-demand skills.

Hard and Soft Skills

In order to create the program, administrators first need to know what manufacturing skills the program should encompass. In order to do this, industry leaders must be convened in order to again get a sense of their skill needs. While survey responses outlined here should be a starting point, reported skill needs in this context will be more granular than what was reported through the survey. It is through these convening sessions that a curriculum of basic manufacturing skills specific to this region can be determined, based on direct feedback from those businesses.

For example, our survey found that basic measurement skills are in demand among regional employers, but the survey did not determine specifically what kind of measurements workers will need to be proficient in. During these Critical Core Manufacturing Skills convening sessions, employers mark down the specific measurement skills they need. This can be done in the same session for other general manufacturing skills, such as specific CNC processes, safety practices, blueprint reading, etc. The curriculum can be developed

based on these specific needs from employers, and can continually be updated based on the changing needs of businesses. If a new manufacturing process becomes standard, and businesses report having to update their needs to accommodate, so too can the curriculum.

This process will also be repeated for soft skills. Despite the clear importance of soft skills, issue of soft skills development is a challenge for educators and workforce trainers. This Critical Core Manufacturing Skills Curriculum can be a way to further identify the soft skills employers consider key to workplace to success. It can also be a means to tie these skills into a certificate or portfolio of skills possessed by job-seekers. Some potential soft skills such as ethics or safety practices may be easier to teach in a classroom setting, but others such as work ethic or attendance are better reinforced in this setting.

Documentation of these checkboxes can be found in **Appendix B**

Credential and Portfolio

It is also imperative that one of the outcomes of this curricula is that students receive a credential or multiple credentials to add to their job portfolios. Credentials should be stackable and independent from other workforce training certification programs in the region – they should be stackable. For example, a job-seeker who goes through the CCMS program, as well as a National Career Readiness Certificate would have both a nationally recognized credential for career skills as well as a regionally recognized credential for critical manufacturing skills needed in Northern Illinois. Both of these, in addition to WorkKeys certifications, a diploma or GED, on-the-job training, previous experience, etc. would all make up a strong job portfolio and show that employers can be confident that this potential hire will be immediately valuable in their organization.

Continuous Improvement

Once hard and soft skills are determined and prioritized, a curriculum and skilled learning plans will need to be developed based on activity packets that already exist for similar programs. After manufacturing curriculum is developed, other major regional sectors should be targeted to develop critical core skill curricula that coincide with their own needs. For example, employers in the transportation and distribution industry could be convened to determine their specific hard and soft skills, and develop a similar critical

core transportation curricula. The program can be annually updated through employer and student feedback, reports on the changing regional economy, and suggestions from workforce partners.

Ensuring Success

It needs to be stressed that such an initiative and the convening required can only be successful if RVC and employers *commit* to the CCMS. The program may very well be successful in its first iteration and produce employable graduates after its first year, but in order to ensure success of the program, there must be buy-in built up over the course of time. Convening sessions with employers to suggest program changes or process improvements must occur annually or bi-annually, which will not only help to improve the program, but demonstrate commitment among all involved. Getting employers on board with the program even in its initial year will require the assistance of regional EDOs and workforce training providers, as well as outreach to business groups comprised of employers within the region. Promotion of the program will play a large role not only as the program is planned, but continually as CCMS becomes a prominent fixture of the regional workforce system.

Manufacturing Workforce Strategy Team

This study is just the first step towards a coordinated workforce system. As outlined in this section, we believe the next step is to take this information, and use it to develop middle-skills programming that gives workers credentials which demonstrate the capacity to fulfill the needs of the region's manufacturers. Our suggested model is the Critical Core Manufacturing Skills Curricula. **In order to plan for programs such as a core skills curriculum, we also recommend the creation of a regional workforce committee. The Manufacturing Workforce Strategy Team can be the main conduit for a Critical Core Skills Curriculum, planning for the process, convening business leaders, promoting the program, and offering insight for continual improvements and ensuring it meets the needs of regional employers.** If the CCMS were to proceed, the committee should also be the administrative body for planning the delivery of the system, where it is to be housed, funding structures, and oversight.

The Strategy Team will also seek to align the current middle-skills related activities done by different institutions around the region, so that each initiative can have its place in the workforce system and no program is

entirely duplicative. Many of these initiatives were mentioned, but also include activities undertaken by the Workforce Connection's incumbent worker training programs.

A pilot workforce committee was formed as a result of funding for this report and presents a way forward with this alignment. The committee is in its infancy and with few members. This Manufacturing Workforce Strategy Team is a recommendation forwarded for consideration, however it is outside the scope of this report to suggest how the committee conducts itself, other than having a goal of aligning middle-skills initiatives. We further recommend the committee expand to include any stakeholders who may have a stake in bettering the regional workforce system:

1. **Workforce boards:** The Workforce Connection and NWI Works - Business Team and BEST, Inc.
2. **Economic Development Organizations:** Rockford Area Economic Development, Growth Dimensions, Greater Freeport Partnership
3. **Secondary Educational Institutions:** Rock Valley College, Highland Community College
4. **Primary School Districts:** Rockford Public Schools, Belvidere Community School District, etc.
5. **Chambers of Commerce and Small Business Development Center**

Rockford Advanced Technology Center

The advanced technology center (ATC) represents a public-private partnership redevelopment of a historic manufacturing heritage landmark between Rock Valley College, the Rockford Local Development Corporation and the City of Rockford. The project also has support from other workforce and economic development organizations in the region, including the federal Economic Development Administration.

While the programming at the ATC is still being determined, some of Rock Valley College's current training and educational programs are planned to be housed at the Center. These include the Business and Professional Institute, Techworks, Welding, and Cold-Forming Training Center. The Advanced Technology Center capacity will also allow the College to expand existing offerings – included among them are industrial maintenance programs (especially focused on mechatronics and automation), Integrated Systems Technology offerings, and CNC, machining, and advanced manufacturing programs. Importantly, the Critical Core Manufacturing Skills program is

A Master Regional Workforce Plan

planned to be housed at the Advanced Technology Center. Because of these connections, **our recommended workforce committee, consisting of regional workforce voices should serve in an advisory role for the Advanced Technology Center programming.**

Planning for the Advanced Technology Center has been in development for years and currently planning is focused on site and assessment of programmatic need. The center's output of skilled workers will have spillover value into neighboring counties as well. The Center represents the regional priority in workforce development which has already added value for business attraction efforts, by correctly portraying the region as one that pays attention to the needs of its businesses and tailors its workforce and educational systems accordingly.

The Workforce Connection Business Team and Rockford Area Economic Development Corporation's CORE Conversations/Talent should also ensure that what they are hearing within the business community is aligned with The Workforce Connections' services and RVC's offerings, as well as the CCMS Curriculum.

A large part of any new up-skilling program should include some kind of outreach with the goal of making programs more known empowers to empower both employers and workers to determine their best career pathways. This can be done through improving access to workforce information and making such programs known to the general public. Because of the amount of training opportunities within the region, each program should be able to differentiate itself and communicate the reasons why a worker or potential employee would enroll. Many current up-skilling initiatives have been successful, as demonstrated by worker or employer testimonies. The workforce committee should plan how to move forward with promoting middle-skills programs and could form a central website or location where information about the various middle-skills opportunities in the region are available.

Our recommendation for a Critical Core Manufacturing Skills Curriculum should not exist independently, but should work in conjunction with other regional workforce programs to provide workers with the skills they need and instill employers with the confidence that they can find quality and lasting workers. We have only outlined a few examples of such programs. There are many more in the region that all accomplish similar goals and are successful in their own ways. Many of these programs are administered by different entities, and coordination between these entities is key. We have suggested the formation of the Manufacturing Workforce Strategy Team consisting of all regional workforce stakeholders as the first step to coordinate, improve, and promote the success of all regional workforce programs. However, we also recommend **the formation of a master workforce plan for the Northern Illinois Region.**

Having a workforce system plan will instill confidence in a unified regional workforce system, and provide specific strategies for that system to thrive. It could determine specific milestones for coordinating workforce development activities and programmatic changes. **Such a plan would build upon many themes, strategies, and objectives present in the Local and Regional WIOA Plans, Comprehensive Economic Development Strategies, and other planning documents. It should not duplicate the purposes of either, but serve as a uniting document and road map as the region grows and strengthens its workforce.**

We hope that through this report and the data presented within, that these workforce partnerships can continue and that we have presented an actionable way forward to closing the skills gap in Northern Illinois.

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Appendix

A. Employer Survey

Northern Illinois Coordinated Workforce Study - Employer Survey Questions

Northern Illinois Coordinated Workforce Report: Employer Survey

Page description:

Hello. We are conducting a survey to better understand the employee skill needs that our region's manufacturers need. This survey is in partnership with and on behalf of Rock Valley College, workforce development, economic development partners in our region. The purpose is to provide educational and training providers with actionable information to adjust their offerings to meet your projected future needs.

We understand and appreciate that manufacturers have frequently been surveyed about their needs in the past. Past surveys and interviews have been helpful and have informed our partners about key trends and issues you have. Now, we are focusing on more specific occupational and skill needs to meet specific demands.

Your individual answers will not be shared publicly, though based on specific occupations and skills you identify, we may contact you for a follow-up interview. Published results of this study will only include aggregate information so that you and your company are not identifiable. Individual comments will not be published without your explicit consent. Our questions should last about 20 minutes. You will receive the results of this study, as well as information on current and future education and training initiatives identified in and/or adjusted because of this study.

1. First, we have some questions about your overall business. Please describe your company's manufacturing products or primary outputs.

2. How many employees does your company *currently* employ in the Northern Illinois area, which includes Winnebago, Boone, Stephenson, and Ogle Counties?

3. For the next year, how does your business *plan* to change your employment level. Would you say your employment level will:

- Increase significantly, by 15% or more
- Increase slightly, by less than 15%
- Remain the same as before
- Decrease slightly, by less than 15%
- Decrease significantly, by more than 15%

4. Have you experienced any of the following barriers to increasing your employment level? If so, please rate each on a 1-5 scale, with 1 being "insignificant" and 5 being a "critical barrier".

	1	2	3	4	5	Not Applicable
Shortage of applicants with required knowledge or skills	<input type="radio"/>					
Shortage of available training programs	<input type="radio"/>					
Economic or market conditions that prevent attraction of applicants	<input type="radio"/>					
Government policies or regulations that prevent growth in company	<input type="radio"/>					
Applicants lacking interest in the occupation	<input type="radio"/>					
Applicants lacking transportation to get to work	<input type="radio"/>					
Applicants lacking child care or other social support that may affect performance	<input type="radio"/>					
<input type="text" value="Enter another option"/>	<input type="radio"/>					
<input type="text" value="Enter another option"/>	<input type="radio"/>					
<input type="text" value="Enter another option"/>	<input type="radio"/>					

5. What other immediate hiring issues are you facing that our workforce partners could assist you with?

6. What was your organization's turnover rate for the past year? If unknown, around how many employees have you lost within the past year?

Now, we will ask you some questions to understand your demand for "middle skill level" employees - that is, employees with a credential, certification, two-year degree, or other formal training or education beyond high school, but less than a 4-year degree

7. In your business, what percentage of your total employees require each of the following levels of training and education as a minimum requirement?

High-skill level (4-year degree or higher)

Middle-skill level (credential, certification, two-year degree, or other formal training or education beyond high school but less than a 4-year degree)

Low-skill level (high school degree or less)

Total : 0

8. How many new hires (either replacement workers or new positions) do you expect to have within the **next year**?

9. Of those new hires (within the next year), what percentage will need the following levels of training and education:

<input type="text"/>	High-skill
<input type="text"/>	Middle-skill
<input type="text"/>	Low-skill

Total : 0	

10. How many new hires (either replacement workers or new positions) do you expect to have within the next **three years**?

11. Of those new hires (within the next three years), what percentage will need the following levels of training and education:

<input type="text"/>	High-skill
<input type="text"/>	Middle-skill
<input type="text"/>	Low-skill

Total : 0	

Now we would like to know some specifics about occupations you anticipate needing in the **next three years** that require middle skills. I am going to ask you to list individual occupation titles, then ask you questions about each.

12. What is the most important occupation you'll need to fill requiring middle skills? (1)

13. How many **replacement workers** for that occupation will you need within the next three years? How many to **fill new positions**? (1)

14. What specific certifications, credentials, degrees, or other training would they need to have? What level of skills and competency would be needed? (1)

15. What is the **next** most important occupation you'll need to fill requiring middle skills? (2)

16. How many **replacement workers** for that occupation will you need within the next three years? How many to **fill new positions**? (2)

17. What specific certifications, credentials, degrees, or other training would they need to have? What level of skills and competency would be needed? (2)

18. What is the **next** most important occupation you'll need to fill requiring middle skills? (3)

19. How many **replacement workers** for that occupation will you need within the next three years? How many to **fill new positions**? (3)

20. What specific certifications, credentials, degrees, or other training would they need to have? What level of skills and competency would be needed? (3)

21. Thinking only of candidates for the previously discussed occupations, are there any soft skills or other shortcomings that should be addressed, which have yet to be addressed in the survey?

22. Over the past year, which of the following methods do you use to assist current workers in order to address your company's need for new or increased skills? (check all that apply)

- In-house classroom training
- On-the-job training
- Apprenticeship programs
- Customized training or education by school or training provider
- Vocational training
- Tuition reimbursement
- Online courses
- Providing flexible schedules for outside continuing education
- Other - Write In
- Other - Write In
- Other - Write In
- (Do not know)
- Not applicable

23. Contact Information

First Name

Last Name

Title

Company Name

Street Address

Apt/Suite/Office

City

State

Zip

Email Address

Phone Number

URL

Thank You!

Thank you for your participation. Once again, your responses will not be shared individually. Taken as a whole, responses to this survey will help educational and workforce providers tailor their current and future programming to the needs of the region.

If you wish to follow-up with us yourself or provide more detail to any of the answers you have provided, we encourage you to reach out to our project manager, Jay Fieser, at jfieser@region1planning.org. Any information you provide will greatly inform our report, its recommendations, and future regional workforce programming.

Have a great day, and thank you again for your help.

B. Fundamental Core Manufacturing Skills

Convening Sample Questions

FUNDAMENTAL CORE MANUFACTURING SKILLS

ROCK VALLEY COLLEGE

DIRECTIONS:							
1) Determine if the skill set is a current need of the industry.		Non-essential = 1					
2) Please indicate the number that corresponds with your view.		Somewhat Non-essential = 2					
		Neutral = 3					
		Somewhat Essential = 4					
		Very Essential = 5					
Standards and Regulations							
Not Needed	Needed	1) Safety Standards and Regulations	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	2) Environmental Standards	1	2	3	4	5
		3) Material Safety Data Sheets	1	2	3	4	5
		4) Analyzing Data	1	2	3	4	5
Comments							
Properties of Metals							
Not Needed	Needed	1) Properties of Ceramics	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	2) Properties of Polymers	1	2	3	4	5
		3) Properties of Composites	1	2	3	4	5
		4) Material Selection	1	2	3	4	5
		5) New Materials	1	2	3	4	5
Comments							
Manufacturing Processes							
Not Needed	Needed	1) Manufacturing Operations	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	2) Forming	1	2	3	4	5
		3) Examining Tools	1	2	3	4	5
		4) Material Removal	1	2	3	4	5
		5) Feeds and Speeds	1	2	3	4	5
		6) Joining	1	2	3	4	5
		7) Routing	1	2	3	4	5

Comments							
Precision Manufacturing							
Not Needed	Needed	1) Introduction to Measurement	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	2) Applying Linear Measurements	1	2	3	4	5
		3) Using Precision Measuring Tools	1	2	3	4	5
		4) Calibration of Instruments	1	2	3	4	5
		5) Repeatability and Reproducibility Studies	1	2	3	4	5
Comments							
Quality Assurance							
Not Needed	Needed	1) Personal Philosophy of Quality	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	2) Teamwork, Customer Focus, Continuous Process Improvement	1	2	3	4	5
		3) Cost of Quality	1	2	3	4	5
		4) Nonconforming Products and Materials	1	2	3	4	5
		5) Quality Experience	1	2	3	4	5
Comments							
Quality Systems							
Not Needed	Needed	1) Quality Systems Standards	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	2) ISO 9001-XXXX	1	2	3	4	5
		3) Quality System Documentation	1	2	3	4	5
		4) Internal Auditing	1	2	3	4	5
		5) Registration to ISO 9001	1	2	3	4	5
		6) Other Quality Systems & Quality Awards	1	2	3	4	5
Comments							

Introduction to Lean Manufacturing							
Not Needed	Needed		1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	1) Lean Manufacturing Overview	1	2	3	4	5
		2) 5S	1	2	3	4	5
		3) Value Stream Mapping	1	2	3	4	5
		4) Cellular Flow Setup	1	2	3	4	5
		5) Reduction & Quick Changeover	1	2	3	4	5
		6) Building a Lean Culture	1	2	3	4	5
		7) Total Productive Maintenance	1	2	3	4	5
		8) Pull Kanban	1	2	3	4	5
		9) Value/Supply Chain Management	1	2	3	4	5

Comments

Interpreting Engineering Drawings							
Not Needed	Needed		1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	1) Role of Drawings & Standards	1	2	3	4	5
		2) Visualization	1	2	3	4	5
		3) Title and Change Blocks	1	2	3	4	5
		4) Shop Notes and Symbols	1	2	3	4	5
		5) General Dimensioning and Tolerancing	1	2	3	4	5
		6) Pictorial Drawings	1	2	3	4	5
		7) Section and Auxiliary Views	1	2	3	4	5
		8) Geometric Dimensioning and Tolerancing	1	2	3	4	5
		9) Assembly Drawings	1	2	3	4	5
		10) Analysis of Part Prints	1	2	3	4	5

Comments

What essential skills not mentioned above are needed for an entry level position in your industry?

		<p>Are you interested in assisting with further validation efforts?</p> <p>Name: _____</p> <p>Company: _____</p> <p>Phone: _____ Email: _____</p>

Thank you for your commitment to our region.

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Endnotes

- 1 United States Department of the Census. American Community Survey 2012-2016 5-year estimates. Retrieved from <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml?>
- 2 Illinois Department of Employment Security. 2017 Q4 Tables, derived from the Quarterly Census of Employment and Wages. Retrieved from http://www.ides.illinois.gov/LMI/Pages/Quarterly_Census_of_Employment_and_Wages.aspx
- 3 United States Department of the Census. American Community Survey 2012-2016 5-year estimates. Retrieved from <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml?>
- 4 U.S. Cluster Mapping. (2018). Harvard Business School Institute for Strategy and Competitiveness. Retrieved from <http://www.clustermapping.us/region>
- 5 The Future of the U.S. Workforce (Rep.). (2012, September). Retrieved <https://www.achieve.org/files/MiddleSkillsJobs.pdf>

Front page rendering of the future Advanced Technology Center appears courtesy of Hagny Architects, LLC

