

This report, prepared by The Institute for Public Policy and Economic Development, addresses labor and wage quality in Northeast Pennsylvania and highlights future labor demand.

Labor Demand:

Which Industries and Occupations Present the Biggest Possibilities for Economic Growth?

This research was originally published in the May 2019 Joint Task Force Report on Economic Competitiveness

The Institute

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A collaboration among Geisinger Commonwealth School of Medicine, Johnson College, Keystone College, King's College, Lackawanna College, Luzerne County Community College, Marywood University, Misericordia University, Penn State Scranton, Penn State Wilkes-Barre, The Wright Center for Graduate Medical Education, University of Scranton & Wilkes University

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Preface

In June 2019, the Education & Workforce Development (Ed/WFD) and Jobs, Economy, & Economic Development (JEED) Task Forces met to discuss the release of the Economic Competitiveness report presented at Indicators 2019 and to identify a research agenda for the 2019-2020 year.

It was determined at that time that this upcoming year's research should again be a joint effort because of the nature of the two task forces is extricably linked especially since there was a workforce shortage at the time that was predicted to last at least two decades.

Based on discussion, it was decided that there were several education and workforce related sections in the economic competitiveness report that should be elevated to their own research brief and that several areas were not addressed.

Therefore, the following sections of the report have been developed into stand-alone research briefs:

- Skills Shortages
- Labor Demand
- Industrial Automation
- Comparative Analysis of Job Opportunities and Higher Education Completions

The following new briefs were developed in the fall 2019 – winter 2020 time frame:

- Rethinking the Senior Worker
- Adapting to the Millennial Worker & Beyond
- Soft Skills & the Workforce
- Rethinking the Trades – Regional Opportunities

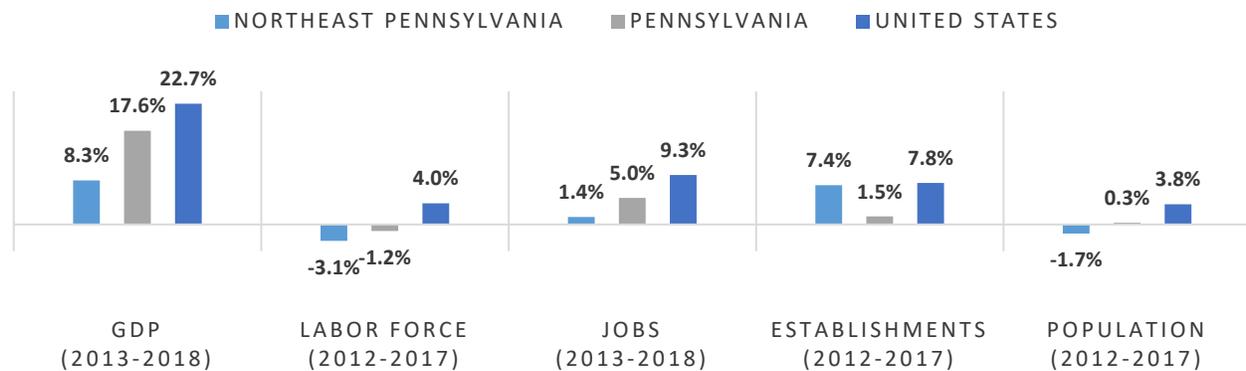
With the recent economic challenges of the current pandemic, some of this research reflects economic circumstances that have been upended, at least in the short-term. However, it should be noted that the data serves as a pre COVID-19 baseline in order for us to evaluate changes.

Further, as we move through recovery and reach February 2020 economic activity, the labor shortage may be center stage again. Therefore, the information outlined in these briefs is pertinent and gives employers an opportunity to plan for the future in a more informed and thoughtful way.

Executive Summary

Like many other Rust Belt communities, Northeastern Pennsylvania’s economy sits at an important crossroads, at the intersection of multiple economic, social, and demographic trends whose pace is accelerating rapidly. While Pennsylvania and the rest of the nation has seen a modest uptick in population, Northeastern Pennsylvania’s contracted by two percent. While other regions’ labor forces are growing or shrinking modestly, this region’s labor force shrank by nearly three percent between 2012 and 2017. Consequently, the region also lags behind the rest of the state and the rest of the nation in other important labor market metrics, including GDP and job creation. While the rest of the commonwealth, as well as the United States, will experience many of these troubling demographic trends, Northeastern Pennsylvania is, somewhat regrettably, ahead of the curve.

LABOR MARKET INDICATORS, 2012-PRESENT



Due to the area’s stagnant population growth, the region’s workforce is, on balance, both older and less educated than the statewide or national equivalents. Specifically, as demonstrated by the graphs below, Northeastern Pennsylvania is home to a disproportionately large percentage of workers at or above the

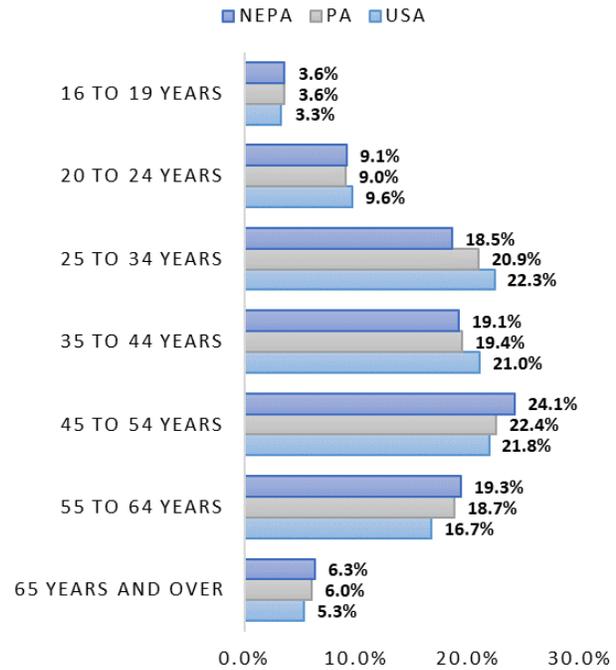
age of 45, while lagging behind the rest of Pennsylvania and the United States among workers between the ages of 25 and 44.

With a crumbling industrial base and an aging workforce disproportionately under-educated, the region remains at a competitive disadvantage in attracting new industries that might require formal educational credentials for entry. The convergence of these trends appear to have spawned an exodus of talent and capital from the region as a whole. Every day, nearly 81,000 workers travel into the region from outside, while nearly 150,000 leave the region to work elsewhere – a net loss of 68,000 workers. Moreover, the region has also experienced a net out-migration of residents, as roughly 6,900 more individuals left the region than entered it between 2012 and 2016.

Finally, the local workforce is set to take its largest hit in the coming decade, as the nearly

24 percent of workers over the age of 55 are set to retire, generating a retirement crisis that may incur losses approaching \$4.5 billion in annual wages and \$12.5 billion in economic output.

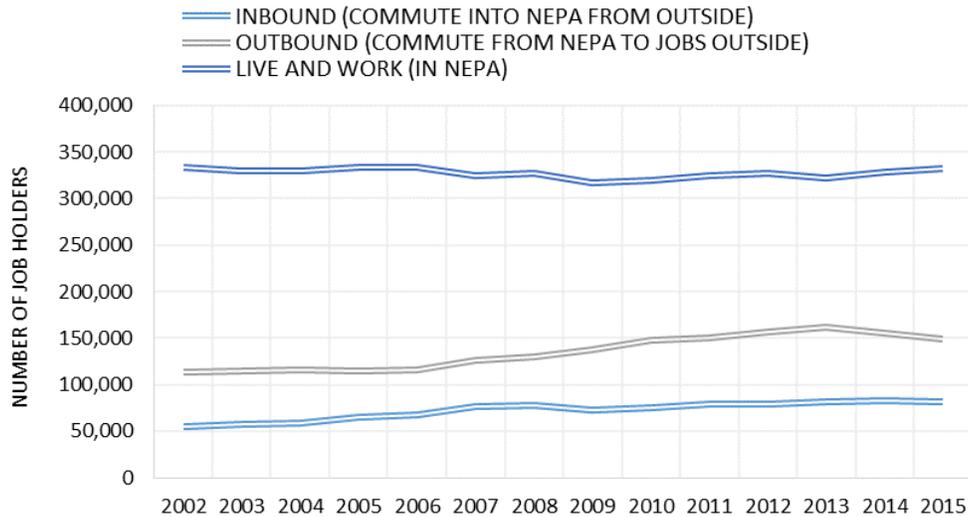
WORKFORCE BY AGE



NET MIGRATION, NEPA (2012-2016)

County	Net Migration	% Intra-Region Migration
Bradford	-1,446	40.8%
Carbon	-558	75.5%
Columbia	-178	70.8%
Lackawanna	361	58.6%
Luzerne	-678	58.3%
Monroe	-1,404	51.9%
Pike	-922	34.9%
Schuylkill	-2,095	66.1%
Susquehanna	-233	53.9%
Wayne	300	60.5%
Wyoming	-14	78.8%
TOTAL	-6,867	58.1%

COMMUTING FLOWS, 2002-2015



Source: U.S. Census Bureau, Local Employment Dynamics (2015)

Nevertheless, several sectors of Northeastern Pennsylvania’s economy are experiencing robust growth. Based on the findings reached in this report, the Institute makes the following recommendations:

1. Harness the value of Northeastern Pennsylvania’s network of higher education institutions in designing a classroom to workplace pipeline through public-private partnership and investment. By utilizing their expansive professional networks, workforce development stakeholders can be effective facilitators between educators and employers in aligning educational priorities with workforce demands.
2. Utilize the grant-making process to incentivize greater stakeholder collaboration in future, while providing support for non-traditional educational avenues. More experienced stakeholders in the field of workforce development can help employers and other relevant actors access public investment for new training opportunities for employees.
3. Equalize the range of services offered among regional workforce development organizations through multi-stakeholder and collective impact initiatives. Only through long-term action from deeply committed cross-sector stakeholders can initiatives that curb the region’s multiple demographic and economic challenges be effectively implemented.

Strategies such as these might establish a roadmap for Northeastern Pennsylvania’s economic recovery, thereby providing new opportunities for a region struggling to overcome multiple demographic and economic challenges and build a dynamic and accessible labor market for all.

Research Methodology

In drafting this report, The Institute for Public Policy and Economic Development reported from a wide variety of federal and state sources. The primary database used for this report was Chmura JobsEQ, a proprietary online platform that aggregates federal, state, and local employment, wages, and educational data down to the zip code level.

Supplementary data was provided from a range of federal datasets from the United States Census Bureau. Population, housing, and workforce data was extracted from the American Community Survey. Commuter data was compiled from the Longitudinal Employer-Household Dynamics program at the Bureau's Center for Economic Studies.

Finally, for the purposes of this report, the region defined as Northeastern Pennsylvania consists of 11 counties: Bradford, Carbon, Columbia, Lackawanna, Luzerne, Monroe, Pike, Schuylkill, Susquehanna, Wayne, and Wyoming. This region has a combined population of 1.2 million and is home to approximately 560,000 employed workers and a labor force of 589,000 individuals. Data for Northeastern Pennsylvania that is not specifically presented on a county-by-county level may be assumed to be reported on an aggregate level for all 11 counties comprising the area's geographic scope.

FAST FACTS

POPULATION

1,204,560

UNEMPLOYMENT RATE

5.6%

GDP

\$46.1 BILLION

LABOR FORCE PARTICIPATION RATE

59.2%

WORKFORCE SIZE

589,463

NUMBER OF JOBS

556,605

ESTABLISHMENTS

28,388

EXPORTS

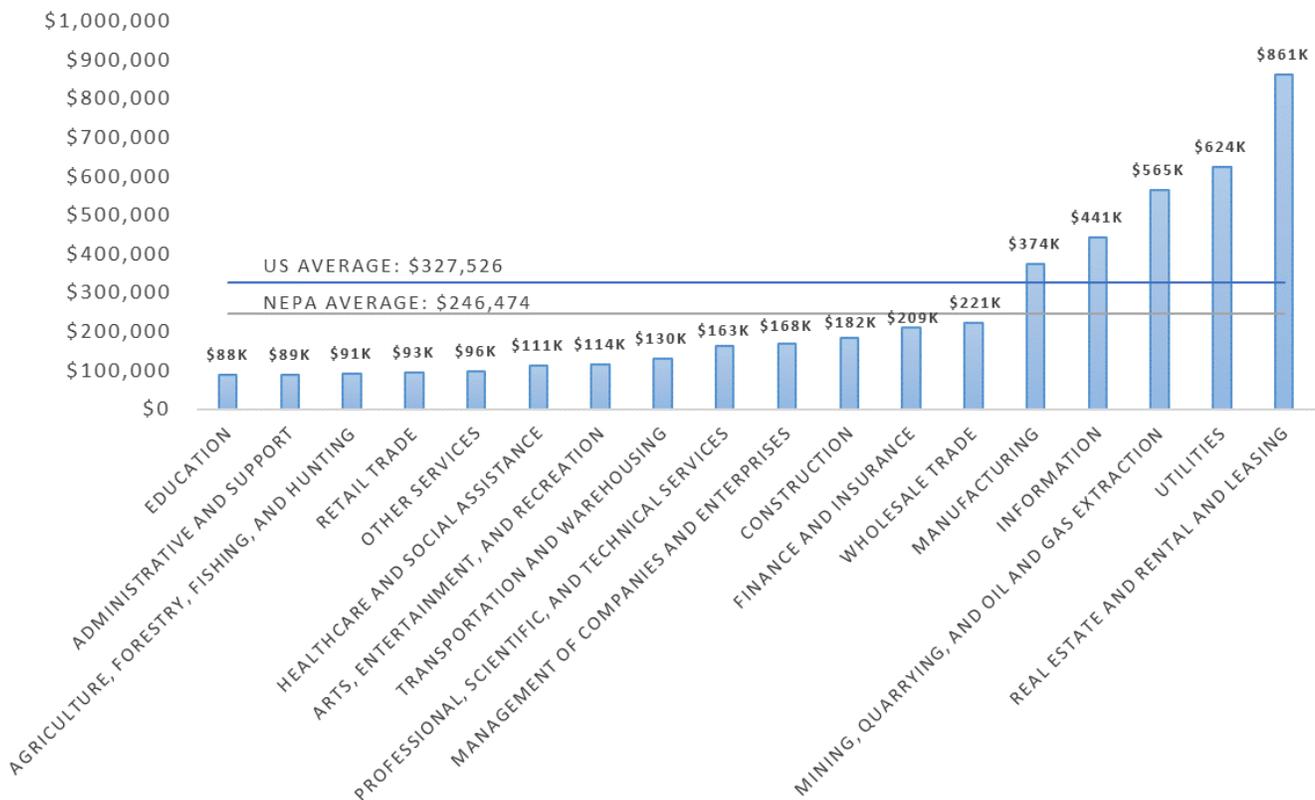
\$5.3 BILLION

Labor Quality: Productivity and Turnover

Industry productivity assesses the efficiency of a given industry’s labor force by measuring its output – the monetary value of goods and services supplied – from each worker. Across all industries, overall productivity by industry in Northeastern Pennsylvania (\$246,474) is dwarfed by the national average (\$327,526), which is 33 percent higher. In Northeastern Pennsylvania, industries with an above-average productivity include: (1) Real Estate, Rental, and Leasing (\$861,000); (2) Utilities (\$624,000); (3) Mining, Quarrying, Oil, and Gas Extraction (\$565,000); (4) Information (\$441,000); and (5) Manufacturing (\$374,000). These most productive regional industries exactly reflect the most productive industries nationwide. Out of these top five industries, Real Estate, Rental, and Leasing is by far the most productive, with a productivity rate that is more than triple regional and statewide averages.

Despite these regional strengths, labor productivity across nearly every industry in Northeastern Pennsylvania was lower than national averages. Only one industry – Education – generated a higher output per worker regionally than nationally. The largest gaps between national and regional industry output can be found in: (1) Arts, Entertainment, and Recreation (81 percent); (2) Finance and Insurance (66 percent); (3) Transportation and Warehousing (47 percent); (4) Agriculture, Forestry, Fishing, and Hunting (45 percent); and (5) Mining, Quarrying, Oil, and Gas Extraction (42 percent). Aside from Education, the smallest gaps between national and regional industries include: (1) Utilities (10 percent); (2) Healthcare and Social Assistance (11 percent); (3) Accommodation and Food Services (14 percent); (4) Construction (15 percent); and (5) Retail Trade (20 percent).

REGIONAL INDUSTRY PRODUCTIVITY: A COMPARATIVE ANALYSIS

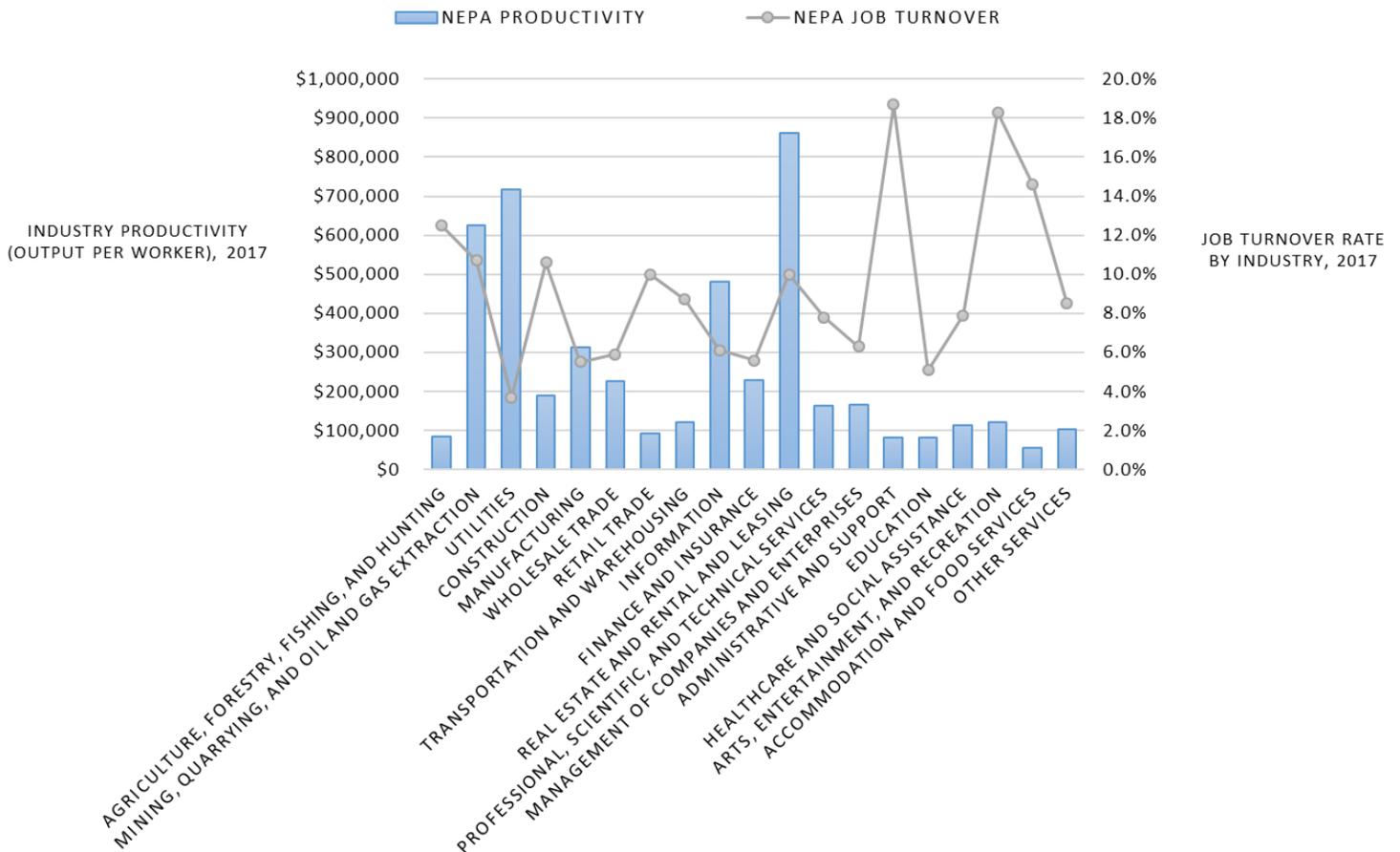


Source: Chmura JobsEQ®

Productivity across Northeastern Pennsylvania may be hampered to some extent by a slightly higher than average job turnover rate in the region (9.2 percent), compared to national averages (8.7 percent). Regional industries with the highest turnover include: (1) Administrative Support and Waste Management (19 percent); (2) Arts, Entertainment, and Recreation (18 percent); (3) Accommodation and Food Services (15 percent); (4) Agriculture, Forestry, Fishing, and Hunting (13 percent); and (5) Mining, Quarrying, and Oil and Gas Extraction (11 percent). Turnover in these industries on the regional level is also higher than national averages. These industries are also generally found among the least productive in the region, and many also house a disproportionately younger workforce, such as Accommodation and Food Services, Construction, and Mining, Quarrying, and Oil and Gas Extraction.

Conversely, the most productive industries in Northeastern Pennsylvania have seen more stable workforces prone to fewer instances of job turnover – a promising trend that protects production and profits. These labor-stable industries also tend to have much older workforces, such as Healthcare and Social Assistance, Manufacturing, and Trade, Transportation and Utilities. Among these industries, turnover is not only below average for the region, but also below national averages, as well.

HOW DOES INDUSTRY PRODUCTIVITY COMPARE TO JOB TURNOVER?



Source: Chmura JobsEQ®

Labor Demand

Demand by Industry

While a majority of industries in Northeastern Pennsylvania enjoyed employment growth between 2013 and 2018 (at 11 out of 20), demographic changes and workforce mismatches may contribute to future contractions in employment growth, even in an era of relative prosperity. Between 2018 and 2026, only five of 20 industries are projected to experience any employment growth: (1) Construction (0.3 percent); (2) Transportation and Warehousing (0.3 percent); (3) Professional, Scientific, and Technical Services (0.1 percent); (4) Administrative and Support (0.2 percent); and (5) Healthcare and Social Assistance (1.1 percent). Manufacturing and Industry are the two industries with the highest projected rate of contraction, at 1.6 and 1.4 percent, respectively. Finally, overall job growth across all industries expected to contract by 0.2 percent over the next eight years.

NEPA Demand by Industry	2018		2013-2018		2018-2026	
	Employment	Average Wages	Employment Change	Annual % Growth	Employment Change	Annual % Growth
Agriculture, Forestry, Fishing and Hunting	4,842	\$23,072	200	0.8%	-180	-0.5%
Mining, Quarrying, and Oil and Gas Extraction	3,063	\$67,721	-779	-4.4%	-68	-0.3%
Utilities	3,797	\$90,223	403	2.3%	-267	-0.9%
Construction	23,602	\$50,606	748	0.6%	662	0.3%
Manufacturing	56,609	\$54,761	1,344	0.5%	-6,899	-1.6%
Wholesale Trade	13,622	\$53,661	-1,105	-1.5%	-767	-0.7%
Retail Trade	61,764	\$26,664	-2,494	-0.8%	-2,701	-0.6%
Transportation and Warehousing	37,545	\$42,787	6,006	3.5%	813	0.3%
Information	6,877	\$50,028	-1,249	-3.3%	-754	-1.4%
Finance and Insurance	14,512	\$60,818	-424	-0.6%	-474	-0.4%
Real Estate and Rental and Leasing	5,015	\$42,269	82	0.3%	-245	-0.6%
Professional, Scientific, and Technical Services	14,550	\$57,940	-529	-0.7%	107	0.1%
Management of Companies and Enterprises	5,480	\$68,518	1,186	5.0%	-142	-0.3%
Administrative and Support and Waste Management and Remediation Services	25,301	\$30,211	2,383	2.0%	445	0.2%
Educational Services	37,168	\$47,151	-1,590	-0.8%	-1,289	-0.4%
Health Care and Social Assistance	81,716	\$45,431	2,845	0.7%	7,141	1.1%
Arts, Entertainment, and Recreation	8,361	\$21,452	-1,044	-2.3%	11	0.0%
Accommodation & Food Services	45,918	\$18,104	4,214	1.9%	-1,025	-0.3%
Other Services (except Public Administration)	19,578	\$24,948	437	0.5%	-690	-0.4%
Public Administration	21,955	\$51,450	-948	-0.8%	-1,169	-0.7%
Total - All Industries	491,274	\$41,726	9,686	0.4%	-7,254	-0.2%

Source: Chmura JobsEQ®

Demand by Occupation

An examination of demand by regional occupation finds similar potential contractions in employment growth on the horizon. Between 2013 and 2018, 15 of 22 occupational categories experienced an average of 0.4 percent employment growth, led by Transportation and Material Moving, Personal Care and Service, and Building and Grounds Cleaning and Maintenance. As the labor market transitions out of a period of recovery and into the upcoming demographic challenges facing this region, just seven occupational categories are likely to experience economic growth from 2018 to 2026: (1) Computer and Mathematical (0.2 percent); (2) Community and Social Service (0.9 percent); (3) Legal (0.1 percent); (4) Healthcare Practitioners and Technical (0.7 percent); (5) Healthcare Support (1.2 percent); (6) Personal Care and Service (1.1 percent); and (7) Construction and Extraction (0.2 percent). Occupations in Production and Farming, Fishing, and Forestry are likely to see the largest employment contractions, at 1.5 and 0.8 percent, respectively.

NEPA Demand by Occupation	2018		2013-2018		2018-2026	
	Employment	Average Wages	Employment Change	Annual % Growth	Employment Change	Annual % Growth
Management	22,508	\$103,600	393	0.4%	-113	-0.1%
Business and Financial Operations	16,472	\$63,000	54	0.1%	-83	-0.1%
Computer and Mathematical	6,779	\$65,600	110	0.3%	102	0.2%
Architecture and Engineering	5,843	\$72,100	-85	-0.3%	-162	-0.4%
Life, Physical, and Social Science	2,984	\$68,400	-53	-0.3%	-34	-0.1%
Community and Social Service	9,247	\$44,000	200	0.4%	722	0.9%
Legal	2,557	\$67,100	-94	-0.7%	11	0.1%
Education, Training, and Library	26,318	\$52,900	-840	-0.6%	-453	-0.2%
Arts, Design, Entertainment, Sports, and Media	6,147	\$41,500	-300	-0.9%	-281	-0.6%
Healthcare Practitioners and Technical	30,308	\$72,000	213	0.1%	1,754	0.7%
Healthcare Support	16,628	\$30,400	631	0.8%	1,597	1.2%
Protective Service	10,500	\$46,800	-180	-0.3%	-467	-0.6%
Food Preparation and Serving Related	41,878	\$22,600	1,790	0.9%	-412	-0.1%
Building and Grounds Cleaning and Maintenance	17,288	\$26,100	993	1.2%	-191	-0.1%
Personal Care and Service	20,058	\$24,100	1,490	1.6%	1,847	1.1%
Sales and Related	48,071	\$32,800	-2,156	-0.9%	-2,193	-0.6%
Office and Administrative Support	74,139	\$34,200	1,107	0.3%	-4,197	-0.7%
Farming, Fishing, and Forestry	1,808	\$28,400	166	1.9%	-115	-0.8%
Construction and Extraction	21,811	\$45,700	78	0.1%	284	0.2%
Installation, Maintenance, and Repair	21,249	\$43,600	640	0.6%	-500	-0.3%
Production	39,943	\$37,100	1,102	0.6%	-4,506	-1.5%
Transportation and Material Moving	48,738	\$35,000	4,428	1.9%	-29	0.0%
Total - All Occupations	491,274	\$42,200	9,686	0.4%	-7,254	-0.2%

Source: Chmura JobsEQ®

Regional Wages

Average wages in Northeastern Pennsylvania do not compare favorably to wages across the Commonwealth of Pennsylvania, and the rest of the nation, as well. As of 2018, NEPA workers earn an average wage of \$41,726 as of the third quarter of 2018, compared to \$54,593 among other Pennsylvanians and \$55,994 across the rest of the United States. Some of this discrepancy is attributable to divergences in cost of living – for example, \$100 in the 11 counties comprising the geographic scope of this report is worth \$110 across the rest of Pennsylvania, and \$104 throughout the entire United States. However, cost of living differentials only explains part of the gap. For instance, an examination of purchasing power demonstrates that \$41,726 in NEPA wages translates to \$49,635 across the rest of the commonwealth, and \$53,912 throughout the entire United States, accounting for 61 percent of the NEPA-Pennsylvania wage gap, and 90 percent of the NEPA-US wage gap.

AVERAGE ANNUAL WAGES BY REGION



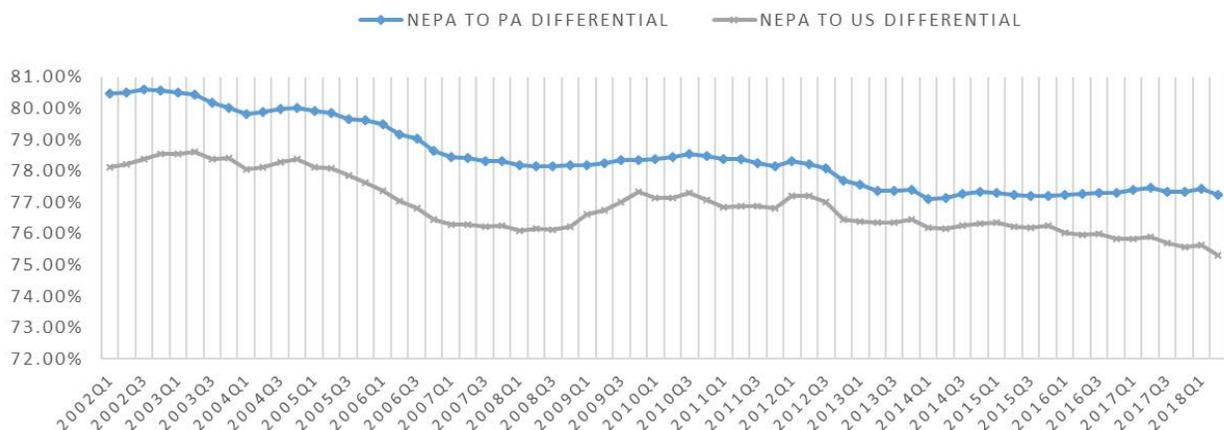
Source: Chmura JobsEQ®

Region	Cost of Living Index (Base NEPA)	Purchasing Power
NEPA	100.0	\$41,726
Pennsylvania	110.0	\$49,635
USA	103.9	\$53,912

Source: Chmura JobsEQ®

The regional wage gap is not a new trend, and has generally widened over time. In 2002, average wages in NEPA stood at approximately 80 percent of Pennsylvania wages and 78 percent of American wages. However, as of 2018, average wages in NEPA stand at approximately 76 percent of Pennsylvania averages, and 75 percent of U.S. averages. While a brief reversal of this trend was observed in the NEPA-US wage gap from 2009 to 2013, the trend has since reverted to a modest decline across both sets of wage gaps.

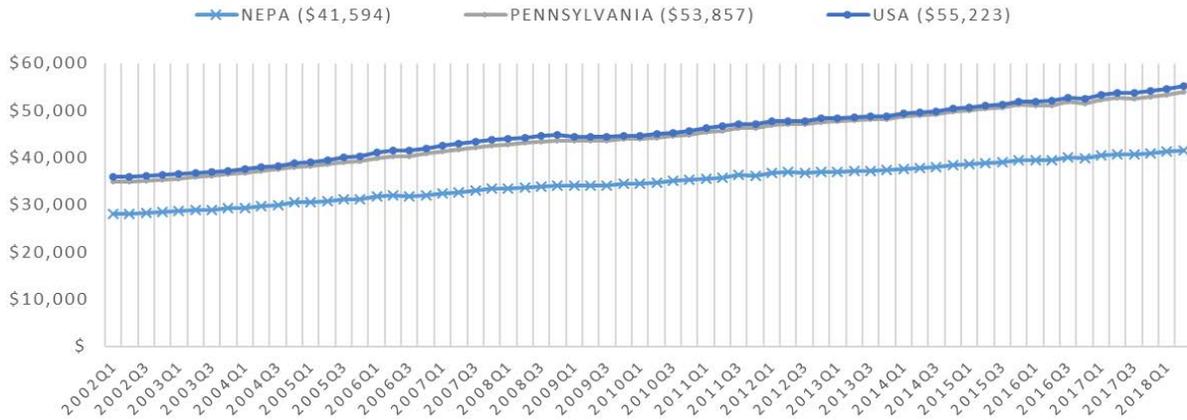
NEPA WAGE DIFFERENTIAL, 2002-2018



Source: Chmura JobsEQ®

Since 2002, wages in Northeastern Pennsylvania increased by an average amount of \$13,686, compared to \$19,743 among other workers in Pennsylvania, and \$20,100 among workers located throughout the rest of the United States. Pennsylvania workers received the largest percentage wage increase, approximately 66 percent, followed by U.S. workers at 59 percent, and NEPA workers at 49 percent.

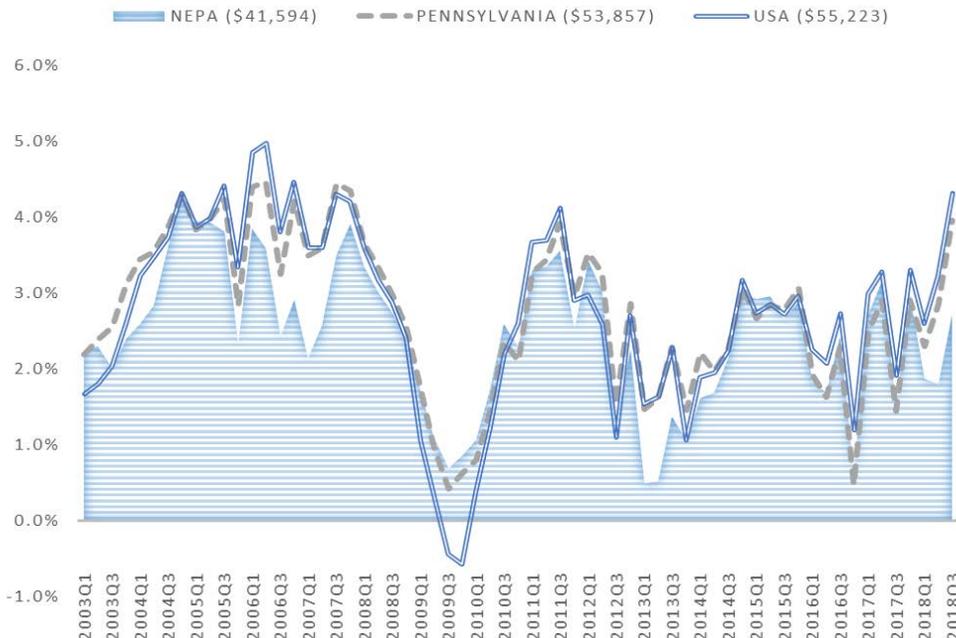
WAGE GROWTH BY REGION, 2002-2018



Source: Chmura JobsEQ®

Generally, wage growth and contraction across Northeastern Pennsylvania has mirrored statewide and national trends, but to a lesser intensity. Since 2003, NEPA wages have averaged 2.4 percent growth, compared to 2.7 percent among workers in both Pennsylvania and the rest of the United States. Across all three regions, the rate of overall wage growth has declined since 2009. In Northeastern Pennsylvania, wages grew by three percent from 2003 to 2008, but fell to an average of 2.1 percent since 2009. Throughout Pennsylvania and the rest of the United States, wage growth fell from 3.5 percent to 2.3 percent across both periods.

ANNUAL WAGE GROWTH BY REGION, 2003-2018



Source: Chmura JobsEQ®

In Northeastern Pennsylvania, workers in the Management occupational category are the highest earners, bringing home approximately \$103,700 in annual wages, while workers in Food Preparation and Serving earn the lowest wages in the region, at approximately \$22,600 a year. Other above-average occupational categories include: (1) Architecture and Engineering (\$72,100); (2) Healthcare Practitioners and Technical (\$71,900); (3) Life, Physical, and Social Sciences (\$68,400); (4) Legal (\$67,100); (5) Computer and Mathematical (\$65,600); (6) Business and Financial Operations (\$63,000); (7) Education, Training, and Library (\$52,900); (8) Protective Service (\$46,800); (9) Construction and Extraction (\$45,700); (10) Community and Social Services (\$43,900); and (11) Installation, Maintenance, and Repair (\$43,600).

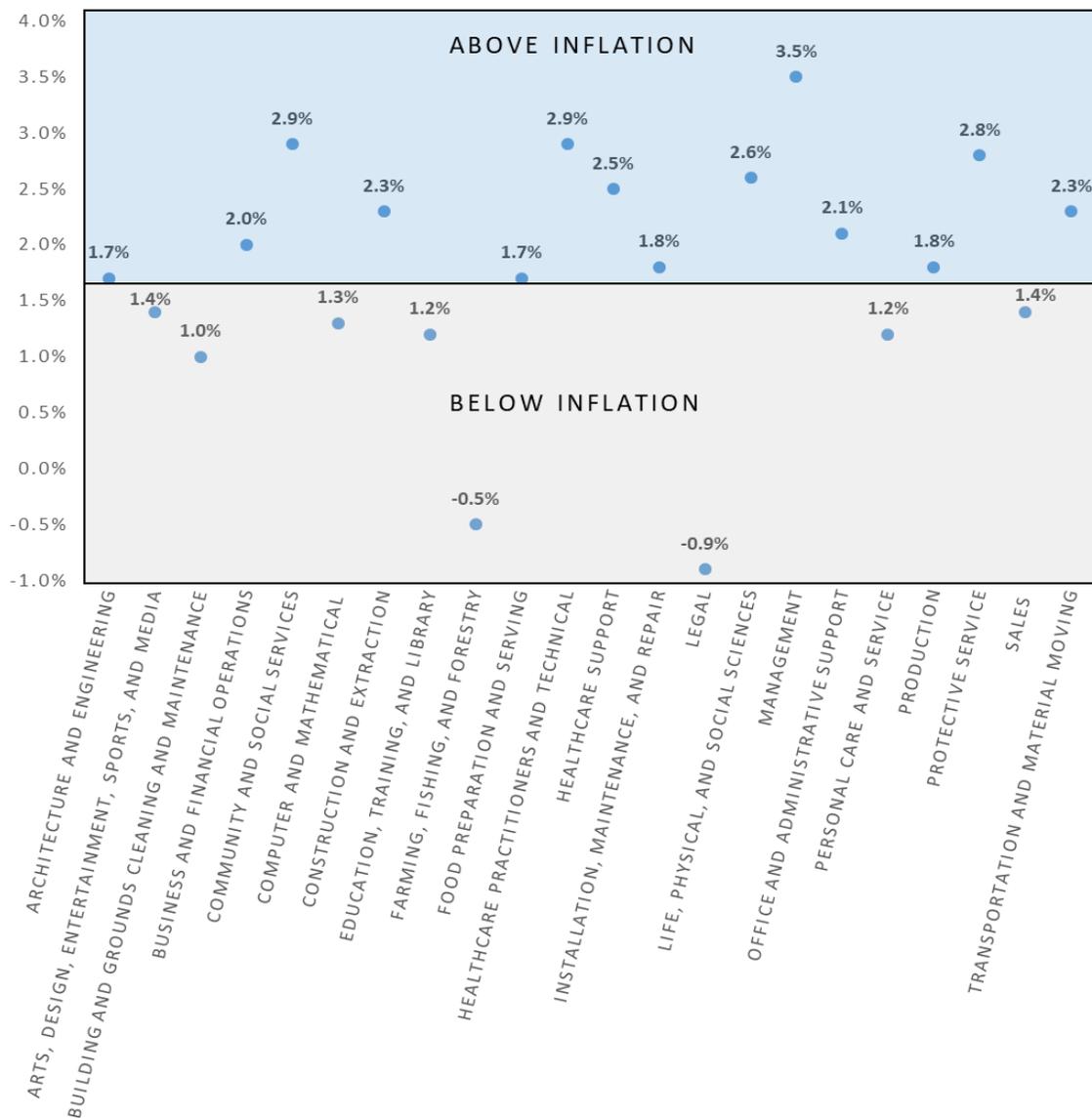
Most occupational categories in Northeastern Pennsylvania, even higher-paying ones, pay significantly lower wages than national averages. The largest wage gaps between regional and national workers can be found in the following occupations: (1) Legal (38 percent); (2) Arts, Design, Entertainment, Sports, and Media (29 percent); (3) Computer and Mathematical (27 percent); (4) Sales (20 percent); and (5) Architecture and Engineering (16 percent). Only two regional occupations offer wages that, on average, are not below national wages: Farming, Fishing, and Forestry with regional wages one percent higher than the national industry, and Protective Services whose wages are even with national workers. Depressed wages in higher-paying occupations can hinder employers' efforts to recruit higher-skill workers to the region.

Wages by Occupational Category	Average Wage, 2018	Comparison to U.S. Average
Management	\$103,700	-13%
Architecture and Engineering	\$72,100	-16%
Healthcare Practitioners and Technical	\$71,900	-11%
Life, Physical, and Social Sciences	\$68,400	-8%
Legal	\$67,100	-38%
Computer and Mathematical	\$65,600	-27%
Business and Financial Operations	\$63,000	-18%
Education, Training, and Library	\$52,900	-5%
Protective Service	\$46,800	0%
Construction and Extraction	\$45,700	-8%
Community and Social Services	\$43,900	-9%
Installation, Maintenance, and Repair	\$43,600	-9%
Arts, Design, Entertainment, Sports, and Media	\$41,500	-29%
Production	\$37,100	-3%
Transportation and Material Moving	\$35,000	-5%
Office and Administrative Support	\$34,200	-10%
Sales	\$32,800	-20%
Healthcare Support	\$30,400	-2%
Farming, Fishing, and Forestry	\$28,500	1%
Building and Grounds Cleaning and Maintenance	\$26,100	-9%
Personal Care and Service	\$24,100	-12%
Food Preparation and Serving	\$22,600	-9%

Source: Chmura JobsEQ®

Despite wage growth across most industries in Northeastern Pennsylvania, many employees still lost ground, as wages for workers in many occupational sectors did not keep pace with the average annual inflation rate of 1.5 percent from 2009 to 2017. Wages in 14 occupational sectors enjoyed annual wage growth above the annual inflation rate, with careers in Management, Healthcare Practitioners and Technical, Community and Social Services, and Protective Services leading the way. Conversely, workers in six occupations experienced modest wage growth that failed to keep up with inflation, including: (1) Arts, Design, Entertainment, Sports and Media (1.4 percent); (2) Building and Grounds Cleaning and Maintenance (1 percent); (3) Computer and Mathematical (1.3 percent); (4) Education, Training, and Library (1.2 percent); (5) Personal Care and Service (1.2 percent); and (6) Sales (1.4 percent). Finally, workers in two occupations actually saw wage contraction from 2009 to 2017: Farming, Fishing, and Forestry (down 0.5 percent), and Legal (down 0.9 percent).

REGIONAL OCCUPATIONAL WAGE GROWTH AGAINST INFLATION, 2009-2017



Source: Chmura JobsEQ®

Synthesis

Despite its important regional assets, Northeastern Pennsylvania stands at an important economic inflection point. The slow and irreversible decline of the region's heavy industrial base in coal mining and manufacturing has resulted in the loss of nearly 39,000 jobs, \$1.5 billion in wages, and \$6.2 billion in economic output in just the last two decades alone, with further contractions still to come. Although the region's manufacturing industry remains its largest employer and contributor to regional GDP, most careers in this industry lack the upward mobility necessary to attract high-quality talent to the region.

In addition to (and, perhaps, because of) these economic challenges, Northeastern Pennsylvania also faces a critical convergence of unfavorable demographic developments. Every day, approximately 81,000 workers travel into the region from outside, while nearly 150,000 leave to work elsewhere – a net loss of 68,000 workers. Approximately 31 percent of Northeastern Pennsylvania residents commute to jobs located outside of the region, and the gap between inbound and outbound commuters has widened by 38 percent between 2005 and 2015. Additionally, the region has seen a net out-migration of residents, as approximately 6,900 more individuals left the region than entered it. Finally, nearly 24 percent of local workers are at or over the age of 55, and most of them will likely retire in the coming decade, spawning a retirement crisis that may incur losses approaching \$4.5 billion in annual wages and \$12.5 billion in economic output. Conversely, just 19 percent of regional workers, those between the ages of 25 and 34, stand ready to replace them – and not all of them are currently working. While the regional population of the 25 to 44 age cohort shrank by nearly four percent since 2011, the percentage of 25-44 year olds who are not currently participating in the workforce increased by three percent. Combined, these limitations may partially help to explain the region's depressed labor force participation, and portend future declines to come. What's more, workers in nearly 43 percent of all occupational sectors are experiencing only modest wage growth that fails to keep up with the average annual inflation rate of 1.5 percent.

Demographic and economic challenges notwithstanding, many sectors of Northeastern Pennsylvania's economy appear primed for expansion, and may provide accessible employment opportunities with upward mobility and transferable skills. A handful of demographic assets remain as well. For instance, despite a disproportionately under-educated workforce, young adults in Northeastern Pennsylvania between the ages of 25 and 34 are more likely to hold a bachelor's degree than workers over the age of 55 – a trend which is likely to continue and grow as even younger workers prepare to enter the workforce many years from now. Additionally, while more workers are seeking opportunities to work outside the region, inbound commuters tend to be younger and better educated, and also represent the fastest-growing group of commuters (compared to outbound commuters and individuals who live and work in the area). Moreover, individuals who have recently moved to Northeastern Pennsylvania from outside the region or abroad are likelier to have a college education than the native workforce, and are also likelier to have graduated from a master's or doctoral program as well. These developments, coupled with the above sectors primed for expansion, clearly set out a pathway for the region's economic restoration and bring new hope for a region struggling to grow in a more innovative, economically competitive, and efficient 21st century labor market.

Recommendations

Harness the value of Northeastern Pennsylvania's network of higher education institutions in designing a classroom to workplace pipeline through public-private partnerships.

For other industries more dependent on a formally educated workforce, the pipeline of emerging younger workers in the region may partially mitigate labor force shrinkage through retirement and other exits. Across the eleven counties comprising the geographical scope of this report, approximately 13,100 degrees were awarded from post-secondary institutions in 2017 alone. Thus, the roughly 10,400 vacancies generated by retirements in the industries of Healthcare and Social Assistance, Professional and Business Services, and Education may potentially be filled by another 7,200 recent degree earners, as these industries may offer easier access to entry-level career opportunities, as opposed to Construction, Manufacturing, or Retail Trade.

However, reliance on these emerging workers alone would prove an impractical strategy – many students of regional colleges and universities originally hail from outside of the local area, and may take their skills and educational credentials back home, or even to a new destination entirely. Thus, building a regional pipeline of educated workers requires cultivating interest in further education among local students, as well. Approximately 1,206 students across Northeastern Pennsylvania dropped out of high school in 2016, and only 11 percent of the 77,000 recent high school completers in 2016 were enrolled in post-graduate educational programs at the time of graduation.

By informing local educators and careers counselors about the benefits of postgraduate education, whether through a degree, certificate, award, or apprenticeship, local students without plans to obtain a bachelor's degree after high school might become more aware of career opportunities that exist outside of that paradigm. For instance, many educators lack the substantive knowledge of vocational and technical training programs, as most colleges of education lack certificates on vocational teacher training. Moreover, guidance counselors across the country must contend with a 482:1 student-to-counselor ratio across public high schools as of 2017, and lack both the resources and the time to discover and disseminate all the available options for high school students uninterested in pursuing a bachelor's degree after graduation.ⁱ Additionally, parents and students must overcome a perceived social bias against vocational programs, which are typically linked with “blue collar” professions with little prospect of meaningful upward mobility.

Regional workforce development organizations, by harnessing the value of their network of local employers and other community stakeholders, can act as critical facilitators in connecting employers and educators alike. When that connection occurs, rewarding and enduring partnerships can form. For instance, some local institutions, such as Lackawanna College, are utilizing growing demand in the energy and utilities sector, and collaborating with many employers in the exploration and development of the Marcellus Shale. In 2014, Cabot Oil and Gas Corporation announced a \$2.5 million donation to Lackawanna College's School of Petroleum and Natural Gas in New Milford, in order to support program scholarships, equipment updates, faculty retention, and student internships.ⁱⁱ Additional investments from Williams Talisman Energy, Exterran Holdings, and Team Oil Tools helped students obtain equipment necessary to develop the skills critical to enter a career in the field.ⁱⁱⁱ In turn, Lackawanna College's School of Petroleum and Natural Gas can boast a 90 percent employment rate for graduating students.

Partnerships like the one above give employers a voice in helping schools equip students with the skills and tools necessary to succeed in today’s workforce, and by extension, the ability to enjoy easier post-graduate career placement. According to recent surveys of state CTE directors, nearly 80 percent have noted an increased level of employer engagement over the last decade, and even more predict that such engagement will continue over the coming decade, as well. However, many employers and educators lack the information necessary to take the first steps toward building these sorts of critical partnerships. In order to build other successful employer-educator partnerships in the future, intermediaries with the requisite knowledge, connections, and efficacy are needed to help accelerate the process of employer engagement in public-private partnerships. By facilitating the formation of employer-educator consortia on an industry-by-industry basis, community stakeholders can help endow students with the ability to build rewarding careers, thereby strengthening the region’s workforce and diversifying our economy.

Utilize the grant-making process to incentivize greater stakeholder collaboration in future, while providing support for non-traditional educational avenues.

Addressing the skills gap outlined in this report is, from a statewide and national perspective, one of the most pressing public policy issues of our time, which is why many agencies on the federal and state level are attempting to jumpstart advancement through regional innovations. For instance, in February 2019, Pennsylvania Governor Tom Wolf enacted an executive order creating the Keystone Economic Development and Workforce Command center, a public-private partnership designed to align state investment with private sector needs and modernize the commonwealth’s workforce and business competitiveness.^{iv}

Consistent with the growing consensus that regional stakeholders are best equipped to divert financial resources to the appropriate recipients, a growing amount of public investment in workforce development is being distributed through grant funding. For instance, in January 2019, the Commonwealth of Pennsylvania distributed over \$2.6 million in Business-Education Partnership (BEP) grants to 22 workforce development boards across the state, with local information reported in the table below.^v This policy follow a spate of recent initiatives targeting growing industries, such as PAsmart, which invested \$30 million in job training and apprenticeships in expanding STEM fields, and the Office of Apprenticeship and Training, which approves and provides grant funding for apprenticeship programs developed by schools, community organizations, and other involved stakeholders.^{vi} Federally, the Department of Labor’s Education and Training Administration provides funding opportunities addressing a number of policy objectives, including sector-based apprenticeship strategies, occupational licensing reform, and workforce reentry opportunities for dislocated workers.^{vii}

Workforce Development Board	Award
Lackawanna	\$151,497.00
Luzerne-Schuylkill	\$100,000.00
Northern Tier (Bradford, Sullivan, Susquehanna, Tioga, Wyoming)	\$131,595.00
Pocono (Carbon, Monroe, Pike, Wayne)	\$90,900.00

Source: Pennsylvania Governor’s Office (2019)

One feasible way for regional stakeholders in workforce development to bring new opportunities to the region is through the Pennsylvania Department of Community and Economic Development's Pre-Apprenticeship and Apprenticeship Grant Program, a statewide initiative offering financial support for registered apprenticeship programs – specifically, to increase talent recruitment and development. Applications are welcomed from a wide range of applicants, including single employers, economic and workforce development organizations, CTCs, community colleges, and non-profit organizations, with a special emphasis on collaborative partnerships.^{viii} In addition to recent high school graduates and the nearly 10,400 degree earners graduating from regional colleges and universities, this report has also identified 45,000 individuals across the region who are unemployed and still looking for work, as well as 43,000 underemployed workers pursuing opportunities to fully utilize their experiences and credentials. A successful pipeline connecting just half of this combined population could potentially fill every vacancy created by retirement across Northeastern Pennsylvania over the next decade, and for students wary of making a long-term commitment or upfront investment into a formal education program, expanded access to apprenticeship opportunities might make a meaningful difference.

In addition to formal programs like apprenticeships, other ad-hoc opportunities exist for employers to provide in-house career advancement with public investment. With the proliferation of Massive Open Online Courses (MOOCs) from a number of sources like Coursera, EdX, or Udemy, it has never been easier for tech-savvy individuals to learn the skills necessary to compete in a more technologically-oriented workforce. For many workers, however, the process of getting started with such a process remains challenging. To help bring these opportunities directly to workers, the Pennsylvania Department of Community and Economic Development also provides support for employers interested in supplying their current employees with advanced technology training through the Workforce and Economic Development Network of Pennsylvania (WEDnetPA).^{ix} Advanced technology training is especially useful to workers due to the transferability of these skills across multiple sectors of the economy. As demonstrated by the skill sets necessary for the area's five target industries (in the previous section), workers with skills and experience in database management, query software, computer aided design software, and business intelligence and data analysis platforms are valuable in a host of occupations.

Just as there is an information deficit among students and educators about the potential of non-traditional educational avenues, employers are often unaware or reluctant to embrace the opportunity to invest in such training. Like expenses on facilities and equipment, such initiatives often require an immediate investment by employers in exchange for long-term returns – but workforce development stakeholders can provide enlightenment and support in combatting this information gap. By partnering with other stakeholders – including interested employers and other community partners – these agents can collaborate to deliver support that transcends county borders and delivers investment to local communities in most need of it. Even when employers are the targeted applicants for career development grants, workforce development stakeholders with more experience seeking public investments through grant applications may become especially vital resources – not only for disseminating information about opportunities like these to local employers, but also for dispensing advice about the application process for employers seeking their first grants. By drawing on the rising number of grants that emphasize multi-stakeholder proposals, entities from across the community can contribute their own assets toward a strategy that enables economic opportunity across the entire region of Northeastern Pennsylvania.

Equalize the range of services offered among regional workforce development organizations through multi-stakeholder and collective impact initiatives.

The overarching theme to many of the recommendations contained in this report involve an enhancement of existing collaborative governance mechanisms in the region. In the study of public administration, collective governance is defined as the assembly of stakeholders to resolve pressing issues of public policy that are too overwhelming for any one entity to solve alone. Collaborative governance can broadly be categorized into five approaches: (1) Funders who assemble over a mutual interest; (2) Public-Private Partnerships, which join private and public entities to solve a narrowly-focused social problem; (3) Multi-Stakeholder Initiatives, which bring together interested organizations of all sizes and backgrounds on a short to medium-term basis; (4) Social Sector Networks, which establish a forum for information sharing on a short-term basis, and (5) Collective Impact Initiatives, which convene deeply committed stakeholders from multiple sectors for long-term action to effect social change.^x

Fortunately for Northeastern Pennsylvania, there is no shortage of deeply committed actors in the field of regional workforce development. There are four regional workforce development boards (Lackawanna, Luzerne-Schuylkill, Northern Tier, and Pocono Counties), NEPA is also home to an array of stakeholders, from public agencies like CareerLink and a number of other non-profits. With the large number of committed regional actors in the sphere of workforce development, the opportunities to harness their collective effort into a comprehensive collective impact initiative are plentiful. Systemic changes at the state level are needed in order for workforce development boards to be more proactive and entrepreneurially in their approach. Thankfully, case studies from similarly situated communities illustrate a number of pathways forward. For instance, stakeholders in Northeastern Ohio established Early College Early Career (ECEC), a program that enables students to take tuition-free courses toward an advanced manufacturing or technology degree through area community colleges, and participate in paid internships at local companies.^{xi} This initiative was established by the Manufacturing Advocacy and Growth Network (MAGNET), a consortium of industry experts, economic development organizations, university partners, government agencies, and other service providers who partnered with The Cleveland Foundation, a regional philanthropic agency.^{xii}

By pooling resources and partnering with the widest range of committed peer groups in the region, local stakeholders can establish uniquely-positioned alternative education tracks for students that allow them not only to survive in today's workforce, but thrive. With Northeastern Pennsylvania's regional assets, there are no limits to the number of similar partnerships that can be formed. In the 11-county region comprising the geographic scope of this report, there are approximately seven institutions that award two-year degrees in health technologies, transportation, energy extraction, and construction, as well as four career and technology centers offering programs in similar fields, including advanced manufacturing. Furthermore, current demographic changes will necessitate such rapid increases in labor demand that some industries may actively seek out new in-house training programs or workforce development partnerships, especially in areas like healthcare, energy, and utilities. For such efforts to come to fruition, however, it is incumbent on more experienced stakeholders to develop and disseminate a business-friendly argument for workforce development investment, and illustrate the potential of deep, multi-stakeholder cross-sector initiatives. Given the desperate need for skilled local talent, initiatives that involve a mix of policymakers, educators, and employers can create forums that

leverage talent, experience, and insight into policies that generate greater value for employers and maximize opportunities for employees' career advancement.

Conclusion

Northeastern Pennsylvania sits at a convergence point of significant challenge and profound opportunity. The region has long struggled to move beyond its heavy industrial base to develop a diversified economy, but new opportunities abound in growing industries like healthcare, transportation, utilities and energy extraction, infrastructure and construction, and other advanced professional services. The area's workforce has grappled with a wave of retirements, the net export of commuters, and a steady number of out-migrants, yet still attracts growing numbers of inbound commuters and newcomers.

All of the aforementioned challenges and opportunities are deeply intertwined, and cannot be fixed by one employer, organization, or public agency alone. Addressing these multi-faceted concerns requires the involvement of every committed stakeholder in the region, including employers, universities, community colleges, career and technology centers, workforce development boards, economic development organizations, and policymakers. The successful resolution of these challenges, however, can help every participant involved, as well. Regional workers can build a lucrative, rewarding, challenging career with upward mobility in an area with a low cost of living. Employers can select from a wide range of talented prospective employees equipped with the skills to start work on day one. Community partners benefit from the economic enrichment of a community with fewer out-of-region commuters and out-migrants.

When all relevant stakeholders collaborate toward this aim, the result is an environment that enables every participant to succeed.

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