

This report, prepared by The Institute for Public Policy and Economic Development, details the top five industries poised to bolster the regional workforce.

# Job Opportunities and Higher Education Completions:

A Comparative Analysis

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

# The Institute

*Turning Information into Insight*

*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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The Institute is a non-profit research organization dedicated to empowering business and community leaders with research based strategies for informed decision making. We conduct independent, non-biased research to identify the opportunities, issues and challenges unique to the region and find innovative solutions to help solve the problems facing our communities. The Institute also offers a wide array of research, consulting and support services to help organizations boost productivity, increase profitability and be successful in their missions.

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# Contents

- Preface ..... 2
- Research Methodology ..... 3
- Executive Summary..... 4
- Regional Workforce Opportunities..... 9
  - Healthcare and Social Assistance..... 11
  - Logistics, Transportation, and Warehousing ..... 15
  - Infrastructure and Construction ..... 20
  - Utilities and Energy Production ..... 24
  - Advanced Professional Services..... 27
- Synthesis ..... 32
- Recommendations ..... 33
- Conclusion..... 37

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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.

## 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. Educational completion data from regional institutions was extracted from the National Center for Educational Statistics. Qualitative occupational descriptions and skill set information was obtained from O\*NET Online, the U.S. Department of Labor's online resource containing descriptive information about national occupations, industries, and fields of work. Projected job losses in the coal mining industries, were provided from internal data compiled and analyzed by the Institute.

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

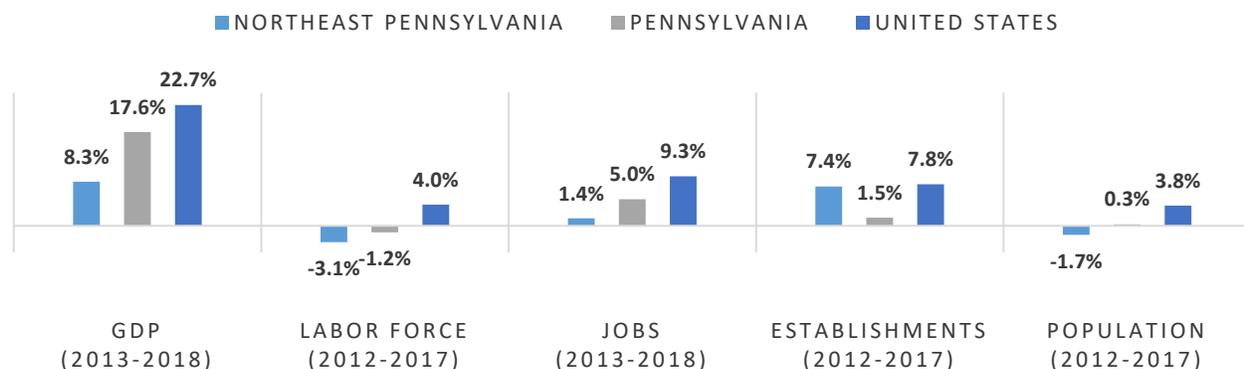
\$5.3 BILLION

## Executive Summary

Home to nearly 560,000 jobs and 29,000 businesses, the economy of Northeastern Pennsylvania is one of the largest in the Commonwealth, both in size and impact. The area’s geographic location, equidistant from both New York City and Philadelphia, is perfectly positioned along the intersection of multiple major transportation hubs, including Interstates 80 and 81, as well as the Pennsylvania Turnpike. In the 2016-2017 academic year alone, the region’s 31 institutes of higher education – including universities, community colleges, CTCs, and for-profit programs – awarded over 13,000 degrees or certificates in over 280 various fields of study. Moreover, Northeastern Pennsylvania has always been home to large swaths of energy-rich land, whether anthracite coal in the past or cleaner, more affordable natural gas today. Finally, the region’s low cost of living makes it an attractive place to build a life or invest in a business.

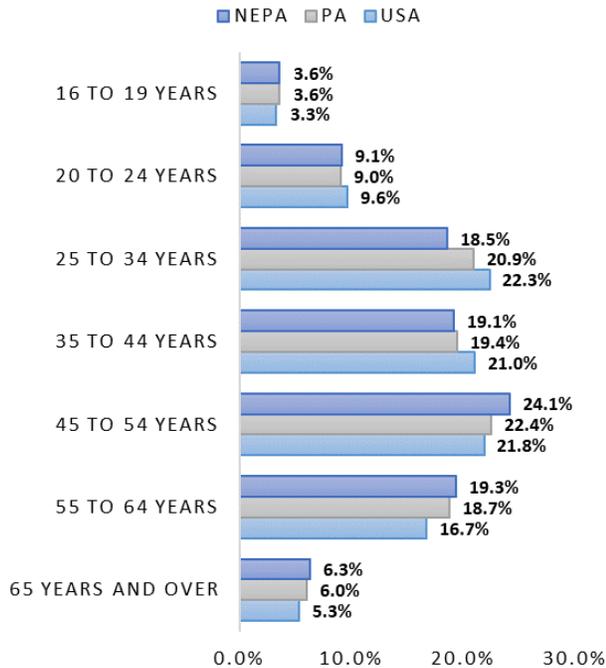
However, like many other Rust Belt communities, Northeastern Pennsylvania’s economy sits at an important crossroads, at the intersection of multiple economic, social, and demographic trends whose pace is accelerating rapidly. While Pennsylvania and the rest of the nation has seen a modest uptick in population, 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

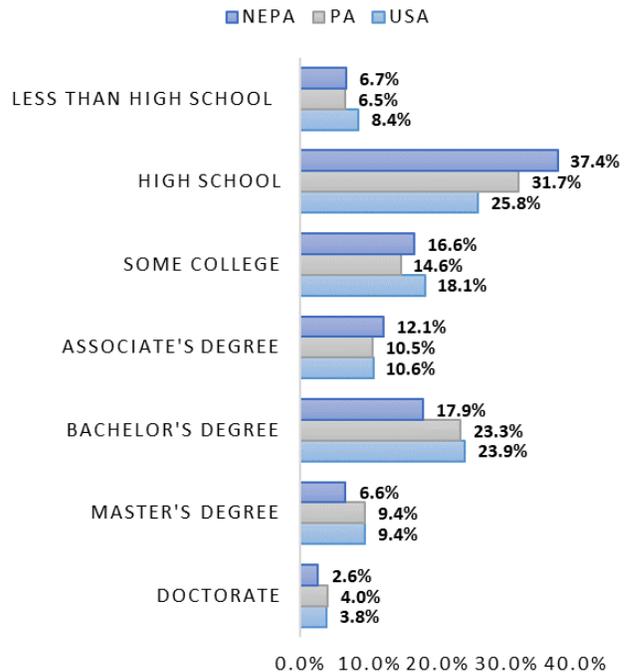


Due to the area’s stagnant population growth, the region’s workforce is, on balance, both older and less educated than the statewide or national equivalents. Specifically, as demonstrated by the graphs below, Northeastern Pennsylvania is home to a disproportionately large percentage of workers at or 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. Additionally, the region has the largest percentage of workers with a high school degree or less, at approximately 44 percent, compared to 38 percent of all Pennsylvania workers and 34 percent of all American workers. Just 27 percent of regional workers have attained a bachelor’s degree or higher, compared to 37 percent of workers in both Pennsylvania and the rest of the country.

## WORKFORCE BY AGE



## WORKFORCE BY EDUCATION



Beyond these demographic troubles, Northeastern Pennsylvania also stands at an important economic inflection point, as evidenced by the region's loss of 39,000 jobs, \$1.5 billion in wages, and \$6.2 billion in economic output from decades of decline in the area's heavy industrial base of coal mining and manufacturing. In addition to these historical losses, production-oriented industries like these face further threats in the form of automation, as nearly half of regional workers currently employed in these industries face at least a 70 percent risk of having some portion of their positions automated in the coming decades.

### *Economic Impact of Heavy Industry Decline (Net Change) 2001-2018*

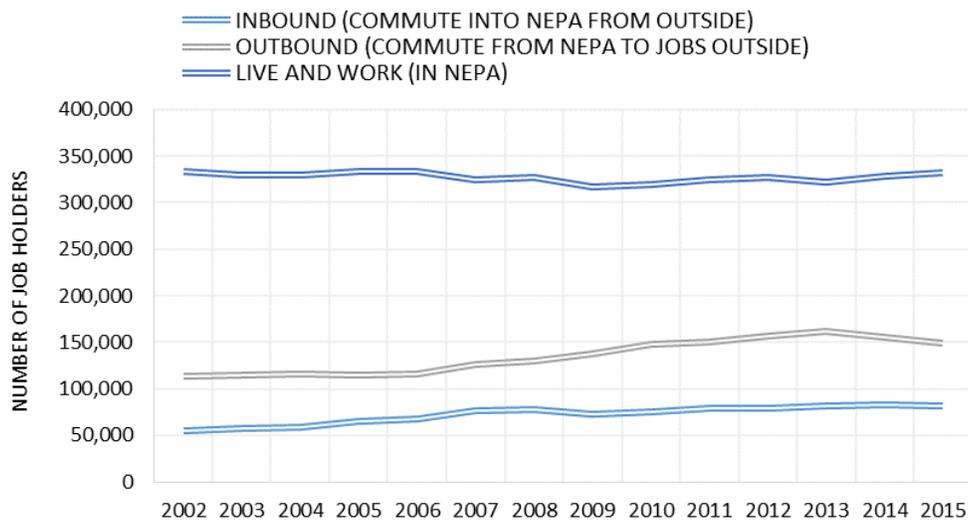
County	<i>Employment Impact</i>		
	Employment	Labor Income	Economic Output
Bradford	-3,895	(\$113,890,868)	(\$586,314,788)
Carbon	-1,544	(\$58,317,293)	(\$238,565,631)
Columbia	-2,997	(\$40,457,089)	(\$354,025,765)
Lackawanna	-10,293	(\$470,731,969)	(\$1,487,845,862)
Luzerne	-11,700	(\$506,010,645)	(\$1,870,192,790)
Monroe	-635	(\$24,548,649)	(\$141,568,452)
Pike	-516	(\$28,410,938)	(\$197,661,960)
Schuylkill	-2,244	(\$112,712,866)	(\$304,442,361)
Susquehanna	-844	(\$30,778,861)	(\$136,906,505)
Wayne	-581	(\$23,584,489)	(\$120,559,543)
Wyoming	-2,046	(\$45,602,945)	(\$779,797,459)
<b>TOTAL</b>	<b>-39094</b>	<b>(\$1,455,046,612)</b>	<b>(\$6,217,881,116)</b>

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.

### 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%
<b>TOTAL</b>	<b>-6,867</b>	<b>58.1%</b>

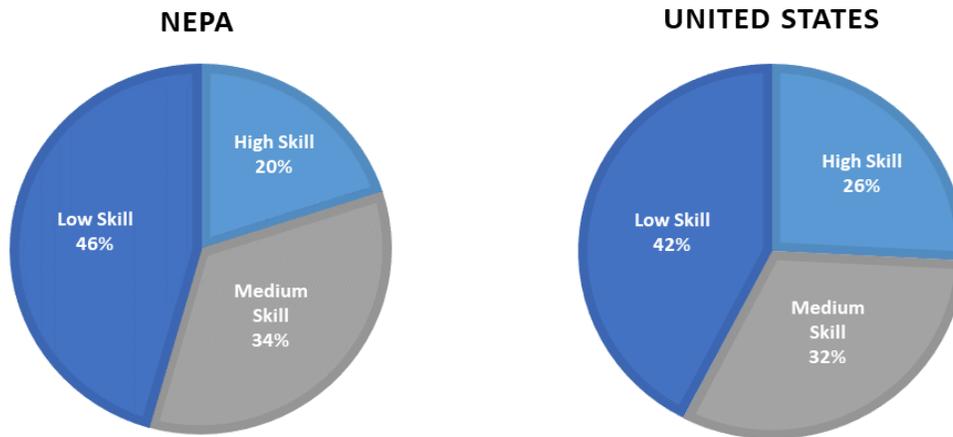
### COMMUTING FLOWS, 2002-2015



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

Taken together, all of these trends risk further hampering the expansion of economic opportunity throughout the region. Employment figures in 64 percent of all occupations and 70 percent of all industries are set to decline by 0.2 percent across the region between 2018 and 2026, with workers at the bottom end of the socioeconomic ladder likelier to take the brunt of this downsizing. Because of the relatively large number of regional workers with only a high school degree or less, the area’s workforce is oriented around low skill occupations – those which require just a high school degree. A mass exodus of workers, either through retirement or out-migration, is projected to result in a large drop in workforce representation of these low skill occupations, from 57 percent in 2018 to 46 percent by 2026. Conversely, the proportion of high skill occupations, those which require at least a bachelor’s degree, is projected to climb from 13 percent of the regional workforce to 20 percent during the same period of time. Middle skill occupations, which require either long-term training or an associate’s degree, are also slated to fall by four percentage points during this time.

### OCCUPATIONAL PROJECTIONS BY SKILL, NEPA AND UNITED STATES

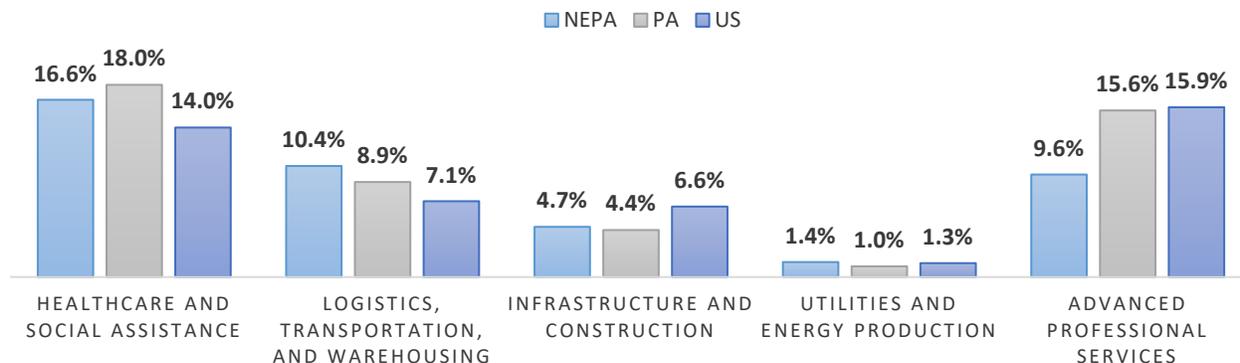


Source: Chmura JobsEQ®

Despite the aforementioned challenges, this report identifies five sectors of Northeastern Pennsylvania’s economy that have experienced robust growth in the last five years, and are primed for continued expansion in the coming years. First, reflecting the major demographic changes facing the region, a rising number of opportunities exist to serve the elderly and infirm in the area’s fastest-growing industry, Healthcare and Social Assistance. Second, the region’s proximity to major transportation networks make a career in Logistics, Transportation, and Warehousing an attractive option, from industrial truck drivers to air transportation. Third, the area’s Infrastructure and Construction has experienced recent gains in support of utilities expansions in the region, including the construction of lines for telecommunication, water, and sewer, as well as oil and gas pipelines. Fourth, although the region’s coal mining industry may be near extinct, the proximity of the Marcellus Shale – as well as rising investment in biomass, wind, and geothermal energy – has opened the door for lucrative and upwardly mobile career opportunities in Utilities and Energy Production. Finally, a myriad of opportunities continue to exist in Advanced Professional Services, from Real Estate Appraisal to Investment to Advice, and Software Publishing to Market Research. Professions in any of these growing sectors offer secure,

dynamic, and well-compensated career pathways to individuals with the credentials, training, and willpower to succeed.

## EMPLOYMENT AS A SHARE OF TOTAL ECONOMY, 2018



Source: Chmura JobsEQ®

In addition to the increased demand for the five industrial sectors above, younger workers in the region may be better equipped to take advantage of this expansion. For instance, younger 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. Moreover, despite the net export of commuters across the region, the number of inbound commuters is growing at a more rapid pace than outbound ones, and this category of commuters tends to be younger and better educated. Finally, individuals who have recently moved to the region, although small in number, are also more likely than the native-born population to have at least a college education.

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.

## Regional Workforce Opportunities

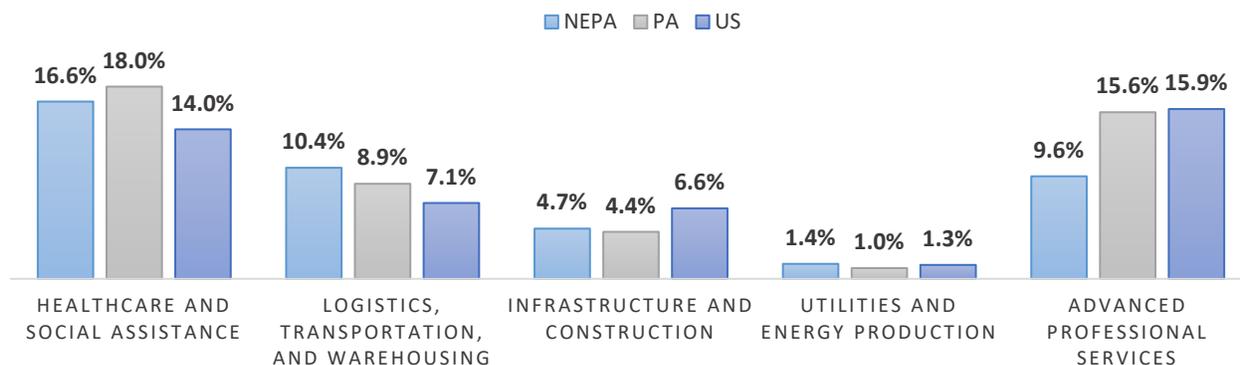
The following analysis outlines five industries of Northeastern Pennsylvania's economy that are poised for future expansion and investment, as well as those that provide accessible employment opportunities with upward mobility and transferable skills. These target industries identify sectors of economic specialization in Northeastern Pennsylvania that offer competitive advantages to employers and employees alike.



Source: North American Industry Classification System, U.S. Census Bureau (2017)

Collectively, the following target industries employ more than 196,000 workers in the region, representing nearly 43 percent of Northeastern Pennsylvania’s economy. Some of the target industries below even surpass national and statewide equivalent shares: (1) Healthcare and Social Assistance, (2) Logistics, Transportation, and Warehousing, and (3) Utilities and Energy Production. Combined, these industries are set to create approximately 7,530 new positions between 2018 and 2026. Employees in these target industries are also, on average, better compensated than regional employees in other industries, receiving approximately \$49,907 in wages – a nearly 20 percent premium over regional workers in all industries.

### EMPLOYMENT AS A SHARE OF TOTAL ECONOMY, 2018



Source: Chmura JobsEQ®

As the table below demonstrates, two of this report’s target industries, Advanced Professional Services and Utilities and Energy Production, are projected to shrink in size from 2018 to 2026. Despite an overall contraction in these two industries, however, there exist multiple pockets of rapid growth in certain industry subsectors. For instance, careers supporting the natural gas boom in the Marcellus Shale are opening up new employment opportunities in the Utilities and Energy Production sector, while careers in software programming and business analytics are opening new doors to qualified employees in the Advanced Professional Services sector. Additionally, due to the projected contractions across the entire regional labor market (as indicated earlier in this report), moderate job loss in a given target industry does not necessarily undermine its economic competitiveness. The following target sectors contain many significant opportunities for regional economic development, and would benefit immensely from a more robust regional targeting initiative.

### PROJECTED EMPLOYMENT BY TARGET INDUSTRY, 2018-2026

Sector	2018	Net Change, 2026	% Change, 2026	LQ (US = 1.00)
Healthcare and Social Assistance	81,235	7,141	8.8%	1.17
Logistics, Transportation, and Warehousing	37,545	813	2.2%	1.74
Advanced Professional Services	47,267	-752	-1.6%	0.60
Infrastructure and Construction	23,143	662	2.9%	0.85
Utilities and Energy Production	6,931	-334	-4.8%	1.46
<b>ALL SECTORS</b>	<b>491,274</b>	<b>-7,254</b>	<b>-1.5%</b>	<b>1.00</b>

Source: Chmura JobsEQ®

## Healthcare and Social Assistance

A source of nearly 82,000 jobs across Northeastern Pennsylvania, Healthcare and Social Assistance is a thriving industry sector in the region. As of 2018, Healthcare and Social Assistance jobs represent nearly 17 percent of the regional workforce, and is projected to grow at a rate of 1.1 percent annually over the next decade, compared to an average projected decrease of 0.2 percent across all other industries in the region. Reflecting the major demographic changes facing the region, many of these jobs are located in industries that serve the elderly and infirm. Projected growth in Services for the Elderly and Persons with Disabilities, along with Home Health Care Services, Continuing Retirement Care Communities, and Assisted Living Facilities for the Elderly, demonstrates the important role of the region's aging population in workforce development through the coming decade. Moreover, the region's challenges in combatting the opioid crisis may regrettably require a greater need for healthcare workers in settings that address this pervasive social crisis, including Residential Mental Health and Substance Abuse Facilities and Outpatient Mental Health and Substance Abuse Centers.

Healthcare and Social Assistance	2018	2013-2018		2018-2026	
Industry Subsector	Employees	Change in Employment	Annual % Change in Employment	Change in Employment	Annual % Change in Employment
Services for the Elderly and Persons with Disabilities	7,422	1,948	6.3%	1,912	2.9%
Home Health Care Services	4,587	787	3.8%	1,487	3.6%
Offices of Physicians (except Mental Health Specialists)	7,736	-350	-0.9%	738	1.1%
All Other Outpatient Care Centers	2,624	997	-10.0%	585	2.5%
Other Individual and Family Services	2,478	-197	-1.5%	558	2.6%
Offices of Physical/Occupational, and Speech Therapists, and Audiologists	1,484	-68	-0.9%	330	2.5%
Continuing Retirement Care Communities	1,447	-311	-3.8%	297	2.4%
Assisted Living Facilities for the Elderly	1,491	320	4.9%	291	2.3%
Child and Youth Services	1,181	-31	-0.5%	273	2.6%
Specialty (except Psychiatric and Substance Abuse) Hospitals	1,142	121	2.3%	271	2.7%
Freestanding Ambulatory Surgical and Emergency Centers	995	249	5.9%	223	2.6%
Offices of Dentists	2,825	8	0.1%	212	0.9%
Outpatient Mental Health and Substance Abuse Centers	1,671	57	0.7%	207	1.5%
Residential Mental Health and Substance Abuse Facilities	1,358	298	5.1%	193	1.7%
Residential Intellectual and Development Disability Facilities	3,581	77	0.4%	162	0.6%
Ambulance Services	1,530	40	0.5%	159	1.2%
Offices of Podiatrists	209	-15	-1.4%	52	2.8%
Family Planning Centers	71	-6	-1.6%	16	2.6%
Kidney Dialysis Centers	370	28	1.6%	82	2.5%
Blood and Organ Banks	473	-42	-1.7%	82	2.0%

Source: Chmura JobsEQ®

The approximately 82,000 Northeastern Pennsylvania workers currently employed in Healthcare and Social Assistance professions earn, on average, approximately \$45,431 - 8.9 percent more than the \$41,726 in average wages earned by workers in all other industries. Between now and 2026, the largest number of jobs created in this industry is projected to come from a handful of occupations, specifically Personal Care Aides (34 percent); Home Health Aides (18 percent); Registered Nurses (6 percent); Medical Assistants (6 percent); and Medical Secretaries (5 percent). The fastest-growing occupations by total percentage growth from 2018 to 2026 include: Home Health Aides (27 percent); Personal Care Aides (23 percent); Medical Assistants and Child, Family, and School Social Workers (17 percent each); Physical Therapists and Mental Health Counselors (14 percent each); Social and Human Service Assistants (13 percent); Mental Health and Substance Abuse Social Workers and Medical Secretaries (12 percent each); and Medical & Health Services Managers (11 percent). Conversely, many larger industries in healthcare occupations are growing at more modest rates, such as Licensed Practical Nurses (3 percent), Preschool Teachers (2.6 percent), and Nursing Assistants (0.5 percent).

#### TOP OCCUPATIONS IN HEALTHCARE AND SOCIAL ASSISTANCE

Occupation	Employees (2018)	Average Wage	Projected Growth (2026)	Occupational Description
Registered Nurses	9,019	\$62,000	576	Assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients. Advise patients on health maintenance and disease prevention or provide case management.
Personal Care Aides	7,169	\$23,000	1,665	Assist the elderly, convalescents, or persons with disabilities with daily living activities at home or in a care facility, including housekeeping and preparing meals. May advise families, elderly, convalescents, and persons with disabilities regarding nutrition, cleanliness, and household activities.
Nursing Assistants	6,847	\$28,800	35	Provide basic patient care under direction of nursing staff. Feed, bathe, dress, groom, or move patients, or change linens. May transfer or transport patients. Includes nursing care attendants, nursing aides, and nursing attendants.
Home Health Aides	3,247	\$25,200	884	Provide routine individualized healthcare (changing bandages, dressing wounds, applying topical medications) to the elderly, convalescents, or persons with disabilities at home or in a care facility. Monitor health changes. Provide personal care (bathing, dressing, grooming) of patient.
Licensed Practical and Licensed Vocational Nurses	3,216	\$43,400	84	Care for ill, injured, or convalescing patients or persons with disabilities in hospitals, nursing homes, clinics, private homes, group homes, and similar institutions. May work under the supervision of a registered nurse.
Medical Secretaries	2,014	\$33,200	239	Perform secretarial duties using knowledge of medical terminology and hospital, clinic, or lab procedures. Duties include scheduling appointments, billing patients, compiling and recording medical charts, reports, and correspondence.
Medical Assistants	1,810	\$31,400	309	Perform administrative and clinical duties under direction of a physician. Schedule appointments, maintain medical records, billing, and coding information for insurance purposes. Record

				vital signs and medical histories, prepare patients for examination, administer medications.
Social and Human Service Assistants	1,323	\$32,500	173	Provide client services in psychology, rehabilitation, social work, and family support. Help clients obtain available benefits and social services. Assist social workers with developing programs to resolve problems with substance abuse, relationships, rehabilitation, or dependent care.
Emergency Medical Technicians and Paramedics	1,171	\$29,500	113	Assess injuries, administer emergency medical care, and extricate trapped individuals. Transport injured or sick persons to medical facilities.
Preschool Teachers, Except Special Education	1,135	\$28,400	30	Instruct preschool-aged children in activities promoting social, physical, and intellectual growth in preschool, day care center, or child development facility.
Physicians and Surgeons, All Other	1,030	\$246,700	59	Allergists and immunologists; dermatologists; hospitalists; neurologists; nuclear medicine physicians; ophthalmologists; pathologists; physical medicine and rehabilitation physicians; preventive medicine physicians; radiologists; sports medicine physicians; urologists
Dental Assistants	1,025	\$36,900	91	Assist dentist, set up equipment, prepare patient for treatment, and keep records.
Medical and Health Services Managers	972	\$82,200	108	Plan, direct, or coordinate medical and health services in hospitals, clinics, managed care organizations, public health agencies, or similar organizations.
Mental Health Counselors	940	\$44,000	129	Counsel with emphasis on prevention. Work with individuals and groups to promote optimum mental and emotional health. Help individuals deal with addictions and substance abuse; family, parenting, and marital problems; stress management; self-esteem; and aging.
Physical Therapists	871	\$86,000	120	Assess, plan, organize, and participate in rehabilitative programs that improve mobility, relieve pain, increase strength, and improve or correct disabling conditions resulting from disease or injury.
Teacher Assistants	757	\$24,500	37	Perform duties that are instructional in nature or deliver direct services to students or parents. Serve in a position for which a teacher has ultimate responsibility for the design and implementation of educational programs and services.
Child, Family, and School Social Workers	746	\$39,000	127	Provide social services to improve social and psychological functioning of children and their families, and child academic performance. Assist parents, arrange adoptions, find foster homes for abandoned/abused children. Address teenage pregnancy, misbehavior, and truancy.
Radiologic Technologists	692	\$59,000	31	Take x rays/CAT scans or administer nonradioactive materials into patient's blood stream for diagnostic purposes. Includes technologists who specialize in other scanning modalities.
Dental Hygienists	635	\$58,600	55	Clean teeth and examine oral areas, head, and neck for signs of oral disease. May educate patients on oral hygiene, take and develop x rays, or apply fluoride or sealants.
Mental Health and Substance Abuse Social Workers	576	\$39,800	71	Treat clients with mental, emotional, or substance abuse problems, including alcohol, tobacco, and drugs. Activities include individual/group therapy, crisis intervention, case management, client advocacy, prevention, and education.

Source: Chmura JobsEQ

Positions in healthcare and social assistance require higher than average concentrations of certain competencies, which a number of available regional academic programs can supply. Not only do many occupations in this industry require formal knowledge of medicine or psychology, but also customer and personal service through clear oral communication, instructional techniques, and written expression. Many positions in these industries also require physical coordination, critical thinking, and an innate ability to detect the core of a patient or student’s problems, as well as a familiarity with a variety of technological platforms, including medical records repositories, student information systems, and informational retrieval or search software. As of the 2016-2017 academic year, approximately 6,494 students are developing these skills through enrollment in healthcare, science, social services, or education-related majors throughout Northeastern Pennsylvania. The majority of these students are in the process of earning a bachelor’s degree (53 percent), followed by master’s candidates (33 percent), associate’s students (11 percent), and doctoral candidates (4 percent).

### INDUSTRY SKILLS: HEALTHCARE AND SOCIAL ASSISTANCE

KNOWLEDGE	SKILLS
Medicine and Dentistry	Active Listening
Customer and Personal Service	Social Perceptiveness
Psychology	Reading Comprehension
English Language	Written Expression
Education and Training	Speech Clarity
Public Safety and Security	Critical Thinking
Computers and Electronics	Instructing
Therapy and Counseling	Coordination

TECHNOLOGY
Database user interface and query software (Microsoft Access, Blackboard, SQL)
Electronic mail software (Microsoft Outlook)
Human resources software (HRMS, Oracle)
Medical software (eClinicalWorks, Epic Systems, MEDITECH, PointClickCare)
Accounting software (Intuit QuickBooks)
Analytical or scientific software (IBM SPSS, Minitab)
Categorization or classification software (AMA CodeManager, ColorSoft AutoMatch)
Enterprise resource planning software (Oracle Fusion, JD Edwards, SAP)

Source: O\*Net OnLine (2018)

### HEALTHCARE AND SOCIAL ASSISTANCE DEGREES AWARDED NORTHEASTERN PENNSYLVANIA, 2016-2017

	Associate	Bachelor	Master’s	Doctoral	TOTAL
Health Professions	478	1,253	727	189	2,647
Education	98	432	1,055	28	1,613
Psychology	19	423	70	8	520
Biological/Biomedical Sciences	8	405	96	-	509
Leisure & Fitness Studies	14	347	57	-	418
Public Administration/Social Services	12	137	136	-	285
Social Sciences	11	256	6	-	273
Physical Sciences	3	128	3	-	134
Human, Family & Consumer Services	67	28	-	-	95
<b>TOTAL</b>	<b>710</b>	<b>3,409</b>	<b>2,150</b>	<b>225</b>	<b>6,494</b>

Source: National Center for Education Statistics (2017)

## Logistics, Transportation, and Warehousing

Northeastern Pennsylvania's Logistics, Transportation, and Warehousing industries supply nearly 38,000 jobs in the region – approximately 11.3 percent of the regional workforce – and is expected to grow by a rate of 0.3 percent annually over the next ten years, compared to an average 0.2 percent contraction across all other industries in the region. Positioned equidistantly from major centers of urban commerce in New York and Philadelphia, and located along the major transportation routes of Interstates 81 and 80, Northeastern Pennsylvania is home to growing industries in warehousing, as well as road, transit, and ground passenger transportation. Since 2013, this sector added approximately 4,900 jobs across Northeastern Pennsylvania – an average annual growth rate of two percent, compared to a 0.4-percent growth rate among all other regional industries. Moreover, as this sector continues to expand, regional workers may continue to access economic opportunities in new sectors. For instance, the continued growth of Wilkes-Barre/Scranton International Airport – the fifth largest airport in Pennsylvania by passenger count – has generated new positions in airport operations and air transportation, as exhibited by the double-digit percentage employment growth in these industries from 2013 to 2018, and the prospect of continued growth in the coming years.

Logistics and Transportation	2018	2013-2018		2018-2026	
Industry Subsector	Employees	Change in Employment	Annual % Change in Employment	Change in Employment	Annual % Change in Employment
General Warehousing and Storage	17,935	4,836	6.5%	1,797	1.2%
Refrigerated Warehousing & Storage	458	-125	-4.7%	42	1.1%
Beer and Ale Merchant Wholesalers	298	-7	-0.4%	35	1.4%
Other Support Activities for Road Transportation	498	232	13.4%	32	0.8%
Other Transit and Ground Passenger Transportation	196	1	0.1%	20	1.2%
Recyclable Material Merchant Wholesalers	308	-80	-4.5%	17	0.7%
Motor Vehicle Towing	298	94	7.9%	16	0.7%
Airport Operations	191	80	11.4%	11	0.7%
Other Warehousing and Storage	106	33	7.7%	10	1.2%
Sporting and Recreational Goods and Supplies Merchant Wholesalers	183	-52	-4.8%	10	0.6%
Wholesale Trade Agents and Brokers	830	-192	-4.1%	9	0.1%
Other Miscellaneous Durable Goods Merchant Wholesalers	160	32	4.5%	6	0.5%
Metal Service Centers and Other Merchant Wholesalers	156	-37	-4.1%	6	0.5%
Local Messengers and Local Delivery	157	-64	-6.6%	4	0.3%
Scenic and Sightseeing Transportation, Land	33	-10	-5.1%	4	1.4%
Other Support Activities for Air Transportation	48	-18	-6.2%	2	0.6%
Support Activities for Rail Transportation	186	100	16.6%	1	0.1%

Source: Chmura JobsEQ®

Workers in Northeastern Pennsylvania currently employed in the Logistics, Transportation, and Warehousing sector earn approximately \$42,787 annually, a nearly three-percent increase over the average regional wages of \$41,726. Although the largest number of employment openings in this sector include Laborers, Packers and Packagers, and Industrial Truck and Tractor Operators, many higher-paying opportunities exist on the supervisory level, as well as in other specialized positions – for instance, First-Line Supervisors of Helpers, Transportation Managers, Logisticians, and Cargo and Freight Agents.

#### TOP OCCUPATIONS IN LOGISTICS, TRANSPORTATION, AND WAREHOUSING

Occupation	Employees (2018)	Average Wage	Projected Growth (2026)	Occupational Description
Laborers and Freight, Stock, and Material Movers, Hand	9,027	\$30,900	715	Manually move freight, stock, or other materials or perform other general labor.
Packers and Packagers, Hand	1,258	\$26,800	125	Pack or package by hand a wide variety of products and materials.
Industrial Truck and Tractor Operators	3,229	\$35,300	106	Operate industrial trucks or tractors equipped to move materials around a warehouse, storage yard, factory, or construction site.
First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	757	\$57,500	66	Directly supervise and coordinate the activities of helpers, laborers, or material movers.
Shipping, Receiving, and Traffic Clerks	1,111	\$33,900	37	Verify and maintain records on incoming and outgoing shipments. Prepare items for shipment. Duties include assembling, addressing, stamping, and shipping merchandise or material; receiving, unpacking, verifying, and recording incoming merchandise or material; and arranging for the transportation of products.
Maintenance and Repair Workers, General	530	\$35,700	35	Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of an establishment in repair. Duties may involve pipe fitting; boiler making; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs.
Machine Feeders and Offbearers	231	\$32,500	29	Feed materials into or remove materials from machines or equipment that is automatic or tended by other workers.
Light Truck or Delivery Services Drivers	1,529	\$33,700	20	Drive a light vehicle, such as a truck or van, with a capacity of less than 26,000 pounds Gross Vehicle Weight (GVW), primarily to deliver or pick up merchandise or to deliver packages. May load and unload vehicle.

Production, Planning, and Expediting Clerks	265	\$44,800	17	Coordinate and expedite the flow of work and materials within or between departments of an establishment according to production schedule. Duties include reviewing and distributing production, work, and shipment schedules; conferring with department supervisors to determine progress of work and completion dates; and compiling reports on progress of work, inventory levels, costs, and production problems.
Packaging and Filling Machine Operators and Tenders	224	\$33,100	13	Operate or tend machines to prepare industrial or consumer products for storage or shipment. Includes cannery workers who pack food products.
Transportation, Storage, and Distribution Managers	274	\$101,100	13	Plan, direct, or coordinate transportation, storage, or distribution activities in accordance with organizational policies and applicable government laws or regulations. Includes logistics managers.
Inspectors, Testers, Sorters, Samplers, and Weighers	214	\$37,100	13	Inspect, test, sort, sample, or weigh nonagricultural raw materials or processed, machined, fabricated, or assembled parts or products for defects, wear, and deviations from specifications. May use precision measuring instruments and complex test equipment.
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	290	\$26,400	12	Keep buildings in clean and orderly condition. Perform heavy cleaning duties, tending furnace and boiler, routine maintenance activities, and notifying management of need for repairs.
Stock Clerks and Order Fillers	1,872	\$25,400	8	Receive, store, and issue sales floor merchandise, materials, equipment, and other items from stockroom, warehouse, or storage yard to fill shelves, racks, tables, or customers' orders. May mark prices on merchandise and set up sales displays.
Logisticians	97	\$69,600	4	Analyze and coordinate the logistical functions of a firm or organization. Responsible for the entire life cycle of a product, including acquisition, distribution, internal allocation, delivery, and final disposal of resources.
Tank Car, Truck, and Ship Loaders	43	\$36,000	4	Sell merchandise, such as furniture, motor vehicles, appliances, or apparel to consumers.
First-Line Supervisors of Production and Operating Workers	113	\$56,600	3	Directly supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators.
Weighers, Measurers, Checkers, and Samplers, Recordkeeping	126	\$30,200	3	Design, develop, test, and evaluate integrated systems for managing industrial production processes, including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination.

Cargo and Freight Agents	219	\$46,700	3	Expedite and route movement of incoming and outgoing cargo and freight shipments in airline, train, and trucking terminals, and shipping docks. Take orders from customers and arrange pickup of freight and cargo for delivery to loading platform. Prepare and examine bills of lading to determine shipping charges and tariffs.
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Source: Chmura JobsEQ®

Positions in the Logistical, Transportation, and Warehousing sector that provide upward mobility may require a set of certain competencies. Some workers, for instance, might require background knowledge of mechanical troubleshooting and repair, engineering and technology, production and processing, quality control and analysis, and customer and personal service. Finally, they may also require a familiarity with a variety of technological platforms, including materials requirement planning logistics and supply chain software, as well as software for industrial control, inventory management, and communications servers. Equipping prospective workers with these skills are a number of regional academic programs. As of the 2016-2017 academic year, approximately 6,494 students are enrolled in regional programs awarding degrees in business, engineering, computer and information sciences, mechanics and repair technologies, precision production, and transportation and materials moving. The majority of these students are in the process of earning a bachelor’s degree (61 percent), followed by associate’s degree holders (20 percent), and master’s candidates (19 percent).

## INDUSTRY SKILLS: LOGISTICS, TRANSPORTATION, AND WAREHOUSING

### KNOWLEDGE

Transportation  
 Mechanical  
 Engineering and Technology  
 Building and Construction  
 Mathematics  
 Production and Processing  
 Customer and Personal Service  
 Administration and Management

### SKILLS

Equipment Operation and Maintenance  
 Repairing and Troubleshooting  
 Operation Monitoring  
 Quality Control Analysis  
 Time Management  
 Management of Personnel Resources  
 Critical Thinking  
 Coordination

### TECHNOLOGY

Materials requirement planning logistics/supply chain software (bill of lading software)  
 Industrial control software (FrieghtDATA, package and vehicle location/tracking, coordinate measuring machine software)  
 Inventory management software (Argos Software ABECAS Insight WMS; ATMS StockTrack)  
 Communications server software (IBM Domino)  
 Enterprise resource planning software (Oracle Fusion, JD Edwards, SAP)  
 Customer relationship management software (Oracle Eloqua, Salesforce)  
 Analytical or scientific software (IBM SPSS, Minitab, KAPES, Tableau)  
 Point of Sale software (iQmetrix RQ4 Retail Management System; Plexis POS)  
 Accounting software (Intuit QuickBooks)

Source: O\*Net OnLine (2018)

**LOGISTICS, TRANSPORTATION, AND WAREHOUSING DEGREES AWARDED  
NORTHEASTERN PENNSYLVANIA, 2016-2017**

<b>Field of Study</b>	<b>Associate</b>	<b>Bachelor</b>	<b>Master's</b>	<b>Doctoral</b>	<b>TOTAL</b>
Business	242	1,345	482	-	2,069
Engineering	92	122	21	-	235
Computer & Information Sciences	41	166	6	-	213
Mechanics & Repair Technologies	98	-	-	-	98
Precision Production	48	-	-	-	48
Transportation & Materials Moving	-	6	-	-	6
<b>TOTAL</b>	<b>521</b>	<b>1,639</b>	<b>509</b>	<b>-</b>	<b>2,669</b>

*Source: National Center for Education Statistics (2017)*

## Infrastructure and Construction

With just under 24,000 workers across Northeastern Pennsylvania, Infrastructure and Construction remains one of the most prominent industries in the region. Between 2013 and 2018, this sector added approximately 748 new positions to the region. More notably, however, the Infrastructure and Construction sector is expected to add another 662 positions between 2018 and 2026. Since Northeastern Pennsylvania is poised for future net job losses in the region, this sector's value to the regional economy will only increase. High-growth industries within this sector include positions involving: (1) Power and Communications Lines; (2) Water and Sewer Lines; (3) Oil and Gas Pipelines; (4) Plumbing, Heating, and Air-Conditioning Contractors; and (5) Highway, Street, and Bridge Construction.

Infrastructure and Construction	2018	2013-2018		2018-2026	
Industry Subsector	Employees	Change in Employment	Annual % Change in Employment	Change in Employment	Annual % Change in Employment
Power and Communication Line and Related Structures Construction	1,082	467	12.0%	233	2.5%
Plumbing, Heating, and Air-Conditioning Contractors	2,909	518	4.0%	176	0.7%
Water and Sewer Line and Related Structures Construction	815	53	1.4%	140	2.0%
Highway, Street, and Bridge Construction	1,638	-233	-2.6%	72	0.5%
Oil and Gas Pipeline and Related Structures Construction	270	-30	-2.1%	43	1.9%
Commercial and Institutional Building Construction	1,954	377	4.4%	31	0.2%
Site Preparation Contractors	2,478	127	1.1%	13	0.1%
Other Building Equipment Contractors	452	-76	-3.1%	8	0.2%
All Other Specialty Trade Contractors	1,535	-33	-0.4%	5	0.0%
Residential Building Construction	3,396	-123	-0.7%	5	0.0%
Roofing Contractors	454	-23	-1.0%	3	0.1%
Masonry Contractors	656	-21	-0.6%	3	0.1%
Poured Concrete Foundation and Structure Contractors	459	-35	-1.5%	3	0.1%
Industrial Building Construction	240	-58	-4.2%	3	0.1%
Other Heavy and Civil Engineering Construction	115	-12	-2.0%	2	0.2%
Glass and Glazing Contractors	142	-8	-1.0%	1	0.1%
Other Foundation, Structure, and Building Exterior Contractors	96	-8	-1.7%	0	0.1%
Siding Contractors	123	-19	-2.8%	0	0.0%
Structural Steel and Precast Concrete Contractors	103	49	13.8%	0	0.1%
Electrical Contractors and Other Wiring Installation Contractors	2,176	111	1.1%	-3	0.0%

Source: Chmura JobsEQ®

Workers in Northeastern Pennsylvania currently employed in the Infrastructure and Construction sector earn approximately \$50,606 annually, a 21-percent increase over the average regional wages of \$41,726. In fact, all but two of the 25 fastest-growing occupations in this sector pay their workers above-average wages. Additionally, the proportion of new jobs created in the Infrastructure and Construction sector paying above-market wages is expected to continue growing well into the next decade. As of 2018, Construction Laborers and Solar Photovoltaic Installers – the two occupations currently paying below-market wages – represent nearly 27 percent of workers in the top 25 Infrastructure and Construction sector; however, by 2026, they will likely represent just 23 percent. The long list of occupations within this sector, presented below, provide an array of diverse paths for workers interested in entering this growing field, from Plumbers and Pipelayers to Power Line Installers and Repairers to Civil Engineers.

#### TOP OCCUPATIONS IN INFRASTRUCTURE AND CONSTRUCTION

Occupation	Employees (2018)	Average Wage	Projected Growth (2026)	Occupational Description
Construction Laborers	3,804	\$37,100	126	Perform tasks involving physical labor at construction sites. May operate hand and power tools of all types: air hammers, earth tampers, cement mixers, small mechanical hoists, surveying and measuring equipment, and a variety of other equipment and instruments.
Operating Engineers and Other Construction Equipment Operators	1,245	\$47,000	80	Operate one or several types of power construction equipment (motor graders, bulldozers, scrapers, compressors, pumps, derricks, shovels, tractors, or front-end loaders to excavate, move, and grade earth, erect structures, or pour concrete.
Plumbers, Pipefitters, and Steamfitters	1,083	\$47,000	63	Assemble, install, alter, and repair pipelines or pipe systems that carry water, steam, air, liquids or gases.
First-Line Supervisors of Construction Trades and Extraction Workers	1,369	\$66,300	53	Directly supervise and coordinate activities of construction or extraction workers.
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	682	\$48,400	46	Install or repair heating, central air conditioning, or refrigeration systems, including oil burners, hot-air furnaces, and heating stoves.
Electrical Power-Line Installers and Repairers	207	\$72,900	42	Install or repair cables or wires used in electrical power or distribution systems.
Telecommunications Line Installers and Repairers	259	\$60,500	38	Install and repair telecommunications cable, including fiber optics.
Heavy and Tractor-Trailer Truck Drivers	388	\$44,300	20	Drive a tractor-trailer combination or a truck with a capacity of at least 26,000 pounds Gross Vehicle Weight (GVW).
Solar Photovoltaic Installers	31	\$39,900	19	Assemble, install, or maintain solar photovoltaic (PV) systems on roofs or other structures in compliance with site assessment and schematics.

Electricians	1,323	\$53,500	16	Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes.
General and Operations Managers	280	\$109,500	14	Plan, direct, or coordinate the operations of public or private sector organizations. Duties and responsibilities include formulating policies, managing daily operations, and planning the use of materials and human resources.
Cost Estimators	349	\$57,400	14	Prepare cost estimates for product manufacturing, construction projects, or services to aid management in bidding on or determining price of product or service.
Construction Managers	1,031	\$87,500	14	Plan, direct, or coordinate, usually through subordinate supervisory personnel, activities concerned with the construction and maintenance of structures.
First-Line Supervisors of Mechanics, Installers, and Repairers	117	\$63,700	12	Directly supervise and coordinate the activities of mechanics, installers, and repairers.
Cement Masons and Concrete Finishers	377	\$44,200	12	Smooth and finish surfaces of poured concrete, such as floors, walks, sidewalks, roads, or curbs using a variety of hand and power tools.
Pipelayers	111	\$57,700	11	Lay pipe for storm or sanitation sewers, drains, and water mains. Perform any combination of the following tasks: grade trenches or culverts, position pipe, or seal joints.
Welders, Cutters, Solderers, and Brazers	145	\$42,000	9	Use hand-welding, flame-cutting, hand soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams.
Paving, Surfacing, and Tamping Equipment Operators	165	\$48,000	7	Operate equipment used for applying concrete, asphalt, or other materials to road beds, parking lots, or airport runways and taxiways, or equipment used for tamping gravel, dirt, or other materials.
Mobile Heavy Equipment Mechanics, Except Engines	110	\$46,500	6	Diagnose, adjust, repair, or overhaul mobile mechanical, hydraulic, and pneumatic equipment, such as cranes, bulldozers, graders, and conveyors, used in construction, logging, and surface mining.
Sheet Metal Workers	219	\$47,900	5	Fabricate, assemble, install, and repair sheet metal products and equipment (ducts, control boxes, drainpipes, and furnace casings).
Structural Iron and Steel Workers	122	\$51,900	5	Raise, place, and unite iron or steel girders, columns, and other structural members to form completed structures or structural frameworks.
Civil Engineers	89	\$82,700	5	Perform engineering duties in planning, designing, and overseeing construction/maintenance of structures (roads, railroads, airports, bridges, harbors, etc.).
Roofers	326	\$44,200	3	Cover roofs of structures with shingles, slate, asphalt, aluminum, wood, or related materials.
Crane and Tower Operators	69	\$51,300	3	Operate mechanical boom and cable or tower and cable equipment to lift and move materials, machines, or products in many directions.
Brickmasons and Blockmasons	335	\$47,100	3	Lay and bind building materials, such as brick, structural tile, concrete block, cinder block, glass block, and terra-cotta block, with mortar and other substances to construct or repair structures.

Source: Chmura JobsEQ®

To succeed in the Infrastructure and Construction sector, prospective employees may need certain background knowledge, soft skills, and technological competence. Some workers, for instance, might require background knowledge of building and construction, mechanical troubleshooting and repair, production and processing, telecommunications, engineering and technology, as well as strength in skills like customer and personal service, time management, coordination, and critical thinking. Workers in this sector may also need to be familiar with an array of technological platforms, including computer aided design and manufacturing software, as well as software for industrial control, map creation, facilities and project management, and route navigation. As of the 2016-2017 academic year, approximately 413 students across Northeastern Pennsylvania are honing a variety of these skills by participating in regional academic programs in engineering, mechanic and repair technologies, architecture, and construction trades.

### INDUSTRY SKILLS: INFRASTRUCTURE AND CONSTRUCTION

KNOWLEDGE	SKILLS
Building and Construction	Repairing and Troubleshooting
Mechanical	Installation
Production and Processing	Equipment Maintenance
Telecommunications	Operation Monitoring
Computers and Electronics	Coordination
Engineering & Technology	Time Management
Transportation	Critical Thinking
Customer and Personal Service	Management of Personnel Resources

TECHNOLOGY
Computer aided design (CAD) software (AutoCAD, Autodesk Revit)
Computer aided manufacturing (CAM) software (Applied Production ProFab, JETCAM Expert, Striker Systems SS-Profile, WiCAM PN4000)
Map creation software (ESRI ArcGIS, Intergraph MGE)
Industrial control software (supervisory control and data acquisition software, Wonderware InTouch)
Route navigation software (ALK Technologies PC*Miller, MarcoSoft Quo Vadis)
Facilities management software (Mapcom Systems M4)
Project management software (HCSS HeavyJob, Oracle)
Database user interface and query software (Intuit QuickBase, Microsoft Access, Xactware Xactimate, Assured Software JPP)
Customer relationship management software (Salesforce)
Analytical or scientific software (Minitab, SAS, STATA, MATLAB)
Enterprise resource planning (ERP) software (SAP, Oracle JD Edwards, Netsuite ERP)

Source: O\*Net OnLine (2018)

### INFRASTRUCTURE AND CONSTRUCTION DEGREES AWARDED NORTHEASTERN PENNSYLVANIA, 2016-2017

Field of Study	Associate	Bachelor	Master's	Doctoral	TOTAL
Engineering	92	122	21	-	235
Mechanic & Repair Technologies	98	-	-	-	98
Architecture	38	4	-	-	42
Construction Trades	38	-	-	-	38
<b>TOTAL</b>	<b>266</b>	<b>126</b>	<b>21</b>	<b>-</b>	<b>413</b>

Source: National Center for Education Statistics (2017)

## Utilities and Energy Production

Home to just under 7,000 jobs, the Utilities and Energy Production sector is, by far, the smallest target industry for Northeastern Pennsylvania; however, it still continues to harness one of the region's most valuable natural assets – its geographic conduciveness toward the generation of various sources of energy, both fossil fuel and renewable in nature. Since the 1950s, the long decline of Northeastern Pennsylvania's coal industry has been a well-established historical phenomenon – a downturn that continues, to some extent, to this very day. However, despite a projected drop in demand for employment in this industry of 0.6 percent (compared to a 0.2-percent drop across all other regional industry), there remain significant and well-compensated employment opportunities in certain corners of the sector. While the region's historical economic development has been steeped in the extraction of fossil fuels like coal and natural gas, subsectors that generate the production of renewable energy sources, such as biomass and wind, are actually growing at a faster rate than non-renewables. Industries experiencing the largest projected absolute employment gains include: (1) Support Activities for Oil and Gas Operations; (2) Natural Gas Extraction; (3) Drilling Oil and Gas Wells; and (4) Biomass Electric Power Generation.

Utilities and Energy Production	2018	2013-2018		2018-2026	
Industry Subsector	Employees	Change in Employment	Annual % Change in Employment	Change in Employment	Annual % Change in Employment
Support Activities for Oil and Gas Operations	821	-53	-1.3%	107	1.5%
Natural Gas Extraction	349	154	12.4%	23	0.8%
Drilling Oil and Gas Wells	146	-214	-16.6%	18	1.5%
Biomass Electric Power Generation	13	5	11.0%	15	10.2%
Support Activities for Nonmetallic Minerals (Except Fuels) Mining	35	-7	-3.7%	5	1.6%
Support Activities for Coal Mining	42	-65	-17.0%	5	1.5%
Wind Electric Power Generation	5	1	2.6%	4	7.9%
Sewage Treatment Facilities	600	-35	-1.1%	2	0.0%
Water Supply and Irrigation Systems	474	87	4.2%	-2	0.0%
Electric Power Distribution	761	317	11.4%	-45	-0.8%

Source: Chmura JobsEQ®

Careers in Northeastern Pennsylvania's Utilities and Energy Production sector pay approximately \$80,177 in average wages – a 92-percent differential from the average regional wage of \$41,726. Moreover, all but one of the fastest-growing occupations within this sector (Oil and Gas Roustabouts) pays more than the average regional wage, representing 76 percent of Utilities and Energy Production employees. Unsurprisingly, many of these jobs also involve the extraction of natural gas, given the rich deposits of natural gas found throughout the Marcellus Shale, including Service Unit Operators for Oil, Gas, and Mining, Roustabouts, and Rotary Drill Operators. Additionally, some occupations in this sector with six-figure salaries are growing at near double-digit percentage rates. For instance, demand for new Petroleum Engineers, positions which pay more than 160 percent of the average wage in Northeastern Pennsylvania, is projected to grow by nearly nine percent from 2018 to 2026.

## TOP OCCUPATIONS IN UTILITIES AND ENERGY PRODUCTION

Occupation	Employees (2018)	Average Wage	Projected Growth (2026)	Occupational Description
Service Unit Operators, Oil, Gas, and Mining	148	\$54,100	18	Operate equipment to increase oil flow from producing wells or to remove stuck pipe, casing, tools, or other obstructions from drilling wells. May also perform similar services in mining exploration operations. Includes fishing-tool technicians.
Roustabouts, Oil and Gas	130	\$38,400	16	Assemble or repair oil field equipment using hand and power tools.
Rotary Drill Operators, Oil and Gas	72	\$55,100	9	Set up or operate a variety of drills to remove underground oil and gas, or remove core samples for testing during oil and gas exploration.
Derrick Operators, Oil and Gas	37	\$44,500	5	Rig derrick equipment and operate pumps to circulate mud through drill hole.
Wellhead Pumpers	36	\$41,000	4	Operate power pumps and auxiliary equipment to produce flow of oil or gas from wells in oil field.
Petroleum Engineers	46	\$109,100	4	Devise methods to improve oil and gas extraction and production and determine the need for new or modified tool designs. Oversee drilling and offer technical advice.
Pump Operators, Except Wellhead Pumpers	33	\$44,400	4	Tend, control, or operate power-driven, stationary, or portable pumps and manifold systems to transfer gases, oil, other liquids, slurries, or powdered materials to and from various vessels and processes.
Geological and Petroleum Technicians	22	\$49,000	2	Assist scientists or engineers in the use of electronic, sonic, or nuclear measuring instruments in both laboratory and production activities to obtain data indicating potential resources such as metallic ore, minerals, gas, coal, or petroleum.
Wind Turbine Service Technicians	3	\$53,000	1	Inspect, diagnose, adjust, or repair wind turbines. Perform maintenance on wind turbine equipment including resolving electrical, mechanical, and hydraulic malfunctions.
Geoscientists, Except Hydrologists and Geographers	18	\$83,700	1	Study the composition, structure, and other physical aspects of the Earth. May use geological, physics, and mathematics knowledge in exploration for oil, gas, minerals, or underground water; or in waste disposal, land reclamation, or other environmental problems.

*Source: Chmura JobsEQ®*

Prospective employees hoping to access many of these lucrative positions in the Utilities and Energy Production sector may require certain background knowledge, soft skills, and technological competence. Some workers, for instance, might need to know the principles guiding engineering and technology, mechanical repair, geography, chemistry and physics, and computers and electronics. Workers may also require a familiarity with a variety of technological platforms, including computer aided design software, as well as software in data logging, enterprise resource planning, and map creation. Equipping prospective workers with these skills are a number of regional academic programs. As of the 2016-2017

academic year, approximately 1,139 students are enrolled in regional programs awarding degrees in the physical sciences, engineering, computer and information sciences, mechanic and repair technologies, precision production, and natural resources and conservation. The majority of these students are in the process of earning a bachelor’s degree (65 percent), followed by associate’s degree holders (26 percent), master’s candidates (nine percent), and doctoral candidates (one percent).

### INDUSTRY SKILLS: UTILITIES AND ENERGY PRODUCTION

#### KNOWLEDGE

Engineering & Technology  
 Mechanical  
 Production and Processing  
 Geography  
 Chemistry & Physics  
 Computers and Electronics  
 Public Safety and Security  
 Administration and Management

#### SKILLS

Operation Monitoring  
 Quality Control Analysis  
 Repairing and Troubleshooting  
 Judgment and Decision Making  
 Critical Thinking  
 Reading Comprehension  
 Active Listening  
 Installation

#### TECHNOLOGY

Computer aided design software (Atoll GeoCAD, AutoDesk AutoCAD)  
 Data logger software (Schlumberger Petrel E&P, IHS PETRA)  
 Database user interface and query software (Drillingsoftware Tubular Database, Pason WellView Field Solution)  
 Enterprise resource planning software (SAP)  
 Facilities management software (computerized maintenance management systems)  
 Industrial control software (CAPSHER Technology SureTec, Drillingsoftware DrillPro)  
 Map creation software (ESRI ArcGIS, Leica Geosystems ERIDAS IMAGINE)  
 Project management software (Microsoft Project, Oracle Primavera Systems)

Source: O\*Net OnLine (2018)

### UTILITIES AND ENERGY PRODUCTION DEGREES AWARDED NORTHEASTERN PENNSYLVANIA, 2016-2017

Field of Study	Associate	Bachelor	Master’s	Doctoral	TOTAL
Physical Sciences	19	423	70	8	520
Engineering	92	122	21	-	235
Computer & Information Sciences	41	166	6	-	213
Mechanic & Repair Technologies	98	-	-	-	98
Precision Production	48	-	-	-	48
Natural Resources & Conservation	-	25	-	-	25
<b>TOTAL</b>	<b>298</b>	<b>736</b>	<b>97</b>	<b>8</b>	<b>1,139</b>

Source: National Center for Education Statistics (2017)

## Advanced Professional Services

A broad sector home to a vast array of diverse industries, Northeastern Pennsylvania's Advanced Professional Services sector employs approximately 46,434 regional workers, roughly 9.5 percent of the area's total workforce. Specifically, this sector includes five NAICS industries, each of which depend disproportionately on workers with bachelor's or advanced degrees: (1) Information; (2) Finance and Insurance; (3) Real Estate and Rental and Leasing; (4) Professional, Scientific, and Technical Services; and (5) Management of Companies and Enterprises. Occupations in this sector can be found across a wide range of professional settings and industry subsectors, from Libraries and Archives to Veterinary Services, and Investment Advice to Software Publishers.

Advanced Professional Services	2018	2013-2018		2018-2026	
Industry Subsector	Employees	Change in Employment	Annual % Change in Employment	Change in Employment	Annual % Change in Employment
Libraries and Archives	710	4	0.1%	210	3.3%
Management Consulting Services	2,003	-135	-1.3%	165	1.0%
Computer Systems Design and Related Services	1,494	117	1.6%	126	1.0%
Other Nondepository Credit Intermediation	1,280	-45	-0.7%	108	1.0%
Veterinary Services	1,205	123	2.2%	77	0.8%
Other Insurance Related Activities	760	72	2.0%	76	1.2%
Data Processing, Hosting, and Related Services	1,382	-37	-0.5%	55	0.5%
Engineering Services	1,637	-111	-1.3%	38	0.3%
Direct Life, Health, and Medical Insurance Carriers	2,155	-4	0.0%	37	0.2%
Portfolio Management	390	-21	-1.0%	34	1.0%
Other Scientific and Technical Consulting Services	196	-10	-1.0%	13	0.8%
Environmental Consulting Services	145	-1	-0.1%	13	1.1%
Research and Development in the Physical, Engineering, and Life Sciences	244	6	0.5%	11	0.6%
Mortgage and Nonmortgage Loan Brokers	97	30	7.7%	10	1.3%
Investment Advice	144	-10	-1.3%	9	0.8%
Software Publishers	144	63	12.3%	9	0.8%
Other Commercial and Industrial Machinery and Equipment Rental and Leasing	178	-30	-3.0%	7	0.5%
Construction, Transportation, Mining, and Forestry Machinery and Equipment Rental and Leasing	219	-219	-12.9%	6	0.4%
Offices of Real Estate Appraisers	111	-15	-2.4%	5	0.5%
All Other Financial Investment Activities	32	-2	-1.1%	3	1.0%
Other Activities Related to Credit Intermediation	29	-26	-11.8%	3	1.1%
Marketing Research & Public Opinion Polling	65	41	21.9%	2	0.3%
Other Activities Related to Real Estate	340	9	0.5%	2	0.1%

Source: Chmura JobsEQ®

Careers in Northeastern Pennsylvania’s Advanced Professional Services sector are well-compensated, as employees earn an average wage of \$57,224 – a 37-percent increase over regional wages of \$41,726. Reflecting the diversity of this broad-based sector, high-growth occupations draw from a vast array of disciplines. While Software Developing and Programming is projected to see the largest job growth between 2018 and 2026, positions focusing on the analysis and synthesis of data are demonstrating more robust relative growth, such as Statisticians (21 percent), Operations Research Analysts (14 percent), Actuaries (14 percent), and Market Research Analysts and Marketing Specialists (10 percent). Finally, occupations historically seen as high-growth are continuing to expand at modest rates, such as Accountants and Auditors or Insurance Sales Agents (one percent each), reaffirming their status as safe educational investments.

#### TOP OCCUPATIONS IN ADVANCED PROFESSIONAL SERVICES

Occupation	Employees (2018)	Average Wage	Projected Growth (2026)	Occupational Description
Software Developers and Programmers	1,273	\$76,300	69	Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency.
Market Research Analysts and Marketing Specialists	588	\$56,500	57	Research market conditions in local, regional, or national areas, or gather information to determine potential sales of a product or service, or create a marketing campaign. May gather information on competitors, prices, sales, and methods of marketing and distribution.
Financial Managers	571	\$122,700	41	Plan, direct, or coordinate accounting, investing, banking, insurance, securities, and other financial activities of a branch, office, or department of an establishment.
Computer and Information Analysts	606	\$75,900	28	Analyze science, engineering, business, and other data processing problems to implement and improve computer systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities.
Operations Research Analysts	174	\$56,300	28	Formulate and apply mathematical modeling and other optimizing methods to develop and interpret information that assists management with decision making, policy formulation, or other managerial functions.
Management Analysts	799	\$84,000	27	Conduct organizational studies and evaluations, design systems and procedures, conduct work simplification and measurement studies, and prepare operations and procedures manuals to assist management in operating more efficiently and effectively. Includes program analysts and management consultants.
Paralegals and Legal Assistants	530	\$39,500	25	Assist lawyers by investigating facts, preparing legal documents, or researching legal precedent. Conduct research to support a legal proceeding, to formulate a defense, or to initiate legal action.

Computer User Support Specialists	808	\$46,600	19	Provide technical assistance to computer users. Answer questions or resolve computer problems for clients in person, or via telephone or electronically. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems.
Accountants and Auditors	1,574	\$64,600	17	Examine, analyze, and interpret accounting records to prepare financial statements, give advice, or audit and evaluate statements prepared by others. Install or advise on systems of recording costs or other financial and budgetary data.
Computer and Information Systems Managers	323	\$125,500	14	Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming.
Insurance Sales Agents	1,138	\$56,900	14	Sell life, property, casualty, health, automotive, or other types of insurance. May refer clients to independent brokers, work as an independent broker, or be employed by an insurance company.
Insurance Claims and Policy Processing Clerks	501	\$38,400	13	Process new insurance policies, modifications to existing policies, and claims forms. Obtain information from policyholders to verify the accuracy and completeness of information on claims forms, applications and related documents, and company records. Update existing policies and company records to reflect changes requested by policyholders and insurance company representatives.
Loan Interviews and Clerks	489	\$30,200	10	Interview loan applicants to elicit information; investigate applicants' backgrounds and verify references; prepare loan request papers; and forward findings, reports, and documents to appraisal department.
Credit Counselors and Loan Officers	728	\$57,000	8	Advise and educate individuals or organizations on acquiring and managing debt. Evaluate, authorize, or recommend approval of commercial, real estate, or credit loans. Advise borrowers on financial status and payment methods.
Training and Development Specialists	182	\$53,100	7	Design and conduct training and development programs to improve individual and organizational performance. May analyze training needs.
Actuaries	50	\$96,800	7	Analyze statistical data, such as mortality, accident, sickness, disability, and retirement rates and construct probability tables to forecast risk and liability for payment of future benefits.
Statisticians	29	\$63,000	6	Develop or apply mathematical or statistical theory and methods to collect, organize, interpret, and summarize numerical data to provide usable information.
Miscellaneous Computer Occupations	207	\$69,200	6	Includes Software Quality Assurance Engineers, Computer Systems Engineers, Web Administrators, Geospatial Information Scientists, Geographic Information Systems Technicians, Database Architects, Data Warehousing Specialists, Business Intelligence Analysts, Information Technology Project Managers, Search Marketing

Miscellaneous Business Operations Specialists	334	\$71,900	5	Strategists, Video Game Designers, Document Management Specialists. Includes Energy Auditors, Security Management Specialists, Customs Brokers, Business Continuity Planners, Sustainability Specialists, and Online Merchants.
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Source: Chmura JobsEQ®

Succeeding in an Advanced Professional Services career requires the mastery of certain academic competence, soft skills, and technological platforms. Depending on the given occupation, prospective employees may need to understand basic principles of Economics and Accounting, Engineering, Human Resources, or Sales and Marketing, and demonstrate an ability to solve complex problems, think critically, use judgment to make sound decisions, understand the nuances of social behavior, and convey information through instruction and management. The increasing reliance on software packages in today’s workforce necessitates a willingness to gain mastery over a variety of platforms, including spreadsheet software, analytical or scientific software, and business intelligence and data analysis software. Regionally, nearly 3,000 graduates annually are equipped with a number of these skills across a multitude of academic degree-granting programs, including in business, computer and information sciences, engineering, math and statistics, and legal services. The majority of these students are in the process of earning a bachelor’s degree (64 percent), followed by master’s candidates (22 percent), and associate’s degree holders (14 percent).

## INDUSTRY SKILLS: ADVANCED PROFESSIONAL SERVICES

### KNOWLEDGE

Administration and Management  
Economics and Accounting  
Law and Government  
Computers and Electronics  
Sales and Marketing  
Customer and Personal Service  
Personnel and Human Resources  
Engineering, Building, and Construction

### SKILLS

Complex Problem Solving  
Critical Thinking  
Judgment and Decision Making  
Management of Financial Resources  
Programming and Systems Analysis  
Reading Comprehension and Writing  
Social Perceptiveness  
Instructing and Monitoring

### TECHNOLOGY

Analytical or scientific software (IBM SPSS, Minitab, STATA, SAS)  
Business intelligence and data analysis software (IBM Cognos Impromptu, MicroStrategy, Tableau)  
Object or component-oriented development software (C++, Python, R)  
Database management system (Hadoop, NoSQL)  
Database user interface and query software (Microsoft Access, SQL, FileMaker Pro)  
Web platform software (JavaScript, ASP.NET)  
Development environment software (PowerShell, Ruby)  
Program testing software (HP LoadRunner, Rockwell, JUnit, Selenium)  
Spreadsheet software (Corel QuattroPro, IBM Lotus 1-2-3, Microsoft Excel)  
Financial analysis software (Microsoft FRx, Oracle E-Business Suite Financials, Hyperion Planning)  
Enterprise resource planning (ERP) software (Microsoft Dynamics, Netsuite ERP, Oracle PeopleSoft Financials, SAP)  
Accounting software (Intuit QuickBooks, Hyperion Enterprise, Sage 50 Accounting)  
Tax preparation software (ATX Total Tax Office, Orrtax Software IntelliTax Classic)  
Project management software (Confluence, Microsoft Project, Oracle Primavera, Realization Streamliner)

Source: O\*Net OnLine (2018)

**ADVANCED PROFESSIONAL SERVICES DEGREES AWARDED  
NORTHEASTERN PENNSYLVANIA, 2016-2017**

<b>Field of Study</b>	<b>Associate</b>	<b>Bachelor</b>	<b>Master's</b>	<b>Doctoral</b>	<b>TOTAL</b>
Business	242	1,345	482	-	<b>2,069</b>
Public Administration & Social Services	12	137	136	-	<b>285</b>
Engineering	92	122	21	-	<b>235</b>
Computer & Information Sciences	41	166	6	-	<b>213</b>
Math and Statistics	2	56	2	-	<b>60</b>
Architecture	-	38	4	-	<b>42</b>
Legal Services	6	-	-	-	<b>6</b>
<b>TOTAL</b>	<b>395</b>	<b>1,864</b>	<b>651</b>	<b>-</b>	<b>2,910</b>

*Source: National Center for Education Statistics (2017)*

## Synthesis

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. This report identifies five such sectors. First, reflecting the major demographic changes facing the region, a rising number of opportunities exist to serve the elderly and infirm in the area's fastest-growing industry, Healthcare and Social Assistance. Second, the region's proximity to major transportation networks make a career in Logistics, Transportation, and Warehousing an attractive option, from industrial truck drivers to air transportation. Third, the area's Infrastructure and Construction has experienced recent gains in support of utilities expansions in the region, including the construction of lines for telecommunication, water, and sewer, as well as oil and gas pipelines. Fourth, although the region's coal mining industry may be near extinct, the proximity of the Marcellus Shale – as well as rising investment in biomass, wind, and geothermal energy – has opened the door for lucrative and upwardly mobile career opportunities in Utilities and Energy Production. Finally, a myriad of opportunities continue to exist in Advanced Professional Services, from Real Estate Appraisal to Investment to Advice, and Software Publishing to Market Research. Professions in any of these growing sectors offer secure, dynamic, and well-compensated career pathways to individuals with the credentials, training, and willpower to succeed.

Several demographic assets remain in Northeastern Pennsylvania's favor 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 21<sup>st</sup> 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.<sup>i</sup> 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.<sup>ii</sup> 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.<sup>iii</sup> 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.<sup>iv</sup>

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.<sup>v</sup> 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.<sup>vi</sup> 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.<sup>vii</sup>

Business Education Partnership Grant Recipients, 2019	
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.<sup>viii</sup> 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).<sup>ix</sup> 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.<sup>x</sup>

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.<sup>xi</sup> 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.<sup>xii</sup>

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 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. 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 lucrative, rewarding, challenging careers 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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