

Northeast
Minnesota

CAREER & TECHNICAL EDUCATION

Workforce Trends & Careers of Tomorrow

RealTime Talent

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RealTime Talent

Using data to build the
world's best workforce

Workforce Trends & Careers of Tomorrow

Overview

Two and a half years after COVID-19 first appeared, the U.S. economy has shifted and strained under the weight of disrupted supply chains and an ever-tightening labor pool. The continuing effects of the pandemic, domestic and international unrest, and shifting economic models have been felt in disparate ways across the nation. Between July and August 2022, unemployment rose in 32 states, fell in 7 states, and remained unchanged in 12. Minnesota's unemployment rate rose by 0.1 percentage point, but remains the lowest unemployment rate nationwide at just 1.9% compared to the national average of 3.7%.¹ Since August, the market has remained tight with unemployment dropping nationally to an all-time nonwartime low of 3.5% unemployment in September. As of October 2022, US unemployment returned to 3.7% with 261,000 net new jobs added to the economy and about two open jobs for every one jobseeker. Despite the Federal Reserve raising interest rates, significantly high corporate profits throughout 2022 mean that companies are likely to continue to invest in their businesses, hold onto their employees, and seek to hire more workers in this tight market.

This report unpacks the current workforce landscape of Minnesota and the regional nuances of talent demand by career field. We aim to support Minnesota Perkins Consortia in navigating changes in their local labor market and guide their understanding of how these changes may impact enrollment, industry, career advancement, and the needed programs of study by region.² Each of the six regional reports—and statewide report—include:

- Regional economic and demographic overview
- Career field and cluster analysis including regional importance of each sector, key labor market statistics, and forecasting for future demand in the six career fields:
 - Health Science Technology
 - Engineering, Manufacturing, and Technology
 - Arts, Communications, and Information Systems
 - Agriculture, Food, and Natural Resources
 - Business, Management, and Administration
 - Human Services
- Gap analysis in each of the six career fields, including:
 - Occupation gaps (i.e. talent shortages)
 - Award gaps
 - Certification gaps
 - Skill gaps
- An origin-to-gateway-to-target model analysis for how to help move students from entrypoints into their field of interest into other aligned careers, taking into account automation, remote work, and the changing work environment
- A word on remote work and jobs of the future

¹ Bureau of Labor Statistics (BLS), Dataset released September 16, 2022.

² All labor market data in this report comes from Chmura Economics JobsEQ Dataset 2022Q2 unless otherwise noted. www.jobseq.com

About This Report

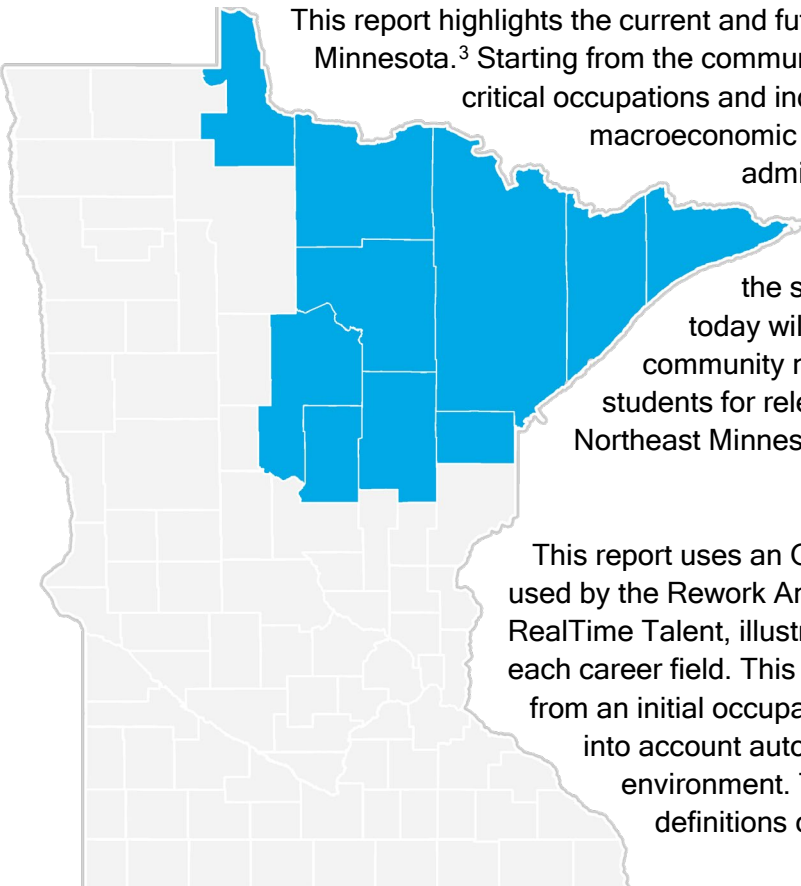
This report was developed by RealTime Talent for the Career and Technical Education Consortia of Minnesota with funding provided by Minnesota State. The contents of this publication were made possible through the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) Federal grant from the United States Department of Education administered through Minnesota State Colleges and Universities. If you have questions about the data found in this report, or are interested in learning more, please contact the Director of Strategic Research Erin Olson at erin@realtimetalentmn.org.

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Northeast Minnesota

Introduction



This report highlights the current and future talent needs in the ten counties of Northeast Minnesota.³ Starting from the community demographics, unique opportunities, and the critical occupations and industries underpinning the regional economy, this macroeconomic overview is intended to support educators and administrators who aim to increase alignment between educational programming and local businesses' most pressing needs. Identifying the skills, certifications, and qualifications for positions today will help the education community anticipate community needs and ensure that curriculum prepares students for relevant job opportunities of the future here in Northeast Minnesota.

This report uses an Origin-to-Gateway-to-Target Occupation model, used by the Rework America Alliance and modified in this report by RealTime Talent, illustrates promising likely and aligned pathways into each career field. This model supports students looking for entrypoints from an initial occupation of interest into other aligned careers, taking into account automation, remote work, and the changing work environment. The model itself is shown below, along with the definitions of each grouping of occupations.

Origin-to-Gateway-to-Target (OGT) Model

Target Occupations

High wage (above regional average)
High-skill (require some credential)
High-demand (2/4 indicators: under 3% unempl, higher than average 5-year growth, total 5-year demand >50% of current empl, high job posting volume)
 *Often also high occupation gap and award gap

Gateway Occupations

Mid-wage (\$42,000 – regional average)
Low-middle skills (HS diploma, some OJT)
Sufficient demand (3-5% unemployment and/or high volumes of current opportunities)

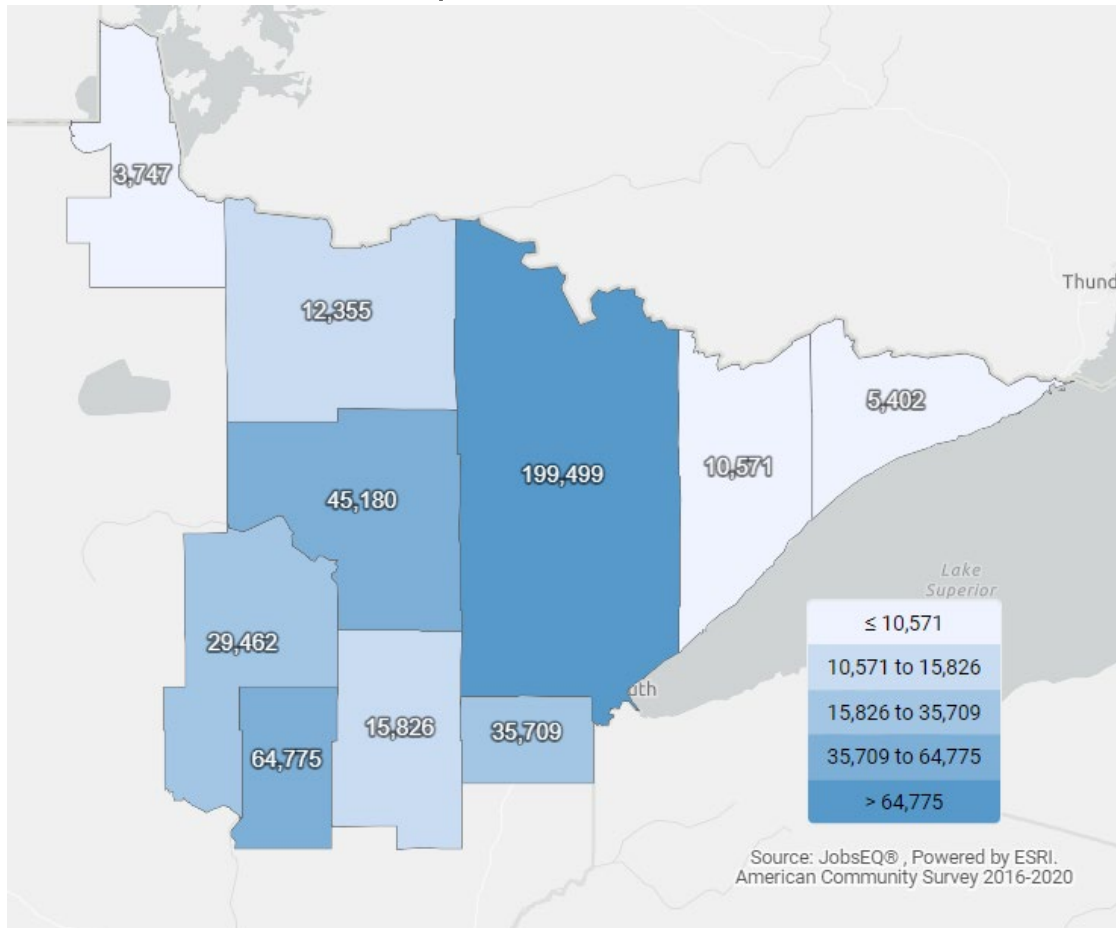
Origin Occupations

Low wage (<\$42,000/year)
Low skill (no credential)
Low demand (over 5% unemployment, low growth, low replacement demand, and/or low job postings)

³ Aitkin, Carlton, Cass, Cook, Crow Wing, Itasca, Koochiching, Lake, Lake of the Woods, and St. Louis Counties.

The Northeast is home to about 7.5% of Minnesota’s total population. In all, about 422,526 people live in Northeast Minnesota, according to 2016-2020 American Community Survey Estimates—an increase of nearly 500 people from the prior year’s estimates. Based on year-over-year population growth, about 422,864 people are estimated to live in the region as of 2021. Approximately 20% of Northeast Minnesota’s population are minors under 18 years of age. Overall, the region’s median age is six years older (44 years) than the statewide median (38.1 years), mostly attributable to a larger share of adults over 55 years of age in the region. The cities of Duluth, Brainerd, Grand Rapids, Hibbing, and Virginia are home to the largest local concentrations of population and are economic hubs for the region. St. Louis County is home to 46.1% of the region’s population.

Resident Population of Northeast Minnesota

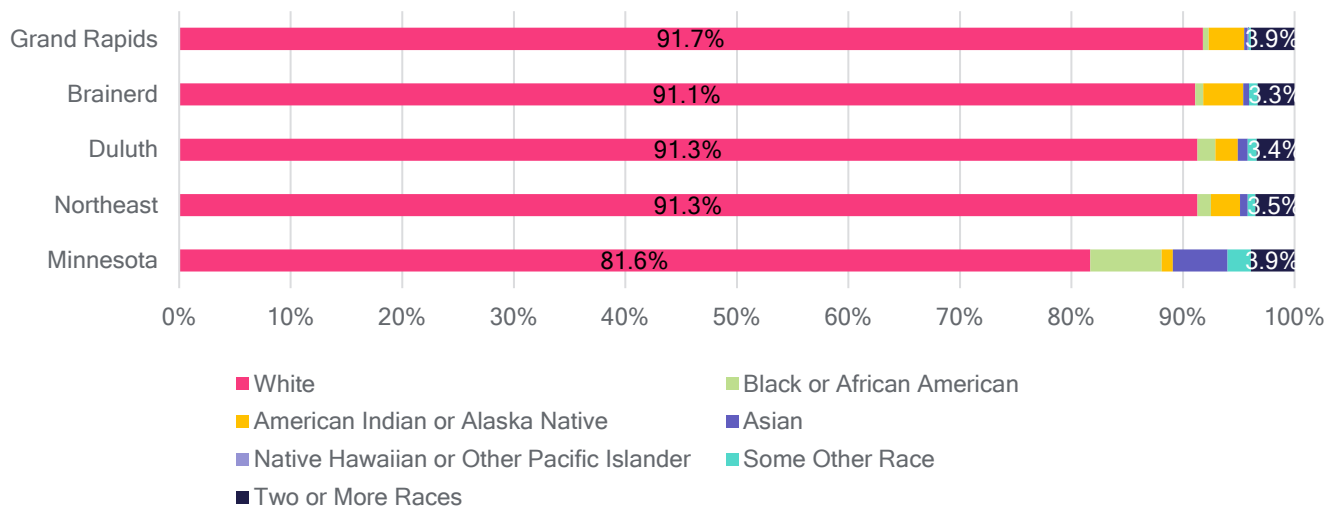


Community Profile

Demographics

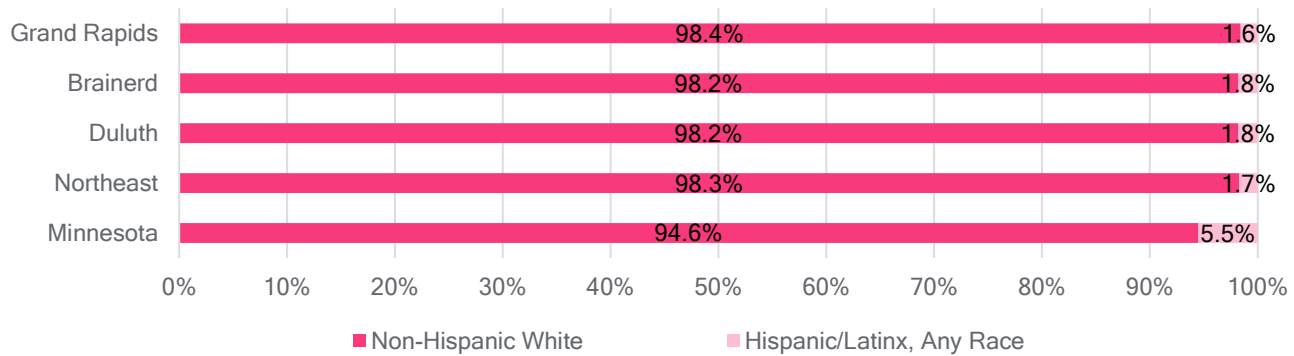
Population diversity increased between the two most recent population estimates statewide by half of a percentage point from 2018 to 2019 estimates, and by another 1.2 percentage points between 2019 and 2020 estimates. In the Northeast, the share of the population that is BIPOC increased only moderately, by 0.1 percentage point between 2018 and 2019 estimates, and by another 0.9 percentage points between 2019 and 2020. Across the region overall, 8.7% of the population identify as Black, Asian, American Indian, Native Hawaiian, or some other race other than White. The three largest cities in the region saw similar increases in diversity, though Brainerd continues to have a greater share of American Indian residents than the other larger cities in the region at 3.6% of the population (though a reduction from the prior year's estimates). While the share of African American and American Indian talent decreased moderately between the most recent years' estimates, those that identify as "some other race" or "two or more races" increased in all major cities of the Northeast—well over one percentage point in each case. The share of the population that is BIPOC in Duluth increased from 8.0% in 2019 estimates to 8.7% in 2020, in Brainerd from 7.8% to 8.9%, and in Grand Rapids from 7.2% to 8.3%. Approximately 1.7% of Northeast Minnesota's residents are Hispanic or Latinx (for comparison, about half the share of the population that is Hispanic/Latinx in the Northwest). This remained the same as last two year's estimates.

Population Race, All Ages



American Community Survey 2016-2020.

Population Ethnicity, All Ages



American Community Survey 2016-2020.

Community Demographics

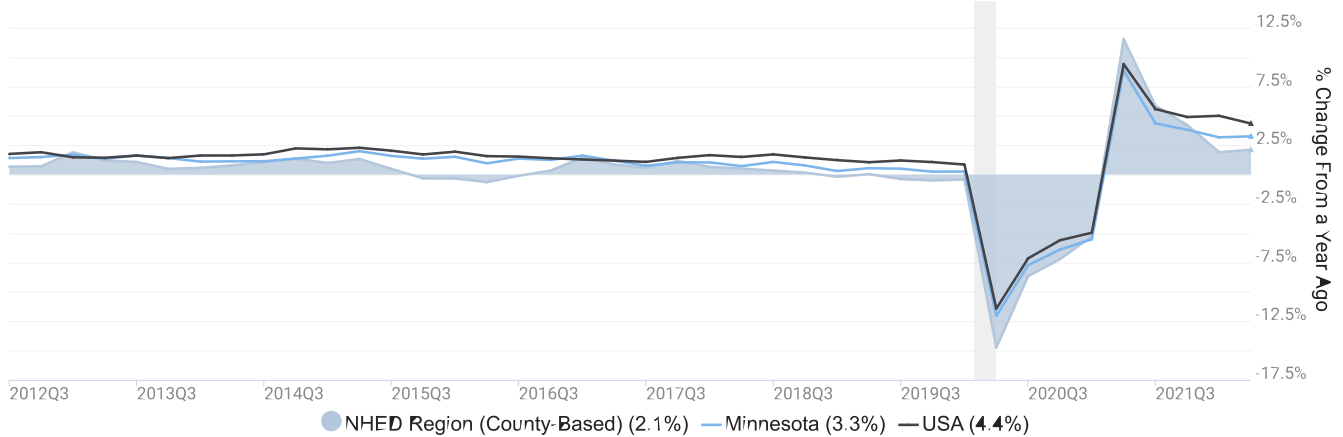
Demographics	Percent			Percent			Value		
	Duluth, MN-WI MSA	Brainerd, MN μSA	Grand Rapids, MN μSA	Northeast Minnesota	Minnesota	USA	Northeast Minnesota	Minnesota	USA
Population (ACS)	—	—	—	—	—	—	422,526	5,600,166	326,569,308
Male	50.5%	50.2%	50.6%	50.5%	49.8%	49.2%	213,271	2,789,017	160,818,530
Female	49.5%	49.8%	49.4%	49.5%	50.2%	50.8%	209,255	2,811,149	165,750,778
Median Age ²	—	—	—	—	—	—	44.0	38.1	38.2
Under 18 Years	19.5%	21.4%	20.8%	19.8%	23.2%	22.4%	83,713	1,299,284	73,296,738
18 to 24 Years	11.1%	6.5%	6.7%	9.4%	8.9%	9.3%	39,703	498,444	30,435,736
25 to 34 Years	11.6%	10.5%	9.6%	10.9%	13.6%	13.9%	45,853	760,033	45,485,165
35 to 44 Years	11.6%	10.5%	11.2%	11.1%	12.7%	12.7%	46,783	710,985	41,346,677
45 to 54 Years	11.8%	11.7%	11.9%	11.6%	12.4%	12.7%	49,163	692,277	41,540,736
55 to 64 Years	15.1%	15.9%	16.3%	15.7%	13.4%	12.9%	66,159	751,567	42,101,439
65 to 74 Years	11.2%	13.7%	13.8%	12.5%	9.1%	9.4%	52,918	511,127	30,547,950
75 Years, and Over	8.1%	9.8%	9.7%	9.0%	6.7%	6.7%	38,234	376,449	21,814,867
Race: White	91.3%	91.1%	91.7%	91.3%	81.6%	70.4%	385,740	4,572,149	229,960,813
Race: Black or African American	1.6%	0.7%	0.5%	1.2%	6.4%	12.6%	5,072	359,817	41,227,384
Race: American Indian and Alaska Native	2.0%	3.6%	3.2%	2.6%	1.0%	0.8%	11,024	54,558	2,688,614
Race: Asian	0.9%	0.5%	0.3%	0.7%	4.9%	5.6%	2,888	275,242	18,421,637
Race: Native Hawaiian and Other Pacific Islander	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%	138	2,201	611,404
Race: Some Other Race	0.8%	0.8%	0.2%	0.7%	2.1%	5.1%	3,024	118,748	16,783,914
Race: Two or More Races	3.4%	3.3%	3.9%	3.5%	3.9%	5.2%	14,640	217,451	16,875,542
Hispanic or Latino (of any race)	1.8%	1.8%	1.6%	1.7%	5.5%	18.2%	7,246	307,675	59,361,020

American Community Survey 2016-2020 unless noted otherwise.

Employment

As of 2020Q1, total employment in Northeast Minnesota was 199,664 (based on a four-quarter moving average). By 2021Q1, employment was hit hard by the COVID-19 pandemic and dropped to 181,573 (based on a four-quarter moving average). Over the year ending 2022Q2, employment increased by 2.1% in the region.

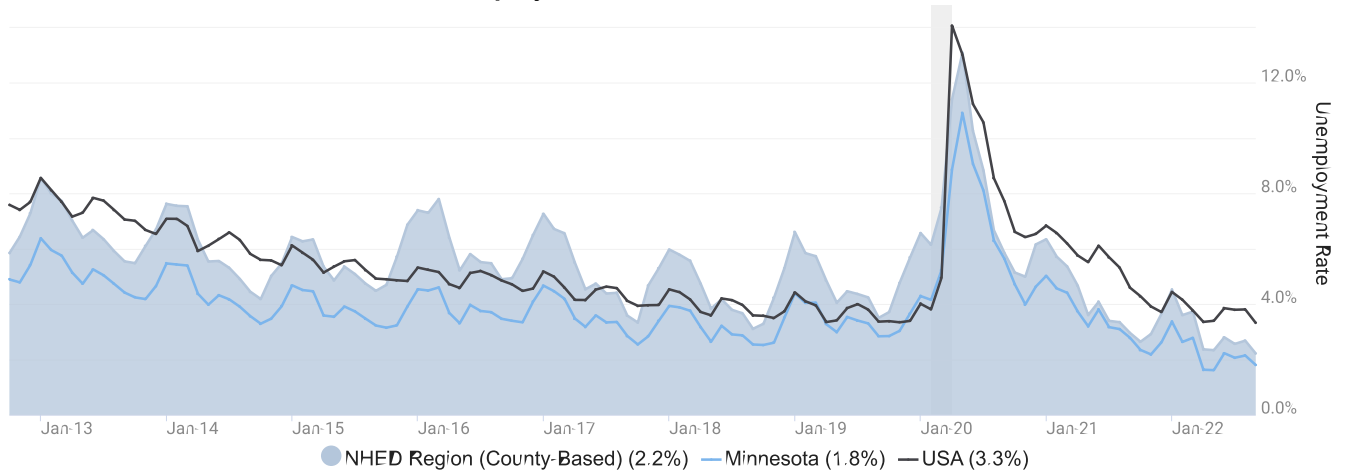
Employment for Northeast Minnesota



Employment data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and imputed where necessary. Data are updated through 2022Q1 with preliminary estimates updated to 2022Q2.

The unemployment rate in Northeast Minnesota was 2.2% as of September 2022. The regional unemployment rate was higher than the statewide rate (1.8%), but lower than the national rate of 3.3%. One year earlier, in September 2021, the unemployment rate in Northeast Minnesota was 3.0%.

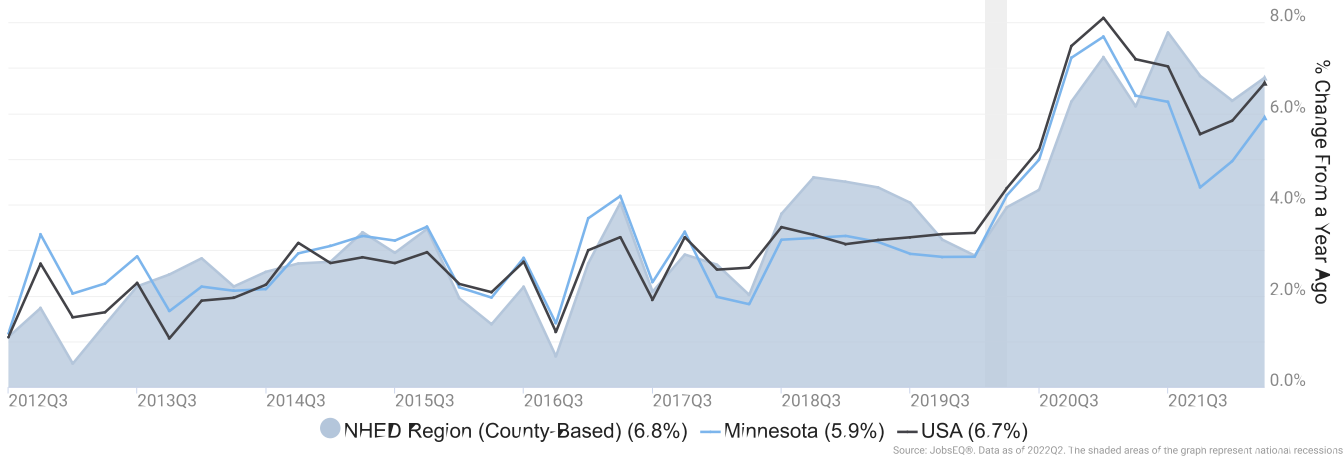
Unemployment for Northeast Minnesota



Unemployment rate data are from the Local Area Unemployment Statistics, provided by the Bureau of Labor Statistics and updated through September 2022.

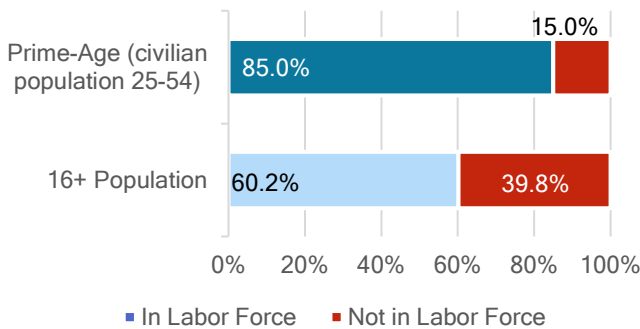
The average worker in Northeast Minnesota earned annual wages of \$51,219 as of 2022Q2, an increase of \$3,500 from 2021Q2 (\$47,759) which follows an increase of about \$3,400 from 2020Q1. Average annual wages per worker increased 6.8% in the region over the preceding four quarters. Wages rose similarly nationwide, where annual average wages were \$67,777 as of 2022Q2 (compared to \$63,393 as of 2021Q1 and \$57,624 as of 2020Q1). Early shifts were due in part to the loss of low-wage workers during the impacts of the COVID-19 pandemic and the ongoing challenge of recruiting and hiring talent for entry-level, lower-wage jobs, particularly in sectors like hospitality, tourism and retail. However, often significant wage uplifts have been recorded particularly in roles that have especially low unemployment or require advanced experience or education credentials.

Average Annual Wages for Northeast Minnesota



Annual average wages per worker data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and imputed where necessary. Data are updated through 2020Q4 with preliminary estimates updated to 2022Q2.

Labor Force Participation Rate



The region has a civilian labor force of 209,734 (up about 400 workers from the prior year’s estimates) with a participation rate of 60.2%, which lags Minnesota’s labor force participation rate for the population over 16 by nine percentage points. This is due primarily to the older age of residents in Northeast Minnesota. However, the participation rate of the prime working age population (between the ages of 25 and 64) also continues to behind the statewide rate—85.0% compared to the statewide 88.3%.

American Community Survey 2016-2020 unless noted otherwise.

The Northeast area has a higher share of veterans in the region, at 5.2% of the regional population compared to 3.7% broadly across the state. Veteran labor force participation is lower in the region than observed statewide, but increased from the prior year’s estimates to 72.3% compared to 80.9% statewide. Similarly, the Northeast has a higher share of persons with a disability, 12.4% compared to 8.7% statewide, and a lower labor force participation rate for the population with a disability, 45.2% compared to 52.8% statewide. The Northeast region overall has a similar share of disconnected youth (1.8% of youth) compared to statewide (1.8%) but below national rates (2.5%), with variation between communities. While 1.4% of Grand Rapids youth are disconnected from school, training, or work (though up significantly from 0.2% in the prior year’s estimates), in Brainerd about 3.7% of youth are disconnected.

Economic and Social Characteristics of Northeast Minnesota

Economic and Social Characteristics	Percent			Percent			Values		
	Duluth, MN-WI MSA	Brainerd, MN μSA	Grand Rapids, MN μSA	Northeast Minnesota	Minnesota	USA	Northeast Minnesota	Minnesota	USA
Labor Force Participation Rate and Size (civilian population 16 years and over)	61.7%	60.0%	56.6%	60.2%	69.2%	63.2%	209,734	3,074,732	164,759,496
Prime-Age Labor Force Participation Rate and Size (civilian population 25-54)	84.5%	86.1%	84.0%	85.0%	88.3%	82.4%	120,169	1,908,423	105,137,520
Armed Forces Labor Force	0.2%	0.1%	0.0%	0.1%	0.1%	0.4%	468	3,607	1,143,342
Veterans, Age 18-64	5.0%	5.6%	5.7%	5.2%	3.7%	4.5%	12,783	125,683	8,920,267
Veterans Labor Force Participation Rate and Size, Age 18-64	73.6%	72.4%	71.1%	72.3%	80.9%	76.8%	9,237	101,620	6,853,673
Median Household Income ²	–	–	–	–	–	–	\$57,413	\$73,382	\$64,994
Per Capita Income	–	–	–	–	–	–	\$32,269	\$38,881	\$35,384
Poverty Level (of all people)	12.9%	10.9%	12.3%	12.4%	9.3%	12.8%	50,693	511,185	40,910,326
Households Receiving Food Stamps/SNAP	9.9%	8.5%	10.8%	9.4%	7.5%	11.4%	17,135	165,078	13,892,407
Enrolled in Grade 12 (% of total population)	1.1%	1.2%	1.4%	1.2%	1.4%	1.3%	5,021	78,075	4,358,865
Disconnected Youth ³	1.5%	3.7%	1.4%	1.8%	1.8%	2.5%	402	5,115	433,164
Children in Single Parent Families (% of all children)	32.7%	34.5%	28.0%	32.5%	28.4%	34.0%	25,434	354,664	23,628,508
Uninsured	4.1%	5.7%	5.5%	4.5%	4.5%	8.7%	18,622	251,900	28,058,903
With a Disability, Age 18-64	12.3%	12.1%	13.6%	12.4%	8.7%	10.3%	30,409	295,441	20,231,217
With a Disability, Age 18-64, Labor Force Participation Rate and Size	44.4%	47.1%	43.4%	45.2%	52.8%	43.2%	13,758	156,039	8,740,236
Foreign Born	2.2%	1.2%	1.0%	1.9%	8.4%	13.5%	7,873	470,687	44,125,628

American Community Survey 2016-2020 unless noted otherwise.

*Median values for certain aggregate regions (such as MSAs) may be estimated as the weighted averages of the median values from the composing counties. **Disconnected Youth are 16-19 year olds who are (1) not in school, (2) not high school graduates, and (3) either unemployed or not in the labor force.

Education



95% of prime working age adult residents have at least a high school diploma or GED.

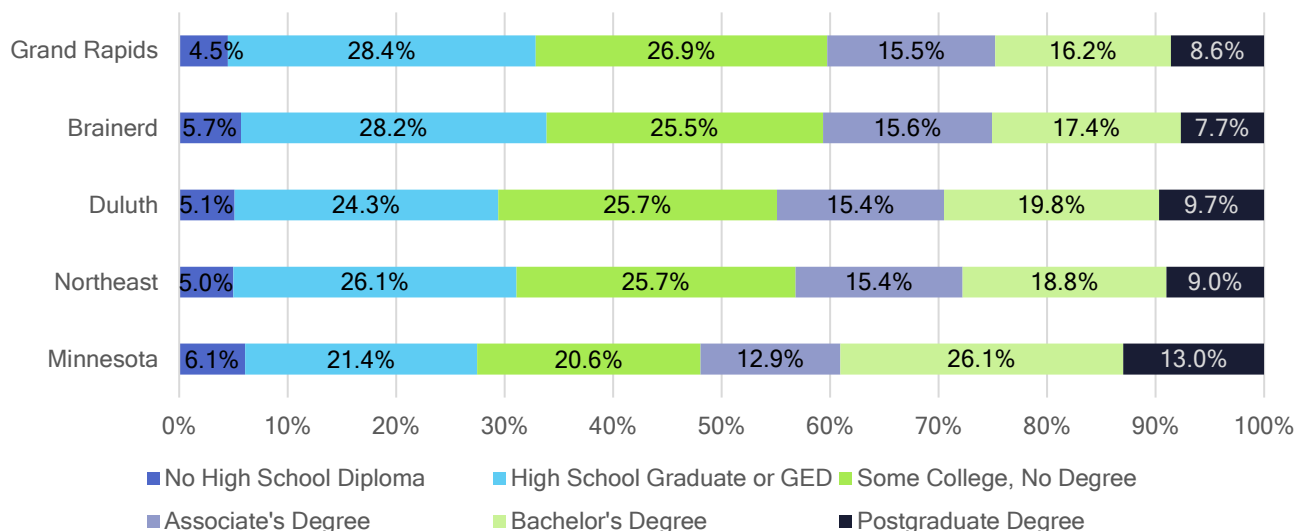
In Northeast Minnesota, 5.0% of adults between the ages of 25 and 64 do not have a high school diploma or equivalent, and about 26.1% have a high school diploma as their highest level of education (compared with 21.4% statewide). Nationwide, 10.5% of U.S. residents between the ages of 25 and 64 never completed high school or obtained an equivalent credential. The prime working age population of Brainerd has a larger share of residents with a high school diploma or less, while Duluth has nearly 10% of its population with a postgraduate degree.

Educational Characteristics of Northeast Minnesota

Educational Characteristics	Percent			Percent			Values		
	Duluth, MN-WI MSA	Brainerd, MN μSA	Grand Rapids, MN μSA	Northeast Minnesota	Minnesota	USA	Northeast Minnesota	Minnesota	USA
No High School Diploma	5.1%	5.7%	4.5%	5.0%	6.1%	10.5%	10,363	176,478	17,929,220
High School Graduate	24.3%	28.2%	28.4%	26.1%	21.4%	25.4%	54,257	622,379	43,289,555
Some College, No Degree	25.7%	25.5%	26.9%	25.7%	20.6%	20.5%	53,465	600,346	34,959,338
Associate's Degree	15.4%	15.6%	15.5%	15.4%	12.9%	9.3%	31,992	376,942	15,776,790
Bachelor's Degree	19.8%	17.4%	16.2%	18.8%	26.1%	21.6%	39,064	760,576	36,888,244
Postgraduate Degree	9.7%	7.7%	8.6%	9.0%	13.0%	12.7%	18,817	378,141	21,630,870

American Community Survey 2016-2020 unless noted otherwise.

Educational Attainment, Age 25-64



American Community Survey 2016-2020.

Regional Colleges and Universities

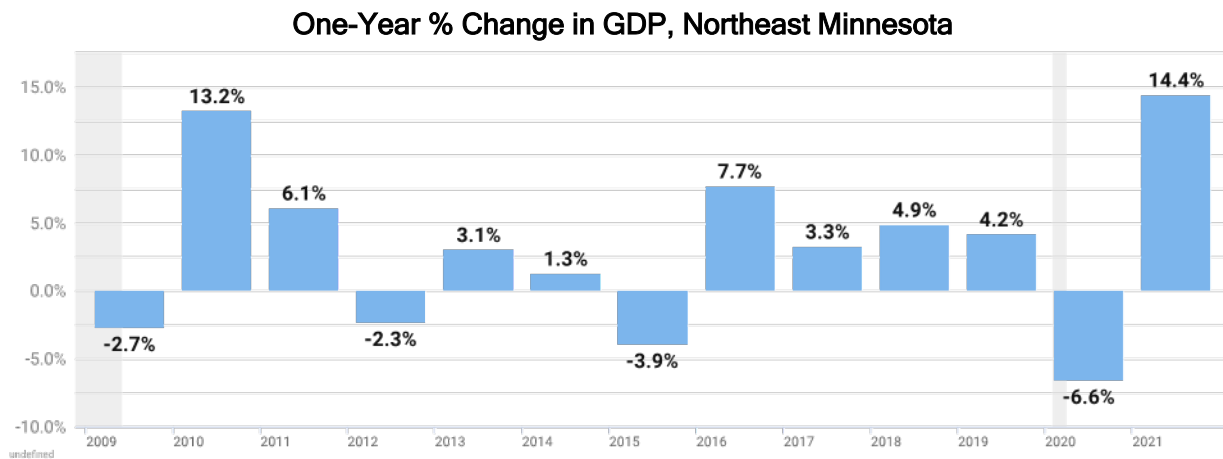
Northeast Minnesota has twelve institutions of higher education that offer non-degree awards, two-year degrees, and four-year degrees. The table below shows these postsecondary institutions sorted by enrollment size in during the 2020-21 school year. There were a total of 7,062 awards conferred in the region in SY2020-21, compared to 6,749 in SY2017-18.

School	Certificate < 1 Yr	Certificate 1+ but < 2 Yr	Associate's	Certificate 2+ but < 4 Yr	Bachelor's	Post-Bacc	Master's	Doctorate	Total Awards	Total School Enrollment	Avg Net Price ¹
University of Minnesota-Duluth	44	0	0	0	2,288	2	230	0	2,564	10,275	\$18,211
Lake Superior College	129	131	654	36	0	0	0	0	950	4,762	\$13,737
Central Lakes College-Brainerd	89	180	521	86	0	0	0	0	876	4,491	\$12,014
The College of Saint Scholastica	12	0	0	0	807	143	308	208	1,478	3,712	\$23,215
Fond du Lac Tribal and Community College	19	12	166	0	0	0	0	0	197	1,639	\$9,336
Itasca Community College	35	27	176	0	0	0	0	0	238	1,058	\$11,019
Mesabi Range College	5	92	131	47	0	0	0	0	275	926	\$10,112
Hibbing Community College	4	22	182	49	0	0	0	0	257	913	\$8,370

Vermilion Community College	64	3	83	0	0	0	0	0	150	554	\$13,623
Rainy River Community College	1	0	28	0	0	0	0	0	29	173	\$7,862
Leech Lake Tribal College	0	0	32	0	0	0	0	0	32	133	\$5,376
Cosmetology Careers Unlimited College of Hair Skin and Nails	0	16	0	0	0	0	0	0	16	23	\$10,443
Total	402	483	1,973	218	3,095	145	538	208	7,062		

Economic Indicators

Gross Domestic Product (GDP) is the total value of goods and services produced by a region. In 2021, nominal GDP in the Northeast region grew by 14.4%. This follows a contraction of 6.6% in 2020 and growth of 6.0% in 2019. As of 2021, total GDP in the region was \$20,854,039,000—of which \$15,106,826,000 is attributed to the Duluth MSA.

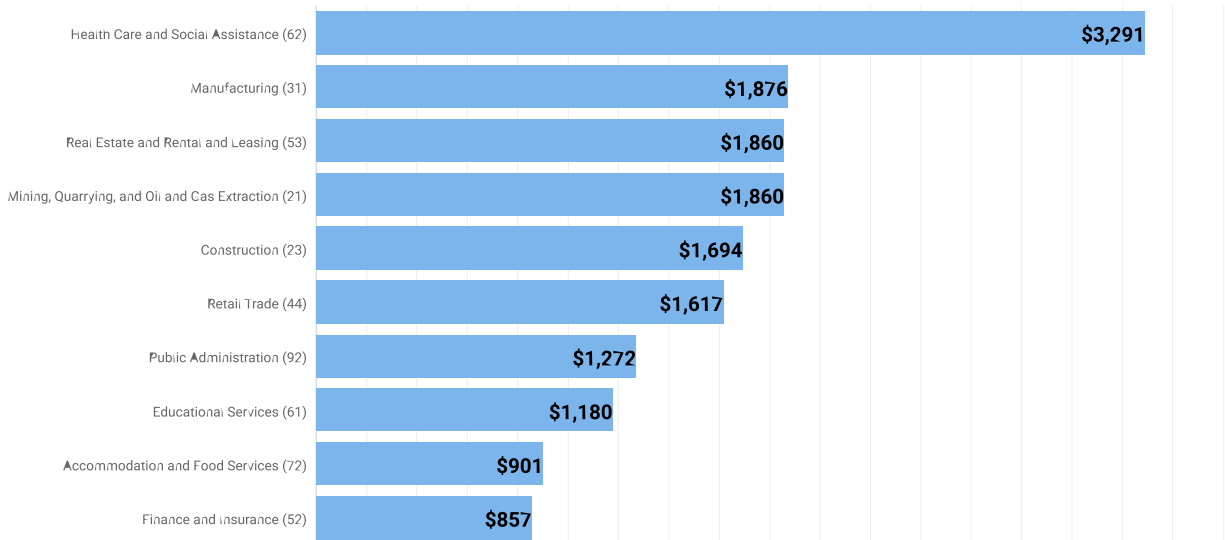


Gross Domestic Product data are provided by the Bureau of Economic Analysis, imputed by Chmura where necessary, updated through 2021.⁴

Of the industries represented in the Northeast, Health Care and Social Assistance contributed the largest portion of GDP in 2021, \$3,291,354,000. The next-largest contributions came from Manufacturing (\$1,875,935,000); Real Estate and Rental and Leasing (\$1,859,583,000); and Mining, Quarrying, and Oil and Gas Extraction (\$1,859,569,000) (Mining, Quarrying, Oil and Gas Extraction dropped from second place in 2020).

⁴ GDP estimates by Chmura Economics. GDP data is revised every year, and there are typically small changes over time, with more recent years being more likely to be revised. Additionally, Chmura's detailed GDP estimates are modeled from industry employment and wage data, which is also subject to revision with each update. In general, with the exception of the most recent 2 or 3 years, historical revisions should be relatively small, only fractions of a percentage point.

GDP (in \$ millions)
NHED Region (County-Based), 2021



Gross Domestic Product data are provided by the Bureau of Economic Analysis, imputed by Chmura where necessary, updated through 2021.

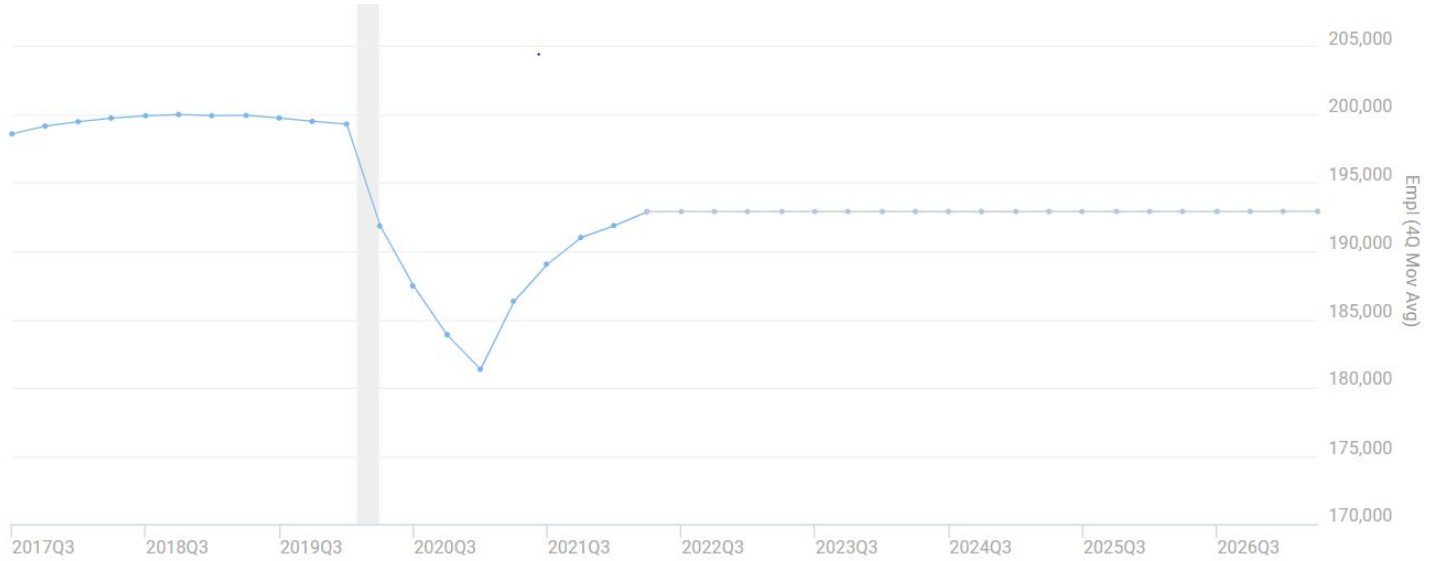
The Workforce of Today and Tomorrow

Workforce Forecast

Nationwide, unemployment hit an all-time non-wartime low of 3.5% in October 2022, rising only to 3.7% in November amidst a still hot jobs market. US companies added 261,000 new jobs to the economy in October alone, likely constricted by the immensely tight talent market, where there are approximately two jobs for every one person seeking work. There are signs that companies are going through their inventories of product more quickly than prior months, with warehousing employment down from the prior months nationwide and with the retail industry seeing mixed employment trends. Manufacturing, Healthcare, and Professional and Technical services employment had the largest job gains as of the October 2022 jobs report nationally, all trends apparent for Minnesota as well.

Employment rose by 3.5% in the region between 2021Q2 and 2022Q2, in line with estimates from one year prior, with an estimated 3.2% of the Northeast Minnesota workforce being unemployed by July 2022 (about 6,119 people). Future growth in jobs in the region is forecasted to remain flat (0.0%) averaged annually through 2027 in a baseline scenario.

5-Year Forecast in Northeast Minnesota



An industry cluster is a geographic concentration of interrelated industries or occupations. The industry cluster in the Northeast region with the highest relative concentration remains Metal & Product Manufacturing with a location quotient of 3.90, an increase in local concentration from estimates in 2021. This cluster employs 5,447 workers in the region (an increase of about 500 workers from 2021) with an average wage of \$111,017—a significant \$15,991 increase in average sector wages from 2021 estimates (2021Q1 wage estimate of \$95,026). Employment in the Metal & Product Manufacturing cluster is now projected to contract in the region by about -0.32% on average annually over the next ten years. Chemical Manufacturing, Wood Manufacturing, Textile and Leather Manufacturing, and Agriculture all saw declines in their forecasted average annual growth between 2021Q1 and 2022Q2 estimates, while forecasted employment in Consumer Services, Media, Education, and Health sectors all saw notable increases in forecasted employment growth.

Industry Clusters for Northeast Minnesota as of 2022Q2



Emerging Critical Needs

SECTORS AND OCCUPATIONS OF FOCUS

The pandemic's acceleration of critical talent shortages through shifts in demand, supply chains, and resource availability has resulted in dramatic upticks in demand for very specifically-trained talent with some college, an industry credential, a two year degree, or a bachelor's degree amidst a severe constriction of talent availability for these same middle-skill, middle-wage roles. Now over two years after the pandemic started, new and surprising talent shortage twists are emerging. This section highlights the most critical talent shortages now apparent statewide, the industries that define each region of Minnesota, and the top Gateway Occupations that are in high demand and low talent supply regionally.

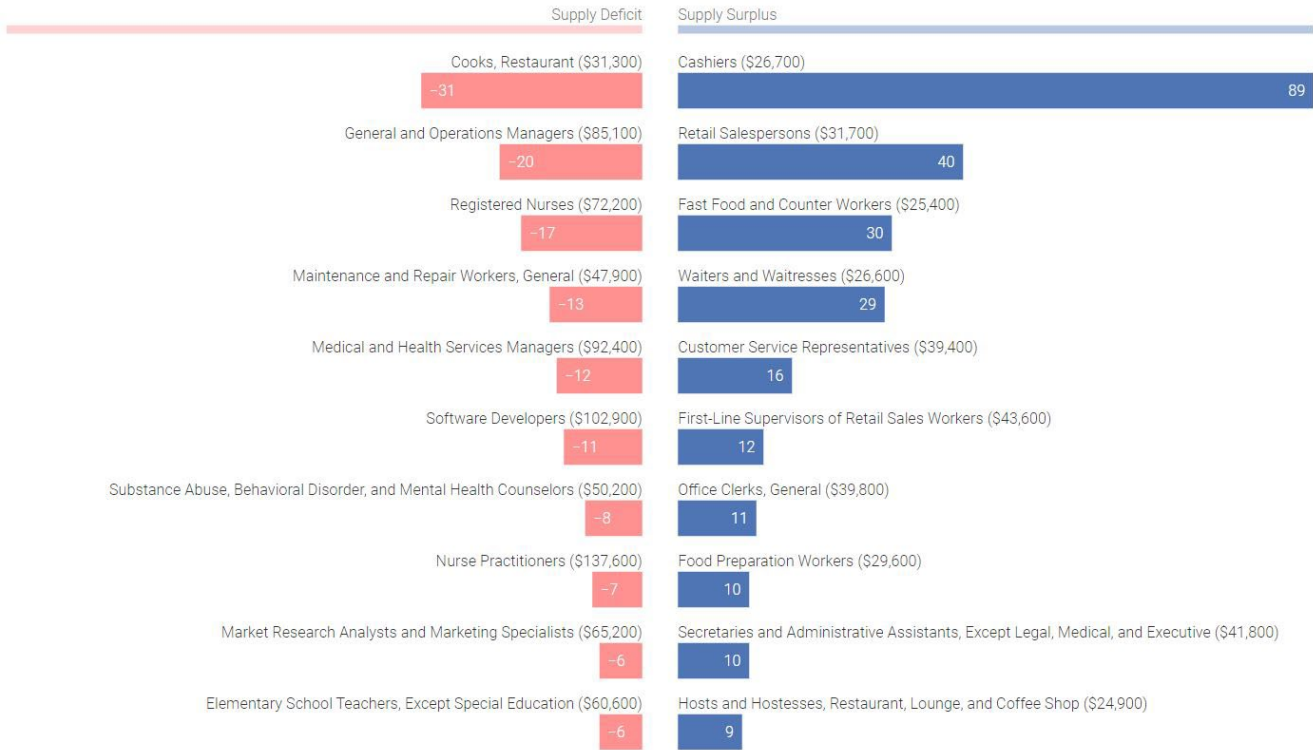
Several occupations that forecast high talent surpluses in 2021 have continued to grow in the estimated size of talent surplus in 2022 (shown in blue below), including Cashiers, Fast Food and Counter Workers, Retail Workers, and Customer Service Representatives. Talent surplus shrunk slightly between 2021 and 2022 for Waiters and Waitresses, but with moderate excess talent still forecast over the coming decade.

Breaking trend with 2020 and 2021, Restaurant Cooks jumped up from a low forecasted shortage into the number one occupation of shortage by volume in the Northeast in 2022. The other occupations of highest forecasted shortage in the Northeast (and statewide) have remained relatively consistent since the last analysis in October 2021, still showing that there is a shortage of local Nurses, General and Operations Managers, and Maintenance Workers, among other critical healthcare, information technology, and management occupations. Police Officers dropped out of the top ten list of occupations in shortage as of 2022, while Medical and Health Services Managers rose to fifth. Among high contact-intensity roles in shortage, Registered Nurses, Nurse Practitioners, and LPNs still make the top ten list of occupations in highest shortage, while Hospitality and Tourism roles are largely forecast to have a surplus of talent except for Restaurant Cooks and General Managers from Hospitality Services.

The baseline two-year degree requirement and wage expectations of roles in highest shortage are no longer all above \$48,500 per year as observed in 2020 and 2021. In fact, two of the four new occupations that entered into the top ten occupations of highest shortage in 2022—Restaurant Cooks and Maintenance and Repair Workers—pay notably below the \$50,000 threshold at \$31,300 and \$47,900 annually on average, respectively. These are also the only two roles in the top ten shortage list that do not typically require a postsecondary credential.

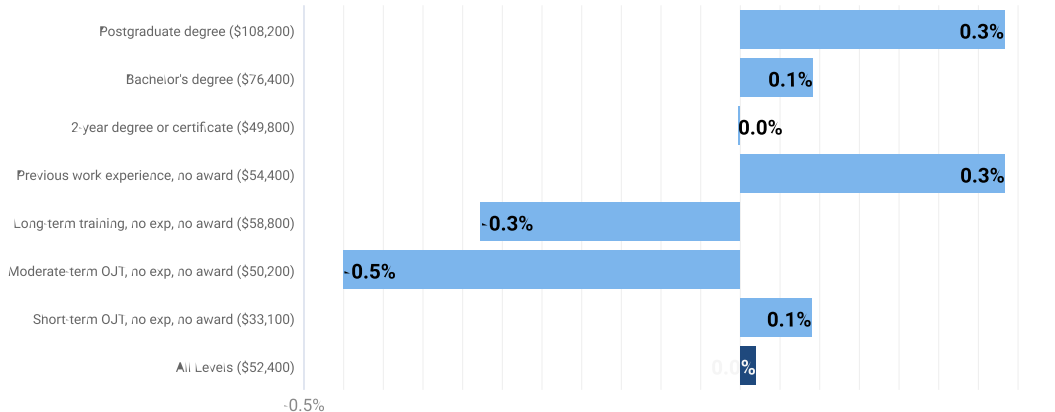
On the side of talent surplus, only one of the ten positions forecast to have the highest surplus of talent in the Northeast as of the first quarter of 2020 or 2021 typically require an advanced degree, and only one of the ten pays over \$43,000 on average (Retail Sales Supervisors). Six out of ten of these positions typically cannot be done remotely, and seven out of ten of these positions are considered high contact-intensity. Given the impacts of the COVID-19 pandemic on local industry, these occupations of anticipated high talent excess will likely decline in overall local demand and shift dramatically in how work is done on a daily basis.

Average Annual Occupation Gaps (i.e. Talent Shortage), 2022Q2 through 2032Q2



Expected growth rates for occupations vary by the education and training required. The employment outlook improved for the Northeast region from 2021 estimates, improving on an overall forecast from a decline of 0.5% employment annually, to current estimates of employment remaining flat through 2027. Occupations typically requiring a postgraduate degree are now expected to grow 0.3% per year, those requiring a bachelor’s degree are forecast to grow by 0.1% per year, and occupations typically needing a two-year degree or certificate are expected to remain flat. Estimated wages have increased across careers at each education level requirement.

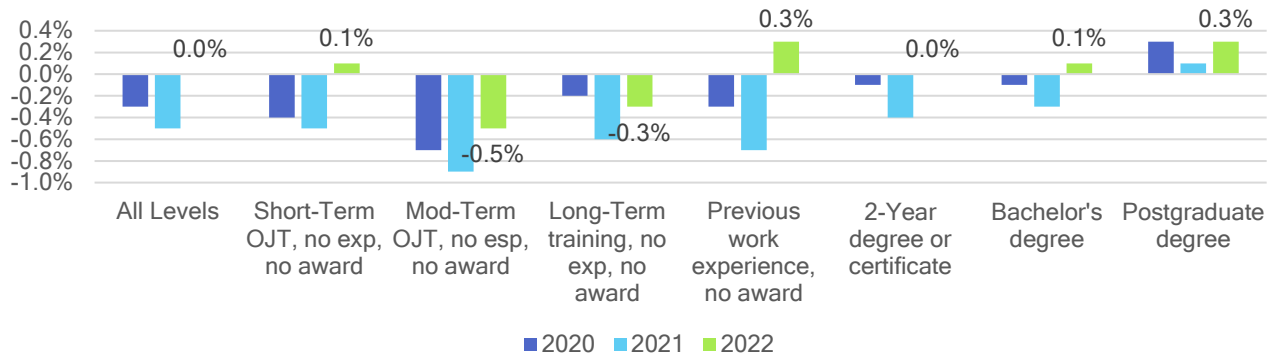
Annual Average Projected Job Growth by Training Required for Northeast Minnesota



Source: JobsEQ®, Data as of 2022Q1

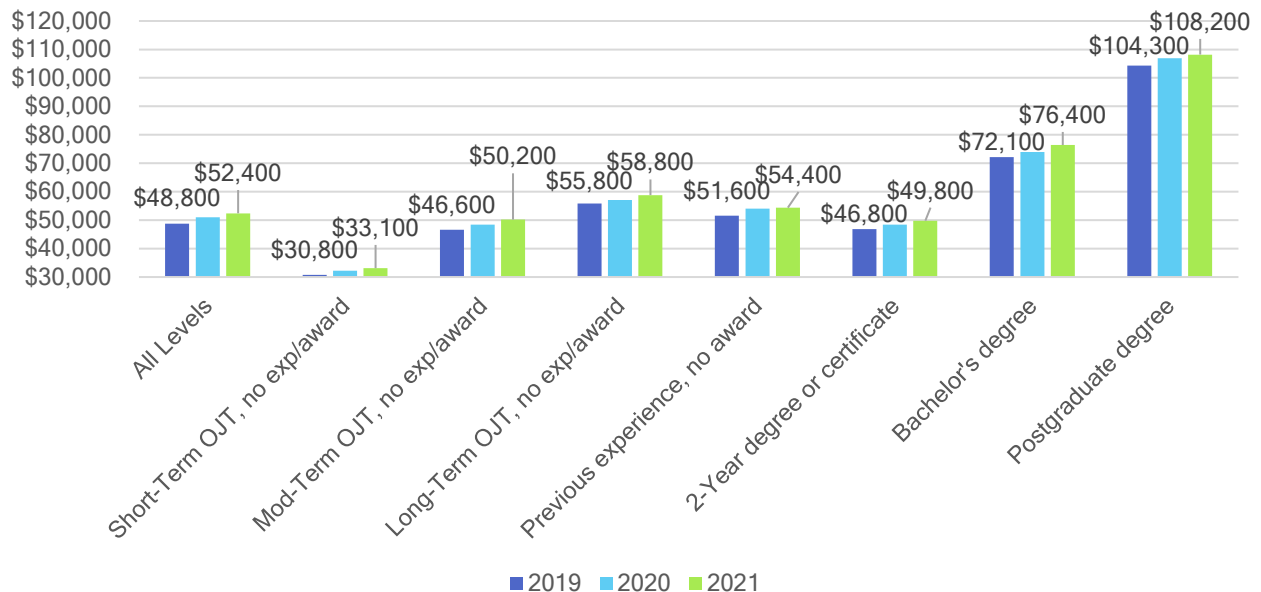
Employment by occupation data are estimates as of 2022Q2. Education levels of occupations are based on BLS assignments. Forecast employment growth uses national projections from the Bureau of Labor Statistics adapted for regional growth patterns.

Average Annual Employment Growth Forecast Estimates in 2020, 2021, and 2022 by Education and Training Requirements, Northeast Minnesota



SOURCE: Chmura JobsEQ 2022Q2.

Average Wage Estimates Annually by Education and Training Requirements, Northeast Minnesota



SOURCE: Chmura JobsEQ 2022Q2. Note wage estimates lag by a full calendar year; 2022Q2 estimates represent 2021 average wages.

The Northeast corner of the state is well known for its unique concentration of Metal Ore Mining industry jobs, with over 79 times more concentration of this industry in the region than a typical region of its size nationally. However it also is home to over four and a half times the concentration of Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities than a typical community. Among top Gateway occupations in the region, we see this hyper-specialization in Mental Health Services in the high local demand in relation to talent supply—and both talent and graduate award shortages—for Mental Health Counselors, which sits at 0.9% unemployment as of 2022Q2. The high local demand for Social and Human Service Assistants in the Northeast is also tied to the unique concentration of Executive, Legislative, and Other General Government Support employers in the Northeast. Gateway occupations as a whole have an average unemployment rate 0.3 percentage points lower than the overall unemployment rate in this region across all occupations.

Regional Summary of Top High-Demand Industries and Gateway Occupations

	Overall Unemployment Rate 2022Q2	Overall Mean Wage	Gateway Occupation Unemployment Rate 2022Q2	Top 4-Digit Sub-Industries of High Local Concentration (LQ) and High Demand (replacement or growth)	Top Gateway Occupations with Occupation Gaps and/or Award Gaps in Order of Total Employment, including Unemployment Rate*
Northeast	3.2%	\$52,500	2.9%	<ul style="list-style-type: none"> • Metal Ore Mining (79.16) • Residential Intellectual & Developmental Disability, Mental Health, & Substance Abuse Facilities (4.52) • Traveler Accommodation (2.90) • Executive, Legislative, & Other General Government Support (2.69) 	<ul style="list-style-type: none"> • Bookkeeping, Accounting, & Auditing Clerks (AG; 2.2%) • Social & Human Service Assistants (AG; 3.0%) • Light Truck Drivers (AG; 2.6%) • Automobile Service Technicians & Mechanics (OG, AG; 2.7%) • Substance Abuse, Behavioral Disorder, & Mental Health Counselors (OG, AG; 0.9%)
Minnesota Statewide	2.5%	\$60,300	2.3%	<ul style="list-style-type: none"> • Hog & Pig Farming (6.05) • Metal Ore Mining (5.13) • Other Residential Care Facilities (3.28) • Farm Product Raw Material Merchant Wholesalers (3.18) 	<ul style="list-style-type: none"> • Heavy Tractor-Trailer & Truck Drivers (OG, AG; 2.2%) • Bookkeeping, Accounting, & Auditing Clerks (AG; 1.8%) • Maintenance & Repair Workers (OG; 1.4%) • Carpenters (OG; 3.2%) • Light Truck Drivers (AG; 2.2%)

*Table includes 4-digit NAICS code industries that have a high Location Quotient (higher than 1.2) in Minnesota, high-demand, and employment over at least 2,300 workers statewide as of 2022Q2. Color coding of industries correspond with the CTE Career Fields. **Table includes high-demand occupations paying average wages between \$42,000-regional mean wage. High-demand is defined as lower than average unemployment rate (by occupations), higher than average regional growth forecast, greater than 50% total replacement demand, high job posting volumes (by occupations), and/or high posting:unemployment ratio (by occupations) as of 2022Q2.

Several occupations have no unemployed talent in the Northeast as of 2022Q2 estimates, resulting in an estimated unemployment rate of 0%. The occupations listed below have nonexistent unemployed talent at the regional level and currently have over 75 people working in these positions locally. Some of these roles have low volumes of online job postings due to unique methods of recruiting talent for specialty roles, while others show high posting volumes which indicates unmet demand and significant likely shortages. All of these roles are Target Occupations paying well over the regional average of \$52,500 annually.

Occupations with No Unemployed Workforce and Employing over 75 Workers, Northeast Minnesota 2022Q2

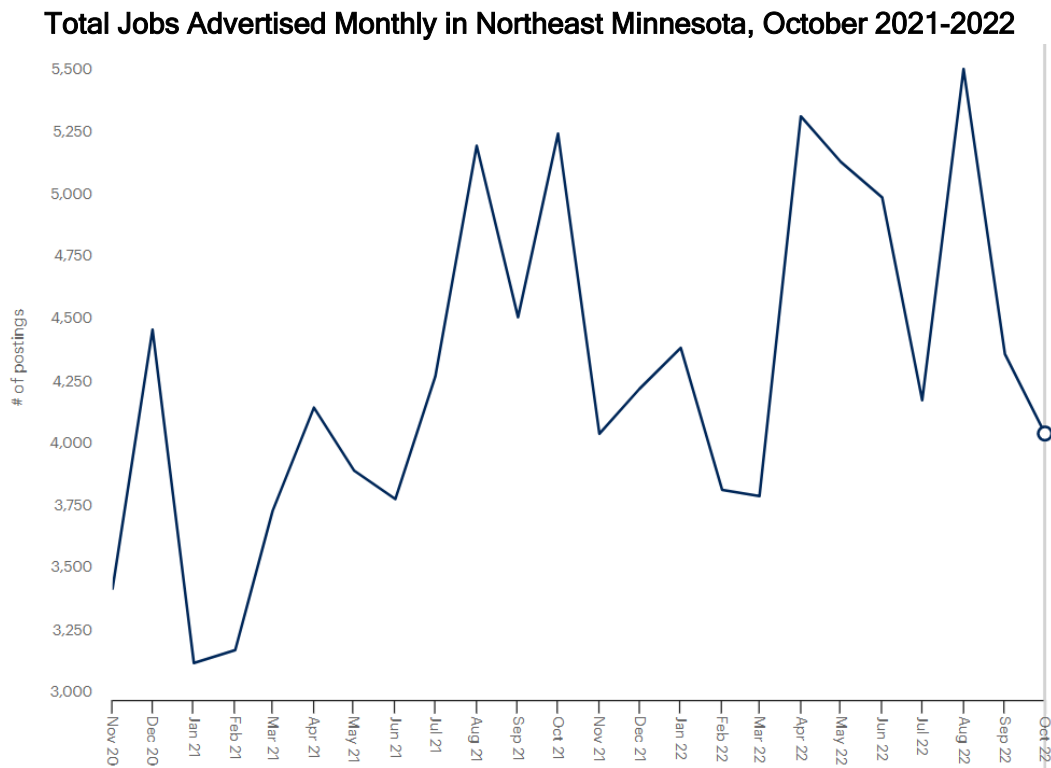
SOC	Occupation	Current						5-Year History		5-Year Forecast				
		Empl	Mean Ann Wages ²	LQ	Unempl	Unempl Rate	30-Day Online Job Ads ³	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
29-1229	Physicians, All Other	301	\$267,400	0.88	0	0.0%	84	128	11.8%	36	24	16	-4	-0.3%
33-1012	First-Line Supervisors of Police and Detectives	206	\$92,000	1.37	0	0.0%	n/a	4	0.4%	63	22	42	-1	-0.1%
21-2021	Directors, Religious Activities and Education	182	\$55,100	0.91	0	0.0%	1	-25	-2.5%	103	36	66	0	0.0%
21-1092	Probation Officers and Correctional Treatment Specialists	155	\$65,400	1.43	0	0.0%	n/a	-3	-0.4%	60	17	46	-2	-0.3%
53-4031	Railroad Conductors and Yardmasters	149	\$69,600	2.63	0	0.0%	1	-13	-1.7%	61	16	48	-3	-0.4%
33-3021	Detectives and Criminal Investigators	147	\$78,200	1.14	0	0.0%	4	0	0.0%	48	18	33	-3	-0.4%
29-1021	Dentists, General	140	\$164,000	0.87	0	0.0%	28	-15	-2.0%	18	13	6	0	0.0%
19-3033	Clinical and Counseling Psychologists	124	\$79,300	1.58	0	0.0%	10	56	12.8%	43	16	25	2	0.4%
29-1131	Veterinarians	124	\$98,700	1.11	0	0.0%	9	28	5.2%	24	10	10	4	0.7%
29-1215	Family Medicine Physicians	121	\$276,600	0.88	0	0.0%	43	-19	-2.8%	14	10	7	-2	-0.3%
29-2031	Cardiovascular Technologists and Technicians	118	\$63,300	1.68	0	0.0%	74	-2	-0.3%	40	16	25	-1	-0.2%
49-9043	Maintenance Workers, Machinery	118	\$58,000	1.61	0	0.0%	n/a	-13	-2.1%	49	19	32	-2	-0.3%
29-1216	General Internal Medicine Physicians	115	\$302,600	1.42	0	0.0%	7	-7	-1.1%	11	9	6	-4	-0.7%
53-4011	Locomotive Engineers	108	\$75,900	2.47	0	0.0%	n/a	-23	-3.8%	44	12	34	-2	-0.4%
33-1021	First-Line Supervisors of Firefighting and Prevention Workers	107	\$70,900	1.16	0	0.0%	1	2	0.3%	34	13	21	0	0.0%
19-2041	Environmental Scientists and Specialists, Including Health	103	\$72,100	1.08	0	0.0%	9	-4	-0.7%	46	9	40	-2	-0.5%
17-1022	Surveyors	100	\$65,400	1.64	0	0.0%	3	6	1.2%	37	17	24	-3	-0.6%
15-1212	Information Security Analysts	92	\$93,900	0.45	0	0.0%	9	10	2.4%	40	7	27	6	1.3%

13-1141	Compensation, Benefits, and Job Analysis Specialists	91	\$67,200	0.77	0	0.0%	3	-20	-3.9%	40	14	27	0	0.0%
19-3034	School Psychologists	87	\$78,300	1.18	0	0.0%	6	8	2.0%	29	11	17	1	0.2%
19-3039	Psychologists, All Other	86	\$87,500	1.26	0	0.0%	5	8	2.0%	26	11	16	-2	-0.4%
29-1011	Chiropractors	77	\$78,200	1.18	0	0.0%	2	2	0.5%	10	5	3	2	0.4%
11-1031	Legislators	76	\$55,800	1.65	0	0.0%	n/a	2	0.5%	27	9	18	0	-0.1%
19-3051	Urban and Regional Planners	75	\$73,900	1.62	0	0.0%	7	1	0.3%	31	6	26	-1	-0.2%
00-0000	Total - All Occupations	192,894	\$52,500	1.00	6,119	3.2%	11,793	-5,395	-0.6%	106,416	42,501	63,932	-17	0.0%

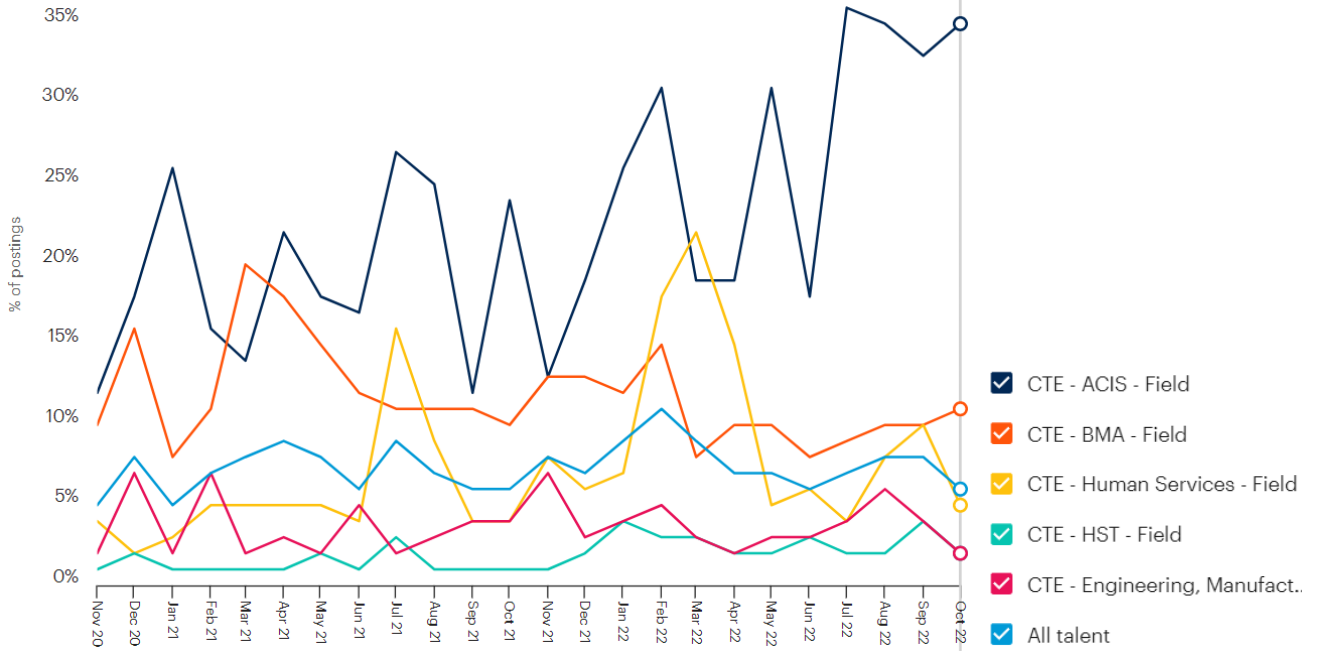
EMERGING CAREER PATHS

Online job posting data reveals a lot about employer demand for certain skills, certifications, qualifications, and occupational competencies. Skills-based hiring continues to trend up in the current tight labor market, particularly in the tech sector, business, and finance industries. Remote and hybrid work environments have also continued to rise well beyond the initial impacts of the pandemic across multiple sectors. However, October 2022 data indicates that there is a slight cooling in the market for all job types statewide, including some remote roles. The October 2022 US Jobs Report observed a similar trend in overall lower job posting volumes, slight dips in remote work opportunities, and a decline in the share of postings that include a signing bonus.

From November 1, 2021 through October 31, 2022 there were 54,199 unique job postings advertised online in Northeast Minnesota on job boards, according to analysis using Gartner TalentNeuron Plan (compared to 1,119,315 postings statewide). This was 10% higher than the 12 months prior. About 10% of all positions advertised were explicitly listed as remote or telecommute roles—either permanently or temporarily. Remote positions increased in prevalence by 31% from the 12 months prior. Remote work opportunities have continued to increase significantly among Information Technology careers and Business, Management, and Administration roles (such as Business Operations Specialists) during the first year of the pandemic. Specifically, 36% of all Information Technology jobs advertised online in Northeast Minnesota between November 2021 and October 2022 were remote positions—up 7 percentage points from the prior year (25% fully remote, 9% hybrid remote, and 2% temporarily remote).

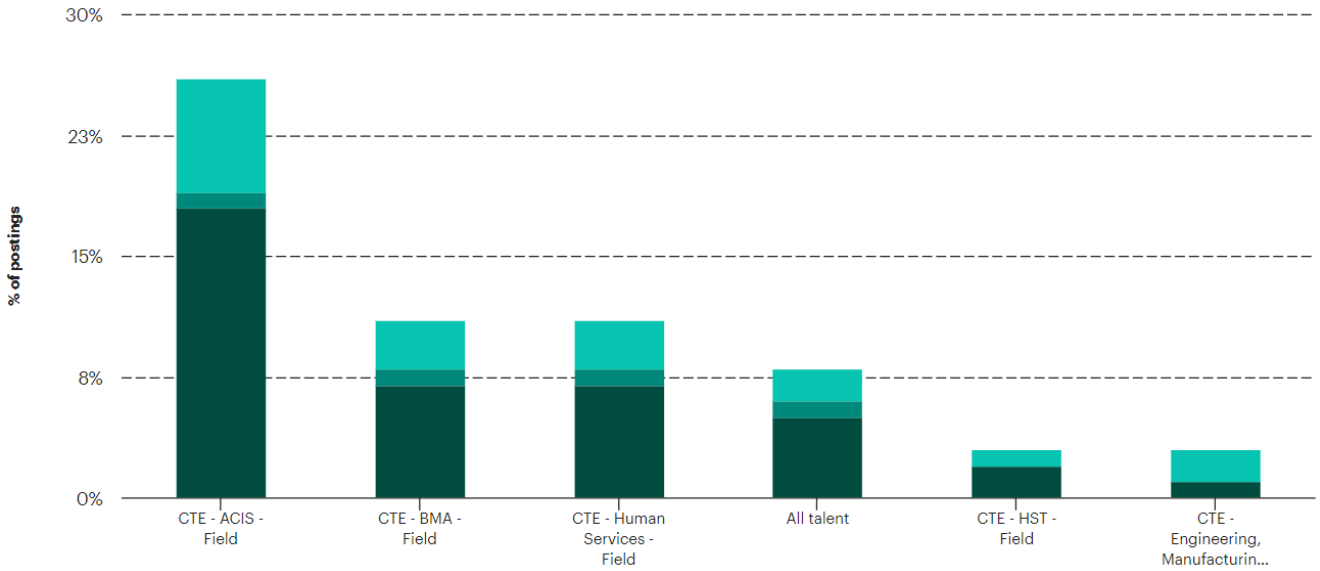


Total Remote Job Postings Advertised Monthly in Northeast Minnesota, October 2021-2022



SOURCE: Gartner TalentNeuron Plan accessed 11/3/2022

Remote Job Postings by Career Field Advertised in Northeast Minnesota, October 2021-2022



Talent Profile ▾	% of postings				
	Unspecified /Onsite ▾	Total remote ▾	Fully remote ▾	Temporary remote ▾	Hybrid remote ▾
CTE - ACIS - Field	74% ▼ -6 pp	26% ▲ 6 pp	18% ▲ 5 pp	1% ▼ -1 pp	7% ▲ 2 pp
CTE - BMA - Field	89% ▲ 2 pp	11% ▼ -2 pp	7% ▼ -3 pp	1% ▲ 0 pp	3% ▲ 1 pp
CTE - Human Services - Field	89% ▼ -5 pp	11% ▲ 5 pp	7% ▲ 3 pp	1% ▲ 0 pp	3% ▲ 2 pp
All talent	92% ▼ -1 pp	8% ▲ 1 pp	5% ▲ 0 pp	1% ▲ 0 pp	2% ▲ 1 pp
CTE - HST - Field	97% ▼ -2 pp	3% ▲ 2 pp	2% ▲ 1 pp	0% ▲ 0 pp	1% ▲ 1 pp
CTE - Engineering, Manufacturing, and Technology - Field	97% ▲ 0 pp	3% ▲ 0 pp	1% ▼ -1 pp	0% ▲ 0 pp	2% ▲ 1 pp

SOURCE: Gartner TalentNeuron Plan accessed 11/3/2022

Remote work opportunities continued to increase significantly among Business, Management, and Administration, Health Science, and Information Technology roles over the past 12 months compared to the 12 months prior. Last year, the volume of remote Software Developer roles increased by 275% during that period—and for remote Human Resources Specialists by 560%; this year’s estimates saw the remote Human Resources Specialist demand cool slightly, but still with a level of demand elevated above where it had been pre-pandemic.

Change in Volume of Remote Work Opportunities by Occupation in Northeast Minnesota, October 2021-2022 Compared to 12 months prior

1. Network and Computer Systems Engineers, 68 (+74%)
2. Insurance Sales Agents, 67 (-83%)
3. Human Resources Specialists, 65 (-31%)
4. Sales Representatives, Services, All Other, 62 (+72%)
5. Business Operations Specialists, 62 (+210%)

During the first six months of the COVID-19 pandemic,⁵ there were 30,150 new jobs advertised in the region—a decrease of about 3% from the same six months in 2019. The top three positions advertised by volume were for Heavy Truck Drivers, Registered Nurses, and Personal Care Aides. Insurance Sales Agents postings grew by 75% between 2020 and 2019. This reflects the sudden and growing local demand for Finance Cluster talent, particularly those with at least a two-year degree in a related area of study.

Throughout 2021, several of those initial occupations continued to see growth in postings, including Software Developers, general computer occupations, Truck Drivers, and Laborers. Additionally, health and finance roles have continued to spike in volume considerably, showing much higher demand since March 2021 compared to early months of the pandemic. Registered Nurse, Nursing Assistant, and Medical Assistant job posting volumes are over two times where they were this time last year.

⁵ March 15-June 15, 2020.

Top Emerging and High Demand Growth Occupations in Northeast Minnesota, October 2021-2022 (by increase in total postings)

1. Printing Press Operators, 243 (+342%)
2. Nuclear Medicine Technologists, 64 (+300%)
3. Medical Equipment Preparers, 124 (+202%)
4. Surgical Technologists, 416 (+174%)
5. Production Workers, All Other, 385 (+164%)

Top Occupations in Growing Demand in Northeast Minnesota, October 2021-2022 (by volume of total job postings)


1. Registered Nurses (+1%)
2. Heavy and Tractor Trailer Truck Drivers (+22%)
3. Gig Economy Careers (+5%)
4. Customer Service Representatives (+10%)
5. Supervisors of Retail Sales Workers (+19%)

Talent accumulates valuable skills in many different ways beyond just work and education, from self-study to apprenticeships/internships, as well as workforce training programs and general life experience all develop relevant skills. Assessing experience in terms of skills unearths a person's qualifications and more clearly identifies training needs. It also helps people recognize the abilities and knowledge they don't know they have.

For example, servers trying to move beyond a likely transition (bartending, retail sales, and other hospitality jobs) to an aligned transition like public relations specialist, skills tell us where their current qualifications align and where there are gaps. This kind of gap analysis is possible at the occupation level and supports with postsecondary planning, workforce development, and employer talent strategy.


Skills tied closely to Health Science Technology occupations have remained consistently present in job postings over the past three years, with "nursing" being the most frequently mentioned skill among health careers. Planning and communication are both core skills that are present in a high percentage of Northeast Minnesota job postings for several years. The majority of rising skills are focused in Information Technology, classroom management, and the printing industry. The regional decline in mentions of physical abilities mirrors the rise in remote positions.

Top Evolving Skills in Northeast Minnesota, October 2021-2022

 **New**


1. Android Marshmallow
2. Offset printing
3. Google Classroom

New skills whose future is uncertain.

 **Emerging**


There are no Emerging skills in the market

Relatively new skills that are becoming more prevalent.

 **Growing**


There are no Growing skills in the market

Fast-growing skills that are becoming core skills.

 **Core**

1. Nursing
2. Planning
3. Communication

Skills that have been present in a high percentage of job postings for some time.

 **Declining**

1. Bending
2. Walking/ambulating

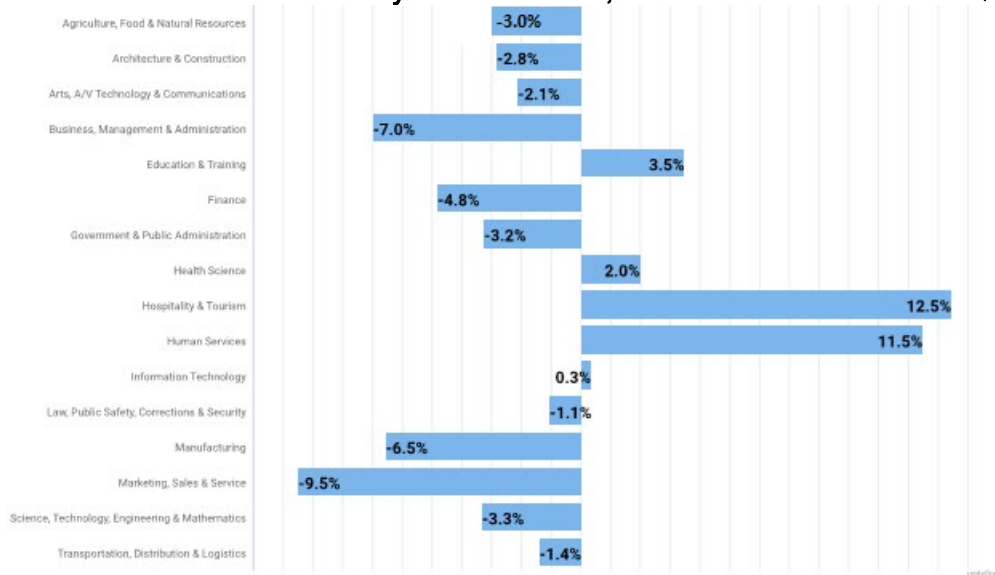
Skills that used to be essential but are becoming obsolete.

Career Field Insights

Analysis of the sixteen CTE Clusters provides an entryway into career pathways, summarizing where opportunities are greatest among hundreds of occupations.

Of sixteen career clusters used by Career and Technical Education (CTE), twelve are forecast to decline in overall employment over the next ten years as of 2022Q2 estimates. The only two clusters forecasting growth are Hospitality and Tourism (12.5%, recovering from previously-forecast decline), Human Services (11.5%, up 2.6 percentage points), Education and Training (3.5%, recovering from previously-forecast decline), and Health Science (2.0%). All Clusters except for Business, Management, and Administration saw improvements in the overall forecast employment outlook. Ten of the sixteen career clusters have average wages above the average occupation wage in the region (\$52,500 in 2021—an increase of \$1,400 from 2020 and \$3,700 from 2019).⁶

Baseline 10-Year Forecasts by Career Cluster, Northeast Minnesota 2022Q2



Cluster forecasts estimated using Chmura, JobsEQ, based on 2022Q2 employment data. All clusters are distinct occupations except for Agriculture, Food, and Natural Resources, which overlaps with other clusters.

An accurate assessment of future occupation demand requires that both future growth and the number of people retiring be taken into account. In the Northeast, Hospitality & Tourism, Business, Management, and Administration, and Marketing, Sales, and Service clusters are expected to have the highest annual job demand by volume of opportunities—due to retirements and job changes.

Science, Technology, Engineering & Mathematics has the highest wages of the Career Clusters followed by the Information Technology and Finance clusters.

Career Cluster	Employment	Avg Ann Wages	Job Ads	Baseline 10-Year Forecasted Empl Change	Ann Empl Growth	Ann Total Demand
Science, Technology, Engineering & Mathematics	2,325	\$92,000	209	-3.0% (+)	-8	154
Information Technology	3,728	\$84,300	300	0.3% (+)	1	263

⁶ Clusters paying an average salary higher than the regional average occupation wage include Science, Technology, Engineering, and Mathematics, Information Technology, Finance, Health Science, Government and Public Administration, Law, Public Safety, Corrections, and Security, Business, Management, and Administration, and Architecture and Construction.

Career Cluster	Employment	Avg Ann Wages	Job Ads	Baseline 10-Year	Ann	Ann
				Forecasted Empl Change	Empl Growth	Total Demand
Finance	4,887	\$72,500	316	-4.8% (+)	-24	378
Health Science	22,619	\$70,000	4,169	2.0% (+)	43	1,742
Government & Public Administration	2,059	\$60,600	62	-3.2% (+)	-7	174
Architecture & Construction	15,647	\$59,800	274	-2.8% (+)	-46	1,490
Law, Public Safety, Corrections & Security	5,892	\$58,300	244	-1.1% (+)	-7	533
Business, Management & Administration	28,761	\$57,600	1,066	-7.0%	-209	2,682
Education & Training	11,916	\$56,600	365	3.5% (+)	40	1,103
Agriculture, Food & Natural Resources	9,639	\$55,200	307	-3.0% (+)	-30	1,024
Arts, A/V Technology & Communications	2,352	\$51,700	138	-2.1% (+)	-5	230
Manufacturing	14,111	\$51,500	414	-6.5% (+)	-97	1,309
Transportation, Distribution & Logistics	12,410	\$49,200	678	-1.4% (+)	-18	1,352
Marketing, Sales & Service	19,993	\$42,100	1,389	-9.5% (+)	-200	2,357
Human Services	14,148	\$41,500	701	11.5% (+)	154	1,886
Hospitality & Tourism	28,795	\$30,100	1,391	12.5% (+)	338	5,196
Total - All Occupations	192,894	\$52,500	11,793	0.0% (+)	-9	21,264

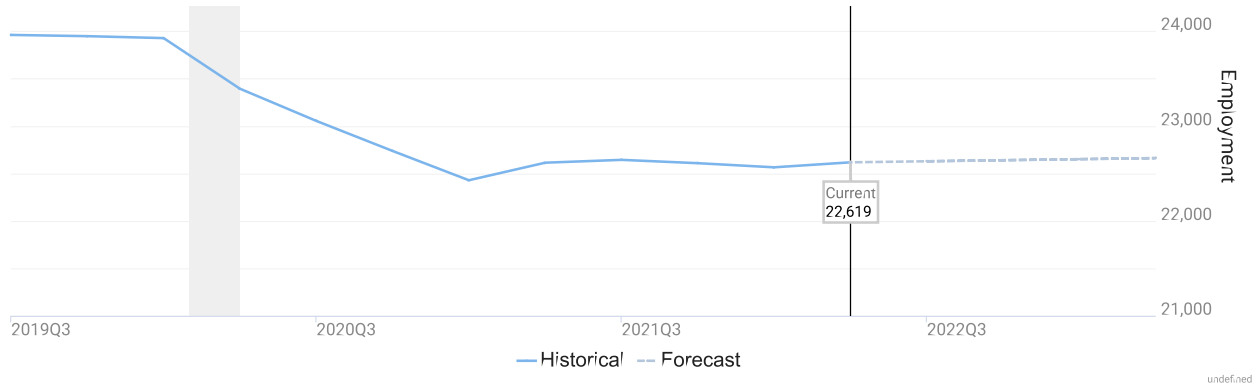
*Cluster forecasts estimated using Chmura, JobsEQ, based on 2022Q2 employment data. All clusters are distinct occupations except for Agriculture, Food, and Natural Resources, which overlaps with other clusters. (+) indicates an improved forecast from 2021Q1 estimates.

HEALTH SCIENCE TECHNOLOGY

Health Science Technology is a critical Career Field to secure the public health of the entire state. The COVID-19 pandemic has made this reality even more clear, and further strained the workforce challenges faced in this sector.

Over the next three years, Health Science Technology employment is forecast to grow by 0.2% on average annually—an improvement on last year’s estimate of flat employment.

Baseline 3-Year Forecast for Health Science Technology Careers, Northeast Minnesota 2022Q2



Top Ten Health Science Technology Occupations by Employment Volume in Northeast Minnesota, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Registered Nurses	6,467	\$72,200	1.71	-231	321	-0.2%
Nursing Assistants	2,421	\$34,100	1.51	-320	285	-0.2%
Home Health Aides	1,644	\$29,500	1.43	-538	221	1.6%
Licensed Practical and Licensed Vocational Nurses	1,042	\$48,300	1.34	-184	77	-0.1%
Medical Secretaries and Administrative Assistants	946	\$41,800	1.17	-41	101	0.0%
Medical and Health Services Managers	722	\$92,400	1.30	-15	72	1.9%
Medical Assistants	568	\$41,300	0.62	-20	72	0.8%
Pharmacy Technicians	564	\$38,600	1.05	-17	35	-0.6%
Pharmacists	494	\$126,900	1.26	-18	13	-1.0%
Radiologic Technologists and Technicians	389	\$66,100	1.43	-21	26	-0.2%
Remaining Component Occupations	7,360	\$94,600	1.16	17	515	0.3%
Health Science (CTE Cluster)	22,619	\$70,000	1.29	-1,384	1,742	0.2%

“Annual Demand” is the projected need for new entrants into an occupation. New entrants are needed due to expected growth and to replace workers who left the occupation due to factors such as retirement or switching careers.

“Forecast Ann Growth” is the expected baseline (most pessimistic) yearly change in employment due to national, long-term trend projections (per the BLS) as well as local factors such as industry mix, labor force participation rates, and population growth (as computed and modeled by RealTime Talent in JobsEQ).

Most talent in Northeast Minnesota that is working in Health Science Technology roles are employed by General Medical and Surgical Hospitals (48.2%, increased from the prior year) or Nursing Care Facilities (8.3%). In comparison, in the metro, only 28.3% of Health Science Technology talent is employed by hospitals.

Health Science Technology Field Employment by Industry, 2022Q2, Northeast Minnesota

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
General Medical and Surgical Hospitals	48.2%	10,904	7,159	-124	7,035
Nursing Care Facilities (Skilled Nursing Facilities)	8.3%	1,887	1,698	-168	1,530
Offices of Physicians	7.5%	1,692	1,184	53	1,237
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	4.0%	909	886	80	966
Offices of Dentists	3.9%	883	739	17	756
Individual and Family Services	3.7%	848	1,016	284	1,299
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	3.6%	820	887	140	1,026
Offices of Other Health Practitioners	2.8%	638	462	92	554
Outpatient Care Centers	2.0%	453	339	54	393
Home Health Care Services	2.0%	448	406	67	473
Health and Personal Care Retailers	2.0%	443	251	-46	206
Other Professional, Scientific, and Technical Services	1.9%	437	364	25	389
Executive, Legislative, and Other General Government Support	1.2%	261	194	-1	193
Psychiatric and Substance Abuse Hospitals	1.2%	261	196	-20	176
Elementary and Secondary Schools	1.1%	240	155	10	165
Other Residential Care Facilities	0.9%	210	190	-25	165
Colleges, Universities, and Professional Schools	0.6%	137	93	0	93
Administration of Environmental Quality Programs	0.5%	117	77	-11	66
All Others	4.6%	1,032	734	25	760

Career Field Demographics

The Health Science Technology field is predominantly female (78.0%) and white (93.5%), but racial diversity grew by 0.3 percentage points from the prior years' estimates due to growth in the field's workforce identifying with two or more races. The age distribution of talent in Health Science Technology aged from prior estimates, with an additional 0.9 percentage points of the population 55 or older and another 0.5 percentage points in the 45 to 54 age cohort compared to the prior years' estimates. Over the past three years, the share of the Health Science Technology workforce that is female has increased by 0.4 percentage points annually in the Northeast.

Age

NHED Region (County-Based)



Minnesota



16 to 19 years (1.4%)
20 to 24 years (9.2%)

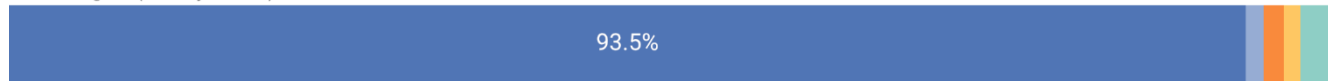
25 to 34 years (22.0%)
35 to 44 years (22.0%)

45 to 54 years (20.5%)
55 to 64 years (19.2%)
65 years and over (5.7%)

Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2022Q2.

Race

NHED Region (County-Based)



Minnesota



White (93.5%)

American Indian (1.6%)

Pacific Islander (0.0%)

Black (1.4%)

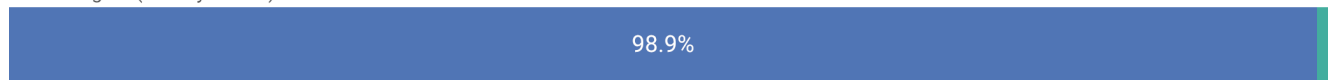
Asian (1.2%)

Two or More Races (2.3%)

Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2022Q2.

Ethnicity

NHED Region (County-Based)



Minnesota



Non-Hispanic/Latino (98.9%)

Hispanic or Latino (of any race) (1.1%)

Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2022Q2.

Gender

NHED Region (County-Based)



Minnesota



Male (22.0%)

Female (78.0%)

Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2022Q2.

Educational Attainment and Requirements

The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this career field in aggregate. In general, the Northeast Minnesota Health Science Technology workforce has a close match to the education and training required for existing roles. For example, 17.3% of Health Science Technology positions require no educational award (up 0.5 percentage points from the prior years' estimates), and about 13.1% of the workforce holds only a high school diploma or less. About 28.5% of the Health Science Technology workforce hold a two-year degree and 15.3% completed some college (such as a certificate), or 43.8% in all, compared to about 32.3% of local jobs in Health Science Technology that typically require a certificate two-year degree. The Northeast has a larger share of local jobs that require a two-year degree or certificate than seen statewide. The table below indicates typical education and training requirements rather than the mix of attainment of workers in such positions.

Educational Attainment

NHED Region (County-Based)



Minnesota



< High School (1.4%)

Some College (15.3%)

Four-Year (25.1%)

High School (11.7%)

Two-Year (28.5%)

Master's (8.4%)

PhD (9.5%)

Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2022Q2.

Education and Training Requirements

NHED Region (County-Based)



Minnesota



Short-term OJT, no exp, no award (9.5%)

Long-term training, no exp, no award (0.5%)

2-year degree or certificate (32.3%)

Moderate-term OJT, no exp, no award (7.3%)

Previous work experience, no award (0.0%)

Bachelor's degree (35.3%)

Postgraduate degree (15.1%)

Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2022Q2.

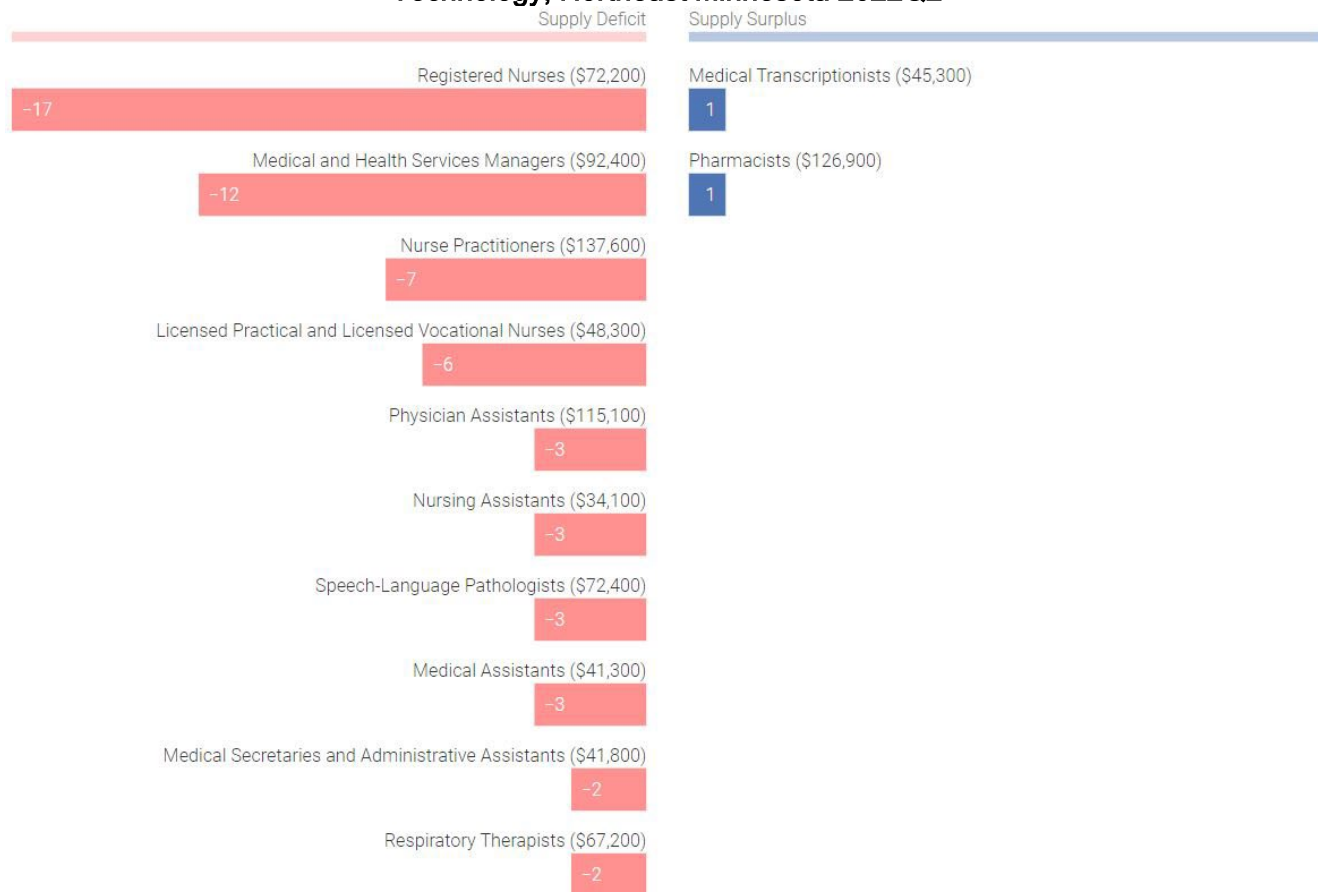
Occupation Gaps

The chart below shows the potential average annual gaps over ten years. Many variables go into this analysis, but at its core it is based on a forecast comparing occupation demand growth to the local population growth and the projected educational attainment of those residents, then matched to specific related programs offered locally. When an area, for example, has an occupation expected to grow quickly but the educational requirement for the occupation does not match well with the educational attainment of its residents, there is a high potential for an occupation shortfall in the region. Alternatively, slow-growing or contracting occupations often represent potential supply surpluses.

The potential supply shortfall is an underlying force that the market needs to resolve one way or another, such as by employers recruiting from further distances for these occupations, wages going up to attract more candidates, and/or increased demand and wages enticing more local residents to get training for these occupations. While this an important analysis for determining local occupation needs, the occupation gap should be considered along with other regional data including growth and separation forecasts, unemployment rates, wage trends, and award and skill gap analyses.

In Health Science Technology, Registered Nurses remains the occupation with the greatest annual shortages in the Northeast and #1 statewide, though with the gap closing moderately from 2021Q1. This critical talent shortage is due in large part to forecasted employment growth and replacement demand needs due to retirements combined with insufficient talent coming through Registered Nursing programs at both the two-year and four-year levels. Other occupations of high shortage have remained consistent with prior estimates.

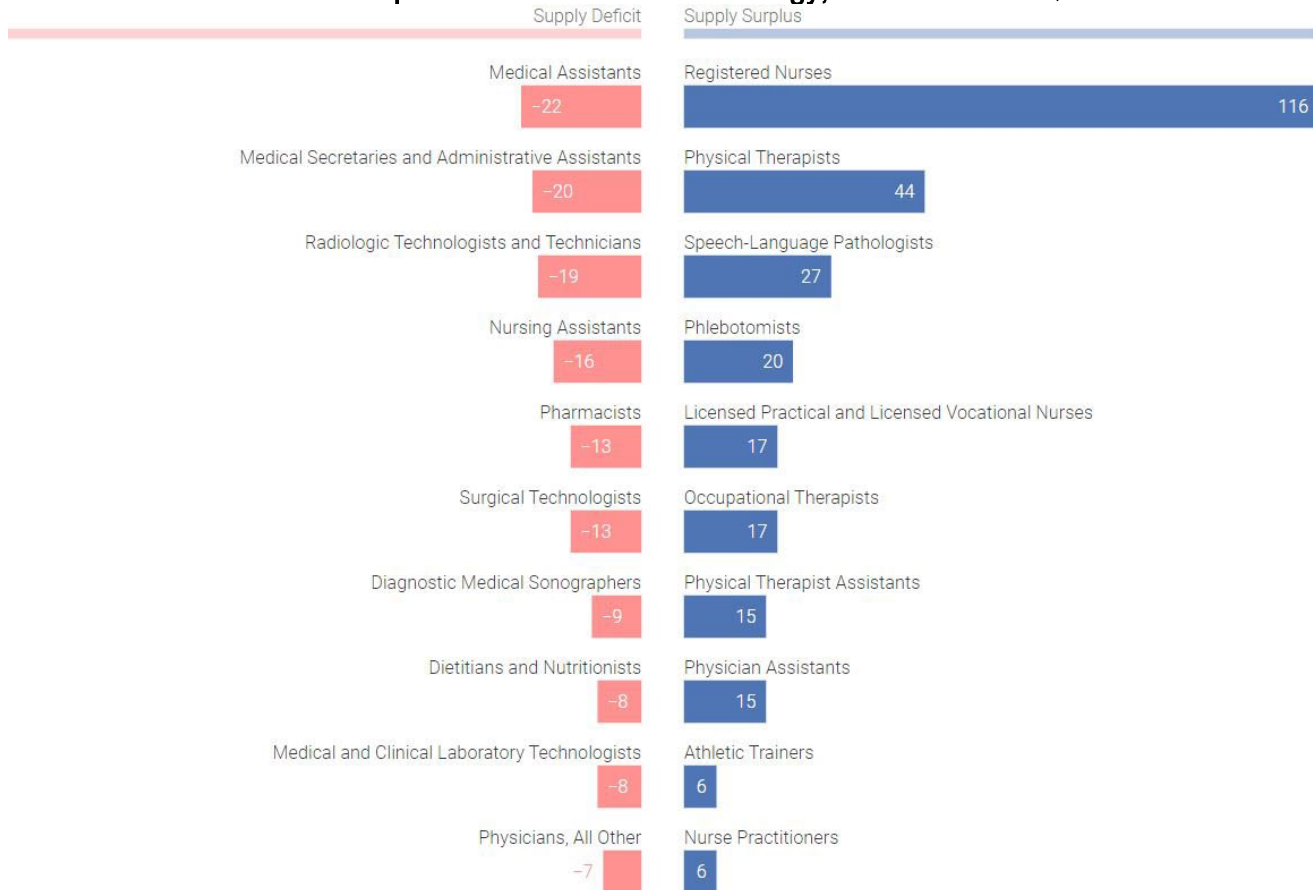
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Health Science Technology, Northeast Minnesota 2022Q2



Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate a few moderate shortages and some general misalignments. The Northeast has several Health Science Technology award gaps, meaning that the region is underproducing local talent in relation to employer demand. For instance, Northeast colleges and universities are underproducing about 22 Medical Assistant graduates annually that are needed to fill positions open with employers in the region. A broad number of other roles that typically require a two-year professional degree are forecasting local shortages. Nurse Practitioner graduates were underproduced in the region in the past two years' reports, but has closed in the Northeast as of 2022Q2. Occupations that show higher awards given than what is currently needed in the local talent market are examples of programs that serve other parts of the state where talent demand is high but relevant programs may not exist, such as Registered Nurses and Physical Therapists. The oversupply of graduates in the Northeast is likely helping to meet award gaps found in the 7-county MSP Metro and elsewhere.

Award Gaps in Health Science Technology, Northeast 2022Q2



Promising Pathways

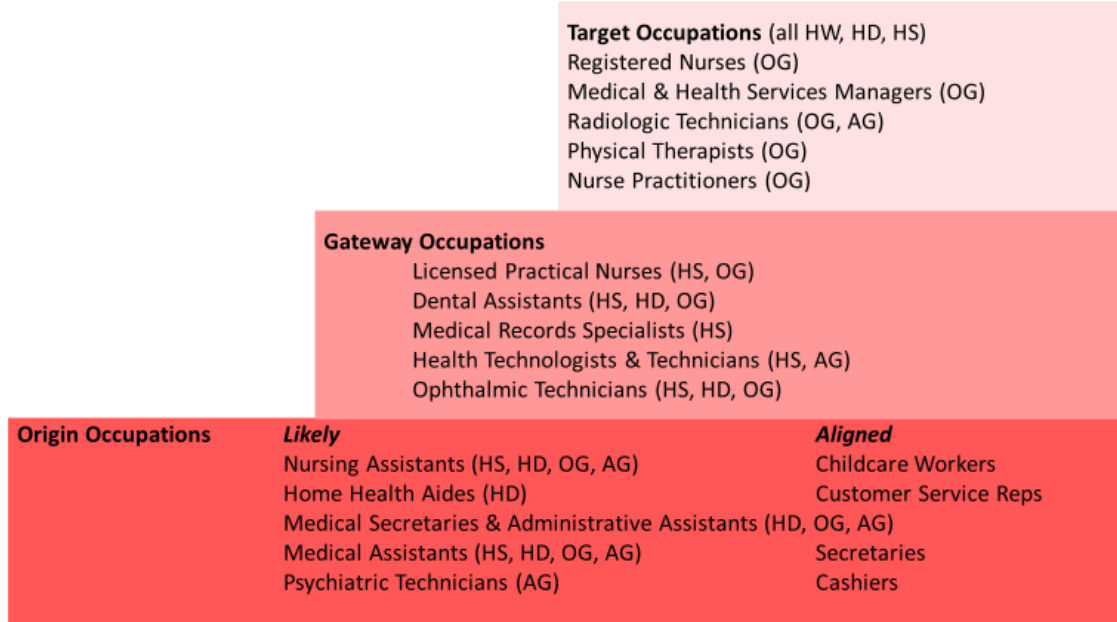
This section offers an origin-to-gateway-to-target model analysis for how to help move students from entrypoints into their field of interest into both likely and other aligned careers, taking into account automation, remote work, and the changing work environment.

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without four-year degrees. Below are a few Origin Occupations that are likely entrypoints into Health Science Technology locally, or aligned opportunities that share a large number of skillsets in-demand in Health Science Technology.

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$52,500 in the Northeast). Below are a few Gateway Occupations in Health Science Technology locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences.

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$52,500 in the Northeast). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

Origin-to-Gateway-to-Target Occupations for Health Science Technology, Northeast Minnesota 2022Q2



HW = High-Wage; HS=High-Skill; HD=High-Demand; OG=Occupation Gaps; AG=Award Gaps

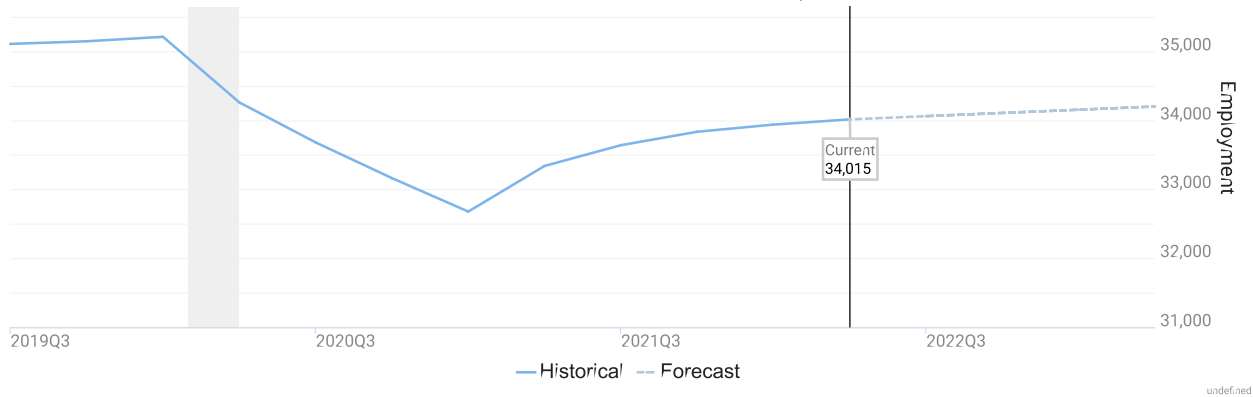
High Location Quotient (LQ) Occupations for Health Science Technology, Northeast Minnesota 2022Q2

- 1) Genetic Counselors (3.03)
- 2) Pediatric Surgeons (2.57)
- 3) Recreational Therapists (2.26)
- 4) Psychiatric Aides (2.21)
- 5) Epidemiologists (2.16)

HUMAN SERVICES

Human Services is the career field forecast to grow the most over the next ten years. Over the next three years, Human Services employment is forecast to grow by 0.5% annually—a significant improvement from estimates in 2021Q1. A total of 34,015 people are employed in Human Services roles regionally, accounting for 17.6% of all regional employment. The field’s average wage is \$50,900, somewhat below the regional average across all occupations (\$52,500).

Baseline 3-Year Forecast for Human Services Careers, Northeast Minnesota 2022Q2



Top Ten Human Services Occupations by Employment Volume in Northeast Minnesota, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Personal Care Aides	4,655	\$29,500	1.43	170	758	1.6%
Teaching Assistants, Except Postsecondary	2,099	\$34,500	1.43	-104	197	0.2%
Elementary School Teachers, Except Special Education	1,588	\$60,600	0.97	-79	112	0.0%
Secondary School Teachers, Except Special and Career/Technical Education	1,205	\$62,000	0.96	-55	82	0.0%
Childcare Workers	1,150	\$26,600	1.15	-117	157	0.0%
Police and Sheriff's Patrol Officers	1,144	\$68,100	1.46	-29	85	-0.1%
Social and Human Service Assistants	1,012	\$42,200	1.99	-36	130	1.0%
Substance Abuse, Behavioral Disorder, and Mental Health Counselors	904	\$50,200	2.10	3	100	1.4%
Child, Family, and School Social Workers	735	\$62,400	1.76	8	75	0.9%
Security Guards	723	\$34,500	0.54	-67	97	0.3%
Remaining Component Occupations	18,792	\$57,600	1.11	-779	1,897	0.3%
Human Services (CTE Field)	34,015	\$50,900	1.13	-1,088	3,689	0.5%

“Annual Demand” is the projected need for new entrants into an occupation. New entrants are needed due to expected growth and to replace workers who left the occupation due to factors such as retirement or switching careers.

“Forecast Ann Growth” is the expected baseline (most pessimistic) yearly change in employment due to national, long-term trend projections (per the BLS) as well as local factors such as industry mix, labor force participation rates, and population growth (as computed and modeled by RealTime Talent in JobsEQ).

The largest share of regional Human Services talent in the Northeast are employed by Elementary and Secondary Schools (22.5%) or Executive, Legislative, and Other General Government Support (13.2%). Individual and Family Services continues to have high forecasted growth and replacement demand needs.

Human Services Field Employment by Industry, 2022Q2, Northeast Minnesota

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Elementary and Secondary Schools	22.5%	7,637	6,351	16	6,367
Executive, Legislative, and Other General Government Support	13.9%	4,732	4,114	-73	4,041
Individual and Family Services	9.7%	3,304	4,585	1,078	5,663
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	6.9%	2,351	2,965	185	3,149
Colleges, Universities, and Professional Schools	3.7%	1,254	1,165	-4	1,161
Other Residential Care Facilities	2.9%	973	1,071	-128	943
Religious Organizations	2.7%	932	988	-3	985
Child Care Services	2.6%	896	1,031	-3	1,028
Personal Care Services	2.4%	833	968	158	1,126
Junior Colleges	2.4%	818	777	34	811
General Medical and Surgical Hospitals	2.3%	774	740	-19	721
Other Schools and Instruction	2.2%	752	977	189	1,166
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	1.8%	611	899	127	1,027
Justice, Public Order, and Safety Activities	1.7%	594	502	-55	447
Legal Services	1.6%	544	389	-27	363
Administration of Environmental Quality Programs	1.6%	533	440	-53	387
Outpatient Care Centers	1.4%	472	467	30	496
Civic and Social Organizations	1.3%	457	726	150	876
Home Health Care Services	1.3%	450	652	74	727
Offices of Other Health Practitioners	1.2%	416	385	43	428
All Others	13.8%	4,683	5,205	194	5,399

Career Field Demographics

The Human Services field is predominantly female (63.0%) and white (93.1%). The share of the Human Services workforce that is female declined by 0.5 percentage points from the 2021Q1 estimates. About 21.1% of the Human Services workforce in the region is between the ages of 45 and 54, but it is the workforce that is 65 or older that saw the greatest increase from the prior year—a full percentage point higher at 7.9% of the local Human Services workforce.

Age

NHED Region (County-Based)



Minnesota



16 to 19 years (2.5%)
20 to 24 years (10.1%)

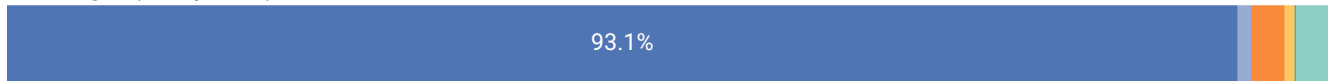
25 to 34 years (18.1%)
35 to 44 years (20.5%)

45 to 54 years (21.1%)
55 to 64 years (19.9%)
65 years and over (7.9%)

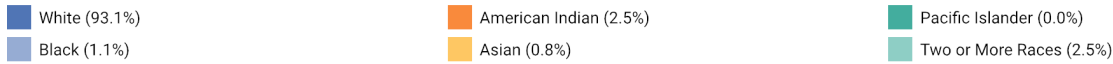
Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2022Q2.

Race

NHED Region (County-Based)



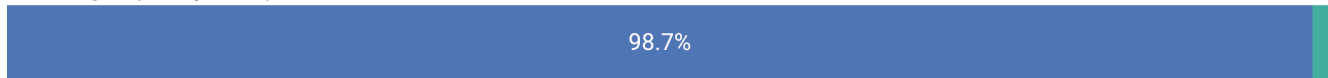
Minnesota



Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2022Q2.

Ethnicity

NHED Region (County-Based)



Minnesota



Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2022Q2.

Gender

NHED Region (County-Based)



Minnesota



Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2022Q2.

Educational Attainment and Requirements

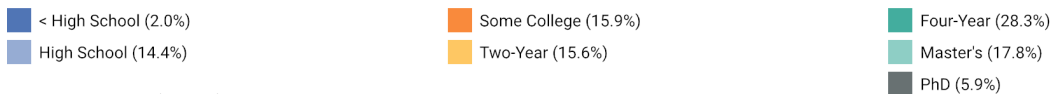
The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this career field in aggregate. In general, the Northeast Human Services workforce is overskilled for the typical credentials of entry-level positions. For example, 2.0% of the Human Services workforce has no diploma at all, and 14.4% hold a high school diploma as their highest credential. In contrast, about 46.3% of positions in this field do not require any kind of postsecondary award or credential. The table below indicates typical education and training requirements rather than the mix of attainment of workers in some key positions in this field.

Educational Attainment

NHED Region (County-Based)



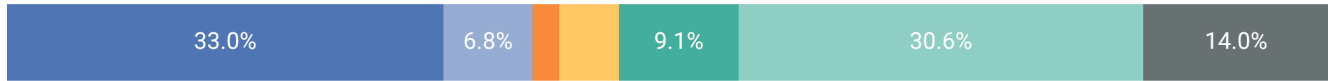
Minnesota



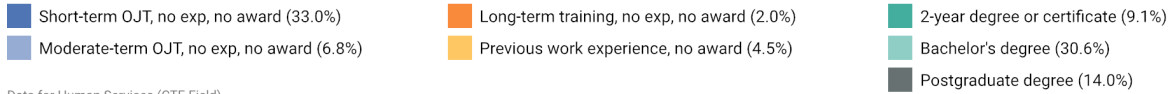
Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2022Q2.

Education and Training Requirements

NHED Region (County-Based)



Minnesota

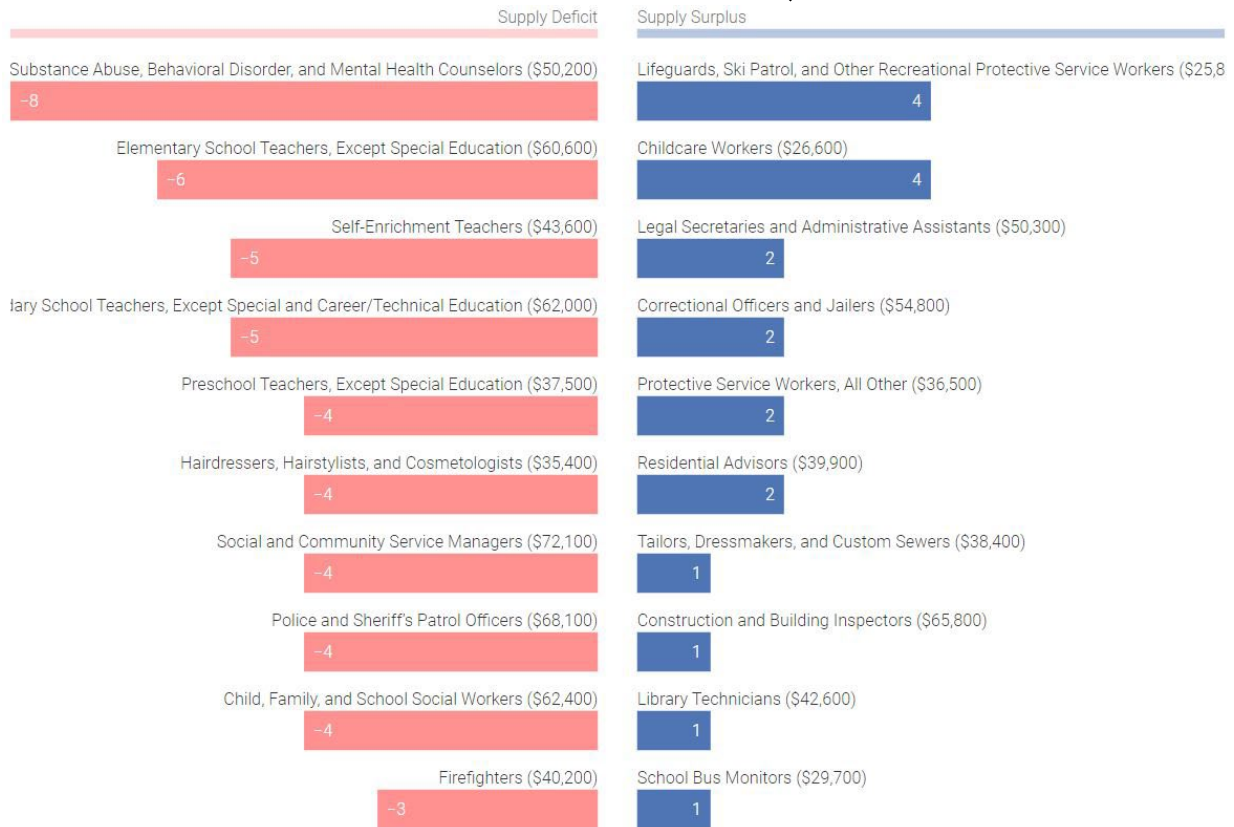


Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2022Q2.

Occupation Gaps

The chart below shows the potential average annual gaps over ten years. In Human Services, Mental Health Counselors and various teaching roles are the top occupations of shortage in the region (Police Officers dropped out of the second-highest occupation of highest forecasted shortage this year). These critical talent shortages in mental health counseling have shifted due in large part to forecasted employment growth and replacement demand needs due to retirements combined with insufficient talent coming through both secondary education and mental health counseling programs; teaching shortages have emerged as a result of significant exits of teachers from the profession during the pandemic.

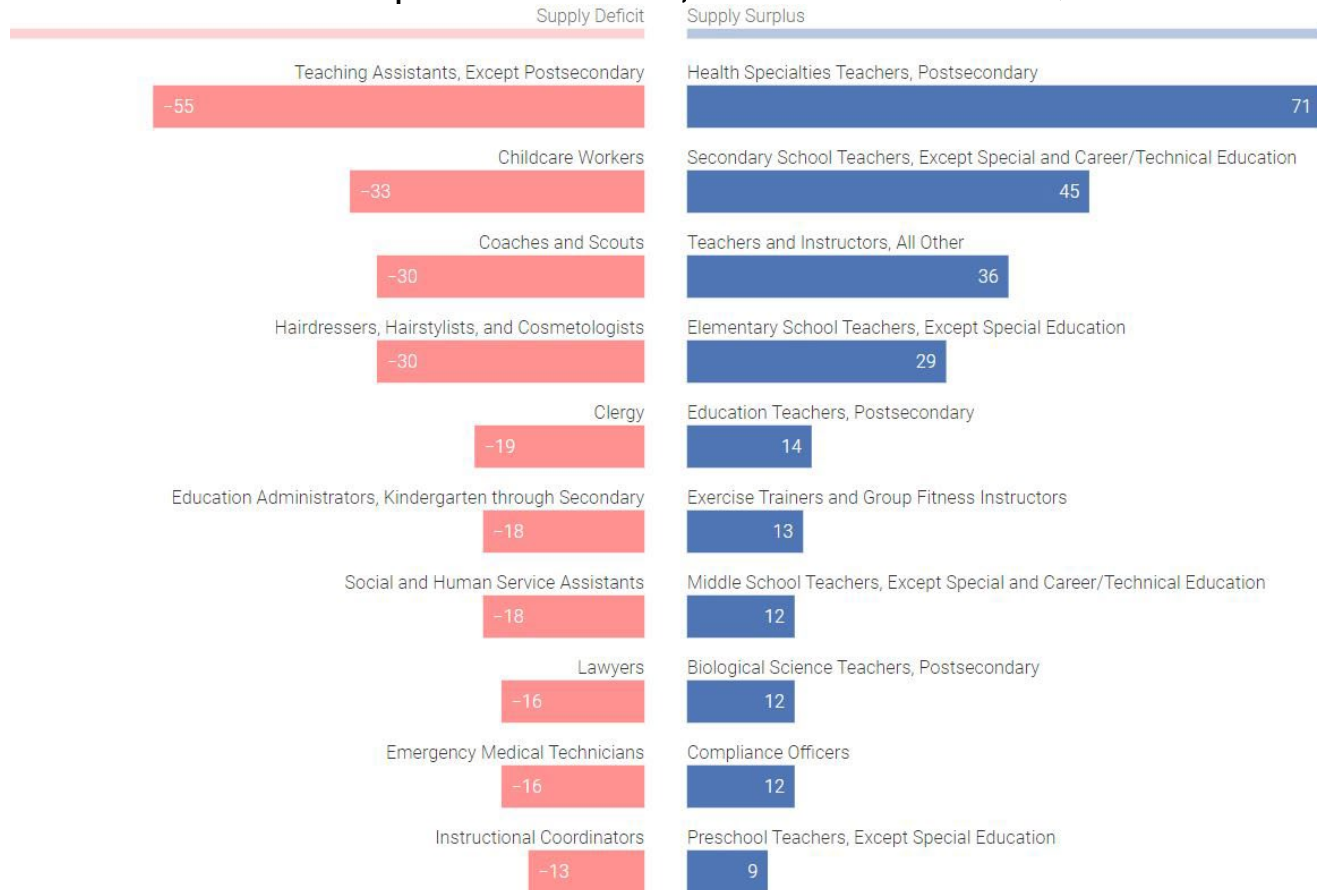
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Human Services, Northeast Minnesota 2022Q2



Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate a number of shortages. Northeast Minnesota faces several notable Human Services award gaps, meaning that the region is underproducing local talent in relation to employer demand. Northeast colleges and universities are underproducing about 55 graduates annually that are needed to fill Teaching Assistant positions open with employers based in the region, at least 33 Childcare Worker roles, and at least 30 Coaching positions. Occupations that show higher awards given than what is currently needed in the local talent market are examples of programs that serve other parts of the state where talent demand is high but relevant programs may not exist.

Award Gaps in Human Services, Northeast Minnesota 2022Q2



Promising Pathways

This section offers an origin-to-gateway-to-target model analysis for how to help move students from entrypoints into their field of interest into both likely and other aligned careers, taking into account automation, remote work, and the changing work environment.

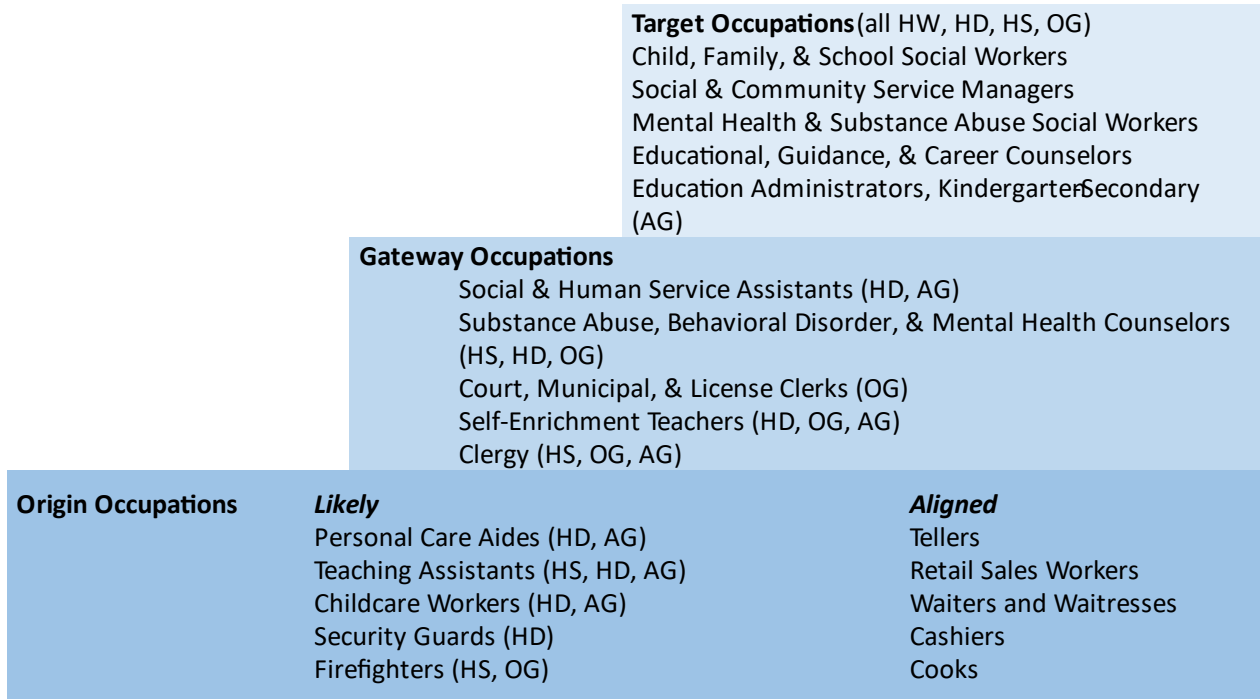
Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without four-year degrees. Below are a few Origin Occupations that are likely entrypoints into Human Services locally, or aligned opportunities that share a large number of skillsets in-demand in Human Services.

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$52,500 in the Northeast). Below are a few Gateway Occupations in Human Services locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term

economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences.

Target Occupations refer to high-wage occupations that pay at or above the region’s average wage (\$52,500 in the Northeast). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

Origin-to-Gateway-to-Target Occupations for Human Services, Northeast Minnesota 2022Q2



HW = High-Wage; HS=High-Skill; HD=High-Demand; OG=Occupation Gaps; AG=Award Gaps

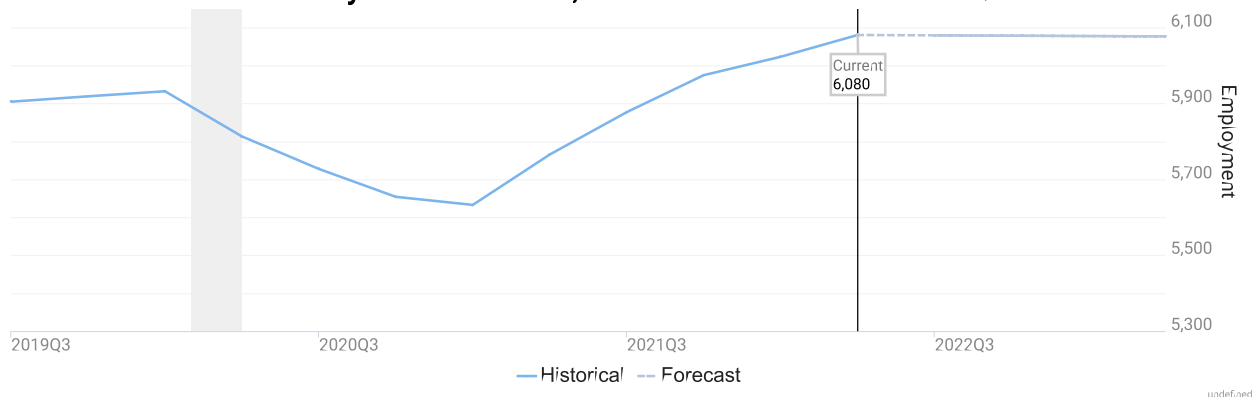
High Location Quotient (LQ) Occupations for Human Services, Northeast Minnesota 2022Q2

- 1) Gambling Surveillance Officers & Gambling Investigators (4.47)
- 2) Court, Municipal, & License Clerks (3.77)
- 3) Special Education Teachers, Preschool (3.14)
- 4) Residential Advisors (2.85)
- 5) Social Workers, All Other (2.57)

ARTS, COMMUNICATIONS, AND INFORMATION SYSTEMS

Arts, Communications, and Information Systems is a diverse career field with artistic careers as well as Information Technology career paths, which experienced somewhat diverging trends during over the course of the COVID-19. Information Technology careers saw nearly no drop in total employment and saw boosted demand during the first two years, but beginning to slow as of July 2022. Over the next three years, Arts, Communications, and Information Systems Field employment is forecast to decline by -0.1% annually. Current employment sits at 6,080 for talent in this field, with about 144 unemployed, trained professionals in the region (2.4% unemployment rate). Among careers in Information Technology, growth is forecast to continue to be high. Software Developers continues to be the occupation of largest employment in the region for this field; in 2021Q1 employment of Software Developers was 758 workers, which has risen to 1,240 as of 2022Q2. An additional 101 Software Developers are forecast to be added to local businesses annually over the next three years.

Baseline Worst-Case Scenario 3-Year Forecast for Arts, Communications, and Information Systems Careers, Northeast Minnesota 2022Q2



Top Ten Arts, Communications, and Information Systems Occupations by Employment Volume in Northeast, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Software Developers	1,240	\$102,900	0.57	353	101	0.8%
Computer Systems Analysts	535	\$80,600	0.81	-30	32	-0.7%
Computer User Support Specialists	481	\$53,800	0.58	-14	33	-0.3%
Computer Network Support Specialists	319	\$65,800	1.43	-14	22	-0.3%
Computer Occupations, All Other	267	\$78,100	0.48	-1	18	-0.4%
Graphic Designers	262	\$48,000	0.79	-5	21	-0.9%
Network and Computer Systems Administrators	230	\$78,500	0.57	-22	13	-0.6%
Printing Press Operators	203	\$41,200	1.09	-10	16	-2.2%
Musicians and Singers	172	\$55,400	0.93	-20	22	0.8%
Writers and Authors	169	\$61,100	0.86	0	16	0.0%
Remaining Component Occupations	2,202	\$63,000	0.74	-37	201	-0.1%
Arts, Communications, & Information Systems (CTE Field)	6,080	\$71,700	0.66	197	490	-0.1%

"Annual Demand" is the projected need for new entrants into an occupation. New entrants are needed due to expected growth and to replace workers who left the occupation due to factors such as retirement or switching careers.

"Forecast Ann Growth" is the expected baseline (most pessimistic) yearly change in employment due to national, long-term trend projections (per the BLS) as well as local factors such as industry mix, labor force participation rates, and population growth (as computed and modeled by RealTime Talent in JobsEQ).

The largest share of talent in the Northeast that is working in Arts, Communications, and Information Systems roles are employed by IT Companies (10.5%) or working as independent artists (6.4%). Overall, employment is relatively spread out across a number of different industries.

Arts, Communications, and Information Systems Field Employment by Industry, 2022Q2, Northeast Minnesota

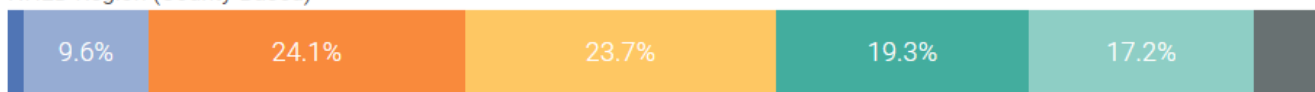
Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Computer Systems Design and Related Services	10.5%	640	485	94	580
Independent Artists, Writers, and Performers	6.4%	389	389	14	403
Other Professional, Scientific, and Technical Services	4.6%	279	224	5	229
Wired and Wireless Telecommunications (except Satellite)	4.4%	265	224	-46	178
Printing and Related Support Activities	4.3%	263	242	-67	176
Depository Credit Intermediation	3.6%	219	151	-9	143
Executive, Legislative, and Other General Government Support	3.4%	204	148	-3	145
Religious Organizations	3.3%	200	213	2	215
General Medical and Surgical Hospitals	3.2%	197	136	-7	129
Newspaper, Periodical, Book, and Directory Publishers	2.6%	156	136	-27	110
Radio and Television Broadcasting Stations	2.4%	146	135	-2	133
Architectural, Engineering, and Related Services	2.2%	133	93	-9	84
Management of Companies and Enterprises	2.1%	126	89	-5	83
Colleges, Universities, and Professional Schools	2.0%	125	93	-5	88
Insurance Carriers	2.0%	122	88	5	93
Elementary and Secondary Schools	1.7%	106	77	-2	75
Management, Scientific, and Technical Consulting Services	1.7%	101	73	0	73
Aerospace Product and Parts Manufacturing	1.6%	98	68	-5	62
Other Miscellaneous Manufacturing	1.5%	90	78	-2	76
Advertising, Public Relations, and Related Services	1.4%	87	79	-1	79
All Others	35.1%	2,136	1,737	33	1,770

Career Field Demographics

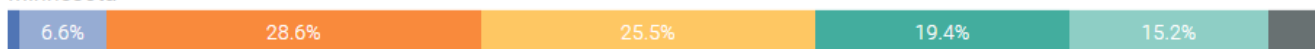
The Arts, Communications, and Information Systems field is predominantly male (72.8%, increasing by 0.7 percentage points from the prior year) and white (92.9%), although diversity increased with now 7.1% of talent in the field BIPOC by race compared to 5.8% in the year prior. About one-third of the Arts, Communications, and Information Systems workforce in the region is between the ages of 20 and 34 (33.7%, the same as one year prior).

Age :

NHED Region (County-Based)



Minnesota



16 to 19 years (1.2%)

25 to 34 years (24.1%)

45 to 54 years (19.3%)

20 to 24 years (9.6%)

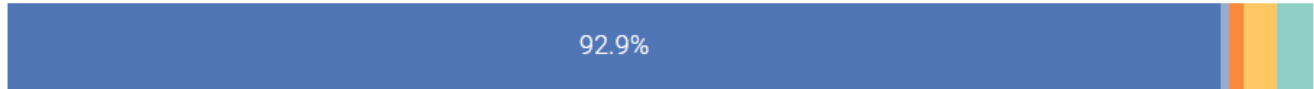
35 to 44 years (23.7%)

55 to 64 years (17.2%)

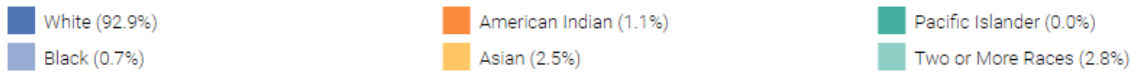
65 years and over (4.9%)

Race :

NHED Region (County-Based)

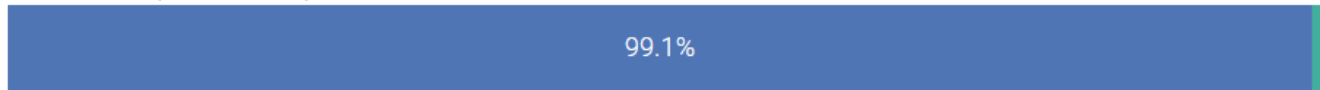


Minnesota

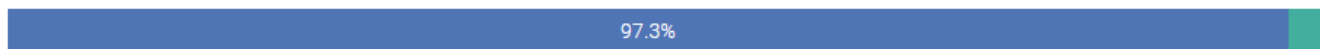


Ethnicity :

NHED Region (County-Based)



Minnesota



Gender :

NHED Region (County-Based)



Minnesota



Educational Attainment and Requirements

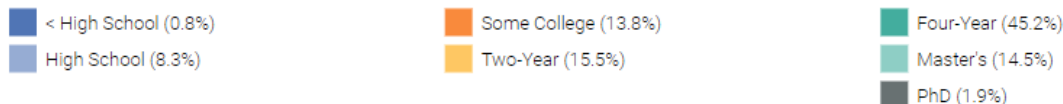
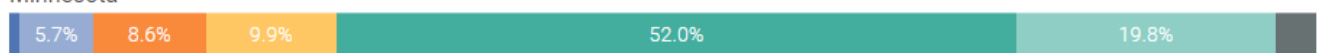
The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this career field in aggregate. The share of all occupations in this field requiring a Bachelor's degree increased from 62.7% to 65.2%, while 45.2% of the workforce hold a four-year degree as their highest credential. Another 14.1% hold a Master's or PhD.

Educational Attainment :

NHED Region (County-Based)



Minnesota

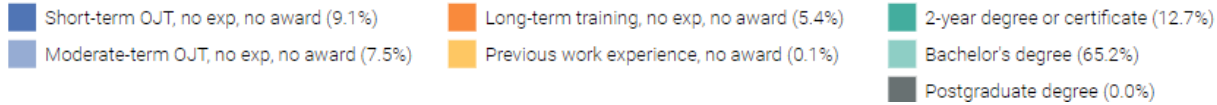


Education and Training Requirements

NHED Region (County-Based)



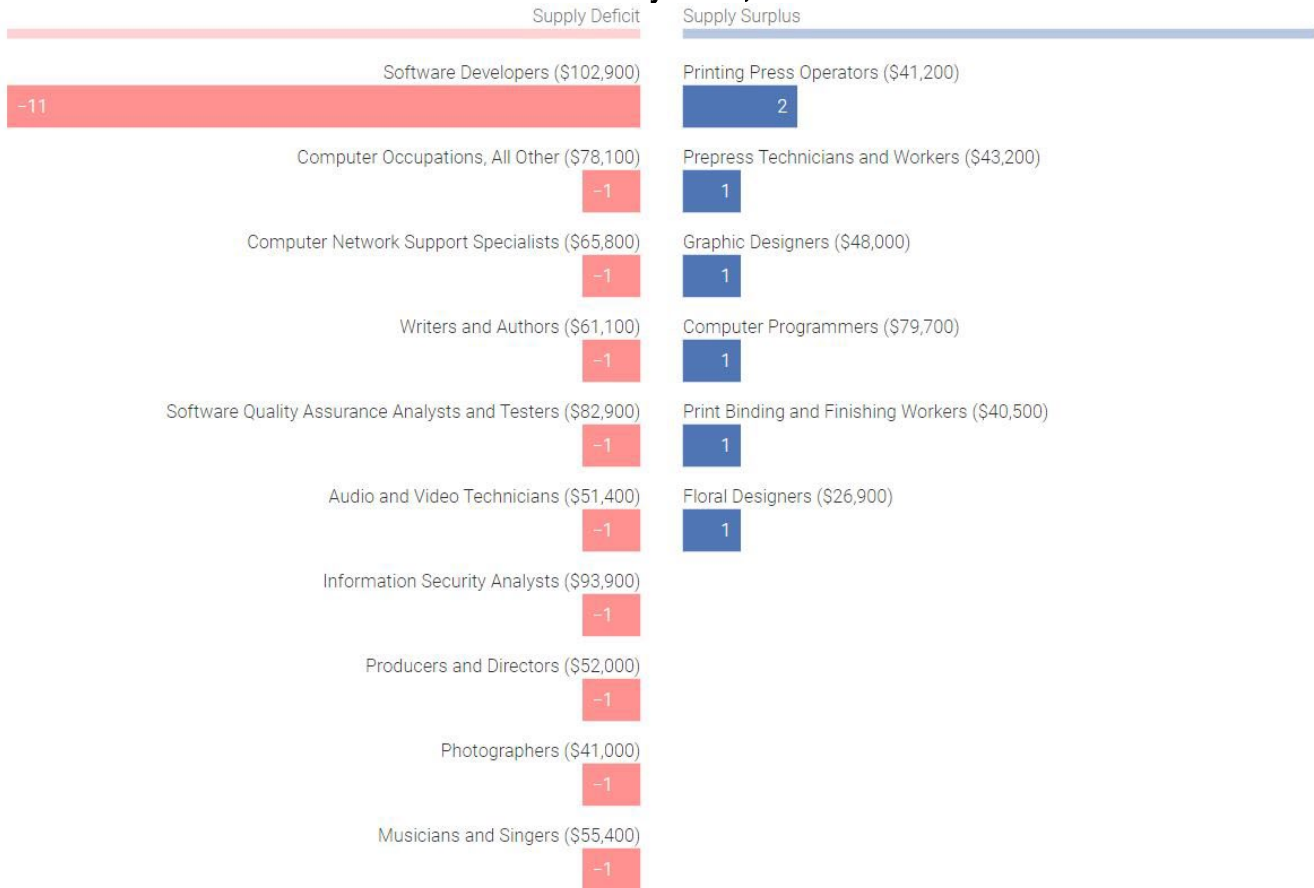
Minnesota



Occupation Gaps

The chart below shows the potential average annual gaps over ten years. Software Developers are the top occupation of shortage in this field, falling short at least ten skilled workers needed annually (averaged over the next ten years) to meet employer demand. This moderate talent shortage is primarily due to employment growth which is outpacing the growth in supply of trained software professionals in this region. Compared to the prior year, the top occupations of shortage and surplus have not changed from the prior year.

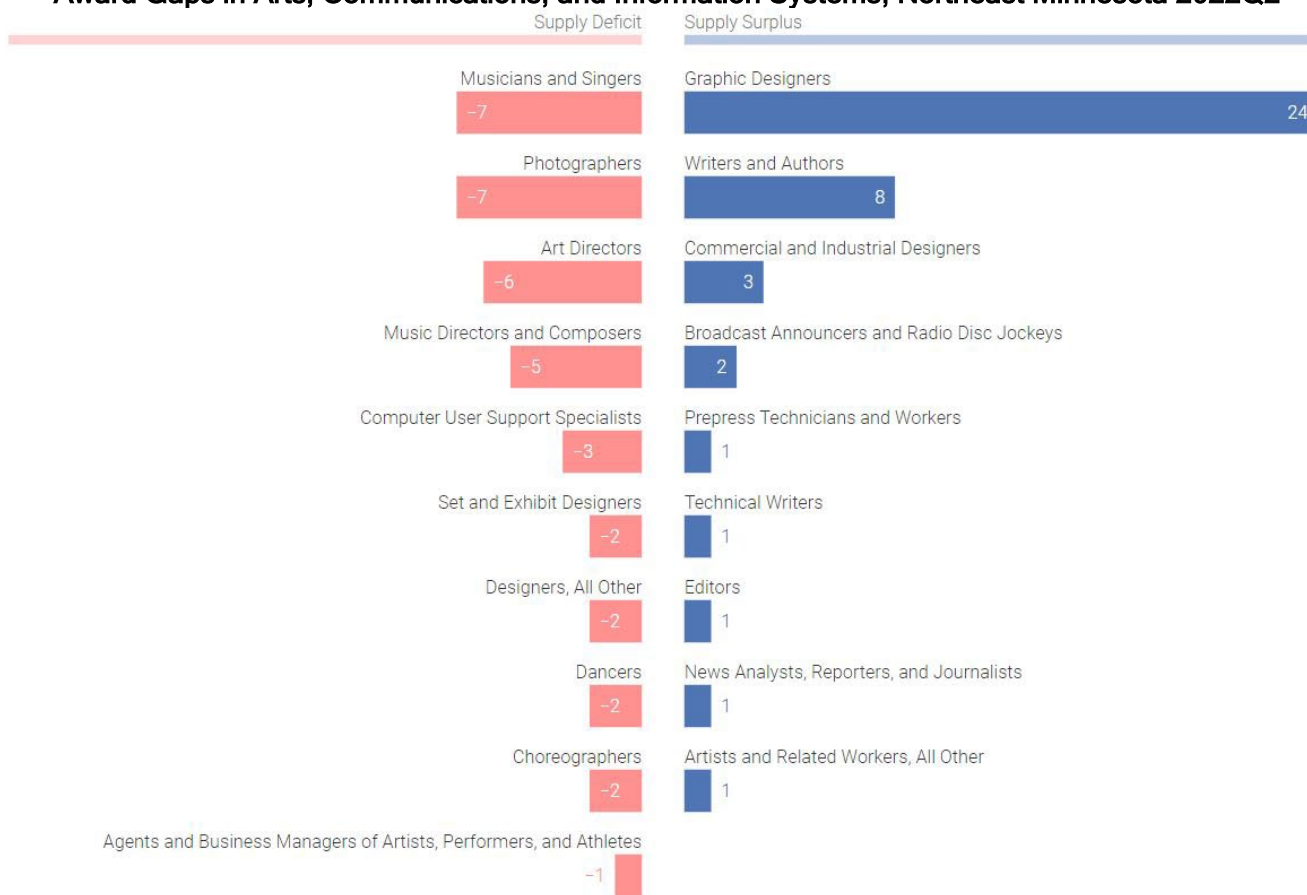
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Arts, Communications. And Information Systems, Northeast Minnesota 2022Q2



Award Gaps

A comparison of the graduate talent pipeline obtaining a certificate or postsecondary degree to the current estimated openings by occupation illuminate a number of regional shortages. The Northeast is underproducing graduates in several Arts, Communications, and Information Systems programs in comparison to national benchmarks, meaning that the region is underproducing local talent in relation to what a typical community with a similar local mix of job opportunities would have. Northeast Minnesota colleges and universities are underproducing trained Photographers, Musicians, Art Directors, and Dancers measured against national benchmarks. Very few Information Technology careers make the list of award gaps or surpluses. Occupations that show higher awards given than what is currently needed in the local talent market are examples of programs that serve other parts of the state where talent demand is high but relevant programs may not exist.

Award Gaps in Arts, Communications, and Information Systems, Northeast Minnesota 2022Q2



Promising Pathways

This section offers an origin-to-gateway-to-target model analysis for how to help move students from entrypoints into their field of interest into both likely and other aligned careers, taking into account automation, remote work, and the changing work environment.

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without four-year degrees. Below are a few Origin Occupations that are likely entrypoints into Arts, Communications, and Information Systems careers locally, or aligned opportunities that share a large number of skillsets in-demand in the field.

Compared to 2021Q1, Photographers joined the ranks of Origin Occupations as wages dropped below the \$42,000 per year threshold for Gateway Occupations.

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$52,500 in the Northeast). Below are a few Gateway Occupations in Arts, Communications, and Information Systems locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences.

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$51,100 in the Northeast). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively. All the top Target Occupations in this field are forecasting occupation gaps over the next five to ten years. As of 2022Q2, Computer Network Support Specialist wages rose considerably, bringing it from the Gateway Occupation category into Target Occupation classification (\$65,800 per year on average).

Origin-to-Gateway-to-Target Occupations for Arts, Communications, and Information Systems, Northeast Minnesota 2022Q2

		Target Occupations (all HW, HD, HS, OG) Software Developers Computer Network Support Specialists Writers & Authors Software Quality Assurance Analysts & Testers Art Directors (AG)
		Gateway Occupations Graphic Designers (HS) Producers & Directors (HS, HD, OG) Editors (HS) Music Directors & Composers (HS, HD, AG) Audio & Video Technicians (HS, HD, OG, AG)
Origin Occupations	Likely Printing Press Operators Photographers (HD, OG, AG) Broadcast Announcers & Radio Disc Jockey (HS) Floral Designers Print Binding & Finishing Workers	Aligned Library Technicians Recreation Attendants Hosts and Hostesses Customer Service Reps Machine Operators

HW = High-Wage; HS=High-Skill; HD=High-Demand; OG=Occupation Gaps; AG=Award Gaps

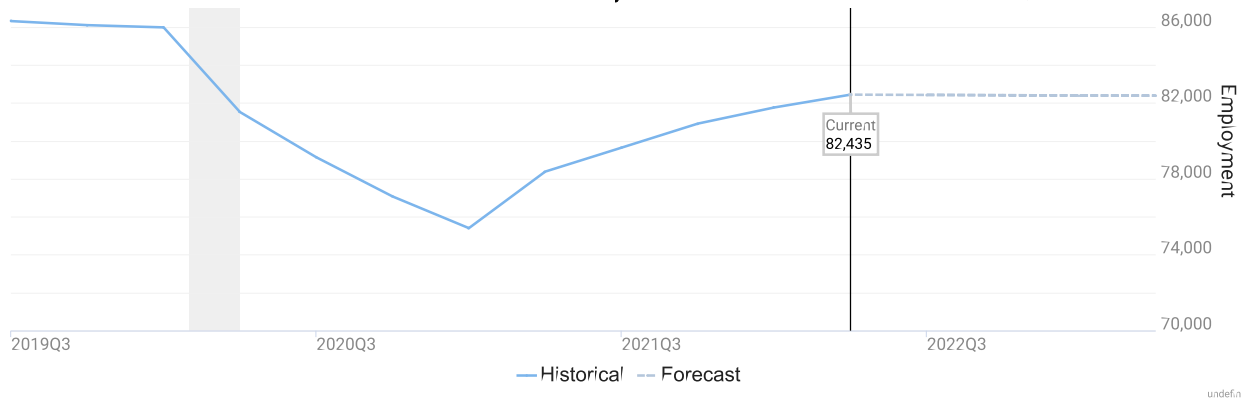
High Location Quotient (LQ) Occupations for Arts, Communications, and Information Systems, Northeast Minnesota 2022Q2

- 1) Broadcast Announcers and Radio Disc Jockeys (1.80)
- 2) Computer Network Support Specialists (1.43)
- 3) Disc Jockeys, Except Radio (1.14)
- 4) Dancers (1.14)
- 5) Choreographers (1.14)

BUSINESS, MANAGEMENT, AND ADMINISTRATION

Business, Management, and Administration is a diverse career field with Hospitality and Tourism, Finance, Administration, Human Resources, and Marketing careers, which all experienced somewhat diverging trends early on in the pandemic and have seen different timing of recovery. Compared to the forecast provided in 2021Q1, the recovery of this field's careers is impressive, rising from 75,259 employed in Business, Management, and Administration careers in the region in 2021Q1 to 82,435 employed in the field in 2022Q2. Over the next three years, Business, Management, and Administration Field employment is forecast to decline by -0.2%, an improvement from the -0.9% forecast one year ago. Most of the recovery over the past 8 months is attributable to the Hospitality and Tourism Cluster careers in this field.

Baseline Worst-Case Scenario 3-Year Forecast for Business, Management, and Administration Careers, Northeast Minnesota 2022Q2



Top Ten Business, Management, and Administration Systems Occupations by Employment Volume in Northeast Minnesota, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Cashiers	5,472	\$26,700	1.31	-215	829	-1.8%
Retail Salespersons	5,452	\$31,700	1.14	-313	670	-1.1%
Fast Food and Counter Workers	3,786	\$25,400	0.95	-142	828	0.9%
Waiters and Waitresses	3,592	\$26,600	1.42	-453	762	1.2%
General and Operations Managers	3,534	\$85,100	0.92	182	296	0.2%
Office Clerks, General	3,189	\$39,800	0.95	-232	320	-1.0%
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2,731	\$33,800	0.97	-184	359	0.0%
Maids and Housekeeping Cleaners	2,496	\$29,200	1.90	-287	346	0.5%
Stockers and Order Fillers	2,496	\$31,700	0.81	69	362	-0.6%
Customer Service Representatives	2,463	\$39,400	0.70	-113	261	-1.4%
Remaining Component Occupations	47,228	\$51,700	1.31	-2,334	5,554	0.0%
Business, Management, & Administration (CTE Field)	82,435	\$45,100	0.97	-4,020	10,584	-0.2%

"Annual Demand" is the projected need for new entrants into an occupation. New entrants are needed due to expected growth and to replace workers who left the occupation due to factors such as retirement or switching careers.

"Forecast Ann Growth" is the expected baseline (most pessimistic) yearly change in employment due to national, long-term trend projections (per the BLS) as well as local factors such as industry mix, labor force participation rates, and population growth (as computed and modeled by RealTime Talent in JobsEQ).

Employment in Business, Management, and Administration careers is spread out across a number of different industries. In the Northeast, the industries with the greatest share of Business, Management, and Administration talent are Restaurants (15.3%, up two percentage points) Traveler Accommodation (6.2%, up 0.7 percentage points), reflecting the importance of the Hospitality and Tourism career cluster in this region. These two industries account for a substantial amount of talent demand over the next ten years (restaurants alone accounts for over half of future positions needing to be filled in this field), but overall both current employment and future growth are relatively spread out over many different industries.

Business, Management, and Administration Field Employment by Industry, 2022Q2, Northeast Minnesota

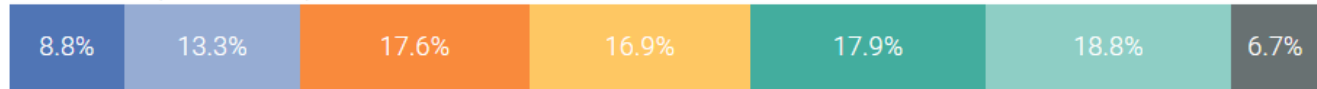
Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Restaurants and Other Eating Places	15.3%	12,610	23,236	1,977	25,213
Traveler Accommodation	6.2%	5,112	7,707	735	8,442
Warehouse Clubs, Supercenters, and Other General Merchandise Retailers	3.6%	2,983	3,992	-447	3,545
Grocery and Convenience Retailers	3.5%	2,854	4,104	-479	3,625
Gasoline Stations	3.3%	2,696	4,206	-349	3,857
General Medical and Surgical Hospitals	3.1%	2,584	2,954	-211	2,743
Executive, Legislative, and Other General Government Support	3.0%	2,437	2,632	-164	2,468
Depository Credit Intermediation	2.6%	2,162	1,832	-319	1,512
Building Material and Supplies Dealers	2.5%	2,073	2,613	-288	2,325
Elementary and Secondary Schools	1.9%	1,594	1,982	-92	1,890
Gambling Industries	1.7%	1,435	2,169	230	2,399
Other Amusement and Recreation Industries	1.7%	1,364	2,432	328	2,760
Agencies, Brokerages, and Other Insurance Related Activities	1.6%	1,309	1,211	-11	1,200
Drinking Places (Alcoholic Beverages)	1.5%	1,219	2,254	401	2,655
Services to Buildings and Dwellings	1.5%	1,216	1,470	-91	1,379
Department Stores	1.4%	1,180	1,574	-199	1,376
Civic and Social Organizations	1.3%	1,033	1,613	324	1,936
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	1.2%	1,014	1,508	124	1,632
Sporting Goods, Hobby, and Musical Instrument Retailers	1.2%	972	1,222	-96	1,126
Nursing Care Facilities (Skilled Nursing Facilities)	1.1%	888	1,144	-114	1,030
All Others	40.9%	33,699	35,190	-1,808	33,382

Career Field Demographics

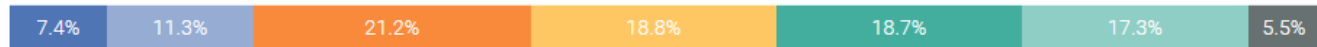
The Business, Management, and Administration field is about 92.7% White, seeing racial diversity increased by an entire percentage point from the prior years' estimates; ethnic diversity remained similar to prior estimates. By gender, the field flipped from being majority male last year to being 55.4% females employed. About 43.4% of workers in Business, Management, and Administration roles are over 45 years old, with the share 65 years or older increasing from 5.9% last year to 6.7% as of the 2016-2020 American Community Survey estimates.

Age :

NHED Region (County-Based)



Minnesota



16 to 19 years (8.8%)

25 to 34 years (17.6%)

45 to 54 years (17.9%)

20 to 24 years (13.3%)

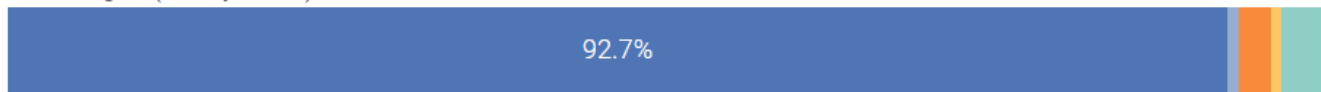
35 to 44 years (16.9%)

55 to 64 years (18.8%)

65 years and over (6.7%)

Race :

NHED Region (County-Based)



Minnesota



White (92.7%)

American Indian (2.4%)

Pacific Islander (0.0%)

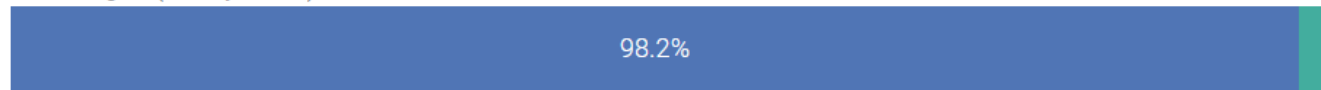
Black (0.9%)

Asian (0.8%)

Two or More Races (3.2%)

Ethnicity :

NHED Region (County-Based)



Minnesota



Non-Hispanic/Latino (98.2%)

Hispanic or Latino (of any race) (1.8%)

Gender :

NHED Region (County-Based)



Minnesota



Male (44.6%)

Female (55.4%)

Educational Attainment and Requirements

The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this career field in aggregate. In general, consistent with data from 2022Q1, the Northeast Minnesota Business, Management, and Administration workforce is more likely to have a two-year degree than what is in demand. While 16.7% of the workforce holds a two-year degree, just 0.2% of the occupations in this field require a two-year degree. Nearly two-thirds of all positions in this field (60.8%) require no degree, no experience, and only short-term on-the-job training. Another 7.7% require experience or some on-the-job training, but still no degree. In contrast, only 4.4% of the

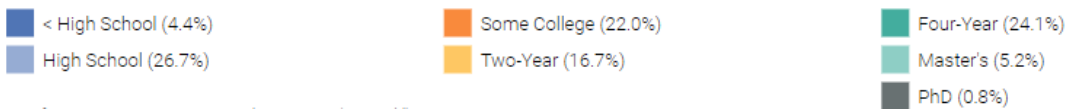
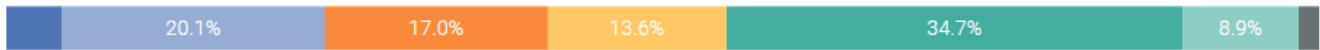
workforce in this field has no degree at all, and 26.7% hold a high school diploma as their highest credential. Overall, the share of local jobs requiring previous work experience but no award, or requiring a Bachelor’s degree both increased by 0.6 and 1.0 percentage points, respectively. The table below indicates typical education and training requirements rather than the mix of attainment of workers in some key positions in this field.

Educational Attainment :

NHED Region (County-Based)



Minnesota

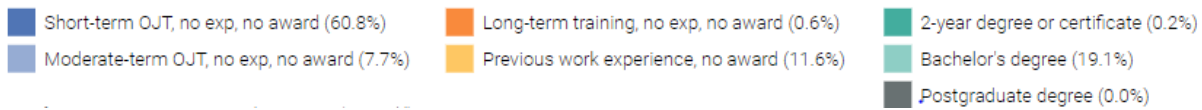


Education and Training Requirements :

NHED Region (County-Based)



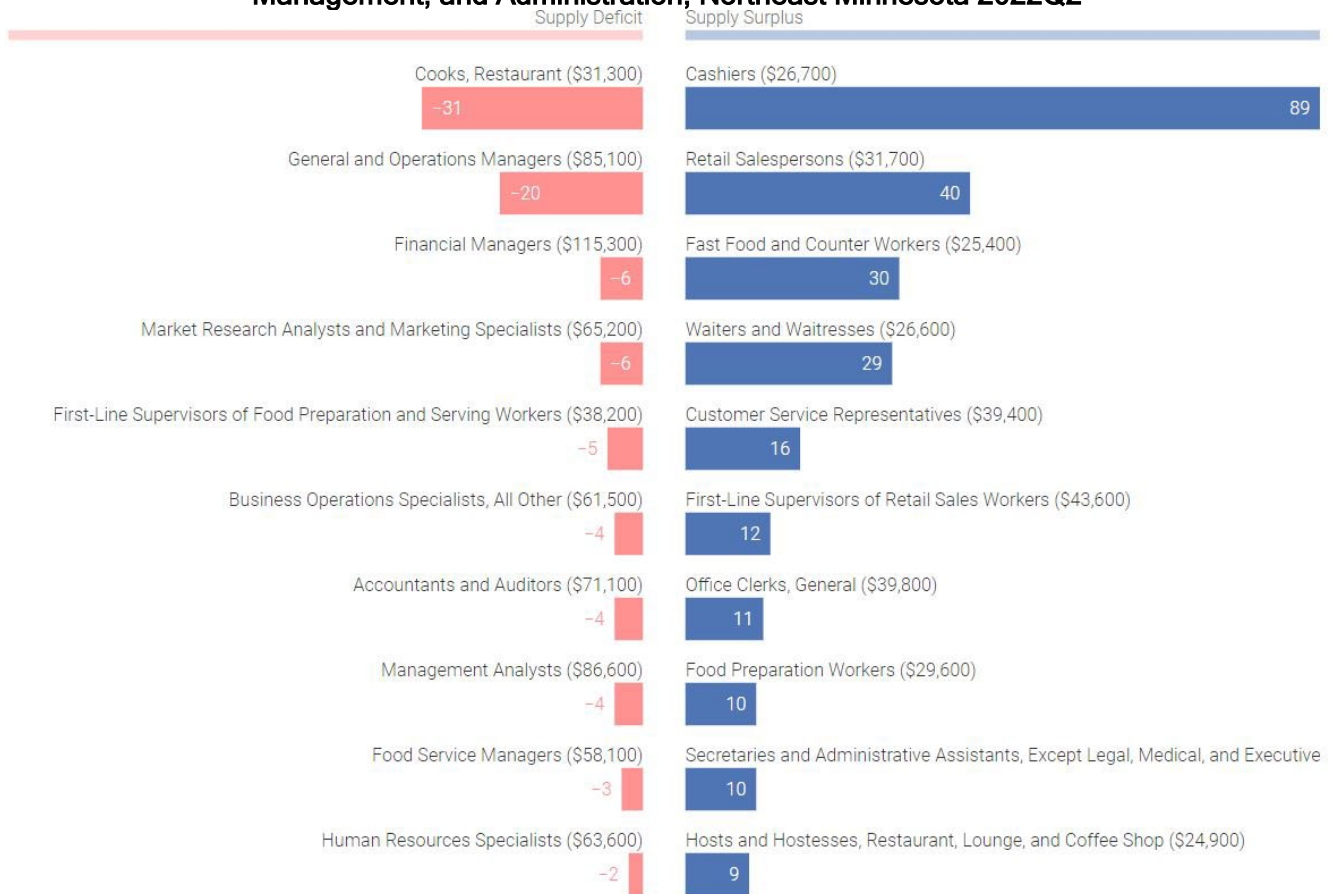
Minnesota



Occupation Gaps

The chart below shows the potential average annual gaps over ten years. A number of management roles indicate significant shortages in the years ahead, with the General and Operations Manager talent pool likely falling short at least 20 skilled workers needed annually (averaged over the next ten years) to meet employer demand—an increase from 13 short estimated the year prior. Hospitality and Tourism cluster careers have rebounded from the pandemic and several are now forecasting talent shortages, with Cooks jumping into first place as of 2022Q2. This critical talent shortage is primarily due to moderate growth and retirements which far outpace demand.

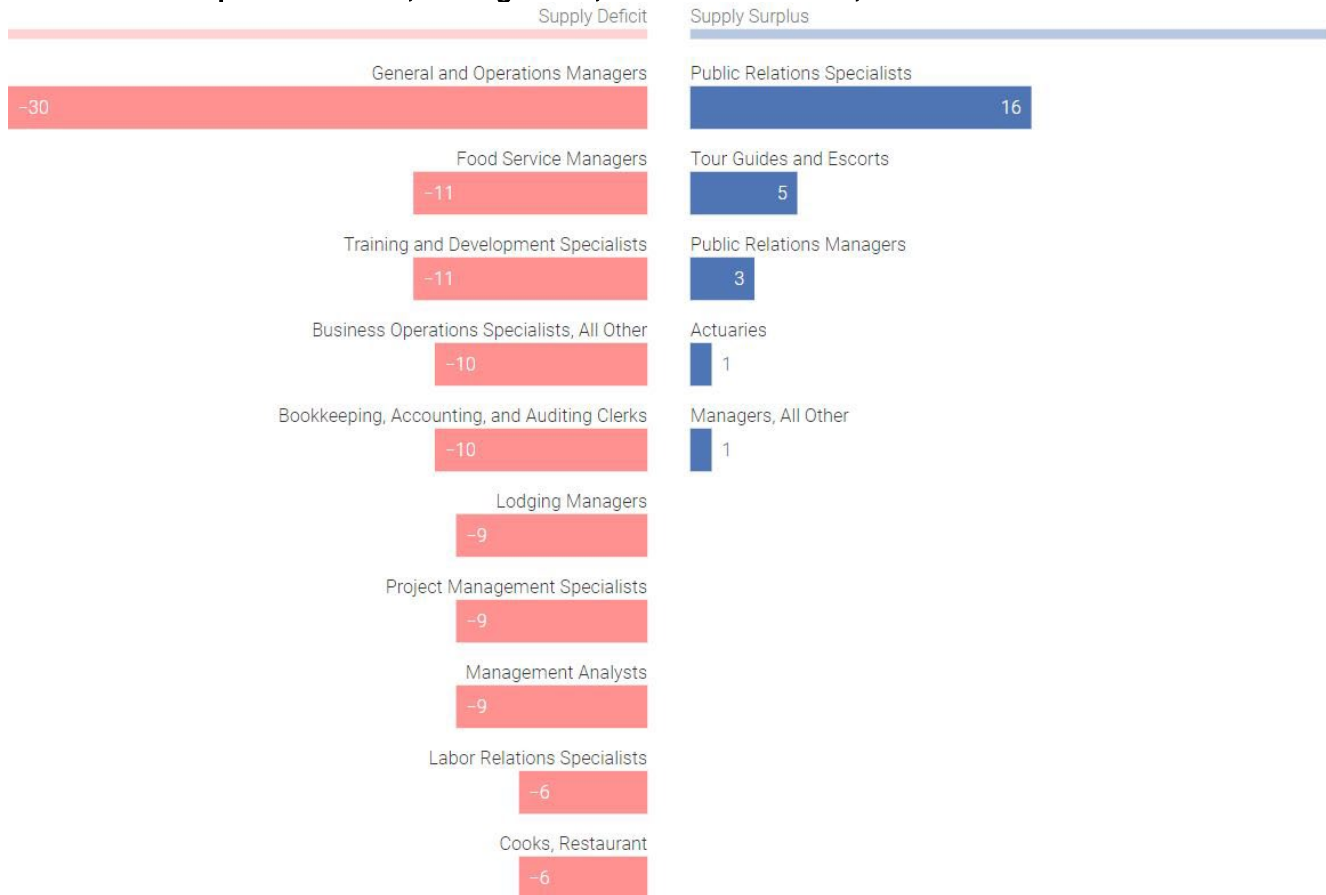
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Business, Management, and Administration, Northeast Minnesota 2022Q2



Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate a few shortfalls in graduate awards needed to meet local demand for credentialed talent. Colleges and universities in the Northeast currently under-train talent in Business, Management, and Administration when compared to national benchmarks. Specifically, regional colleges and universities are underproducing around 24 graduates annually that are needed to fill General and Operations Manager positions open with employers based in the Northeast alone.

Award Gaps in Business, Management, and Administration, Northeast Minnesota 2022Q2



Promising Pathways

This section offers an origin-to-gateway-to-target model analysis for how to help move students from entrypoints into their field of interest into both likely and other aligned careers, taking into account automation, remote work, and the changing work environment.

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without four-year degrees. Below are a few Origin Occupations that are likely entrypoints into Business, Management, and Administration roles locally, or aligned opportunities that share a large number of skillsets in-demand in the field.

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$52,500 in the Northeast). Below are a few Gateway Occupations in Business, Management, and Administration locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences.

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$52,500 in the Northeast). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

Origin-to-Gateway-to-Target Occupations for Business, Management, and Administration, Northeast Minnesota 2022Q2

Target Occupations (all HW, HD, HS)

General & Operations Managers (OG, AG)
 Project Management Specialists (OG, AG)
 Management Analysts (OG, AG)
 Market Research Analysts & Marketing Specialists (OG)
 Financial Managers (OG)

Gateway Occupations

Supervisors of Retail Sales Workers (HD)
 Bookkeeping, Accounting, & Auditing Workers (HS, AG)
 Real Estate Sales Agents (AG)
 Billing & Posting Clerks
 Supervisors of Housekeeping & Janitorial Workers (HD, OG)

Origin Occupations

Likely

Cashiers
 Retail Salespersons (HD)
 Fast Food & Counter Workers (HD)
 Waiters & Waitresses (HD)
 Office Clerks, General

Aligned

Library Technicians
 Eligibility Interviewers
 Childcare Workers

HW = High-Wage; HS=High-Skill; HD=High-Demand; OG=Occupation Gaps; AG=Award Gaps

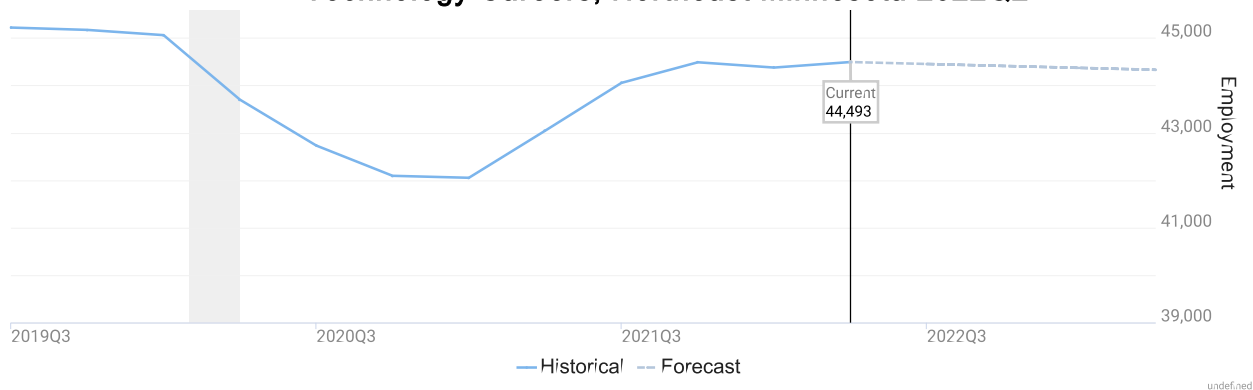
High Location Quotient (LQ) Occupations for Business, Management, and Administration, Northeast Minnesota 2022Q2

- 1) Gambling & Sports Book Writers & Runners (20.63)
- 2) Gambling Service Workers, All Other (17.59)
- 3) Gambling Cage Workers (5.77)
- 4) Supervisors of Gambling Service Workers (4.84)
- 5) Gambling Change Persons & Booth Cashiers (4.60)

ENGINEERING, MANUFACTURING, AND TECHNOLOGY

Engineering, Manufacturing, and Technology is a wide career field with transportation, logistics, STEM, architecture, construction, manufacturing, and machining careers, which all experienced somewhat diverging trends in the early months of the COVID-19 pandemic. Over the next three years, this career field's employment is forecast to decline moderately (-0.4% annually), an improvement on the -0.7% forecast estimated in 2021Q1. Previously, employment sat at 41,613 in this field, which has rebounded to 44,493 as of 2022Q2 in the Northeast. Most of the growth is attributable to maintenance, transportation, construction, and landscaping careers in this field. The forecast for Maintenance and Repair Workers changed most considerably, from -0.3% decline forecast one year ago to 0.3% average annual growth estimated over the coming three years.

Baseline Worst-Case Scenario 3-Year Forecast for Engineering, Manufacturing, and Technology Careers, Northeast Minnesota 2022Q2



Top Ten Engineering, Manufacturing, and Technology Occupations by Employment Volume in the Northeast, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Heavy and Tractor-Trailer Truck Drivers	2,176	\$53,700	0.83	-47	223	-0.5%
Maintenance and Repair Workers, General	2,169	\$47,900	1.14	-128	211	0.3%
Construction Laborers	2,097	\$48,400	1.26	211	203	-0.1%
Laborers and Freight, Stock, and Material Movers, Hand	2,013	\$39,900	0.57	-32	257	-0.2%
Landscaping and Groundskeeping Workers	1,467	\$35,800	1.02	25	195	0.3%
Carpenters	1,431	\$52,100	1.24	-55	118	-0.6%
Operating Engineers and Other Construction Equipment Operators	1,079	\$61,500	2.10	39	109	-0.3%
First-Line Supervisors of Construction Trades and Extraction Workers	1,055	\$81,600	1.12	74	94	-0.3%
Team Assemblers	1,009	\$38,900	0.71	-22	89	-2.1%
Light Truck Drivers	1,002	\$43,800	0.73	23	108	0.0%
Remaining Component Occupations	28,995	\$59,400	1.30	-809	2,677	-0.5%
Engineering, Manufacturing, & Technology (CTE Field)	44,493	\$55,900	0.94	-731	4,294	-0.4%

"Annual Demand" is the projected need for new entrants into an occupation. New entrants are needed due to expected growth and to replace workers who left the occupation due to factors such as retirement or switching careers.

"Forecast Ann Growth" is the expected baseline (most pessimistic) yearly change in employment due to national, long-term trend projections (per the BLS) as well as local factors such as industry mix, labor force participation rates, and population growth (as computed and modeled by RealTime Talent in JobsEQ).

Many different industries employ Engineering, Manufacturing, and Technology talent in the Northeast. Locally, the industries with the greatest share of this field’s talent are Metal Ore Mining (7.8%) and Executive, Legislative, and Other General Government Support (4.6%). Most industries employing talent in this field only touch less than 1% of total talent skilled in this field, suggesting that education and training programs will need to build broad strategies that cross each of these sectors.

Engineering, Manufacturing, and Technology Field Employment by Industry, 2022Q2, Northeast Minnesota

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Metal Ore Mining	7.8%	3,471	3,473	-92	3,381
Executive, Legislative, and Other General Government Support	4.6%	2,028	2,030	-29	2,001
Building Equipment Contractors	4.3%	1,924	1,869	-58	1,811
Residential Building Construction	3.3%	1,461	1,293	-49	1,243
Foundation, Structure, and Building Exterior Contractors	3.0%	1,338	1,241	-65	1,176
Pulp, Paper, and Paperboard Mills	2.9%	1,289	1,226	-219	1,007
Other Specialty Trade Contractors	2.8%	1,258	1,230	-43	1,186
Highway, Street, and Bridge Construction	2.7%	1,195	1,150	-48	1,103
Architectural, Engineering, and Related Services	2.2%	999	771	-87	684
Automotive Repair and Maintenance	2.2%	991	1,012	-43	969
Electric Power Generation, Transmission and Distribution	2.1%	946	740	-223	517
Building Finishing Contractors	2.1%	935	815	-29	786
Utility System Construction	2.1%	926	913	-11	902
Services to Buildings and Dwellings	1.8%	792	952	-28	924
Nonresidential Building Construction	1.6%	722	649	-10	639
General Freight Trucking	1.6%	707	749	-34	715
Couriers and Express Delivery Services	1.6%	704	837	43	880
Aerospace Product and Parts Manufacturing	1.5%	670	574	-81	492
Automobile Dealers	1.4%	627	671	-32	639
Rail Transportation	1.4%	604	537	-27	510
All Others	47.0%	20,905	21,798	-449	21,349

Career Field Demographics

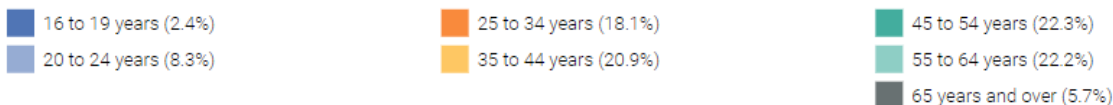
Engineering, Manufacturing, and Technology field is heavily male (85.7%, female representation increased by 0.5 percentage points) and White (93.7%), with the share of talent that is BIPOC by race increasing by 0.9 percentage points, and Hispanic or Latinx by 0.2 percentage points from the prior years’ estimates. Just over 50% of workers in this field are 45 years or older, signaling potential exacerbation of the talent shortage due to impending retirements. The share 55 and older increased by 0.8 percentage points from the prior years’ estimates.

Age :

NHED Region (County-Based)

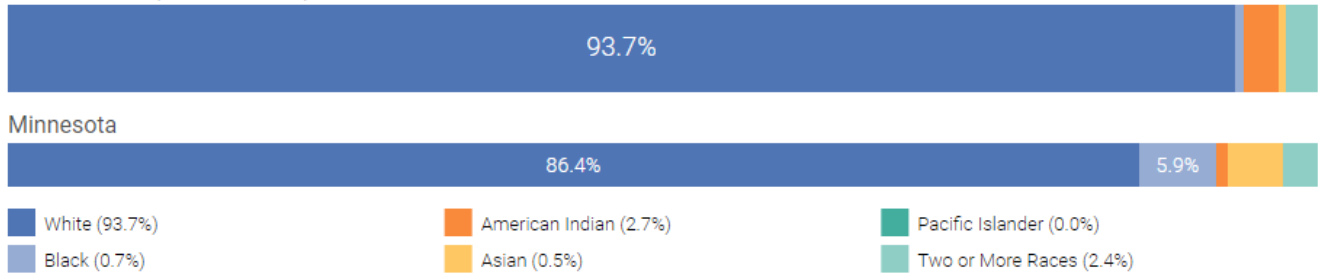


Minnesota



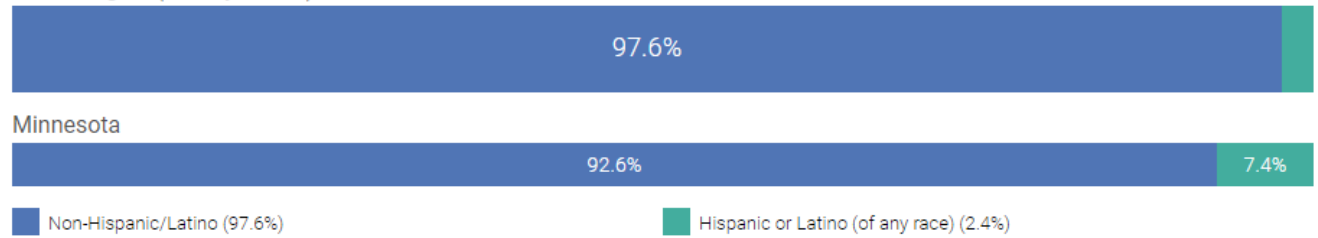
Race :

NHED Region (County-Based)



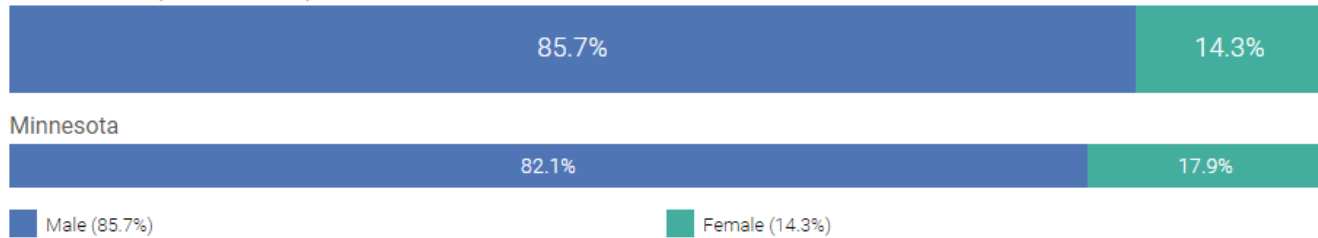
Ethnicity :

NHED Region (County-Based)



Gender :

NHED Region (County-Based)



Educational Attainment and Requirements

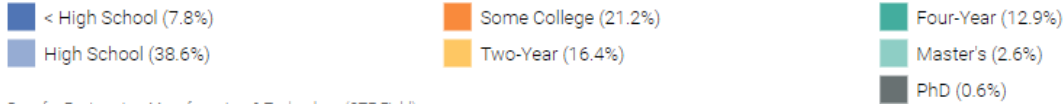
The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this career field in aggregate. In general, the Northeast Minnesota Engineering, Manufacturing, and Technology workforce is well-aligned for the typical credentials of entry-level positions. Just under 1 in 4 of all positions in this field (23.9%) require no degree, no experience, and only short-term on-the-job training. About 54.8% require experience or some on-the-job training, but still no degree (up from 42.2% last year). Almost 1 in 10 of the workforce in this field has no degree at all (7.8%), and just over 1 in 3 (38.6%) hold a high school diploma as their highest credential. In all, 67.5% of the Engineering, Manufacturing, and Technology workforce have not completed a postsecondary credential.

Educational Attainment :

NHED Region (County-Based)



Minnesota

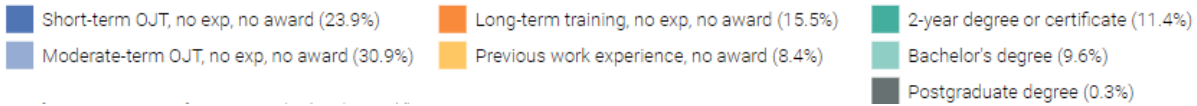


Education and Training Requirements :

NHED Region (County-Based)



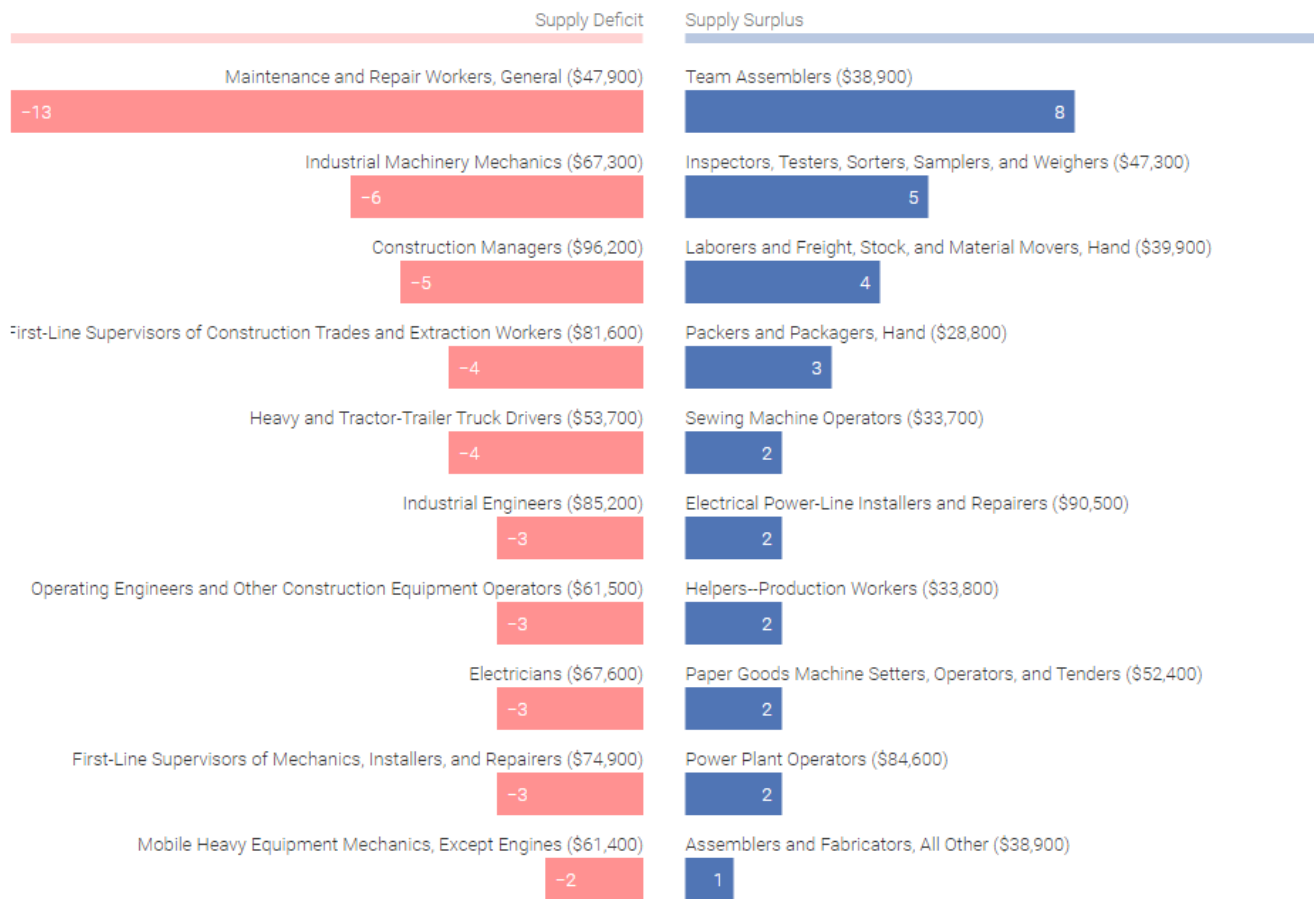
Minnesota



Occupation Gaps

The chart below shows the potential average annual gaps over ten years. A number of management, maintenance, construction, and automotive roles indicate shortages in the years ahead, with the Maintenance and Repair Worker talent pool likely falling short at least 13 skilled workers needed annually (averaged over the next ten years) to meet employer demand (increased from 9 last year). This talent shortage is primarily due to growth in demand and retirements which far outpace the talent pipeline. All other forecasted shortages and talent surpluses are similar to what was observed in 2021Q1.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Engineering, Manufacturing, and Technology, Northeast Minnesota 2022Q2

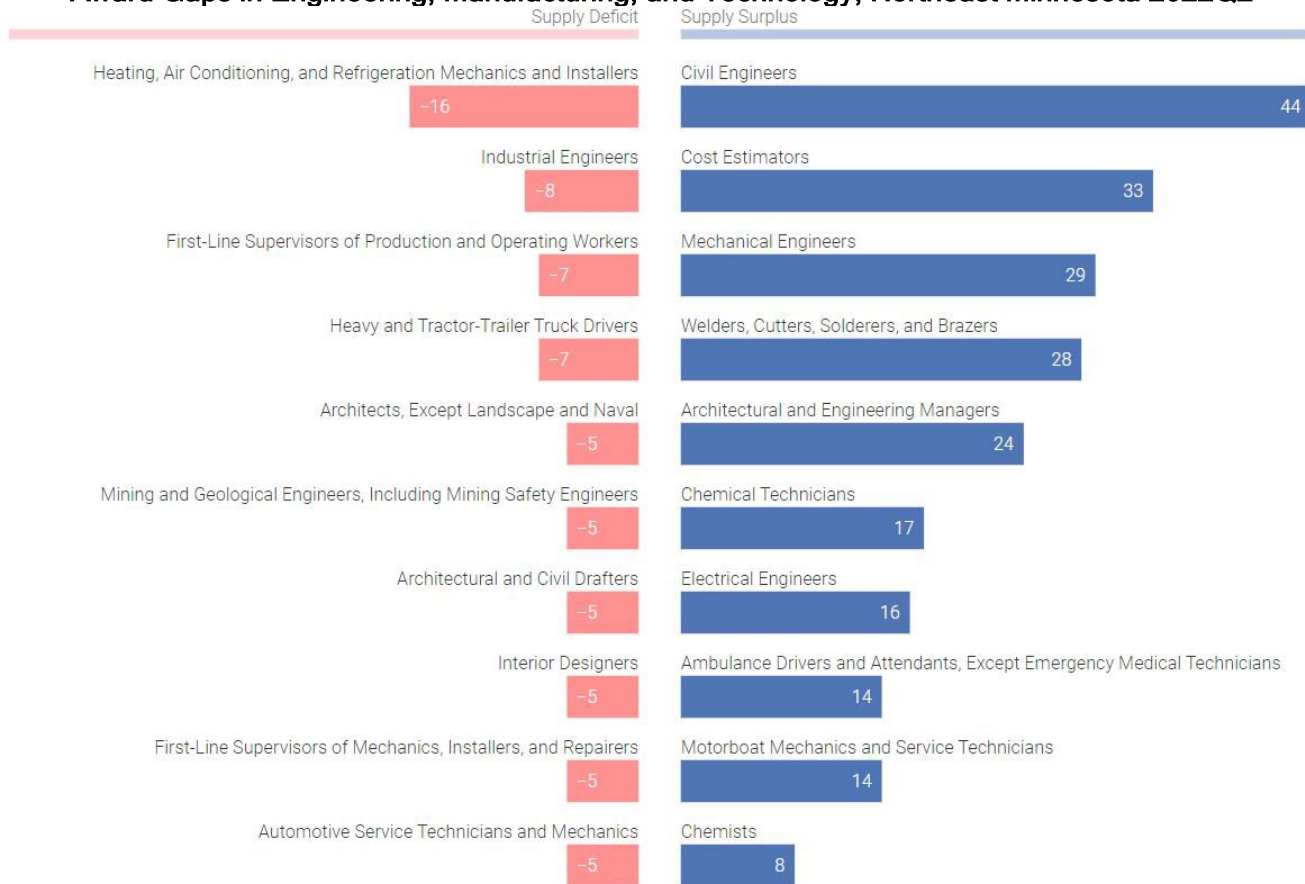


Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate a number of important shortages. The Northeast currently under-trains some talent in Engineering, Manufacturing, and Technology when compared to national benchmarks. Award gaps for HVAC Technicians, Industrial Engineers, and Supervisors of Production and Operating Workers increased from the prior year.

Northeast Minnesota colleges and universities are underproducing around 16 graduates annually that are needed to fill HVAC Mechanic positions open with employers based in this region alone. Second, there are at least 8 fewer Industrial Engineers graduating locally annually than what employers currently need to support demand. Automotive Technician graduate talent gap improved slightly, but was still in the top ten of graduate talent gaps regionally.

Award Gaps in Engineering, Manufacturing, and Technology, Northeast Minnesota 2022Q2



Promising Pathways

This section offers an origin-to-gateway-to-target model analysis for how to help move students from entrypoints into their field of interest into both likely and other aligned careers, taking into account automation, remote work, and the changing work environment.

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without four-year degrees. Below are a few Origin Occupations that are likely entrypoints into Engineering, Manufacturing, and Technology roles locally, or aligned opportunities that share a large number of skillsets in-demand in the field.

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$52,500 in the Northeast). Below are a few Gateway Occupations in Engineering, Manufacturing, and Technology locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences. Out of all three categories, the Engineering, Manufacturing and Technology Field has the most different occupations at the Gateway level. Light Truck Drivers increased in wages to \$43,800 this year, bringing the role up from being an Origin Occupation to being a Gateway Occupation.

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$52,500 in the Northeast). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations

are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

Origin-to-Gateway-to-Target Occupations for Engineering, Manufacturing, and Technology, Northeast Minnesota 2022Q2

		Target Occupations (all HW, HD, HS) Heavy & Tractor Trailer Truck Drivers (OG, AG) Construction Managers (OG, AG) Industrial Engineers (OG, AG) Chemical Technicians Logisticians (OG, AG)
		Gateway Occupations Maintenance & Repair Workers, General (HD, OG, AG) Construction Laborers Carpenters (OG) Light Truck Drivers (HD, AG) Highway Maintenance Workers (OG) Automotive Service Technicians & Mechanics (HS, AG)
Origin Occupations	Likely	Aligned
	Laborers & Freight, Stock Movers	Parking Lot Attendants
	Landscaping & Groundskeeping Workers (HD)	Retail Sales Workers
	Team Assemblers	Stockers & Order Fillers
	School Bus Drivers (HD, AG)	Janitors & Cleaners
	Cleaners of Vehicles & Equipment	Personal Services Managers

HW = High-Wage; HS=High-Skill; HD=High-Demand; OG=Occupation Gaps; AG=Award Gaps

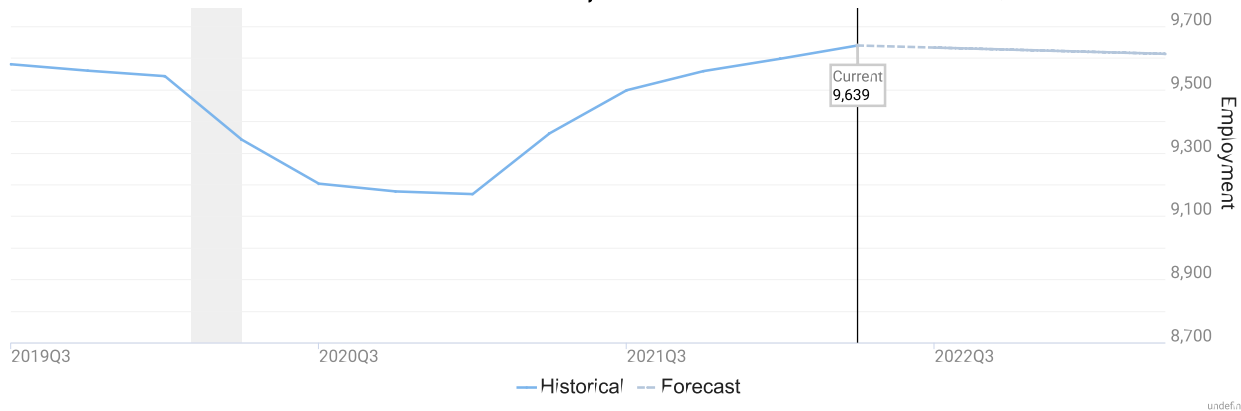
High Location Quotient (LQ) Occupations for Engineering, Manufacturing, and Technology, Northeast Minnesota 2022Q2

- 1) Underground Mining Machine Operators, All Other (48.76)
- 2) Loading and Moving Machine Operators, Underground Mining (10.79)
- 3) Mining and Geological Engineers, Including Mining Safety Engineers (9.31)
- 4) Extraction Workers, All Other (8.70)
- 5) Continuous Mining Machine Operators (8.26)

AGRICULTURE, FOOD, AND NATURAL RESOURCES

There are eight career pathways within Agriculture, Food, and Natural Resources: 1) Food Products and Processing Systems, 2) Plant Systems, 3) Animal Systems, 4) Natural Resources Systems, 5) Agribusiness Systems, 6) Environmental Services Systems, 7) Power, Structural and Technical Systems, and 8) Biotechnology Systems. These roles represent positions that are at least 50% or more concentrated in Agriculture, Food, and Natural Resources industries, and as such exclude some occupations that are critical to the industry but may have smaller in-industry employment numbers (such as Ag Loan Officers, Ag Financing, or some trades). Over the next three years, this career field's employment is forecast to decline by about -0.3% in the Northeast, an improvement from last year's estimated -0.7% rate.

Baseline Worst-Case Scenario 3-Year Forecast for Agriculture, Food, and Natural Resources Careers, Northeast Minnesota 2022Q2



Top Ten Agriculture, Food, and Natural Resources Occupations by Employment Volume in the Northeast, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Landscaping and Groundskeeping Workers	1,467	\$35,800	1.02	25	195	0.3%
Farmers, Ranchers, and Other Agricultural Managers	987	\$64,200	1.03	-23	81	-1.1%
Plumbers, Pipefitters, and Steamfitters	602	\$69,200	1.02	54	57	-0.4%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	354	\$61,800	0.72	36	31	-0.5%
Animal Caretakers	309	\$28,900	0.76	26	55	2.1%
Refuse and Recyclable Material Collectors	242	\$44,000	1.36	10	33	0.3%
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	240	\$52,500	0.97	2	24	-0.1%
Logging Equipment Operators	233	\$43,900	6.17	-19	33	-0.6%
Veterinary Technologists and Technicians	230	\$35,800	1.53	36	18	0.5%
Electrical Power-Line Installers and Repairers	230	\$90,500	1.46	-29	13	-2.4%
Remaining Component Occupations	4,741	\$59,200	1.27	-72	482	-0.5%
Agriculture, Food, and Natural Resources	9,639	\$55,200	0.94	48	1,023	-0.3%

"Annual Demand" is the projected need for new entrants into an occupation. New entrants are needed due to expected growth and to replace workers who left the occupation due to factors such as retirement or switching careers.

"Forecast Ann Growth" is the expected baseline (most pessimistic) yearly change in employment due to national, long-term trend projections (per the BLS) as well as local factors such as industry mix, labor force participation rates, and population growth (as computed and modeled by RealTime Talent in JobsEQ).

Many different industries employ Agriculture, Food, and Natural Resources talent in the Northeast. Locally, the industries with the greatest share of this field's talent are Services to Buildings and Dwellings (7.9%) and Executive, Legislative, and other General Government Support (7.6%). Most industries employing talent in this field only touch less than 3% of total talent skilled in this field, and span from animal production companies to logging and electric power generation.

Agriculture, Food, and Natural Resources Field Employment by Industry, 2022Q2, Northeast Minnesota

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Services to Buildings and Dwellings	7.9%	758	929	-26	904
Building Equipment Contractors	7.6%	734	717	-25	692
Executive, Legislative, and Other General Government Support	7.6%	729	765	-11	753
Animal Production (Proprietors)	6.1%	587	545	-63	482
Metal Ore Mining	5.4%	523	493	-14	479
Other Professional, Scientific, and Technical Services	4.9%	473	422	27	449
Electric Power Generation, Transmission and Distribution	4.8%	460	368	-116	252
Crop Production (Proprietors)	4.7%	454	456	-48	408
Logging	4.0%	382	522	-31	491
Other Amusement and Recreation Industries	3.5%	334	455	62	518
Grocery and Convenience Retailers	2.4%	231	254	-38	216
Other Personal Services	2.1%	207	318	58	375
Architectural, Engineering, and Related Services	2.1%	203	184	-21	162
Colleges, Universities, and Professional Schools	1.6%	155	158	-5	153
Restaurants and Other Eating Places	1.6%	150	212	31	243
Wired and Wireless Telecommunications (except Satellite)	1.5%	148	152	-20	132
Waste Collection	1.4%	132	178	8	186
Traveler Accommodation	1.2%	115	157	23	180
Administration of Environmental Quality Programs	1.2%	112	109	-12	97
General Medical and Surgical Hospitals	1.0%	100	108	-3	105
All Others	27.5%	2,652	3,023	-37	2,986

Career Field Demographics

Between the 2015-2019 and 2016-2020 American Community Survey estimates of employment demographics in Agriculture, Food, and Natural Resources roles, female employment has seen significant gains: 1.4 percentage point increase in field employment (23.5% of all employment in Agriculture, Food, and Natural Resources). Overall, the Agriculture, Food, and Natural Resources field is predominantly male (76.5%, reduced by 1.4 percentage points) and White (94.1%, increasing by 0.6 percentage points), but with variation by career pathway. Overall, the age of the workforce in this field is distributed evenly from 25 through 64 years, but key career pathways in Animal Systems and Food Products and Processing Systems in particular have a rapidly aging workforce with limited new talent entering. However, the share of the field's talent that is 65 years or older increased by one percentage point from the prior years' estimates, indicating the urgency for increasing talent attraction into this field to address likelihood of high rates of retirement.

Age :

NHED Region (County-Based)



Minnesota



16 to 19 years (3.1%)

25 to 34 years (18.1%)

45 to 54 years (19.3%)

20 to 24 years (8.8%)

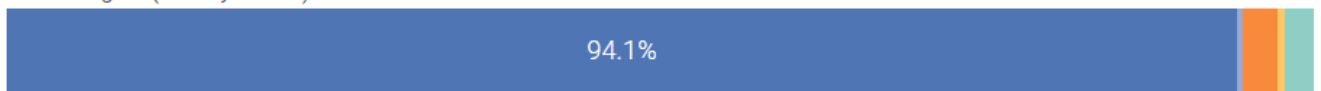
35 to 44 years (20.0%)

55 to 64 years (21.3%)

65 years and over (9.4%)

Race :

NHED Region (County-Based)



Minnesota



White (94.1%)

American Indian (2.6%)

Pacific Islander (0.0%)

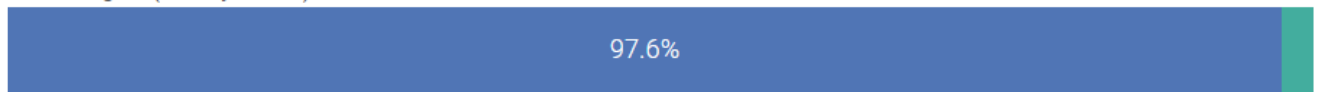
Black (0.4%)

Asian (0.6%)

Two or More Races (2.3%)

Ethnicity :

NHED Region (County-Based)



Minnesota

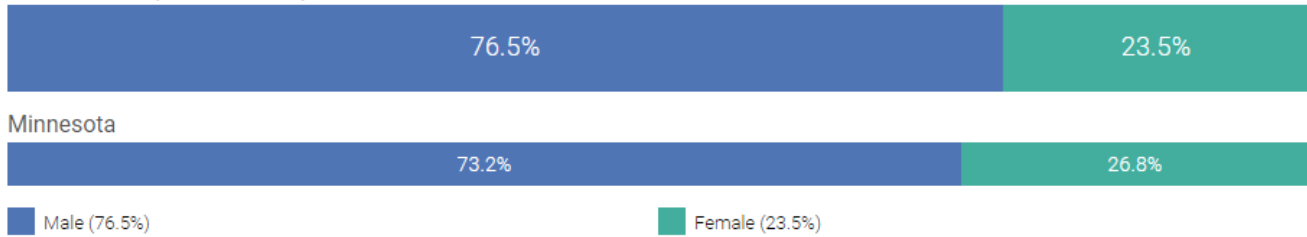


Non-Hispanic/Latino (97.6%)

Hispanic or Latino (of any race) (2.4%)

Gender :

NHED Region (County-Based)

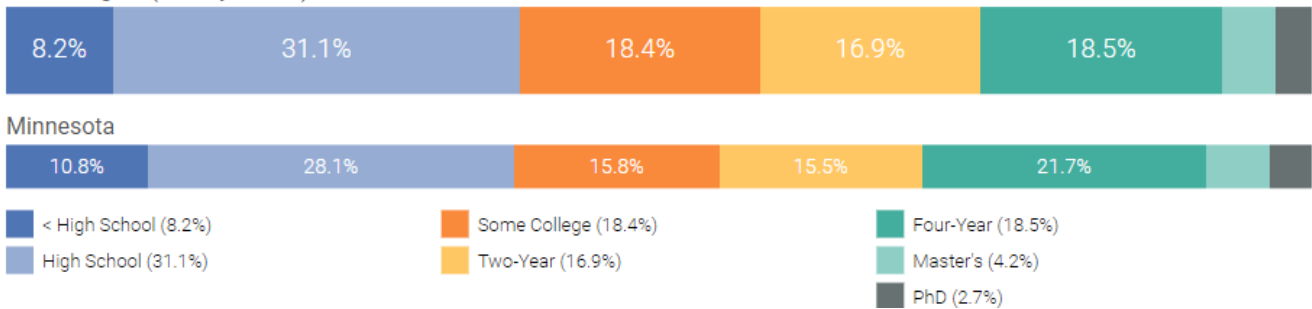


Educational Attainment and Requirements

The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in the career field in aggregate. In general, Northeast Minnesota’s Agriculture, Food, and Natural Resources workforce remains well-aligned for the typical credentials of entry-level positions. Just over 1 in 4 of all positions in this field regionally (26.3%) require no degree, no experience, and only short-term on-the-job training. Almost half (47.3%) now require experience or some on-the-job training, but still no degree (up from about 1 in 3 in last year’s estimates). About 8.2% of the workforce in this field has no degree at all, and about 1 in 3 (31.1%) hold a high school diploma as their highest credential, plus an additional 18.4% with some college experience. In all, 57.7% of the regional Agriculture, Food, and Natural Resources workforce have not completed a postsecondary credential. Compared to one year ago, the share of regional opportunities in this field that only require short-term on-the-job training and no experience saw the largest gains, representing 26.3% of all opportunities as of 2016-2020 estimates compared to 22.1% in the prior years’ estimates.

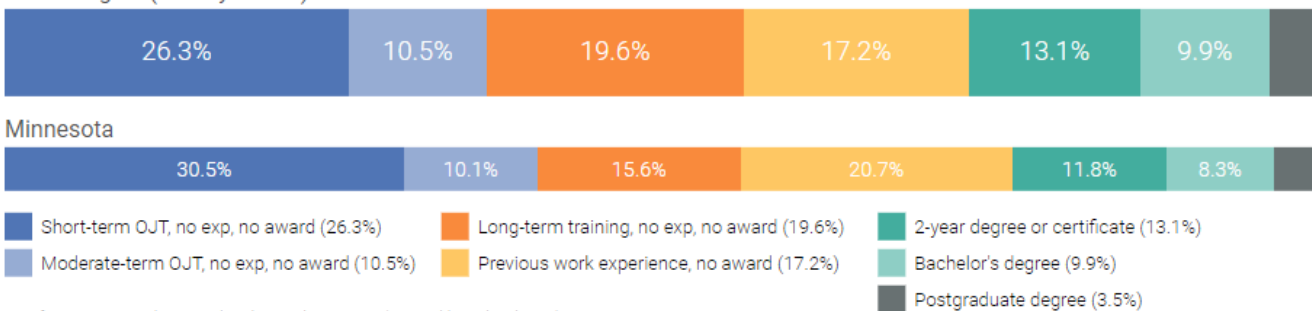
Educational Attainment :

NHED Region (County-Based)



Education and Training Requirements :

NHED Region (County-Based)

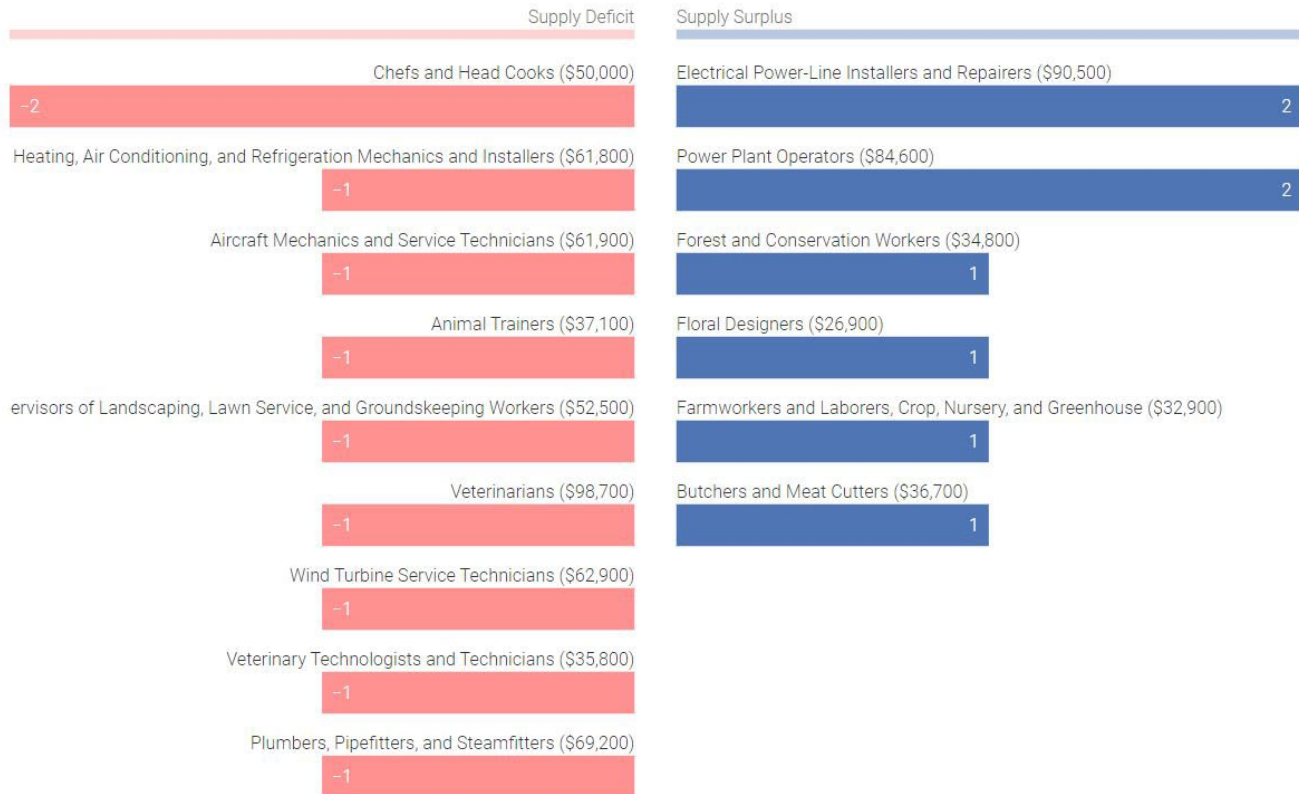


Occupation Gaps

The chart below shows the potential average annual gaps over ten years in a conservative estimate of talent shortfall. A number of crucial trades, veterinary, environmental services, and natural sciences roles indicate shortages in the years ahead, matching with statewide shortages. Retirements and

growing demand unmet by the local talent supply chain are both contributing factors. While forecasted growth remains small, there is continued demand for replacement talent to fill job openings that will be challenging to meet with the supply of local talent currently available.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Agriculture, Food, and Natural Resources, Northeast Minnesota 2022Q2



Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate a number of moderate shortages. Postsecondary institutions in the Northeast currently under-train some talent in Agriculture, Food, and Natural Resources when compared to national benchmarks. Northeast Minnesota colleges and universities are underproducing at least 16 graduates annually that are needed to fill HVAC Technician positions open with employers based in the Northeast. A number of veterinary support roles are also lagging in local graduate awards, as the majority of Animal Systems completions are made in the MSP Metro. Farmers, Ranchers, and Agricultural Managers dropped out of the top ten list (ranked first last year as highest shortage), while HVAC Technicians jumped into first place followed by Mining and Geological Engineers, Veterinarians, and Environmental Engineers for top regional shortages of graduate awards.

Award Gaps in Agriculture, Food, and Natural Resources, Northeast Minnesota 2022Q2



Promising Pathways

This section offers an origin-to-gateway-to-target model analysis for how to help move students from entrypoints into their field of interest into both likely and other aligned careers, taking into account automation, remote work, and the changing work environment.

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without four-year degrees. Below are a few Origin Occupations that are likely entrypoints into Agriculture, Food, and Natural Resources roles locally, or aligned opportunities that share a large number of skillsets in-demand in the field.

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$52,500 in the Northeast). Below are a few Gateway Occupations in Agriculture, Food, and Natural Resources locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences.

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$52,500 in the Northeast). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

Origin-to-Gateway-to-Target Occupations for Agriculture, Food, and Natural Resources, Northeast Minnesota 2022Q2

Target Occupations (all HW, HD, HS)

Chemical Technicians
 Veterinarians (OG, AG)
 Biological Science Teachers, Postsecondary (OG)
 Life, Physical, & Social Science Technicians
 Biochemists & Biophysicists

Gateway Occupations

Refuse & Recyclable Material Collectors (HD)
 Logging Equipment Operators (HD)
 Chefs & Head Cooks (HD, AG)
 Tree Trimmers & Pruners
 Forest & Conservation Technicians (HS, HD)

Origin Occupations

Likely

Landscaping & Groundskeeping Workers (HD)
 Animal Caretakers (HD)
 Veterinary Techs (HS, HD, OG)
 Bakers (HD)
 Farmworkers & Laborers, Crop, Nursery, & Greenhouse (HD)

Aligned

Compliance Officers
 Laborers & Freight Movers
 Stockers & Order Fillers
 Cooks

HW = High-Wage; HS=High-Skill; HD=High-Demand; OG=Occupation Gaps; AG=Award Gaps

High Location Quotient (LQ) Occupations for Agriculture, Food, and Natural Resources, Northeast Minnesota 2022Q2

- 1) Mining and Geological Engineers, Including Mining Safety Engineers (9.31)
- 2) Logging Equipment Operators (6.17)
- 3) Logging Workers, All Other (5.97)
- 4) Fallers (5.44)
- 5) Foresters (4.45)

Conclusion

Some noticeable shifts have occurred in the talent landscape, with employers continuing to recruit heavily over the past twelve months. Some new occupations of need have emerged, signaling some rebounding of the Hospitality and Tourism industry, and reflecting the tight labor market across all levels of experience and education requirements, and through each industry sector. What continues to be true is that the most in-demand occupations of the future typically require a two-year degree or higher, offer high average wages, and will likely experience talent shortages within the next three years and beyond due to low qualified talent pool located within the region.

As the talent pool has tightened, Minnesota employers are struggling to find talent for Origin, Gateway, and Target roles across the spectrum, but with Gateway occupations posing the greatest opportunities for skills-based hiring innovations and workforce system strategies. Overall, digital skills, human skills, and business enablers will be the foundational skills of the future both in Minnesota and nationwide. Remote work opportunities are proving to be a more permanent change to the landscape of work in Minnesota.

The region is poised to see changes in demand for talent over the next five years and beyond as the region continues to recover from the impacts of the pandemic, wrestle with deepening talent shortages, and face the possibility of recession as interest rates continue to rise. Unemployment has dropped while employer demand for talent remains high in the Northeast. There is urgency to address these talent shortages now by leveraging new ways of working remotely and leveraging new technologies wherever possible.