2024 Regional Career Trends

For Career and Technical Education
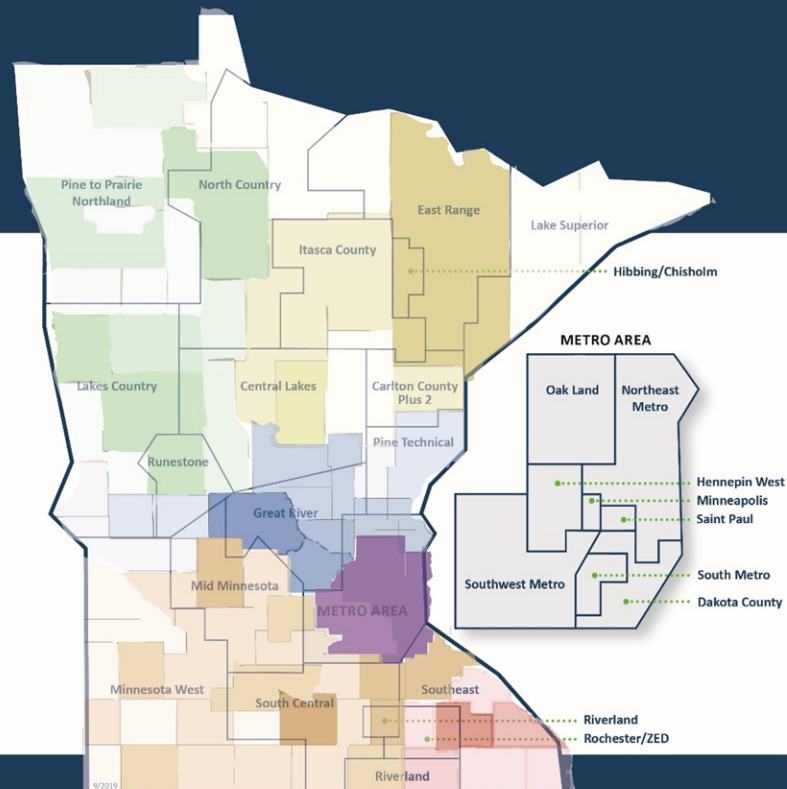
RealTime Talent

Northeast

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Overview

Minnesota's workforce landscape is undergoing a dramatic transformation, shaped by a confluence of demographic shifts, technological advancements, and evolving economic needs. As Baby Boomers retire and younger generations enter the labor market, employers are facing an urgent demand for skilled workers across industries ranging from healthcare and manufacturing to tech and green energy. At the same time, the rise of automation and remote work is redefining traditional job roles, prompting businesses to rethink recruitment strategies and workforce development. In this dynamic environment, Minnesota must navigate the challenges of upskilling its existing workforce, ensuring young people have access to well-paying local careers, and attracting new talent to ensure long-term economic growth and resilience.

The local job market remains strong in Minnesota, with a variety of high-quality career opportunities available in every career field. As of October 2024, Minnesota's unemployment rate remained at 3.4% for the fourth consecutive month, with labor force participation also holding steady at 67.7%. The state continues to have more available jobs than jobseekers—about 75 jobseekers for every 100 jobs. Although the job market has changed dramatically since 2018 or 2020, Minnesota is still experiencing significant talent shortages plaguing every industry and career cluster.

This report details the current workforce landscape of Minnesota and the regional nuances of talent demand by career field. The content is intended 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.[1] Each report includes:

- Regional economic and demographic overview
- Career field analysis including regional importance of each sector, key labor market statistics, and forecasting for future demand and talent shortages in the six career fields:
  - Health Science Technology
  - Human Services
  - Arts, Communications, and Information Systems
  - Business, Management, and Administration
  - Engineering, Manufacturing, and Technology
  - Agriculture, Food, and Natural Resources
- An Origin-to-Gateway-to-Target model analysis for how to help move students from entry points into their field of interest into other aligned careers

About This Report

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[1] All labor market data in this report comes from Chmura Economics JobsEQ Dataset 2024Q1 unless otherwise noted. www.jobseq.com

Table of Contents

Northeast Minnesota

Introduction

This report examines the current and future talent needs across the ten counties of Northeast Minnesota.[2] Beginning with an analysis of local demographics, unique opportunities, and the key industries driving the regional economy, this macroeconomic overview is designed to help educators and administrators align educational programs with the evolving needs of local businesses. By grouping regional careers by wage, skill requirements, and demand, the report aims to guide the education community in anticipating future workforce demands and ensuring that curricula are tailored to prepare students for relevant career opportunities in the region.

This series has been developed in partnership with Minnesota State through the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) annually since 2020. The 2024 iteration of this report has shifted from a definition of "high-wage" aligned to average (mean) wages to one which more closely aligns to Minnesota's official definition, "occupations that have an annual median salary higher than the area's composite median salary of all occupations." For more information on this and other Career and Technical Education (CTE) definitions, please refer to Minnesota's Perkins Glossary.[3]

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, and illustrates promising likely and aligned pathways into each career field. This model supports students looking for entry points from an initial occupation of interest into other aligned careers, considering automation, remote work, and the changing work environment. The model 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 median)
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 ($45,000 – regional median)
Low-middle skills (HS diploma, some OJT)
Sufficient demand (3-5% unemployment and/or high volumes of current opportunities)

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[2] Aitkin, Carlton, Cass, Cook, Crow Wing, Itasca, Koochiching, Lake, Lake of the Woods, and St. Louis Counties.
[3] Perkins Glossary. Section 14. Accessed November 30, 2024 at https://www.minnstate.edu/system/cte/operational-guide/section-14-glossary.html

Origin Occupations
Low wage (<$45,000/year)
Low skill (no credential)
Varied demand (may have over 5% unemployment, low growth, low replacement demand, and/or low job postings)

Origin Occupations are roles that are low-wage (<$45,000 median annual wages), typically do not require a postsecondary credential, and may or may not be in high demand.

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between $45,000 up to the regional median wage ($49,600 in the Northeast). 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 median wage ($49,600 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.

Community Profile
Demographics

POPULATION

- Total population in Northeast Minnesota: 426,627
    - Change from prior year: + 1,300 people
    - Share of Minnesota's total population who live in the Northeast: 7.5%
- Largest local concentrations of population: cities of Duluth, Brainerd, Grand Rapids, Hibbing, and Virginia
- Most populous county: St. Louis County (46.9% of the region's population)
- Median age: 44.2 years
    - Comparison to statewide median (38.5 years): 5.7 years older, mostly attributable to a larger share of adults over 55 years of age in the region
    - Minors under 18 years of age are 19.5% of Northeast Minnesota's population

Resident Population of Northeast Minnesota
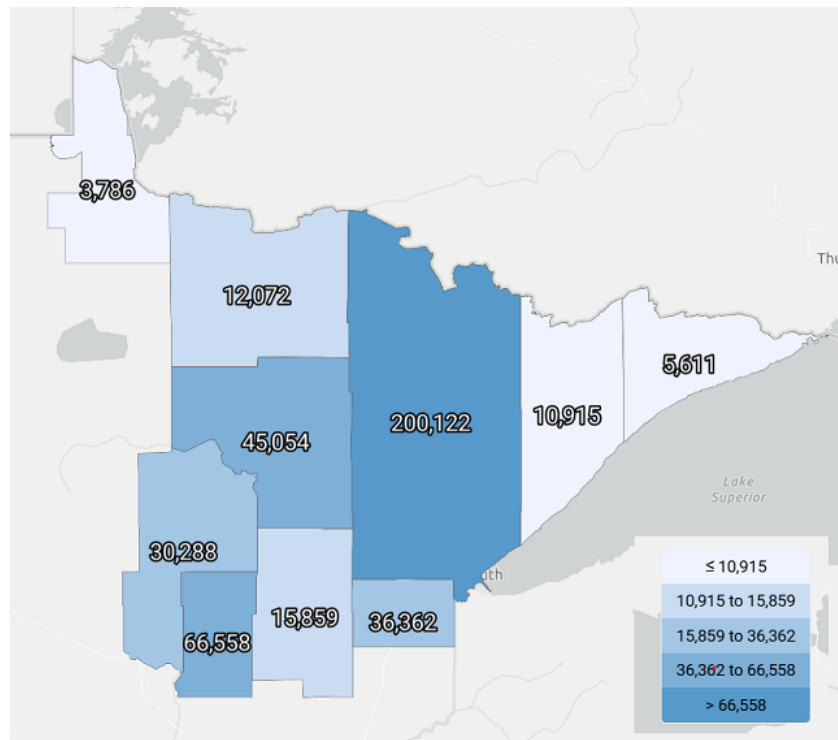
American Community Survey 2018-2022.

RACE AND ETHNICITY

Northeast Minnesota is home to residents of many racial and ethnic backgrounds, though 90.7% of residents are white.

- 9.3% of residents are Black, Asian, American Indian, Native Hawaiian, two or more race(s), or some other race other than white (BIPOC), while 1.8% are of Hispanic/Latine ethnicity
- The Northeast region has a 10% higher share of white residents than the state as a whole

- Northeast Minnesota has a higher share of American Indian residents than many other regions, with 10,679 American Indian residents, or 2.5% of the population
  - Brainerd has a higher share of American Indian residents than other cities in the Northeast region, at 3.4%
- Diversity in the Northeast region is increasing, but more slowly than it is increasing statewide

Race and Ethnicity Summary Info

Geography	% BIPOC by Race	% white by Race	% Hispanic/ Latine Ethnicity
Duluth	9.3%	90.7%	1.9%
Brainerd	9.5%	90.5%	1.9%
Grand Rapids	10.3%	89.7%	1.7%
Northeast	**9.3%**	**90.7%**	**1.8%**
Minnesota	**20.3%**	**79.7%**	**5.7%**

American Community Survey 2018-2022
BIPOC residents are those who identify as Black, Asian, American Indian, Native Hawaiian, two or more races, or some other race other than white
Hispanic/Latine ethnicity is reported separately from race in the American Community Survey

Population Race of BIPOC Residents, All Ages
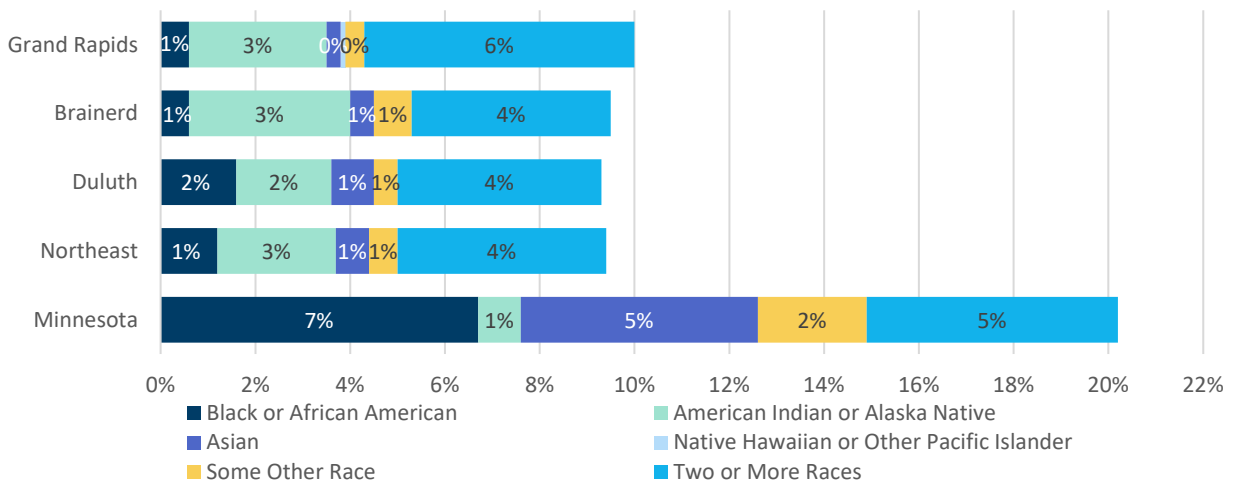
American Community Survey 2018-2022.

Population Hispanic/Latine Ethnicity, All Ages

American Community Survey 2018-2022.

Detailed Community Demographics

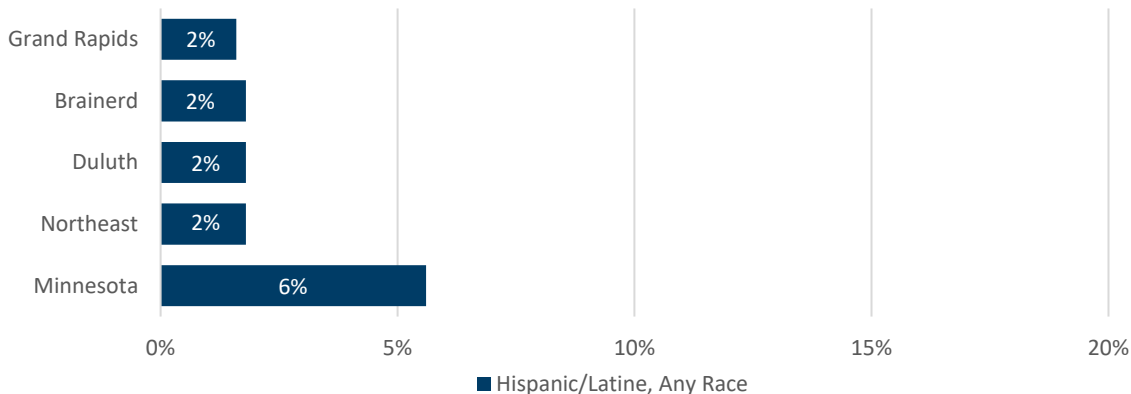| Demographics	Metro Area			Region			Region (Value)		
	Duluth, MN-WI MSA	Brainerd, MN μSA	Grand Rapids, MN μSA	Northeast Minnesota	Minnesota	USA	Northeast Minnesota	Minnesota	USA
Population (ACS)	—	—	—	—	—	—	426,627	5,695,292	331,097,593
Male	50.8%	50.5%	50.8%	50.8%	50.2%	49.6%	216,580	2,857,964	164,200,298
Female	49.2%	49.5%	49.2%	49.2%	49.8%	50.4%	210,047	2,837,328	166,897,295
Median Age[2]	—	—	—	—	—	—	44.2	38.5	38.5
Under 18 Years	19.2%	20.9%	20.3%	19.5%	23.0%	22.1%	83,167	1,307,084	73,213,705
18 to 24 Years	11.3%	6.6%	6.9%	9.4%	9.0%	9.4%	40,128	513,816	31,282,896
25 to 34 Years	11.6%	10.3%	9.3%	10.7%	13.2%	13.7%	45,505	751,997	45,388,153
35 to 44 Years	12.0%	11.0%	11.4%	11.4%	13.2%	12.9%	48,810	751,128	42,810,359
45 to 54 Years	11.5%	11.1%	11.5%	11.2%	11.9%	12.4%	47,988	675,835	41,087,357
55 to 64 Years	14.5%	15.9%	15.8%	15.2%	13.3%	12.9%	64,988	756,036	42,577,475
65 to 74 Years	11.9%	14.3%	14.7%	13.3%	9.7%	9.7%	56,790	550,838	32,260,679
75 Years, and Over	8.0%	10.1%	9.9%	9.2%	6.8%	6.8%	39,251	388,558	22,476,969
Race: White	90.7%	90.5%	89.7%	90.7%	79.7%	65.9%	386,893	4,537,219	218,123,424
Race: Black or African American	1.6%	0.6%	0.6%	1.2%	6.7%	12.5%	4,957	382,082	41,288,572
Race: American Indian and Alaska Native	2.0%	3.4%	2.9%	2.5%	0.9%	0.8%	10,679	51,434	2,786,431
Race: Asian	0.9%	0.5%	0.3%	0.7%	5.0%	5.8%	2,834	286,146	19,112,979
Race: Native Hawaiian and Other Pacific Islander	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%	78	2,324	624,863
Race: Some Other Race	0.5%	0.8%	0.7%	0.6%	2.3%	6.0%	2,542	133,098	20,018,544
Race: Two or More Races	4.3%	4.2%	5.7%	4.4%	5.3%	8.8%	18,644	302,989	29,142,780
Hispanic or Latino (of any race)	1.9%	1.9%	1.7%	1.8%	5.7%	18.7%	7,773	327,049	61,755,866

American Community Survey 2018-2022.

Economic and Social Characteristics

LABOR FORCE PARTICIPATION

- Civilian labor force: 208,279 workers (an increase of 76 from the prior year)
- Labor force participation rate: 59.0%
  - This lags Minnesota's statewide rate by nearly 10 percentage points
  - Northeast Minnesota's lower rate is primarily due to the older age of residents
- Participation rate for the prime working-age population (ages 25 to 54): 84.8%.

Labor Force Participation Rate

	In Labor Force	Not in Labor Force
16+ Population	59%	41%
Prime-Age (civilian population 25-54)	85%	15%
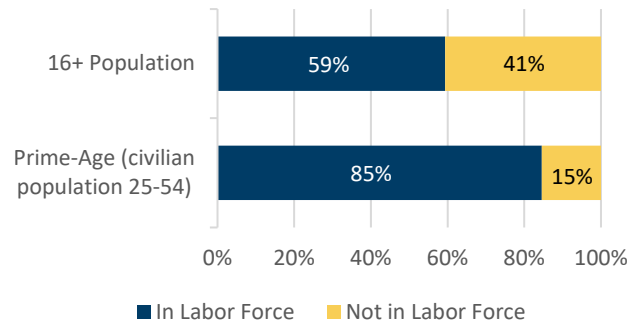
American Community Survey 2018-2022.

SOCIAL CHARACTERISTICS

- The Northeast region has a higher percentage of veterans and of people with disabilities than the statewide average:
  - Veterans are 4.6% of the regional population vs. 3.5% statewide
  - People with disabilities are 13.1% in the region vs. 9.2% statewide
- Labor force participation for those groups is lower in the Northeast region than statewide:
  - Veteran labor force participation in the region is 72.7% vs. 81.1% for Minnesota
  - Labor force participation rate for people with disabilities is 46.9% in the region vs. 54.4% statewide
- The Northeast region's share of disconnected youth is similar to the statewide average:
  - 1.8% in the Northeast vs. 1.7% statewide
- Disconnected youth rates vary between communities:
  - Grand Rapids: 3.6% of youth are disconnected (up 0.2 percentage points from last year).
  - Brainerd: 2.0% of youth are disconnected (down almost one percentage point from last year).

Detailed Economic and Social Characteristics

Characteristic	Metro Area			Region			Region (Value)		
	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)	60.9%	58.7%	55.4%	59.0%	68.7%	63.3%	208,279	3,112,649	167,857,207
Prime-Age Labor Force Participation Rate and Size (civilian population 25-54)	84.7%	86.0%	83.5%	84.8%	88.4%	82.8%	120,162	1,924,211	106,380,520
Armed Forces Labor Force	0.3%	0.1%	0.1%	0.2%	0.1%	0.5%	625	4,104	1,236,378
Veterans, Age 18-64	4.5%	5.0%	5.1%	4.6%	3.5%	4.3%	11,379	119,296	8,636,019
Veterans Labor Force Participation Rate and Size, Age 18-64	76.1%	69.0%	68.1%	72.7%	81.1%	77.1%	8,268	96,710	6,656,238
Median Household Income[2]	—	—	—	—	—	—	$66,118	$84,313	$75,149
Per Capita Income	—	—	—	—	—	—	$36,819	$44,947	$41,261
Poverty Level (of all people)	13.2%	11.0%	11.8%	12.5%	9.3%	12.5%	51,612	516,284	40,521,584
Households Receiving Food Stamps/SNAP	9.8%	8.4%	10.3%	9.1%	7.4%	11.5%	16,400	167,713	14,486,880
Enrolled in Grade 12 (% of total population)	1.2%	1.3%	1.3%	1.2%	1.4%	1.4%	5,032	80,290	4,476,703
Disconnected Youth[3]	1.7%	2.0%	3.6%	1.8%	1.7%	2.5%	396	5,089	430,795
Children in Single Parent Families (% of all children)	33.4%	34.8%	26.6%	33.0%	28.3%	34.0%	25,900	355,832	23,568,955
Uninsured	4.1%	6.5%	5.1%	4.8%	4.6%	8.7%	20,045	260,483	28,315,092
With a Disability, Age 18-64	12.6%	12.9%	15.1%	13.1%	9.2%	10.5%	31,942	313,760	20,879,820

Characteristic	Metro Area			Region			Region (Value)		
	Duluth, MN-WI MSA	Brainerd, MN μSA	Grand Rapids, MN μSA	Northeast Minnesota	Minnesota	USA	Northeast Minnesota	Minnesota	USA
With a Disability, Age 18-64, Labor Force Participation Rate and Size	47.3%	47.8%	46.9%	46.9%	54.4%	45.5%	14,971	170,629	9,492,098
Foreign Born	1.9%	1.4%	0.7%	1.6%	8.5%	13.7%	7,019	481,922	45,281,071

American Community Survey 2018-2022.
*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

EDUCATIONAL ATTAINMENT

- In Northeast Minnesota, 5.2% of adults aged 25-64 do not have a high school diploma or equivalent
- About 25.5% of adults aged 25-64 in the region have a high school diploma as their highest level of education (compared to 20.9% statewide)
- Educational attainment varies among metropolitan areas:
  - In Brainerd, 33.3% of adults have a high school diploma or less, and the share is similar in Grand Rapids, at 33.5%. In contrast, only 28.7% of Duluth's population has a high school diploma or less
  - Duluth has a greater share of its population with high levels of educational attainment, with 31.2% having a bachelor's degree or higher, compared to 25.3% in Grand Rapids and 26.1% in Brainerd

Educational Attainment of Northeast Minnesota Residents, Age 25-64

Educational Attainment	Metro Area			Region			Region (Value)		
	Duluth, MN-WI MSA	Brainerd, MN μSA	Grand Rapids, MN μSA	Northeast Minnesota	Minnesota	USA	Northeast Minnesota	Minnesota	USA
No High School Diploma	4.9%	5.9%	5.3%	5.2%	5.9%	10.1%	10,781	173,843	17,373,867
High School Graduate	23.8%	27.4%	28.2%	25.5%	20.9%	25.1%	52,834	614,415	43,176,248
Some College, No Degree	24.8%	25.2%	24.3%	24.9%	19.7%	19.7%	51,674	578,062	33,916,989
Associate degree	15.4%	15.4%	16.9%	15.5%	12.9%	9.2%	32,028	377,910	15,886,884
Bachelor's Degree	20.8%	18.3%	16.5%	19.4%	26.9%	22.4%	40,216	790,857	38,451,123
Postgraduate Degree	10.4%	7.8%	8.8%	9.5%	13.6%	13.4%	19,758	399,909	23,058,233

American Community Survey 2018-2022.

Educational Attainment, Age 25-64

Region	No High School Diploma	High School Graduate or GED	Some College, No Degree	Associate's Degree	Bachelor's Degree	Postgraduate Degree
Grand Rapids	5%	28%	24%	17%	17%	9%
Brainerd	6%	27%	25%	15%	18%	8%
Duluth	5%	24%	25%	15%	21%	10%
Northeast	5%	26%	25%	16%	19%	10%
Minnesota	6%	21%	20%	13%	27%	13%
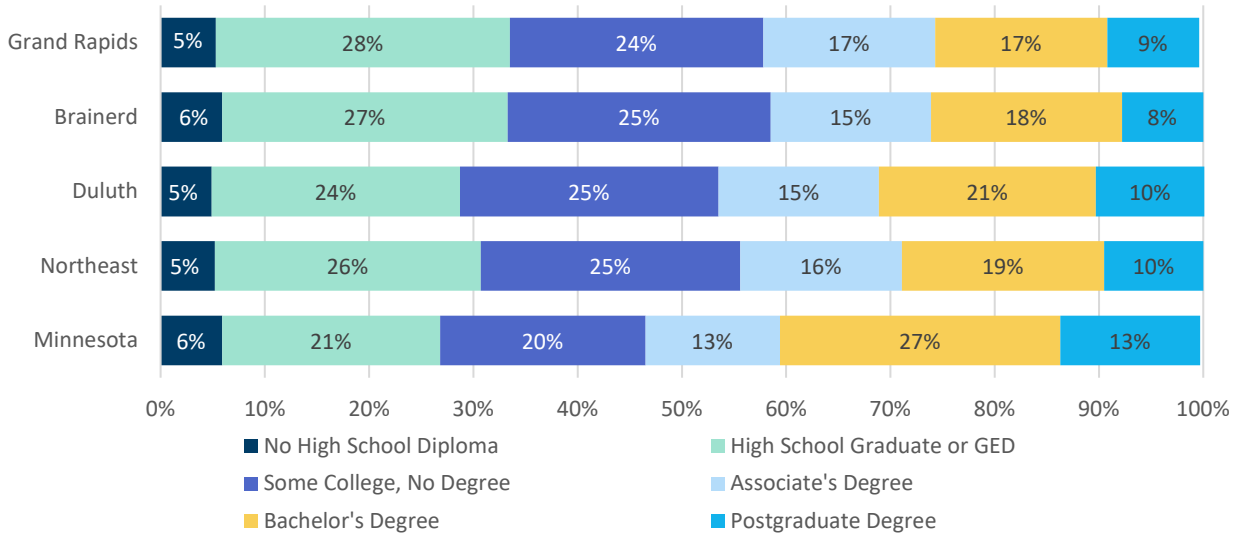
American Community Survey 2018-2022.

REGIONAL COLLEGES AND UNIVERSITIES

Northeast Minnesota has seven institutions of higher education that offer both degree and non-degree awards, two-year degrees, four-year degrees, and graduate degrees.[4] This is one fewer institution than in SY2021-22, as Cosmetology Careers Unlimited College of Hair Skin and Nails did not grant any awards in SY2022-23. The table below shows these postsecondary institutions sorted by total awards conferred from all programs during SY2022-23. There were a total of 6,618 awards conferred in the region in SY2022-23, compared to 7,004 awards conferred in the region in SY2021-22.

Postsecondary Awards by Institution, School Year 2022-23

School	Certificate < 1 Yr	Certificate 1+ but < 2 Yr	Associate	Certificate 2+ but < 4 Yr	Bachelor's	Post-Bacc	Master's	Post Master's/ Doctorate	Total Awards	Total School Enrollment	Avg Net Price*
University of Minnesota-Duluth	37	0	0	0	2,070	1	202	3	2,313	9,675	$16,960
The College of Saint Scholastica	10	0	0	0	706	98	285	197	1,296	3,207	$25,744
Minnesota North College	180	122	598	82	0	0	0	0	982	3,044	$9,151
Lake Superior College	140	100	612	46	0	0	0	0	898	3,849	$13,682
Central Lakes College-Brainerd	135	198	490	53	0	0	0	0	876	4,633	$12,279
Fond du Lac Tribal and Community College	30	37	144	0	0	0	0	0	211	1,648	$10,307
Leech Lake Tribal College	0	2	40	0	0	0	0	0	42	172	$9,947
Total	**532**	**459**	**1,884**	**181**	**2,776**	**99**	**487**	**200**	**6,618**		

* Average net price represents full-time beginning undergraduate students who paid the in-state or in-district tuition rate and were awarded grant or scholarship aid from federal, state or local governments, or the institution. Data as of the 2022-2023 academic year.

[4] This was the second year where five campuses in the Minnesota State system were reported together as Minnesota North College, dropping the total number of schools down by four. There still remain multiple campuses for Minnesota North College.

Economy
Economic Indicators

GROSS DOMESTIC PRODUCT

Gross Domestic Product (GDP) is the total value of goods and services produced by a region. In 2023, nominal GDP in the Northeast region grew by 5.4%. This follows an expansion of 5.2% in 2022. As of 2023, total GDP in the region was $23,372,529,000—of which $16,742,667,000 is attributed to the Duluth MSA.

One-Year % Change in GDP, Northeast Minnesota
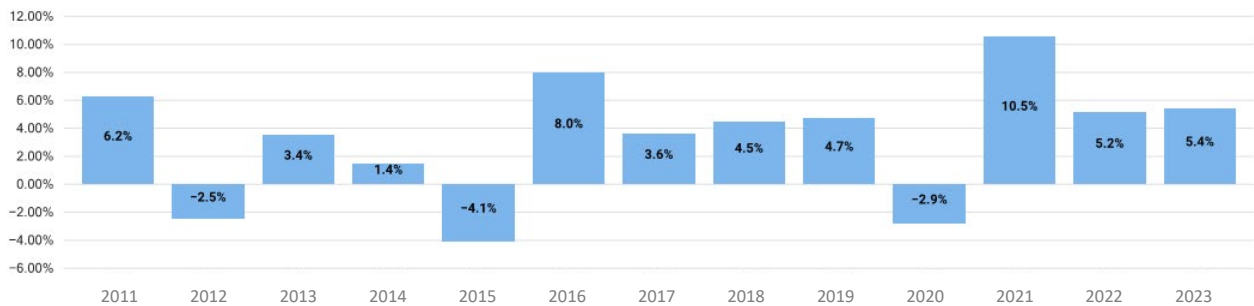
Gross Domestic Product data are provided by the Bureau of Economic Analysis, imputed by Chmura where necessary, updated through 2023

INDUSTRY CONTRIBUTIONS TO GDP

Top Industry Contributions to GDP (2023):

1. Health Care and Social Assistance: $3.78 billion
2. Real Estate and Rental and Leasing: $2.30 billion
3. Retail Trade: $2.05 billion
4. Manufacturing: $1.94 billion

Key Changes:

- All industries saw increased output except for Mining, Quarrying, and Oil and Gas Extraction
- Mining dropped from 4th place in 2022 to 5th place in 2023
- Retail Trade moved from 5th place in 2022 to 3rd place in 2023 with a 0.6 billiion increase.

Industry Contributions to GDP in Northeast Minnesota (in $ Millions), 2023
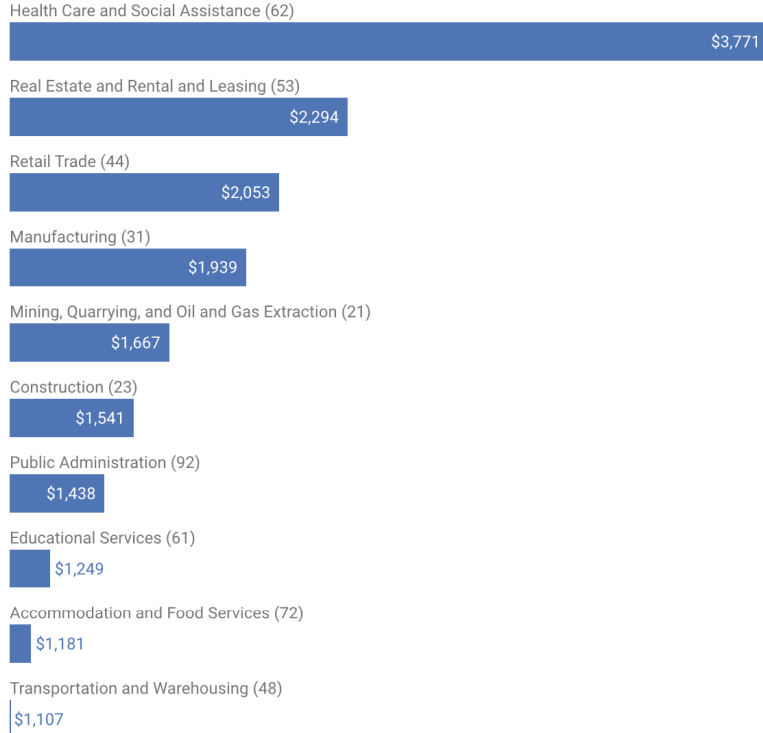
Health Care and Social Assistance (62)
$3,771

Real Estate and Rental and Leasing (53)
$2,294

Retail Trade (44)
$2,053

Manufacturing (31)
$1,939

Mining, Quarrying, and Oil and Gas Extraction (21)
$1,667

Construction (23)
$1,541

Public Administration (92)
$1,438

Educational Services (61)
$1,249

Accommodation and Food Services (72)
$1,181

Transportation and Warehousing (48)
$1,107

Gross Domestic Product data are provided by the Bureau of Economic Analysis, imputed by Chmura where necessary, updated through 2023.

Labor Market

UNEMPLOYMENT TRENDS

- The unemployment rate in Northeast Minnesota was 4.4% as of June 2024
  - o The regional unemployment rate was higher than the statewide rate (3.8%) and slightly higher than the national rate (4.3%)
  - o One year earlier, in June 2023, the unemployment rate in Northeast Minnesota was 3.9%.

Unemployment for Northeast Minnesota

NHED Region (County-Based) (4.4%) — Minnesota (3.8%) — USA (4.3%)

Source: JobsEQ®. Data as of Jun 2024. The shaded areas of the graph represent national recessions.
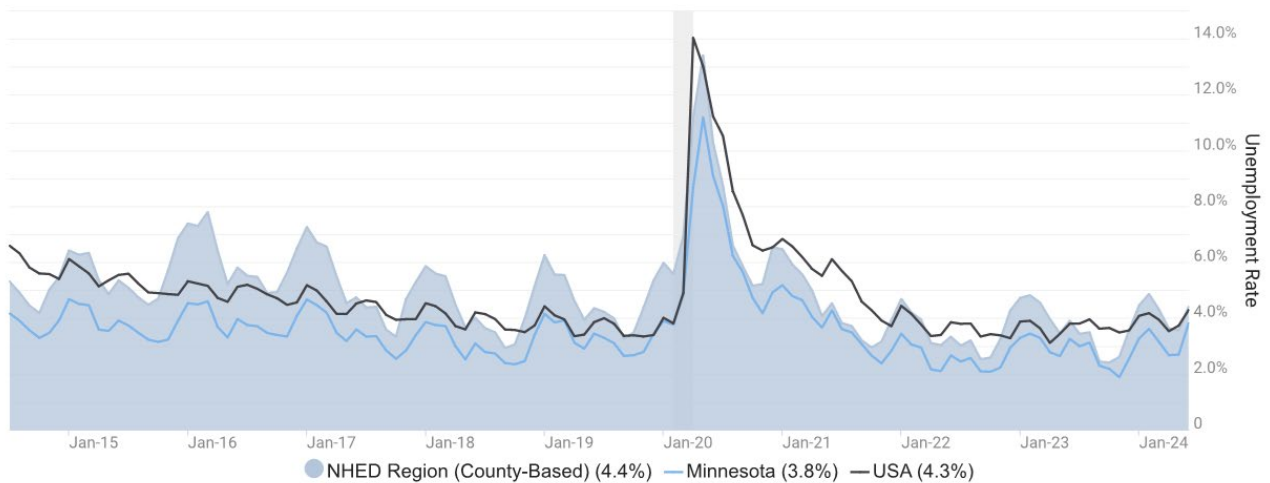
Unemployment rate data are from the Local Area Unemployment Statistics, provided by the Bureau of Labor Statistics and updated through June 2024.

WAGE TRENDS

- In Northeast Minnesota, average annual wages were $53,467 as of 2024Q1
    - Up $235.00 from the 2023Q2 average of $53,232
    - This is an increase of 1.6% over the past four quarters, as compared to a 3.9% increase the previous year
- Nationwide, average annual wages were $70,857 as of 2024Q1
    - This represents an increase from $70,318 as of 2023Q2 and $67,777 in 2022Q2

Change in Average Annual Wages for Northeast Minnesota
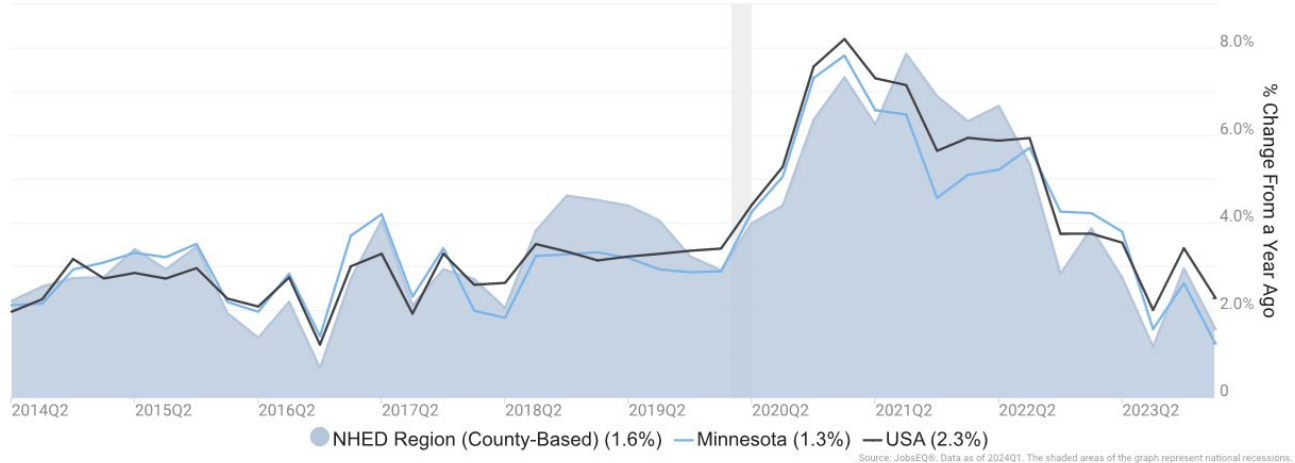
Annual average wages per worker data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and imputed where necessary. Data are updated through 2023Q4 with preliminary estimates updated to 2024Q1.

EMPLOYMENT TRENDS AND FORECAST

Employment rose by 1.0% in Northeast Minnesota between 2023Q1 and 2024Q1, growing more slowly than the prior 12 months. Employment in the region is forecast to decline by -0.3% on average annually through 2029Q1 in a baseline scenario.

5-Year Employment Forecast in Northeast Minnesota
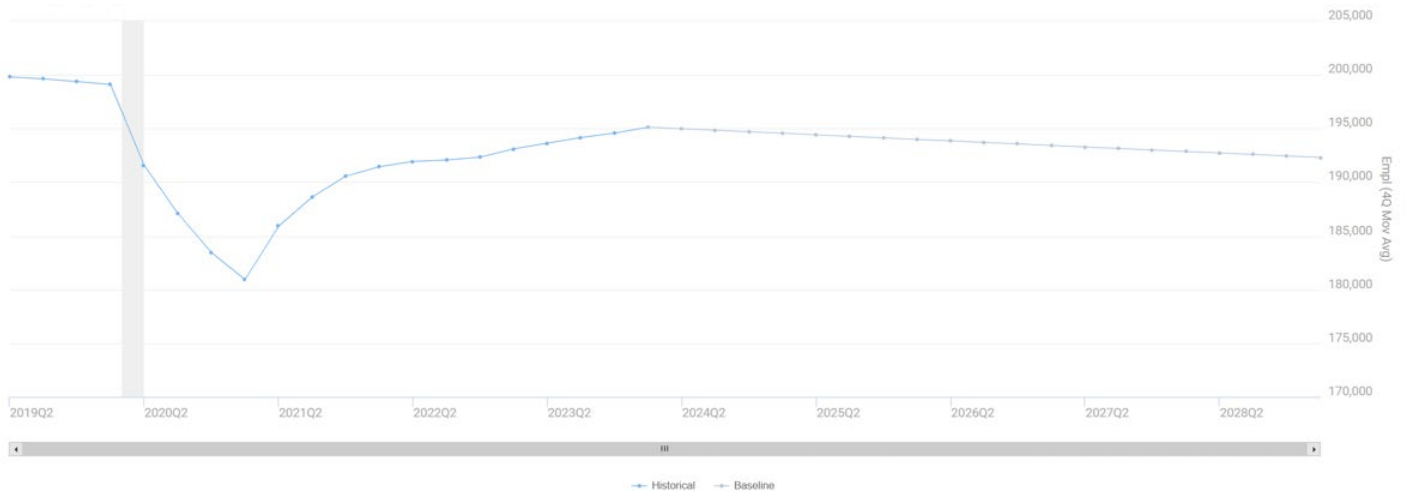
INDUSTRY CLUSTER FORECASTS

Employment forecasts vary considerably by industry. An industry cluster is a geographic concentration of interrelated industries or occupations. The chart below shows industry clusters employing talent in Northeast Minnesota. The larger the circle, the more concentrated the industry is in the region (compared to the national average); this is called a Location Quotient (LQ). Clusters are positioned on the chart based on their wages and forecast employment. Clusters higher up on the Y-axis of the chart have higher average wages, and clusters located further to the right on the X-axis of the chart have higher forecasted employment growth. In summary, large circles in the top-right corner of the chart would be considered high-wage, high-growth, uniquely important clusters for the region's economy. Smaller circles further to the bottom-left corner of the chart would be lower-wage, declining, underrepresented clusters.

The most highly concentrated cluster in the Northeast region is <u>Metal and Product Manufacturing</u>:
- Location Quotient: 3.75 (slightly up from 2023)
- Employment: 5,316 workers (up by ~200 from 2023)
- Average Wage: $105,518 (down by nearly $11,300 from 2023)
- Employment Forecast: Projected to decline by -0.4% annually over the next 10 years

Industry Cluster Employment Forecast Trends:
- Utilities and Health are the only industries projected to have positive average employment growth in the region; all others are forecast to shrink
- Most industries saw improvement in forecasted employment from 2023Q2 to 2024Q1

Industry Clusters for Northeast Minnesota as of 2024Q1
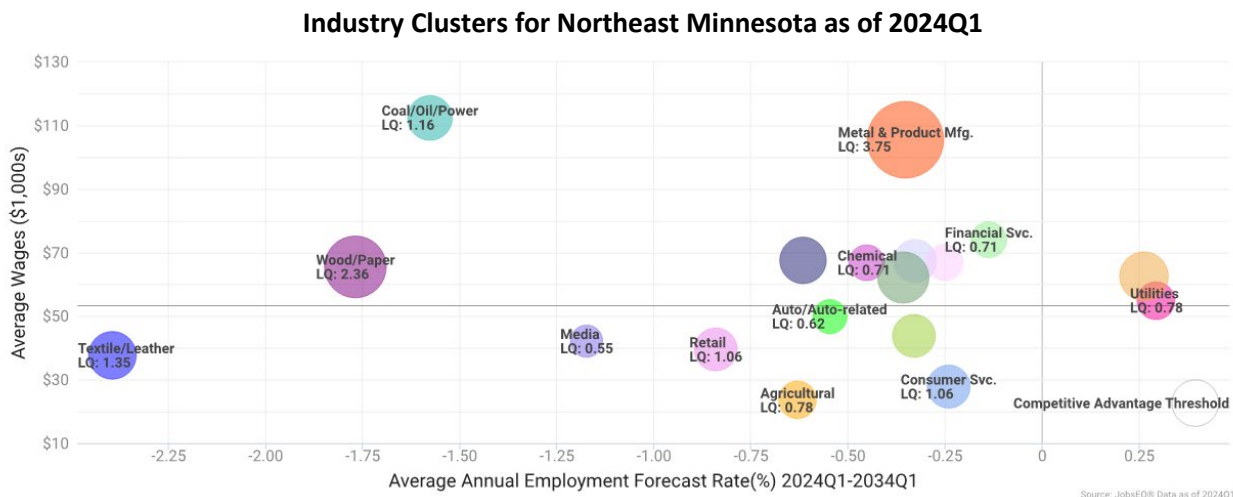
Quantifying Talent Shortages

Occupation Gaps

The chart below shows the potential average annual talent gaps by occupation in the Northeast region over the next ten years. This summary estimate is based on a forecast comparing occupation demand growth to the local population growth and the projected educational attainment of those residents, 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. While this an important high-level 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, award and skill gap analyses, as well as local employer insights.

Key Insights:
- Restaurant Cooks and General and Operations Managers are the top occupations in talent shortage
- Growing talent shortage of Maintenance and Repair Workers and Heavy and Tractor-Trailer Truck Drivers
- Growing talent surplus of Cashiers, Waiters and Waitresses, Fast Food and Counter Workers, and Retail Workers
- Carpenters is newly on the list of top occupation shortages

Average Annual Occupation Gaps (i.e. Talent Shortage), 2024Q1 through 2034Q1

Supply Deficit		Supply Surplus	
Cooks, Restaurant ($36,200)	−15	Cashiers ($31,500)	68
General and Operations Managers ($94,600)	−15	Waiters and Waitresses ($26,100)	44
Medical and Health Services Managers ($109,400)	−13	Fast Food and Counter Workers ($31,200)	38
Registered Nurses ($84,800)	−13	Retail Salespersons ($37,500)	25
Maintenance and Repair Workers, General ($53,500)	−12	Customer Service Representatives ($45,600)	14
Software Developers ($119,800)	−10	Bartenders ($28,300)	13
Heavy and Tractor-Trailer Truck Drivers ($61,900)	−10	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop ($28,800)	13
Nurse Practitioners ($151,600)	−9	Amusement and Recreation Attendants ($32,500)	10
Licensed Practical and Licensed Vocational Nurses ($55,900)	−7	Office Clerks, General ($46,400)	10
Carpenters ($61,300)	−7	Food Preparation Workers ($33,800)	10

The Role of Education

EMPLOYMENT FORECAST BY EDUCATION

While overall employment in Northeast Minnesota is forecast to decline by -0.7% annually on average, expected forecasts for occupations vary by the education required:
- Occupations requiring no education, high school, or some college (but no degree) have the biggest forecast declines (-0.4% to -0.6%)—but these declines are smaller than previously forecast in 2023Q2

- Roles typically requiring a master's degree or doctoral degree are the only ones expected to grow (+0.7% and +0.1%, respectively)
- Occupations requiring any other postsecondary credential are forecast to contract very slightly or remain flat (-0.1% to -0.0%)

Annual Average Projected Job Growth by Education Required for Northeast Minnesota, 2024Q1

Doctoral or professional degree ($164,500) — .1%

Master's degree ($91,900) — 0.7%

Bachelor's degree ($87,000) — 0

Associate's degree ($66,700) — -0.1%

Postsecondary non-degree award ($54,000) — -0.1%

High school diploma or equivalent ($53,000) — -0.4%

Some college, no degree ($46,100) — -0.6%

None ($37,800) — -0.5%

All Levels ($60,500) — -0.3%
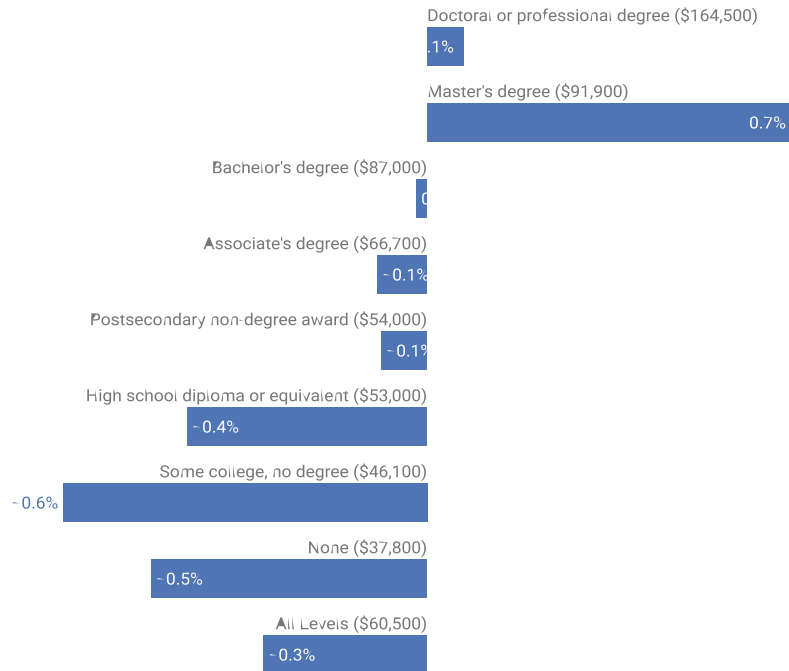
Employment by occupation data are estimates are as of 2024Q1. Education levels of occupations are based on BLS assignments. Forecast employment growth uses national projections from the Bureau of Labor Statistics adapted for regional growth patterns.

AWARD GAPS

Award gaps quantify the total number of postsecondary award completions in a region tied to an occupation benchmarked against national rates. In the Northeast region, local postsecondary programs are now likely underproducing General and Operations Managers, Teaching Assistants, and Hairdressers, Hairstylists and Cosmetologists. There is an oversupply of Registered Nurses, Secondary School Teachers, and Postsecondary Health Specialties Teachers completing local postsecondary programs compared to national volumes.

Award Gaps, All Occupations, Northeast Minnesota, 2024Q1

Supply Deficit		Supply Surplus	
General and Operations Managers	−63	Registered Nurses	115
Teaching Assistants, Except Postsecondary	−56	Secondary School Teachers, Except Special and Career/Technical Education	71
Hairdressers, Hairstylists, and Cosmetologists	−47	Health Specialties Teachers, Postsecondary	64
Medical Assistants	−27	Physical Therapists	48
Automotive Service Technicians and Mechanics	−27	Civil Engineers	48
Medical Secretaries and Administrative Assistants	−20	Welders, Cutters, Solderers, and Brazers	42
Pharmacists	−19	Forest and Conservation Technicians	38
Childcare Workers	−19	Mechanical Engineers	35
Business Operations Specialists, All Other	−18	Cost Estimators	32
Coaches and Scouts	−18	Teachers and Instructors, All Other	30

Occupations in Current Shortage

Several occupations have zero unemployed talent in the Northeast as of 2024Q1 estimates, resulting in an estimated unemployment rate of 0%. The occupations listed below have nonexistent unemployed talent at the regional level and 75 people or more 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 pay over the regional median of $49,600 annually, with many significantly higher.

RealTime Talent

Occupations with No Unemployed Workforce and Employing over 75 Workers, Northeast Minnesota 2024Q1

SOC	Occupation	Current						5-Year History		5-Year Forecast				
		Empl	Median Ann Wages[2]	LQ	Unempl	Unempl Rate	30-Day Online Job Ads[3]	Empl Change	Ann %	Total Demand	Exits	Trans-fers	Empl Change	Ann % Change
11-9041	Architectural and Engineering Managers	200	$148,600	0.82	0	n/a	107	10	1.1%	58	20	42	-4	-0.4%
47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining	163	$62,900	3.68	0	n/a	n/a	-10	-1.2%	78	37	43	-2	-0.2%
51-8013	Power Plant Operators	147	$83,000	3.67	0	n/a	n/a	17	2.4%	28	18	33	-24	-3.4%
19-5011	Occupational Health and Safety Specialists	138	$89,200	1.01	0	n/a	27	22	3.6%	78	20	54	4	0.6%
31-9011	Massage Therapists	135	$76,000	0.83	0	n/a	7	-15	-2.0%	104	47	48	9	1.3%
53-4031	Railroad Conductors and Yardmasters	131	$80,300	2.66	0	n/a	1	-12	-1.8%	47	15	35	-3	-0.5%
47-4011	Construction and Building Inspectors	129	$71,800	0.78	0	n/a	23	9	1.5%	66	41	30	-5	-0.7%
29-1131	Veterinarians	110	$103,400	1.03	0	n/a	27	9	1.8%	27	13	6	8	1.4%
17-3023	Electrical and Electronic Engineering Technologists and Technicians	106	$66,200	0.87	0	n/a	12	-17	-2.9%	46	26	23	-4	-0.7%
29-1031	Dietitians and Nutritionists	100	$68,100	1.05	0	n/a	14	0	0.0%	31	18	13	0	0.0%
19-3039	Psychologists, All Other	93	$98,700	1.39	0	n/a	3	6	1.3%	30	14	15	1	0.1%
11-1031	Legislators	84	$50,200	1.67	0	n/a	n/a	-1	-0.2%	30	13	17	0	-0.1%
27-1025	Interior Designers	82	$52,000	0.74	0	n/a	3	8	2.2%	35	17	19	-1	-0.2%
19-3034	School Psychologists	77	$81,900	1.05	0	n/a	41	-26	-5.7%	24	7	18	0	0.0%
	Total - All Occupations	**195,125**	**$49,600**	**1.00**	**7,377**	**3.6%**	**16,074**	**-4,658**	**-0.5%**	**103,726**	**47,504**	**59,088**	**-2,866**	**-0.3%**

Job Posting Trends in Northeast Minnesota

Online job posting data reveals much about employer demand for certain skills, certifications, qualifications, and occupational competencies.

TOTAL JOBS

Total job postings in the past 12 months (11/1/23 – 10/31/24):

- 33,849 unique job postings advertised online in Northeast Minnesota
    - + 2% compared to the 12 months prior
- 594,113 unique postings statewide
    - -10% compared to the 12 months prior

Total Jobs Advertised Monthly in Northeast Minnesota, October 2023-2024
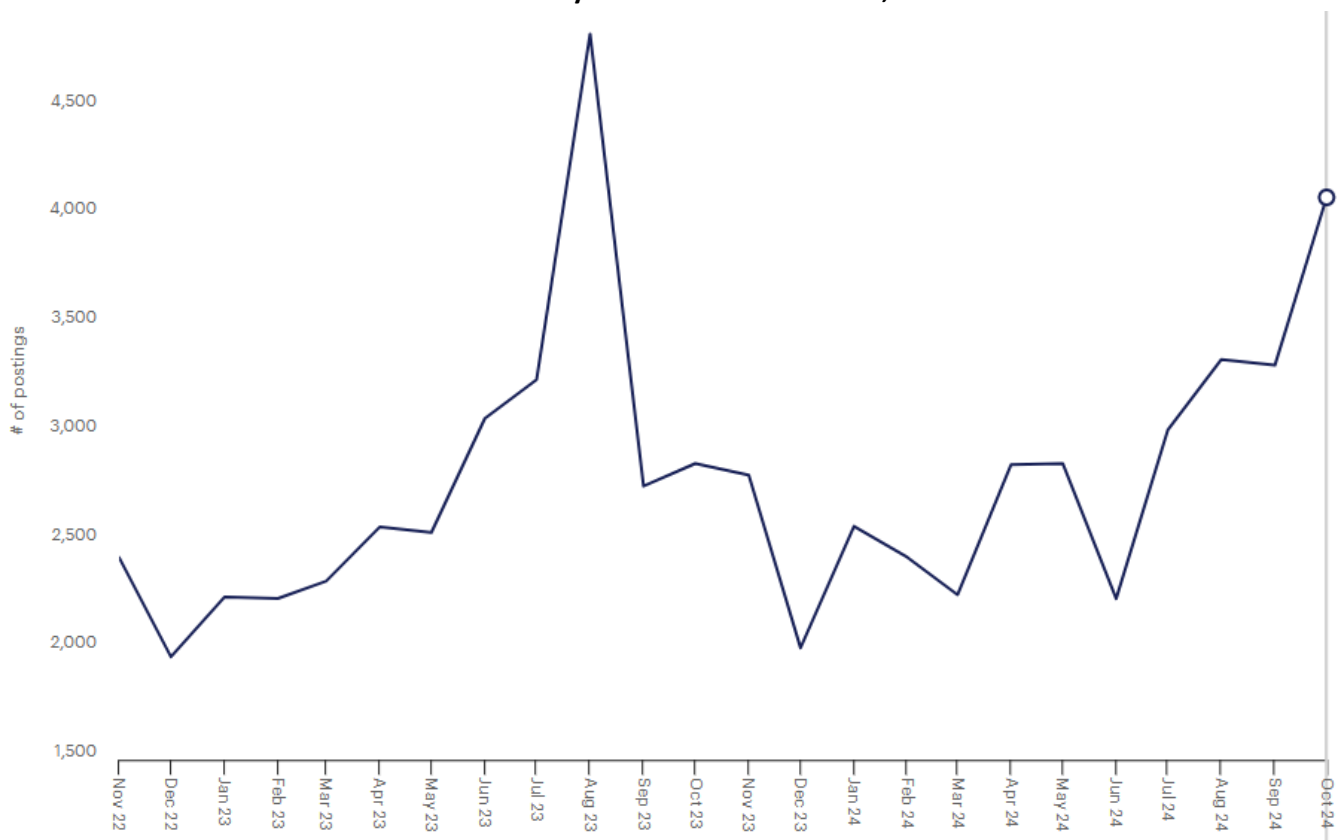
SOURCE: TalentNeuron accessed 11/1/2024

REMOTE AND HYBRID POSITIONS

Remote and hybrid positions have been shifting greatly in the past five years, and this trend plays out differently across CTE fields:

- 22% of all positions advertised in the past 12 months were explicitly listed as remote, hybrid, or telecommute roles—either permanently or temporarily
- Remote work is increasing year over year
    - Among all positions, the share of positions that are remote and hybrid remote increased by six percentage points from the prior year
    - Hybrid remote roles grew the most, representing 17% of all postings

- Arts, Communications and Information Systems, Health Science, and Engineering, Manufacturing, and Technology roles have particularly seen increases (by seven, eight, and nine percentage points respectively from the prior year)

Total Remote Job Postings Advertised Monthly in Northeast Minnesota, October 2023-2024
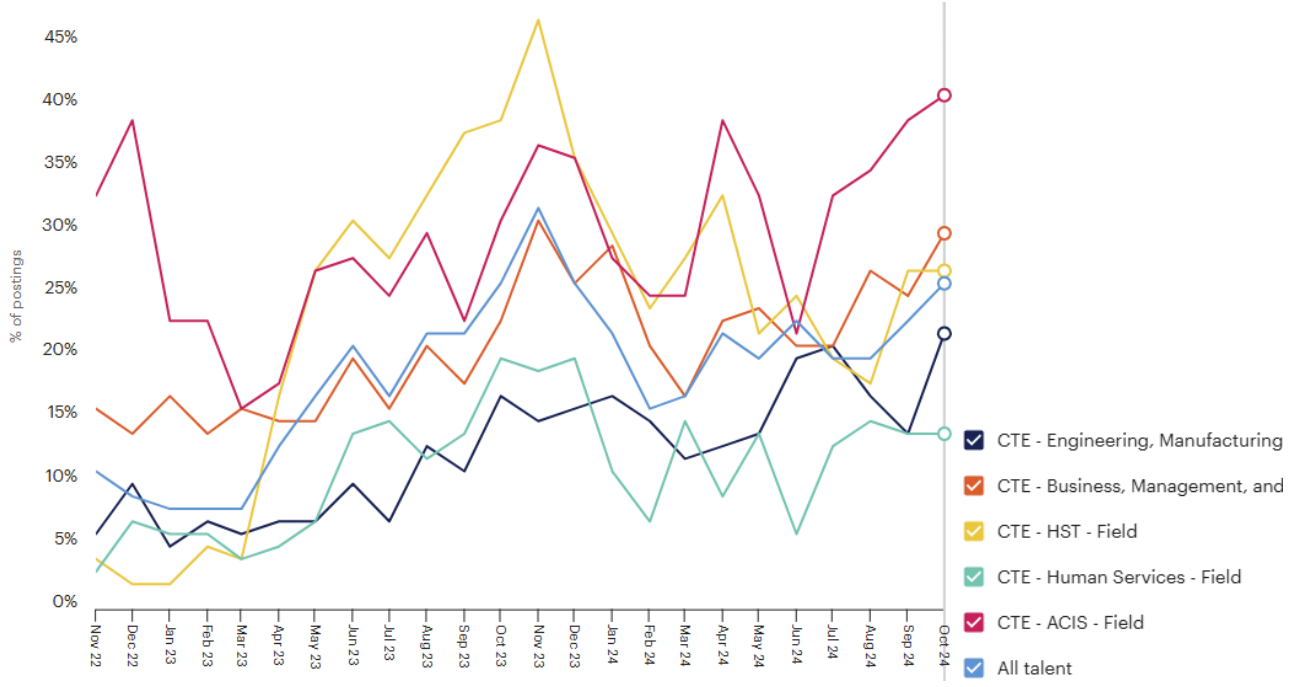
SOURCE: TalentNeuron accessed 11/1/2024

Remote Job Postings by Career Field Advertised in Northeast Minnesota, October 2023-2024
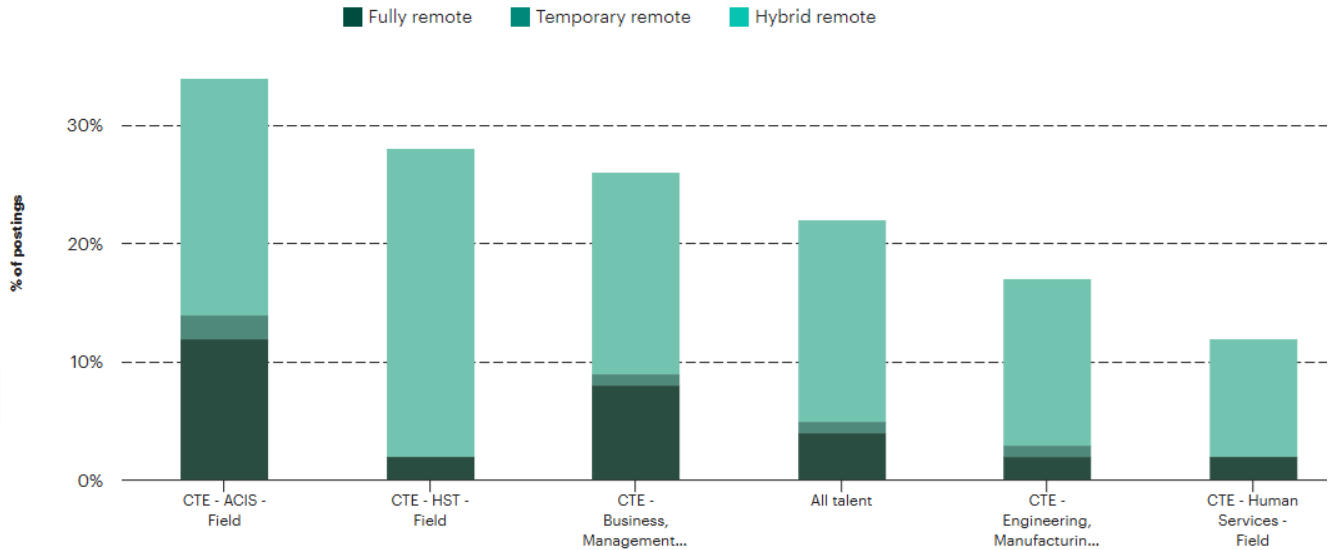
Talent Profile ⌄	Unspecified /Onsite ⌄	% of postings Total remote ⌄	Fully remote ⌄	Temporary remote ⌄	Hybrid remote ⌄
CTE - ACIS - Field	66% ▼ -7 pp	34% ▲ 7 pp	12% ▲ 4 pp	2% ▼ -1 pp	20% ▲ 4 pp
CTE - HST - Field	72% ▼ -8 pp	28% ▲ 8 pp	2% ▲ 1 pp	0% ▲ 0 pp	26% ▲ 7 pp
CTE - Business, Management, and Administration - Field	74% ▼ -8 pp	26% ▲ 8 pp	8% ▲ 3 pp	1% ▲ 0 pp	17% ▲ 5 pp
All talent	78% ▼ -6 pp	22% ▲ 6 pp	4% ▲ 1 pp	1% ▲ 0 pp	17% ▲ 5 pp
CTE - Engineering, Manufacturing, and Technology - Field	83% ▼ -9 pp	17% ▲ 9 pp	2% ▲ 1 pp	1% ▲ 1 pp	14% ▲ 7 pp
CTE - Human Services - Field	88% ▼ -3 pp	12% ▲ 3 pp	2% ▲ 0 pp	0% ▲ 0 pp	10% ▲ 3 pp

SOURCE: TalentNeuron accessed 11/1/2024

EVOLVING SKILLS

Talent accumulates valuable skills in many different ways beyond just work and education. Everything 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 for career growth. 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 postsecondary planning, workforce development, and employer talent strategy.

Evolving skills key trends:
- Most of the **newest** skills on the rise in regional job postings are hard skills required for target occupations in management and finance
- **Core** skills have remained relatively consistent with human skills such as communication and supervisory skills, and schedule management ranking in high importance
- While nursing was a core skill in regional postings last year, it is now declining in presence in regional job postings

Top Evolving Skills in Northeast Minnesota, October 2023-2024

🌱 New	🌱 Emerging	🌱 Growing	🌺 Core	🌿 Declining
1. Development Supp... 2. Earned Value Mana... 3. Mariner	There are no Emerging skills in the market	1. Collaboration	1. Communication 2. Supervision 3. Scheduling	1. Nursing
New skills whose future is uncertain.	Relatively new skills that are becoming more prevalent.	Fast-growing skills that are becoming core skills.	Skills that have been present in a high percentage of job postings for some time.	Skills that used to be essential but are becoming obsolete.

Career Fields

Each of the six Career and Technical Education (CTE) career fields has unique talent demand and employment forecasts, based on its mix of occupations and industry needs.

Health Science Technology
- Moderately high concentration in the region (LQ 1.27)
- Highest forecast growth among career fields (+0.2%)

Human Services
- Slightly high concentration in the region (LQ 1.14)
- Third largest employment in the region among career fields

Arts, Communications, and Information Systems
- Smallest local employment volume
- Low concentration in the region (LQ 0.62)
- Highest median and average entry-level wages of all career fields

Business, Management, and Administration
- Largest employment volume in the Northeast region
- Concentration comparable to the national average (LQ 0.97)
- High unemployment, at 4.1%, largely due to high unemployment in the Hospitality and Tourism cluster (5.2% unemployment) and Marketing, Sales and Service cluster (4.5% unemployment)

Engineering, Manufacturing, and Technology
- Second highest employment volume in the region
- High unemployment (4.2%), largely due to high unemployment in the Architecture and Construction cluster (5.0% unemployment)

Agriculture, Food, and Natural Resources
- The second smallest share of regional employment
- Third highest entry level wages of the six career fields, but fourth highest median wages

CTE Field Employment and Wages in Northeast Minnesota, 2024Q1

CTE Field (occupation overlap exists, will not sum)	Current 2024Q1 Estimates							5-Year History	
	Empl	Avg Entry-Level Wages	Median Wages	LQ	Unempl	Unempl Rate	Online Job Ads[3]	Empl Change	Ann %
Health Science Technology	22,971	$40,300	$67,900	1.27	429	1.9%	5,333	-1,409	-1.2%
Human Services	34,643	$42,300	$55,100	1.13	950	2.7%	2,165	-314	-0.2%
Arts, Communications, and Information Systems	5,419	$54,300	$76,200	0.61	159	2.6%	385	-384	-1.4%
Business, Management, and Administration	84,011	$36,600	$48,700	0.97	3,683	4.1%	5,665	-2,067	-0.5%
Engineering, Manufacturing, and Technology	45,047	$46,300	$62,000	0.95	2,067	4.2%	2,362	-268	-0.1%
Agriculture, Food, and Natural Resources*	9,435	$43,400	$59,600	0.93	341	3.4%	578	10	0.0%
Total - All Occupations	195,125			1.00	7,377	3.6%	16,074	-4,658	-0.5%

Data as of 2024Q1 unless noted otherwise
Note: Figures may not sum due to rounding and overlap in occupations between career fields. All clusters are distinct occupations except for Agriculture, Food, and Natural Resources, which overlaps with other clusters. Employment by place of work.
1. Data based on a four-quarter moving average unless noted otherwise.
2. Wage data represent the average for all Covered Employment
3. Data represent found online ads active 10/1/2024-11/1/2024 in the selected region. Due to alternative county-assignment algorithms, ad counts in this analytic may not match that shown in RTI (nor in the popup window ad list). Ad counts for ZCTA-based regions are estimates.

CTE Field Baseline Employment Forecast for Northeast Minnesota, 2029Q1

CTE Field (occupation overlap exists, will not sum)	Current	5-Year Growth 2029Q1				
	Empl	Total Demand	Exits	Transfers	Empl Change	Ann % Change
Health Science Technology	22,971	9,252	4,478	4,527	246	0.2%
Human Services	34,643	17,973	8,435	9,314	224	0.1%
Arts, Communications, and Information Systems	5,419	2,010	820	1,211	-22	-0.1%
Business, Management, and Administration	84,011	52,278	24,204	30,544	-2,470	-0.6%
Engineering, Manufacturing, and Technology	45,047	20,418	8,800	12,501	-883	-0.4%
Agriculture, Food, and Natural Resources*	9,435	4,911	2,028	3,024	-141	-0.3%
Total - All Occupations	195,125	103,726	47,504	59,088	-2,866	-0.3%

Data as of 2024Q1 unless noted otherwise
Note: Figures may not sum due to rounding and overlap in occupations between career fields. All clusters are distinct occupations except for Agriculture, Food, and Natural Resources, which overlaps with other clusters. Employment by place of work.
1. Data based on a four-quarter moving average unless noted otherwise.
2. Wage data represent the average for all Covered Employment
3. Data represent found online ads active 10/1/2024-11/1/2024 in the selected region. Due to alternative county-assignment algorithms, ad counts in this analytic may not match that shown in RTI (nor in the popup window ad list). Ad counts for ZCTA-based regions are estimates.

Career Cluster Detail

Of the sixteen career clusters used by Career and Technical Education (CTE), thirteen are forecast to decline in overall employment over the next ten years as of 2024Q1 estimates. The only three clusters forecasting growth are Health Science (+2.2%), Human Services (+6.0%) and Information Technology (+3.5%). All clusters saw improvements in employment outlook from the prior year's forecast.

Baseline 10-Year Forecasts by Career Cluster, Northeast Minnesota, 2024Q1
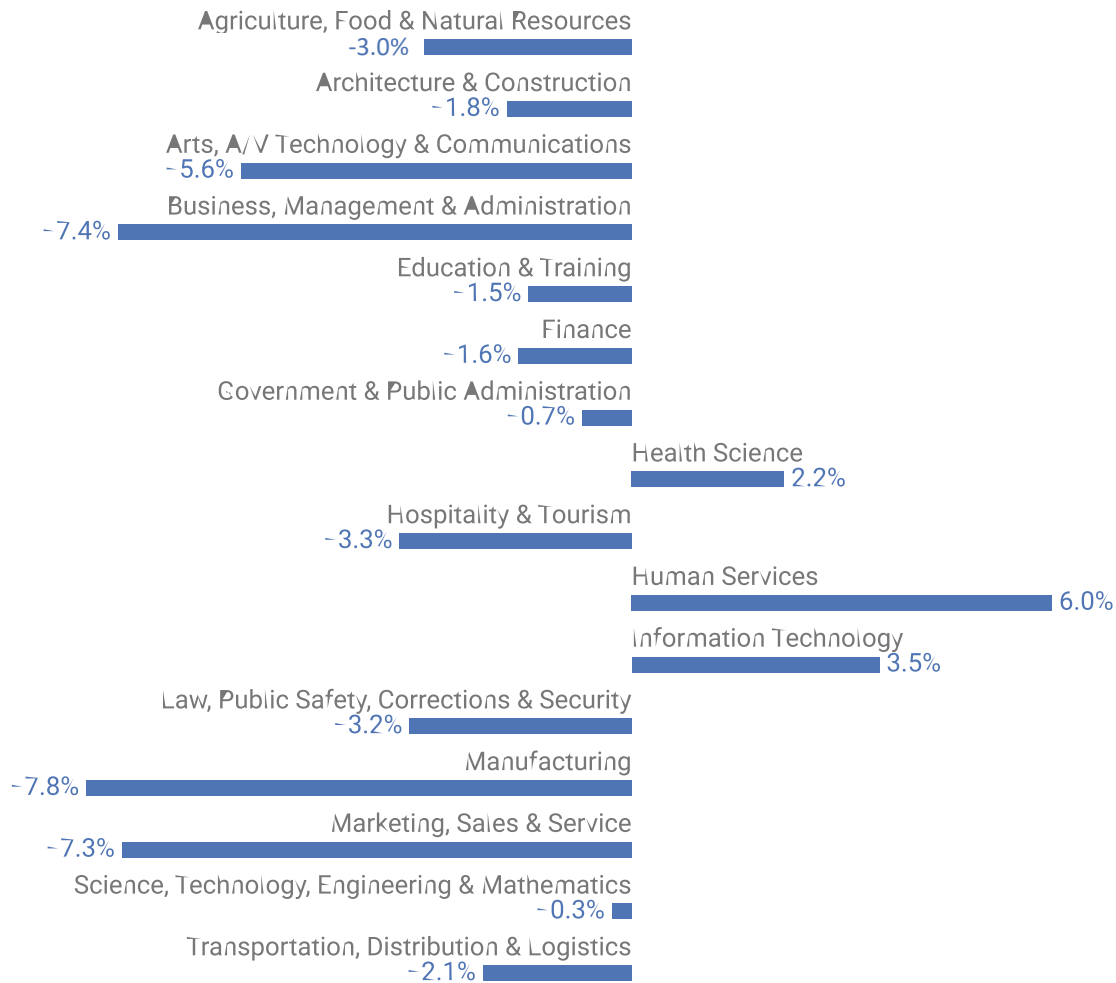
Agriculture, Food & Natural Resources
-3.0%

Architecture & Construction
-1.8%

Arts, A/V Technology & Communications
-5.6%

Business, Management & Administration
-7.4%

Education & Training
-1.5%

Finance
-1.6%

Government & Public Administration
-0.7%

Health Science
2.2%

Hospitality & Tourism
-3.3%

Human Services
6.0%

Information Technology
3.5%

Law, Public Safety, Corrections & Security
-3.2%

Manufacturing
-7.8%

Marketing, Sales & Service
-7.3%

Science, Technology, Engineering & Mathematics
-0.3%

Transportation, Distribution & Logistics
-2.1%

Cluster forecasts estimated using Chmura, JobsEQ, based on 2024Q1 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 future growth, retirements, and other job exits be considered. In the Northeast, Hospitality and 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.

Eleven of the sixteen career clusters have average wages above the average occupation wage in the region. The Science, Technology, Engineering and Mathematics cluster has the highest wages of the Career Clusters followed by the Information Technology and Health Science clusters.

Employment, Wages, and Forecast by Career Cluster, 2024Q1

Career Cluster	Employment	Avg Ann Wages	Job Ads	Ann Empl Change	Ann Total Demand
Science, Technology, Engineering & Mathematics	2,358	$101,000	356	-1	143
Information Technology	3,017	$96,500	286	10	189
Health Science	22,971	$84,900	5,256	48	1,845
Finance	5,147	$83,000	506	-9	380
Architecture & Construction	15,778	$68,500	484	-30	1,358
Law, Public Safety, Corrections & Security	5,753	$66,700	341	-19	500
Business, Management & Administration	30,560	$66,000	1,532	-236	2,890
Government & Public Administration	2,087	$65,600	153	-2	185
Arts, A/V Technology & Communications	2,403	$63,600	97	-14	214
Education & Training	12,229	$61,600	568	-19	1,071
Agriculture, Food & Natural Resources*	9,435	$60,600	663	-30	983
Manufacturing	14,285	$58,600	668	-119	1,263
Transportation, Distribution & Logistics	12,625	$56,400	844	-28	1,336
Marketing, Sales & Service	19,537	$49,200	1,870	-150	2,379
Human Services	14,574	$48,100	1,101	84	1,833
Hospitality & Tourism	28,766	$34,400	1,805	-100	4,873
Total - All Occupations	**195,125**	**$60,500**	**16,033**	**-584**	**20,811**

*Cluster forecasts estimated using Chmura, JobsEQ, based on 2024Q1 employment data. All clusters are distinct occupations except for Agriculture, Food, and Natural Resources, which overlaps with other clusters.

CAREER CLUSTER FORECASTS

Just as with industry clusters, it is possible to chart Career and Technical Education career clusters by wage, forecast, and local concentration. The chart below shows career clusters of employment in Northeast Minnesota. The larger the circle, the more concentrated the career cluster is in the region (compared to the national average); this is called a Location Quotient (LQ). Clusters are positioned on the chart based on their wages and forecast employment. Clusters higher up on the Y-axis of the chart have higher average wages, and clusters located further to the right on the X-axis of the chart have higher forecasted employment growth. In summary, large circles in the top-right corner of the chart would be considered high-wage, high-growth, uniquely important clusters for the region's economy. Smaller circles further to the bottom-left corner of the chart would be lower-wage, declining, underrepresented clusters.

The most highly concentrated career cluster in the Northeast region is Human Services:

- Location Quotient: 1.37
- Employment: 14,574 workers
- Average Wage: $48,100
- Employment Forecast: Projected to grow by 0.6% annually over the next 10 years

Career Clusters for Northeast Minnesota as of 2024Q1

Science, Technology, Engineering & Mathematics
LQ: 0.82

Information Technology
LQ: 0.52

Finance
LQ: 0.69

Health Science
LQ: 1.27

Arts, A/V Technology & Communic…
LQ: 0.78

Architecture & Construction
LQ: 1.17

Agriculture, Food, & Natural Resources
LQ: 0.93

Marketing, Sales & Service
LQ: 0.98

Human Services
LQ: 1.37

Hospitality & Tourism
LQ: 1.25

Competitive Advantage Threshold

Average Wages ($1,000s)

Average Annual Employment Forecast Rate(%) 2024Q1-2034Q1

- Agriculture, Food & Natural Resources
- Business, Management & Administration
- Government & Public Administration
- Human Services
- Manufacturing
- Transportation, Distribution & Logistics
- Architecture & Construction
- Education & Training
- Health Science
- Information Technology
- Marketing, Sales & Service
- Competitive Advantage Threshold
- Arts, A/V Technology & Communications
- Finance
- Hospitality & Tourism
- Law, Public Safety, Corrections & Security
- Science, Technology, Engineering & Mathematics

Source: JobsEQ® Data as of 2024Q1

Key Takeaways by Career Field

Health Science Technology	Human Services	Arts, Communications, and Information Technology
- Unique high local concentration - Forecast to grow slowly (+0.2% annually), yet this is the highest forecast growth among career fields - Largest volumes of occupations forecasting shortages, including Registered Nurses - Medical and Health Services Managers are in shortage *and* forecast to grow	- High share of workforce over-credentialed for the roles they currently hold - Critical occupations of shortage such as Mental Health Counselors - Mental Health Counselors and Personal Care Aides are expected to grow more quickly than average for the field - Lowest median wage of all career fields	- Occupations in this field offer the highest average entry-level wages - Smallest local employment volume and low concentration in the region - Continued shortage of software developers expected, as well as continued growth in software developer employment
Business, Management, and Administration	**Engineering, Manufacturing, and Technology**	**Agriculture, Food, and Natural Resources**
- Largest share of employment by career field - High unemployment (4.1%) - Shortage of General and Operations Managers and very high award gaps for this occupation– there is a need for a pathway - Restaurant Cooks in shortage *and* expected to grow	- Second highest employment volume by career field - Highest unemployment rate among career fields (4.2%) - Employment spread among many different industries - Shortage of Maintenance & Repair Workers and Heavy & Tractor-Trailer Truck Drivers expected	- Fairly low occupation and award gaps means a better aligned workforce than other career fields - Nine out of the ten top occupations by employment volume forecasted to remain flat or decline - Zero trained Veterinarians in the region are unemployed

Health Science Technology

The Health Science Technology field includes an array of careers in the health sciences, including the following career pathways:

- Therapeutic Services
- Diagnostic Services
- Support Services
- Health Informatics
- Biotechnology Research and Development

EMPLOYMENT FORECAST

Over the next five years, Health Science Technology field employment is forecast to increase by 0.2% on average annually—a generally flat forecast that has been fairly consistent for the past three years.

Baseline 5-Year Forecast for Health Science Technology Careers, Northeast Minnesota, 2024Q1
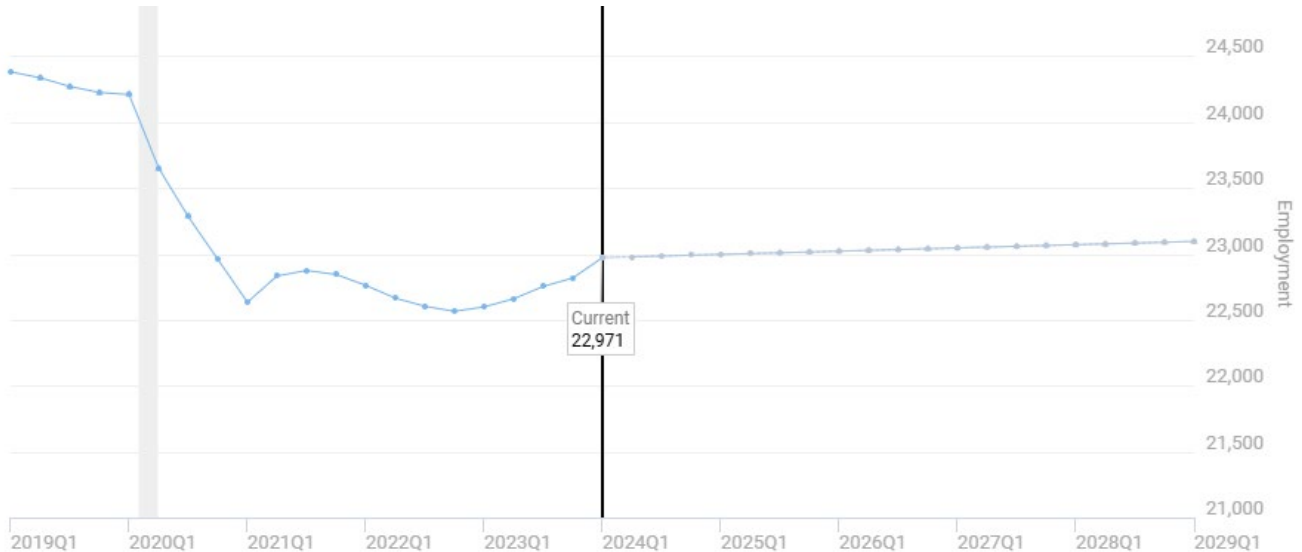
TOP OCCUPATIONS

A total of 22,971 people are employed in Health Science Technology roles regionally, accounting for about 12% of all regional employment. Medical and Health Services Managers and Home Health Aides are the top occupations with highest forecast growth, at 1.8% and 1.1%, respectively.

Top Ten Health Science Technology Occupations by Employment Volume, Northeast Minnesota, 2024Q1

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Registered Nurses	6,154	$83,700	1.59	-143	1,599	-0.2%
Nursing Assistants	2,306	$41,000	1.38	-491	1,578	-0.2%
Home Health Aides	1,629	$35,800	1.34	-711	1,037	1.1%
Licensed Practical and Licensed Vocational Nurses	1,062	$55,100	1.33	-277	391	-0.2%
Medical Secretaries and Administrative Assistants	994	$46,500	1.17	51	513	0.0%
Medical and Health Services Managers	783	$102,800	1.26	33	367	1.8%
Medical Assistants	709	$48,000	0.75	84	491	0.7%
Pharmacy Technicians	581	$44,200	1.09	-10	255	-0.1%
Pharmacists	500	$147,300	1.26	-15	93	0.0%
Dental Assistants	425	$57,000	0.95	15	295	0.1%
Health Science (CTE Field)	**22,971**	**$67,900**	**1.27**	**-1,409**	**9,252**	**0.2%**

"Forecast 5-Year Demand" is the projected need for new entrants into an occupation over the next five years. 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 Annual Change" 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).

TOP INDUSTRIES

Nearly half of talent in Northeast Minnesota working in Health Science Technology roles are employed by General Medical and Surgical Hospitals (47.1%). The next most common industries are Office of Physicians (9.7%) and Nursing Care Facilities (7.1%).

Health Science Technology Field Employment by Industry, Northeast Minnesota, 2024Q1

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
General Medical and Surgical Hospitals	47.1%	10,828	7,329	-42	7,287
Offices of Physicians	9.7%	2,225	1,560	82	1,642
Nursing Care Facilities (Skilled Nursing Facilities)	7.1%	1,636	1,637	-122	1,515
Offices of Dentists	4.2%	965	904	14	918
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	3.8%	871	841	8	849
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	3.6%	831	948	84	1,032
Individual and Family Services	3.5%	812	940	192	1,131
Offices of Other Health Practitioners	2.7%	619	471	71	543
Outpatient Care Centers	2.6%	590	453	99	552
Health and Personal Care Retailers	2.1%	481	355	-22	333
Home Health Care Services	1.9%	428	406	72	478
Other Professional, Scientific, and Technical Services	1.7%	388	406	66	472
Psychiatric and Substance Abuse Hospitals	1.2%	276	233	-1	232
Executive, Legislative, and Other General Government Support	1.1%	253	194	1	196
Elementary and Secondary Schools	1.1%	253	166	2	168
Other Residential Care Facilities	1.0%	235	229	-10	219
Colleges, Universities, and Professional Schools	0.7%	151	96	0	95
Other Ambulatory Health Care Services	0.5%	121	108	15	123
Administration of Environmental Quality Programs	0.5%	118	83	-5	78
All Others	3.9%	891	654	2	655

CAREER FIELD DEMOGRAPHICS

- The Health Science Technology field is predominantly white (92.7%) by race and non-Hispanic/Latinx by ethnicity (98.8%)
- Nearly four out of every five people employed in the field are female (78.1%)

Age
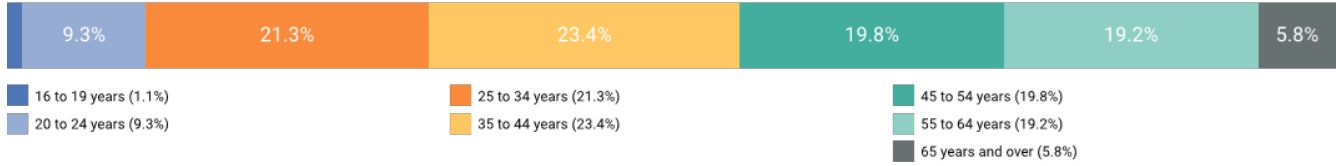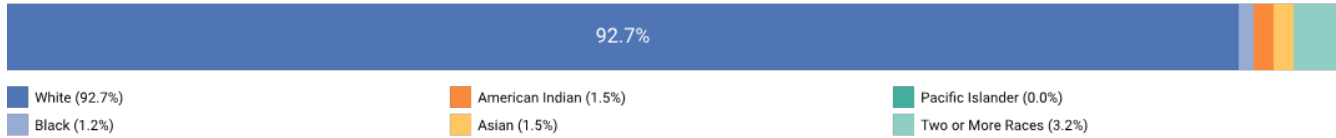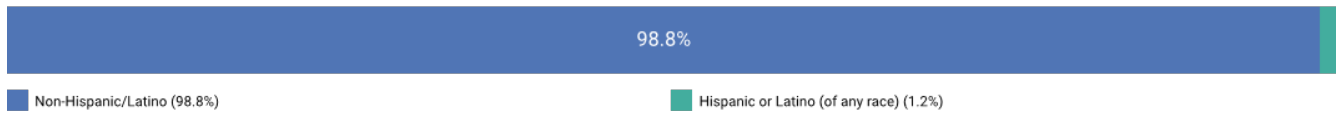
9.3%	21.3%	23.4%	19.8%	19.2%	5.8%

- 16 to 19 years (1.1%)
- 20 to 24 years (9.3%)
- 25 to 34 years (21.3%)
- 35 to 44 years (23.4%)
- 45 to 54 years (19.8%)
- 55 to 64 years (19.2%)
- 65 years and over (5.8%)

Race

92.7%		

- White (92.7%)
- Black (1.2%)
- American Indian (1.5%)
- Asian (1.5%)
- Pacific Islander (0.0%)
- Two or More Races (3.2%)

Ethnicity

98.8%	

- Non-Hispanic/Latino (98.8%)
- Hispanic or Latino (of any race) (1.2%)

Gender

21.9%	78.1%

- Male (21.9%)
- Female (78.1%)

EDUCATIONAL ATTAINMENT AND REQUIREMENTS

The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- Generally, the Northeast Minnesota Health Science Technology workforce is fairly closely matched to the education and training required for existing roles
  - 17.5% of Health Science Technology positions require no educational award, and about 13.8% of the workforce holds only a high school diploma or less
  - 42.0% of the Health Science Technology workforce hold a two-year degree or completed some college, compared to 31.9% of local jobs in Health Science Technology that typically require a certificate or two-year degree

Educational Attainment
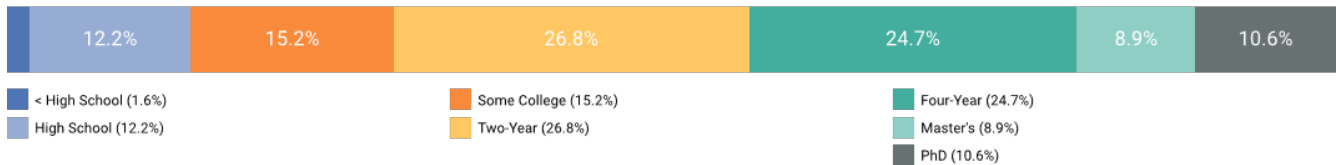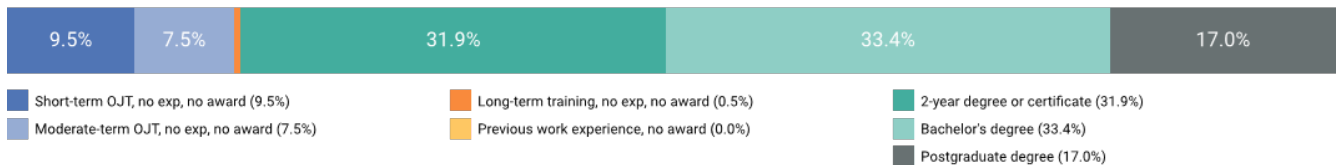
12.2%	15.2%	26.8%	24.7%	8.9%	10.6%

- < High School (1.6%)
- High School (12.2%)
- Some College (15.2%)
- Two-Year (26.8%)
- Four-Year (24.7%)
- Master's (8.9%)
- PhD (10.6%)

Education and Training Requirements

9.5%	7.5%	31.9%	33.4%	17.0%

- Short-term OJT, no exp, no award (9.5%)
- Moderate-term OJT, no exp, no award (7.5%)
- Long-term training, no exp, no award (0.5%)
- Previous work experience, no award (0.0%)
- 2-year degree or certificate (31.9%)
- Bachelor's degree (33.4%)
- Postgraduate degree (17.0%)

OCCUPATION GAPS

The chart below shows the potential average annual talent shortages over ten years.

In the Health Science Technology field, Medical and Health Service Managers and Registered Nurses are the two occupations with the greatest annual shortages in the Northeast. Other occupations of high shortage have remained consistent with prior estimates. The only occupation group not forecasting at least moderate talent shortage in the region is specialized Physician roles.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Health Science Technology, Northeast Minnesota, 2024Q1
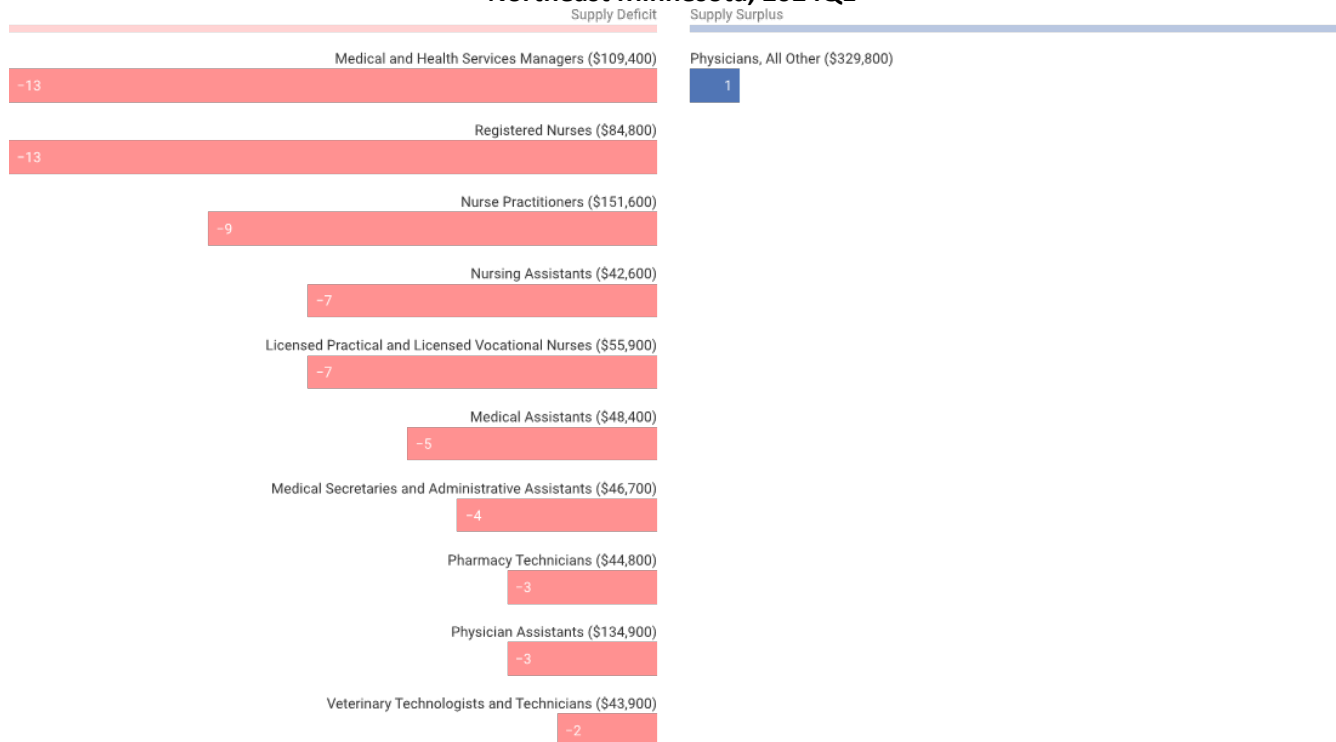
Supply Deficit		Supply Surplus	
Medical and Health Services Managers ($109,400)	−13	Physicians, All Other ($329,800)	1
Registered Nurses ($84,800)	−13		
Nurse Practitioners ($151,600)	−9		
Nursing Assistants ($42,600)	−7		
Licensed Practical and Licensed Vocational Nurses ($55,900)	−7		
Medical Assistants ($48,400)	−5		
Medical Secretaries and Administrative Assistants ($46,700)	−4		
Pharmacy Technicians ($44,800)	−3		
Physician Assistants ($134,900)	−3		
Veterinary Technologists and Technicians ($43,900)	−2		

AWARD GAPS

The chart below shows the shortfall of new postsecondary graduates needed to meet local demand, benchmarked against national average volumes of graduates in the 2022-23 school year.

The Northeast has several Health Science Technology award shortages and some general misalignments:

- All but ten Health Science Technology occupations have a local shortage of new graduates from local postsecondary programs, with local employers likely filling a large share of local job openings with talent trained outside of the region
- Northeast colleges and universities are underproducing about 27 Medical Assistant and 20 Medical Secretary graduates annually that are needed to fill positions open with employers in the region
- Regional postsecondary institutions continue to have a surplus of Registered Nurses, which should help to address the current talent shortage in this occupation in the region and statewide

Award Gaps in Health Science Technology, Northeast Minnesota, 2024Q1
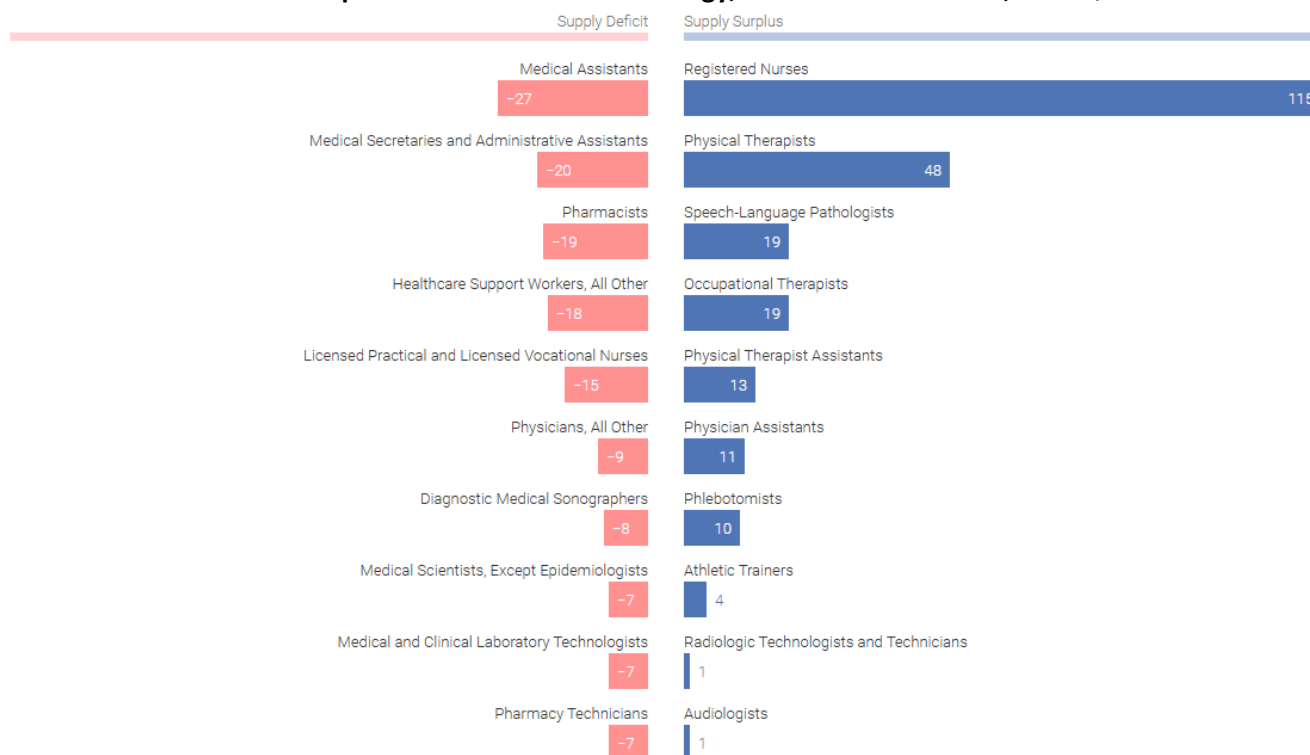
Supply Deficit		Supply Surplus	
Medical Assistants	−27	Registered Nurses	115
Medical Secretaries and Administrative Assistants	−20	Physical Therapists	48
Pharmacists	−19	Speech-Language Pathologists	19
Healthcare Support Workers, All Other	−18	Occupational Therapists	19
Licensed Practical and Licensed Vocational Nurses	−15	Physical Therapist Assistants	13
Physicians, All Other	−9	Physician Assistants	11
Diagnostic Medical Sonographers	−8	Phlebotomists	10
Medical Scientists, Except Epidemiologists	−7	Athletic Trainers	4
Medical and Clinical Laboratory Technologists	−7	Radiologic Technologists and Technicians	1
Pharmacy Technicians	−7	Audiologists	1

ORIGIN, GATEWAY, AND TARGET OCCUPATIONS

This section offers an Origin-to-Gateway-to-Target model analysis for how to help move students from entry points into their field of interest into both likely and other aligned careers, considering automation, remote work, and the changing work environment.

Origin-to-Gateway-to-Target Occupations for Health Science Technology, Northeast Minnesota, 2024Q1

Target Occupations (All HW, HD, HS, OG)
Registered Nurses
Licensed Practical & Licensed Vocational Nurses (AG)
Medical & Health Services Managers
Pharmacists (AG)
Dental Assistants

Gateway Occupations
Medical Secretaries (HD, OG, AG)
Medical Assistants (HS, HD, OG, AG)
Psychiatric Technicians (HS, HD, OG, AG)
Medical Equipment Preparers (HD, AG)
Medical Transcriptionists (HS)

Origin Occupations
Nursing Assistants (HS, HD, OG)
Home Health Aides (HD)
Pharmacy Technicians (OG, AG)
Healthcare Support Workers (HD, AG)
Veterinary Technologists & Technicians (HS, HD, OG, AG)

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

Featured Pathway

Consistent with observations in 2023, the Northeast region's nursing pathway requires further expansion and stabilization to respond to rising demand. The Target occupation of Registered Nurse remains highly concentrated in the Northeast region with a location quotient of 1.59. This role is in high demand and currently experiencing an occupation gap. Licensed Practical and Licensed Vocational Nurse (LPN) median wages are now above the region's overall median wage, making it a Target occupation in the field. LPNs are also more highly concentrated in the Northeast region than a typical community nationwide (LQ 1.33) and are experiencing an occupation gap and award gap. The Origin occupation of Nursing Assistant is an example of a potential feeder occupation into these roles, given overlapping foundational skillsets and training required. Stackability of credentials is vital to building viable career pathways up to Registered Nursing positions at the AS, BSN, or MSN levels.

Origin		Target
Nursing Assistants (HS, HD, OG)	Licensed Practical & Licensed Vocational Nurses (HW, HS, HD, OG, AG)	Registered Nurses (HW, HS, HD, OG)
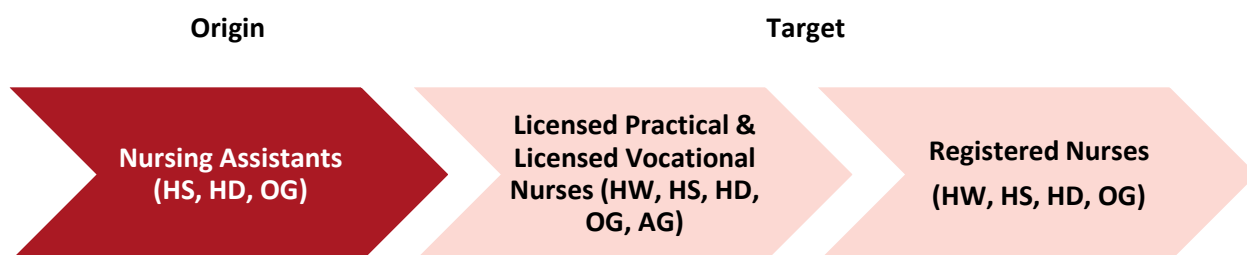
OGT Wages and Experience Level Requirements, Health Science Technology, Northeast Minnesota, 2024Q1

	SOC	Occupation	Empl	Mean	Entry Level	Experienced	10%	25%	50% Median	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Target	29-1141	Registered Nurses	6,154	$84,800	$69,500	$92,400	$68,400	$73,100	$83,700	$92,300	$105,400	BA	None	None
	29-2061	Licensed Practical and Licensed Vocational Nurses	1,062	$55,900	$49,200	$59,300	$48,600	$50,800	$55,100	$60,300	$65,100	Certificate	None	None
	11-9111	Medical and Health Services Managers	783	$109,400	$74,500	$126,800	$71,100	$83,300	$102,800	$118,400	$142,800	BA	< 5 years	None
	29-1051	Pharmacists	500	$143,900	$119,800	$156,000	$112,400	$133,300	$147,300	$161,500	$178,000	PhD	None	None
	31-9091	Dental Assistants	425	$56,700	$47,300	$61,400	$46,500	$49,900	$57,000	$61,700	$65,000	Certificate	None	None
Gateway	43-6013	Medical Secretaries and Administrative Assistants	994	$46,700	$39,500	$50,200	$39,000	$41,300	$46,500	$49,800	$55,400	HS/GED	None	Mod-term OJT
	31-9092	Medical Assistants	709	$48,400	$39,900	$52,600	$37,600	$44,100	$48,000	$55,400	$59,200	Certificate	None	None
	29-2053	Psychiatric Technicians	231	$46,000	$34,000	$52,000	$33,400	$36,500	$46,100	$52,200	$60,900	Certificate	< 5 years	Short-term OJT
	31-9093	Medical Equipment Preparers	135	$46,900	$38,600	$51,100	$38,000	$40,500	$46,100	$50,600	$56,500	HS/GED	None	Mod-term OJT
	31-9094	Medical Transcriptionists	27	$49,400	$40,900	$53,600	$40,700	$42,400	$49,200	$52,300	$61,500	Certificate	None	None
Origin	31-1131	Nursing Assistants	2,306	$42,600	$38,100	$44,900	$37,800	$38,900	$41,000	$46,100	$50,700	Certificate	None	None
	31-1121	Home Health Aides	1,629	$35,700	$30,700	$38,200	$30,500	$31,700	$35,800	$38,500	$41,200	HS/GED	None	Short-term OJT
	29-2052	Pharmacy Technicians	581	$44,800	$37,500	$48,400	$37,400	$38,800	$44,200	$49,500	$52,800	HS/GED	None	Mod-term OJT
	31-9099	Healthcare Support Workers, All Other	299	$43,400	$34,600	$47,800	$32,400	$38,600	$43,100	$50,600	$52,300	HS/GED	None	None
	29-2056	Veterinary Technologists and Technicians	210	$43,900	$37,400	$47,200	$37,000	$38,700	$42,300	$46,700	$54,000	AS	None	None

Human Services

The Human Services field includes a wide range of career pathways sorted into the following career clusters:

- Education and Training
- Law, Public Safety, Corrections, and Security
- Government and Public Administration
- Human Services

EMPLOYMENT FORECAST

Over the next five years, Human Services employment is forecast to grow by 0.1% annually – an improvement from last year's estimated -0.3% decline.

Baseline 5-Year Forecast for Human Services Careers, Northeast Minnesota, 2024Q1
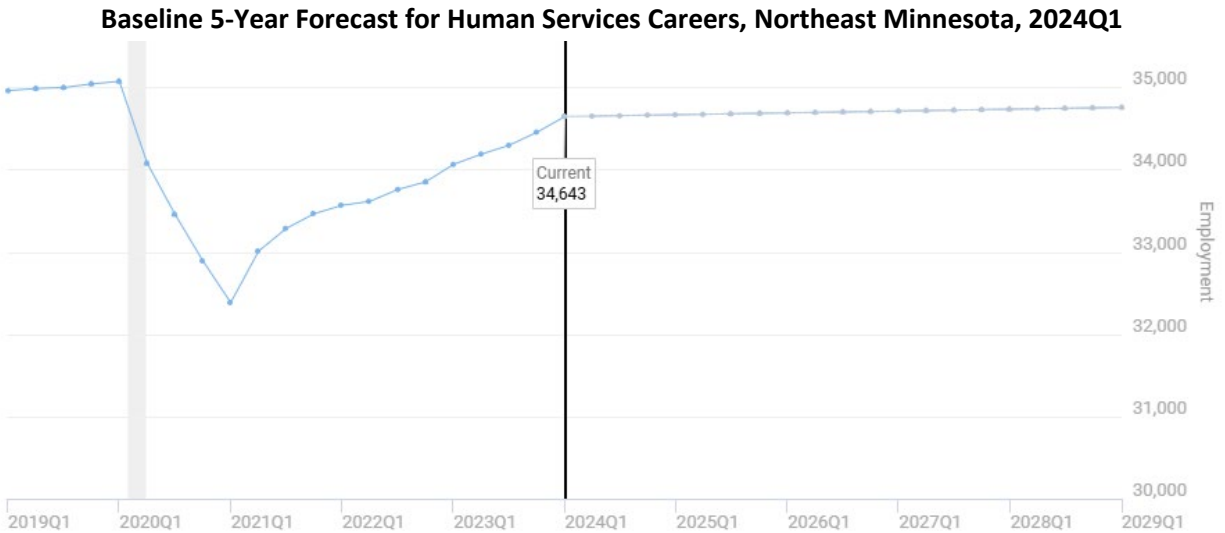
TOP OCCUPATIONS

A total of 34,643 people are employed in Human Services roles regionally, accounting for about 18% of all regional employment. The highest growth of top occupations is expected among Mental Health Counselors (1.3%) and Personal Care Aides (1.1%).

Top Ten Human Services Occupations by Employment Volume, Northeast Minnesota, 2024Q1

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Personal Care Aides	4,611	$35,800	1.34	514	3,583	1.1%
Teaching Assistants, Except Postsecondary	2,235	$39,000	1.47	-42	1,258	-0.2%
Elementary School Teachers, Except Special Education	1,671	$64,600	1.00	-9	534	-0.2%
Secondary School Teachers, Except Special and Career/Technical Education	1,260	$67,000	1.00	-5	367	-0.2%
Childcare Workers	1,130	$30,400	1.14	-146	894	-0.4%
Police and Sheriffs Patrol Officers	1,108	$75,500	1.41	-12	413	-0.1%
Social and Human Service Assistants	1,081	$43,900	2.11	-4	592	0.6%
Substance Abuse, Behavioral Disorder, and Mental Health Counselors	873	$50,200	1.75	52	440	1.3%
Child, Family, and School Social Workers	728	$68,600	1.69	21	298	0.5%
Preschool Teachers, Except Special Education	719	$39,200	1.18	20	376	0.0%
Human Services (CTE Field)	**34,643**	**$55,100**	**1.13**	**-314**	**17,973**	**0.1%**

"Forecast 5-Year Demand" is the projected need for new entrants into an occupation over the next five years. 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 Annual Change" 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).

TOP INDUSTRIES

The largest share of regional Human Services talent in the Northeast is employed by Elementary and Secondary Schools (23.5%) or Executive, Legislative, and Other General Government Support (13.6%). Individual and Family Services continues to have high forecasted growth and replacement demand needs.

Human Services Field Employment by Industry, Northeast Minnesota, 2024Q1

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Elementary and Secondary Schools	23.5%	8,155	6,926	-194	6,732
Executive, Legislative, and Other General Government Support	13.6%	4,721	4,083	-66	4,018
Individual and Family Services	9.6%	3,317	4,253	749	5,002
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	6.8%	2,368	2,846	2	2,848
Other Residential Care Facilities	3.3%	1,130	1,319	-61	1,258
Colleges, Universities, and Professional Schools	3.2%	1,097	910	-9	901
Child Care Services	2.7%	930	1,189	-60	1,129
Religious Organizations	2.7%	925	923	-26	897
Personal Care Services	2.4%	830	1,092	40	1,132
Other Schools and Instruction	2.3%	782	998	5	1,002
Junior Colleges	2.0%	703	582	-20	562
General Medical and Surgical Hospitals	2.0%	701	632	-17	615
Justice, Public Order, and Safety Activities	1.9%	674	556	-33	523
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	1.8%	629	913	106	1,018
Civic and Social Organizations	1.6%	552	850	-10	840
Administration of Environmental Quality Programs	1.5%	523	420	-28	392
Legal Services	1.4%	498	330	-17	313
Outpatient Care Centers	1.4%	480	427	67	494
Home Health Care Services	1.3%	454	652	72	724
Offices of Other Health Practitioners	1.2%	433	375	74	449
All Others	13.7%	4,743	5,221	-71	5,150

CAREER FIELD DEMOGRAPHICS

- The Human Services field is predominantly female (62.6%) and white (92.4%)
- Compared to the workforce statewide, Northeast Minnesota has a slightly larger share of male workers (by 2.2 percentage points)
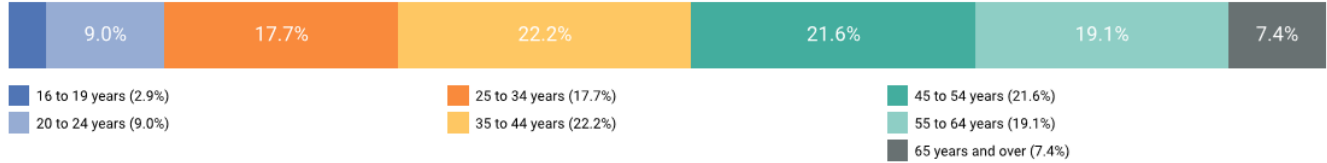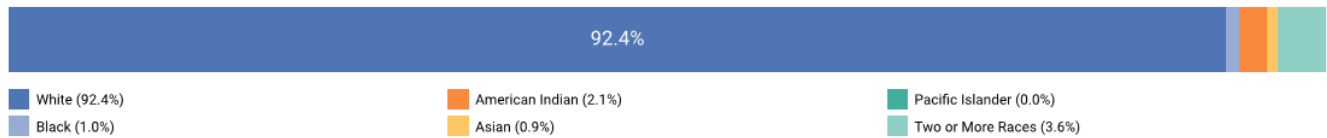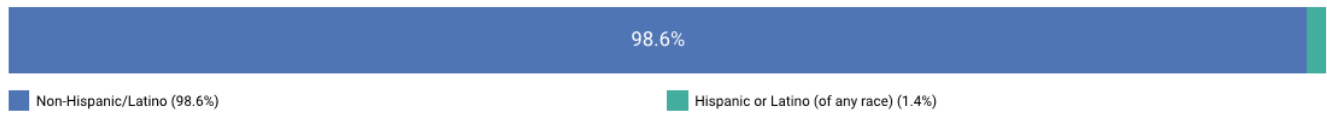
Age

| 9.0% | 17.7% | 22.2% | 21.6% | 19.1% | 7.4% |

- 16 to 19 years (2.9%)
- 20 to 24 years (9.0%)
- 25 to 34 years (17.7%)
- 35 to 44 years (22.2%)
- 45 to 54 years (21.6%)
- 55 to 64 years (19.1%)
- 65 years and over (7.4%)

Race

| 92.4% | | |

- White (92.4%)
- Black (1.0%)
- American Indian (2.1%)
- Asian (0.9%)
- Pacific Islander (0.0%)
- Two or More Races (3.6%)

Ethnicity

| 98.6% | |

- Non-Hispanic/Latino (98.6%)
- Hispanic or Latino (of any race) (1.4%)

Gender

| 37.4% | 62.6% |

- Male (37.4%)
- Female (62.6%)

EDUCATIONAL ATTAINMENT AND REQUIREMENTS

The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- In general, the Northeast Human Services workforce is over-skilled for the typical credentials of Human Services positions
- For example, over half of the Human Services workforce has a four-year degree or more, whereas only 43.9% of jobs require a bachelor's or postgraduate degree
- And while nearly half (46.7%) of jobs require no award at all, only 17.2% of the workforce has no college education

Educational Attainment
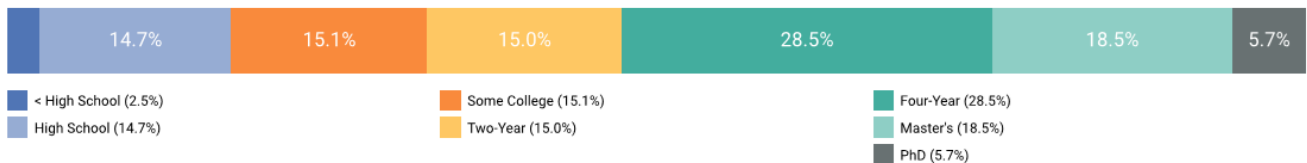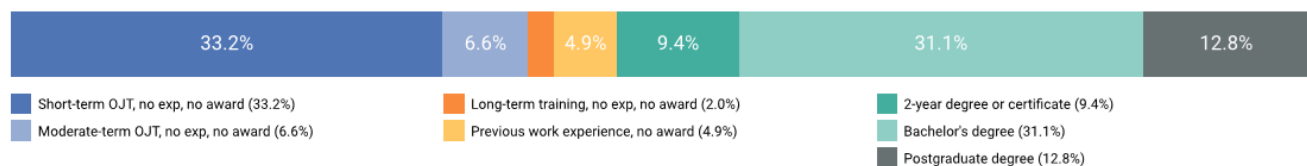
| 14.7% | 15.1% | 15.0% | 28.5% | 18.5% | 5.7% |

- < High School (2.5%)
- High School (14.7%)
- Some College (15.1%)
- Two-Year (15.0%)
- Four-Year (28.5%)
- Master's (18.5%)
- PhD (5.7%)

Education and Training Requirements

| 33.2% | 6.6% | 4.9% | 9.4% | 31.1% | 12.8% |

- Short-term OJT, no exp, no award (33.2%)
- Moderate-term OJT, no exp, no award (6.6%)
- Long-term training, no exp, no award (2.0%)
- Previous work experience, no award (4.9%)
- 2-year degree or certificate (9.4%)
- Bachelor's degree (31.1%)
- Postgraduate degree (12.8%)

OCCUPATION GAPS

The chart below shows the potential average annual talent shortages over ten years.

In Human Services, Mental Health Counselors, Community Service Managers, and Police Officers remain the top occupations of shortage in the region. 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. Ten occupations continue to forecast slight talent surpluses in the region in relation to demand.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Human Services, Northeast Minnesota, 2024Q1

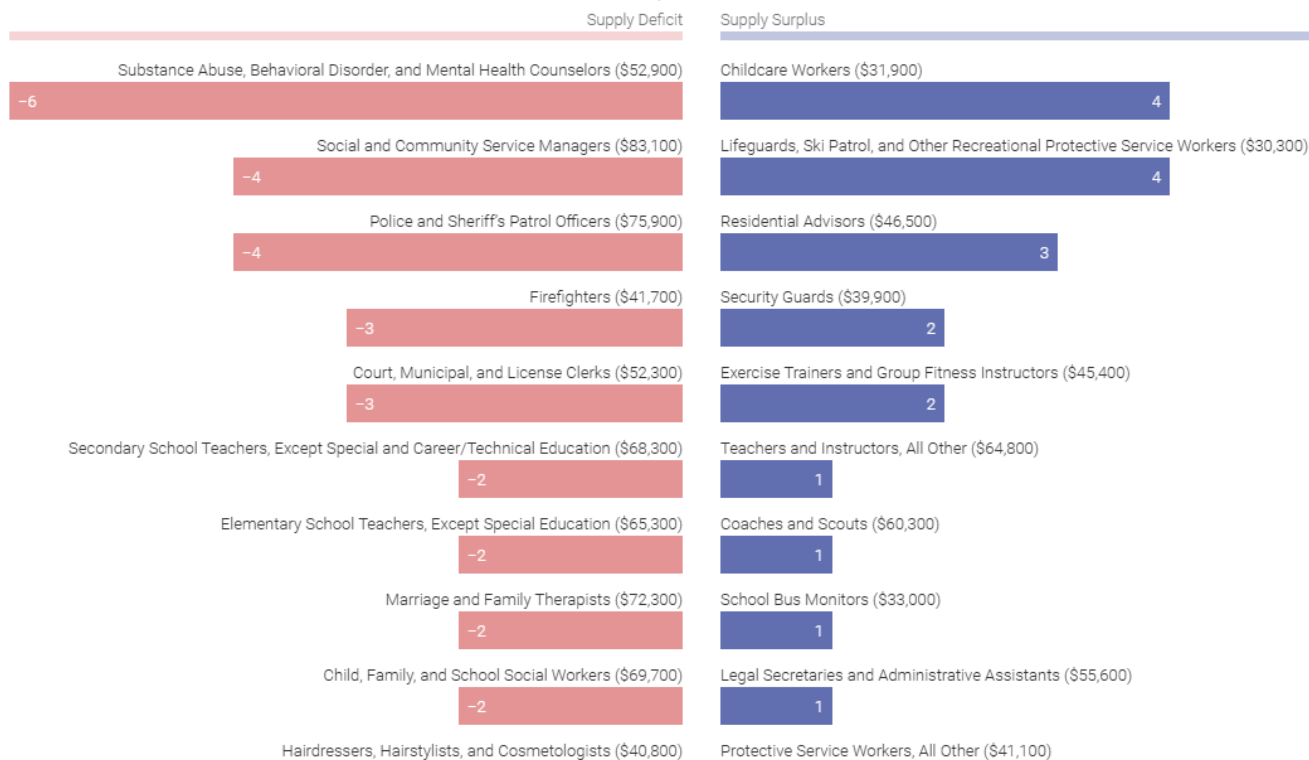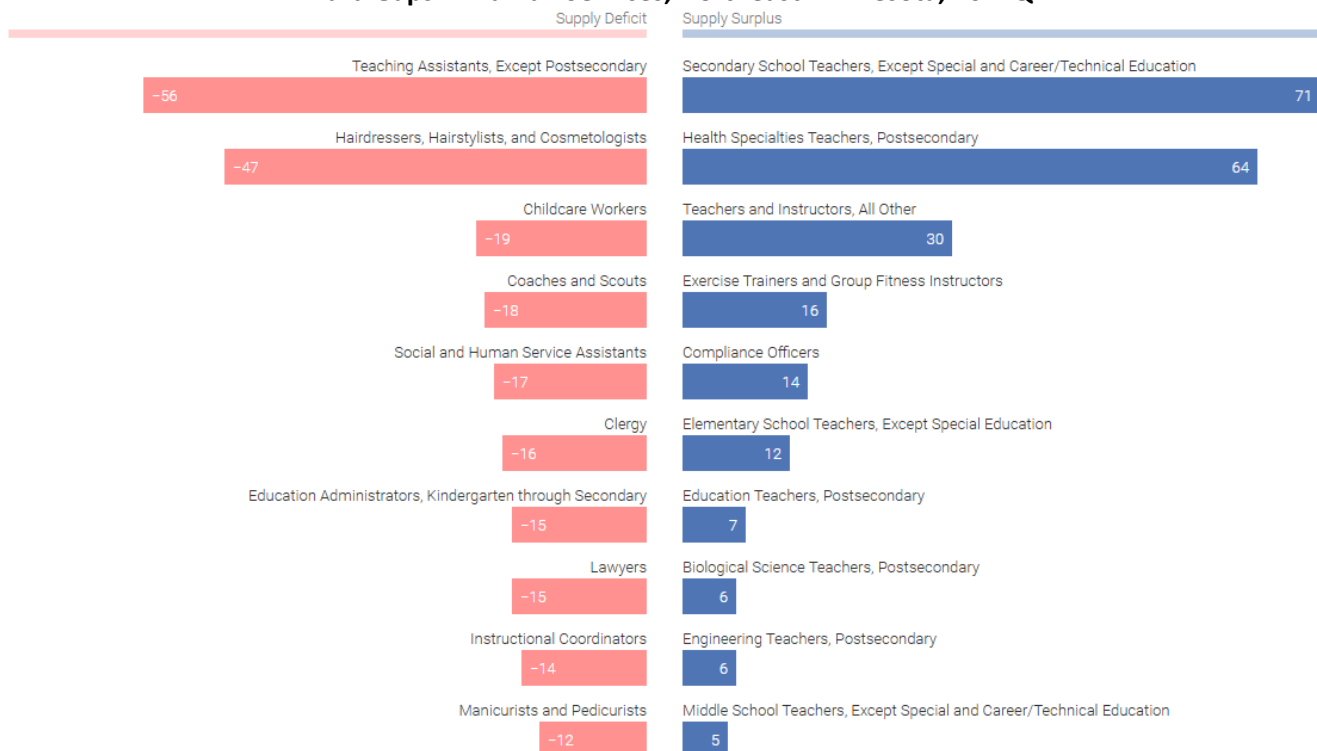| Supply Deficit		Supply Surplus	
Substance Abuse, Behavioral Disorder, and Mental Health Counselors ($52,900)	−6	Childcare Workers ($31,900)	4
Social and Community Service Managers ($83,100)	−4	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers ($30,300)	4
Police and Sheriff's Patrol Officers ($75,900)	−4	Residential Advisors ($46,500)	3
Firefighters ($41,700)	−3	Security Guards ($39,900)	2
Court, Municipal, and License Clerks ($52,300)	−3	Exercise Trainers and Group Fitness Instructors ($45,400)	2
Secondary School Teachers, Except Special and Career/Technical Education ($68,300)	−2	Teachers and Instructors, All Other ($64,800)	1
Elementary School Teachers, Except Special Education ($65,300)	−2	Coaches and Scouts ($60,300)	1
Marriage and Family Therapists ($72,300)	−2	School Bus Monitors ($33,000)	1
Child, Family, and School Social Workers ($69,700)	−2	Legal Secretaries and Administrative Assistants ($55,600)	1
Hairdressers, Hairstylists, and Cosmetologists ($40,800)		Protective Service Workers, All Other ($41,100)	

AWARD GAPS

The chart below shows the shortfall of new postsecondary graduates needed to meet local demand, benchmarked against national average volumes of graduates in the 2022-23 school year.

Northeast Minnesota faces several notable Human Services award shortages and some general misalignments:

- A large share of Human Services occupations have a local shortage of new graduates from local postsecondary programs, with local employers likely filling many local job openings with talent trained outside of the region
- Education and Training occupations are found both in award shortages and surpluses; Northeast colleges and universities are underproducing about 56 graduates annually that are needed to fill Teaching Assistant positions open with employers based in the region, plus Education Administrators, Instructional Coordinators, and Childcare Workers, while Secondary and Middle School Teachers and Postsecondary Health Specialties Teachers graduate in higher number in the Northeast than in an average community with a similar occupational mix nationally

Award Gaps in Human Services, Northeast Minnesota, 2024Q1

Supply Deficit		Supply Surplus	
Teaching Assistants, Except Postsecondary	−56	Secondary School Teachers, Except Special and Career/Technical Education	71
Hairdressers, Hairstylists, and Cosmetologists	−47	Health Specialties Teachers, Postsecondary	64
Childcare Workers	−19	Teachers and Instructors, All Other	30
Coaches and Scouts	−18	Exercise Trainers and Group Fitness Instructors	16
Social and Human Service Assistants	−17	Compliance Officers	14
Clergy	−16	Elementary School Teachers, Except Special Education	12
Education Administrators, Kindergarten through Secondary	−15	Education Teachers, Postsecondary	7
Lawyers	−15	Biological Science Teachers, Postsecondary	6
Instructional Coordinators	−14	Engineering Teachers, Postsecondary	6
Manicurists and Pedicurists	−12	Middle School Teachers, Except Special and Career/Technical Education	5

ORIGIN, GATEWAY, AND TARGET OCCUPATIONS

This section offers an Origin-to-Gateway-to-Target model analysis for how to help move students from entry points into their field of interest into both likely and other aligned careers, considering automation, remote work, and the changing work environment.

Origin-to-Gateway-to-Target Occupations for Human Services, Northeast Minnesota, 2024Q1

Target Occupations (All HW, HS, HD)
Elementary School Teachers
Secondary School Teachers (OG)
Substance Abuse, Behavioral Disorder, & Mental Health Counselors (OG)
Child, Family, & School Social Workers (OG)
Middle School Teachers

Gateway Occupations
Residential Advisors (HD, AG)
Supervisors of Entertainment & Recreation Workers (HD, OG)
Community Health Workers (HD)
Skincare Specialists (HS, HD, AG)
Transportation Security Screeners

Origin Occupations
Personal Care Aides (HD, AG)
Teaching Assistants (HS, HD, AG)
Childcare Workers (AG)
Social & Human Service Assistants (HD, AG)
Preschool Teachers (HS, HD)

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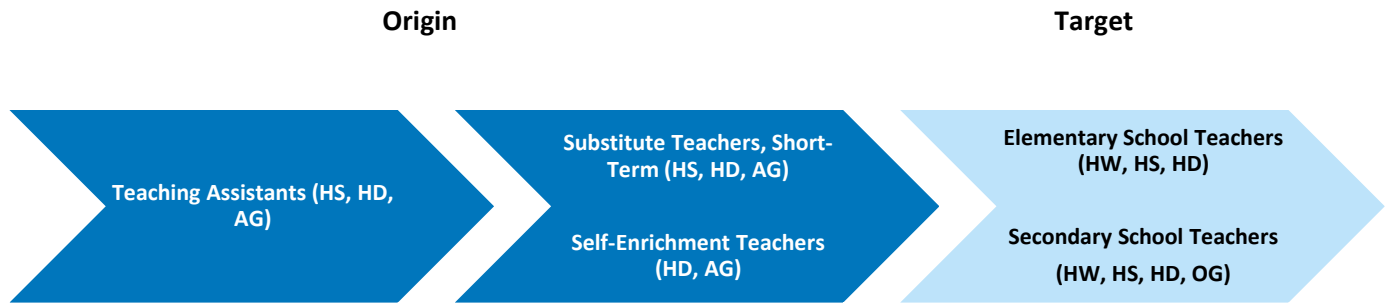
Other Promising Occupations

A number of other Human Services occupations that are high-wage and high-demand, yet do not meet the high-skill threshold to be considered Target Occupations, may be promising careers for students to consider. These occupations may offer a fast track to good jobs for those interested in starting a career in the field without requiring a postsecondary credential. These occupations to consider include:

- Police and Sheriffs Patrol Officers (OG)
- Court Municipal, and License Clerks (OG)
- Eligibility Interviews, Government Program (AG)
- First-Line Supervisors of Police and Detectives (OG)
- First-Line Supervisors of Personal Service Workers (OG, AG)

Featured Pathway

A potential pathway to explore in the Northeast region is the Teaching and Training Pathway. Teaching careers are in high local concentration across the region from preschool through postsecondary education, with shortages observed across the entire pathway. Elementary and Secondary School Teachers are both Target occupations in the region, meaning that median wages for these roles exceed the overall median wage in the Northeast. The region also has a higher-than-normal concentration of Teaching Assistants—47% more in this region than found nationwide. A challenge of this pathway is that there are no aligned Gateway occupations that pay living wages and create a path from Origin occupations into Target occupations, meaning that individuals choosing this career path may experience financial burdens on their career journey. Many of these

roles are experiencing high demand and low local volumes of new graduates entering the field compared to national rates.

Origin   **Target**

Teaching Assistants (HS, HD, AG)

Substitute Teachers, Short-Term (HS, HD, AG)

Self-Enrichment Teachers (HD, AG)

Elementary School Teachers (HW, HS, HD)

Secondary School Teachers (HW, HS, HD, OG)

OGT Wages and Experience Level Requirements, Human Services, Northeast Minnesota, 2024Q1

	SOC	Occupation	Empl	Mean	Entry Level	Experienced	10%	25%	50% Median	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Target	25-2021	Elementary School Teachers, Except Special Education	1,671	$65,300	$48,200	$73,900	$48,100	$51,000	$64,600	$78,700	$82,300	BA	None	None
	25-2031	Secondary School Teachers, Except Special and Career/Technical Education	1,260	$68,300	$49,400	$77,800	$49,000	$52,600	$67,000	$81,700	$86,800	BA	None	None
	21-1018	Substance Abuse, Behavioral Disorder, and Mental Health Counselors	873	$52,900	$43,100	$57,700	$41,500	$46,300	$50,200	$60,000	$68,600	BA	None	None
	21-1021	Child, Family, and School Social Workers	728	$69,700	$50,300	$79,400	$46,900	$57,200	$68,600	$82,000	$85,100	BA	None	None
	25-2022	Middle School Teachers, Except Special and Career/Technical Education	706	$66,400	$47,400	$75,900	$45,900	$52,100	$65,300	$80,800	$86,700	BA	None	None
Gateway	39-9041	Residential Advisors	391	$46,500	$39,200	$50,100	$37,800	$42,200	$46,500	$49,100	$55,700	HS/GED	None	Short-term OJT
	39-1014	First-Line Supervisors of Entertainment and Recreation Workers, Except Gambling Services	180	$50,000	$31,900	$59,000	$27,600	$37,400	$49,200	$61,600	$70,600	HS/GED	< 5 years	None
	21-1094	Community Health Workers	88	$45,900	$30,300	$53,700	$28,200	$33,300	$47,200	$54,500	$62,800	HS/GED	None	Short-term OJT
	39-5094	Skincare Specialists	77	$52,500	$30,600	$63,500	$27,600	$34,700	$47,200	$62,900	$81,300	Certificate	None	None
	33-9093	Transportation Security Screeners	47	$49,200	$40,900	$53,300	$40,000	$43,400	$48,600	$53,500	$60,000	HS/GED	None	Short-term OJT
Origin	31-1122	Personal Care Aides	4,611	$35,700	$30,700	$38,200	$30,500	$31,700	$35,800	$38,500	$41,200	HS/GED	None	Short-term OJT
	25-9045	Teaching Assistants, Except Postsecondary	2,235	$39,200	$32,900	$42,400	$31,200	$36,000	$39,000	$43,000	$47,600	Some college	None	None
	39-9011	Childcare Workers	1,130	$31,900	$27,900	$33,900	$26,700	$29,600	$30,400	$33,600	$38,900	HS/GED	None	Short-term OJT
	21-1093	Social and Human Service Assistants	1,081	$46,800	$37,500	$51,400	$36,400	$39,900	$43,900	$52,400	$62,000	HS/GED	None	Short-term OJT
	25-2011	Preschool Teachers, Except Special Education	719	$42,300	$31,200	$47,900	$30,000	$33,900	$39,200	$47,800	$60,100	AS	None	None

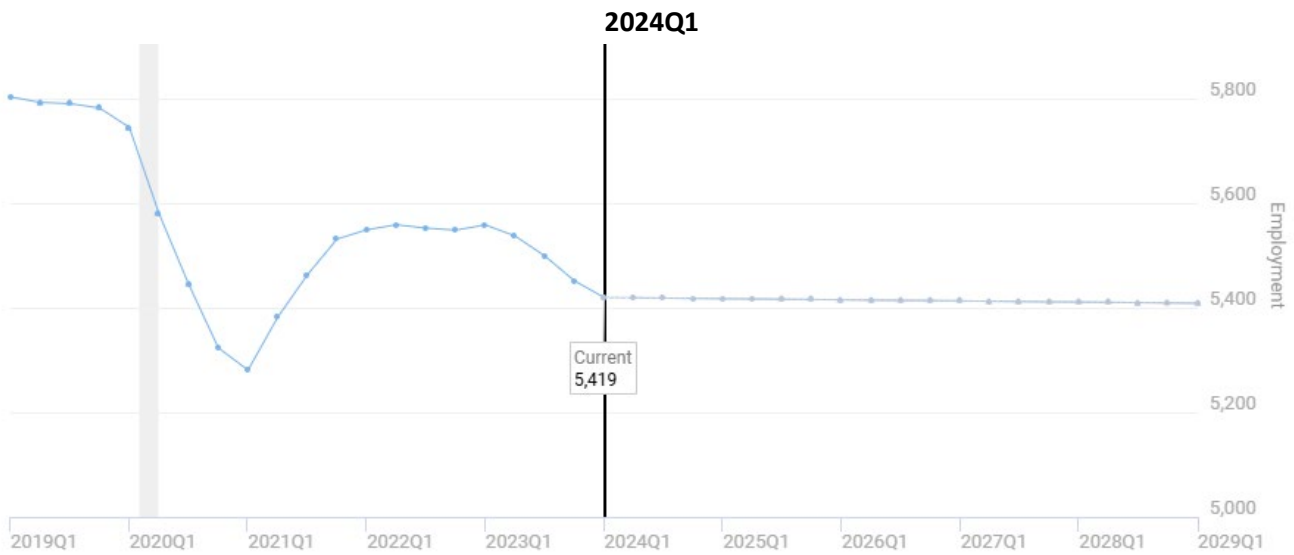# *Arts, Communications, and Information Systems*

Arts, Communications, and Information Systems is a diverse career field with artistic careers as well as Information Technology career paths. The specific career clusters included in this field are:

- Arts, Audio/Video Technology, and Communications
- Information Technology

EMPLOYMENT FORECAST

Over the next five years, Arts, Communications, and Information Systems Field employment is forecast to decline by -0.1% annually, a similar forecast to recent years.

Baseline 5-Year Forecast for Arts, Communications, and Information Systems Careers, Northeast Minnesota, 2024Q1

TOP OCCUPATIONS

A total of 5,419 people are employed in Arts, Communications, and Information Systems roles regionally, accounting for about 3% of all regional employment. This is the smallest CTE Career Field in the Northeast region. The career field has a low concentration in the region (LQ 0.61).

Top Ten Arts, Communications, and Information Systems Occupations by Employment Volume, Northeast Minnesota, 2024Q1

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Software Developers	860	$110,600	0.45	61	306	1.4%
Computer User Support Specialists	491	$61,000	0.57	-7	148	-0.4%
Computer Systems Analysts	455	$100,200	0.73	-39	131	0.0%
Graphic Designers	267	$52,400	0.84	-11	99	-0.4%
Computer Network Support Specialists	262	$73,000	1.26	-21	84	-0.2%
Network and Computer Systems Administrators	206	$87,100	0.51	-23	49	-0.6%
Computer Occupations, All Other	203	$89,700	0.39	-3	63	0.1%
Musicians and Singers	184	$75,200	0.89	-54	113	-0.3%
Photographers	179	$37,200	1.02	2	79	0.1%
Printing Press Operators	175	$45,300	0.97	-21	72	-1.6%
Arts, Communications, & Information Systems (CTE Field)	**5,419**	**$76,200**	**0.61**	**-384**	**2,010**	**-0.1%**

"Forecast 5-Year Demand" is the projected need for new entrants into an occupation over the next five years. 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 Annual Change" 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).

TOP INDUSTRIES

The largest share of talent in the Northeast working in Arts, Communications, and Information Systems roles are employed by Computer Systems Design and Related Services Companies (8.5%) or working as independent artists (6.4%). Overall, employment in this field is relatively spread out across a number of different industries.
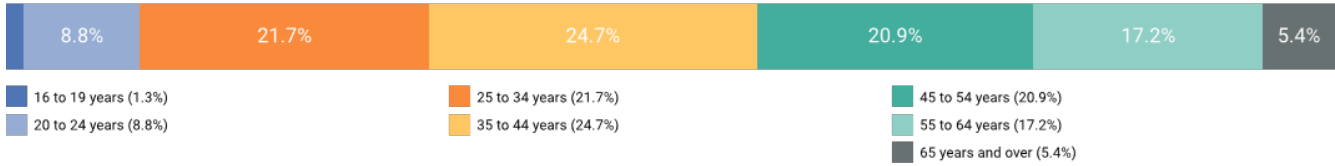
Arts, Communications, and Information Systems Field Employment by Industry, Northeast Minnesota, 2024Q1

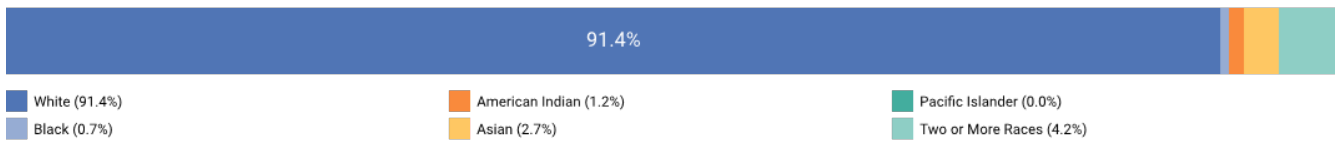| Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Computer Systems Design and Related Services	8.5%	461	285	64	350
Independent Artists, Writers, and Performers	6.4%	347	336	-5	330
Printing and Related Support Activities	4.4%	237	215	-43	172
Wired and Wireless Telecommunications (except Satellite)	4.2%	228	184	-2	182
Executive, Legislative, and Other General Government Support	3.6%	196	124	-1	123
General Medical and Surgical Hospitals	3.6%	193	116	-3	113
Religious Organizations	3.4%	186	195	-6	189
Depository Credit Intermediation	3.4%	184	108	11	119
Other Professional, Scientific, and Technical Services	3.0%	163	136	3	140
Newspaper, Periodical, Book, and Directory Publishers	2.7%	147	127	-29	99
Colleges, Universities, and Professional Schools	2.2%	120	80	-4	76
Architectural, Engineering, and Related Services	2.2%	120	72	4	76
Management of Companies and Enterprises	2.2%	118	74	9	83
Radio and Television Broadcasting Stations	2.0%	109	91	-22	69
Elementary and Secondary Schools	1.9%	105	68	-5	64
Aerospace Product and Parts Manufacturing	1.9%	104	60	6	65
Media Streaming Distribution Services, Social Networks, and Other Media Networks and Content Providers	1.7%	93	77	-1	76
Other Miscellaneous Manufacturing	1.6%	89	70	1	71
Insurance Carriers	1.6%	87	52	4	56
Advertising, Public Relations, and Related Services	1.5%	80	71	3	74
All Others	37.9%	2,055	1,518	-13	1,506

CAREER FIELD DEMOGRAPHICS

- The Arts, Communications, and Information Systems field is predominantly male (72.6%) and white (91.4%), as well as non-Hispanic/Latine (99.0%)
- Compared to the workforce statewide, Northeast Minnesota has a greater share of younger workers under age 25 (by 2.8 percentage points) and older workers age 55+ (by 3.0 percentage points)
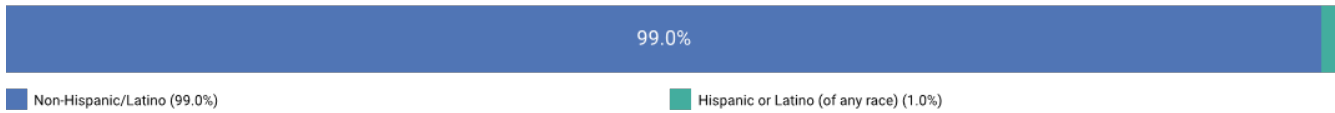
Age

| 8.8% | 21.7% | 24.7% | 20.9% | 17.2% | 5.4% |

- 16 to 19 years (1.3%)
- 20 to 24 years (8.8%)
- 25 to 34 years (21.7%)
- 35 to 44 years (24.7%)
- 45 to 54 years (20.9%)
- 55 to 64 years (17.2%)
- 65 years and over (5.4%)

Race

| 91.4% |

- White (91.4%)
- Black (0.7%)
- American Indian (1.2%)
- Asian (2.7%)
- Pacific Islander (0.0%)
- Two or More Races (4.2%)

Ethnicity

| 99.0% |

- Non-Hispanic/Latino (99.0%)
- Hispanic or Latino (of any race) (1.0%)

Gender

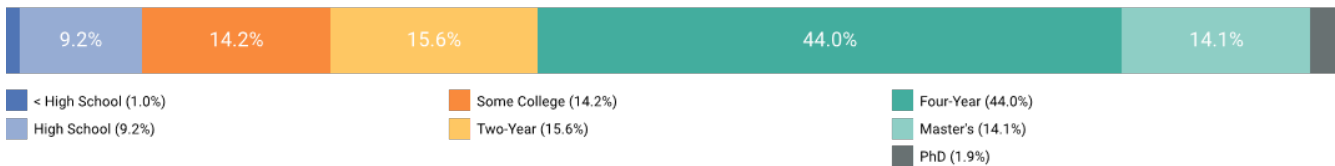| 72.6% | 27.4% |

- Male (72.6%)
- Female (27.4%)

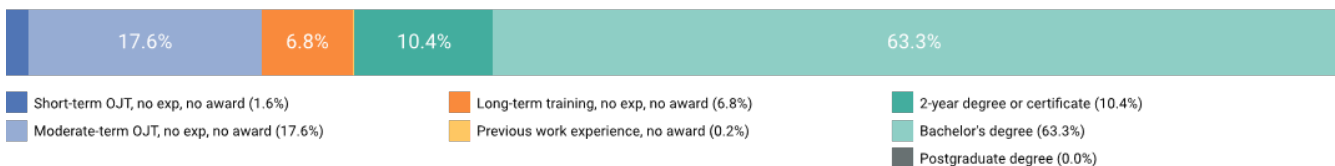## EDUCATIONAL ATTAINMENT AND REQUIREMENTS

The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- The Northeast Minnesota Arts, Communications, and Information Systems workforce is fairly aligned in educational attainment to the requirements in the field, with high overall educational attainment requirements
  - Three out of five (63.3%) positions require a bachelor's degree, while a similar share of the workforce (60.0%) hold a bachelor's degree or higher

Educational Attainment

| 9.2% | 14.2% | 15.6% | 44.0% | 14.1% | |

- < High School (1.0%)
- High School (9.2%)
- Some College (14.2%)
- Two-Year (15.6%)
- Four-Year (44.0%)
- Master's (14.1%)
- PhD (1.9%)

Education and Training Requirements

| 17.6% | 6.8% | 10.4% | 63.3% |

- Short-term OJT, no exp, no award (1.6%)
- Moderate-term OJT, no exp, no award (17.6%)
- Long-term training, no exp, no award (6.8%)
- Previous work experience, no award (0.2%)
- 2-year degree or certificate (10.4%)
- Bachelor's degree (63.3%)
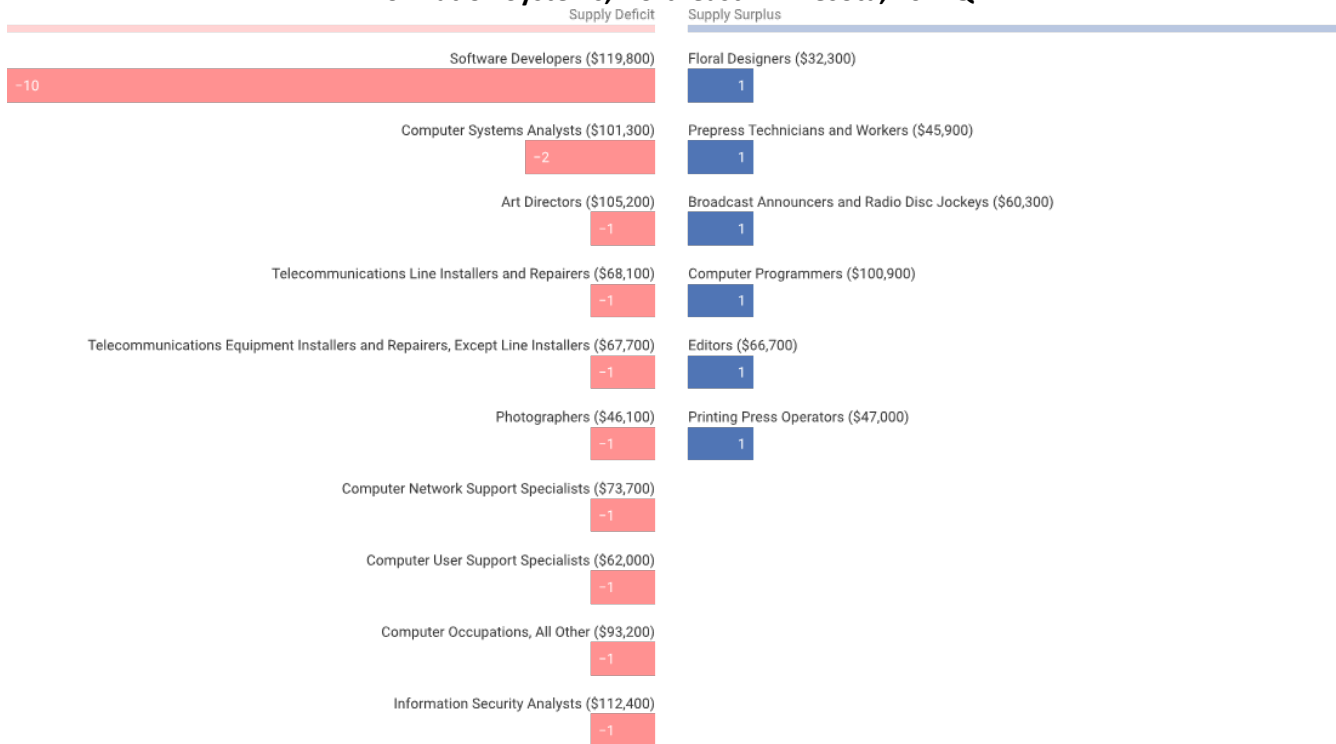- Postgraduate degree (0.0%)

OCCUPATION GAPS

The chart below shows the potential average annual talent shortages 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. The Computer Systems Analyst role has the second greatest forecasted shortage and Web Developers are also newly forecast to have shortages. Shortage and surplus estimates have remained similar to 2023.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Arts, Communications. And Information Systems, Northeast Minnesota, 2024Q1

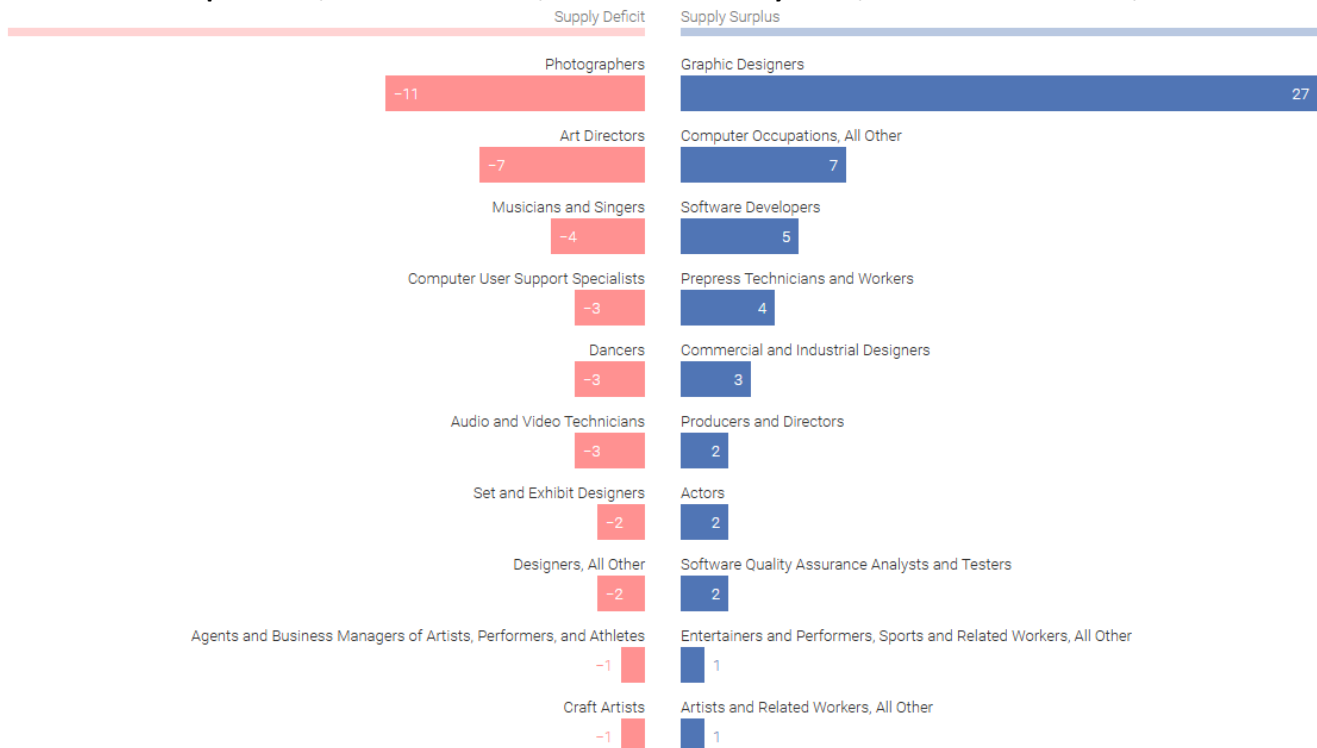| Supply Deficit		Supply Surplus	
Software Developers ($119,800)	-10	Floral Designers ($32,300)	1
Computer Systems Analysts ($101,300)	-2	Prepress Technicians and Workers ($45,900)	1
Art Directors ($105,200)	-1	Broadcast Announcers and Radio Disc Jockeys ($60,300)	1
Telecommunications Line Installers and Repairers ($68,100)	-1	Computer Programmers ($100,900)	1
Telecommunications Equipment Installers and Repairers, Except Line Installers ($67,700)	-1	Editors ($66,700)	1
Photographers ($46,100)	-1	Printing Press Operators ($47,000)	1
Computer Network Support Specialists ($73,700)	-1		
Computer User Support Specialists ($62,000)	-1		
Computer Occupations, All Other ($93,200)	-1		
Information Security Analysts ($112,400)	-1		

AWARD GAPS

The chart below shows the shortfall of new postsecondary graduates needed to meet local demand, benchmarked against national average volumes of graduates in the 2022-23 school year.

The Northeast is underproducing graduates in several Arts, Communications, and Information Systems programs in addition to showing some general misalignments:

- Sixteen out of the fifty-seven occupations in the field (28%) have a smaller volume of recent graduates than the national average: Photographers, Art Directors, Musicians, and Dancers are among the top occupations with smaller than typical volumes of graduates, as well as Computer User Support Specialists and Audio and Video Technicians
- Northeast Minnesota colleges and universities produce a moderate oversupply of local graduates pointed toward careers in Graphic Design, Software Development, and Computer Occupations, largely serving to address the regional talent shortages in these roles

Award Gaps in Arts, Communications, and Information Systems, Northeast Minnesota, 2024Q1

Supply Deficit		Supply Surplus	
Photographers	−11	Graphic Designers	27
Art Directors	−7	Computer Occupations, All Other	7
Musicians and Singers	−4	Software Developers	5
Computer User Support Specialists	−3	Prepress Technicians and Workers	4
Dancers	−3	Commercial and Industrial Designers	3
Audio and Video Technicians	−3	Producers and Directors	2
Set and Exhibit Designers	−2	Actors	2
Designers, All Other	−2	Software Quality Assurance Analysts and Testers	2
Agents and Business Managers of Artists, Performers, and Athletes	−1	Entertainers and Performers, Sports and Related Workers, All Other	1
Craft Artists	−1	Artists and Related Workers, All Other	1

ORIGIN, GATEWAY, AND TARGET OCCUPATIONS

This section offers an Origin-to-Gateway-to-Target model analysis for how to help move students from entry points into their field of interest into both likely and other aligned careers, considering automation, remote work, and the changing work environment.

Origin-to-Gateway-to-Target Occupations for Arts, Communications, and Information Systems, Northeast Minnesota, 2024Q1

Target Occupations (All HW, HS, HD, OG)
Software Developers
Computer Systems Analysts
Computer Network Support Specialists
Computer Occupations, All Other
Telecommunications Equipment Installers

Gateway Occupations
Printing Press Operators
Producers & Directors (HS)
News Analysts, Reporters, & Journalists (HS)
Print Binding & Finishing Workers
Camera Operators, Television, Video, & Film (HS)

Origin Occupations
Photographers (HD, AG)
Audio & Video Technicians (HS, AG)
Floral Designers
Broadcast Announcers & Radio Disc Jockeys (HS)
Prepress Technicians & Workers (HS)

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

Other Promising Occupations

Another Arts, Communications, and Information Systems occupation that is high-wage and in high-demand, yet does not meet the high-skill threshold to be considered a Target Occupation, may be a promising career for students to consider. This occupation may offer a fast track to good jobs for those interested in starting a career in the field without requiring a postsecondary credential. The occupation to consider is:

- Telecommunications Line Installers and Repairers (OG)

Featured Pathway

With a projected occupation gap, high wages, high demand, and high local concentration of opportunities, the occupation of Computer Network Support Specialists remains a promising pathway to explore in the Northeast region. There are about 26% more Computer Network Support Specialists in the region compared to an average community nationally. The Origin occupation of Audio and Visual Technicians is a potential feeder occupation for Computer Network Support Specialists, but this occupation has a shortfall of graduates in this region as compared to national graduate volumes. This may also be a strong feeder occupation for another local Target occupation, Telecommunications Line Installers and Repairers, which is experiencing regional talent shortage.

Origin

Target

Audio & Visual Technicans (HS, AG)

Telecommunications Equipment Installers

(HW, HS, HD, OG)

Computer Network Support Specialists

(HW, HS, HD, OG)

OGT Wages and Experience Level Requirements, Arts, Communications, and Information Systems, Northeast Minnesota, 2024Q1

|	SOC	Occupation	Empl	Mean	Entry Level	Experienced	10%	25%	50% Median	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Target	15-1252	Software Developers	860	$119,800	$79,800	$139,800	$76,000	$89,400	$110,600	$151,900	$178,300	BA	None	None
	15-1211	Computer Systems Analysts	455	$101,300	$68,800	$117,600	$65,300	$78,100	$100,200	$127,100	$139,900	BA	None	None
	15-1231	Computer Network Support Specialists	262	$73,700	$55,200	$83,000	$50,900	$63,300	$73,000	$81,400	$95,200	AS	None	Mod-term OJT
	15-1299	Computer Occupations, All Other	203	$93,200	$57,100	$111,300	$50,700	$69,400	$89,700	$113,200	$140,000	BA	None	None
	49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	124	$67,700	$49,800	$76,700	$46,600	$56,300	$66,900	$82,300	$85,000	Certificate	None	Mod-term OJT
Gateway	51-5112	Printing Press Operators	175	$47,000	$35,200	$52,900	$35,000	$37,000	$45,300	$53,800	$67,300	HS/GED	None	Mod-term OJT
	27-2012	Producers and Directors	96	$54,600	$34,000	$64,900	$32,800	$37,100	$45,700	$69,600	$88,900	BA	< 5 years	None
	27-3023	News Analysts, Reporters, and Journalists	51	$72,200	$33,800	$91,400	$32,300	$37,200	$49,400	$71,900	$118,000	BA	None	None
	51-5113	Print Binding and Finishing Workers	46	$46,700	$38,800	$50,600	$37,700	$41,200	$45,500	$52,200	$55,800	HS/GED	None	Mod-term OJT
	27-4031	Camera Operators, Television, Video, and Film	25	$56,500	$33,300	$68,100	$30,800	$37,900	$48,500	$74,400	$99,500	BA	None	None
Origin	27-4021	Photographers	179	$46,100	$28,200	$55,100	$27,200	$30,300	$37,200	$56,000	$84,800	HS/GED	None	Mod-term OJT
	27-4011	Audio and Video Technicians	75	$49,600	$37,100	$55,900	$37,400	$37,700	$43,000	$54,400	$72,300	Certificate	None	Short-term OJT
	27-1023	Floral Designers	64	$32,300	$26,100	$35,500	$24,100	$28,500	$31,900	$34,800	$37,600	HS/GED	None	Mod-term OJT
	27-3011	Broadcast Announcers and Radio Disc Jockeys	57	$60,300	$27,700	$76,700	$25,000	$30,800	$41,000	$57,600	$90,500	BA	None	None
	51-5111	Prepress Technicians and Workers	48	$45,900	$34,900	$51,500	$33,500	$38,000	$43,600	$53,200	$59,500	Certificate	None	None

Business, Management, and Administration

Business, Management, and Administration is a diverse career field with the following career clusters:

- Hospitality and Tourism
- Finance
- Marketing
- Business, Management, and Administration

EMPLOYMENT FORECAST

Over the next five years, Business, Management, and Administration Field employment is forecast to decline by -0.6%, a slight improvement from the -1.0% decline which was forecast one year ago.

Baseline 5-Year Forecast for Business, Management, and Administration Careers, Northeast Minnesota 2024Q1
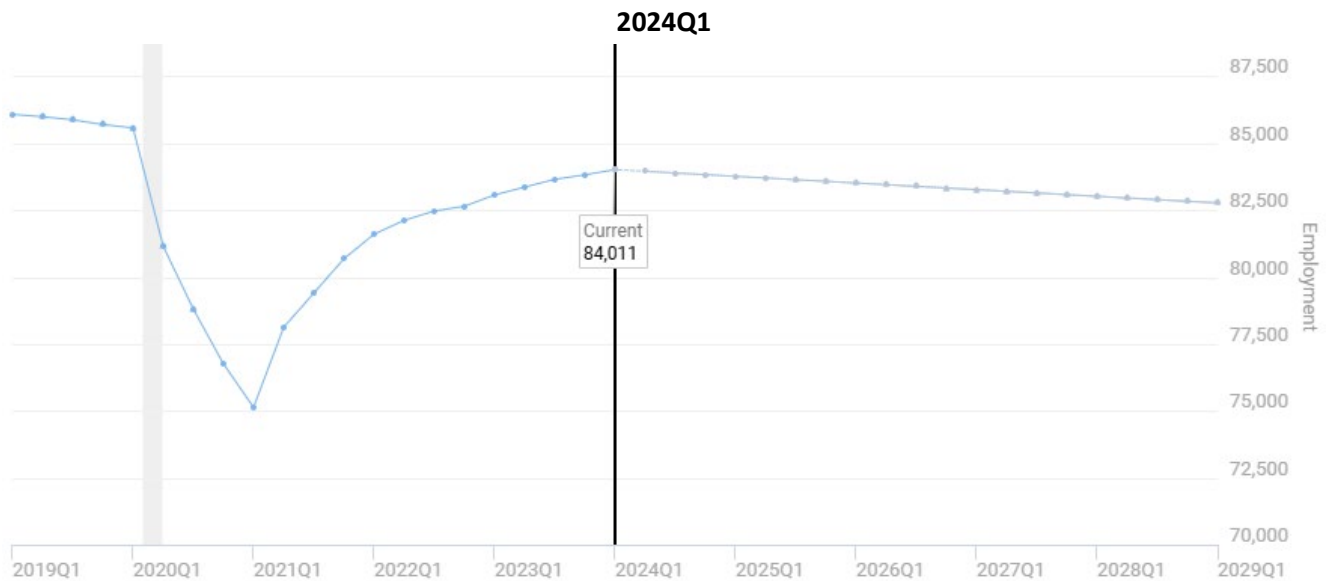
TOP OCCUPATIONS

A total of 84,011 people are employed in Business, Management and Administration Systems roles regionally, accounting for about 43% of all regional employment. While most occupations on this list are projected to decline, Restaurant Cooks are forecast to grow by 1.3%.

Top Ten Business, Management, and Administration Systems Occupations by Employment Volume in Northeast Minnesota, 2024Q1

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Retail Salespersons	5,240	$34,600	1.18	-366	3,498	-0.7%
Cashiers	5,162	$30,700	1.29	-252	4,309	-1.4%
General and Operations Managers	4,131	$79,700	0.99	581	1,563	-0.2%
Fast Food and Counter Workers	3,704	$30,500	0.90	-74	4,052	-0.4%
Waiters and Waitresses	3,624	$23,800	1.35	-371	3,486	-0.8%
Office Clerks, General	3,268	$44,800	1.03	-240	1,650	-1.2%
Stockers and Order Fillers	2,897	$38,100	0.85	284	2,350	0.1%
Customer Service Representatives	2,774	$44,400	0.80	19	1,571	-1.3%
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2,694	$37,700	0.94	-131	1,794	-0.4%
Cooks, Restaurant	2,364	$37,200	1.42	164	2,021	1.3%
Business, Management, & Administration (CTE Field)	**84,011**	**$48,700**	**0.97**	**-2,067**	**52,278**	**-0.6%**

"Forecast 5-Year Demand" is the projected need for new entrants into an occupation over the next five years. 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 Annual Change" 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).

TOP INDUSTRIES

In the Northeast, the industries with the greatest share of Business, Management, and Administration talent are Restaurants (15.6%) and Traveler Accommodation (6.3%), 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, as restaurants alone account for well over half of future positions needing to be filled in this field. Beyond Restaurants and Traveler Accommodation, current Business, Management and Administration employment is relatively spread out over many different industries.
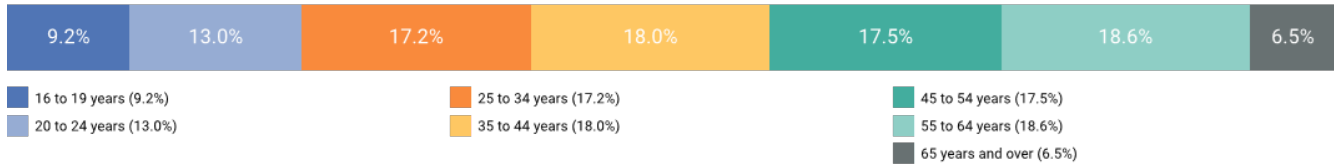
Business, Management, and Administration Field Employment by Industry, Northeast Minnesota, 2024Q1

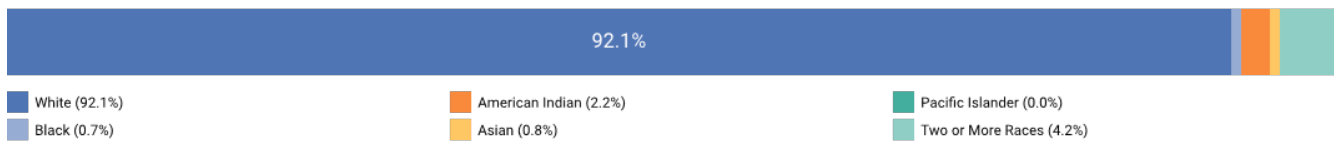| Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Restaurants and Other Eating Places	15.6%	13,090	23,664	-465	23,199
Traveler Accommodation	6.3%	5,331	7,827	-100	7,727
Warehouse Clubs, Supercenters, and Other General Merchandise Retailers	3.6%	2,988	4,357	-207	4,150
Grocery and Convenience Retailers	3.4%	2,865	4,459	-209	4,250
Gasoline Stations	3.2%	2,678	4,395	-280	4,115
General Medical and Surgical Hospitals	3.0%	2,482	2,882	-193	2,689
Executive, Legislative, and Other General Government Support	2.9%	2,465	2,793	-172	2,621
Building Material and Supplies Dealers	2.6%	2,221	3,027	-96	2,932
Depository Credit Intermediation	2.5%	2,105	1,757	-152	1,606
Elementary and Secondary Schools	1.9%	1,584	2,005	-135	1,870
Agencies, Brokerages, and Other Insurance Related Activities	1.8%	1,509	1,352	41	1,394
Other Amusement and Recreation Industries	1.7%	1,422	2,601	23	2,624
Services to Buildings and Dwellings	1.4%	1,207	1,539	-60	1,478
Drinking Places (Alcoholic Beverages)	1.4%	1,199	1,978	-47	1,930
Department Stores	1.4%	1,197	1,728	-114	1,614
Gambling Industries	1.4%	1,191	1,659	-179	1,480
Civic and Social Organizations	1.4%	1,176	1,682	-45	1,637
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	1.2%	1,020	1,538	43	1,581
Sporting Goods, Hobby, and Musical Instrument Retailers	1.1%	906	1,182	-70	1,112
Automobile Dealers	1.1%	886	1,023	-60	964
All Others	41.1%	34,488	35,958	-2,248	33,709

CAREER FIELD DEMOGRAPHICS

- The Business, Management, and Administration field is evenly balanced by gender overall, but with occupational segregation at the six-digit occupational level with more executive leadership and management roles held by male workers
- Compared to the workforce statewide, Northeast Minnesota's Business, Management, and Administration workforce is much less diverse by race and ethnicity than the average, with a lower share of the available Black, Asian, and Hispanic/Latine workforce working in this field
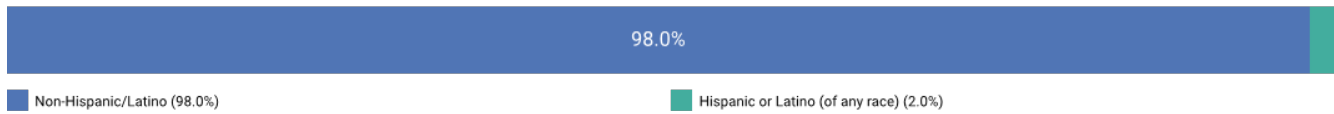
Age

| 9.2% | 13.0% | 17.2% | 18.0% | 17.5% | 18.6% | 6.5% |

- 16 to 19 years (9.2%)
- 20 to 24 years (13.0%)
- 25 to 34 years (17.2%)
- 35 to 44 years (18.0%)
- 45 to 54 years (17.5%)
- 55 to 64 years (18.6%)
- 65 years and over (6.5%)

Race

| 92.1% | | |

- White (92.1%)
- Black (0.7%)
- American Indian (2.2%)
- Asian (0.8%)
- Pacific Islander (0.0%)
- Two or More Races (4.2%)

Ethnicity

| 98.0% | |

- Non-Hispanic/Latino (98.0%)
- Hispanic or Latino (of any race) (2.0%)

Gender

| 45.8% | 54.2% |

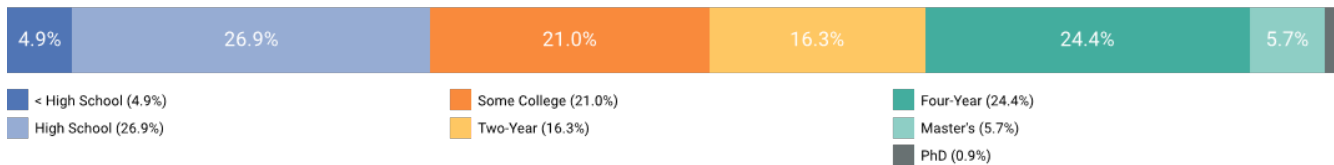- Male (45.8%)
- Female (54.2%)

EDUCATIONAL ATTAINMENT AND REQUIREMENTS

The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- The Northeast Minnesota Business, Management, and Administration workforce is fairly aligned in educational attainment to the requirements in the field, with a mix of opportunities at the entry, mid-level, and experienced levels; there is evidence that there may be a significant number of underemployed workers in this field regionally
  - About half (52.8%) of Business, Management, and Administration talent working in the region do not hold a postsecondary credential beyond a certificate, while 79.5% of positions in this field require no postsecondary credential

Educational Attainment

| 4.9% | 26.9% | 21.0% | 16.3% | 24.4% | 5.7% |

- < High School (4.9%)
- High School (26.9%)
- Some College (21.0%)
- Two-Year (16.3%)
- Four-Year (24.4%)
- Master's (5.7%)
- PhD (0.9%)

Education and Training Requirements

| 59.7% | 7.9% | 11.6% | 20.3% |

- Short-term OJT, no exp, no award (59.7%)
- Moderate-term OJT, no exp, no award (7.9%)
- Long-term training, no exp, no award (0.3%)
- Previous work experience, no award (11.6%)
- 2-year degree or certificate (0.2%)
- Bachelor's degree (20.3%)
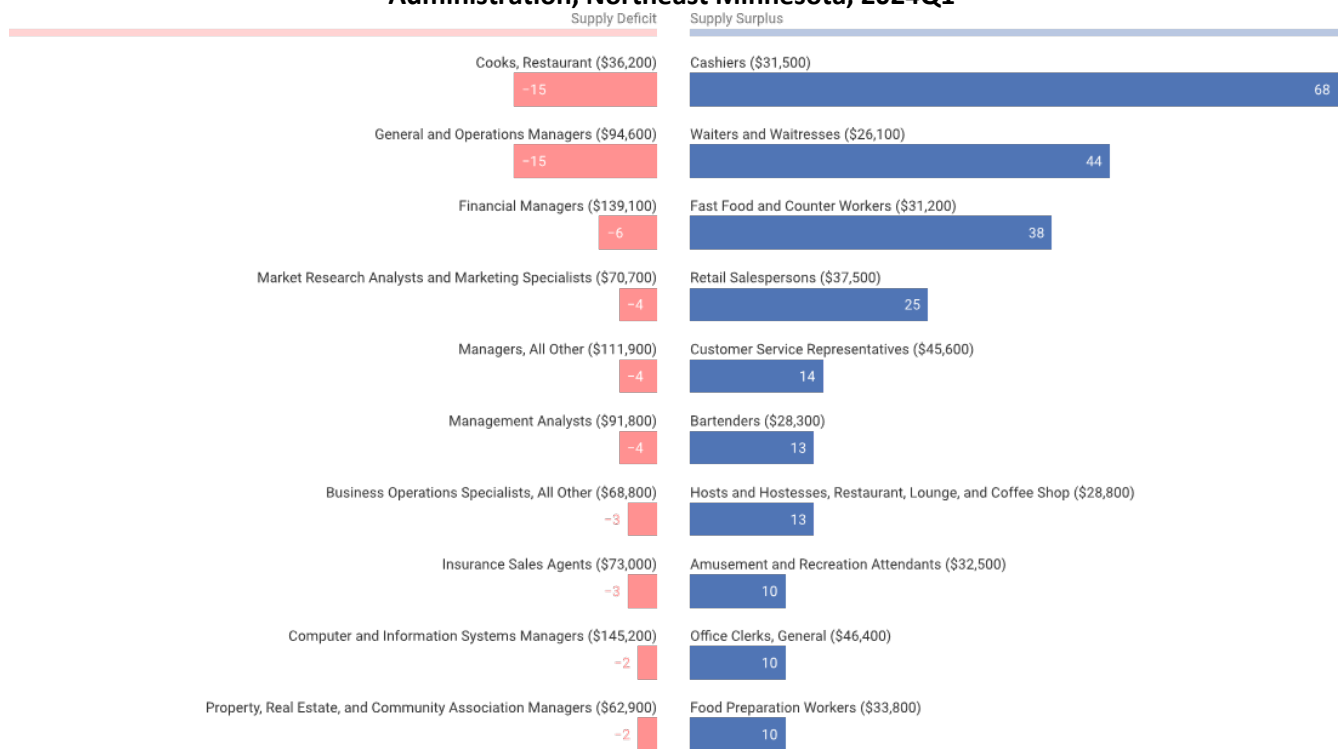- Postgraduate degree (0.0%)

OCCUPATION GAPS

The chart below shows the potential average annual talent shortages over ten years.

Many management roles indicate moderate shortages in the years ahead, for example, the General and Operations Manager talent pool in this region will likely fall short at least 15 skilled workers needed annually to meet employer demand. Occupations shortage forecasts have remained consistent in comparison to 2023 estimates.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Business, Management, and Administration, Northeast Minnesota, 2024Q1

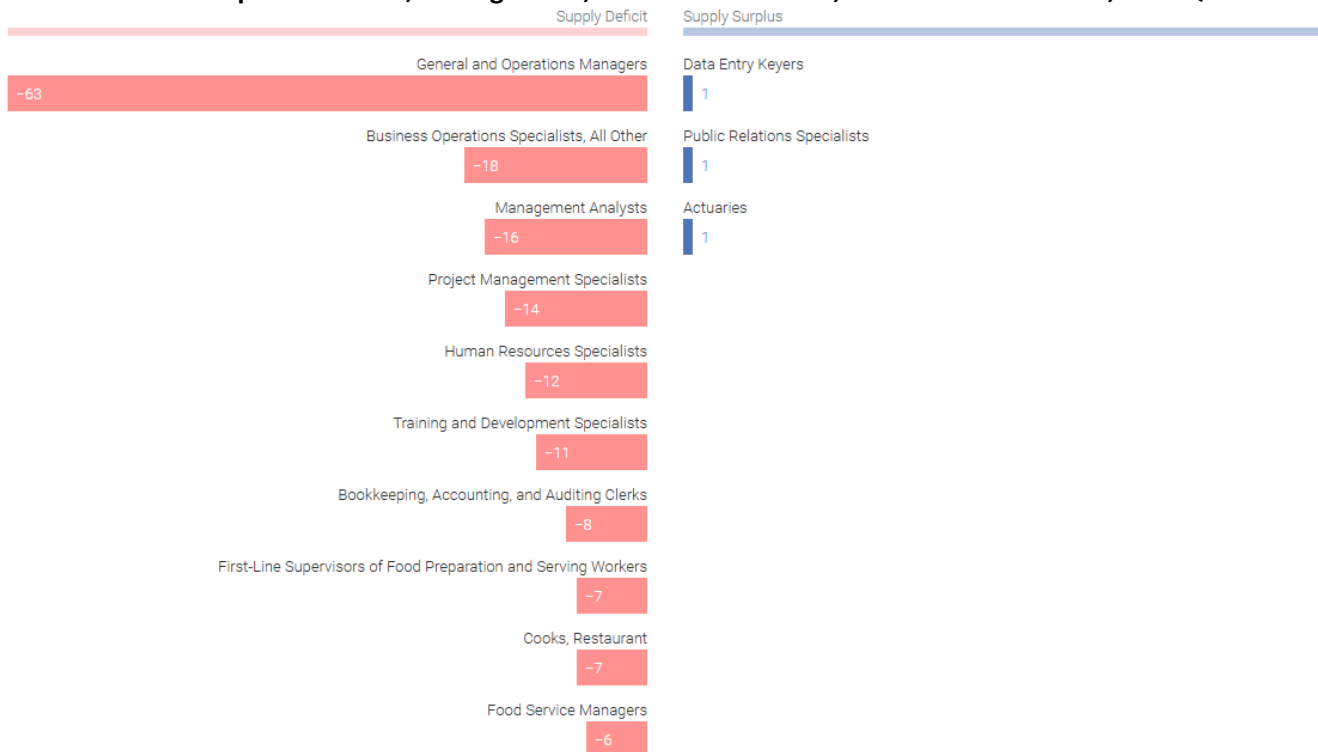| Supply Deficit		Supply Surplus	
Cooks, Restaurant ($36,200)	−15	Cashiers ($31,500)	68
General and Operations Managers ($94,600)	−15	Waiters and Waitresses ($26,100)	44
Financial Managers ($139,100)	−6	Fast Food and Counter Workers ($31,200)	38
Market Research Analysts and Marketing Specialists ($70,700)	−4	Retail Salespersons ($37,500)	25
Managers, All Other ($111,900)	−4	Customer Service Representatives ($45,600)	14
Management Analysts ($91,800)	−4	Bartenders ($28,300)	13
Business Operations Specialists, All Other ($68,800)	−3	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop ($28,800)	13
Insurance Sales Agents ($73,000)	−3	Amusement and Recreation Attendants ($32,500)	10
Computer and Information Systems Managers ($145,200)	−2	Office Clerks, General ($46,400)	10
Property, Real Estate, and Community Association Managers ($62,900)	−2	Food Preparation Workers ($33,800)	10

AWARD GAPS

The chart below shows the shortfall of new postsecondary graduates needed to meet local demand, benchmarked against national average volumes of graduates in the 2022-23 school year.

The Northeast faces several shortages in Business, Management and Administration awards:

- Most notably, when benchmarked nationally, Northeast regional colleges and universities are underproducing around 63 graduates annually that are needed to fill General and Operations Manager positions, an increase in award gaps from 2023 (shortfall of 59) and 2022 (shortfall of 24).
- Among the six career fields, this field has the smallest number of roles with a comparative surplus of new graduates

Award Gaps in Business, Management, and Administration, Northeast Minnesota, 2024Q1

Supply Deficit		Supply Surplus	
General and Operations Managers	−63	Data Entry Keyers	1
Business Operations Specialists, All Other	−18	Public Relations Specialists	1
Management Analysts	−16	Actuaries	1
Project Management Specialists	−14		
Human Resources Specialists	−12		
Training and Development Specialists	−11		
Bookkeeping, Accounting, and Auditing Clerks	−8		
First-Line Supervisors of Food Preparation and Serving Workers	−7		
Cooks, Restaurant	−7		
Food Service Managers	−6		

ORIGIN, GATEWAY, AND TARGET OCCUPATIONS

This section offers an Origin-to-Gateway-to-Target model analysis for how to help move students from entry points into their field of interest into both likely and other aligned careers, considering automation, remote work, and the changing work environment.

Origin-to-Gateway-to-Target Occupations for Business, Management, and Administration, Northeast Minnesota, 2024Q1

Target Occupations (All HW, HS, HD, OG)
General & Operations Managers (AG)
Accountants & Auditors
Managers, All Other
Business Operations Specialists (AG)
Management Analysts (AG)

Gateway Occupations
Secretaries & Administrative Assistants (AG)
Supervisors of Retail Workers (HD)
Bookkeeping, Accounting, & Auditing Clerks (HS, AG)
Billing & Posting Clerks
Supervisors of Housekeeping & Janitorial Workers (HD, OG)

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

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

Other Promising Occupations

A number of other Business, Management, and Administration occupations that are high-wage and high-demand, yet do not meet the high-skill threshold to be considered Target Occupations, may be promising careers for students to consider. These occupations may offer a fast track to good jobs for those interested in starting a career in the field without requiring a postsecondary credential. These occupations to consider include:

- Insurance Sales Agents (OG, AG)
- Real Estate Sales Agents (OG, AG)
- Property, Real Estate, and Community Association Managers (OG, AG)
- Chefs and Head Cooks
- Food Service Managers (AG)

Featured Pathway

Shortfall of postsecondary graduates have been exacerbated across this career field compared to prior years, with many Target occupations seeing fewer local postsecondary graduates than national averages for a community of the region's size and industry mix. Careers in the Hospitality and Tourism career cluster are overrepresented in the Northeast region by about 25% in comparison to the national average; however, this cluster's median annual wages are about $32,200 and many roles have elevated unemployment rates across the region. Addressing low wages and increasing cross-pathway access to higher-wage, higher-growth

occupations in other Business, Management, and Administration career clusters will ensure that the local hospitality and tourism industries continue to have sustained talent pools.

With a projected occupation gap, a projected award gap, and high demand the Target occupation of General and Operations Managers is a promising pathway to explore in the Northeast region. This occupation is relatively concentrated in the region with a location quotient of 0.98. The Gateway occupation of First-Line Supervisors of Retail Sales Workers is highly concentrated locally (LQ 1.21) and is also in high demand. Two Origin occupations with related skillsets in the region are also in high demand—Retail Salespersons and Fast-Food Workers. These retail Origin and Gateway occupations are a potential entry point for the Target occupation of General Operations Managers, recognizing that this role typically has an education requirement of a bachelor's degree, but that opportunities to expand skill-based hiring are increasing in popularity statewide.

Origin	Gateway	Target
Retail Salespersons (HD) Fast Food & Counter Workers (HD)	Supervisors of Retail Workers (HD)	General & Operations Managers (HW, HS, HD, OG, AG)

RealTime Talent

OGT Wages and Experience Level Requirements, Business, Management, and Administration, Northeast Minnesota, 2024Q1

	SOC	Occupation	Empl	Mean	Entry Level	Experienced	10%	25%	50% Median	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Target	11-1021	General and Operations Managers	4,131	$94,600	$44,900	$119,400	$40,400	$53,800	$79,700	$116,900	$168,400	BA	> 5 years	None
	13-2011	Accountants and Auditors	1,418	$79,100	$51,200	$93,100	$48,300	$58,100	$72,300	$91,800	$117,000	BA	None	None
	11-9199	Managers, All Other	1,011	$111,900	$73,300	$131,200	$70,100	$83,000	$109,400	$129,100	$157,400	BA	< 5 years	None
	13-1199	Business Operations Specialists, All Other	989	$68,800	$47,200	$79,600	$46,000	$51,500	$64,700	$80,300	$103,400	BA	None	None
	13-1111	Management Analysts	810	$91,800	$64,000	$105,800	$62,600	$68,700	$82,600	$103,900	$127,900	BA	< 5 years	None
Gateway	43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	2,188	$48,100	$36,400	$53,900	$34,600	$40,400	$47,900	$52,500	$60,300	HS/GED	None	Short-term OJT
	41-1011	First-Line Supervisors of Retail Sales Workers	2,012	$49,200	$37,000	$55,300	$36,300	$39,400	$46,400	$54,700	$65,100	HS/GED	< 5 years	None
	43-3031	Bookkeeping, Accounting, and Auditing Clerks	1,715	$49,700	$35,400	$56,800	$33,000	$40,100	$48,400	$57,600	$65,200	Some college	None	Mod-term OJT
	43-3021	Billing and Posting Clerks	348	$50,700	$41,100	$55,500	$39,500	$44,200	$48,900	$58,400	$62,300	HS/GED	None	Mod-term OJT
	37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	322	$48,500	$35,500	$55,000	$34,000	$39,000	$45,700	$59,200	$65,400	HS/GED	< 5 years	None
Origin	41-2031	Retail Salespersons	5,240	$37,500	$28,000	$42,200	$27,200	$30,000	$34,600	$39,000	$49,200	None	None	Short-term OJT
	41-2011	Cashiers	5,162	$31,500	$27,000	$33,700	$25,700	$29,100	$30,700	$34,800	$37,100	None	None	Short-term OJT
	35-3023	Fast Food and Counter Workers	3,704	$31,200	$26,700	$33,500	$24,900	$29,000	$30,500	$35,100	$36,800	None	None	Short-term OJT
	35-3031	Waiters and Waitresses	3,624	$26,100	$23,300	$27,500	$23,300	$23,400	$23,800	$27,700	$32,500	None	None	Short-term OJT
	43-9061	Office Clerks, General	3,268	$46,400	$33,900	$52,700	$32,000	$37,800	$44,800	$51,900	$63,000	HS/GED	None	Short-term OJT

RealTime Talent

Engineering, Manufacturing, and Technology

Engineering, Manufacturing, and Technology is a wide career field with the following career clusters:

- Transportation, Distribution, and Logistics
- Architecture and Construction
- Manufacturing
- Science, Technology, Engineering, and Mathematics

EMPLOYMENT FORECAST

Over the next five years, this career field's employment is forecast to decline slightly (-0.4% annually), a slight improvement over the -0.8% forecast estimated in 2023Q2.

5-Year Forecast for Engineering, Manufacturing, and Technology Careers, Northeast Minnesota 2024Q1
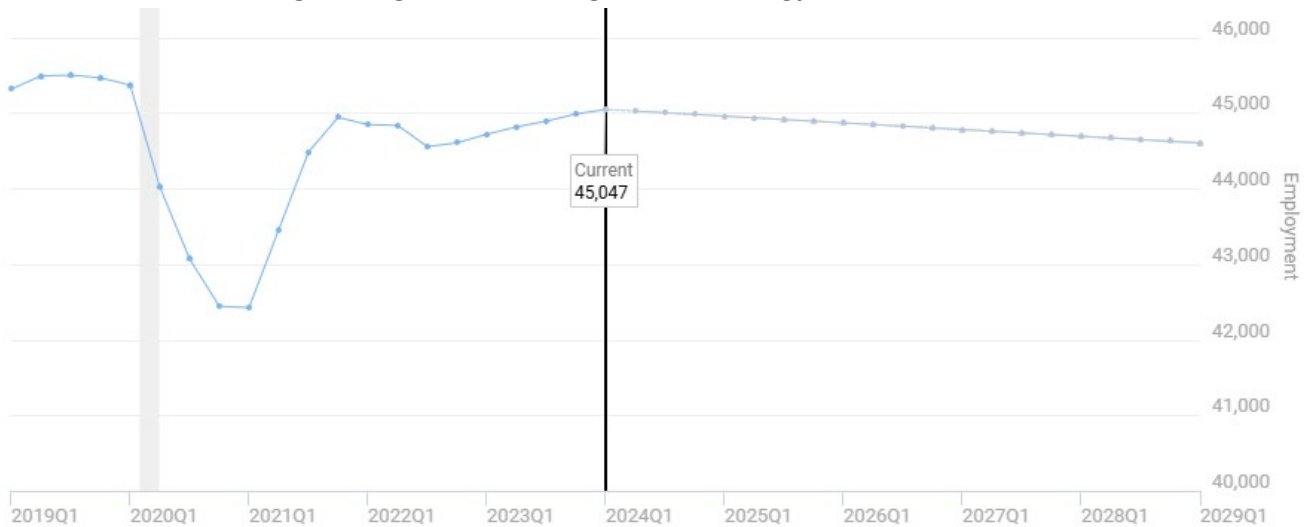
TOP OCCUPATIONS

A total of 45,047 people are employed in Engineering, Manufacturing, and Technology roles regionally, accounting for about 23% of all regional employment. Most top occupations are expected to remain steady or decline, but Light Truck Drivers are forecast to grow by 0.3%.

Top Ten Engineering, Manufacturing, and Technology Occupations by Employment Volume, Northeast Minnesota, 2024Q1

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Construction Laborers	2,346	$57,200	1.36	220	999	0.0%
Maintenance and Repair Workers, General	2,263	$50,800	1.17	-42	983	-0.2%
Laborers and Freight, Stock, and Material Movers, Hand	2,206	$41,600	0.64	8	1,375	-0.3%
Heavy and Tractor-Trailer Truck Drivers	2,138	$60,400	0.82	31	1,070	-0.3%
Landscaping and Groundskeeping Workers	1,526	$39,100	1.08	76	979	0.0%
Carpenters	1,402	$59,800	1.24	-37	539	-0.4%
First-Line Supervisors of Construction Trades and Extraction Workers	1,094	$85,800	1.10	87	412	-0.2%
Team Assemblers	1,058	$43,800	0.72	15	508	-1.4%
Light Truck Drivers	1,051	$48,300	0.78	44	569	0.3%
Automotive Service Technicians and Mechanics	969	$52,100	1.03	-81	384	-0.3%
Engineering, Manufacturing, & Technology (CTE Field)	**45,047**	**$62,000**	**0.95**	**-268**	**20,418**	**-0.4%**

"Forecast 5-Year Demand" is the projected need for new entrants into an occupation over the next five years. 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 Change" 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).

TOP INDUSTRIES

Many different industries employ Engineering, Manufacturing, and Technology talent in the Northeast region. Locally, the industries with the greatest share of this field's talent are Metal Ore Mining (7.5%) and Executive, Legislative, and Other General Government Support (4.4%). Most industries employing talent in this field 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, Northeast Minnesota, 2024Q1

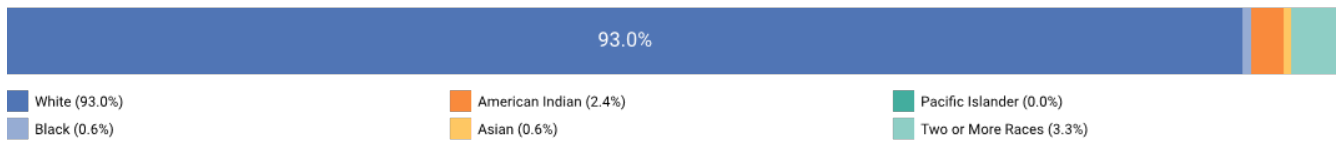| Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Metal Ore Mining	7.5%	3,380	3,119	-64	3,055
Executive, Legislative, and Other General Government Support	4.4%	2,004	1,882	-9	1,873
Building Equipment Contractors	4.3%	1,956	1,679	-18	1,661
Residential Building Construction	3.5%	1,566	1,258	-30	1,228
Highway, Street, and Bridge Construction	3.0%	1,349	1,133	-25	1,108
Other Specialty Trade Contractors	3.0%	1,339	1,157	-19	1,138
Pulp, Paper, and Paperboard Mills	2.9%	1,318	1,153	-356	796
Foundation, Structure, and Building Exterior Contractors	2.7%	1,223	989	-49	939
Architectural, Engineering, and Related Services	2.2%	988	718	-35	683
Automotive Repair and Maintenance	2.2%	973	898	-24	874
Electric Power Generation, Transmission and Distribution	2.1%	941	697	-154	543
Building Finishing Contractors	2.1%	930	727	-30	697
Services to Buildings and Dwellings	2.0%	914	1,088	-14	1,074
Nonresidential Building Construction	2.0%	884	706	-22	684
Aerospace Product and Parts Manufacturing	1.8%	807	668	-48	620
Couriers and Express Delivery Services	1.7%	745	870	80	950
General Freight Trucking	1.5%	685	705	-11	694
Rail Transportation	1.5%	660	543	-31	512
Automobile Dealers	1.4%	632	621	-9	612
Traveler Accommodation	1.3%	572	567	16	584
All Others	47.0%	21,181	21,393	-825	20,569

CAREER FIELD DEMOGRAPHICS

- The Engineering, Manufacturing, and Technology field is heavily male (84.9% male) and white (93.0%)
- This field has seen a notable share of its workforce retire in recent years; 48.7% of workers this field are 45 years or older, signaling potential exacerbation of the talent shortage with further waves of retirements
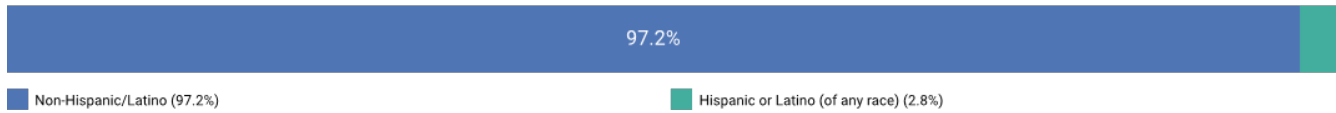
Age
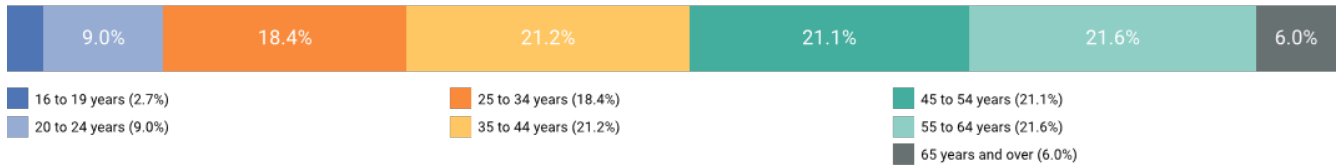
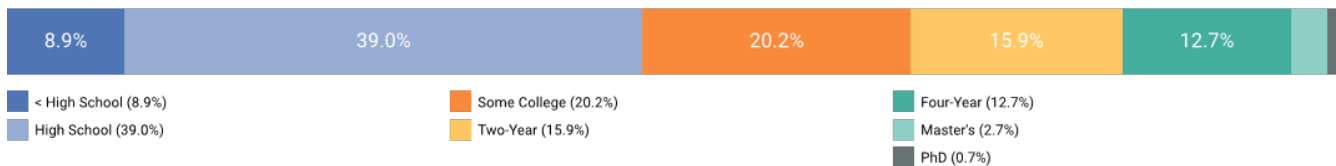| 9.0% | 18.4% | 21.2% | 21.1% | 21.6% | 6.0% |

16 to 19 years (2.7%)
20 to 24 years (9.0%)
25 to 34 years (18.4%)
35 to 44 years (21.2%)
45 to 54 years (21.1%)
55 to 64 years (21.6%)
65 years and over (6.0%)

Race

| 93.0% | | |

White (93.0%)
Black (0.6%)
American Indian (2.4%)
Asian (0.6%)
Pacific Islander (0.0%)
Two or More Races (3.3%)

Ethnicity

| 97.2% | |

Non-Hispanic/Latino (97.2%)
Hispanic or Latino (of any race) (2.8%)

Gender

| 84.9% | 15.1% |

Male (84.9%)
Female (15.1%)

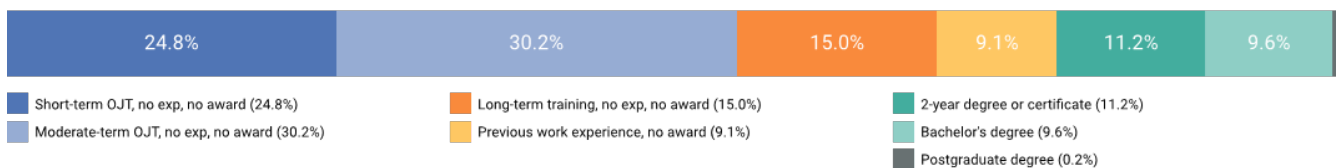## EDUCATIONAL ATTAINMENT AND REQUIREMENTS

The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- The Northeast Minnesota Engineering, Manufacturing, and Technology workforce is fairly aligned in educational attainment to the requirements in the field, with a large share of roles requiring no more than a high school diploma and some relevant work experience
  - o Over two thirds (68.1%) of Engineering, Manufacturing, and Technology talent working in the region do not hold a postsecondary credential beyond a certificate, while 79.1% of positions in this field require no postsecondary credential

Educational Attainment

| 8.9% | 39.0% | 20.2% | 15.9% | 12.7% | |

< High School (8.9%)
High School (39.0%)
Some College (20.2%)
Two-Year (15.9%)
Four-Year (12.7%)
Master's (2.7%)
PhD (0.7%)

Education and Training Requirements

| 24.8% | 30.2% | 15.0% | 9.1% | 11.2% | 9.6% |

Short-term OJT, no exp, no award (24.8%)
Moderate-term OJT, no exp, no award (30.2%)
Long-term training, no exp, no award (15.0%)
Previous work experience, no award (9.1%)
2-year degree or certificate (11.2%)
Bachelor's degree (9.6%)
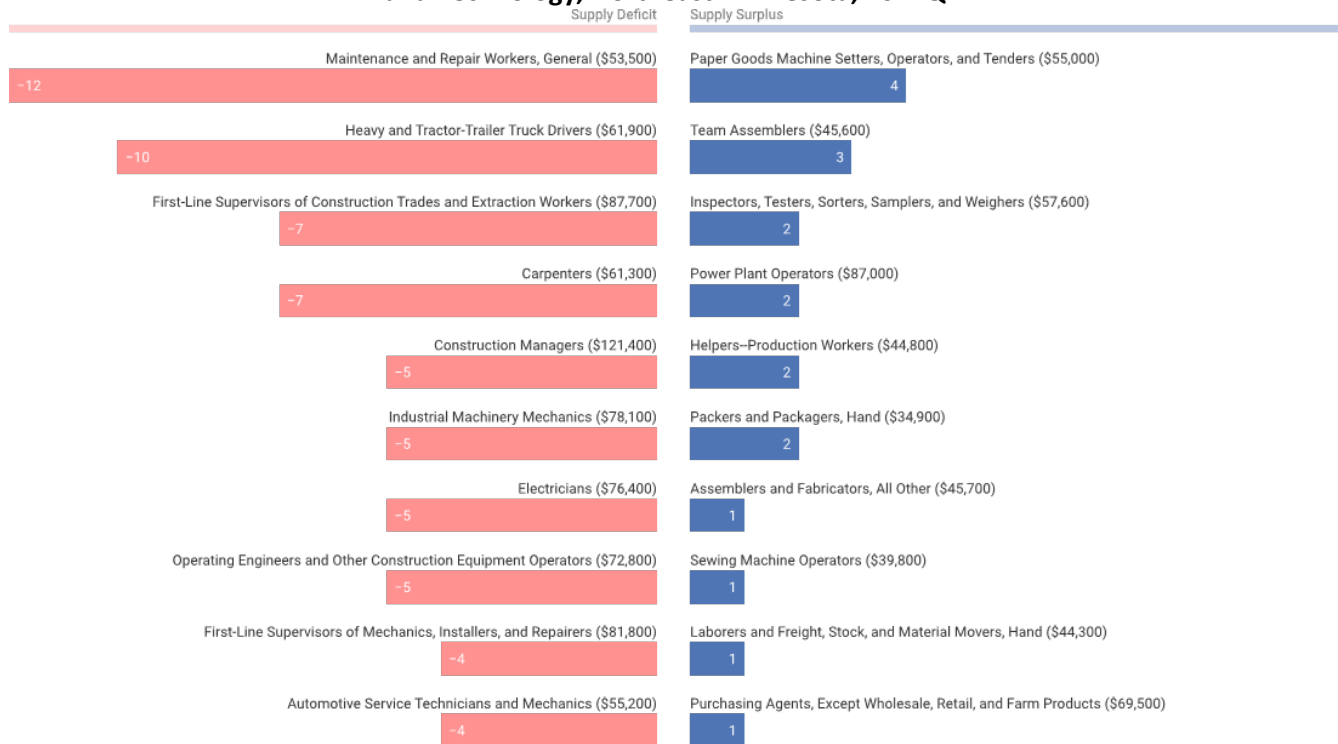Postgraduate degree (0.2%)

OCCUPATION GAPS

The chart below shows the potential average annual talent shortages over ten years.

Several management, maintenance, construction, and automotive roles continue to signal shortages in the years ahead, with the Maintenance and Repair Worker talent pool likely falling short at least 12 skilled workers needed annually to meet employer demand. This talent shortage is primarily due to growth in demand and retirements which outpace the existing talent pipeline. The Heavy and Tractor-Trailer Truck Driver forecasted shortage continued to grow from last year's estimate and is now falling short at least 10 workers needed annually to meet employer demand.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Engineering, Manufacturing, and Technology, Northeast Minnesota, 2024Q1

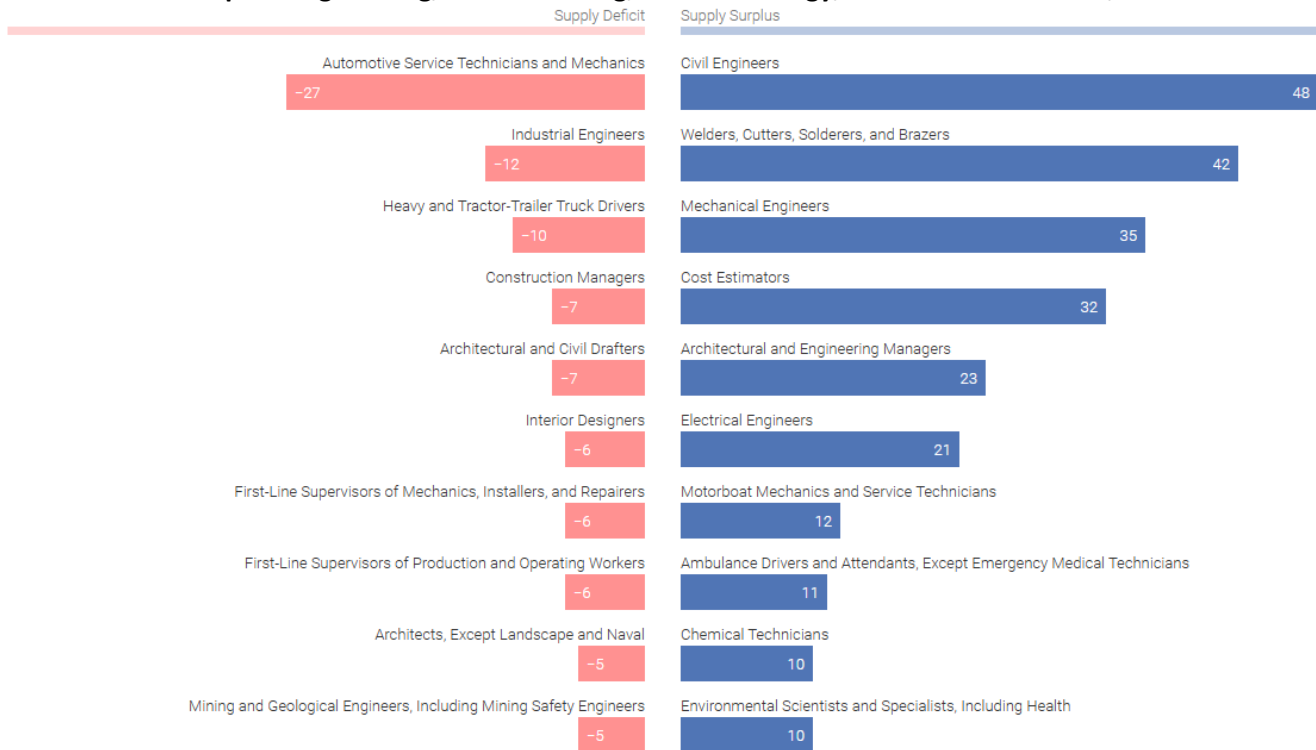| Supply Deficit		Supply Surplus	
Maintenance and Repair Workers, General ($53,500)	−12	Paper Goods Machine Setters, Operators, and Tenders ($55,000)	4
Heavy and Tractor-Trailer Truck Drivers ($61,900)	−10	Team Assemblers ($45,600)	3
First-Line Supervisors of Construction Trades and Extraction Workers ($87,700)	−7	Inspectors, Testers, Sorters, Samplers, and Weighers ($57,600)	2
Carpenters ($61,300)	−7	Power Plant Operators ($87,000)	2
Construction Managers ($121,400)	−5	Helpers–Production Workers ($44,800)	2
Industrial Machinery Mechanics ($78,100)	−5	Packers and Packagers, Hand ($34,900)	2
Electricians ($76,400)	−5	Assemblers and Fabricators, All Other ($45,700)	1
Operating Engineers and Other Construction Equipment Operators ($72,800)	−5	Sewing Machine Operators ($39,800)	1
First-Line Supervisors of Mechanics, Installers, and Repairers ($81,800)	−4	Laborers and Freight, Stock, and Material Movers, Hand ($44,300)	1
Automotive Service Technicians and Mechanics ($55,200)	−4	Purchasing Agents, Except Wholesale, Retail, and Farm Products ($69,500)	1

AWARD GAPS

The chart below shows the shortfall of new postsecondary graduates needed to meet local demand, benchmarked against national average volumes of graduates in the 2022-23 school year.

Northeast Minnesota faces many Engineering, Manufacturing and Technology award shortages and generates a surplus of graduates in six specialized occupations:

- Postsecondary institutions based in the region continue to underproduce Automotive Service Technicians, Industrial Engineers, Heavy and Tractor-Trailer Truck Drivers, and Construction Managers compared with national volumes of new graduates for a region of equivalent size and industry mix
- Occupations such as Civil Engineers, Welders, Mechanical Engineers, and Cost Estimators all show higher awards conferred in the region than what is currently needed in the local talent market; these programs likely serve other parts of the state and the Midwest where talent demand is high but relevant programs may not exist

Award Gaps in Engineering, Manufacturing, and Technology, Northeast Minnesota, 2024Q1

Supply Deficit		Supply Surplus	
Automotive Service Technicians and Mechanics	−27	Civil Engineers	48
Industrial Engineers	−12	Welders, Cutters, Solderers, and Brazers	42
Heavy and Tractor-Trailer Truck Drivers	−10	Mechanical Engineers	35
Construction Managers	−7	Cost Estimators	32
Architectural and Civil Drafters	−7	Architectural and Engineering Managers	23
Interior Designers	−6	Electrical Engineers	21
First-Line Supervisors of Mechanics, Installers, and Repairers	−6	Motorboat Mechanics and Service Technicians	12
First-Line Supervisors of Production and Operating Workers	−6	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	11
Architects, Except Landscape and Naval	−5	Chemical Technicians	10
Mining and Geological Engineers, Including Mining Safety Engineers	−5	Environmental Scientists and Specialists, Including Health	10

ORIGIN, GATEWAY, AND TARGET OCCUPATIONS

This section offers an Origin-to-Gateway-to-Target model analysis for how to help move students from entry points into their field of interest into both likely and other aligned careers, considering automation, remote work, and the changing work environment.

Origin-to-Gateway-to-Target Occupations for Engineering, Manufacturing, and Technology, Northeast Minnesota, 2024Q1

Target Occupations (All HW, HS, HD, OG)
Heavy & Tractor-Trailer Truck Drivers (AG)
Construction Managers (AG)
Industrial Engineers (AG)
HVAC Mechanics (AG)
Civil Engineers

Gateway Occupations
Light Truck Drivers (HD, AG)
School Bus Drivers (HD, AG)
Industrial Truck & Tractor Operators
Computer Numerically Controlled Tool Operators
Automotive Body & Related Repairers (OG)

Origin Occupations
Laborers & Freight, Stock Movers
Landscaping & Groundskeeping Workers (HD)
Team Assemblers
Packers & Packagers, Hand
Shuttle Drivers & Chauffeurs (HD, AG)

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

Other Promising Occupations

A number of other Engineering, Manufacturing, and Technology occupations that are high-wage and high-demand, yet do not meet the high-skill threshold to be considered Target Occupations, may be promising careers for students to consider. These occupations may offer a fast track to good jobs for those interested in starting a career in the field without requiring a postsecondary credential. These occupations to consider include:

- Maintenance and Repair Workers, General (OG, AG)
- First-Line Supervisors of Construction Trades and Extraction Workers (OG)
- Electricians (OG)
- Industrial Machinery Mechanics (OG)
- Mobile Heavy Equipment Mechanics, Except Engines (OG)

Featured Pathway

Careers in the Architecture and Construction cluster are highly concentrated in the Northeast region and in high demand. With a projected occupation gap, a projected award gap, and high demand, expanding opportunities for talent to enter Construction Manager careers should be considered in the Northeast region. This Target occupation is highly concentrated in the region with a location quotient of 1.11. The related Gateway occupation of Construction Laborers is also highly concentrated in the region (location quotient of 1.36). Several Origin occupations in the construction trades may serve as strong entry points into this pathway given the overlap in skillsets. Team Assemblers, Laborers, and Packers are all Origin occupations in high

number in the region that could be a source for talent to grow in this pathway with additional education and training.

Origin	Gateway	Target
Laborers & Freight, Stock Movers / **Team Assemblers** / **Packers & Packagers**	**Construction Laborers**	**Construction Managers (HW, HS, HD, OG, AG)**
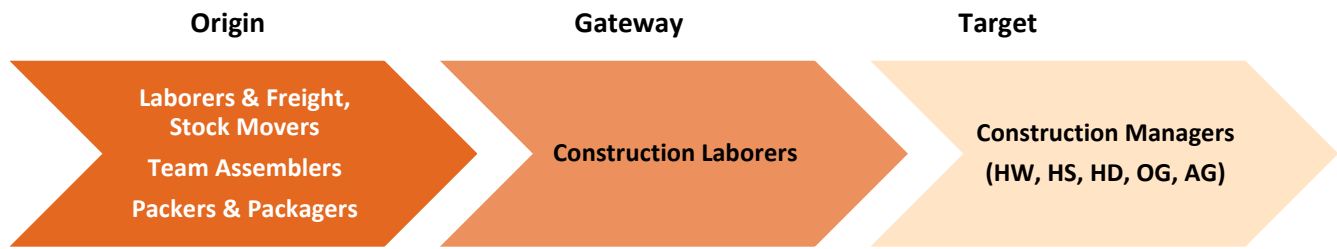
OGT Wages and Experience Level Requirements, Engineering, Manufacturing, and Technology, Northeast Minnesota, 2024Q1

	SOC	Occupation	Empl	Mean	Entry Level	Experienced	10%	25%	50% Median	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Target	53-3032	Heavy and Tractor-Trailer Truck Drivers	2,138	$61,900	$47,300	$69,100	$45,500	$51,700	$60,400	$73,400	$80,300	Certificate	None	Short-term OJT
	11-9021	Construction Managers	678	$121,400	$81,700	$141,300	$77,600	$91,600	$112,400	$139,700	$175,400	BA	None	Mod-term OJT
	17-2112	Industrial Engineers	608	$95,500	$69,900	$108,400	$65,800	$78,400	$92,000	$108,000	$128,900	BA	None	None
	49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	381	$65,400	$46,700	$74,800	$45,100	$51,600	$65,200	$78,300	$87,500	Certificate	None	Long-term OJT
	17-2051	Civil Engineers	315	$100,600	$70,600	$115,500	$67,100	$79,100	$96,700	$115,900	$136,900	BA	None	None
Gateway	53-3033	Light Truck Drivers	1,051	$50,800	$33,300	$59,500	$30,600	$38,100	$48,300	$57,600	$85,000	HS/GED	None	Short-term OJT
	53-3051	Bus Drivers, School	522	$48,700	$35,900	$55,000	$34,500	$39,400	$48,500	$52,300	$65,000	HS/GED	None	Short-term OJT
	53-7051	Industrial Truck and Tractor Operators	295	$51,000	$38,400	$57,300	$37,700	$40,900	$48,800	$55,700	$64,800	None	None	Short-term OJT
	51-9161	Computer Numerically Controlled Tool Operators	226	$51,900	$39,200	$58,200	$38,400	$41,700	$48,600	$63,400	$71,000	HS/GED	None	Mod-term OJT
	49-3021	Automotive Body and Related Repairers	221	$52,900	$35,700	$61,500	$34,800	$39,000	$49,200	$62,900	$75,500	HS/GED	None	Long-term OJT
Origin	53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2,206	$44,300	$34,100	$49,400	$32,300	$37,500	$41,600	$48,900	$60,400	None	None	Short-term OJT
	37-3011	Landscaping and Groundskeeping Workers	1,526	$41,300	$29,900	$46,900	$27,900	$33,300	$39,100	$47,000	$58,100	None	None	Short-term OJT
	51-2092	Team Assemblers	1,058	$45,600	$35,100	$50,900	$33,200	$38,700	$43,800	$50,300	$61,900	HS/GED	None	Mod-term OJT
	53-7064	Packers and Packagers, Hand	397	$34,900	$26,300	$39,100	$24,400	$28,700	$33,400	$41,800	$43,700	None	None	Short-term OJT
	53-3053	Shuttle Drivers and Chauffeurs	353	$34,800	$28,100	$38,200	$26,800	$30,300	$34,300	$38,200	$43,600	None	None	Short-term OJT

Agriculture, Food, and Natural Resources

Agriculture, Food, and Natural Resources is a wide career field that includes eight career pathways:

- Food Products and Processing Systems
- Plant Systems
- Animal Systems
- Natural Resources Systems
- Agribusiness Systems
- Environmental Services Systems
- Power, Structural and Technical Systems
- 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). This career field is the only one of the six Career and Technical Education career fields that has overlapping occupations with other fields.

EMPLOYMENT FORECAST

Over the next five years, this career field's employment is forecast to decline by about -0.3% in the Northeast region, an improvement from last year's forecast of -0.7%.

5-Year Forecast for Agriculture, Food, and Natural Resources Careers, Northeast Minnesota, 2024Q1
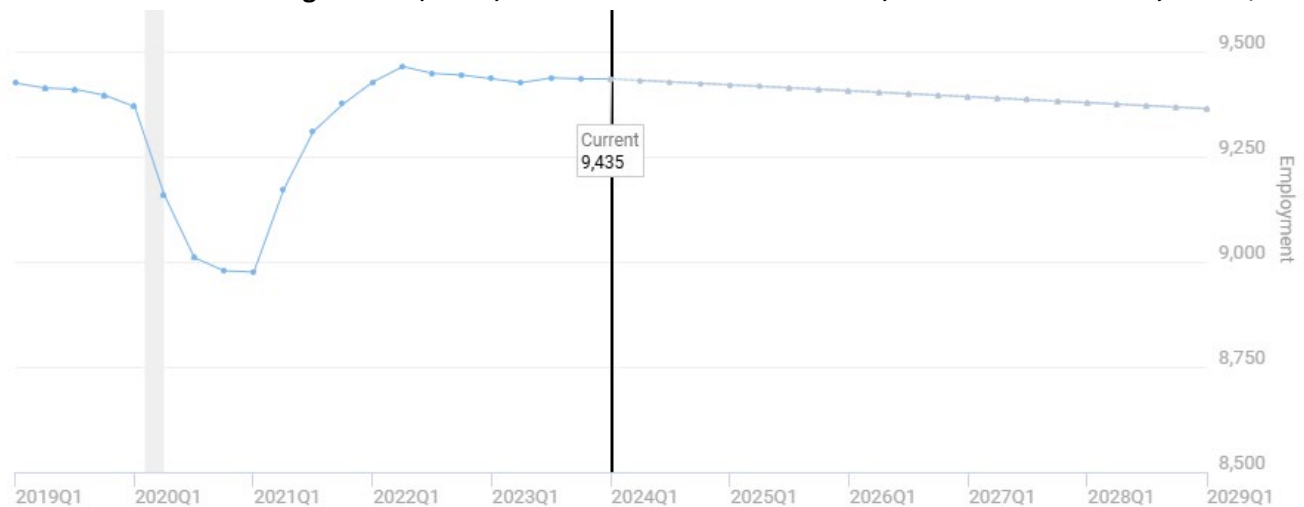
TOP OCCUPATIONS

A total of 9,435 people are employed in Agriculture, Food, and Natural Resources roles regionally, accounting for about 5% of all regional employment. While most occupations are forecast to decline, Animal Caretakers are projected to grow by 0.9% annually over the next five years.

Top Ten Agriculture, Food, and Natural Resources Occupations by Employment Volume, Northeast Minnesota, 2024Q1

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Landscaping and Groundskeeping Workers	1,526	$39,100	1.08	76	979	0.0%
Farmers, Ranchers, and Other Agricultural Managers	933	$65,300	1.04	-178	403	-1.2%
Plumbers, Pipefitters, and Steamfitters	600	$80,400	1.02	47	246	-0.3%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	381	$65,200	0.76	64	156	-0.1%
Animal Caretakers	279	$32,300	0.68	27	274	0.9%
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	271	$61,900	0.97	21	136	-0.1%
Chefs and Head Cooks	244	$53,100	1.16	20	146	0.1%
Logging Equipment Operators	230	$48,800	6.18	-43	145	-1.1%
Water and Wastewater Treatment Plant and System Operators	227	$62,800	1.49	0	88	-1.2%
Refuse and Recyclable Material Collectors	218	$50,700	1.24	7	131	-0.1%
Agriculture, Food, and Natural Resources (CTE Field)	**9,435**	**$59,600**	**0.93**	**10**	**4,911**	**-0.3%**

"Forecast 5-Year Demand" is the projected need for new entrants into an occupation over the next five years. 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 Annual Change" 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).

TOP INDUSTRIES

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 (9.4%) and Building Equipment Contractors (8.0%). Overall, employment in this field is relatively spread out across many different industries.
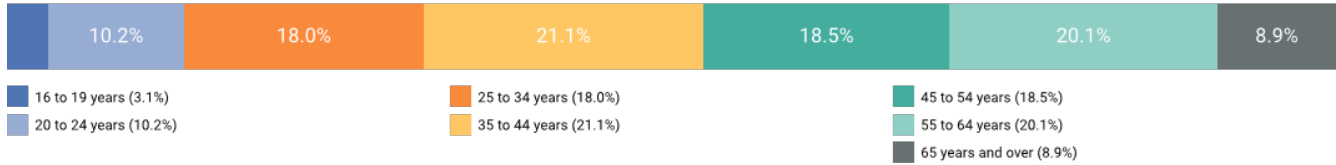
Agriculture, Food, and Natural Resources Field Employment by Industry, Northeast Minnesota, 2024Q1

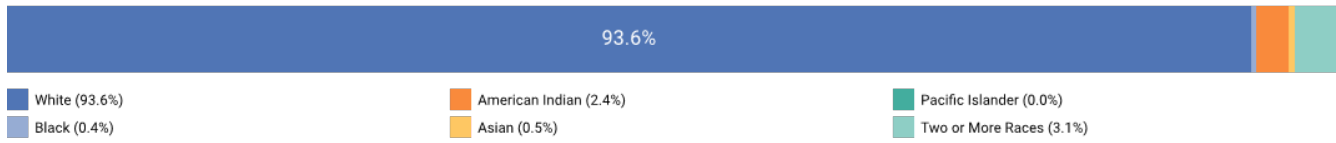| Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Services to Buildings and Dwellings	9.4%	884	1,080	-12	1,068
Building Equipment Contractors	8.0%	754	643	-7	636
Executive, Legislative, and Other General Government Support	7.4%	698	710	-12	698
Animal Production (Proprietors)	5.3%	501	489	-58	431
Metal Ore Mining	4.8%	452	380	-7	373
Electric Power Generation, Transmission and Distribution	4.6%	430	322	-71	251
Crop Production (Proprietors)	4.5%	428	430	-47	383
Other Professional, Scientific, and Technical Services	4.5%	426	480	71	551
Other Amusement and Recreation Industries	3.6%	337	423	9	433
Logging	3.4%	323	422	-40	382
Grocery and Convenience Retailers	2.5%	232	283	-17	266
Architectural, Engineering, and Related Services	2.2%	208	178	-6	172
Restaurants and Other Eating Places	2.0%	187	240	0	240
Other Personal Services	1.9%	183	321	26	348
Traveler Accommodation	1.6%	155	186	5	191
Colleges, Universities, and Professional Schools	1.5%	146	138	-4	134
Wired and Wireless Telecommunications (except Satellite)	1.4%	132	129	6	135
Waste Collection	1.4%	129	158	2	160
Administration of Environmental Quality Programs	1.1%	106	97	-6	91
Other Specialty Trade Contractors	1.1%	100	112	-2	109
All Others	27.8%	2,625	2,879	-89	2,790

CAREER FIELD DEMOGRAPHICS

- The Agriculture, Food, and Natural Resources field remains predominantly male (77.1%) and white (93.6%), but with significant variation across the eight career pathways
- Three in ten (29.0%) workers in Agriculture, Food, and Natural Resources careers are 55 or older; key career pathways in Animal Systems and Food Products and Processing Systems in particular have a rapidly aging workforce with limited new talent entering
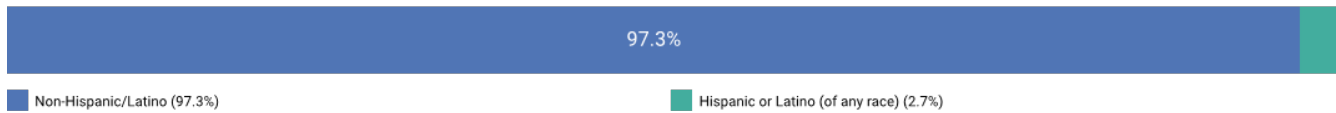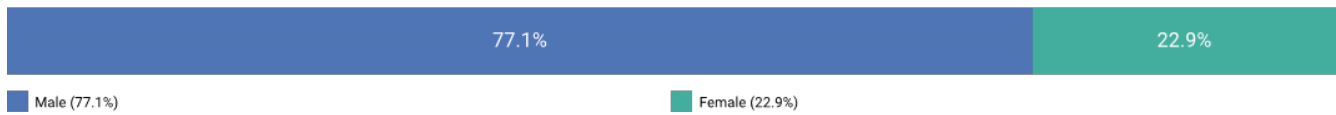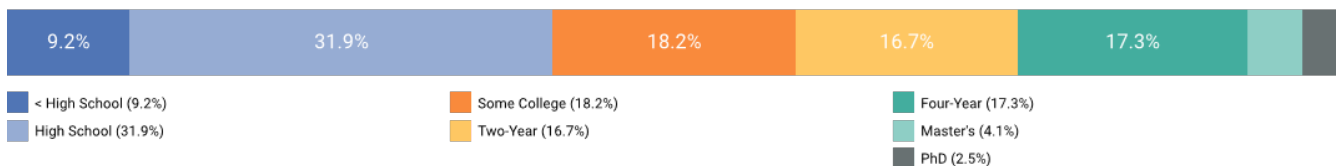
Age

| 10.2% | 18.0% | 21.1% | 18.5% | 20.1% | 8.9% |

- 16 to 19 years (3.1%)
- 20 to 24 years (10.2%)
- 25 to 34 years (18.0%)
- 35 to 44 years (21.1%)
- 45 to 54 years (18.5%)
- 55 to 64 years (20.1%)
- 65 years and over (8.9%)

Race

| 93.6% | | |

- White (93.6%)
- Black (0.4%)
- American Indian (2.4%)
- Asian (0.5%)
- Pacific Islander (0.0%)
- Two or More Races (3.1%)

Ethnicity

| 97.3% | |

- Non-Hispanic/Latino (97.3%)
- Hispanic or Latino (of any race) (2.7%)

Gender

| 77.1% | 22.9% |

- Male (77.1%)
- Female (22.9%)

EDUCATIONAL ATTAINMENT AND REQUIREMENTS

The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- The Northeast Minnesota Agriculture, Food, and Natural Resources workforce is fairly aligned in educational attainment to the requirements in the field, with a large share of roles requiring no more than a high school diploma and some relevant work experience
  - Over half (59.3%) of Agriculture, Food, and Natural Resources talent working in the region do not hold a postsecondary credential beyond a certificate, while 74.7% of positions in this field require no postsecondary credential; this suggests that at least 15% of the region's talent in this field may be overqualified (underemployed) for their current role

Educational Attainment
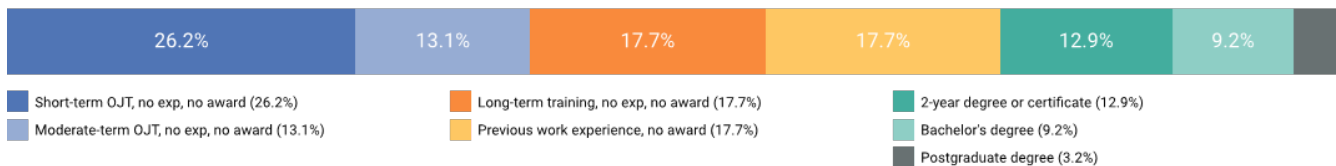
| 9.2% | 31.9% | 18.2% | 16.7% | 17.3% | | |

- < High School (9.2%)
- High School (31.9%)
- Some College (18.2%)
- Two-Year (16.7%)
- Four-Year (17.3%)
- Master's (4.1%)
- PhD (2.5%)

Education and Training Requirements

| 26.2% | 13.1% | 17.7% | 17.7% | 12.9% | 9.2% | |

- Short-term OJT, no exp, no award (26.2%)
- Moderate-term OJT, no exp, no award (13.1%)
- Long-term training, no exp, no award (17.7%)
- Previous work experience, no award (17.7%)
- 2-year degree or certificate (12.9%)
- Bachelor's degree (9.2%)
- Postgraduate degree (3.2%)

OCCUPATION GAPS

The chart below shows the potential average annual talent shortages over ten years.

Occupation shortage forecasts have persisted from 2022, worsening for several roles including Plumbers and Pipefitters. Only two occupations in the field still forecast small talent surpluses. 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, 2024Q1
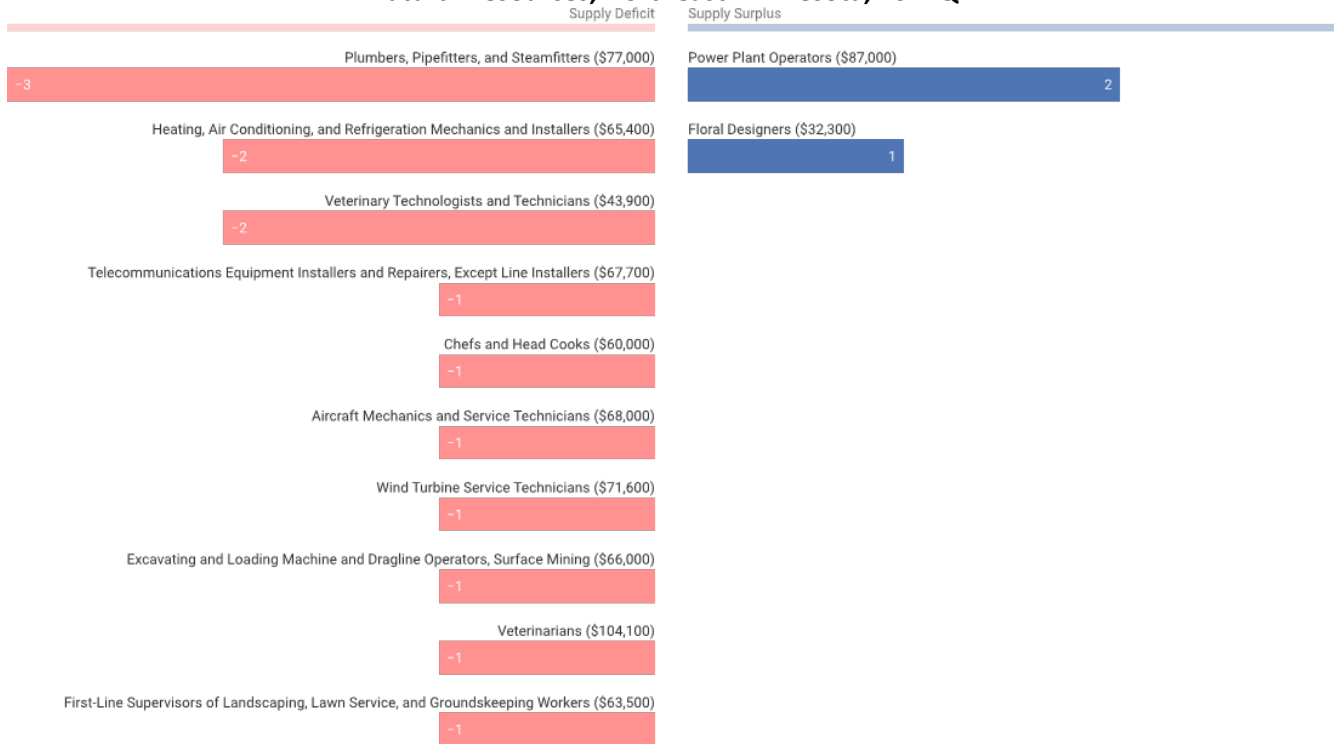
AWARD GAPS

The chart below shows the shortfall of new postsecondary graduates needed to meet local demand, benchmarked against national average volumes of graduates in the 2022-23 school year.

Northeast Minnesota faces some moderate Agriculture, Food, and Natural Resources postsecondary award shortages and generates a surplus of graduates in other areas:

- Northeast Minnesota colleges and universities are underproducing an estimated five graduates annually that are needed to fill Mining and Geological Engineering positions open with employers based in the Northeast, an increase in the graduate deficit from the prior year tied to growing regional demand
- Veterinarian, HVAC Mechanic, and Urban and Regional Planner postsecondary awards also lag national volumes considerably and contribute to regional talent shortages
- Only thirteen of the 106 occupations in this field (12%) have a higher supply of local postsecondary graduates from aligned local programs than the national average for a community of similar size and industry composition, a small decline from the 14 occupations with graduate surpluses estimated in 2023; occupations with a higher relative share of postsecondary completions in the local talent market are examples of programs that serve other parts of the state or Midwest region where talent demand is high but relevant programs may not exist

Award Gaps in Agriculture, Food, and Natural Resources, Northeast Minnesota, 2024Q1
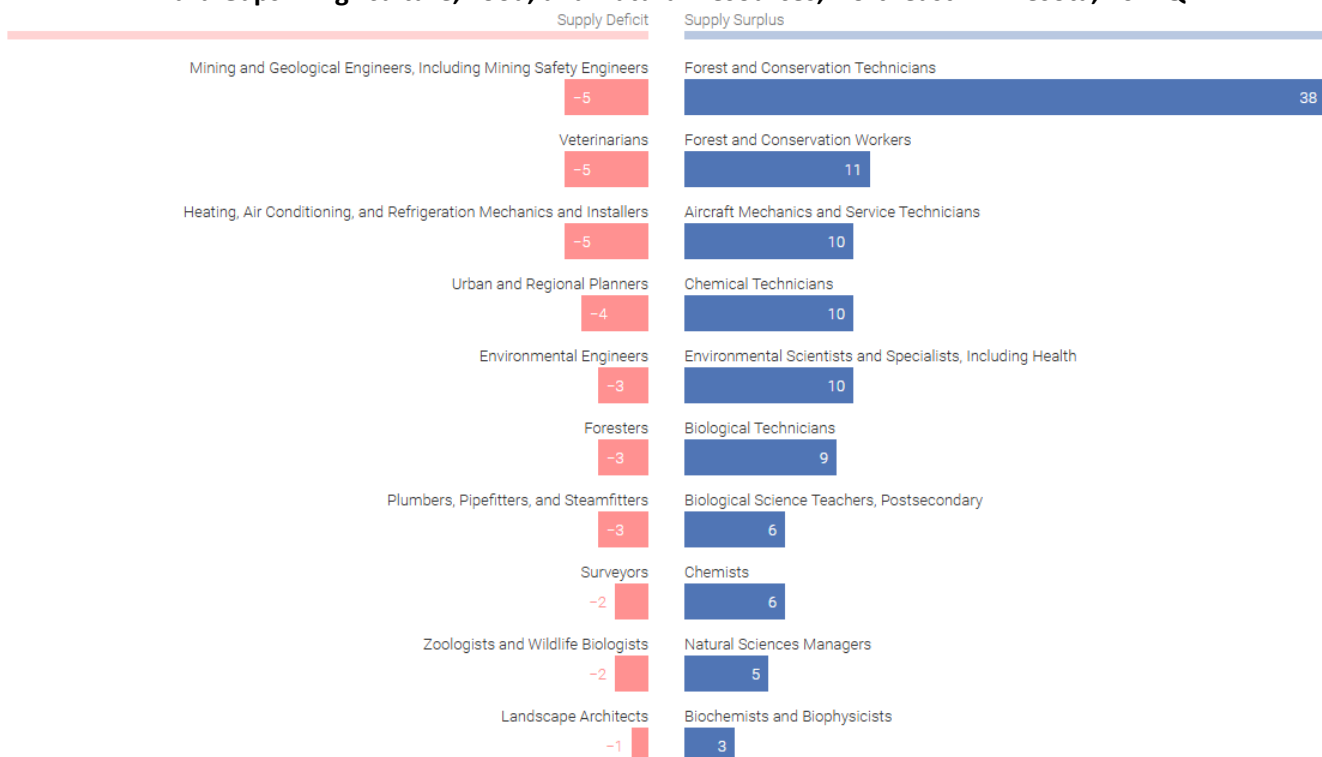
Supply Deficit		Supply Surplus	
Mining and Geological Engineers, Including Mining Safety Engineers	−5	Forest and Conservation Technicians	38
Veterinarians	−5	Forest and Conservation Workers	11
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	−5	Aircraft Mechanics and Service Technicians	10
Urban and Regional Planners	−4	Chemical Technicians	10
Environmental Engineers	−3	Environmental Scientists and Specialists, Including Health	10
Foresters	−3	Biological Technicians	9
Plumbers, Pipefitters, and Steamfitters	−3	Biological Science Teachers, Postsecondary	6
Surveyors	−2	Chemists	6
Zoologists and Wildlife Biologists	−2	Natural Sciences Managers	5
Landscape Architects	−1	Biochemists and Biophysicists	3

ORIGIN, GATEWAY, AND TARGET OCCUPATIONS

This section offers an Origin-to-Gateway-to-Target model analysis for how to help move students from entry points into their field of interest into both likely and other aligned careers, considering automation, remote work, and the changing work environment.

Origin-to-Gateway-to-Target Occupations for Agriculture, Food, and Natural Resources, Northeast Minnesota, 2024Q1

Target Occupations (All HW, HS, HD)
HVAC Mechanics (OG, AG)
Telecommunications Equipment Installers (OG)
Environmental Scientists & Specialists
Chemical Technicians (AG)
Surveyors (AG)

Gateway Occupations
Logging Equipment Operators
Butchers & Meat Cutters
Biological Technicians (HS, HD)
Outdoor Power Equipment Mechanics (HD)
Pesticide Handlers, Sprayers, & Applicators, Vegetation (HD)

Origin Occupations
Landscaping & Groundskeeping Workers (HD)
Animal Caretakers (HD)
Veterinary Technologists & Technicians (HS, HD, OG, AG)
Bakers (HD)
Farmworkers & Laborers, Crop, Nursery, & Greenhouse

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

Other Promising Occupations
A number of other Agriculture, Food, and Natural Resources occupations that are high-wage and high-demand, yet do not meet the high-skill threshold to be considered Target Occupations, may be promising careers for students to consider. These occupations may offer a fast track to good jobs for those interested in starting a career in the field without requiring a postsecondary credential. These occupations to consider include:
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers

- Chefs and Head Cooks
- Refuse and Recyclable Material Collectors

Featured Pathway
The Northeast region has many Agriculture, Food, and Natural Resources career pathways that could be featured for greater development, include Animal Systems (veterinary pathways), Environmental Services Systems, Natural Resource Systems (conservation, logging, mining, and more), with many roles in these pathways having a low local supply of new graduates compared to national averages. For instance, the region has an undersupply of postsecondary graduates from Geological Engineering programs needed to fill local Mining and Geological Engineering roles, which pay impressive wages of $99,700 per year and are more than seven times more concentrated in the region than the average community nationwide.

The pathways featured below are of particular importance to the Northeast region. Although small in volume, Forest and Conservation Technicians are nearly 50% more concentrated in the region than a typical community

nationwide, and the Origin occupation of Forest and Conservation Workers are found in more than double the volume (LQ 2.21) regionally compared to nationwide.

Origin	Lower-Wage Target Occupation	Target
Forest & Conservation Workers	**Forest & Conservation Technicians** (HS, HD, OG)	**Environmental Scientists & Specialists** (HW, HS, HD)

Origin		Other Aligned Occupation
Veterinary Assistants (HD, AG) **Animal Caretakers (HD)**	**Veterinary Technicans & Technologists** (HS, HD, OG, AG)	**Veterinarians** (HW, HS, OG, AG)

RealTime Talent
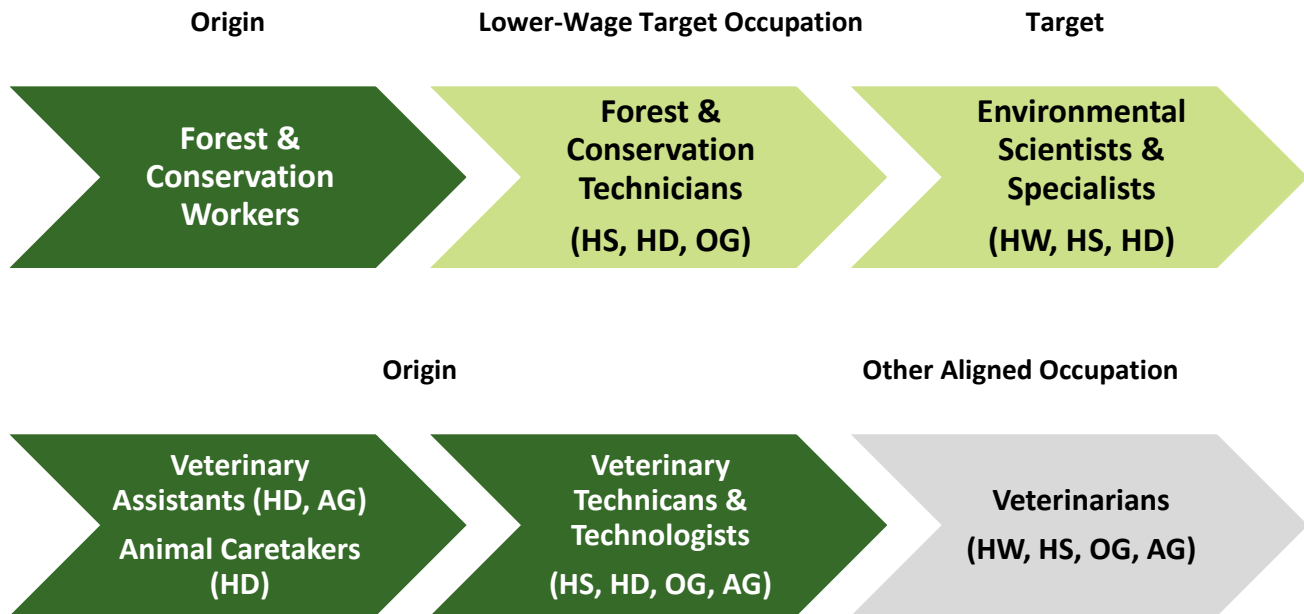
OGT Wages and Experience Level Requirements, Agriculture, Food, and Natural Resources, Northeast Minnesota, 2024Q1

	SOC	Occupation	Empl	Mean	Entry Level	Experienced	10%	25%	50% Median	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Target	49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	381	$65,400	$46,700	$74,800	$45,100	$51,600	$65,200	$78,300	$87,500	Certificate	None	Long-term OJT
	49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	124	$67,700	$49,800	$76,700	$46,600	$56,300	$66,900	$82,300	$85,000	Certificate	None	Mod-term OJT
	19-2041	Environmental Scientists and Specialists, Including Health	109	$77,900	$57,600	$88,000	$55,100	$63,500	$75,400	$91,100	$106,400	BA	None	None
	19-4031	Chemical Technicians	87	$67,700	$46,500	$78,200	$43,900	$53,400	$71,900	$76,200	$80,400	AS	None	Mod-term OJT
	17-1022	Surveyors	78	$78,700	$56,600	$89,800	$52,600	$65,000	$78,200	$85,800	$103,500	BA	None	Internship/residency
Gateway	45-4022	Logging Equipment Operators	230	$49,700	$43,300	$52,900	$42,300	$45,300	$48,800	$52,200	$56,900	HS/GED	None	Mod-term OJT
	51-3021	Butchers and Meat Cutters	163	$44,700	$34,800	$49,700	$32,500	$38,900	$45,400	$50,000	$54,200	None	None	Long-term OJT
	19-4021	Biological Technicians	75	$51,200	$39,000	$57,300	$39,200	$40,100	$46,600	$56,900	$75,200	BA	None	None
	49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	59	$47,500	$39,900	$51,300	$37,400	$43,900	$46,600	$50,900	$58,300	HS/GED	None	Mod-term OJT
	37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	35	$47,100	$38,800	$51,200	$37,300	$41,900	$46,700	$51,500	$58,300	HS/GED	None	Mod-term OJT
Origin	37-3011	Landscaping and Groundskeeping Workers	1,526	$41,300	$29,900	$46,900	$27,900	$33,300	$39,100	$47,000	$58,100	None	None	Short-term OJT
	39-2021	Animal Caretakers	279	$33,500	$25,900	$37,300	$25,200	$27,200	$32,300	$38,000	$41,500	HS/GED	None	Short-term OJT
	29-2056	Veterinary Technologists and Technicians	210	$43,900	$37,400	$47,200	$37,000	$38,700	$42,300	$46,700	$54,000	AS	None	None
	51-3011	Bakers	204	$37,400	$30,600	$40,900	$29,300	$33,000	$36,800	$40,100	$46,800	None	None	Mod-term OJT
	45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	145	$39,600	$28,300	$45,200	$27,200	$30,200	$37,800	$50,000	$56,200	None	None	Short-term OJT

Conclusion

Minnesota continues to experience a persistent labor shortage in critical career fields and has seen slower workforce growth in the past two years compared to other states due to retirement-related departures. Demand for talent in Architecture, Engineering, Health Science, and other Life Sciences continues to grow significantly, with the diversity of Minnesota's industries remaining one of its greatest economic strengths. Minnesota's highly educated workforce is a critical asset for addressing future talent gaps, as many occupations forecasting shortages typically require an associate or bachelor's degree, although interest in skills-based hiring and developments in Learning and Employment Records (LERs) may shift the landscape of career opportunities rapidly for individuals with related experience and skillsets.

The Northeast region lags 2019 pre-pandemic employment volumes by only about 4,000 workers and is currently exceeding pre-pandemic employment forecast expectations. However, despite a steady recovery for the region since 2021 and improving employment forecasts for all six career fields compared to last year's estimates, the Northeast is likely to experience an overall employment decline of about -0.3% on average annually over the next five years due in large part to the aging of the local workforce.

The top broad industries in the region forecast some of the largest declines in total employment due to the aging of the workforce: Mining, Quarrying, and Oil and Gas Extraction (NAICS 21), Utilities (NAICS 22), Public Administration (NAICS 92) all forecast declines in employment and significant replacement demand needs necessary to sustain business and the regional economy. The Metal Mining and Product Manufacturing (LQ 3.75), Wood and Paper Manufacturing (LQ 2.36), and Machinery Manufacturing (LQ 1.26) industries are all uniquely concentrated in the Northeast region, leading to a high concentration of Engineering, Manufacturing, and Technology careers as well as Natural Resources Systems careers. Health Science Technology careers forecast the highest growth and replacement demand of any career field in this region, supporting the region's largest industry by total employment: Healthcare and Social Assistance (NAICS 62). With a rapidly aging workforce in Health Science Technology, Human Services, and Engineering, Manufacturing, and Technology—the three career fields most closely aligned to the Northeast's top industries by economic contribution—talent shortages have persisted and will continue to be exacerbated without an influx of new talent into these careers.

FAQ

What is a location quotient?

A location quotient (LQ) is a measurement of concentration in comparison to the nation. An LQ of 1.00 indicates a region has the same concentration of an industry (or occupation) as the nation. An LQ of 2.00 would mean the region has twice the expected employment compared to the nation and an LQ of 0.50 would mean the region has half the expected employment in comparison to the nation.

What is a cluster?

A cluster is a geographic concentration of interrelated industries or occupations. If a regional cluster has a location quotient of 1.25 or greater, the region is considered to possess a competitive advantage in that cluster.

What is the Career and Technical Education (CTE) Career Field, Cluster, and Pathway taxonomy used in this report?

Career clusters and pathways have been identified for this report by the Source: National Career Clusters® Framework external site implemented by Department of Defense ASVAB Career Exploration Program, Advance CTE and viewable on ONET https://www.onetonline.org/find/career?c=8, updated to the 2020 SOC classification system. A summary of these six career fields and associated clusters and pathways can be found at https://www.minnstate.edu/system/cte/consortium_resources/documents/pos-career-wheel-8x11-2016.pdf. This report uses the prior Framework currently in use nationally, *not* the Modern Framework, which was released in October 2024.

What is separation demand?

Separation demand is the number of jobs required due to separations—labor force exits (including retirements) and turnover resulting from workers moving from one occupation into another. Note that separation demand does not include all turnover—it does not include when workers stay in the same occupation but switch employers. The total projected demand for an occupation is the sum of the separation demand and the growth demand (which is the increase or decrease of jobs in an occupation expected due to expansion or contraction of the overall number of jobs in that occupation).

What is the difference between industry wages and occupation wages?

Industry wages and occupation wages are estimated via separate data sets, often the time periods being reported do not align, and wages are defined slightly differently in the two systems (for example, certain bonuses are included in the industry wages but not the occupation wages). It is therefore common that estimates of the average industry wages and average occupation wages in a region do not match exactly.

What is NAICS?

The North American Industry Classification System (NAICS) is used to classify business establishments according to the type of economic activity. The NAICS Code comprises six levels, from the "all industry" level to the 6-digit level. The first two digits define the top level category, known as the "sector," which is the level examined in this report.

What is SOC?

The Standard Occupational Classification system (SOC) is used to classify workers into occupational categories. All workers are classified into one of over 804 occupations according to their occupational definition. To facilitate classification, occupations are combined to form 22 major groups, 95 minor groups, and 452 occupation groups. Each occupation group includes detailed occupations requiring similar job duties, skills, education, or experience.

What is CIP?

The Classification of Instructional Programs (CIP) is a taxonomy of academic programs developed by the US Department of Education. Colleges and universities across the country assign CIP codes to their academic programs. CIP codes are also often assigned to courses, certificates, and degrees.

Where can I learn more about the sources that were used in this report?

Lightcast offers a suite of labor market data analysis tools that are used to analyze candidate profiles and educational data from NCES IPEDS to track program graduate data and estimate talent pool availability. These tools scrape millions of candidate profiles and model skills, credentials, and employment experience to link where talent is located to where talent is in demand.

Chmura JobsEQ is a labor market data analysis tool that provides employment, unemployment, and education data from sources like the Bureau of Labor Statistics, Census Bureau, and NCES IPEDS and models this data at detailed geographic levels. This tool is utilized by RealTime Talent to model alternate forecasts impacted by COVID-19 to show possible future-state talent gaps, award gaps, and optimistic employment growth.

Who created this report?

This report was developed by RealTime Talent for Minnesota State in November 2024. If you have questions about the data found in this report, or are interested in learning more, please contact Catherine Jett at catherine@realtimetalentmn.org or visit the RealTime Talent website at www.realtimetalent.org

Data Notes

Chmura JobsEQ Source Details

- Occupation employment by default indicates employment by place of work. Occupation employment is as of 2024Q1 and based on industry employment and local staffing patterns calculated by JobsEQ and utilizing BLS OES data. Employment forecasts are by RealTime Talent using models provided by JobsEQ and are consistent with BLS national-level 10-year forecasts. Occupation wages (mean, median, and percentiles) are derived from BLS OES data as of 2023 and represent the average for all Covered Employment. Entry-level and experienced wages are derived from these source data, computed by JobsEQ.

- Industry employment is as of 2024Q1 and based upon BLS QCEW data that are imputed by JobsEQ where necessary and supplemented by additional sources including Census ZBP data.

- Education and training requirements are from the BLS. Educational attainment mix and other occupation demographics data are modeled by JobsEQ for 2024Q1 using regional occupation employment from JobsEQ, ZCTA-level demographics data from the Census Bureau, and national occupation-demographics patterns from the BLS.

- Postsecondary awards are per the NCES and for the 2022-2023 academic year. Any programs shown are linked with the occupation(s) being analyzed via the program-occupation crosswalk, which may not be comprehensive. Any programs shown reflect only data reported to the NCES; reporting is required of all Title IV schools. Training providers that do not report data to the NCES are not reflected.

- The sections on Employer Demand include Job ads data from TalentNeuron, which allows for greater specificity on education, experience level, and employer names. Since many extraneous factors can affect short-term volume of online job postings, time-series data can be volatile and should be used with caution. All ad counts represent deduplicated figures.

- Occupation gaps are modeled by JobsEQ, indicating long-term potential supply and demand mismatches in a region due, in part, to job demand and labor pool dyanamics, including educational attainment and projected growth.

- Occupation employment by place of residence is as of 2024Q1 and modeled by JobsEQ based upon occuaption employment by place of work and commuting patterns. Commuting patterns are derived from source data from the Census Bureau, occupation-specific commuting tendancies, and updated to reflect more recent population and employment estimates.

- Annual demand is the sum of the annual projected growth demand and separation demand. Separation demand is the number of jobs required due to separations—labor force exits (including retirements) and turnover resulting from workers moving from one occupation into another. Note that separation demand does not include all turnover—it does not include when workers stay in the same occupation but switch employers. Growth demand is the increase or decrease of jobs expected due to expansion or contraction of the overall number of jobs.

- Figures may not sum due to rounding.

Job Posting Source Details

- **Chmura JobsEQ:** General job ads data from the Regional Overview section of the report are based on online job posts from the Real-Time Intelligence (RTI) data set, produced by JobsEQ and gleaned from over 45,000 websites. Data reflect ads active during October 2024 and advertised for any Zip Code Tabulation Area in or intersecting with the region for which this report was produced. Historical ad volume is revised as additional data are made available and processed.

- **TalentNeuron:** Detailed job posting data insights provided in the Job Postings section of the report are aggregated using TalentNeuron (https://www.talentneuron.com/), a job posting aggregation tool which allows for greater specificity on education, experience level, and employer names. This report summarizes information from postings newly advertised between November 1, 2023, and October 31, 2024. Since many extraneous factors can affect short-term volume of online job postings, time-series data can be volatile and should be used with caution. All ad counts represent deduplicated figures.

  - o Demand: TalentNeuron scrapes approximately 1.3 million job postings daily, which are cleaned, deduplicated, and aggregated on the platform daily.

  - o Skills: TalentNeuron categorizes and tags skill and experience data from individual job postings for analysis at the aggregate level. The platform recognizes over 30,000 unique individual skills.

  - o Salary: TalentNeuron AI algorithms scrape job postings for salaries which are added to a historical database. As not all job postings include salaries, statistical analysis is used to predict or model the likely salary offer, which is vetted against U.S. Bureau of Labor Statistics employment wage data.

Definitions and Methodology

High-Wage
High-Wage occupations are defined as occupations that have average annual wages greater than the overall regional median wage ($49,600 in the region as of 2024Q1).
High-Skill
High-Skill occupations are those that typically require a certificate or other formal credential for employment. Occupation by educational attainment are regional data modeled by JobsEQ using U.S. Census Bureau Educational Attainment data projected to 2024Q1 along with source data from the BLS.
High-Demand
High-Demand occupations are defined as occupations that fulfill two or more of the following demand criteria: 1) high growth, 2) high total demand, 3) low unemployment, 4) high unemployment-to-posting ratio, and/or 5) high posting volume.
D1: 5-Yr Growth
An occupation is considered to have high growth in that occupation has forecasted 5-year growth that is greater than the overall regional forecasted 5-year pessimistic growth model.
D2: Total Demand
An occupation is considered to have high total demand if the total 5-year forecast employment growth, transfers, and exits combined is greater than 50% of total employment in that occupation as of 2024Q1 (i.e. high long-term demand)
D3: Unempl <3%
An occupation is considered to have low unemployment if the estimated unemployment rate for the occupation is below 3% in the region as of 2024Q1 (i.e. high employer retention demand)
D4: Posting Ratio
An occupation is considered to have a strained unemployment-to-posting ratio if the estimated volume of unemployed individuals regionally exceeds the number of online job postings advertised in the month of October 2024 (i.e. ratio of unemployed-to-posts is greater than 1; low talent supply)
D5: Posting Volume
An occupation is considered to have high posting volumes if the volume of online job postings in August 2024 was greater than 200 in the region, the occupation is considered to have high job posting volumes (i.e. high immediate employer demand).
Occupation Gaps
Occupation gaps are developed by JobsEQ and use a multitude of data sources. Employment supply and demand projections are based on a starting date of 2024Q1 using baseline low-growth forecasts modeled from the Bureau of Labor Statistics (more pessimistic forecast outlook than utilized in D1 and D2). 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 is 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.

Award Gaps

This metric illustrates the difference between the number of awards conferred (which are post-secondary certificates or degrees) and the occupation demand in your region. Negative values represent the gap, or shortage, of degrees being awarded in the region to meet the demand for the occupations selected. The positive values represent the surplus of awards meaning that the number of awards awarded are greater than the target range of demand for the region. Awards data are based upon degrees conferred for the academic year 2022-2023 and are provided by the National Center for Education Statistics (NCES). Occupation employment data are derived from the most recent four quarters of industry employment (from the Bureau of Labor Statistics, updated quarterly) and the industry/occupation matrix available for the region. Occupation training concentrations and shortfalls are calculated by JobsEQ. The percent college educated are provided by the BLS per the Employment Projections Program.

Location Quotient

Location quotient is a measurement of concentration in comparison to the nation. An LQ of 1.00 indicates a region has the same concentration of an industry (or occupation) as the nation. An LQ of 2.00 would mean the region has twice the expected employment compared to the nation and an LQ of 0.50 would mean the region has half the expected employment in comparison to the nation. Click here to see the formula for LQ. Occupations with a LQ greater than or equal to 1.2 have been flagged in this analysis of having a unique specialization in the region.