

2024 Regional Career Trends

For Career and Technical Education

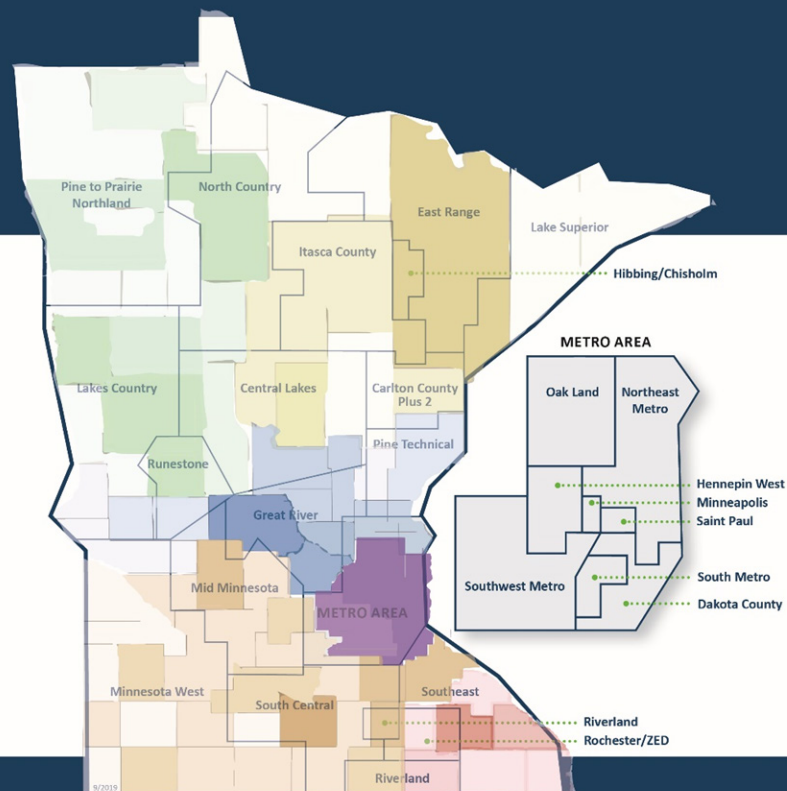


Northwest

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The contents of this series were made possible through the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) Federal grant from the United States Department of Education administered through Minnesota State Colleges and Universities.



December 2024

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

This report was developed by RealTime Talent for the Career and Technical Education Consortia of Minnesota with funding provided by Minnesota State. The contents of this publication were made possible through the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) Federal grant from the United States Department of Education administered through Minnesota State Colleges and Universities.

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

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Northwest Minnesota

Introduction

This report examines the current and future talent needs across the nineteen counties of Northwest 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)

²Becker, Beltrami, Clay, Clearwater, Douglas, Grant, Hubbard, Kittson, Mahnommen, Marshall, Norman, Otter Tail, Pennington, Polk, Red Lake, Roseau, Todd, Wadena, and Wilkin 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 (\$48,600 in the Northwest). 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 (\$48,600 in the Northwest). 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.

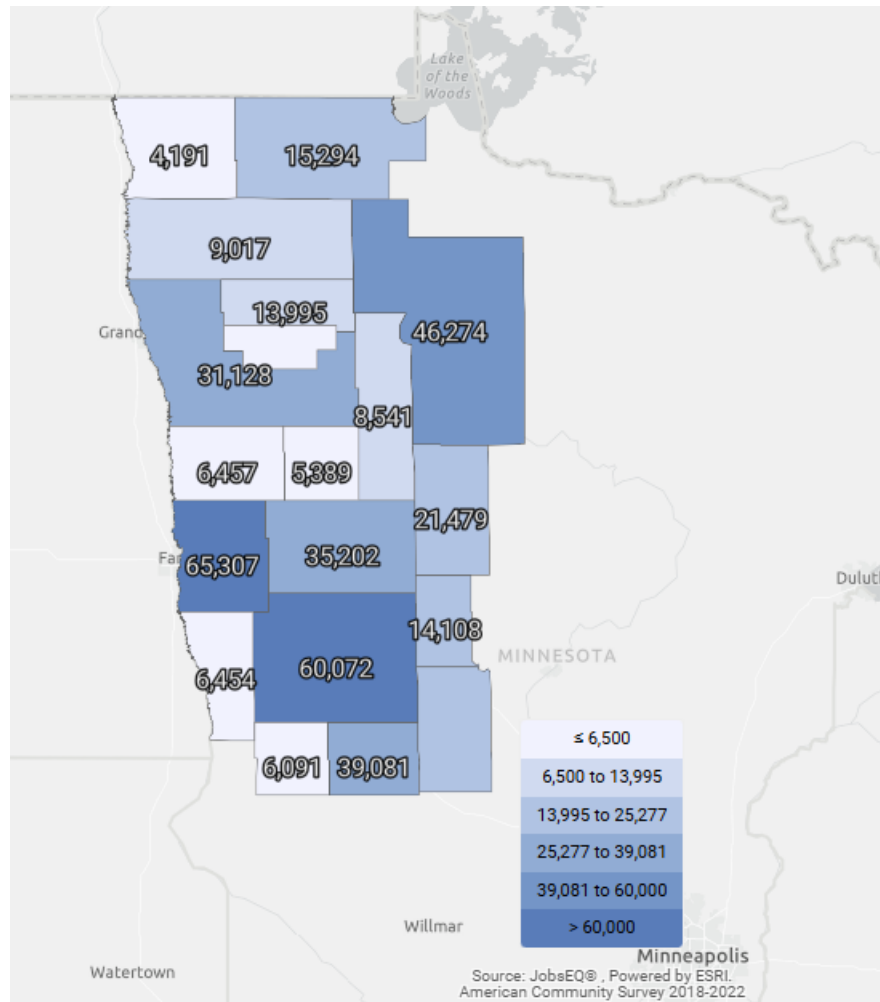
Community Profile

Demographics

POPULATION

- Total population in Northwest Minnesota: 417,269
 - Change from prior year: + 1,550 people
 - Share of Minnesota's total population who live in the Northwest: 7.3%
- Largest local concentrations of population: cities of Bemidji, Alexandria, Moorhead
- Most populous county: Otter Tail County (14.4% of the region's population)
- Median age: 40.7 years
 - Comparison to statewide median (38.5 years): 2.2 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 23.5% of Northwest Minnesota's population

Resident Population of Northwest Minnesota



American Community Survey 2018-2022.

RACE AND ETHNICITY

Northwest Minnesota is home to residents of many racial and ethnic backgrounds, though 87.8% of residents are white.

- 12.2% of residents are Black, Asian, American Indian, Native Hawaiian, two or more race(s), or some other race other than white (BIPOC), while 3.8% are of Hispanic/Latine ethnicity
- The Northwest region has an 8.1% higher share of white residents than the state as a whole
- Northwest Minnesota has a higher share of American Indian residents than many other regions, with 16,151 American Indian residents, or 3.9% of the population
 - Bemidji has a higher share of American Indian residents than other cities in the Northwest region, at 19.5%
- Diversity in the Northwest region is increasing, but more slowly than it is increasing statewide

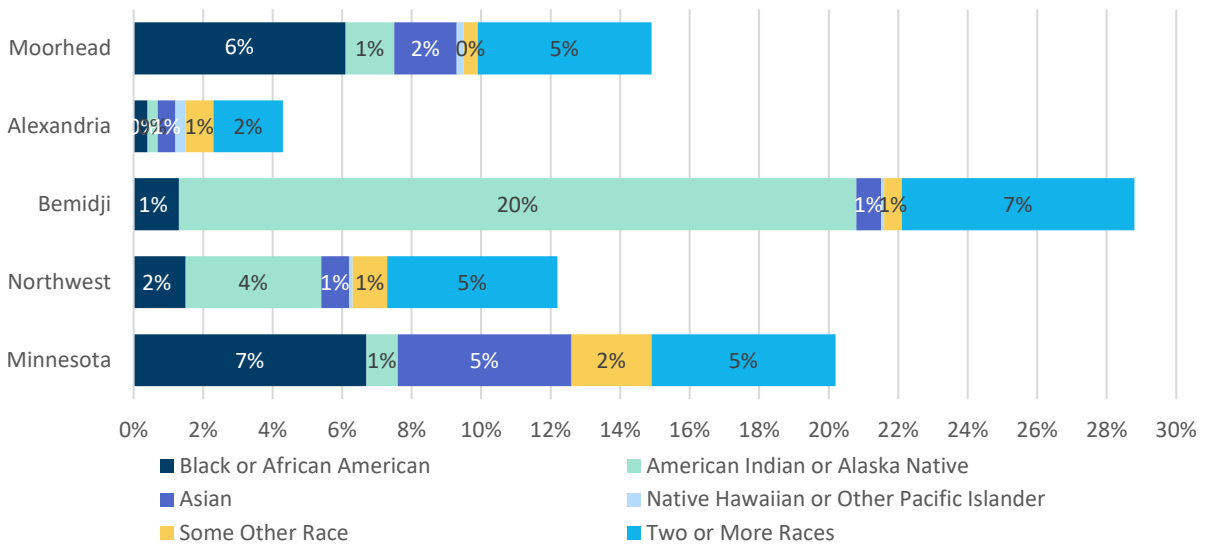
Race and Ethnicity Summary Info

Geography	% BIPOC by Race	% white by Race	% Hispanic/Latine Ethnicity
Bemidji	28.7%	71.3%	2.6%
Alexandria	4.3%	95.7%	2.0%
Moorhead	14.9%	85.1%	5.1%
Northwest	12.2%	87.8%	3.8%
Minnesota	20.3%	79.7%	5.7%

American Community Survey 2018-2022

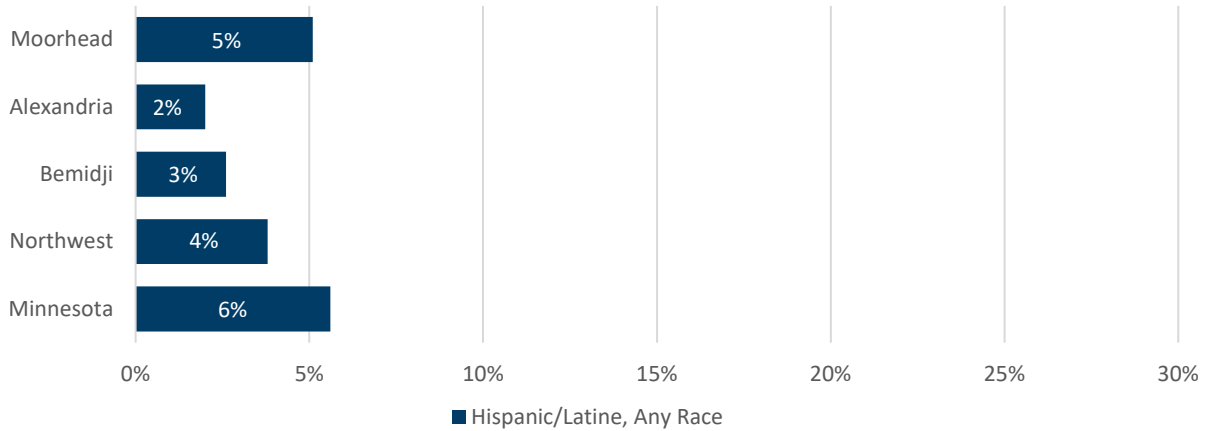
BIPOC residents are those who identify as Black, Asian, American Indian, Native Hawaiian, two or more races, or some other race other than white
Hispanic/Latine ethnicity is reported separately from race in the American Community Survey

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

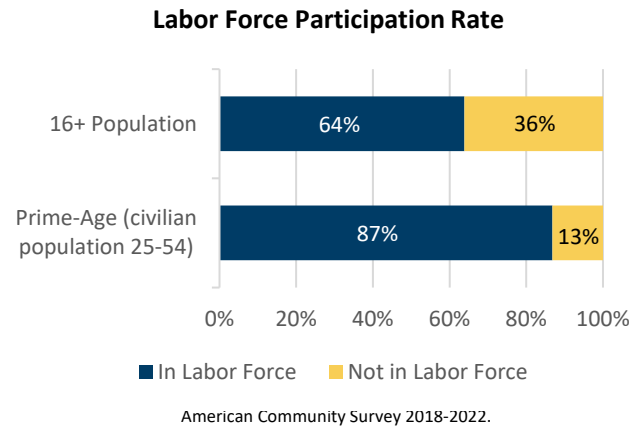
Demographics	Metro Area			Region			Region (Value)		
	Bemidji, MN μ SA	Alexandria, MN μ SA	Moorhead city, MN	Northwest Minnesota	Minnesota	USA	Northwest Minnesota	Minnesota	USA
Population (ACS)	—	—	—	—	—	—	417,269	5,695,292	331,097,593
Male	50.4%	50.4%	49.7%	50.7%	50.2%	49.6%	211,376	2,857,964	164,200,298
Female	49.6%	49.6%	50.3%	49.3%	49.8%	50.4%	205,893	2,837,328	166,897,295
Median Age ²	—	—	—	—	—	—	40.7	38.5	38.5
Under 18 Years	24.9%	21.5%	23.1%	23.5%	23.0%	22.1%	98,238	1,307,084	73,213,705
18 to 24 Years	13.0%	7.0%	18.5%	8.9%	9.0%	9.4%	37,277	513,816	31,282,896
25 to 34 Years	12.1%	11.0%	14.6%	11.1%	13.2%	13.7%	46,208	751,997	45,388,153
35 to 44 Years	11.3%	11.5%	12.5%	11.7%	13.2%	12.9%	48,830	751,128	42,810,359
45 to 54 Years	9.9%	10.7%	9.6%	10.7%	11.9%	12.4%	44,600	675,835	41,087,357
55 to 64 Years	12.1%	14.6%	9.4%	14.0%	13.3%	12.9%	58,354	756,036	42,577,475
65 to 74 Years	10.0%	12.9%	6.8%	11.4%	9.7%	9.7%	47,610	550,838	32,260,679
75 Years, and Over	6.7%	10.7%	5.6%	8.7%	6.8%	6.8%	36,152	388,558	22,476,969
Race: White	71.3%	95.7%	85.1%	87.8%	79.7%	65.9%	366,214	4,537,219	218,123,424
Race: Black or African American	1.3%	0.4%	6.1%	1.5%	6.7%	12.5%	6,370	382,082	41,288,572
Race: American Indian and Alaska Native	19.5%	0.3%	1.4%	3.9%	0.9%	0.8%	16,151	51,434	2,786,431
Race: Asian	0.7%	0.5%	1.8%	0.8%	5.0%	5.8%	3,388	286,146	19,112,979
Race: Native Hawaiian and Other Pacific Islander	0.1%	0.3%	0.2%	0.1%	0.0%	0.2%	403	2,324	624,863
Race: Some Other Race	0.5%	0.8%	0.4%	1.0%	2.3%	6.0%	4,272	133,098	20,018,544
Race: Two or More Races	6.7%	2.0%	5.0%	4.9%	5.3%	8.8%	20,471	302,989	29,142,780
Hispanic or Latino (of any race)	2.6%	2.0%	5.1%	3.8%	5.7%	18.7%	15,815	327,049	61,755,866

American Community Survey 2018-2022.

Economic and Social Characteristics

LABOR FORCE PARTICIPATION

- Civilian labor force: 210,417 workers (an increase of 971 from the prior year)
- Labor force participation rate: 63.9%
 - This lags Minnesota's statewide rate by nearly 5 percentage points
 - Northwest 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): 86.8%.



SOCIAL CHARACTERISTICS

- The Northwest region has a higher percentage of veterans and of people with disabilities than the statewide average:
 - Veterans are 4.1% of the regional population vs. 3.5% statewide
 - People with disabilities are 11.5% in the region vs. 9.2% statewide
- Labor force participation for those groups is lower in the Northwest region than statewide:
 - Veteran labor force participation in the region is 78.4% vs. 81.1% for Minnesota
 - Labor force participation rate for people with disabilities is 52.9% in the region vs. 54.4% statewide
- The Northwest region's share of disconnected youth is slightly higher than the statewide average:
 - 2.6% in the Northwest vs. 1.7% statewide
- Disconnected youth rates vary between communities:
 - Bemidji: 3.0% of youth are disconnected (down by 1.7 percentage points from last year).
 - Moorhead: 0.6% of youth are disconnected (the same share as last year).

Detailed Economic and Social Characteristics

Characteristic	Metro Area			Region			Region (Value)		
	Bemidji, MN μSA	Alexandria, MN μSA	Moorhead city, MN	Northwest Minnesota	Minnesota	USA	Northwest Minnesota	Minnesota	USA
Labor Force Participation Rate and Size (civilian population 16 years and over)	62.9%	64.3%	71.1%	63.9%	68.7%	63.3%	210,417	3,112,649	167,857,207
Prime-Age Labor Force Participation Rate and Size (civilian population 25-54)	82.9%	91.4%	87.9%	86.8%	88.4%	82.8%	120,875	1,924,211	106,380,520
Armed Forces Labor Force	0.1%	0.1%	0.2%	0.1%	0.1%	0.5%	423	4,104	1,236,378
Veterans, Age 18-64	5.5%	4.4%	3.3%	4.1%	3.5%	4.3%	9,652	119,296	8,636,019
Veterans Labor Force Participation Rate and Size, Age 18-64	75.4%	76.7%	83.0%	78.4%	81.1%	77.1%	7,563	96,710	6,656,238
Median Household Income ²	—	—	—	—	—	—	\$68,236	\$84,313	\$75,149
Per Capita Income	—	—	—	—	—	—	\$35,777	\$44,947	\$41,261
Poverty Level (of all people)	16.1%	8.5%	18.4%	11.6%	9.3%	12.5%	47,111	516,284	40,521,584
Households Receiving Food Stamps/SNAP	13.7%	4.8%	10.5%	8.9%	7.4%	11.5%	14,913	167,713	14,486,880
Enrolled in Grade 12 (% of total population)	1.5%	1.1%	1.0%	1.3%	1.4%	1.4%	5,632	80,290	4,476,703
Disconnected Youth ³	3.0%	1.6%	0.6%	2.6%	1.7%	2.5%	573	5,089	430,795
Children in Single Parent Families (% of all children)	44.2%	28.3%	28.8%	29.3%	28.3%	34.0%	27,355	355,832	23,568,955
Uninsured	8.1%	3.6%	3.7%	5.6%	4.6%	8.7%	23,174	260,483	28,315,092
With a Disability, Age 18-64	13.0%	8.5%	12.1%	11.5%	9.2%	10.5%	26,794	313,760	20,879,820
With a Disability, Age 18-64, Labor Force Participation Rate and Size	51.1%	56.5%	64.7%	52.9%	54.4%	45.5%	14,168	170,629	9,492,098
Foreign Born	1.5%	1.5%	6.7%	2.5%	8.5%	13.7%	10,522	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 Northwest Minnesota, 6.2% of adults aged 25-64 do not have a high school diploma or equivalent
- About 26.7% 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 Bemidji, 32.7% of adults have a high school diploma or less. In contrast, only 23.9% of Moorhead's population has a high school diploma or less

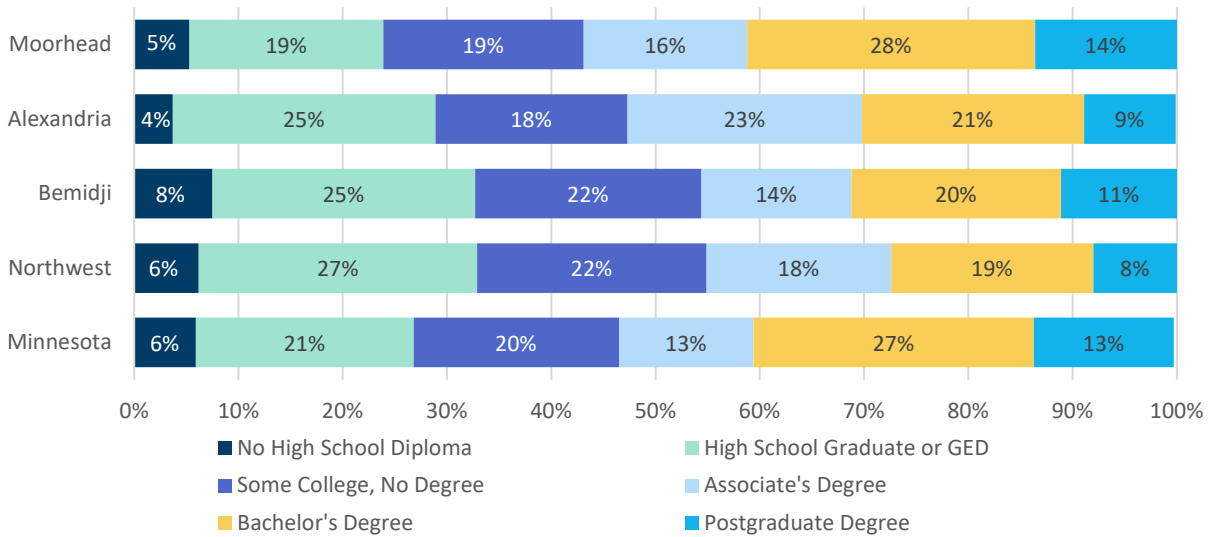
- Moorhead has a greater share of its population with high levels of educational attainment, with 41.2% having a bachelor’s degree or higher, compared to 30.1% in Alexandria and 31.2% in Bemidji

Educational Attainment of Northwest Minnesota Residents, Age 25-64

Educational Attainment	Metro Area			Region			Region (Value)		
	Bemidji, MN μSA	Alexandria, MN μSA	Moorhead city, MN	Northwest Minnesota	Minnesota	USA	Northwest Minnesota	Minnesota	USA
No High School Diploma	7.5%	3.7%	5.3%	6.2%	5.9%	10.1%	12,279	173,843	17,373,867
High School Graduate	25.2%	25.2%	18.6%	26.7%	20.9%	25.1%	52,852	614,415	43,176,248
Some College, No Degree	21.7%	18.4%	19.2%	22.0%	19.7%	19.7%	43,607	578,062	33,916,989
Associate degree	14.4%	22.5%	15.7%	17.7%	12.9%	9.2%	34,961	377,910	15,886,884
Bachelor’s Degree	20.1%	21.3%	27.6%	19.4%	26.9%	22.4%	38,499	790,857	38,451,123
Postgraduate Degree	11.1%	8.8%	13.6%	8.0%	13.6%	13.4%	15,794	399,909	23,058,233

American Community Survey 2018-2022.

Educational Attainment, Age 25-64



American Community Survey 2018-2022.

REGIONAL COLLEGES AND UNIVERSITIES

Northwest Minnesota has eleven institutions of higher education that offer both degree and non-degree awards, two-year degrees, four-year degrees, and graduate degrees. The table below shows these postsecondary institutions sorted by total awards conferred from all programs during SY2022-23. There were a total of 6,116 awards conferred in the region in SY2022-23, compared to 6,326 awards conferred in the region in SY2021-22.

Postsecondary Awards by Institution, School Year 2022-23

School	Certificate				Bachelor's	Post-Bacc	Master's	Post Master's/Doctorate	Total Awards	Total School Enrollment	Avg Net Price*
	< 1 Yr	1+ but < 2 Yr	Associate	2+ but < 4 Yr							
Minnesota State University Moorhead	46	0	13	0	1,042	10	282	70	1,463	4,682	\$17,254
Bemidji State University	16	6	40	0	891	0	88	0	1,041	4,023	\$15,594
Minnesota State Community and Technical College	60	216	654	69	0	0	0	0	999	5,282	\$10,119
Alexandria Technical & Community College	158	132	397	54	0	0	0	0	741	2,865	\$13,189
Northland Community and Technical College	122	166	339	31	0	0	0	0	658	2,495	\$11,952
Concordia College at Moorhead	0	0	0	0	482	0	16	0	498	1,903	\$23,890
University of Minnesota-Crookston	9	0	0	0	398	0	0	0	407	2,303	\$11,925
Northwest Technical College	40	27	122	49	0	0	0	0	238	721	\$12,540
Red Lake Nation College	0	0	29	0	0	0	0	0	29	184	\$6,956
White Earth Tribal and Community College	6	0	21	0	0	0	0	0	27	102	\$8,562
Oak Hills Christian College	0	2	7	0	6	0	0	0	15	102	\$20,855
Total	457	549	1,622	203	2,819	10	386	22	6,116	4,682	\$17,254

* 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.

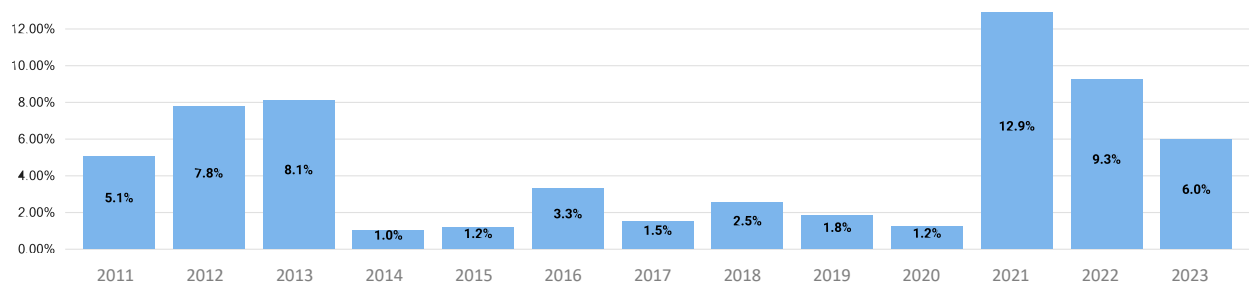
Economy

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 Northwest region grew by 6.0%. This follows an expansion of 9.3% in 2022. As of 2023, total GDP in the region was \$21,263,844,000—of which \$2,273,514,000 is attributed to the Bemidji, MN μSA.

One-Year % Change in GDP, Northwest 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

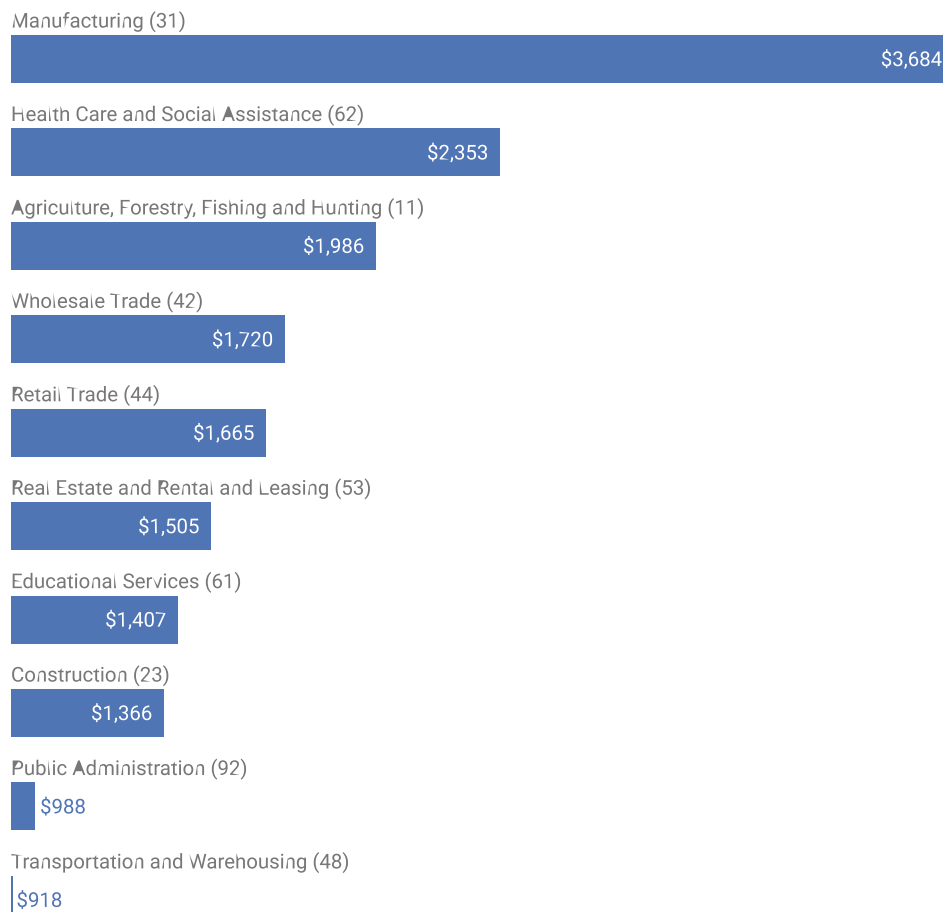
Top Industry Contributions to GDP (2023):

1. Manufacturing: \$3.68 billion
2. Health Care and Social Assistance: \$2.35 billion
3. Agriculture, Forestry, Fishing and Hunting: \$1.97 billion
4. Wholesale Trade: \$1.72 billion

Key Changes:

- Agriculture, Forestry, Fishing and Hunting saw a dramatic increase in output from the prior year (up around \$600 million)
- Manufacturing dropped in total output from the prior year (by nearly \$300 million)
- All other top industries maintained output or increased from the prior year

Industry Contributions to GDP in Northwest Minnesota (in \$ Millions), 2023



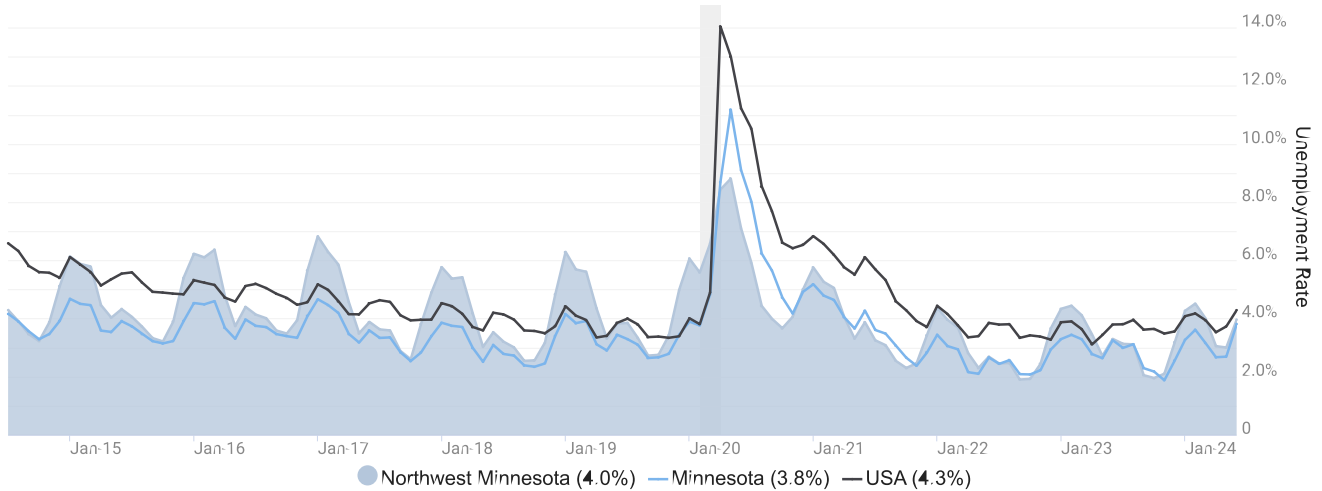
Gross Domestic Product data are provided by the Bureau of Economic Analysis, imputed by Chmura where necessary, updated through 2023.

Labor Market

UNEMPLOYMENT TRENDS

- The unemployment rate in Northwest Minnesota was 4.0% as of June 2024
 - The regional unemployment rate was higher than the statewide rate (3.8%) and slightly lower than the national rate (4.3%)
 - One year earlier, in June 2023, the unemployment rate in Northwest Minnesota was 3.3%.

Unemployment for Northwest Minnesota

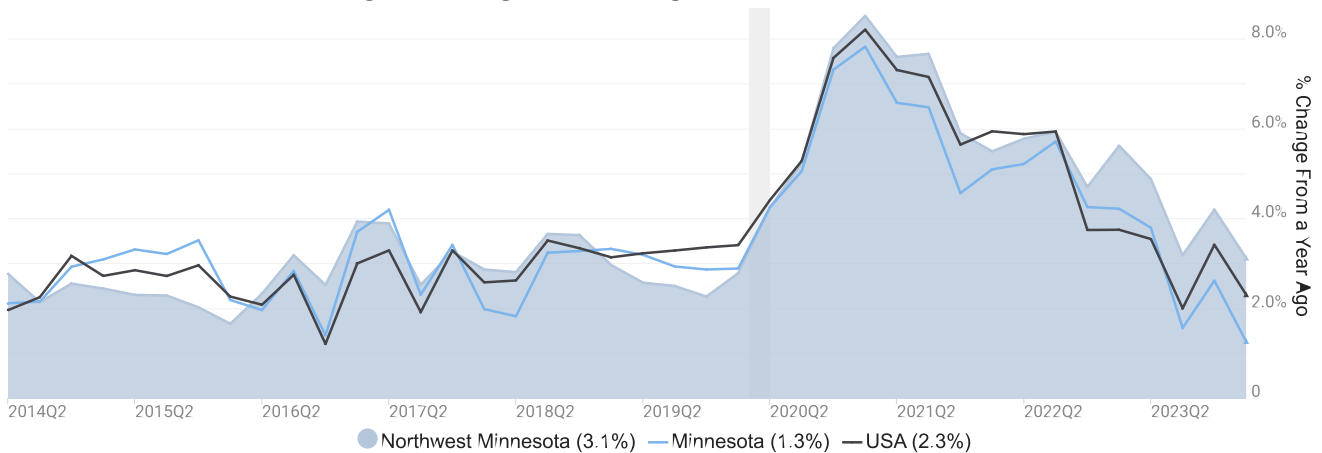


Unemployment rate data are from the Local Area Unemployment Statistics, provided by the Bureau of Labor Statistics and updated through June 2024.

WAGE TRENDS

- In Northwest Minnesota, average annual wages were \$52,384 as of 2024Q1
 - Up \$1,139 from the 2023Q2 average of \$51,245
 - This is an increase of 3.1% over the past four quarters, as compared to a 5.8% 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 Northwest 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 0.7% in Northwest Minnesota between 2023Q1 and 2024Q1, growing more slowly than the prior 12 months. Employment in the region is forecast to decline by -0.2% on average annually through 2029Q1 in a baseline scenario.

5-Year Employment Forecast in Northwest Minnesota



INDUSTRY CLUSTER FORECASTS

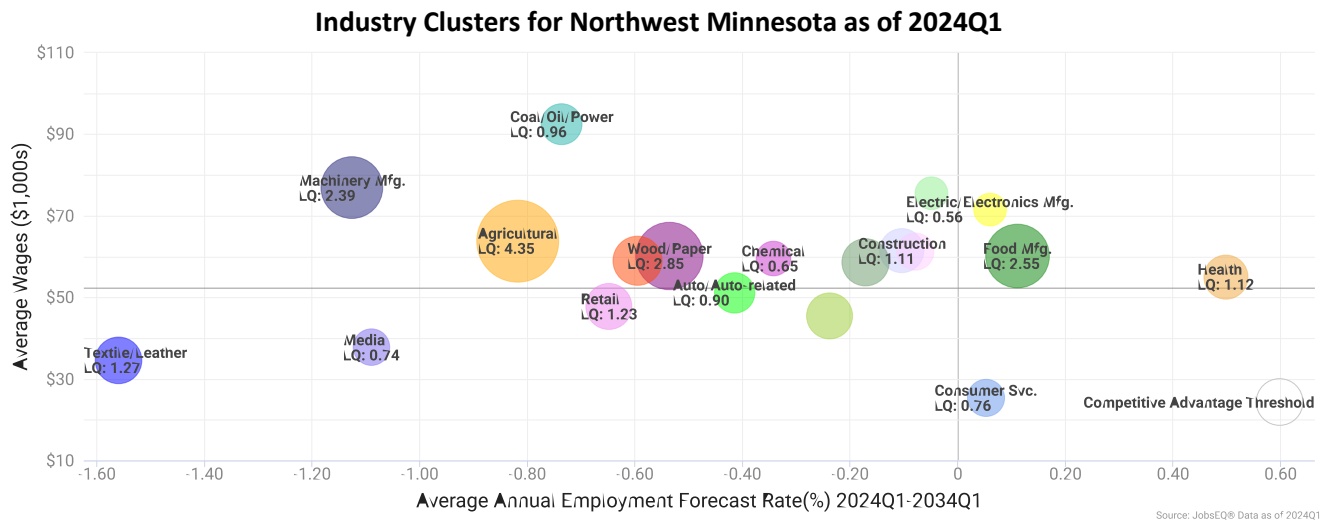
Employment forecasts vary considerably by industry. An industry cluster is a geographic concentration of interrelated industries or occupations. The chart below shows industry clusters employing talent in Northwest Minnesota. The larger the circle, the more concentrated the industry is in the region (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 Northwest region is Agricultural:

- Location Quotient: 4.35 (up from 2023)
- Employment: 9,321 workers (down by ~243 from 2023)
- Average Wage: \$63,813 (up by about \$7,654 from 2023)
- Employment Forecast: Projected to decline by -0.8% annually over the next 10 years

Industry Cluster Employment Forecast Trends:

- Health, Food Manufacturing, Electronics Manufacturing, and Consumer Services are the industry clusters projected to have positive average employment growth in the region; all others are forecast to shrink
- Most industry clusters saw improvement in forecasted employment from 2023Q2 to 2024Q1



Quantifying Talent Shortages

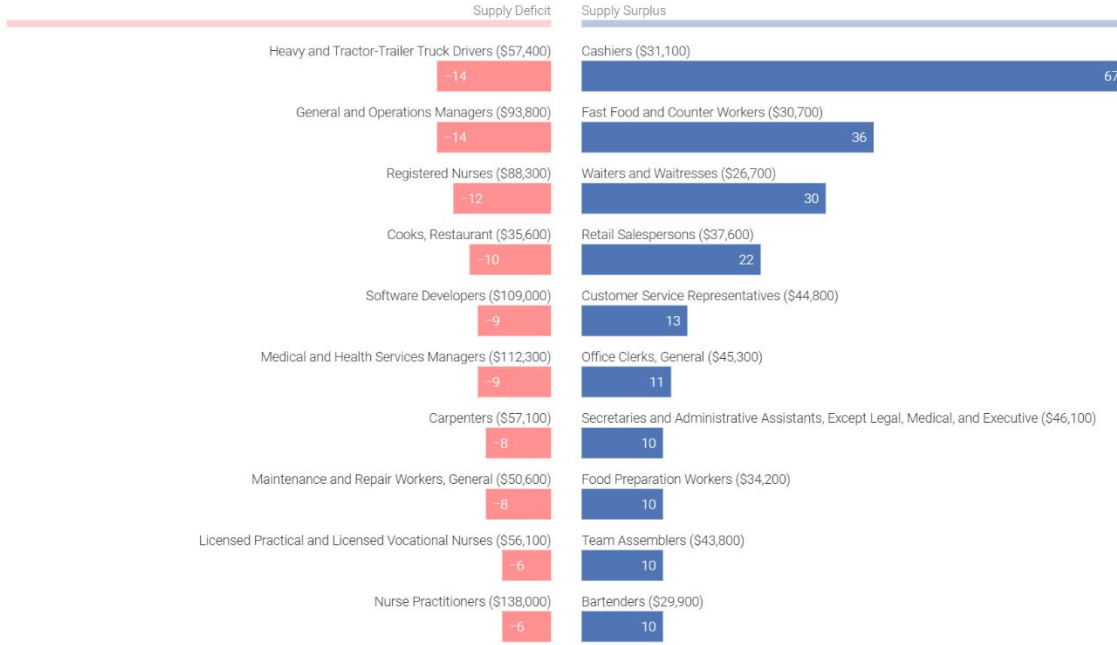
Occupation Gaps

The chart below shows the potential average annual talent gaps by occupation in the Northwest 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:

- Heavy and Tractor-Trailer Truck Drivers, and General and Operations Managers are the top occupations in talent shortage
- Volume of shortages similar to 2023, with most declining in total annual shortage slightly
- Growing talent surplus of Cashiers, Fast Food and Counter Workers, and other customer service roles
- Elementary School Teachers is newly on the list of top occupation shortages

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



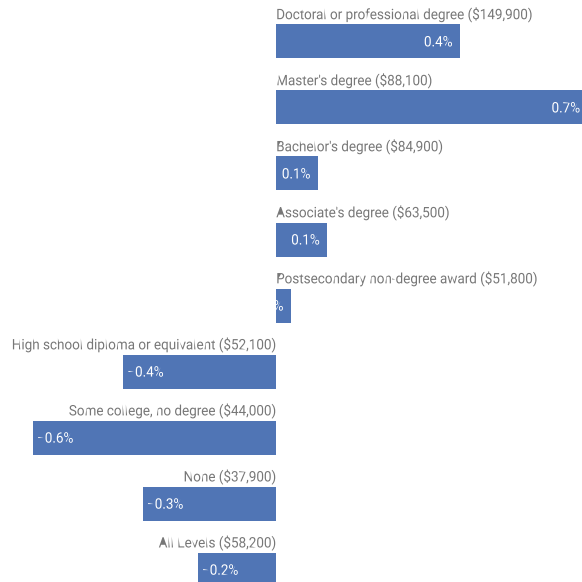
The Role of Education

EMPLOYMENT FORECAST BY EDUCATION

While overall employment in Northwest Minnesota is forecast to decline by -0.2% 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%)—similar to forecasts in 2023Q2
- Roles typically requiring an associate, bachelor’s, master’s, or doctoral degree are all expected to grow—now at higher rates than forecast in 2023Q2

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

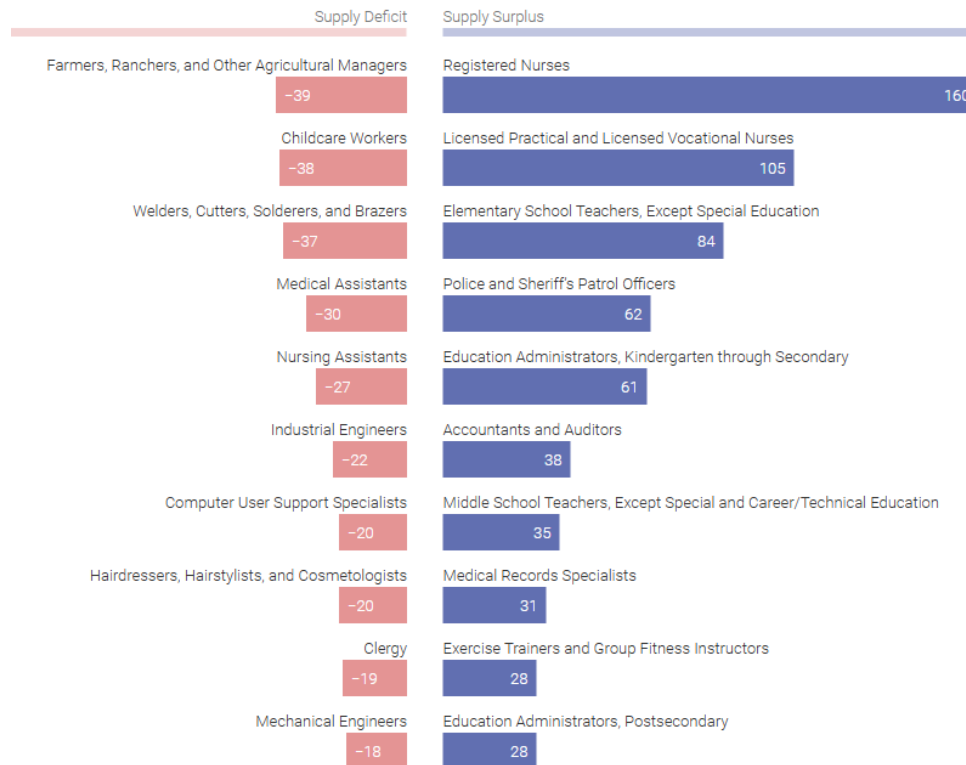


Employment by occupation data are estimates as of 2024Q1. Education levels of occupations are based on BLS assignments. Forecast employment growth uses national projections from the Bureau of Labor Statistics adapted for regional growth patterns.

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 Northwest region, local postsecondary programs are now likely underproducing Agricultural Managers, Childcare Workers, Welders, Cutters, Solderers, and Brazers, and a variety of other Health Science and Human Services talent. There is a local oversupply of new graduates from programs aligned to Registered Nurses, Licensed Practical Nurses, and Elementary School Teachers compared to national volumes.

Award Gaps, All Occupations, Northwest Minnesota, 2024Q1



Occupations in Current Shortage

Twelve occupations have zero unemployed talent in the Northwest 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 \$48,600 annually, with many significantly higher.

Half (six) occupations with no unemployed workers were facing these shortages in 2023. The occupations that had zero unemployment in the region in 2023 as well as 2024 include: School Psychologists, Family Medicine Physicians, Locomotive Engineers, Veterinarians, General Internal Medicine Physicians, and Dietitians and Nutritionists.

Occupations with No Unemployed Workforce and Employing over 75 Workers, Northwest 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	Transfers	Empl Change	Ann % Change
11-9041	Architectural and Engineering Managers	162	\$129,500	0.72	0	n/a	44	14	1.8%	49	16	34	-1	-0.2%
19-5011	Occupational Health and Safety Specialists	106	\$79,000	0.85	0	n/a	17	20	4.3%	62	15	42	5	0.9%
19-3034	School Psychologists	96	\$79,400	1.42	0	n/a	40	-5	-1.0%	30	8	22	0	0.0%
31-9011	Massage Therapists	94	\$73,000	0.63	0	n/a	3	-11	-2.2%	72	33	34	6	1.2%
47-4011	Construction and Building Inspectors	94	\$69,100	0.62	0	n/a	26	4	0.9%	50	30	22	-2	-0.5%
29-1215	Family Medicine Physicians	91	\$288,700	0.74	0	n/a	56	-15	-2.9%	13	9	3	1	0.2%
17-3023	Electrical and Electronic Engineering Technologists and Technicians	90	\$68,400	0.81	0	n/a	10	-9	-1.9%	39	22	20	-3	-0.7%
53-4011	Locomotive Engineers	87	\$77,600	2.25	0	n/a	1	-17	-3.5%	32	12	21	-1	-0.3%
29-1131	Veterinarians	83	\$101,400	0.86	0	n/a	7	11	2.8%	22	10	4	7	1.6%
29-1216	General Internal Medicine Physicians	82	\$256,200	0.97	0	n/a	18	-2	-0.5%	11	8	2	0	0.1%
29-1031	Dietitians and Nutritionists	78	\$69,700	0.89	0	n/a	11	2	0.6%	25	14	11	1	0.2%
47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining	74	\$65,700	1.84	0	n/a	1	-12	-3.1%	35	17	19	-1	-0.4%
Total - All Occupations		178,838	\$48,600	1.00	7,002	3.2%	13,899	469	0.1%	95,944	43,603	54,056	-1,715	-0.2%

Job Posting Trends in Northwest Minnesota

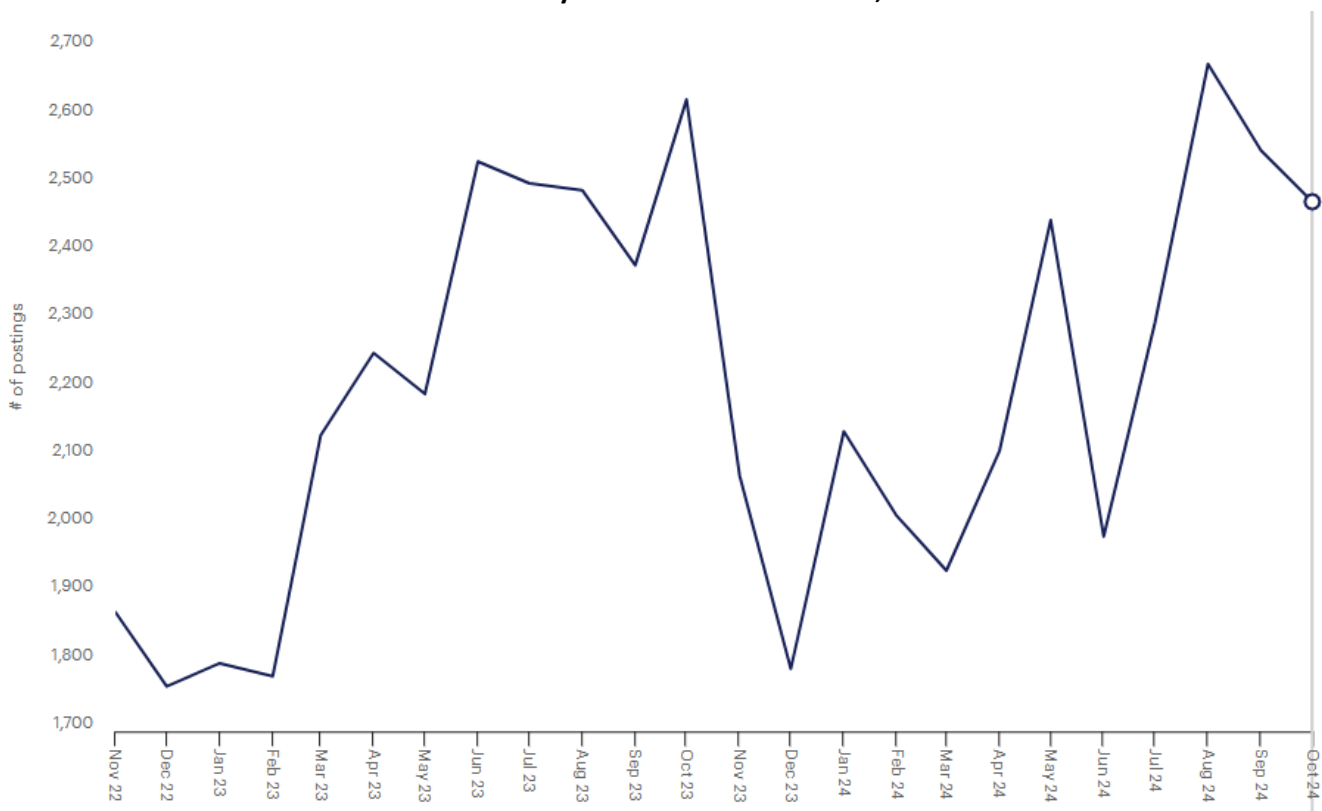
Online job posting data reveals much about employer demand for certain skills, certifications, qualifications, and occupational competencies.

TOTAL JOBS

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

- 26,515 unique job postings advertised online in Northwest Minnesota
 - + 1% compared to the 12 months prior
- 594,113 unique postings statewide
 - -10% compared to the 12 months prior

Total Jobs Advertised Monthly in Northwest Minnesota, October 2023-2024



SOURCE: TalentNeuron accessed 11/1/2024

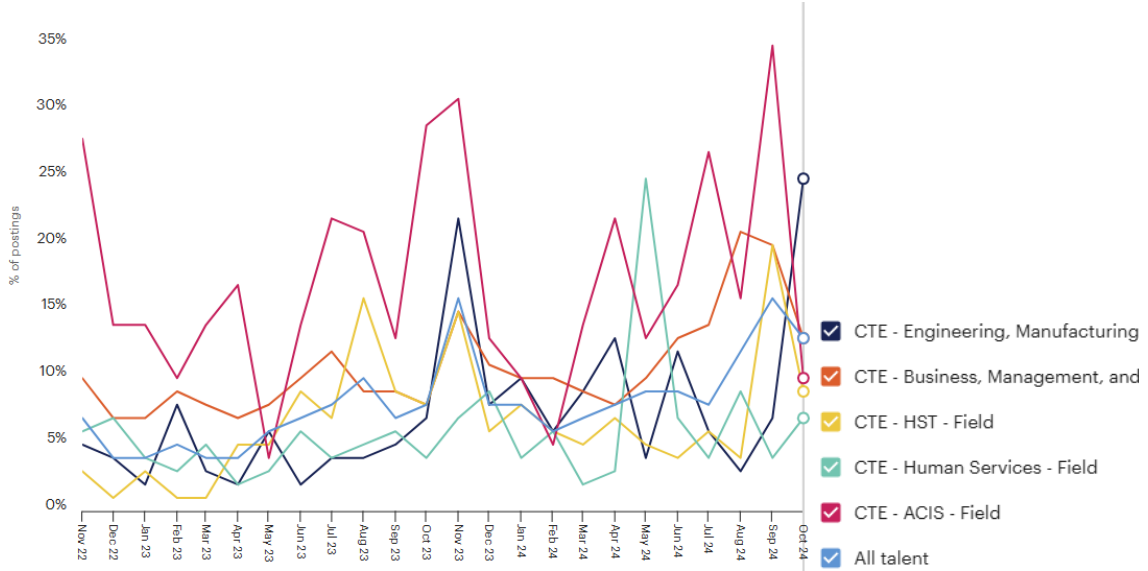
REMOTE AND HYBRID POSITIONS

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

- 10% of all positions advertised in the past 12 months were explicitly listed as remote, hybrid remote, 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 four percentage points from the prior year
 - Fully remote roles grew the most, rising by three percentage points and representing 4% of all postings

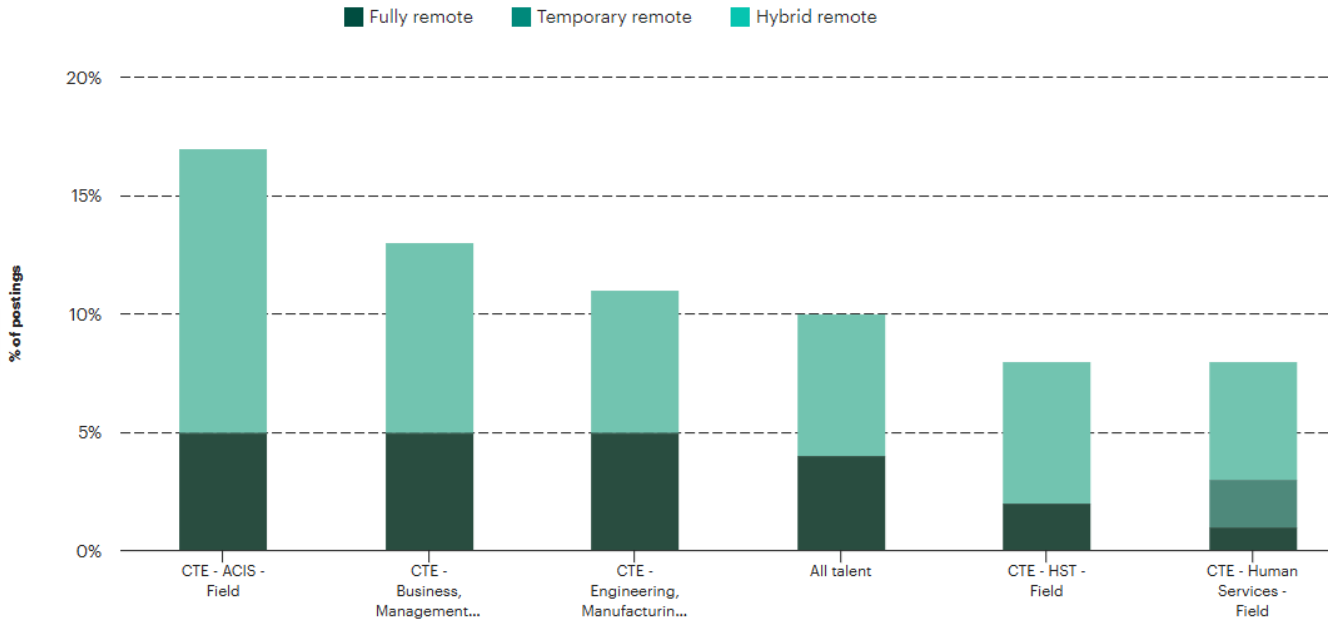
- Engineering, Manufacturing and Technology, and Business, Management, and Administration roles have particularly seen increases (by six and five percentage points respectively from the prior year)

Total Remote Job Postings Advertised Monthly in Northwest Minnesota, October 2023-2024



SOURCE: TalentNeuron accessed 11/1/2024

Remote Job Postings by Career Field Advertised in Northwest Minnesota, October 2023-2024



Talent Profile	% of postings				
	Unspecified /Onsite	Total remote	Fully remote	Temporary remote	Hybrid remote
CTE - ACIS - Field	83% ▲1 pp	17% ▼-1 pp	5% ▲0 pp	0% ▲0 pp	12% ▼-1 pp
CTE - Business, Management, and Administration - Field	87% ▼-5 pp	13% ▲5 pp	5% ▲3 pp	0% ▲0 pp	8% ▲2 pp
CTE - Engineering, Manufacturing, and Technology - Field	89% ▼-6 pp	11% ▲6 pp	5% ▲4 pp	0% ▲0 pp	6% ▲2 pp
All talent	90% ▼-4 pp	10% ▲4 pp	4% ▲3 pp	0% ▲0 pp	6% ▲1 pp
CTE - HST - Field	92% ▼-2 pp	8% ▲2 pp	2% ▲1 pp	0% ▲0 pp	6% ▲1 pp
CTE - Human Services - Field	92% ▼-4 pp	8% ▲4 pp	1% ▲0 pp	2% ▲2 pp	5% ▲2 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 tied to jobs seeing significant regional growth in Human Services and Health Science
- **Core** skills have remained relatively consistent with human skills such as communication, leadership, and monitoring ranking in high importance

Top Evolving Skills in Northwest Minnesota, October 2023-2024

<p>New</p> <ol style="list-style-type: none"> Officer Training Patient Comfort Power generation s... <p>New skills whose future is uncertain.</p>	<p>Emerging</p> <ol style="list-style-type: none"> Rehabilitation <p>Relatively new skills that are becoming more prevalent.</p>	<p>Growing</p> <p>There are no Growing skills in the market</p> <p>Fast-growing skills that are becoming core skills.</p>	<p>Core</p> <ol style="list-style-type: none"> Collaboration Monitoring Leadership <p>Skills that have been present in a high percentage of job postings for some time.</p>	<p>Declining</p> <ol style="list-style-type: none"> Nursing <p>Skills that used to be essential but are becoming obsolete.</p>
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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

- Lowest unemployment rate (1.8%)
- Highest volume of 30-day job ads in the region (4,660)
- Greatest decline in employment over the past five years (-0.6% on average annually)
- Highest forecast growth among career fields by percent and total volume (+0.4% on average annually)

Human Services

- Low unemployment rate (2.4%)
- Second highest average entry-level annual wages (\$42,700)
- Third largest employment in the region among career fields

Arts, Communications, and Information Systems

- Smallest employment volume in the region
- Low unemployment rate (2.3%)
- Low concentration in the region (LQ 0.59)
- Highest median and average entry-level wages of all career fields

Business, Management, and Administration

- Largest employment volume in the region
- Concentration slightly below the national average (LQ 0.89)
- Highest total five-year demand for talent due to replacement needs (43,484)
- Greatest forecast decline in employment over the next five years (-0.4%, -1,541 workers)

Engineering, Manufacturing, and Technology

- Second highest employment volume in the region
- Highest unemployment rate (3.7%)
- Highest growth in employment over the past five years (+0.5% on average annually)

Agriculture, Food, and Natural Resources

- The second smallest share of regional employment
- Lowest average entry-level annual wages (\$36,600)
- High concentration in the region (LQ 1.67)
- High total five-year demand in relation to total employment volume

CTE Field Employment and Wages in Northwest 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	17,002	\$39,400	\$65,200	1.03	365	1.8%	4,660	-496	-0.6%
Human Services	30,072	\$42,700	\$55,400	1.07	810	2.4%	2,040	421	0.3%
Arts, Communications, and Information Systems	4,830	\$50,800	\$69,300	0.59	141	2.3%	260	-27	-0.1%
Business, Management, and Administration	70,220	\$37,300	\$50,300	0.89	3,116	3.5%	4,432	70	0.0%
Engineering, Manufacturing, and Technology	48,009	\$42,600	\$54,200	1.10	2,327	3.7%	2,383	1,158	0.5%
Agriculture, Food, and Natural Resources*	15,538	\$36,600	\$54,300	1.67	528	2.9%	549	-104	-0.1%
Total - All Occupations	178,838			1.00	7,002	3.2%	13,952	469	0.1%

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 Northwest 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	17,002	7,375	3,454	3,556	364	0.4%
Human Services	30,072	15,423	7,172	7,912	338	0.2%
Arts, Communications, and Information Systems	4,830	1,867	766	1,112	-11	0.0%
Business, Management, and Administration	70,220	43,484	19,909	25,117	-1,541	-0.4%
Engineering, Manufacturing, and Technology	48,009	23,090	9,767	13,953	-629	-0.3%
Agriculture, Food, and Natural Resources*	15,538	8,461	4,050	4,737	-325	-0.4%
Total - All Occupations	178,838	95,944	43,603	54,056	-1,715	-0.2%

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.

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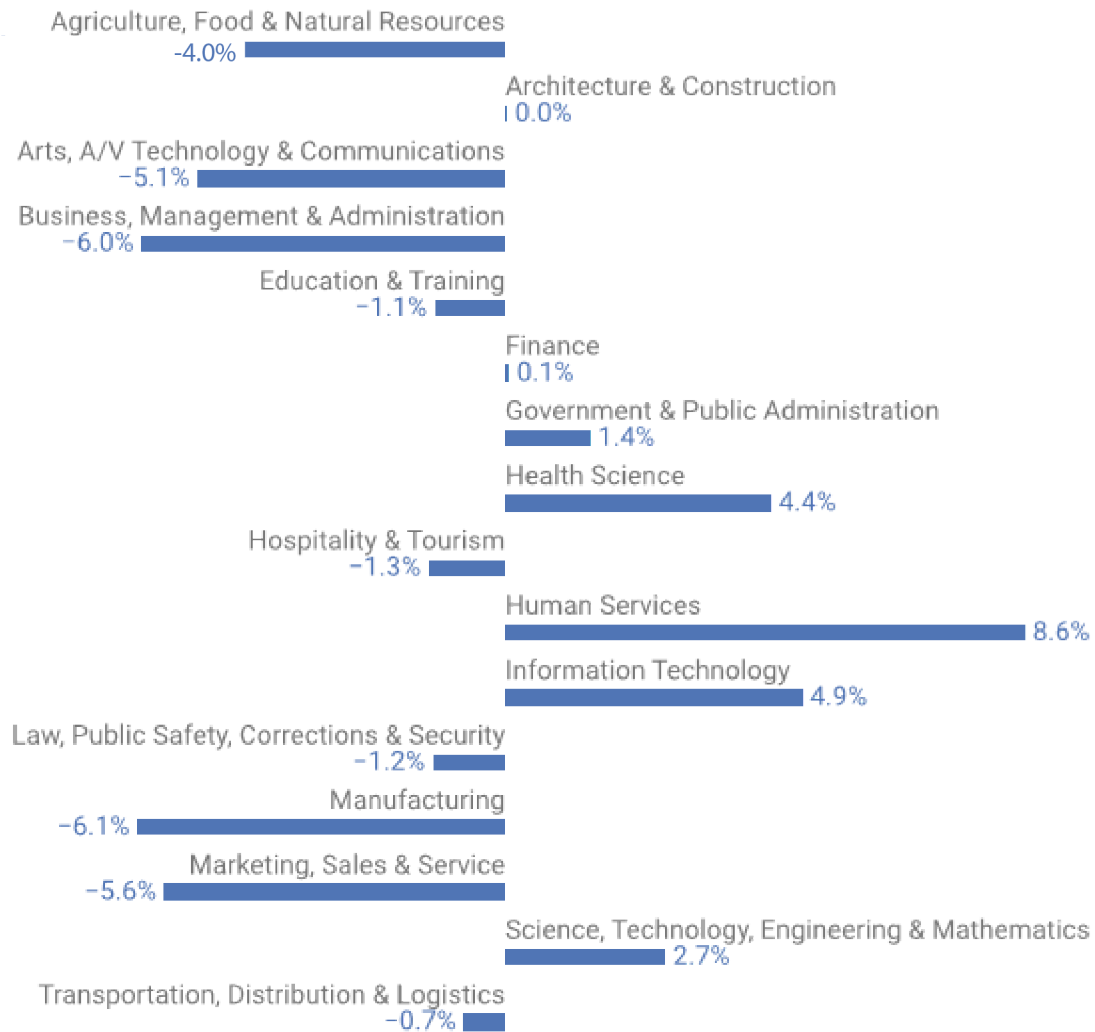
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Career Cluster Detail

Of the sixteen career clusters used by Career and Technical Education (CTE), nine are forecast to decline in overall employment over the next ten years as of 2024Q1 estimates. The five clusters forecasting growth are Human Services (+8.6%), Information Technology (+4.9%), Health Science (+4.4%), STEM (+2.2%), and Government and Public Administration (+1.4%). Finance (+0.1%) and Architecture and Construction (+0.0%) are forecast to see employment remain relatively flat. All clusters saw improvements in employment outlook from the prior year's forecast.

Baseline 10-Year Forecasts by Career Cluster, Northwest Minnesota, 2024Q1



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 Northwest, 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.

Nine 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 Finance 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	1,971	\$93,700	226	5	123
Information Technology	2,413	\$89,300	179	11	156
Finance	4,149	\$81,600	393	0	316
Health Science	17,002	\$80,600	4,574	71	1,468
Business, Management & Administration	27,445	\$66,200	1,242	-172	2,659
Law, Public Safety, Corrections & Security	4,242	\$66,200	260	-6	377
Government & Public Administration	1,573	\$64,600	154	2	144
Architecture & Construction	13,612	\$62,500	475	-1	1,202
Education & Training	13,463	\$60,700	512	-17	1,159
Arts, A/V Technology & Communications	2,417	\$58,100	72	-13	219
Agriculture, Food & Natural Resources*	15,538	\$54,100	573	-68	1,696
Manufacturing	18,797	\$51,300	683	-121	1,799
Marketing, Sales & Service	18,230	\$51,300	1,536	-107	2,220
Transportation, Distribution & Logistics	13,630	\$51,200	958	-10	1,507
Human Services	10,794	\$48,400	1,063	88	1,396
Hospitality & Tourism	20,395	\$34,400	1,208	-28	3,544
Total - All Occupations	178,838	\$58,200	13,734	-353	19,226

*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.

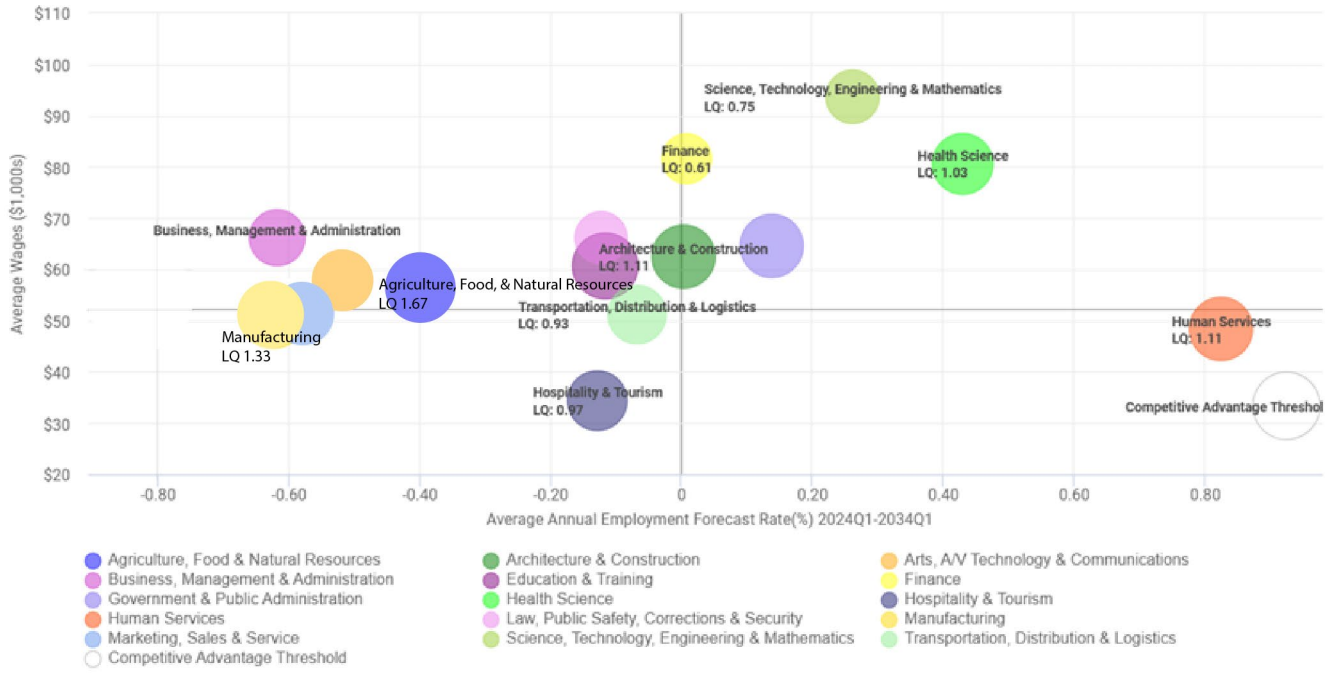
CAREER CLUSTER FORECASTS

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 Northwest 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 Northwest region is Agriculture, Food, and Natural Resources:

- Location Quotient: 2.64
- Employment: 15,538 workers
- Average Wage: \$54,100
- Employment Forecast: Projected to decline by -0.4% annually over the next 10 years

Career Clusters for Northwest Minnesota as of 2024Q1



Key Takeaways by Career Field

Health Science Technology	Human Services	Arts, Communications, and Information Technology
<ul style="list-style-type: none"> All occupations forecast talent shortages Registered Nurses remains the top occupation of shortage in the field (projected annual talent shortage of at least 12 Registered Nurses) Award gaps in critical Therapeutic Services roles (shortage of at least 30 Medical Assistant, 27 Nursing Assistant, and 17 Nurse Practitioner graduates) Highest forecasted growth (0.4% on average annually) More than four in five workers are female 	<ul style="list-style-type: none"> Critical occupations of shortage across careers in mental health and public safety Graduates needed to fill Childcare Worker roles are the second highest forecasted award gap across all fields (shortage of at least 38 graduates to fill this role) High share of workforce over-credentialed for the roles they currently hold 	<ul style="list-style-type: none"> Ongoing shortage of Software Developers expected (at least nine annually) – volume of local talent (and new graduates) continues to outpace demand Telecommunications Line and Equipment Installers are in high-demand, offer high wages, and are experiencing a regional talent shortage Hybrid remote roles increased by seven percentage points from prior year estimates
Business, Management, and Administration	Engineering, Manufacturing, and Technology	Agriculture, Food, and Natural Resources
<ul style="list-style-type: none"> Largest share of employment by career field High unemployment (3.6%) Nine out of the ten top occupations by employment volume continue to forecast employment declines over the next five years Top industry employing the field's talent is the Restaurant Industry (13%), yet roles such as Cashiers, Fast Food Workers, Waiters and Waitresses forecast the largest talent surpluses 	<ul style="list-style-type: none"> More than one in four workers regionally (27%) are employed in this field Architecture and Construction and Production pathway roles are most highly concentrated in the region (Welders, Production Supervisors, Team Assemblers, Construction Laborers, and more) Exacerbation of talent shortage due to upcoming retirements with 47.7% of workers in this field 45 years or older 	<ul style="list-style-type: none"> Zero trained Veterinarians in the region are unemployed Crop Production (14.3%) and Animal Production (13.3%) employ the largest shares of the field's talent Overrepresentation of talent between the ages of 55 and 64 years (21.3%), flagging potential for high retirement rates in coming years

Health Science Technology

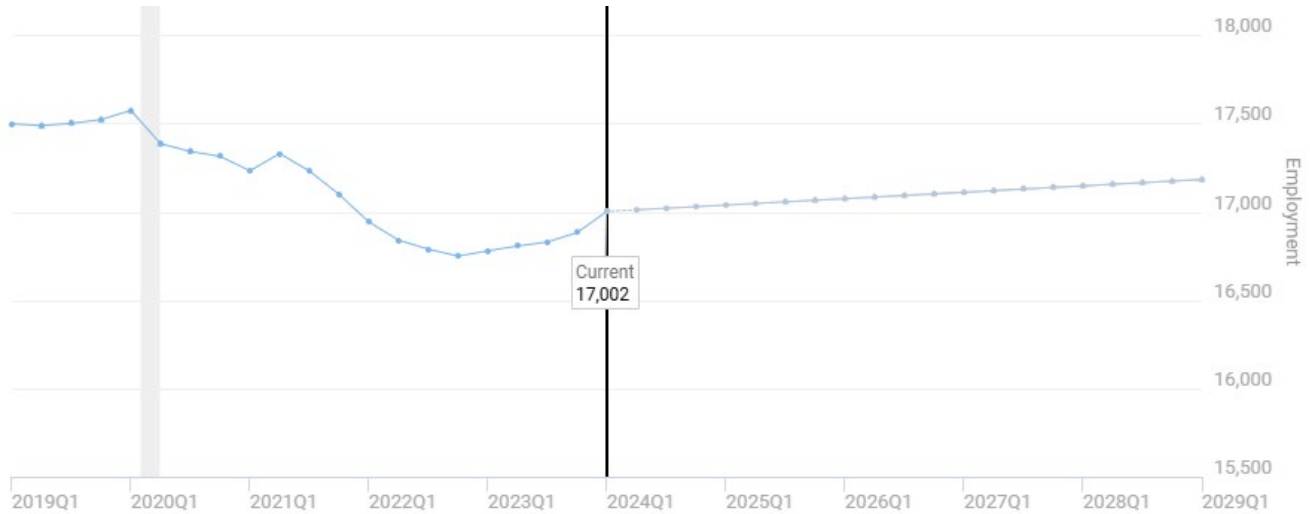
The Health Science Technology field includes an array of careers in the health sciences, including the following career pathways:

- 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 0.4% on average annually. Employment volumes have hovered around 17,000 workers since 2021.

Baseline 5-Year Forecast for Health Science Technology Careers, Northwest Minnesota, 2024Q1



TOP OCCUPATIONS

A total of 17,002 people are employed in Health Science Technology roles regionally, accounting for about 10% of all regional employment. Home Health Aides in the occupation with highest forecast among top occupations, at 1.5% growth anticipated annually.

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

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Registered Nurses	4,036	\$84,600	1.14	23	1,112	0.1%
Nursing Assistants	2,383	\$40,200	1.55	-258	1,635	-0.2%
Licensed Practical and Licensed Vocational Nurses	1,132	\$55,100	1.54	-178	418	-0.1%
Home Health Aides	999	\$35,900	0.90	-406	670	1.5%
Medical Secretaries and Administrative Assistants	669	\$44,600	0.86	18	362	0.3%
Medical and Health Services Managers	550	\$105,700	0.97	37	268	2.1%
Pharmacy Technicians	508	\$46,500	1.04	55	235	0.3%
Medical Assistants	469	\$47,200	0.54	3	337	1.0%
Pharmacists	396	\$139,200	1.09	25	74	0.0%
Dental Assistants	391	\$55,600	0.96	58	284	0.5%
Health Science (CTE Field)	17,002	\$65,200	1.03	-496	7,375	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 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

About one in three Health Science Technology workers in Northwest Minnesota are employed by General Medical and Surgical Hospitals (38.1%). The next most common industries are Nursing Care Facilities (18.4%) and Offices of Physicians (7.6%).

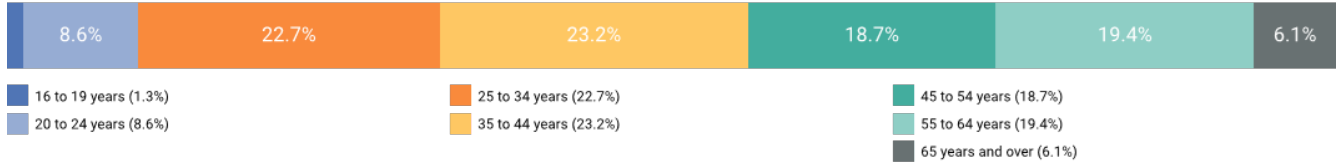
Health Science Technology Field Employment by Industry, Northwest Minnesota, 2024Q1

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	38.1%	6,481	4,462	171	4,633
Nursing Care Facilities (Skilled Nursing Facilities)	18.4%	3,134	3,180	-145	3,035
Offices of Physicians	7.6%	1,286	920	100	1,020
Offices of Dentists	5.3%	902	863	48	910
Individual and Family Services	3.5%	603	694	164	857
Offices of Other Health Practitioners	3.4%	577	440	74	514
Health and Personal Care Retailers	2.9%	494	371	-6	366
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	2.5%	433	500	54	554
Home Health Care Services	2.5%	433	411	74	486
Outpatient Care Centers	2.3%	396	312	91	404
Elementary and Secondary Schools	1.8%	313	205	-1	204
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	1.8%	309	305	12	317
Other Professional, Scientific, and Technical Services	1.6%	281	293	53	346
Executive, Legislative, and Other General Government Support	1.0%	177	139	5	143
Colleges, Universities, and Professional Schools	0.9%	158	104	12	116
Other Ambulatory Health Care Services	0.8%	136	126	26	152
Warehouse Clubs, Supercenters, and Other General Merchandise Retailers	0.6%	109	82	-4	78
Psychiatric and Substance Abuse Hospitals	0.6%	106	88	-3	86
All Others	4.0%	674	532	19	550

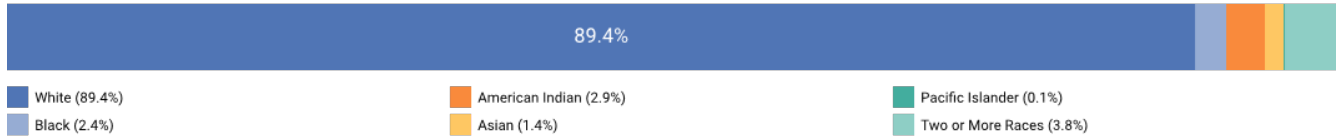
CAREER FIELD DEMOGRAPHICS

- The Health Science Technology field is predominantly white (89.4%) by race and non-Hispanic/Latinx by ethnicity (98.0%)
- Four out of every five people employed in the field are female (81.1%)

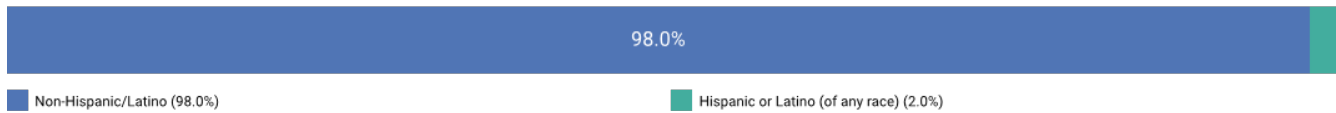
Age



Race



Ethnicity



Gender

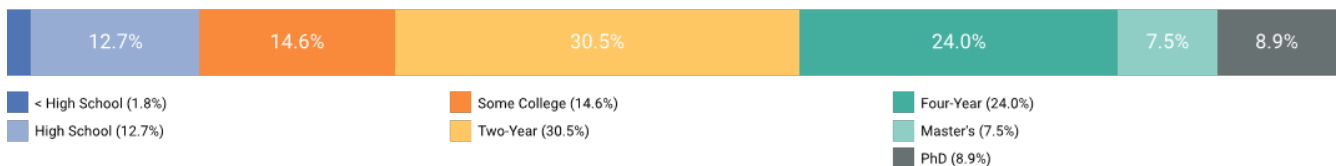


EDUCATIONAL ATTAINMENT AND REQUIREMENTS

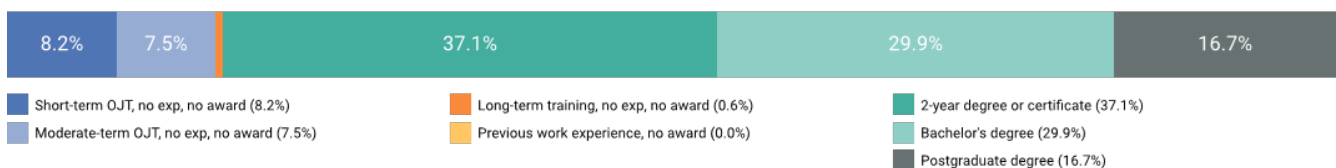
The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- Generally, the Northwest Minnesota Health Science Technology workforce is closely matched to the education and training required for existing roles, however there are fewer workers with a bachelor’s degree or higher in this region than would be expected based on local Health Science Technology roles
- 16.3% of Health Science Technology positions require no educational award, and about 14.5% of the workforce holds only a high school diploma or less
- 30.5% of the Health Science Technology workforce hold a two-year degree or completed some college, compared to 37.1% of local jobs in Health Science Technology that typically require a certificate or two-year degree
- Although 46.6% of Health Science Technology roles in the region typically require a bachelor’s degree or higher, only 40.4% of local Health Science Technology workers hold these credentials

Educational Attainment



Education and Training Requirements

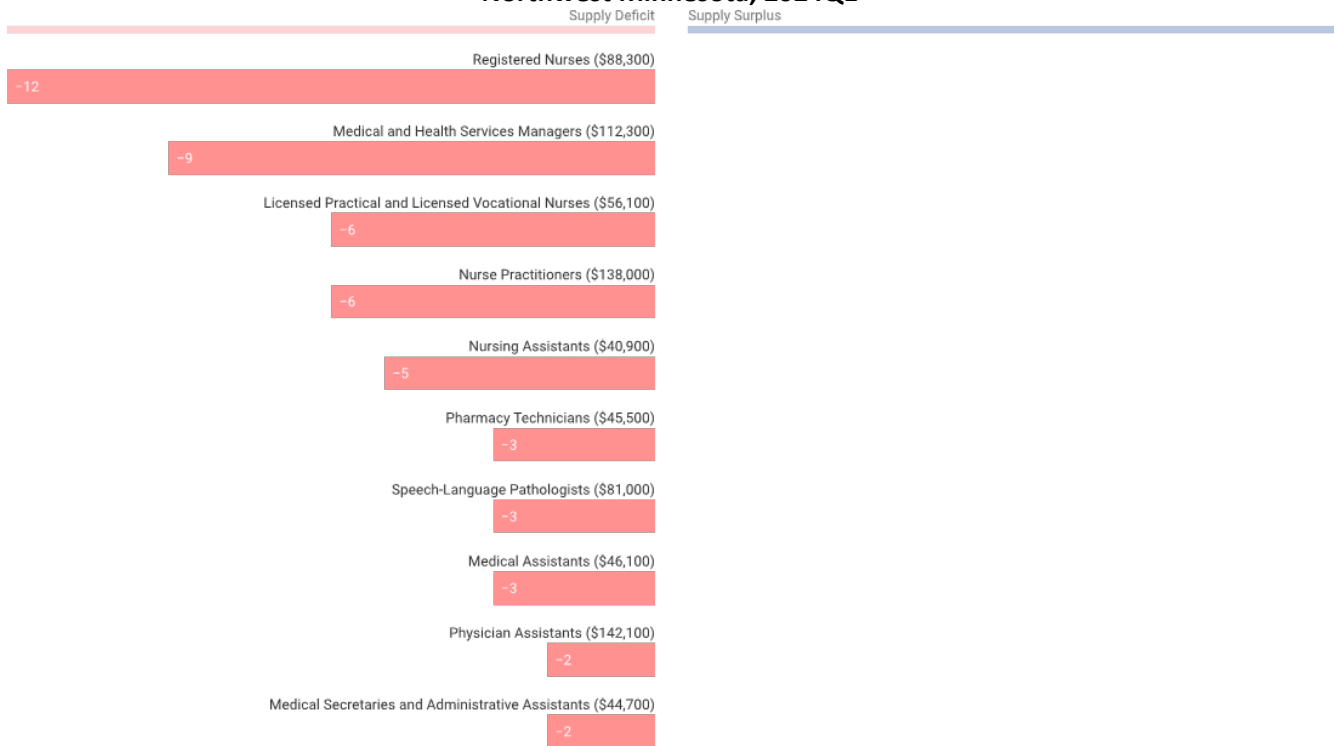


OCCUPATION GAPS

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

In the Health Science Technology field, Registered Nurses and Medical and Health Service Managers are the two occupations with the greatest annual shortages in the Northwest. All occupations in this field forecast talent shortages across the region for the next ten years with current talent supplies.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Health Science Technology, Northwest Minnesota, 2024Q1



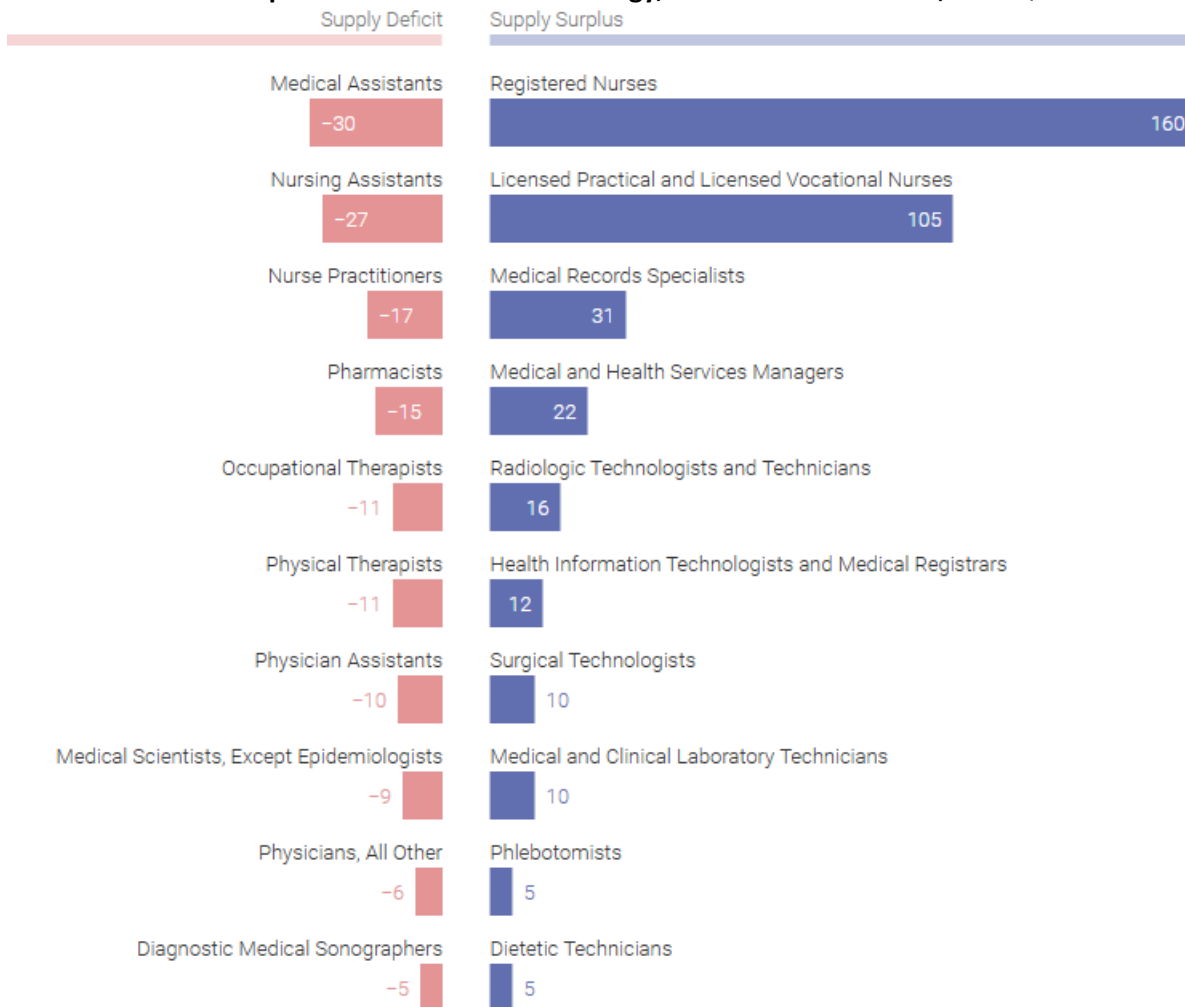
AWARD GAPS

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.

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

- Most Health Science Technology roles have small to moderate award gaps in the region, meaning that postsecondary institutions in the region are undersupplying graduates into these degrees compared to national rates
- Northwest colleges and universities are underproducing about 30 Medical Assistant and 27 Nursing Assistant graduates annually that are needed to fill positions open with employers in the region
- There are ten occupations for which Northwest regional postsecondary institutions are producing an oversupply of talent, likely supporting and sustaining the talent needs of neighboring regions (Northwest and Central Minnesota) where there are talent shortages and award gaps for these roles

Award Gaps in Health Science Technology, Northwest Minnesota, 2024Q1



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, Northwest Minnesota, 2024Q1

Target Occupations (All HW, HD, HS, OG)

Registered Nurses
 Licensed Practical & Licensed Vocational Nurses
 Medical & Health Services Managers
 Dental Assistants
 Dental Hygienists

Gateway Occupations

Pharmacy Technicians (HD, OG)
 Medical Assistants (HS, HD, OG, AG)
 Ophthalmic Medical Technicians (HS, HD, OG)
 Psychiatric Aides (HD)
 Medical Transcriptionists (HS)

Origin Occupations

Nursing Assistants (HS, HD, OG, AG)
 Home Health Aides (HD)
 Medical Secretaries & Administrative Assistants (HD, OG, AG)
 Healthcare Support Workers (HD)
 Veterinary Technologists & Technicians (HS, HD, OG, AG)

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

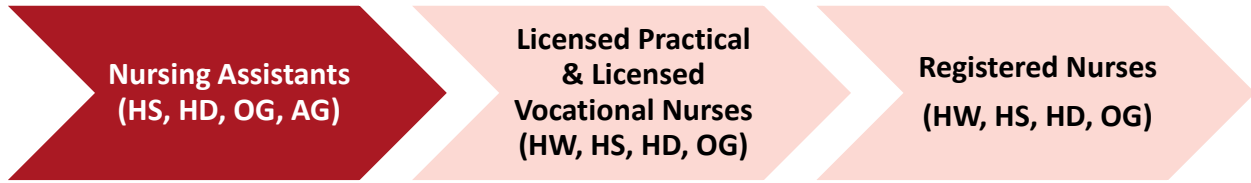
Featured Pathway

The nursing pathway remains a high priority pathway in the Northwest region in order to respond to rising demand. The Target occupation of Registered Nurse remains highly concentrated in the Northwest region with a location quotient of 1.14. 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 Northwest region than a typical community nationwide (LQ 1.54) and are experiencing an occupation 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.

Another potential Pathway to consider in the Northwest region is the dental pathway. The target occupations of Dental Hygienist (LQ 1.15) and Dental Assistants (LQ 0.96) are moderately concentrated in the region and are both in high demand. The Origin occupation of Healthcare Support Workers (LQ 1.81) and the Gateway Occupation of Medical Assistants (LQ 0.54) could be entry points into the Dental field.

Origin

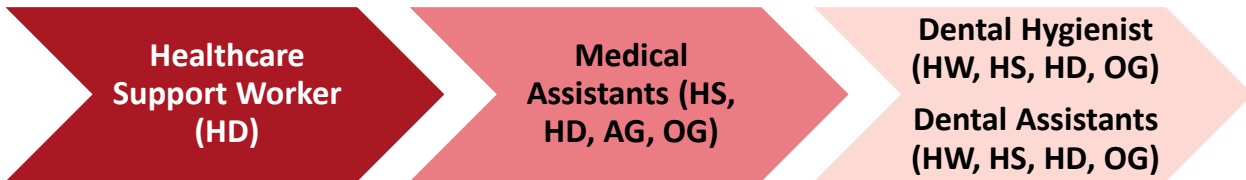
Target



Origin

Gateway

Target



OGT Wages and Experience Level Requirements, Health Science Technology, Northwest 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	4,036	\$88,300	\$73,200	\$95,900	\$69,800	\$79,100	\$84,600	\$100,800	\$107,100	BA	None	None
	29-2061	Licensed Practical and Licensed Vocational Nurses	1,132	\$56,100	\$50,000	\$59,200	\$49,500	\$51,400	\$55,100	\$60,100	\$64,000	Certificate	None	None
	11-9111	Medical and Health Services Managers	550	\$112,300	\$78,200	\$129,400	\$74,900	\$86,800	\$105,700	\$130,600	\$151,900	BA	< 5 years	None
	31-9091	Dental Assistants	391	\$55,100	\$47,800	\$58,800	\$47,600	\$49,400	\$55,600	\$60,200	\$63,300	Certificate	None	None
	29-1292	Dental Hygienists	277	\$86,400	\$79,300	\$89,900	\$78,700	\$81,000	\$85,100	\$93,900	\$97,300	AS	None	None
Gateway	29-2052	Pharmacy Technicians	508	\$45,500	\$37,200	\$49,600	\$37,300	\$38,700	\$46,500	\$49,500	\$54,900	HS/GED	None	Mod-term OJT
	31-9092	Medical Assistants	469	\$46,100	\$35,800	\$51,300	\$33,700	\$40,000	\$47,200	\$51,600	\$58,600	Certificate	None	None
	29-2057	Ophthalmic Medical Technicians	48	\$50,100	\$39,400	\$55,500	\$39,000	\$41,400	\$48,100	\$57,100	\$64,500	Certificate	None	None
	31-1133	Psychiatric Aides	32	\$46,000	\$32,300	\$52,800	\$32,400	\$34,300	\$47,500	\$56,000	\$56,600	HS/GED	None	Short-term OJT
	31-9094	Medical Transcriptionists	17	\$45,300	\$36,300	\$49,800	\$33,200	\$41,200	\$46,700	\$49,700	\$51,900	Certificate	None	None
Origin	31-1131	Nursing Assistants	2,383	\$40,900	\$36,800	\$43,000	\$36,200	\$38,100	\$40,200	\$44,100	\$47,900	Certificate	None	None
	31-1121	Home Health Aides	999	\$36,100	\$30,800	\$38,700	\$30,400	\$32,200	\$35,900	\$38,600	\$43,300	HS/GED	None	Short-term OJT
	43-6013	Medical Secretaries and Administrative Assistants	669	\$44,700	\$37,800	\$48,100	\$37,500	\$39,300	\$44,600	\$48,200	\$54,600	HS/GED	None	Mod-term OJT
	31-9099	Healthcare Support Workers, All Other	218	\$42,400	\$32,700	\$47,200	\$29,700	\$37,400	\$41,100	\$47,200	\$55,200	HS/GED	None	None
	29-2056	Veterinary Technologists and Technicians	151	\$42,800	\$36,900	\$45,800	\$36,300	\$38,100	\$40,600	\$46,200	\$47,900	AS	None	None

Human Services

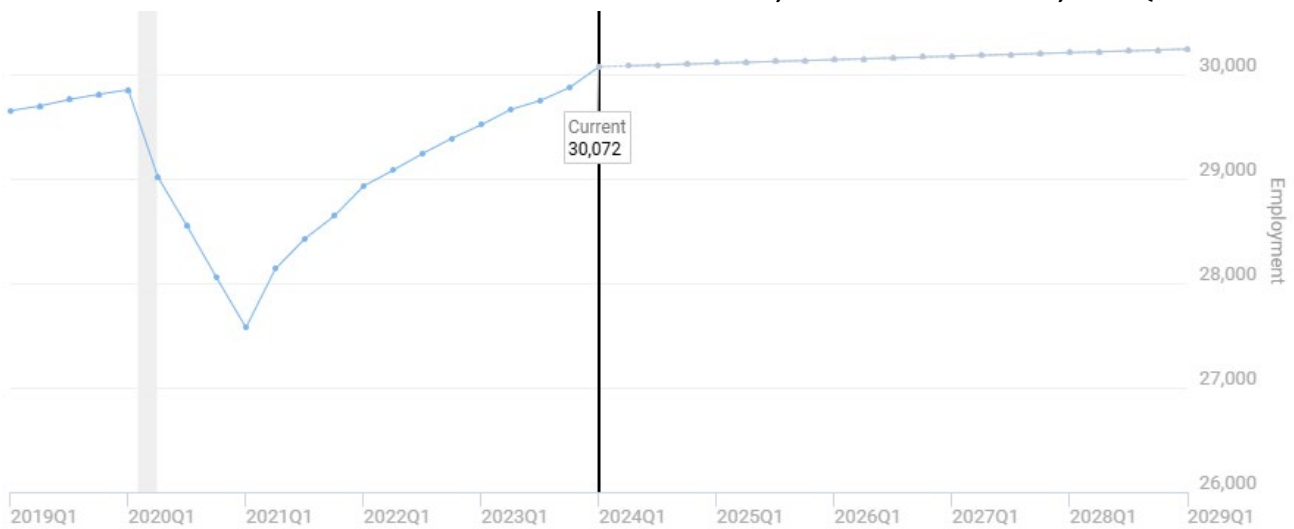
The Human Services field includes a wide range of career pathways sorted into the following career clusters:

- 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 0.2% annually. Human Services employment surpassed pre-pandemic employment volumes by the third quarter of 2023.

Baseline 5-Year Forecast for Human Services Careers, Northwest Minnesota, 2024Q1



TOP OCCUPATIONS

A total of 30,072 people are employed in Human Services roles regionally, accounting for about 17% of all regional employment. The occupation with highest forecast growth is Personal Care Aides, at 1.5% annually.

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

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Personal Care Aides	2,836	\$35,900	0.90	335	2,307	1.5%
Teaching Assistants, Except Postsecondary	2,654	\$37,600	1.90	107	1,487	-0.3%
Elementary School Teachers, Except Special Education	2,053	\$63,000	1.35	67	641	-0.3%
Secondary School Teachers, Except Special and Career/Technical Education	1,547	\$65,900	1.35	75	439	-0.3%
Childcare Workers	1,243	\$30,800	1.37	-156	996	-0.3%
Police and Sheriffs Patrol Officers	875	\$72,700	1.21	-82	335	0.0%
Middle School Teachers, Except Special and Career/Technical Education	863	\$62,600	1.30	27	269	-0.3%
Social and Human Service Assistants	752	\$46,700	1.60	118	439	1.1%
Preschool Teachers, Except Special Education	692	\$39,500	1.24	24	372	0.2%
Child, Family, and School Social Workers	594	\$63,600	1.50	111	260	0.9%
Human Services (CTE Field)	30,072	\$55,400	1.07	421	15,423	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

The largest share of regional Human Services talent in the Northwest is employed by Elementary and Secondary Schools (33.3%), followed by Executive, Legislative, and Other General Government Support (11.7%). Individual and Family Services is the third largest industry by employment (9.7%) and has high forecasted growth.

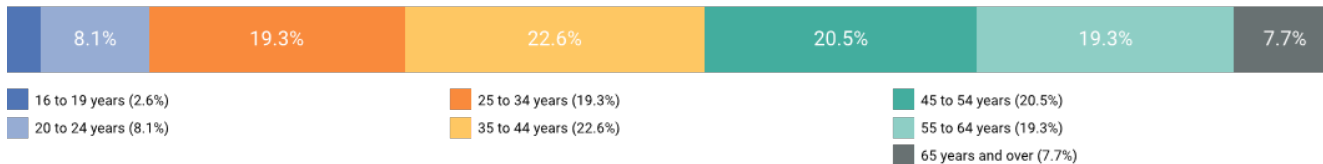
Human Services Field Employment by Industry, Northwest Minnesota, 2024Q1

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Elementary and Secondary Schools	33.3%	10,027	8,466	-353	8,113
Executive, Legislative, and Other General Government Support	11.7%	3,529	3,071	-9	3,062
Individual and Family Services	9.7%	2,913	3,615	747	4,362
Colleges, Universities, and Professional Schools	4.1%	1,241	1,066	82	1,148
Religious Organizations	4.1%	1,226	1,233	-15	1,217
Child Care Services	3.5%	1,064	1,476	-45	1,431
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	2.8%	845	1,038	28	1,066
Personal Care Services	2.0%	612	817	44	862
Junior Colleges	2.0%	607	508	-3	505
Justice, Public Order, and Safety Activities	1.7%	513	432	-13	419
Home Health Care Services	1.5%	460	661	75	736
General Medical and Surgical Hospitals	1.5%	444	405	1	406
Legal Services	1.4%	416	279	-3	276
Civic and Social Organizations	1.3%	405	628	-3	625
Other Schools and Instruction	1.3%	395	516	12	527
Other Residential Care Facilities	1.2%	363	436	-1	435
Nursing Care Facilities (Skilled Nursing Facilities)	1.2%	353	419	-20	399
Administration of Human Resource Programs	1.1%	340	291	0	290
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	1.1%	328	481	63	544
Administration of Environmental Quality Programs	1.0%	309	257	-6	250
All Others	12.2%	3,683	4,082	160	4,241

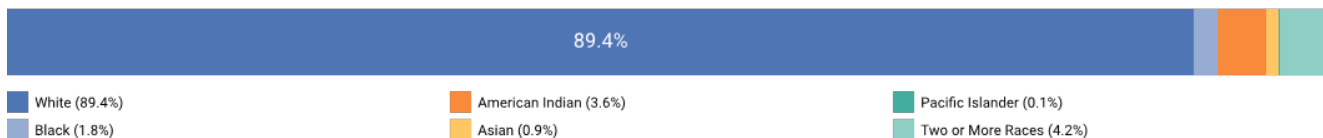
CAREER FIELD DEMOGRAPHICS

- The Human Services field is predominantly female (65.9%) and white (89.4%)
- Compared to the workforce statewide, Northwest Minnesota’s Human Services workforce has a greater share of workers who are 55 and older by 2.4 percentage points

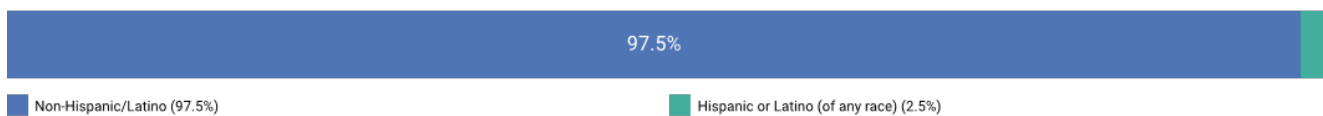
Age



Race



Ethnicity



Gender

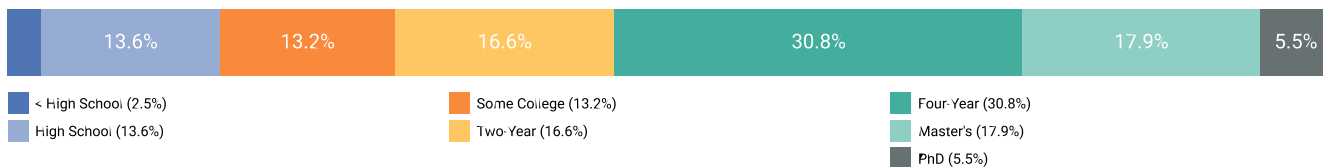


EDUCATIONAL ATTAINMENT AND REQUIREMENTS

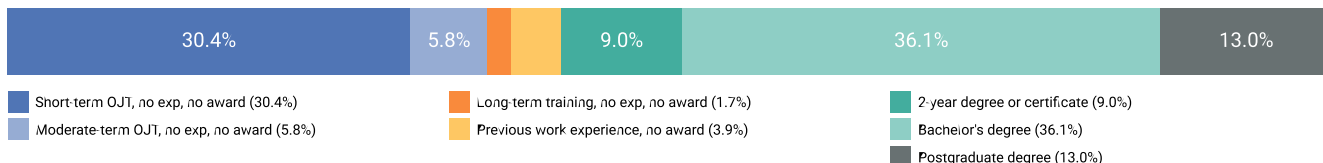
The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- In general, the Northwest Human Services workforce is over-skilled for the typical credentials of Human Services positions
- For example, over half (54.2%) of the Human Services workforce has a four-year degree or more, whereas only 49.1% of jobs require a bachelor’s or postgraduate degree
- And while about two in five (41.8%) regional Human Services jobs require no award at all, only 16.1% of the workforce has no college education

Educational Attainment



Education and Training Requirements

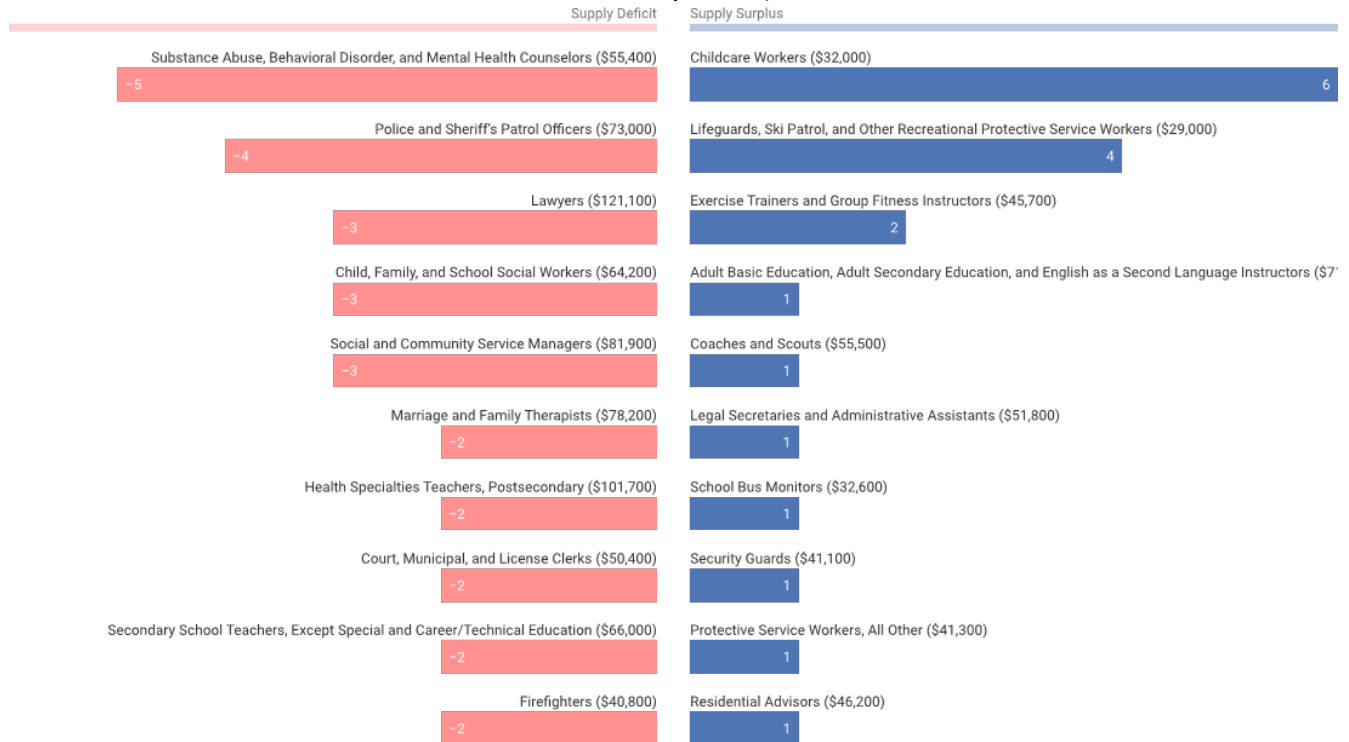


OCCUPATION GAPS

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

In Human Services, Mental Health Counselors, Police Officers, and Lawyers are the top occupations of shortage in the region, though not in high volumes of shortage. 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, Northwest Minnesota, 2024Q1



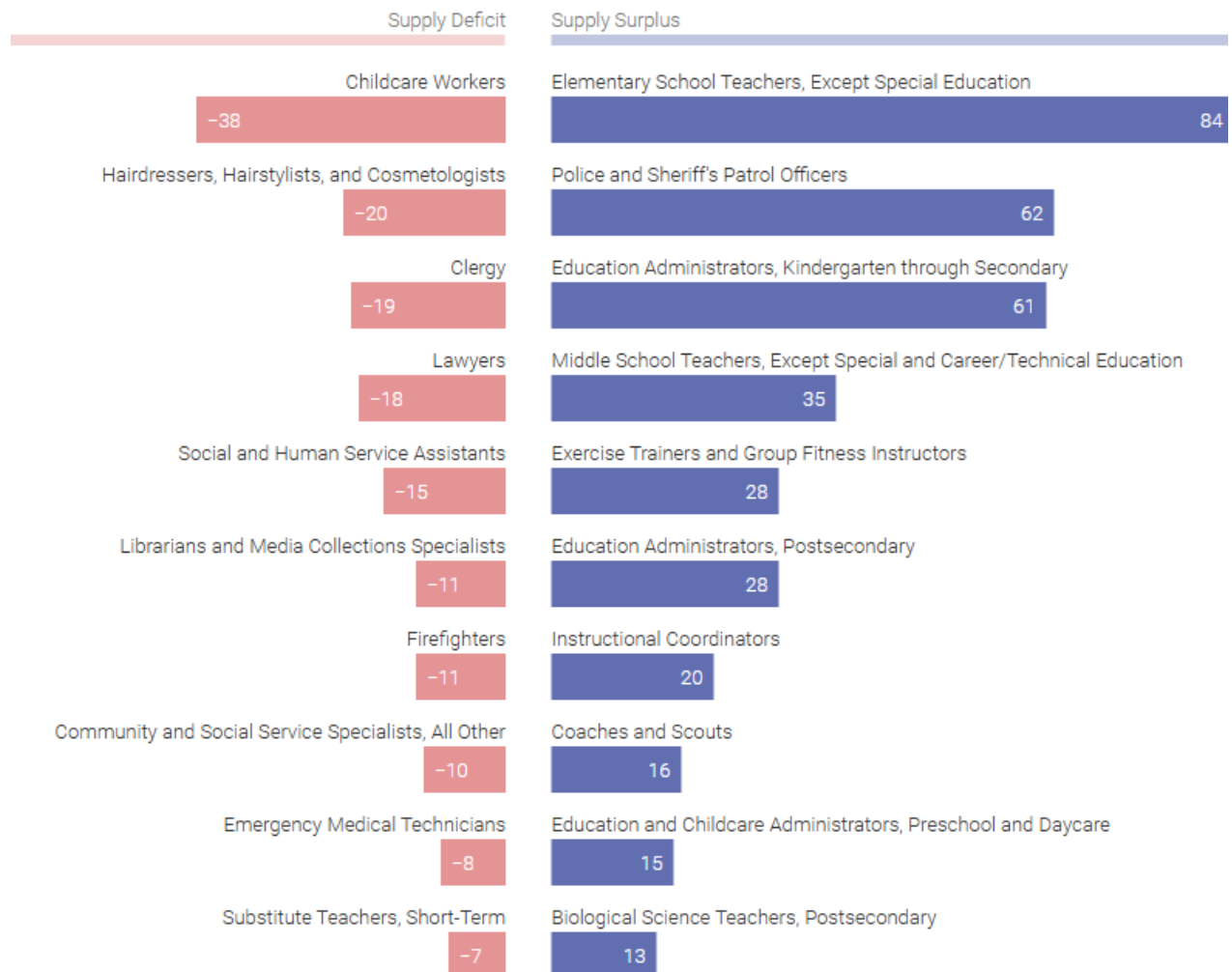
AWARD GAPS

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.

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

- Most occupations in the Human Services field have an undersupply of local postsecondary graduates compared to national averages for a community of this size and industry mix
- Childcare training and cosmetology programs are underproducing the most graduates; Northwest education providers are underproducing about 38 graduates annually that are needed to fill Childcare Worker positions open with employers based in the region
- Only 20% of occupations in this career field have an oversupply of local postsecondary graduates compared to national volumes, and many of them are in the Education and Training cluster; being a pathway of persistent shortage in most parts of the state, regional programs are likely to be a hub for teacher recruitment

Award Gaps in Human Services, Northwest Minnesota, 2024Q1



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, Northwest Minnesota, 2024Q1

Target Occupations (All HW, HS, HD)

Child, Family, & School Social Workers (OG)
 Substance Abuse, Behavioral Disorder, & Mental Health Counselors (OG)
 Lawyers (OG, AG)
 Social & Community Service Manager (OG)
 Educational, Guidance, & Career Counselors and Advisors

Gateway Occupations

Social and Human Services Assistants (HD, AG)
 Substitute Teachers, Short-Term (HS, HD, AG)
 Self-Enrichment Teachers (HD, AG)
 Residential Advisors (HD, AG)
 Rehabilitation Counselors (HS)

Origin Occupations (All AG)

Personal Care Aides (HD)
 Teaching Assistants, Except Postsecondary (HS)
 Childcare Workers
 Preschool Teachers, Except Special Education (HS, HD)
 Firefighters (HS, HS, OG, AG)

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:

- Court, Municipal, and License Clerks (OG)
- Eligibility Interviewers, Government Programs (AG)
- First-Line Supervisors of Personal Service Workers (OG)

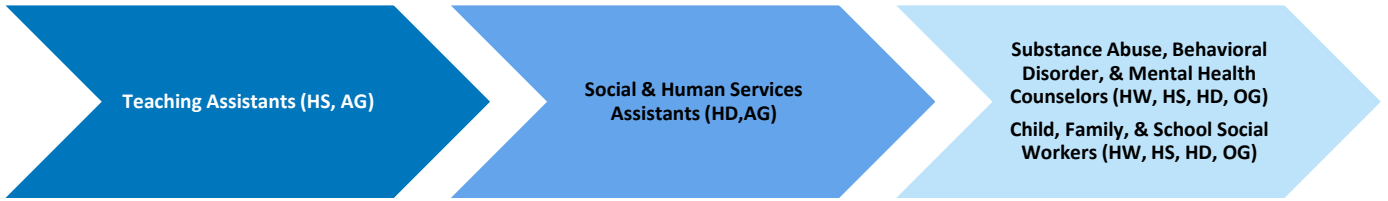
Featured Pathway

Similar to 2023, the Social Services Pathway remains a strong priority for the Northwest region. Social services occupations have local concentrations across the region above 1.0 from assistants to social workers, with shortages observed across the entire pathway. Child, Family, and School Social Workers as well as Substance Abuse, Behavioral Disorder, and Mental Health Counselors are Target occupations in the region, meaning that median wages for these roles exceed the overall median wage in the Northwest region. In addition, there are multiple possible origin and gateway occupations that lead to the target occupations of Social Worker and Counselor. Each of these roles are experiencing high demand and low local volumes of new graduates entering the field compared to national rates.

Origin

Gateway

Target



OGT Wages and Experience Level Requirements, Human Services, Northwest 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	21-1021	Child, Family, and School Social Workers	594	\$64,200	\$47,500	\$72,500	\$45,000	\$53,100	\$63,600	\$75,100	\$83,300	BA	None	None
	21-1018	Substance Abuse, Behavioral Disorder, and Mental Health Counselors	506	\$55,400	\$43,300	\$61,500	\$40,800	\$47,700	\$52,300	\$63,800	\$71,200	BA	None	None
	23-1011	Lawyers	439	\$121,100	\$80,800	\$141,300	\$76,400	\$90,200	\$105,900	\$141,500	\$176,500	PhD	None	None
	11-9151	Social and Community Service Managers	373	\$81,900	\$53,300	\$96,300	\$49,600	\$61,400	\$76,200	\$101,100	\$121,600	BA	< 5 years	None
	21-1012	Educational, Guidance, and Career Counselors and Advisors	298	\$59,400	\$47,900	\$65,200	\$47,100	\$50,700	\$59,100	\$65,600	\$72,600	MA	None	None
Gateway	21-1093	Social and Human Service Assistants	752	\$47,300	\$36,900	\$52,600	\$36,500	\$38,900	\$46,700	\$52,400	\$62,100	HS/GED	None	Short-term OJT
	25-3031	Substitute Teachers, Short-Term	504	\$52,600	\$37,000	\$60,400	\$36,100	\$39,100	\$45,500	\$71,200	\$83,000	BA	None	None
	25-3021	Self-Enrichment Teachers	310	\$49,700	\$33,000	\$58,000	\$29,100	\$38,500	\$45,300	\$61,400	\$70,100	HS/GED	< 5 years	None
	39-9041	Residential Advisors	194	\$46,200	\$37,100	\$50,800	\$35,700	\$40,300	\$46,500	\$49,700	\$58,000	HS/GED	None	Short-term OJT
	21-1015	Rehabilitation Counselors	158	\$49,000	\$36,200	\$55,400	\$34,300	\$40,200	\$47,100	\$55,400	\$65,800	MA	None	None
Origin	31-1122	Personal Care Aides	2,836	\$36,100	\$30,800	\$38,700	\$30,400	\$32,200	\$35,900	\$38,600	\$43,300	HS/GED	None	Short-term OJT
	25-9045	Teaching Assistants, Except Postsecondary	2,654	\$37,700	\$30,900	\$41,100	\$30,100	\$33,000	\$37,600	\$40,400	\$46,600	Some college	None	None
	39-9011	Childcare Workers	1,243	\$32,000	\$27,000	\$34,500	\$25,700	\$28,900	\$30,800	\$34,300	\$39,100	HS/GED	None	Short-term OJT
	25-2011	Preschool Teachers, Except Special Education	692	\$43,100	\$32,100	\$48,600	\$31,300	\$34,200	\$39,500	\$50,400	\$59,800	AS	None	None
	33-2011	Firefighters	433	\$40,800	\$30,000	\$46,300	\$29,200	\$31,600	\$36,200	\$46,800	\$58,000	Certificate	None	Long-term OJT

Arts, Communications, and Information Systems

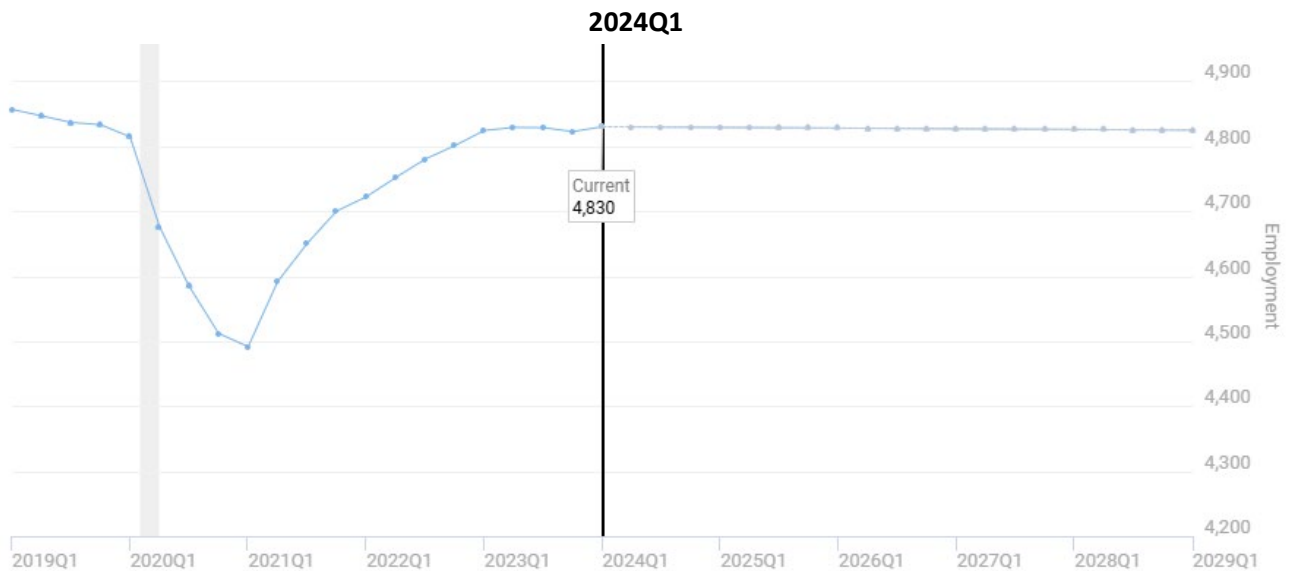
Arts, Communications, and Information Systems is a diverse career field with artistic careers as well as Information Technology career paths. The specific career clusters included in this field are:

- 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 remain flat, with only a possible decline in employment of 11 people across the entire region.

Baseline 5-Year Forecast for Arts, Communications, and Information Systems Careers, Northwest Minnesota,



TOP OCCUPATIONS

A total of 4,830 people are employed in Arts, Communications, and Information Systems roles regionally, accounting for about 3% of all regional employment. This is the smallest Career and Technical Education (CTE) Career Field in the Northwest region. The career field has a low concentration in the region (LQ 0.59).

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

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Software Developers	676	\$104,800	0.38	105	250	1.7%
Computer User Support Specialists	430	\$59,900	0.54	28	131	-0.4%
Computer Systems Analysts	319	\$90,200	0.56	-9	95	0.2%
Graphic Designers	251	\$49,500	0.86	6	93	-0.4%
Printing Press Operators	241	\$42,800	1.46	-20	100	-1.6%
Computer Network Support Specialists	235	\$68,900	1.23	6	76	-0.1%
Musicians and Singers	190	\$80,900	1.01	-38	121	-0.1%
Network and Computer Systems Administrators	174	\$86,300	0.47	-9	43	-0.5%
Telecommunications Equipment Installers and Repairers, Except Line Installers	167	\$67,800	0.90	12	87	0.3%
Computer Occupations, All Other	155	\$83,700	0.32	8	49	0.2%
Arts, Communications, & Information Systems (CTE Field)	4,830	\$69,300	0.59	-27	1,867	0.0%

"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 Northwest working in Arts, Communications, and Information Systems roles are employed by Printing and Related Support Activities (7.6%) or Wired and Wireless Telecommunications (except Satellite) (7.2%). Overall, employment in this field is relatively spread out across a number of different industries.

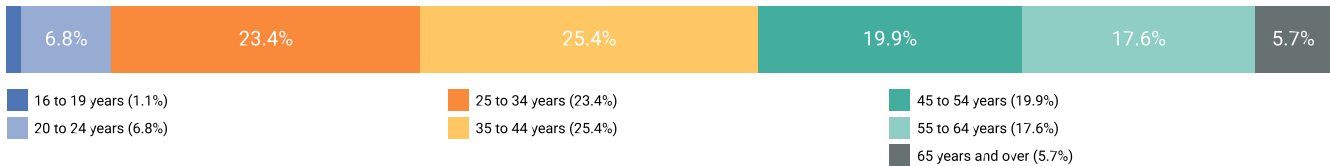
Arts, Communications, and Information Systems Field Employment by Industry, Northwest Minnesota, 2024Q1

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Printing and Related Support Activities	7.6%	368	335	-69	266
Wired and Wireless Telecommunications (except Satellite)	7.2%	350	282	-2	281
Independent Artists, Writers, and Performers	5.3%	255	252	6	258
Religious Organizations	5.1%	245	259	-4	255
Newspaper, Periodical, Book, and Directory Publishers	4.3%	206	182	-32	150
Computer Systems Design and Related Services	4.2%	204	128	34	163
Depository Credit Intermediation	3.3%	160	95	15	110
Executive, Legislative, and Other General Government Support	3.0%	143	91	1	92
Other Professional, Scientific, and Technical Services	2.8%	134	113	7	119
Elementary and Secondary Schools	2.7%	130	83	-7	76
Colleges, Universities, and Professional Schools	2.7%	129	90	4	94
Web Search Portals, Libraries, Archives, and Other Information Services	2.5%	123	78	32	110
General Medical and Surgical Hospitals	2.5%	121	74	1	75
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	2.5%	120	81	-5	75
Radio and Television Broadcasting Stations	2.0%	96	82	-20	62
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	2.0%	96	55	5	60
Management of Companies and Enterprises	1.5%	72	46	8	54
Florists	1.5%	70	70	-18	52
Specialized Design Services	1.1%	55	47	2	49
Other Miscellaneous Manufacturing	1.1%	53	42	1	43
All Others	35.2%	1,701	1,267	38	1,305

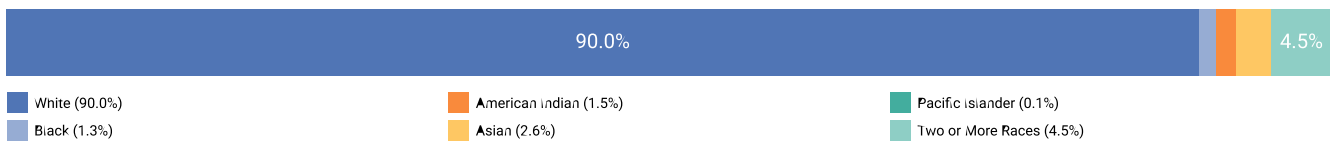
CAREER FIELD DEMOGRAPHICS

- About seven in ten workers in the Arts, Communications, and Information Systems field are male (70.4%) and nine in ten (90.0%) are white
- Compared to the workforce statewide, Northwest Minnesota’s Arts, Communications, and Information Systems workforce is notably less diverse by race, with an estimated 11% of the workforce identifying as black, indigenous or people of color (compared to at least 27% statewide)
- There is a slightly higher share of female workers (29.6%) in the Northwest’s Arts, Communications, and Information Systems field compared to the statewide rate (27.4%)

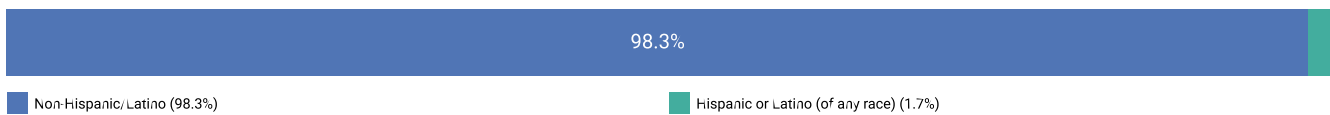
Age



Race



Ethnicity



Gender

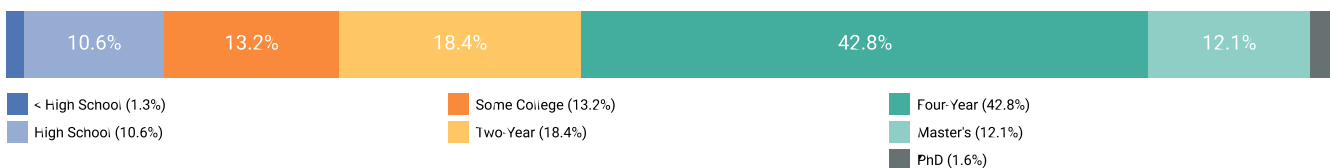


EDUCATIONAL ATTAINMENT AND REQUIREMENTS

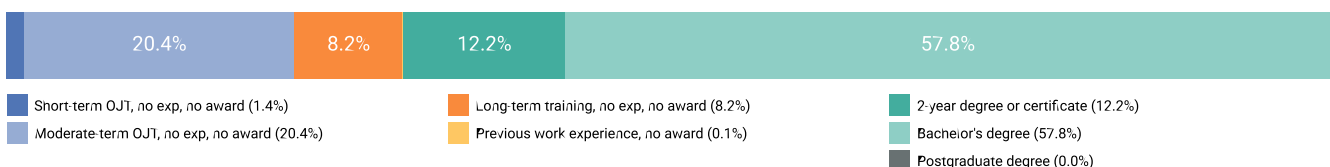
The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- The Northwest 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
 - Nearly three out of five (57.8%) positions require a bachelor's degree, while a similar share of the workforce (56.5%) hold a bachelor's degree or higher

Educational Attainment



Education and Training Requirements

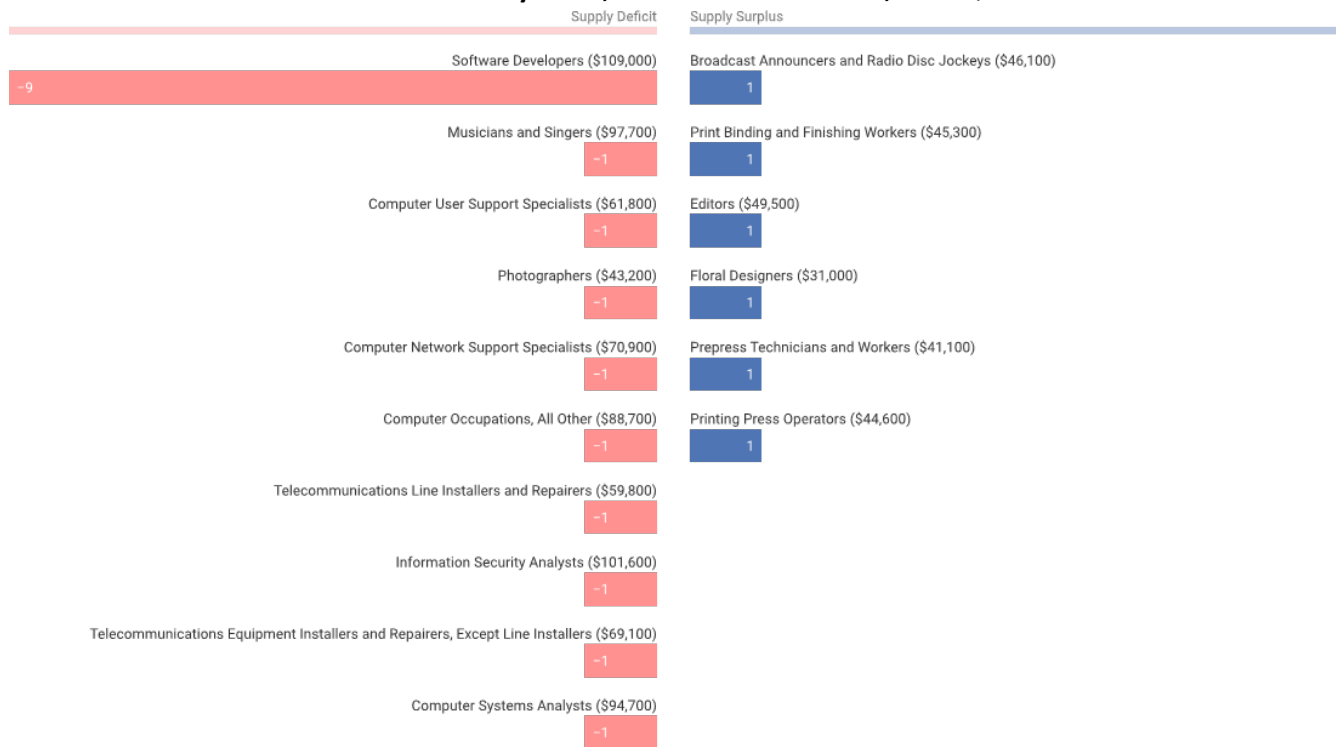


OCCUPATION GAPS

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 nine 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. Most other roles in this field will have sufficient local talent supply, if current talent pipelines remain consistent with past trends.

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



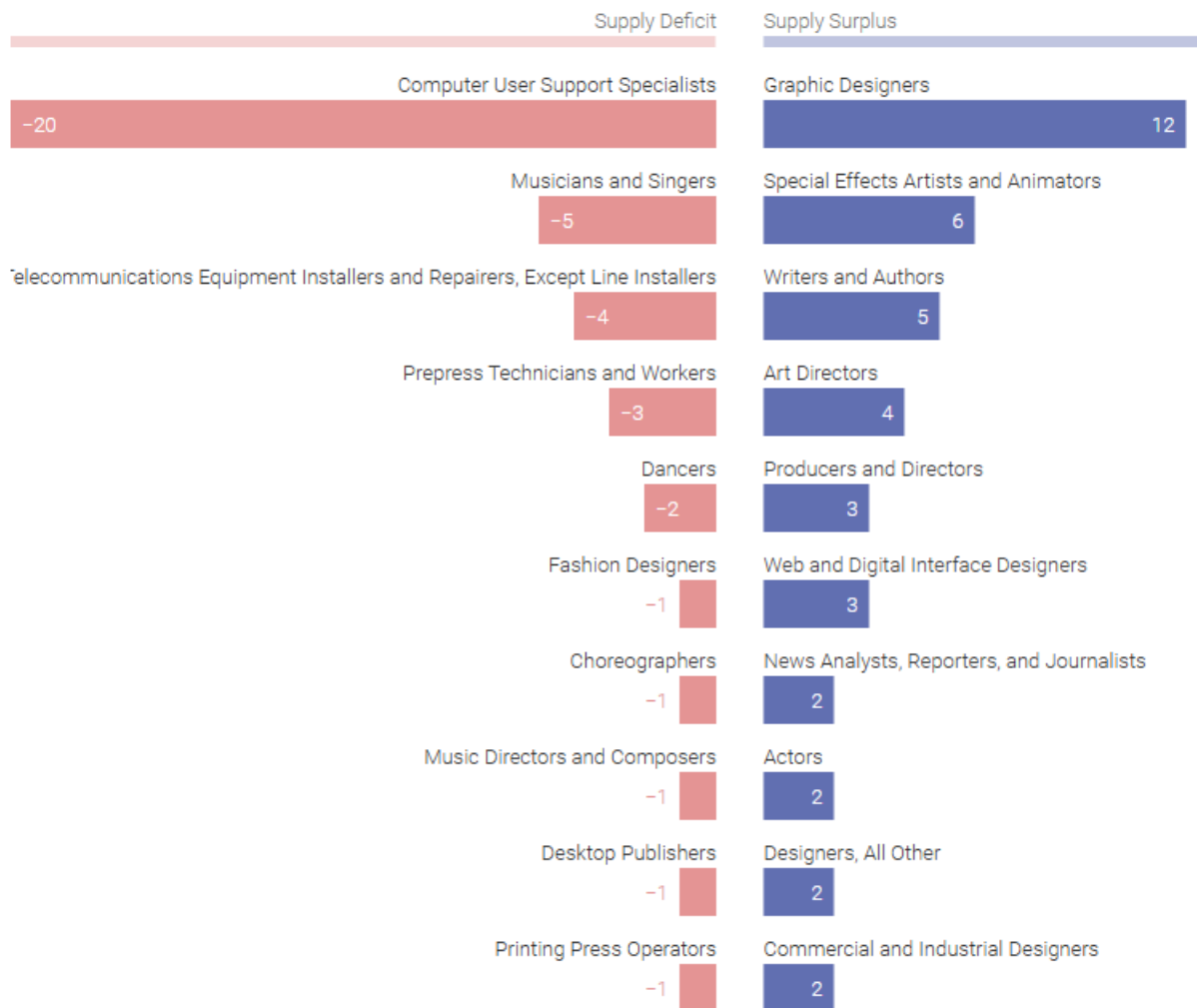
AWARD GAPS

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.

The Northwest has a well-balanced landscape of postsecondary awards compared to national volumes of graduates for a community of similar occupational mix:

- Most programs in arts production and design produce a relative oversupply of graduates compared to national trends
- Northwest Minnesota colleges and universities are underproducing trained Computer User Support Specialists, Musicians, and Telecommunications Equipment Installers compared to national trends

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



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, Northwest Minnesota, 2024Q1

Target Occupations (All HW, HS, HD)

Software Developers (OG)
 Computer Systems Analysts (OG)
 Telecommunications Equipment Installers & Repairers (OG, AG)
 Computer Occupations, All Other (OG)
 Web & Digital Interface Designers

Gateway Occupations (All HS)

Editors
 Broadcast Technicians
 Proofreaders & Copy Markers

Origin Occupations

Printing Press Operators (AG)
 Photographers (HD, OG)
 Floral Designers
 Prepress Technicians & Workers (HS, AG)
 Print Binding & Finishing Workers

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 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 a good job 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, and high demand, the occupation of Telecommunications Equipment Installers and Repairers. This occupation is highly concentrated locally (LQ 1.16) and there is an occupation gap, award gap, and high demand for this role. The Gateway occupation of Broadcast Technicians is a potential feeder occupation into this role and a closely aligned other role (Telecommunications Line Installers and Repairers), has an occupation gap and is in high demand. There are no in-field Origin occupations, but entry-level customer services and office support roles may have transferrable skills.

Gateway

Other Aligned Occupation

Target



OGT Wages and Experience Level Requirements, Arts, Communications, and Information Systems, Northwest 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	676	\$109,000	\$73,000	\$126,900	\$67,100	\$85,400	\$104,800	\$133,200	\$156,300	BA	None	None
	15-1211	Computer Systems Analysts	319	\$94,700	\$66,100	\$109,000	\$65,700	\$70,500	\$90,200	\$108,200	\$136,900	BA	None	None
	49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	167	\$69,100	\$54,900	\$76,200	\$50,500	\$62,400	\$67,800	\$80,300	\$85,000	Certificate	None	Mod-term OJT
	15-1299	Computer Occupations, All Other	155	\$88,700	\$53,900	\$106,100	\$49,700	\$63,400	\$83,700	\$104,700	\$130,000	BA	None	None
	15-1255	Web and Digital Interface Designers	67	\$80,000	\$48,900	\$95,600	\$45,400	\$56,700	\$73,700	\$100,500	\$122,300	BA	None	None
Gateway	27-3041	Editors	99	\$48,600	\$31,500	\$58,500	\$29,200	\$35,200	\$48,600	\$56,600	\$71,900	BA	< 5 years	None
	27-4012	Broadcast Technicians	23	\$46,400	\$27,100	\$58,200	\$25,000	\$29,400	\$46,400	\$57,700	\$86,200	AS	None	Short-term OJT
	43-9081	Proofreaders and Copy Markers	8	\$47,500	\$37,800	\$52,500	\$35,100	\$42,500	\$47,500	\$50,300	\$60,000	BA	None	None
Origin	51-5112	Printing Press Operators	241	\$42,800	\$34,300	\$49,800	\$34,700	\$35,100	\$42,800	\$49,400	\$61,400	HS/GED	None	Mod-term OJT
	27-4021	Photographers	151	\$34,900	\$27,700	\$50,900	\$26,700	\$29,600	\$34,900	\$52,600	\$76,900	HS/GED	None	Mod-term OJT
	27-1023	Floral Designers	93	\$31,000	\$25,000	\$34,000	\$24,800	\$25,600	\$31,000	\$33,200	\$38,500	HS/GED	None	Mod-term OJT
	51-5111	Prepress Technicians and Workers	73	\$38,000	\$32,700	\$45,200	\$31,400	\$35,200	\$38,000	\$47,600	\$52,000	Certificate	None	None
	51-5113	Print Binding and Finishing Workers	70	\$44,700	\$39,300	\$48,300	\$38,700	\$41,100	\$44,700	\$50,300	\$50,500	HS/GED	None	Mod-term OJT

Business, Management, and Administration

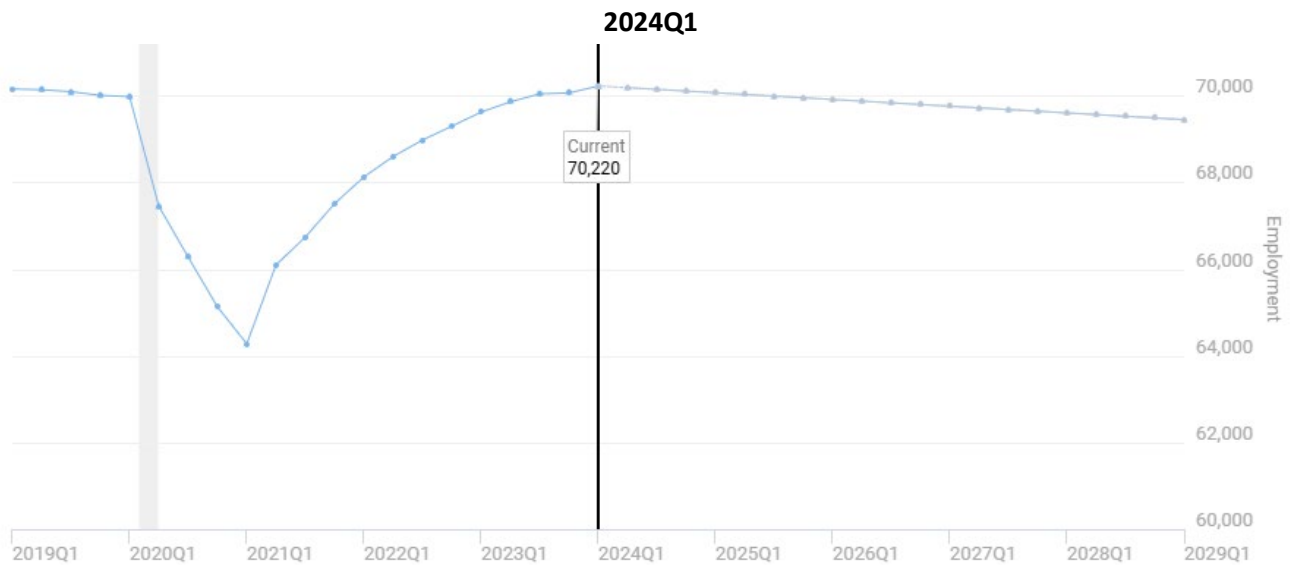
Business, Management, and Administration is a diverse career field with the following career clusters:

- 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 -0.4% on average annually.

Baseline 5-Year Forecast for Business, Management, and Administration Careers, Northwest Minnesota



TOP OCCUPATIONS

A total of 70,220 people are employed in Business, Management and Administration Systems roles regionally, accounting for about 39% of all regional employment. All of the top ten occupations are expected to decline, with the exception of Stockers and Order Fillers, which is forecast to grow 0.3% annually.

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

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Cashiers	4,785	\$30,400	1.30	-150	4,092	-1.2%
Retail Salespersons	4,037	\$35,000	0.99	-157	2,789	-0.4%
General and Operations Managers	3,712	\$80,400	0.97	619	1,434	-0.1%
Fast Food and Counter Workers	3,109	\$29,800	0.82	-198	3,489	-0.2%
Office Clerks, General	2,990	\$43,200	1.03	-98	1,538	-1.1%
Stocker and Order Fillers	2,856	\$40,600	0.91	320	2,368	0.3%
Customer Service Representatives	2,347	\$43,700	0.74	160	1,359	-1.2%
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2,306	\$37,600	0.88	-17	1,570	-0.2%
Waiters and Waitresses	2,255	\$24,500	0.92	-206	2,219	-0.5%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	2,029	\$64,600	1.40	6	824	-0.5%
Business, Management, & Administration (CTE Field)	70,220	\$50,300	0.89	70	43,484	-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 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 Northwest, the industry with the greatest share of Business, Management, and Administration talent and greatest forecast demand is Restaurants (13.0%). Beyond Restaurants, employment is relatively spread out across different industries, many of which have significant demand over the next 10 years.

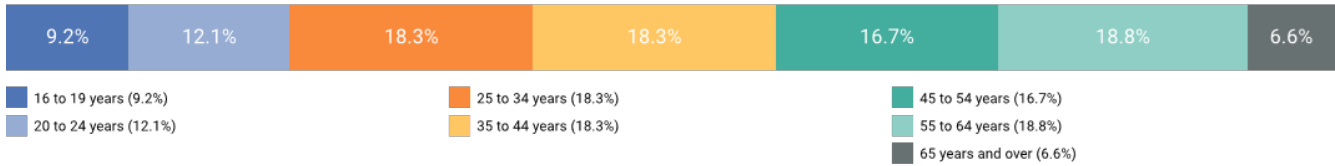
Business, Management, and Administration Field Employment by Industry, Northwest Minnesota, 2024Q1

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	13.0%	9,160	16,849	-66	16,783
Warehouse Clubs, Supercenters, and Other General Merchandise Retailers	4.8%	3,344	4,914	-179	4,735
Gasoline Stations	4.1%	2,862	4,716	-275	4,441
Grocery and Convenience Retailers	3.8%	2,689	4,237	-129	4,108
Traveler Accommodation	3.2%	2,240	3,324	-15	3,309
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	3.0%	2,074	1,962	-196	1,766
Elementary and Secondary Schools	2.8%	1,956	2,468	-187	2,281
Depository Credit Intermediation	2.6%	1,831	1,549	-84	1,466
Executive, Legislative, and Other General Government Support	2.6%	1,819	2,083	-106	1,977
Building Material and Supplies Dealers	2.4%	1,672	2,316	-18	2,299
General Medical and Surgical Hospitals	2.2%	1,545	1,819	-76	1,743
Nursing Care Facilities (Skilled Nursing Facilities)	2.0%	1,431	1,985	-129	1,857
Agencies, Brokerages, and Other Insurance Related Activities	1.5%	1,031	913	17	930
Drinking Places (Alcoholic Beverages)	1.5%	1,026	1,721	-6	1,715
Other Amusement and Recreation Industries	1.4%	996	1,839	54	1,893
Religious Organizations	1.4%	966	1,025	-67	958
Civic and Social Organizations	1.2%	856	1,231	-22	1,209
Services to Buildings and Dwellings	1.2%	847	1,074	-14	1,060
Automobile Dealers	1.1%	749	877	-31	846
Grocery and Related Product Merchant Wholesalers	1.1%	748	803	-8	795
All Others	43.3%	30,378	32,281	-1,393	30,887

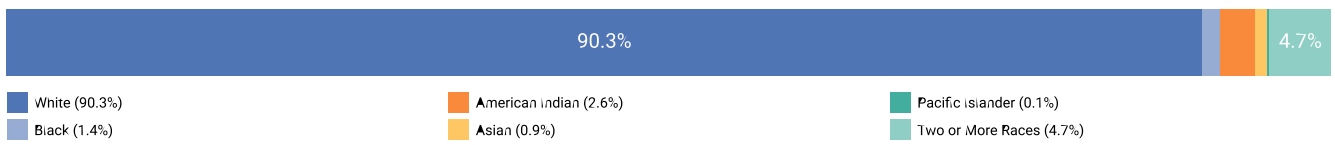
CAREER FIELD DEMOGRAPHICS

- The Business, Management, and Administration field has a slight overrepresentation of female talent (55.8%)
- Northwest Minnesota’s Business, Management, and Administration workforce is demographically similar to the overall regional workforce, within 0.2 percentage points for all groups except for individuals identifying with two or more races, which are more highly concentrated in this field than observed across all occupations combined (by 0.5 percentage points)

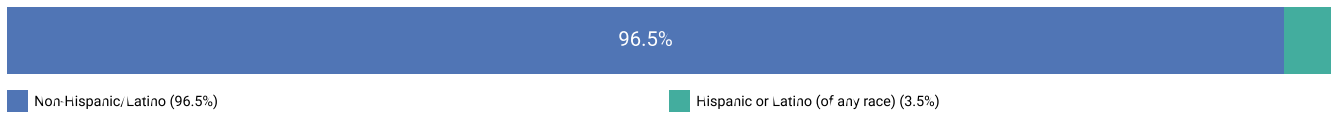
Age



Race



Ethnicity



Gender

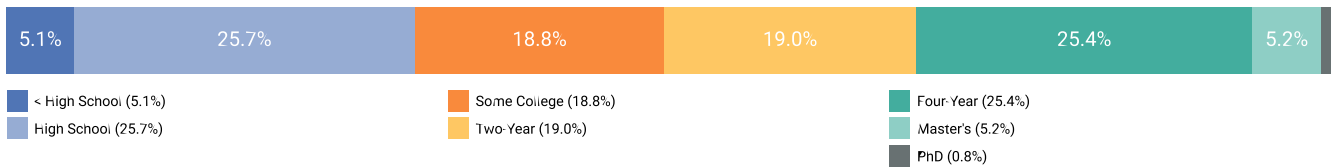


EDUCATIONAL ATTAINMENT AND REQUIREMENTS

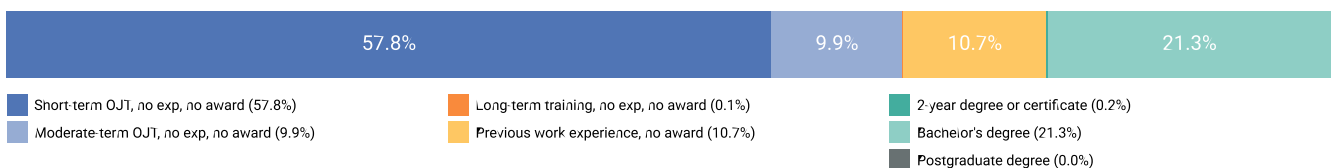
The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- The Northwest 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 (49.6%) of Business, Management, and Administration talent working in the region do not hold a postsecondary credential beyond a certificate, while 78.5% of positions in this field require no postsecondary credential

Educational Attainment



Education and Training Requirements

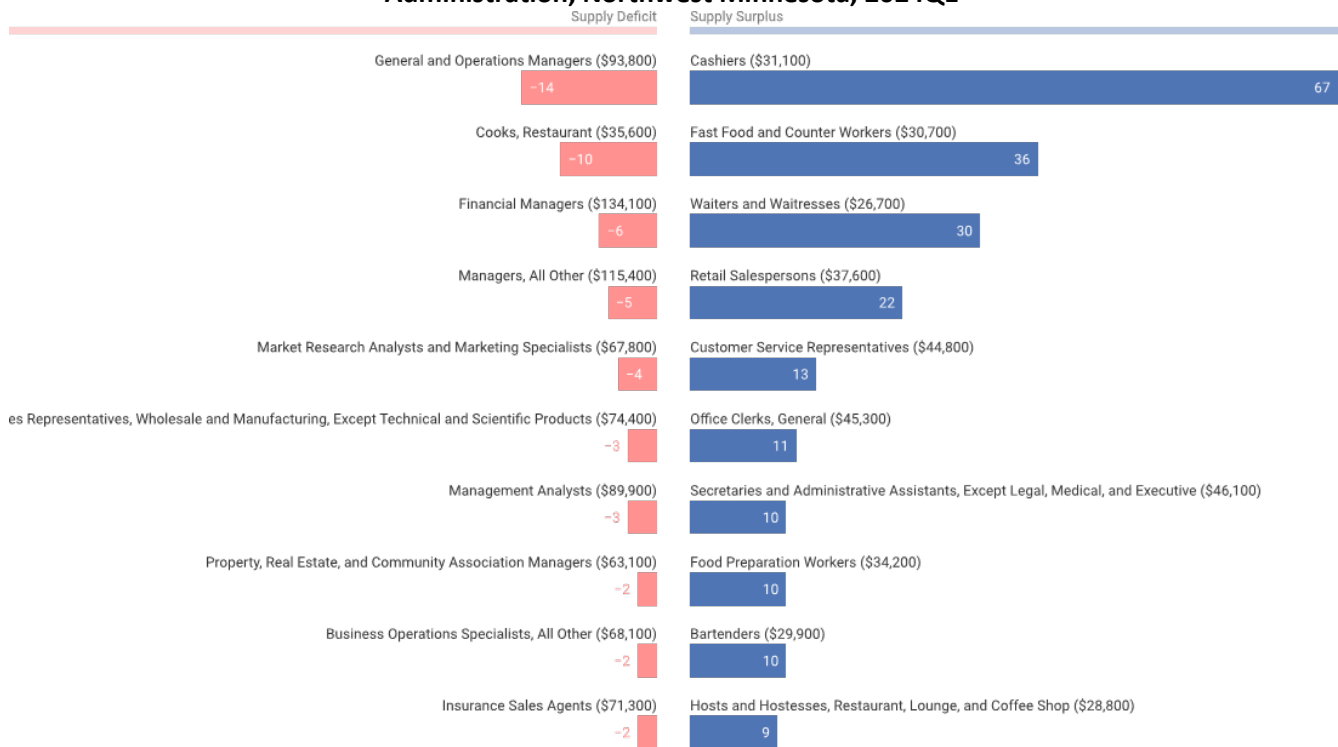


OCCUPATION GAPS

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

Many management roles indicate significant shortages in the years ahead, for example, the General and Operations Manager talent pool in this region will likely fall short at least 14 skilled workers needed annually to meet employer demand. About three quarters of occupations in this field are forecasting talent surpluses, primarily in Hospitality and Tourism pathways and administrative support roles.

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



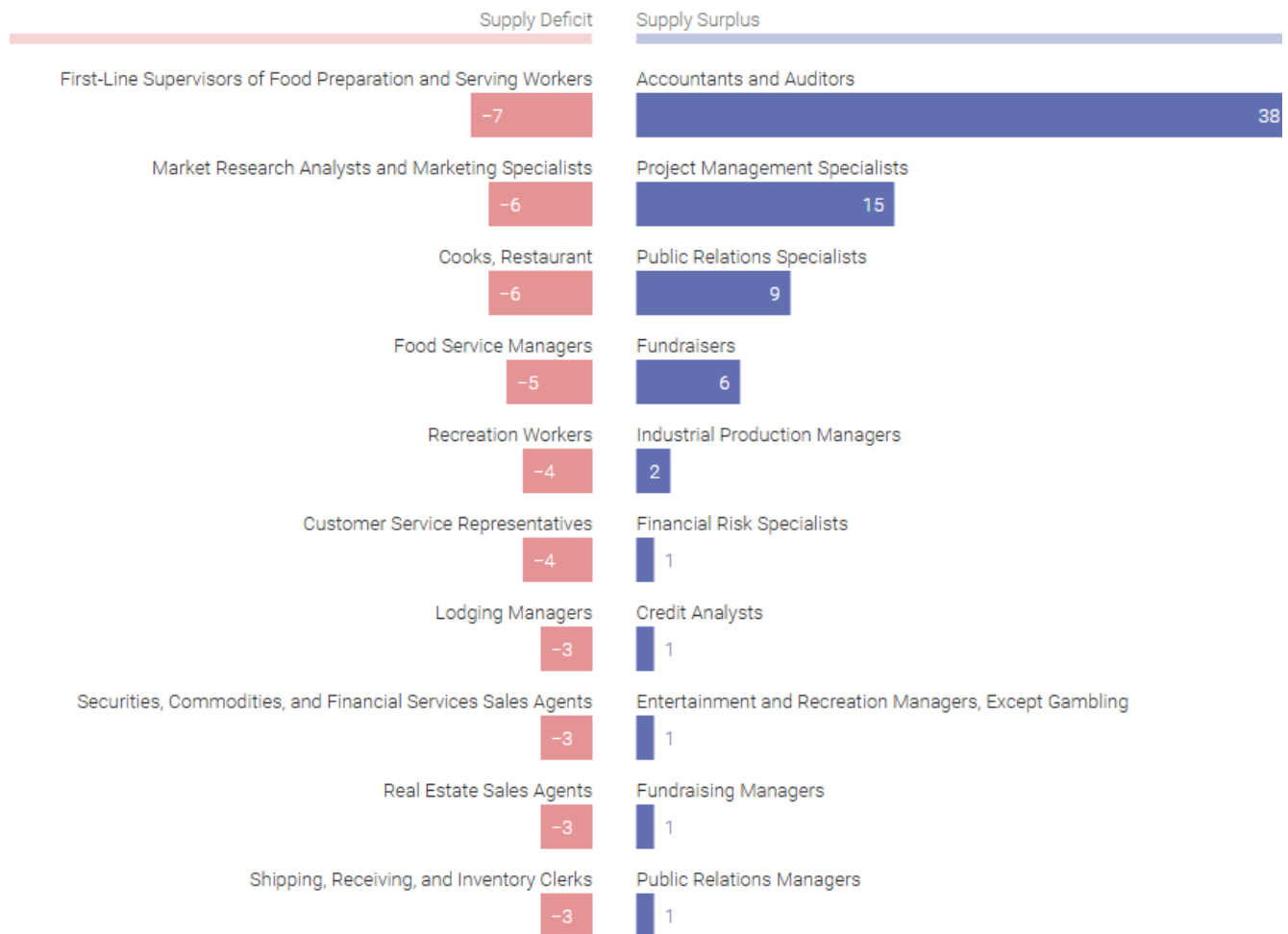
AWARD GAPS

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.

Overall, the volume of graduates completing programs aligned to the Business, Management, and Administration field are well-matched for the region's mix of talent needs. The Northwest has a shortfall of graduates completing programs aligned to 28 different Business, Management and Administration occupations (about 18% of the field's occupations):

- The occupation with the largest shortfall of new graduates compared to national trends is relatively small and is related to short-term credentials: Supervisors of Food Preparation and Serving Workers
- The region's postsecondary institutions produce a surplus of Accountants and Auditors, which helps to meet talent shortages in the region and statewide

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



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, Northwest Minnesota, 2024Q1

Target Occupations (All HW, HS, HD)

Financial Managers (OG)
 Management Analysts (OG)
 Securities, Commodities, & Financial Services
 Sales Agents (OG, AG)
 Public Relations Specialists
 Computer & Information Systems Managers (OG)

Gateway Occupations

Secretaries & Administrative Assistants
 First-Line Supervisors of Retail Sales Workers (HD)
 Bookkeeping, Accounting, & Auditing Clerks (HS)
 Shipping, Receiving, & Inventory Clerks (AG)
 Office & Administrative Support Workers, All Other

Origin Occupations

Cashiers
 Retail Salespersons (HD)
 Fast Food & Counter Workers (HD)
 Office Clerks, General (HD, AG)
 Stockers & Order Fillers (HD)

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:

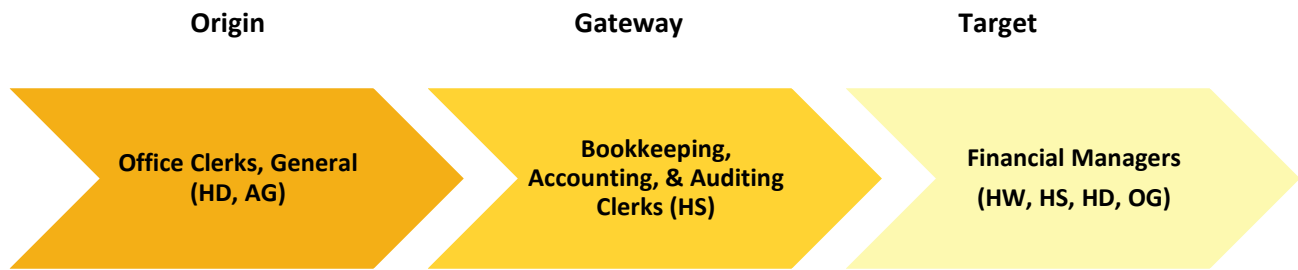
- Insurance Sales Agents (OG, AG)
- Property, Real Estate, and Community Association Managers (OG, AG)
- Food Service Managers (AG)
- Chefs and Head Cooks (AG)

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.

With a projected occupation gap, a projected award gap, and high demand the Target occupation of Financial Managers is a promising pathway to explore in the Northwest region. This occupation is relatively concentrated in the region with a location quotient of 0.65. The Gateway occupation of Bookkeeping, Accounting, and Auditing Clerks is also relatively concentrated in the region with a location quotient of 0.86.

The Origin of Office Clerks, General is highly concentrated locally (LQ 1.03) and is also in high demand. The general pathway of Finance and Administrative work has multiple possibilities in this region.



OGT Wages and Experience Level Requirements, Business, Management, and Administration, Northwest 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	11-3031	Financial Managers	555	\$134,100	\$86,300	\$158,000	\$81,600	\$97,200	\$118,000	\$150,600	\$208,800	BA	> 5 years	None
	13-1111	Management Analysts	547	\$89,900	\$62,800	\$103,400	\$60,900	\$68,300	\$83,400	\$103,000	\$127,400	BA	< 5 years	None
	41-3031	Securities, Commodities, and Financial Services Sales Agents	303	\$92,100	\$48,200	\$114,100	\$46,900	\$53,700	\$72,500	\$114,700	\$169,500	BA	None	Mod-term OJT
	27-3031	Public Relations Specialists	255	\$61,500	\$39,600	\$72,400	\$36,900	\$45,200	\$59,700	\$74,800	\$84,800	BA	None	None
	11-3021	Computer and Information Systems Managers	245	\$141,100	\$95,400	\$163,900	\$90,100	\$108,200	\$134,000	\$165,600	\$198,200	BA	> 5 years	None
Gateway	43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	1,983	\$46,100	\$36,600	\$50,900	\$35,100	\$40,000	\$46,800	\$51,100	\$58,500	HS/GED	None	Short-term OJT
	41-1011	First-Line Supervisors of Retail Sales Workers	1,818	\$49,600	\$36,900	\$56,000	\$36,400	\$39,100	\$46,600	\$55,300	\$67,400	HS/GED	< 5 years	None
	43-3031	Bookkeeping, Accounting, and Auditing Clerks	1,642	\$48,700	\$36,300	\$54,900	\$34,500	\$40,200	\$47,600	\$54,800	\$63,400	Some college	None	Mod-term OJT
	43-5071	Shipping, Receiving, and Inventory Clerks	928	\$45,900	\$35,800	\$51,000	\$34,400	\$39,100	\$45,900	\$50,200	\$58,000	HS/GED	None	Short-term OJT
	43-9199	Office and Administrative Support Workers, All Other	279	\$50,000	\$32,500	\$58,800	\$30,600	\$35,900	\$46,700	\$55,000	\$79,800	HS/GED	None	Short-term OJT
Origin	41-2011	Cashiers	4,785	\$31,100	\$26,700	\$33,300	\$25,100	\$29,000	\$30,400	\$34,500	\$36,700	None	None	Short-term OJT
	41-2031	Retail Salespersons	4,037	\$37,600	\$27,500	\$42,700	\$26,400	\$29,500	\$35,000	\$39,400	\$49,600	None	None	Short-term OJT
	35-3023	Fast Food and Counter Workers	3,109	\$30,700	\$26,400	\$32,900	\$24,600	\$28,600	\$29,800	\$34,600	\$36,500	None	None	Short-term OJT
	43-9061	Office Clerks, General	2,990	\$45,300	\$33,100	\$51,400	\$31,300	\$36,700	\$43,200	\$51,400	\$63,000	HS/GED	None	Short-term OJT
	53-7065	Stockers and Order Fillers	2,856	\$41,000	\$31,800	\$45,500	\$30,500	\$34,800	\$40,600	\$47,100	\$50,000	HS/GED	None	Short-term OJT

Engineering, Manufacturing, and Technology

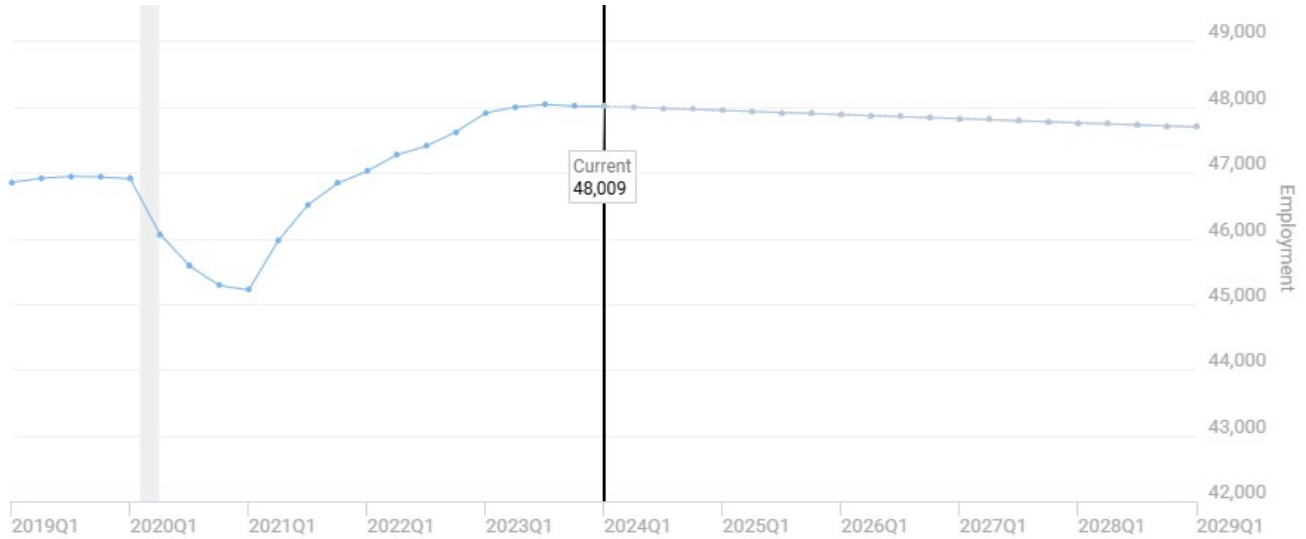
Engineering, Manufacturing, and Technology is a wide career field with the following career clusters:

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

EMPLOYMENT FORECAST

Over the next five years, the Engineering, Manufacturing, and Technology field's employment is forecast to decline slightly (-0.3% on average annually).

5-Year Forecast for Engineering, Manufacturing, and Technology Careers, Northwest Minnesota 2024Q1



TOP OCCUPATIONS

A total of 48,009 people are employed in Engineering, Manufacturing, and Technology roles regionally, accounting for about 27% of all regional employment. While most occupations are forecast to decline, Construction Laborers, Landscaping and Groundskeeping Workers, and Light Truck Drivers are projected to increase slightly, at 0.1%-0.3% annually.

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

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Laborers and Freight, Stock, and Material Movers, Hand	2,876	\$41,600	0.91	104	1,808	-0.2%
Heavy and Tractor-Trailer Truck Drivers	2,833	\$55,300	1.19	40	1,451	-0.1%
Construction Laborers	2,302	\$48,900	1.45	321	1,003	0.2%
Team Assemblers	2,277	\$40,600	1.70	162	1,051	-1.7%
Maintenance and Repair Workers, General	1,847	\$49,400	1.05	3	809	-0.2%
Landscaping and Groundskeeping Workers	1,592	\$39,600	1.23	192	1,026	0.1%
Carpenters	1,385	\$57,200	1.34	-41	552	-0.2%
Light Truck Drivers	1,081	\$47,900	0.87	-19	583	0.3%
Welders, Cutters, Solderers, and Brazers	1,015	\$51,200	2.11	105	424	-0.9%
First-Line Supervisors of Production and Operating Workers	979	\$67,400	1.31	18	416	-0.5%
Engineering, Manufacturing, & Technology (CTE Field)	48,009	\$54,200	1.10	1,158	23,090	-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 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 Northwest region. Locally, the industries with the greatest share of this field's talent are Other Transportation Equipment Manufacturing (4.5%) and Other Wood Product Manufacturing (4.3%). Most industries employing talent in this field touch less than 3% 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.

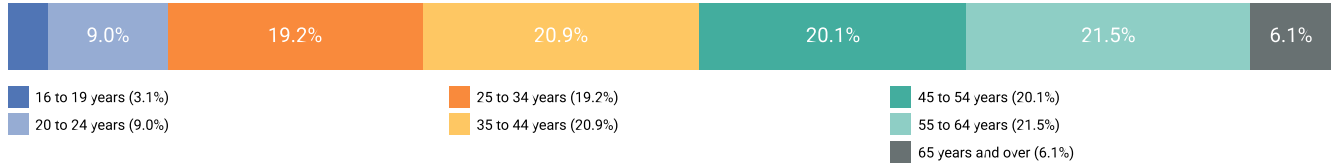
Engineering, Manufacturing, and Technology Field Employment by Industry, Northwest Minnesota, 2024Q1

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Other Transportation Equipment Manufacturing	4.5%	2,138	1,855	-533	1,321
Other Wood Product Manufacturing	4.3%	2,070	2,100	-109	1,991
Building Equipment Contractors	3.9%	1,890	1,647	36	1,683
Animal Slaughtering and Processing	3.8%	1,810	2,110	-12	2,098
Highway, Street, and Bridge Construction	3.2%	1,535	1,298	-7	1,292
Executive, Legislative, and Other General Government Support	3.1%	1,487	1,408	12	1,419
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	2.9%	1,379	1,405	-108	1,297
Other Specialty Trade Contractors	2.7%	1,296	1,124	-12	1,112
Other General Purpose Machinery Manufacturing	2.6%	1,272	1,218	21	1,239
Residential Building Construction	2.6%	1,262	1,016	-3	1,014
General Freight Trucking	2.6%	1,250	1,296	-5	1,291
Foundation, Structure, and Building Exterior Contractors	2.5%	1,197	985	-6	979
Automotive Repair and Maintenance	2.2%	1,067	1,023	-4	1,019
Building Finishing Contractors	2.2%	1,042	820	-15	805
Services to Buildings and Dwellings	2.2%	1,038	1,247	-9	1,238
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1.8%	879	836	-48	788
Sugar and Confectionery Product Manufacturing	1.8%	840	1,031	-30	1,001
Utility System Construction	1.6%	770	660	14	674
Nonresidential Building Construction	1.3%	625	501	-2	499
Other Food Manufacturing	1.2%	595	752	87	839
All Others	47.0%	22,565	23,078	-440	22,638

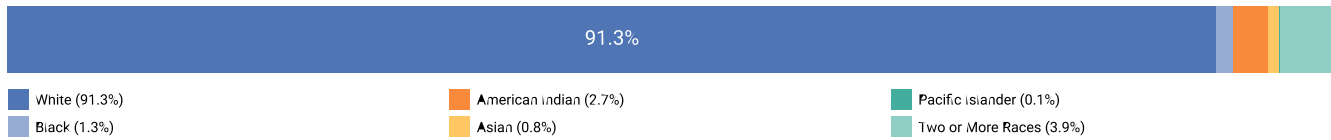
CAREER FIELD DEMOGRAPHICS

- The Engineering, Manufacturing, and Technology field is heavily male (81.8% male) and white (91.3%), and has a slightly higher representation of Hispanic/Latine talent than the regional average (by 1.7 percentage points)
- This field has seen a notable share of its workforce retire in recent years; 47.7% of workers this field are 45 years or older, signaling potential exacerbation of the talent shortage with further waves of retirements

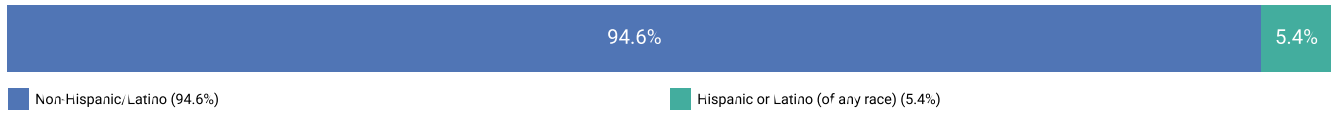
Age



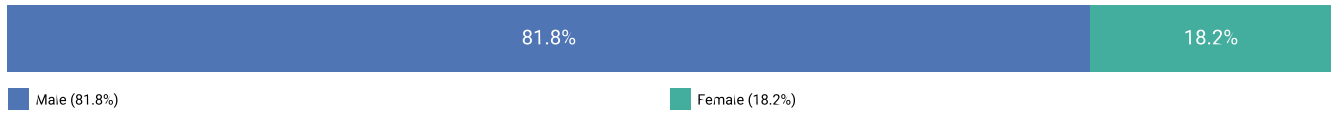
Race



Ethnicity



Gender

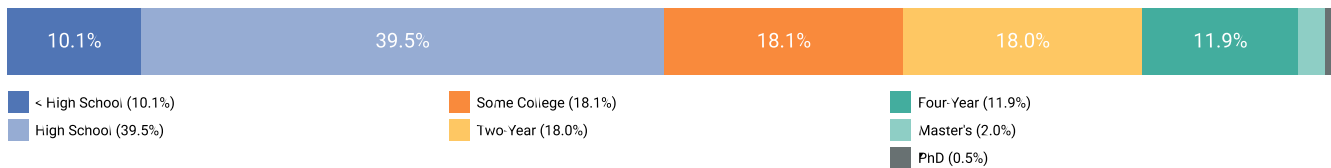


EDUCATIONAL ATTAINMENT AND REQUIREMENTS

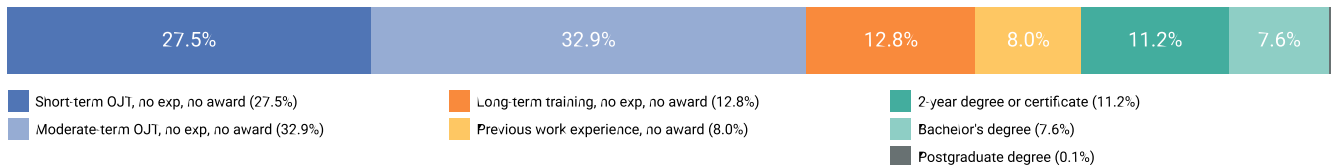
The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- The Northwest Minnesota Engineering, Manufacturing, and Technology workforce has a more highly trained workforce than is typically required for the roles located in the region
 - Over two thirds (67.7%) of Engineering, Manufacturing, and Technology talent working in the region do not hold a postsecondary credential beyond a certificate, while a much higher share, 81.2% of positions in this field, require no postsecondary credential

Educational Attainment



Education and Training Requirements

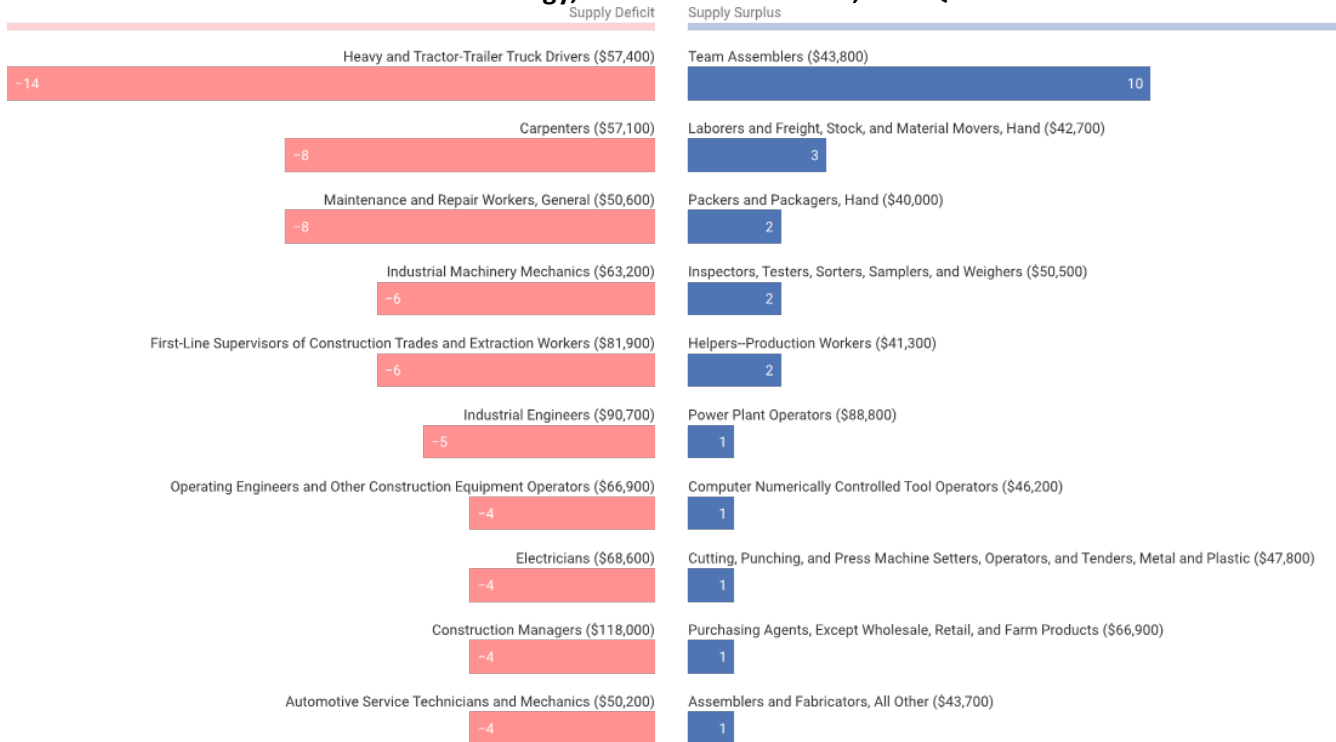


OCCUPATION GAPS

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

Several transportation, trades, and maintenance roles continue to signal shortages in the years ahead, with the Heavy Truck Driver talent pool likely falling short at least 14 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.

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



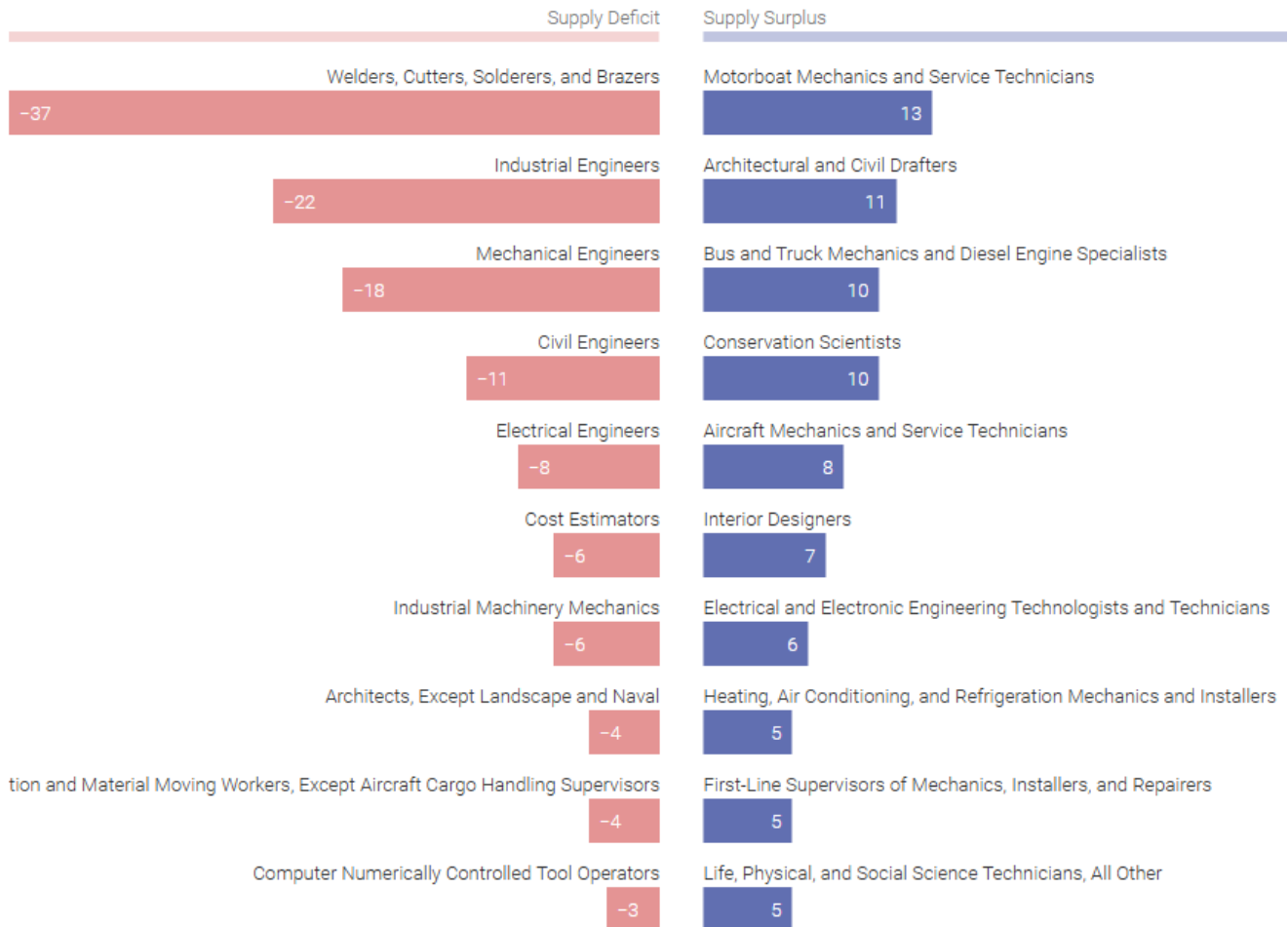
AWARD GAPS

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.

Northwest Minnesota has many Engineering, Manufacturing and Technology postsecondary award shortages and generates a surplus of graduates in several specialized occupations:

- Postsecondary institutions based in the region continue to underproduce Welders, Industrial Engineers, Mechanical Engineers, and Civil Engineers as compared with national volumes of new graduates for a region of equivalent size and industry mix
- Occupations such as Motorboat Mechanics and Architectural Drafters 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, Northwest Minnesota, 2024Q1



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, Northwest Minnesota, 2024Q1

Target Occupations (All HW, HS, HD, OG)

Heavy & Tractor-Trailer Truck Drivers
 Industrial Engineers (AG)
 Construction Managers
 HVAC Mechanics & Installers
 Mechanical Engineers (AG)

Gateway Occupations

Light Truck Drivers (HD)
 Automotive Service Technicians & Mechanics (HS, OG)
 School Bus Drivers (HD)
 Industrial Truck & Tractor Operators
 Painters, Construction & Maintenance (OG)

Origin Occupations

Laborers & Freight, Stock, & Material Movers, Hand
 Team Assemblers
 Landscaping & Groundskeeping Workers (HD, AG)
 Food Batchmakers (HD, OG, AG)
 Packaging & Filling Machine Operators & Tenders (HD, OG)

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

Other Promising Occupations

Several 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:

- Electricians (OG)
- Plumbers, Pipefitters, and Steamfitters (OG)
- Industrial Machinery Mechanics (OG, AG)
- First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers (OG, AG)

Featured Pathway

Careers in the Transportation cluster are highly concentrated in the Northwest region and in high demand. With a projected occupation gap and high demand, expanding opportunities for talent to enter Heavy & Tractor Trailer Truck Driver careers should be considered in the Northwest region. This Target occupation is highly concentrated in the region with a location quotient of 1.19. There are several related Gateway occupations including Light Truck Drivers, School Bus Drivers, and Industrial Truck & Tractor Operators. While there are no specific Origin occupations in this field, Several Origin occupations in the related industrial fields may serve as strong entry points into this pathway. Team Assemblers and Laborers are two such 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.



OGT Wages and Experience Level Requirements, Engineering, Manufacturing, and Technology, Northwest 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	2,833	\$57,400	\$43,700	\$64,200	\$41,200	\$48,700	\$55,300	\$64,400	\$77,000	Certificate	None	Short-term OJT
	17-2112	Industrial Engineers	684	\$90,700	\$66,600	\$102,700	\$62,700	\$74,400	\$85,300	\$102,400	\$124,200	BA	None	None
	11-9021	Construction Managers	633	\$118,000	\$74,600	\$139,700	\$70,300	\$85,200	\$107,100	\$133,500	\$173,600	BA	None	Mod-term OJT
	49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	397	\$61,900	\$44,000	\$70,800	\$41,100	\$50,100	\$61,700	\$75,700	\$81,900	Certificate	None	Long-term OJT
	17-2141	Mechanical Engineers	321	\$83,500	\$65,100	\$92,800	\$63,100	\$69,700	\$79,100	\$91,000	\$113,600	BA	None	None
Gateway	53-3033	Light Truck Drivers	1,081	\$49,900	\$33,100	\$58,300	\$29,800	\$38,400	\$47,900	\$57,100	\$87,800	HS/GED	None	Short-term OJT
	49-3023	Automotive Service Technicians and Mechanics	930	\$50,200	\$36,200	\$57,200	\$35,000	\$39,400	\$47,800	\$58,100	\$67,700	Certificate	None	Short-term OJT
	53-3051	Bus Drivers, School	664	\$50,000	\$37,000	\$56,600	\$35,500	\$40,400	\$48,000	\$52,900	\$67,900	HS/GED	None	Short-term OJT
	53-7051	Industrial Truck and Tractor Operators	481	\$48,200	\$40,200	\$52,300	\$39,800	\$41,700	\$46,400	\$50,400	\$56,600	None	None	Short-term OJT
	47-2141	Painters, Construction and Maintenance	395	\$50,800	\$37,100	\$57,600	\$37,100	\$38,700	\$47,500	\$61,200	\$64,200	None	None	Mod-term OJT
Origin	53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2,876	\$42,700	\$35,000	\$46,600	\$33,900	\$37,400	\$41,600	\$47,100	\$52,400	None	None	Short-term OJT
	51-2092	Team Assemblers	2,277	\$43,800	\$35,800	\$47,700	\$34,000	\$38,800	\$40,600	\$49,200	\$55,800	HS/GED	None	Mod-term OJT
	37-3011	Landscaping and Groundskeeping Workers	1,592	\$40,800	\$29,500	\$46,400	\$28,100	\$32,200	\$39,600	\$46,200	\$56,700	None	None	Short-term OJT
	51-3092	Food Batchmakers	795	\$42,000	\$33,800	\$46,100	\$33,200	\$35,300	\$38,200	\$47,100	\$58,000	HS/GED	None	Mod-term OJT
	51-9111	Packaging and Filling Machine Operators and Tenders	641	\$41,200	\$34,900	\$44,300	\$35,200	\$35,600	\$40,700	\$45,300	\$48,000	HS/GED	None	Mod-term OJT

Agriculture, Food, and Natural Resources

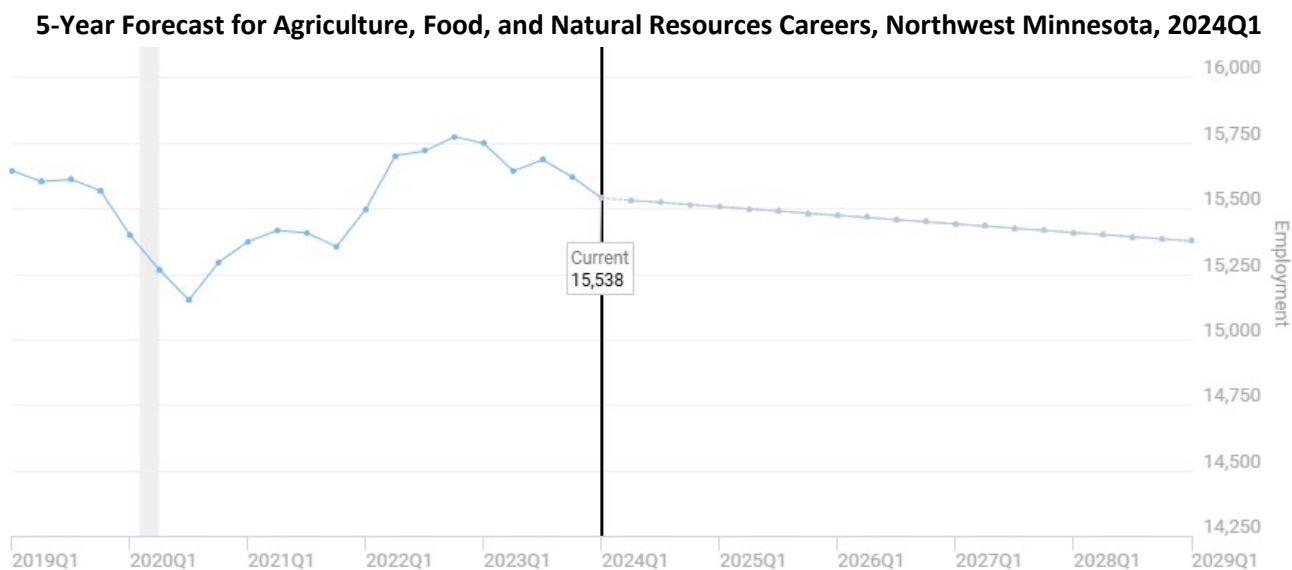
Agriculture, Food, and Natural Resources is a wide career field that includes eight career pathways:

- 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 -0.4% in the Northwest region, continuing a recent downward trend.



TOP OCCUPATIONS

A total of 15,538 people are employed in Agriculture, Food, and Natural Resources roles regionally, accounting for about 9% of all regional employment. Animal Caretakers are projected to grow the most of the top ten occupations, by 1.3% annually over the next five years.

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

6-Digit Occupation	Empl	Median Wages	LQ	Historical 5-Year Empl Change	Forecast 5-Year Demand	Forecast Annual Change
Farmers, Ranchers, and Other Agricultural Managers	4,699	\$65,100	5.70	-820	2,001	-1.2%
Landscaping and Groundskeeping Workers	1,592	\$39,600	1.23	192	1,026	0.1%
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1,489	\$38,300	2.39	90	997	-0.8%
Food Batchmakers	795	\$38,200	4.22	125	598	0.2%
Plumbers, Pipefitters, and Steamfitters	607	\$60,200	1.13	95	263	0.1%
Meat, Poultry, and Fish Cutters and Trimmers	439	\$38,600	2.87	6	258	0.1%
Farmworkers, Farm, Ranch, and Aquacultural Animals	403	\$35,400	2.48	-1	265	-0.9%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	397	\$61,700	0.86	84	173	0.3%
Animal Caretakers	288	\$30,100	0.77	54	293	1.3%
Farm Equipment Mechanics and Service Technicians	282	\$62,700	5.63	44	120	0.3%
Agriculture, Food, and Natural Resources (CTE Field)	15,538	\$54,300	1.67	-104	8,461	-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 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

Locally, the industries with the greatest share of Agriculture, Food, and Natural Resources talent are Crop Production (14.3%) and Animal Production (13.3%). Aside from those, employment in this field is relatively spread out across many different industries.

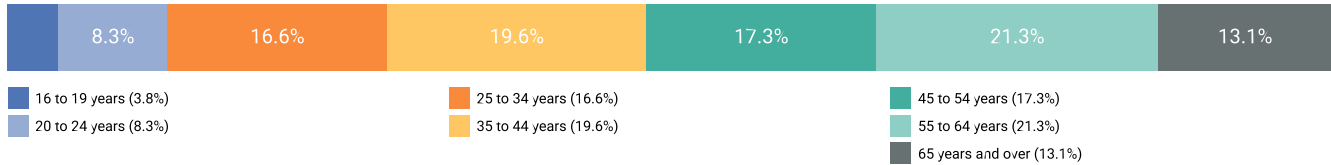
Agriculture, Food, and Natural Resources Field Employment by Industry, Northwest Minnesota, 2024Q1

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Crop Production (Proprietors)	14.3%	2,225	2,196	-317	1,879
Animal Production (Proprietors)	13.3%	2,072	2,015	-259	1,755
Services to Buildings and Dwellings	6.6%	1,031	1,265	-10	1,255
Oilseed and Grain Farming	5.4%	835	1,090	-34	1,056
Building Equipment Contractors	5.1%	800	693	20	713
Animal Slaughtering and Processing	3.6%	554	674	3	676
Executive, Legislative, and Other General Government Support	3.3%	517	530	-2	527
Support Activities for Crop Production	2.8%	437	605	-24	580
Sugar and Confectionery Product Manufacturing	2.7%	423	592	-19	574
Vegetable and Melon Farming	2.3%	360	479	-1	478
Other Crop Farming	2.3%	359	467	-18	448
Cattle Ranching and Farming	2.2%	334	423	-23	401
Other Professional, Scientific, and Technical Services	2.0%	309	348	57	405
Machinery, Equipment, and Supplies Merchant Wholesalers	1.5%	239	201	5	206
Electric Power Generation, Transmission and Distribution	1.5%	234	179	-27	153
Other Personal Services	1.5%	227	404	38	442
Other Amusement and Recreation Industries	1.5%	226	289	15	304
Grocery and Convenience Retailers	1.4%	218	268	-10	258
Other Food Manufacturing	1.3%	202	299	28	327
Wired and Wireless Telecommunications (except Satellite)	1.3%	202	197	10	207
All Others	24.0%	3,732	4,352	-44	4,308

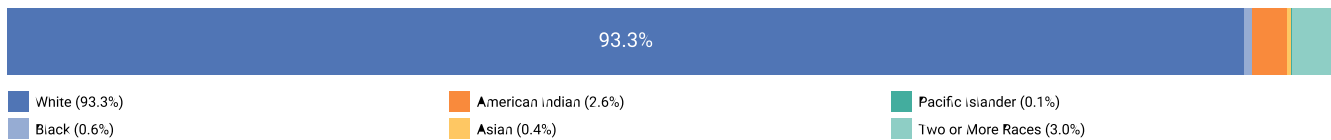
CAREER FIELD DEMOGRAPHICS

- The Agriculture, Food, and Natural Resources field continues to have an overrepresentation of male (73.5%) and white (93.3%) workers, but with significant variation across the eight career pathways
- The largest age cohort of talent holding Agriculture, Food, and Natural Resources careers are between the ages of 55 and 64 years old (21.3% in this field compared to 19.8% across all occupations), signaling a wave of likely retirements on the horizon

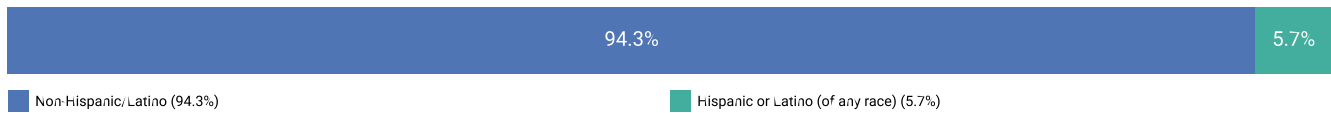
Age



Race



Ethnicity



Gender

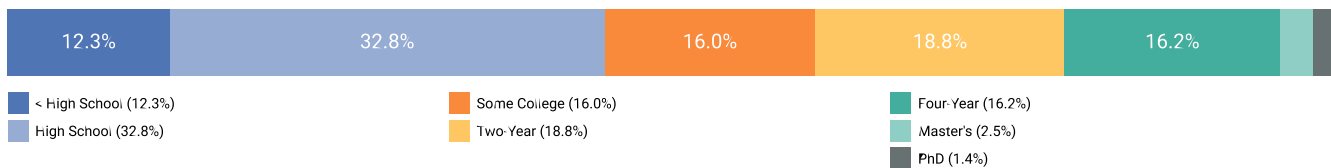


EDUCATIONAL ATTAINMENT AND REQUIREMENTS

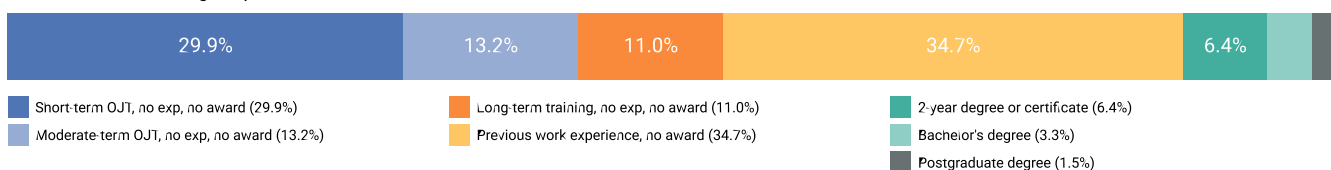
The charts below illustrate the estimated educational attainment of current workers in this career field, followed by the typical education and training requirements in the field.

- The Northwest 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 (61.1%) of Agriculture, Food, and Natural Resources talent working in the region do not hold a postsecondary credential beyond a certificate, while 88.8% of positions in this field require no postsecondary credential; this suggests that at nearly 28% of the region’s talent in this field may be overqualified (underemployed) for their current role

Educational Attainment



Education and Training Requirements

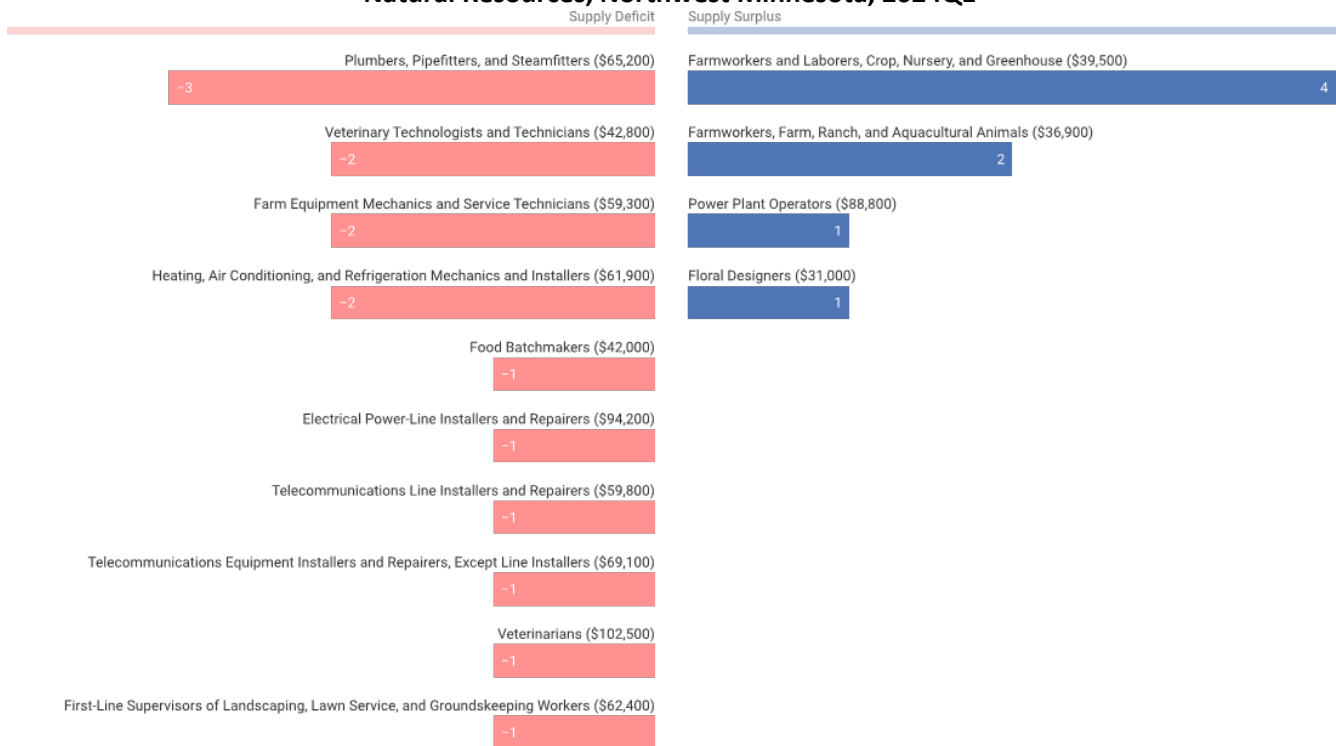


OCCUPATION GAPS

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

Only four occupations in the Agriculture, Food, and Natural Resources field forecast small talent surpluses in the region. Among the field's most notable talent shortages are Plumbers, Veterinary Technologists, Farm Equipment Mechanics, and HVAC Mechanics. Retirements and growing demand unmet by the local talent supply chain are both contributing factors to rising shortages. 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, Northwest Minnesota, 2024Q1



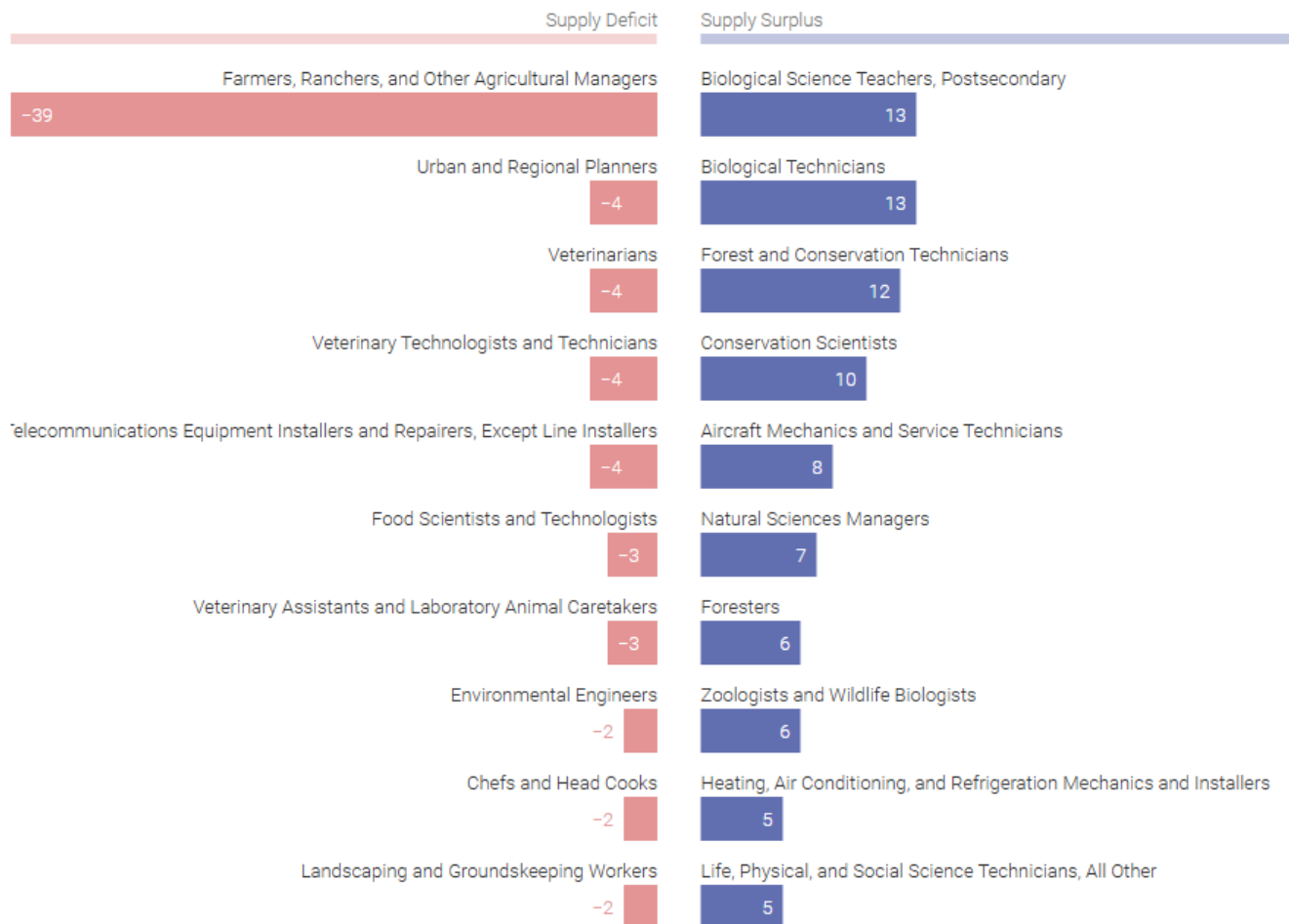
AWARD GAPS

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.

Northwest Minnesota colleges and universities have several notable Agriculture, Food, and Natural Resources postsecondary award shortages:

- Northwest Minnesota colleges and universities are underproducing at least 39 graduates annually that are needed to fill Agricultural Manager positions open with employers based in the Northwest, an expansion of the graduate deficit from the prior year tied to growing regional demand
- Urban and Regional Planner, Veterinary, and Line Installer postsecondary awards and credentials also lag national volumes considerably and contribute to regional talent shortages
- Only about 12% of occupations are seeing a larger local supply of new postsecondary graduates from aligned local programs than the national average for a community of similar size and industry composition; 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, Northwest Minnesota, 2024Q1



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, Northwest Minnesota, 2024Q1

Target Occupations (All HW, HS, HD)

HVAC Mechanics & Installers (OG)
 Telecommunications Equipment Installers & Repairers (OG, AG)
 Environmental Scientists & Specialists
 Urban & Regional Planners (AG)
 Biological Science Teachers, Postsecondary

Gateway Occupations

Agricultural Equipment Operators (HD, AG)
 Food Cooking Machine Operators & Tenders (HD)
 Logging Equipment Operators
 Pesticide Handlers, Sprayers, & Applicators, Vegetation
 Outdoor Power Equipment & Other Small Engine Mechanics

Origin Occupations

Landscaping & Groundskeeping Workers (HD, AG)
 Farmworkers & Laborers, Crop, Nursery, & Greenhouse
 Food Batchmakers (HD, OG, AG)
 Meat, Poultry, & Fish Cutters & Trimmers (HD)
 Farmworkers, Farm, Ranch, & Aquacultural Animals

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

Other Promising Occupations

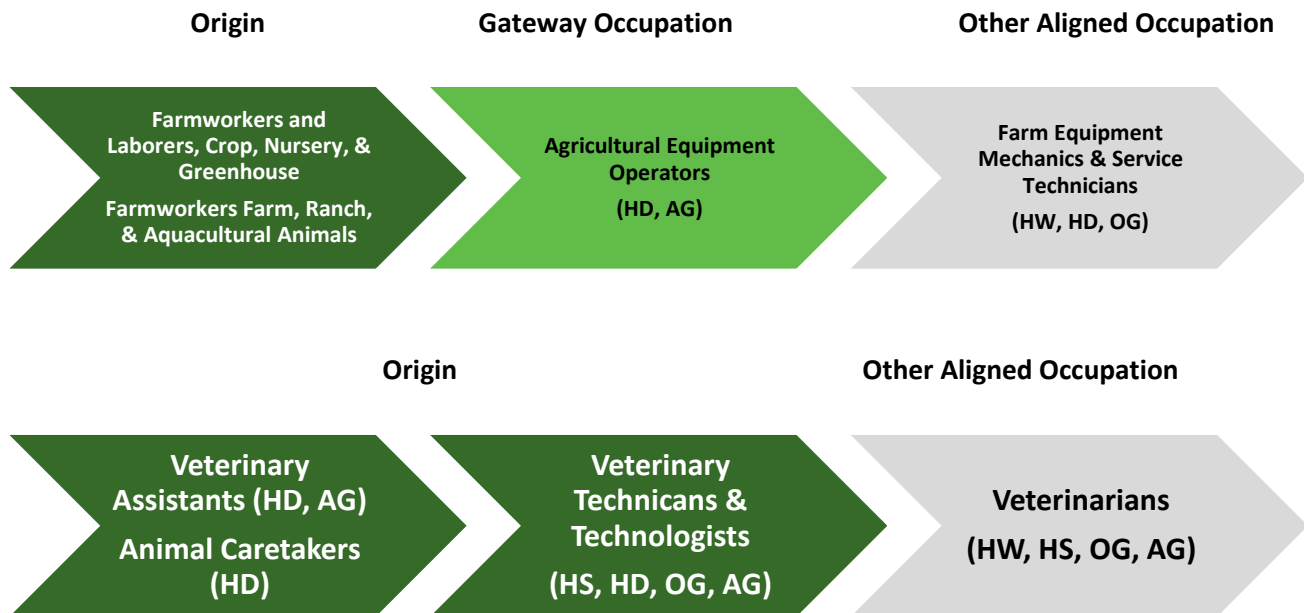
A number of other Agriculture, Food, and Natural Resources occupations that are high-wage and high-demand, yet do not meet the high-skill threshold to be considered Target Occupations, may be promising careers for students to consider. These occupations may offer a fast track to good jobs for those interested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

- Plumbers, Pipefitters, and Steamfitters (OG)
- Farm Equipment Mechanics and Service Technicians (OG)
- First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers (AG)
- Chefs and Head Cooks (OG)
- Refuse and Recyclable Material Collectors

Featured Pathway

Similar to 2023, the Animal Sciences (Veterinary) Pathway is still a valuable one for exploration. There is zero unemployment for Veterinarians, extremely low unemployment for Veterinary Technologists and Technicians, and high demand for Veterinary Assistants and Animal Caretakers. Another potential pathway to explore that is important to the Northwest region is the Agriculture related pathway. Although the Farm Equipment Mechanics and Service Technicians Occupation lacks the high skill designation to be a target occupation, it is a high-wage and high demand occupation with a very high concentration in the Northwest region (LQ 5.63). The Origin occupations of Farmworkers, Farm, Ranch, and Aquacultural Animals and Farmworkers and Laborers,

Crop, Nursery, and Greenhouse could be potential entry points for this occupation by leading to the Gateway occupation of Agricultural Equipment Operators which is in high demand and in high concentration (LQ 3.28) in the region.



OGT Wages and Experience Level Requirements, Agriculture, Food, and Natural Resources, Northwest 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	397	\$61,900	\$44,000	\$70,800	\$41,100	\$50,100	\$61,700	\$75,700	\$81,900	Certificate	None	Long-term OJT
	49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	167	\$69,100	\$54,900	\$76,200	\$50,500	\$62,400	\$67,800	\$80,300	\$85,000	Certificate	None	Mod-term OJT
	19-2041	Environmental Scientists and Specialists, Including Health	61	\$75,500	\$55,400	\$85,500	\$54,700	\$59,000	\$71,500	\$92,200	\$101,300	BA	None	None
	19-3051	Urban and Regional Planners	54	\$79,100	\$59,000	\$89,100	\$57,600	\$62,900	\$72,700	\$90,400	\$113,600	MA	None	None
	25-1042	Biological Science Teachers, Postsecondary	50	\$92,600	\$64,500	\$106,600	\$60,700	\$73,600	\$92,100	\$110,800	\$122,300	PhD	None	None
Gateway	45-2091	Agricultural Equipment Operators	215	\$48,000	\$37,500	\$53,300	\$37,500	\$39,200	\$47,500	\$56,100	\$60,600	None	None	Mod-term OJT
	51-3093	Food Cooking Machine Operators and Tenders	135	\$44,400	\$35,600	\$48,800	\$33,600	\$39,600	\$45,000	\$50,600	\$52,100	HS/GED	None	Mod-term OJT
	45-4022	Logging Equipment Operators	83	\$47,500	\$45,500	\$48,500	\$45,300	\$46,000	\$47,000	\$47,500	\$48,500	HS/GED	None	Mod-term OJT
	37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	64	\$47,000	\$41,000	\$50,100	\$39,400	\$43,700	\$46,200	\$50,800	\$57,500	HS/GED	None	Mod-term OJT
	49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	62	\$46,900	\$39,100	\$50,700	\$37,200	\$42,600	\$46,700	\$51,700	\$55,000	HS/GED	None	Mod-term OJT
Origin	37-3011	Landscaping and Groundskeeping Workers	1,592	\$40,800	\$29,500	\$46,400	\$28,100	\$32,200	\$39,600	\$46,200	\$56,700	None	None	Short-term OJT
	45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1,489	\$39,500	\$30,100	\$44,200	\$29,200	\$32,300	\$38,300	\$46,800	\$52,700	None	None	Short-term OJT
	51-3092	Food Batchmakers	795	\$42,000	\$33,800	\$46,100	\$33,200	\$35,300	\$38,200	\$47,100	\$58,000	HS/GED	None	Mod-term OJT
	51-3022	Meat, Poultry, and Fish Cutters and Trimmers	439	\$38,100	\$31,800	\$41,300	\$30,800	\$34,200	\$38,600	\$41,700	\$45,100	None	None	Short-term OJT
	45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	403	\$36,900	\$29,900	\$40,500	\$29,600	\$31,100	\$35,400	\$43,000	\$47,800	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 Northwest region has recovered beyond 2019 pre-pandemic employment volumes by nearly 500 workers and is currently on track in close alignment with 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 Northwest is likely to experience an overall employment decline of about -0.2% on average annually over the next five years.

It appears that it will be the industries that are most concentrated in the region that may experience some of the largest declines in total employment. Agriculture, Fishing, and Forestry (LQ 4.05), Manufacturing (LQ 1.66), Wholesale Trade (LQ 1.41), and Public Administration (LQ 1.26) all forecast declines in employment and significant replacement demand needs necessary to sustain business and the regional economy. These particular industries that are uniquely concentrated in the Northwest region contribute to a high concentration of Agriculture, Food, and Natural Resources careers as well as Engineering, Manufacturing, and Technology 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 these most critical career fields, it is likely that talent shortages will continue to persist 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@realtimentalentmn.org or visit the RealTime Talent website at www.realtimentalent.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 dynamics, including educational attainment and projected growth.
- Occupation employment by place of residence is as of 2024Q1 and modeled by JobsEQ based upon occupation employment by place of work and commuting patterns. Commuting patterns are derived from source data from the Census Bureau, occupation-specific commuting tendencies, 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.
 - Demand: TalentNeuron scrapes approximately 1.3 million job postings daily, which are cleaned, deduplicated, and aggregated on the platform daily.
 - 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.
 - 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 (\$48,600 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.