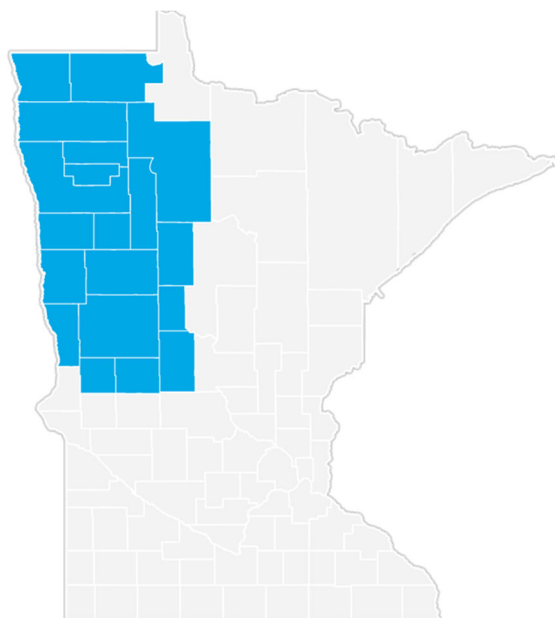


Workforce Trends

CAREER & TECHNICAL EDUCATION



Northwest Minnesota

RealTime Talent

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Overview

Recent years have brought seismic shifts in the world of work, driven forward by ongoing economic uncertainties, dramatic talent shortages, workforce misalignments, and rapidly evolving technology. These dynamics make forecasting future labor market needs and supply uniquely challenging. But despite the turbulence, several pivotal shifts have begun to materialize, illuminating the path ahead in inclusive workplaces, skills-based hiring, and the digital workplace. The continuing effects of the pandemic, domestic and international unrest, and shifting economic models have been felt in disparate ways across the nation. The job market is undoubtedly cooling but is still experiencing significant talent shortages plaguing every industry and career cluster.

This report unpacks the current workforce landscape of Minnesota and the regional nuances of talent demand by career field. We aim to support Minnesota Perkins Consortia in navigating changes in their local labor market and guide their understanding of how these changes may impact enrollment, industry, career advancement, and the needed programs of study by region.¹ Each report includes:

- Regional economic and demographic overview
- Career field and cluster analysis including regional importance of each sector, key labor market statistics, and forecasting for future demand in the six career fields:
 - Health Science Technology
 - Engineering, Manufacturing, and Technology
 - Arts, Communications, and Information Systems
 - Agriculture, Food, and Natural Resources
 - Business, Management, and Administration
 - Human Services
- Gap analysis in each of the six career fields, including:
 - Occupation gaps (i.e., talent shortages)
 - Award gaps
- 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, taking into account automation, remote work, and the changing work environment
- A word on remote work and jobs of the future

About This Report

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

¹ All labor market data in this report comes from Chmura Economics JobsEQ Dataset 2023Q2 unless otherwise noted. www.jobseq.com



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Northwest Minnesota

Introduction

This report highlights the current and future talent needs in the nineteen counties of Northwest Minnesota.² Starting from the community demographics, unique opportunities, and the critical occupations and industries underpinning the regional economy, this macroeconomic overview is intended to support educators and administrators who aim to increase alignment between educational programming and local businesses' most pressing needs. Identifying the skills, certifications, and qualifications for positions today will help the education community anticipate community needs and ensure that curriculum best prepares students for relevant job opportunities of the future here in Northwest Minnesota.

This report uses an Origin-to-Gateway-to-Target Occupation model, used by the Rework America Alliance and modified in this report by RealTime Talent, 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 itself is shown below, along with the definitions of each grouping of occupations.

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

Target Occupations

High wage (above regional average)

High-skill (require some credential)

High-demand (2/4 indicators: under 3% unempl, higher than average 5-year growth, total 5-year demand >50% of current empl, high job posting volume)

*Often also high occupation gap and award gap

Gateway Occupations

Mid-wage (\$45,000 – regional average)

Low-middle skills (HS diploma, some OJT)

Sufficient demand (3-5% unemployment and/or high volumes of current opportunities)

Origin Occupations

Low wage (<\$45,000/year)

Low skill (no credential)

Low demand (over 5% unemployment, low growth, low replacement demand, and/or low job postings)

² Becker, Beltrami, Clay, Clearwater, Douglas, Grant, Hubbard, Kittson, Mahnomen, Marshall, Norman, Otter Tail, Pennington, Polk, Red Lake, Roseau, Todd, Wadena, and Wilkin Counties.



Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$45,000) that have high unemployment locally among workers without four-year degrees.

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 average wage (\$55,600 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.

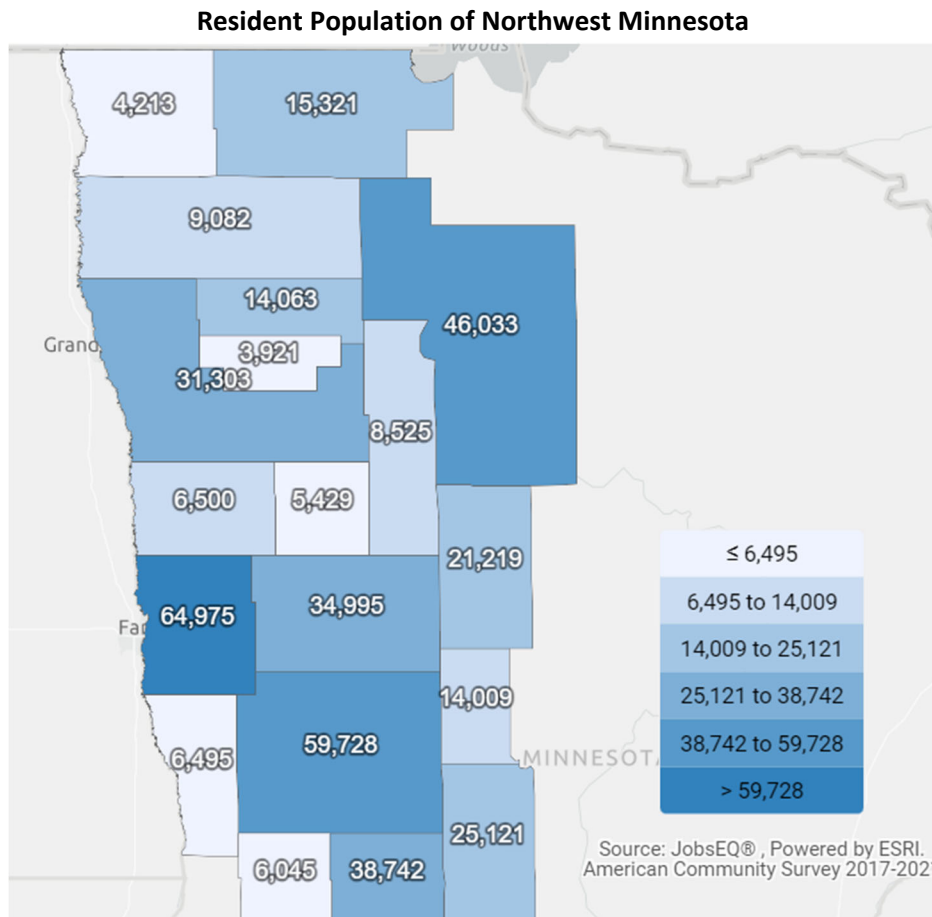
Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$55,600 in the Northwest). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.



Community Profile

Demographics

The Northwest is home to about 7.3% of Minnesota’s total population. In all, about 415,719 people live in Northwest Minnesota, according to 2017-2021 American Community Survey Estimates—an increase of over 3,000 people from the prior year’s estimates. Just under 24% of Northwest Minnesota’s population are minors under 18 years of age. Overall, the region’s median age is 2.4 years older (40.6 years) than the statewide median (38.2 years), mostly attributable to a larger share of adults over 55 years of age in the region. The cities of Bemidji, Alexandria, and Moorhead are home to the largest local concentrations of population and are economic hubs for the region. Otter Tail County is home to 14.4% of the region’s population.

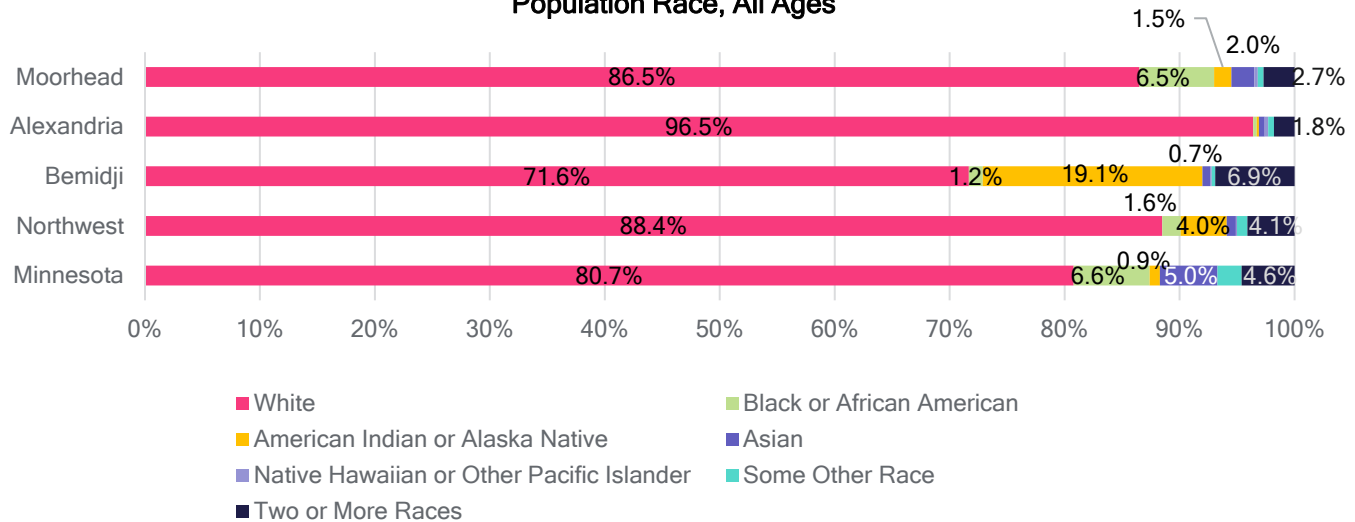


Population diversity increased between the two most recent population estimates statewide by 1.2 percentage points from 2019 to 2020 estimates, and by another 0.9 percentage points between 2020 and 2021 estimates. In the Northwest, the share of the population that is Black, Asian, American Indian, Native Hawaiian, or some other race (BIPOC) increased by 0.8 percentage points (following an increase of just 1.1 points in the prior year’s estimates). Across the region overall, 11.6% of the population identify as BIPOC. The demographic makeup of communities across the



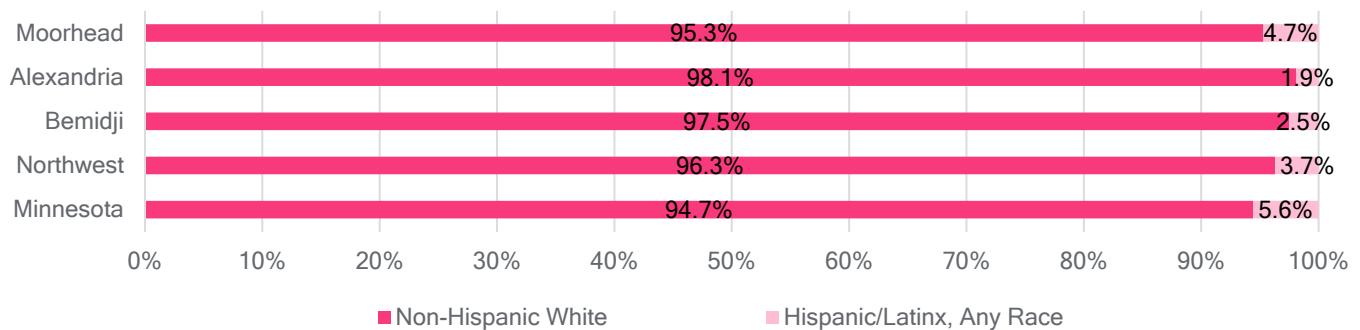
Northwest are distinct from one another demographically; Bemidji remains the most diverse of the region's three largest economic hubs. Nearly one in five people living in Bemidji identify as American Indian, compared to just 0.2% in Alexandria, and 1.5% in Moorhead. Approximately 3.7% of Northwest Minnesota's residents are Hispanic or Latinx an increase of 0.2 percentage points from the previous year. Alexandria's population became more diverse by 0.2 percentage points (following a similar increase from the year prior) and following a decrease in the share of the population that is Black or African American in the 2016-2020 estimates, this share has increased by 0.1 percentage points in the 2017-2021 estimates. The share of the population that is two or more races jumped up substantially in the 2017-2021 estimates statewide (3.9% to 4.6%), in the Northwest region (3.5% to 4.1%), and Bemidji (6.1% to 6.9%). Moorhead continues to have a particularly high concentration of Hispanic and Latinx residents at 4.7% of the population, and each community experienced an increase in Hispanic and Latinx residents of at least 0.1 percentage point from last year's estimates.

Population Race, All Ages



American Community Survey 2017-2021.

Population Ethnicity, All Ages



American Community Survey 2017-2021.



Community Demographics

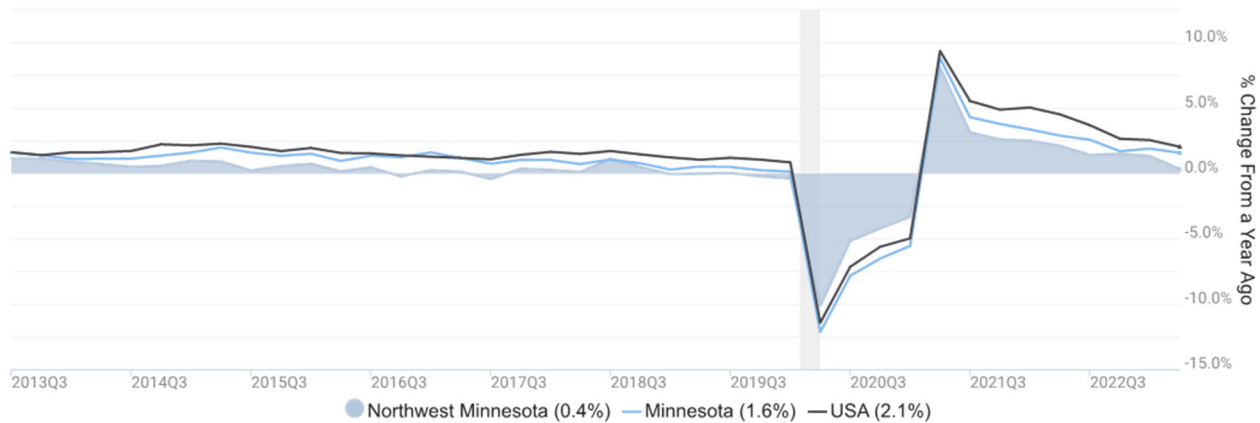
Demographics	Percent			Percent			Value		
	Bemidji, MN μSA	Alexandria, MN μSA	City of Moorhead, MN	Northwest Minnesota	Minnesota	USA	Northwest Minnesota	Minnesota	USA
Population (ACS)	—	—	—	—	—	—	415,719	5,670,472	329,725,481
Male	50.0%	50.4%	50.0%	50.6%	50.1%	49.5%	210,187	2,839,135	163,206,615
Female	50.0%	49.6%	50.0%	49.4%	49.9%	50.5%	205,532	2,831,337	166,518,866
Median Age2	—	—	—	—	—	—	40.6	38.2	38.4
Under 18 Years	25.4%	21.8%	23.3%	23.9%	23.3%	22.5%	99,290	1,323,569	74,234,075
18 to 24 Years	13.0%	6.7%	18.3%	8.8%	8.8%	9.2%	36,610	499,402	30,339,089
25 to 34 Years	12.3%	11.4%	14.9%	11.1%	13.3%	13.8%	46,293	756,215	45,360,942
35 to 44 Years	11.1%	11.5%	12.4%	11.5%	13.0%	12.9%	47,815	738,714	42,441,883
45 to 54 Years	9.9%	11.1%	9.6%	10.9%	12.1%	12.6%	45,507	688,596	41,631,458
55 to 64 Years	12.3%	15.0%	9.7%	14.2%	13.4%	13.0%	59,220	762,459	42,829,413
65 to 74 Years	9.8%	12.6%	6.8%	11.1%	9.4%	9.6%	46,340	535,592	31,590,619
75 Years and Over	6.2%	10.0%	5.1%	8.3%	6.5%	6.5%	34,644	365,925	21,298,002
Race: White	71.6%	96.5%	86.5%	88.4%	80.7%	68.2%	367,686	4,576,758	224,789,109
Race: Black or African American	1.2%	0.3%	6.5%	1.6%	6.6%	12.6%	6,589	376,406	41,393,012
Race: American Indian and Alaska Native	19.1%	0.2%	1.5%	4.0%	0.9%	0.8%	16,657	52,695	2,722,661
Race: Asian	0.7%	0.5%	2.0%	0.8%	5.0%	5.7%	3,497	283,382	18,782,924
Race: Native Hawaiian and Other Pacific Islander	0.1%	0.3%	0.3%	0.1%	0.0%	0.2%	388	2,338	615,557
Race: Some Other Race	0.3%	0.5%	0.5%	0.9%	2.1%	5.6%	3,673	120,011	18,382,796
Race: Two or More Races	6.9%	1.8%	2.7%	4.1%	4.6%	7.0%	17,229	258,882	23,039,422
Hispanic or Latino (of any race)	2.5%	1.9%	4.7%	3.7%	5.6%	18.4%	15,298	319,828	60,806,969

American Community Survey 2017-2021 unless noted otherwise.

Employment

By 2021Q1, employment was significantly impacted by the COVID-19 pandemic and dropped to 168,863 (based on a four-quarter moving average). Over the year ending 2022Q2, employment rose by 1.8% in the region to 175,767 employed across Northwest Minnesota. As of 2023Q2, total employment in Northwest Minnesota was 177,841, increasing by 0.4% from the prior year.

Employment for Northwest Minnesota

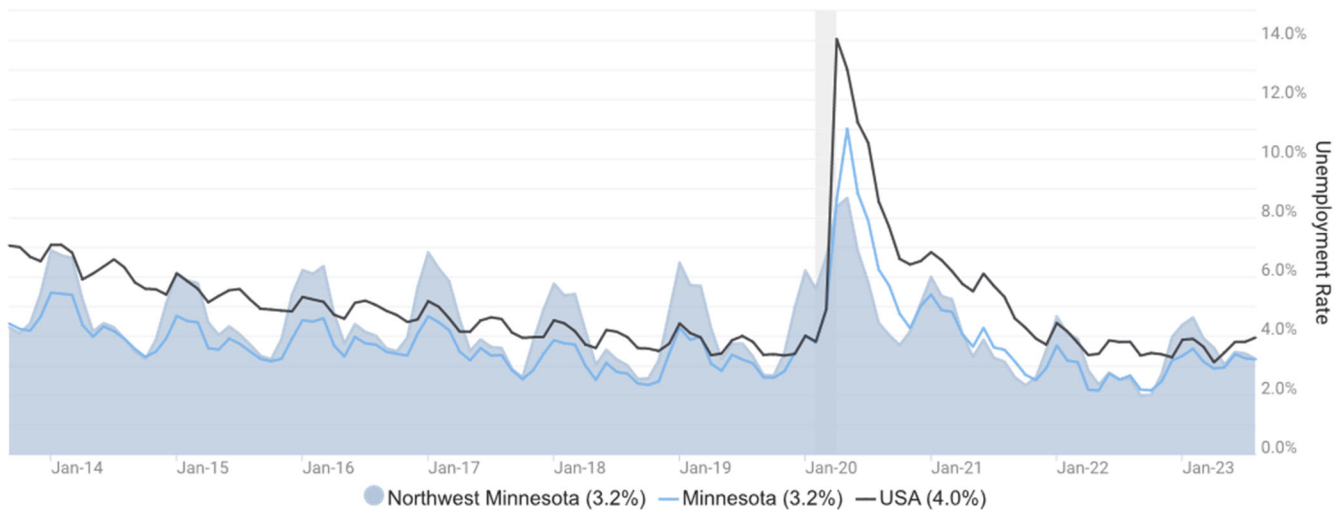


Employment data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and imputed where necessary. Data are updated through 2023Q1 with preliminary estimates updated to 2023Q2.



The unemployment rate for Northwest Minnesota was 3.2% as of August 2023. The regional unemployment rate was the same as the statewide rate (3.2%), but lower than the national rate of 4%. One year earlier, in August 2022, the unemployment rate in Northwest Minnesota was 2.6%.

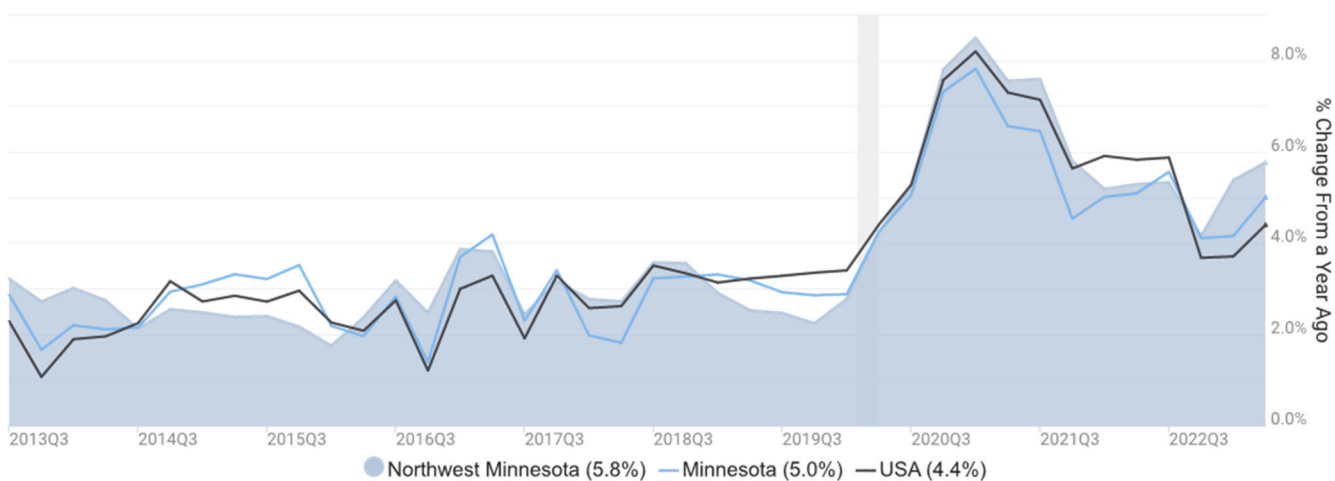
Unemployment for Northwest Minnesota



Unemployment rate data are from the Local Area Unemployment Statistics, provided by the Bureau of Labor Statistics and updated through August 2023.

The average worker in Northwest Minnesota earned annual wages of \$51,245 as of 2023Q2, an increase of about \$3,000 from 2022Q2 (\$48,214). Average annual wages per worker increased 5.8% in the region over the preceding four quarters. Wages rose similarly nationwide, where annual average wages were \$70,318 as of 2023Q2 (compared to \$67,777 as of 2022Q2 and \$63,393 as of 2021Q1).

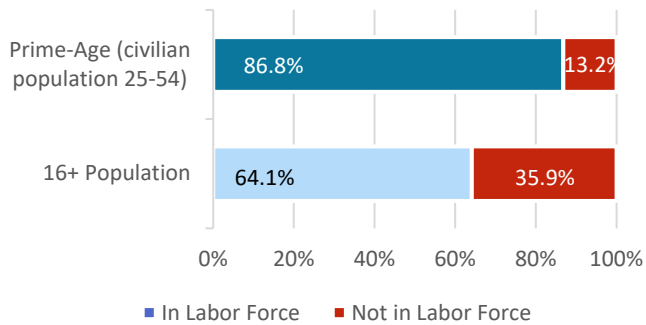
Average Annual Wages for Northwest Minnesota



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 2023Q1 with preliminary estimates updated to 2023Q2.



Labor Force Participation Rate



The region has a civilian labor force of 209,446 (down about 326 workers from the prior year's estimates) with a participation rate of 64.1%, which lags Minnesota's labor force participation rate for the population over 16 by five percentage points. This is due primarily to the older average age of residents in Northwest Minnesota. The participation rate of the prime working age population (between the ages of 25 and 64) also continues to lag behind the statewide rate—86.8% compared to the statewide 88.4%.

American Community Survey 2017-2021 unless noted otherwise.

The Northwest region has a higher share of veterans than observed statewide, at 4.1% of the regional population compared to 3.6% broadly across the state. Veteran labor force participation is slightly lower in the region than observed statewide, and decreased from the prior year's estimates to 77.6% compared to last year's 79.9%. Statewide veteran labor force participation is at 80.6%. The Northwest has a higher share of people with disabilities, 10.8% compared to 9% statewide, and a lower labor force participation rate for the population with a disability, 50.9% compared to 53.5% statewide. The Northwest region has a higher share of disconnected youth (3.0% of youth, an increase of 0.6 percentage points from the prior year estimates) compared to statewide (1.8%) and above national rates (2.5%), with variation between communities. While just 0.6% of Moorhead youth are disconnected from school, training, or work, in Bemidji about 4.7% are disconnected—a slight increase of 0.3 percentage points for Moorhead and a slight decrease of 0.3 percentage points for Bemidji.

Economic and Social Characteristics of Northwest Minnesota

Economic and Social Characteristics	Percent			Percent			Values		
	Bemidji, MN μSA	Alexandria, MN μSA	City of Moorhead, MN	Northwest Minnesota	Minnesota	USA	Northwest Minnesota	Minnesota	USA
Labor Force Participation Rate and Size (civilian population 16 years and over)	63.1%	64.8%	70.7%	64.1%	69.1%	63.4%	209,446	3,105,784	166,672,597
Prime-Age Labor Force Participation Rate and Size (civilian population 25-54)	83.2%	91.0%	87.3%	86.8%	88.4%	82.5%	120,937	1,926,180	106,173,534
Armed Forces Labor Force	0.0%	0.1%	0.2%	0.1%	0.1%	0.5%	367	4,029	1,196,529
Veterans, Age 18-64	5.1%	4.5%	3.0%	4.1%	3.6%	4.4%	9,622	122,885	8,848,937
Veterans Labor Force Participation Rate and Size, Age 18-64	75.6%	80.9%	79.5%	77.6%	80.6%	77.0%	7,462	99,030	6,809,906
Median Household Income	—	—	—	—	—	—	\$62,663	\$77,706	\$69,021
Per Capita Income	—	—	—	—	—	—	\$32,503	\$41,204	\$37,638
Poverty Level (of all people)	16.8%	8.1%	17.9%	11.8%	9.2%	12.6%	47,603	512,312	40,661,636
Households Receiving Food Stamps/SNAP	13.0%	4.5%	8.7%	8.5%	7.5%	11.4%	14,180	167,348	14,105,231



Enrolled in Grade 12 (% of total population)	1.3%	0.9%	1.0%	1.3%	1.4%	1.3%	5,262	78,960	4,425,322
Disconnected Youth ³	4.7%	1.9%	0.6%	3.0%	1.8%	2.5%	645	5,245	432,389
Children in Single Parent Families (% of all children)	45.1%	23.1%	26.7%	29.6%	28.4%	34.0%	27,863	361,209	23,909,672
Uninsured	8.7%	3.2%	4.6%	5.8%	4.6%	8.8%	23,969	258,292	28,489,142
With a Disability, Age 18-64	12.2%	8.3%	10.7%	10.8%	9.0%	10.3%	25,384	306,405	20,537,729
With a Disability, Age 18-64, Labor Force Participation Rate and Size	42.7%	57.8%	62.6%	50.9%	53.5%	44.2%	12,930	164,030	9,068,973
Foreign Born	1.4%	1.3%	6.5%	2.5%	8.5%	13.6%	10,368	479,231	44,844,808

American Community Survey 2017-2021 unless noted otherwise.

*Median values for certain aggregate regions (such as MSAs) may be estimated as the weighted averages of the median values from the composing counties.

**Disconnected Youth are 16-19 year olds who are (1) not in school, (2) not high school graduates, and (3) either unemployed or not in the labor force.

Education

In Northwest Minnesota, 6.2% of adults between the ages of 25 and 64 do not have a high school diploma or equivalent, and about 26.9% have a high school diploma as their highest level of education (compared with 21.2% statewide). Nationwide, 10.3% of U.S. residents between the ages of 25 and 64 never completed high school or obtained an equivalent credential. The prime working age population of Bemidji has a larger share of residents with a high school diploma or less (6.8%), while Alexandria (previously Moorhead) has the smallest share of residents with lower educational attainment (3.9%).

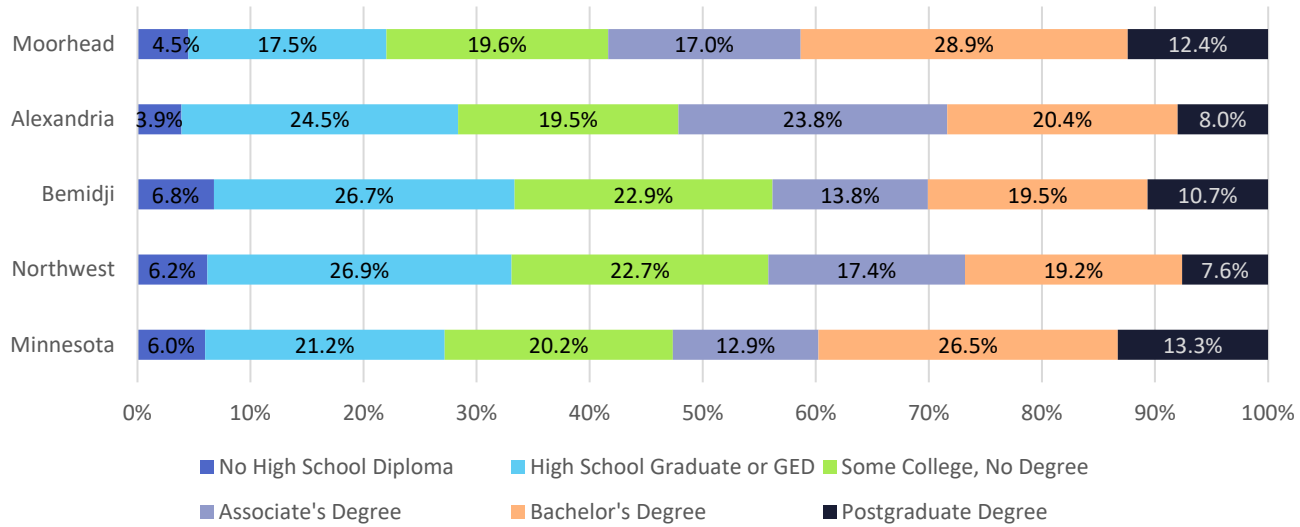
Educational Characteristics of Northwest Minnesota

Educational Characteristics	Percent				Percent		Values		
	Bemidji, MN μSA	Alexandria, MN μSA	City of Moorhead, MN	Northwest Minnesota	Minnesota	USA	Northwest Minnesota	Minnesota	USA
No High School Diploma	6.8%	3.9%	4.5%	6.2%	6.0%	10.3%	12,281	176,696	17,756,046
High School Graduate	26.7%	24.5%	17.5%	26.9%	21.2%	25.3%	53,565	623,436	43,535,564
Some College, No Degree	22.9%	19.5%	19.6%	22.7%	20.2%	20.1%	45,106	593,618	34,637,141
Associate Degree	13.8%	23.8%	17.0%	17.4%	12.9%	9.3%	34,528	379,909	15,944,395
Bachelor's Degree	19.1%	20.4%	28.9%	19.2%	26.5%	22.0%	38,182	780,055	37,890,674
Postgraduate Degree	10.7%	8.0%	12.4%	7.6%	13.3%	13.1%	15,173	392,270	22,499,876

American Community Survey 2017-2021 unless noted otherwise.



Educational Attainment, Age 25-64



American Community Survey 2017-2021.

Regional Colleges and Universities

Northwest Minnesota has eleven institutions of higher education that offer non-degree awards, two-year degrees, four-year degrees, and higher. The table below shows these postsecondary institutions sorted by total awards conferred during the 2021-22 school year. There were a total of 6,326 awards conferred in the region, a decrease from the 2020-21 school year award count of 6,613.

School	Certificate < 1 Yr	Certificate 1+ but < 2 Yr	Associate's	Certificate 2+ but < 4 Yr	Bachelor's	Post-Bacc	Master's	Post-Master's/Doctorate	Total Awards	Total School Enrollment	Avg Net Price*
Minnesota State University Moorhead	102	0	5	0	1,039	15	277	49	1,487	5,088	\$17,254
Bemidji State University	18	10	57	0	972	2	88	0	1,147	4,279	\$15,594
Minnesota State Community and Technical College	43	230	727	52	0	0	0	0	1,052	5,360	\$10,119
Northland Community and Technical College	167	230	385	28	0	0	0	0	810	2,716	\$11,952
Alexandria Technical & Community College	161	114	337	50	0	0	0	0	662	2,586	\$13,189
Concordia College at Moorhead	0	0	0	0	453	0	16	0	469	1,919	\$23,890
University of Minnesota-Crookston	11	0	0	0	435	0	0	0	446	2,304	\$11,925
Northwest Technical College	37	22	115	29	0	0	0	0	203	794	\$12,540
Oak Hills Christian College	0	4	6	0	10	0	0	0	20	94	\$20,855
White Earth Tribal and Community College	0	0	16	0	0	0	0	0	16	123	\$8,562
Red Lake Nation College	0	0	14	0	0	0	0	0	14	152	\$6,956
Total	539	610	1,662	159	2,909	17	381	49	6,326		

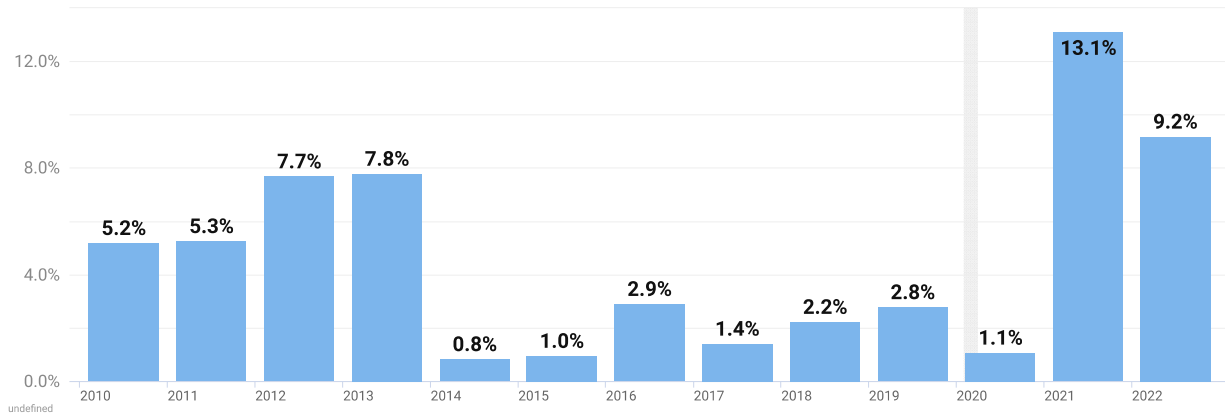
* Average net price represents full-time beginning undergraduate students who paid the in-state or in-district tuition rate and were awarded grant or scholarship aid from federal, state or local governments, or the institution. Data as of the 2020-2021 academic year.



Economic Indicators

Gross Domestic Product (GDP) is the total value of goods and services produced by a region. In 2022, nominal GDP in the Northwest region expanded by 9.2%. This follows a growth of 13.1% in 2021. As of 2022, total GDP in the region was \$19,919,984,000.

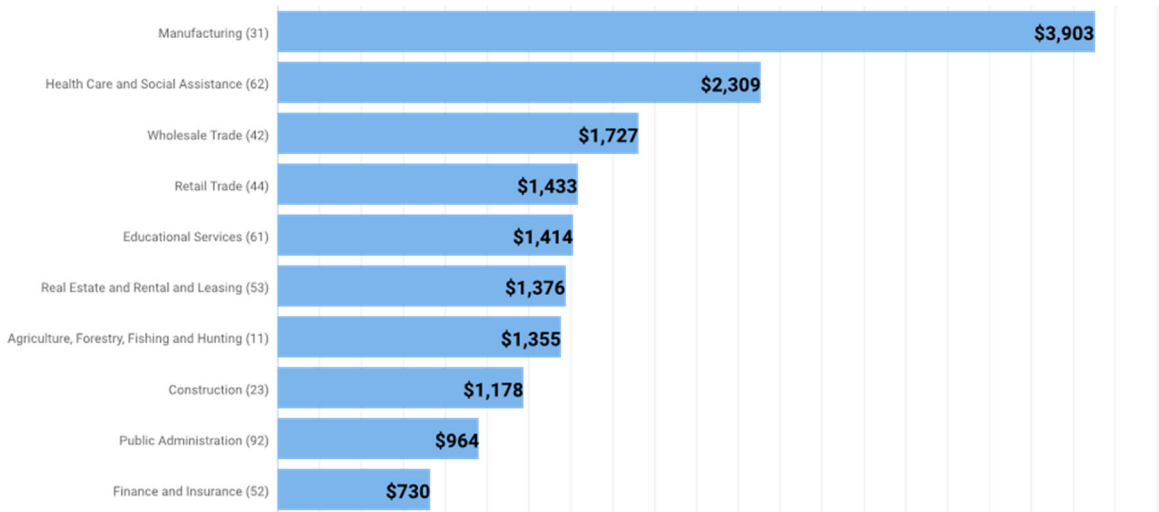
One-Year % Change in GDP, Northwest Minnesota



Gross Domestic Product data are provided by the Bureau of Economic Analysis, imputed by Chmura where necessary, updated through 2022.³

As was the case in years prior, Manufacturing contributed the largest portion of GDP in 2022 for Northwest Minnesota \$3,903,105,000. The next-largest contributions came from Health Care and Social Assistance (\$2,309,051,000); Wholesale Trade (\$1,726,872,000); and Retail Trade (\$1,432,794,000). Overall, the industry mix contributing to regional GDP has not changed dramatically over the past three years.

GDP (in \$ millions)
Northwest Minnesota, 2022



Gross Domestic Product data are provided by the Bureau of Economic Analysis, imputed by Chmura where necessary, updated through 2022.

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

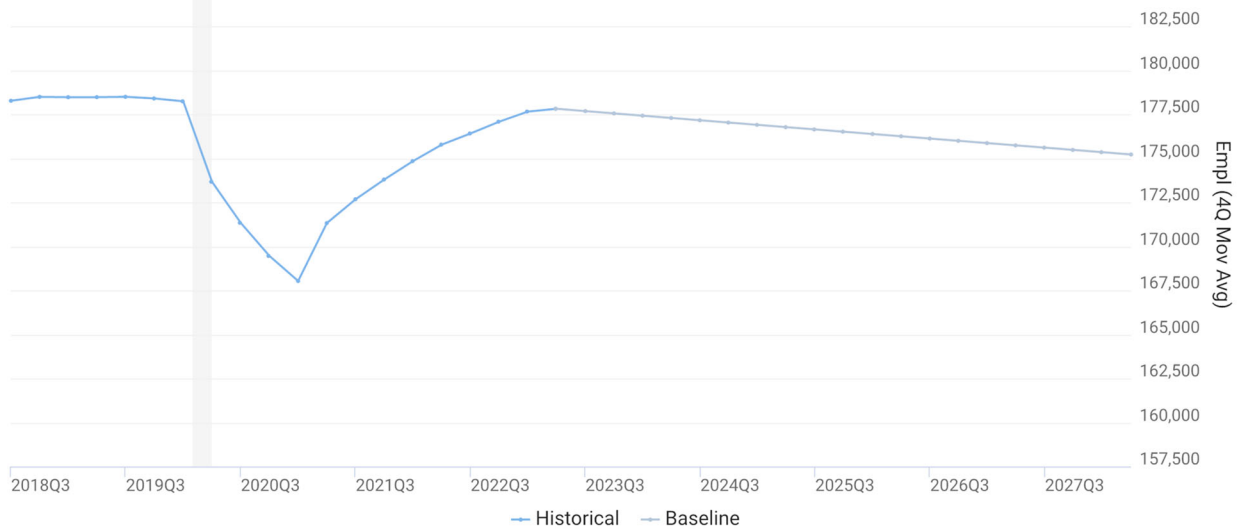


Labor Market

Workforce Forecast

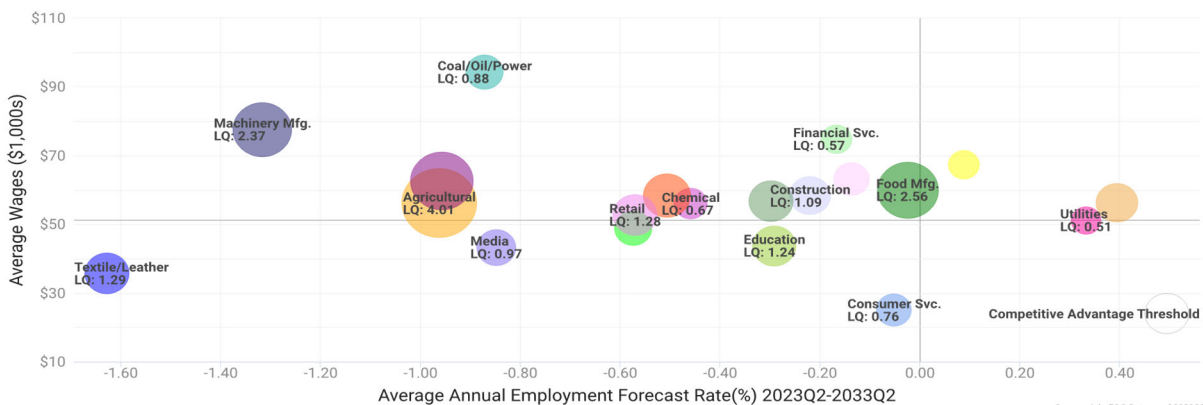
Employment rose by 0.4% in the region between 2022Q2 and 2023Q2, lower than the previous estimates. An estimated 3.2% of the Northwest Minnesota workforce is unemployed as of September 2023 (about 6,859 people). Employment in the region is forecast to decline by -0.3% on average annually through 2028 in a baseline scenario.

5-Year Forecast in Northwest Minnesota



Employment forecasts vary considerably by industry. An industry cluster is a geographic concentration of interrelated industries or occupations. The industry cluster in the Northwest region with the highest relative concentration is Agricultural with a location quotient (LQ) of 4.01 (a slight increase in LQ from last year). This cluster employs 9,564 workers in the region (a decrease of about 177 workers from 2022) with an average wage of \$56,159 – an increase of just over \$7,000 in average sector wages from 2022 estimates. Employment in the Agricultural cluster is projected to contract in the region by about -1.0% on average annually over the next ten years. Between 2022Q2 and 2023Q2 estimates, many industries saw decline in forecasted employment change – notably, there are now only four industries with a positive value of average employment growth forecasted (there were eight industries in 2022 estimates).

Industry Clusters for Northwest Minnesota as of 2023Q2



Source: JobsEQ® Data as of 2023Q2

Quantifying Talent Shortages

Occupation Gaps

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

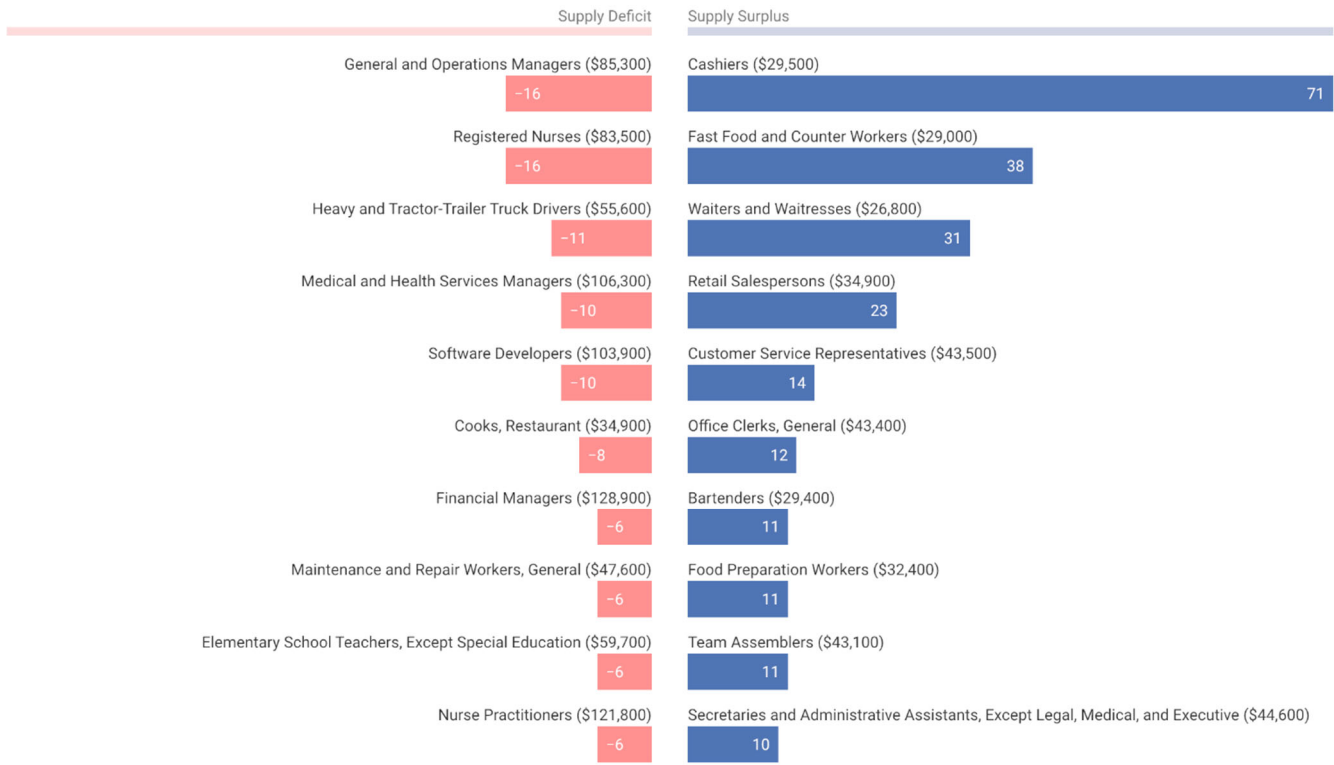
The chart below shows the potential average annual talent gaps over ten years. Many variables go into this analysis, but at its core it is based on a forecast comparing occupation demand growth to the local population growth and the projected educational attainment of those residents, then matched to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

General and Operations Managers jumped up from second place to the occupation of greatest shortage in the region, tied with Registered Nurses. Restaurant Cooks fell from the second highest occupation shortage down to fourth. Eight out of the ten occupations forecasting shortages are target or gateway occupations, meaning that they pay at or above the wage of \$55,600. School Teachers, Except Special and Career/Technical Education dropped out of the top ten forecasted occupation shortages, and Financial Managers is now in the top ten. The other occupations of highest forecasted shortage in the Northwest (and statewide) have remained relatively consistent since the last analysis in October 2022, still showing that there is a shortage of local Nurses and Maintenance Workers, among other critical healthcare, information technology, and management occupations. Among high contact-intensity roles in shortage, Registered Nurses and Nurse Practitioners still make the top ten list of occupations in highest shortage, while Hospitality and Tourism roles are largely forecast to have a surplus of talent except for Restaurant Cooks.

Several occupations that forecast high talent surpluses in 2022 have continued to grow in the estimated size of talent surplus in 2023 (shown in blue below), including Cashiers, Waiters and Waitresses, Fast Food and Counter Workers, Retail Workers, and Customer Service Representatives.



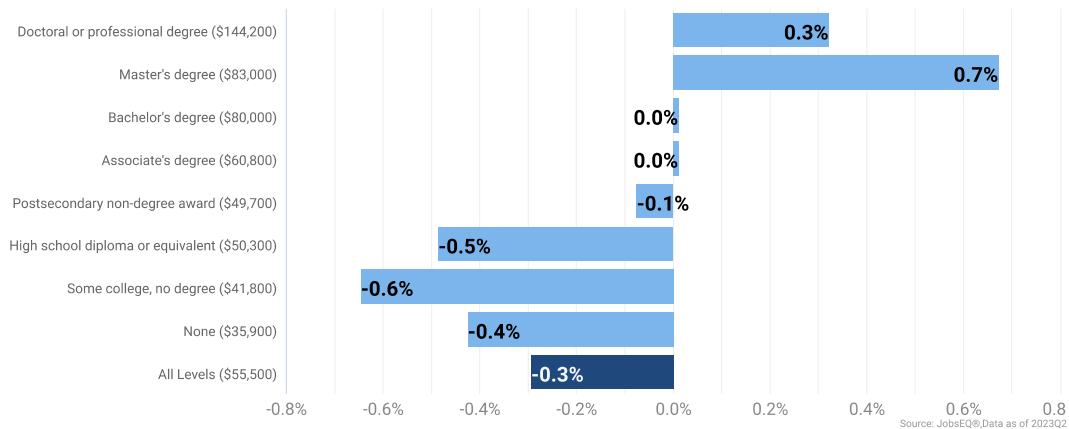
Average Annual Occupation Gaps (i.e. Talent Shortage), 2023Q2 through 2033Q2



Award Gaps

Expected growth rates for occupations vary by the education and training required. The employment outlook declined for the Northwest region from 2022 estimates, contracting -0.3% over the next ten years. Occupations typically requiring a doctoral degree are now expected to grow 0.3% per year, whereas those requiring a master’s degree are expected to grow by 0.7%. Those requiring either a bachelor’s degree or a 2-year degree or certificate are forecast to grow 0.0% per year. Estimated wages have increased across careers at each education level requirement.

Annual Average Projected Job Growth by Training Required for Northwest Minnesota, 2023Q2

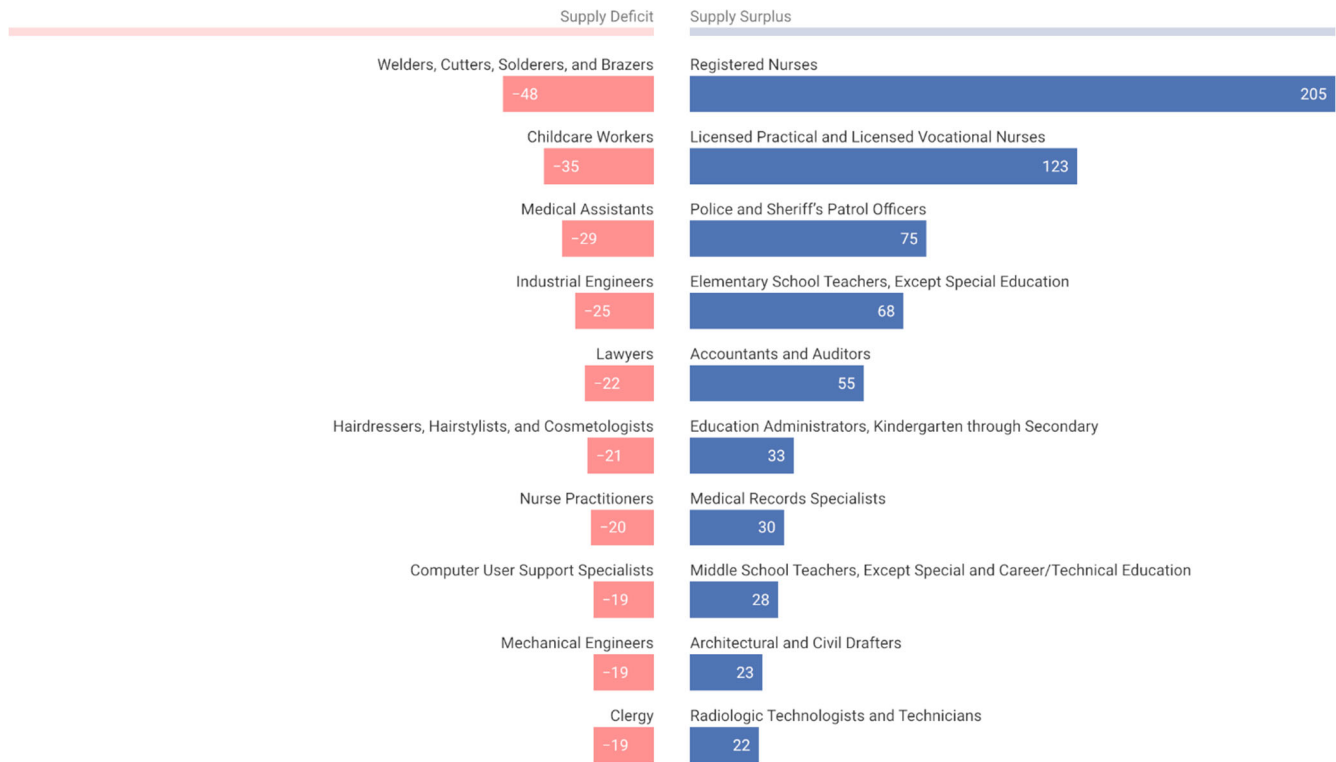


Employment by occupation data are estimates as of 2023Q2. Education levels of occupations are based on BLS assignments. Forecast employment growth uses national projections from the Bureau of Labor Statistics adapted for regional growth patterns.



Award gaps 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 likely underproducing Welders, Childcare Workers, and Medical Assistants. There is an oversupply of Registered Nurses and Licensed Practical and Licensed Vocational Nurses completing local postsecondary programs compared to national volumes.

Award Gaps, All Occupations, Northwest Minnesota, 2023Q2



Several occupations have zero unemployed talent in the Northwest as of 2023Q2 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 but one of these roles pay well over the regional average of \$55,600 annually.

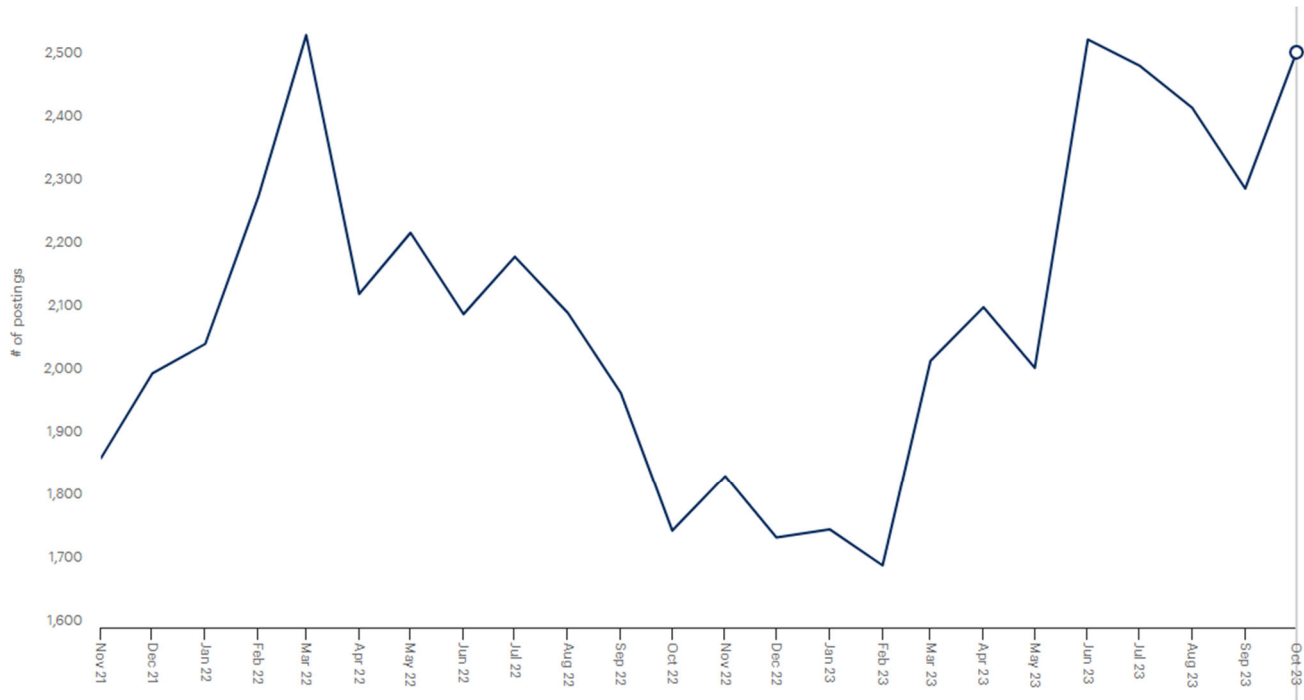
Occupations with No Unemployed Workforce and Employing over 75 Workers, Northwest Minnesota 2023Q2

SOC	Occupation	Current						5-Year History		5-Year Forecast				
		Empl	Mean Ann Wages ²	LQ	Unempl	Unempl Rate	30-Day Online Job Ads ³	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Change	Ann % Change
21-2021	Directors, Religious Activities and Education	302	\$58,900	1.68	0	n/a	2	-15	-1.0%	153	63	94	-4	-0.2%
11-3012	Administrative Services Managers	248	\$104,900	0.94	0	n/a	n/a	47	4.3%	102	41	62	-1	-0.1%
19-1042	Medical Scientists, Except Epidemiologists	155	\$74,300	1.23	0	n/a	0	-9	-1.1%	52	12	37	4	0.5%
49-9043	Maintenance Workers, Machinery	103	\$59,000	1.47	0	n/a	n/a	-4	-0.8%	53	25	29	-1	-0.2%
29-1215	Family Medicine Physicians	94	\$290,300	0.78	0	n/a	17	-15	-3.0%	14	9	4	0	0.1%
19-3034	School Psychologists	93	\$81,800	1.40	0	n/a	13	-6	-1.3%	34	10	25	0	-0.1%
53-4011	Locomotive Engineers	85	\$75,100	2.24	0	n/a	1	-19	-3.9%	36	12	26	-2	-0.4%
29-1216	General Internal Medicine Physicians	83	\$276,700	1.01	0	n/a	7	-2	-0.4%	11	8	4	0	-0.1%
29-1131	Veterinarians	82	\$102,800	0.83	0	n/a	2	8	2.2%	20	9	6	6	1.5%
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	82	\$42,900	1.28	0	n/a	n/a	-15	-3.3%	39	14	27	-2	-0.5%
29-1031	Dietitians and Nutritionists	77	\$68,400	0.90	0	n/a	11	3	0.7%	26	13	12	0	0.0%
00-0000	Total - All Occupations	177,841	\$55,600	1.00	6,859	3.2%	9,584	691	0.1%	99,150	43,123	58,679	-2,651	-0.3%

Job Posting Trends in Northwest Minnesota

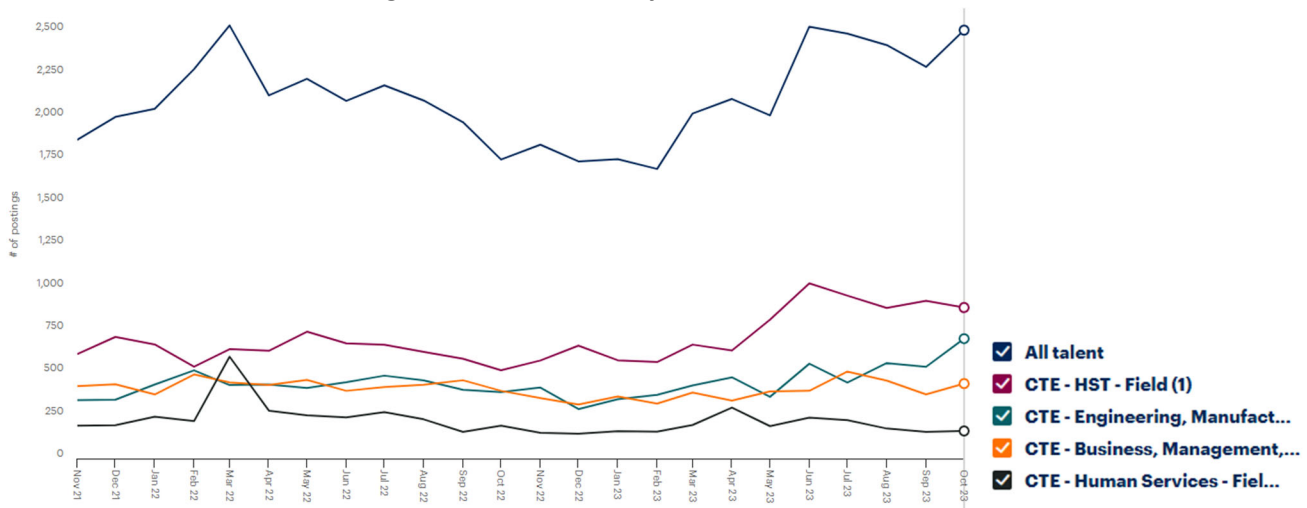
Online job posting data reveals a lot about employer demand for certain skills, certifications, qualifications, and occupational competencies. From November 1, 2022, through October 31, 2023, there were 19,420 unique job postings advertised online in Northwest Minnesota on job boards, according to analysis using Gartner TalentNeuron Plan (compared to 512,054 postings statewide). This was 6% lower than the 12 months prior. About 6% of all positions advertised were explicitly listed as remote or telecommute roles—either permanently or temporarily—an increase of six percentage points from the prior year. Remote positions doubled for all talent from the 12 months prior. The share of remote work opportunities has decreased among all career fields except for Engineering, Manufacturing, and Technology.

Total Jobs Advertised Monthly in Northwest Minnesota, October 2022-2023



SOURCE: Gartner TalentNeuron Plan accessed 11/6/2023

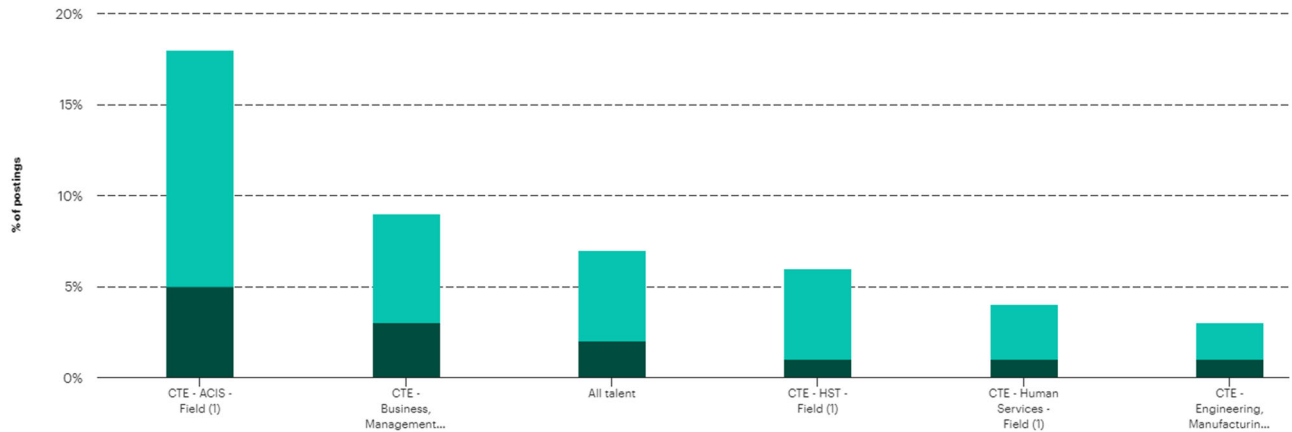
Total Remote Job Postings Advertised Monthly in Northwest Minnesota, October 2022-2023



SOURCE: Gartner TalentNeuron Plan accessed 11/6/2023

Remote Job Postings by Career Field Advertised in Northwest Minnesota, October 2022-2023

■ Fully remote ■ Temporary remote ■ Hybrid remote



Talent Profile	Unspecified /Onsite	Total remote	Fully remote	Temporary remote	Hybrid remote
CTE - ACIS - Field (1)	82% ▼ -5 pp	18% ▲ 5 pp	5% ▼ -2 pp	0% ▲ 0 pp	13% ▲ 7 pp
CTE - Business, Management, and Administration - Field	91% ▼ -2 pp	9% ▲ 2 pp	3% ▲ 0 pp	0% ▲ 0 pp	6% ▲ 2 pp
All talent	93% ▼ -3 pp	7% ▲ 3 pp	2% ▲ 0 pp	0% ▲ 0 pp	5% ▲ 3 pp
CTE - HST - Field (1)	94% ▼ -4 pp	6% ▲ 4 pp	1% ▲ 0 pp	0% ▲ 0 pp	5% ▲ 4 pp
CTE - Human Services - Field (1)	96% ▲ 5 pp	4% ▼ -5 pp	1% ▼ -6 pp	0% ▲ 0 pp	3% ▲ 1 pp
CTE - Engineering, Manufacturing, and Technology - Low Education	97% ▼ -3 pp	3% ▲ 3 pp	1% ▲ 1 pp	0% ▲ 0 pp	2% ▲ 2 pp

SOURCE: Gartner TalentNeuron Plan accessed 11/6/2023

Talent accumulates valuable skills in many ways beyond just work and education, from self-study to apprenticeships and internships, workforce training programs, as well as general life experiences, which all develop relevant skills. Assessing experience in terms of skills unearths a person’s qualifications and more clearly identifies training needs. It also helps people recognize the abilities and knowledge they may not know they have. This kind of gap analysis is possible at the occupation level and supports postsecondary planning, workforce development, and employer talent strategy. Most of the newest skills on the rise in regional job postings include specialized technical skills. Core skills have remained mostly consistent with human skills such as communication and relationship management ranking in high importance.

Top Evolving Skills in Northwest Minnesota, October 2022-2023

New

1. Parsing
2. Fiduciary services
3. Lesson Planning

New skills whose future is uncertain.

Emerging

1. Forgiving

Relatively new skills that are becoming more prevalent.

Growing

There are no Growing skills in the market

Fast-growing skills that are becoming core skills.

Core

1. Monitoring
2. Operations
3. Nursing

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

Declining

1. Computer usage (basic)
2. English Language

Skills that used to be essential but are becoming obsolete.

Career Fields

The Business, Management, and Administration field accounts for the largest share of employment by career field in the Northwest region yet are no more concentrated locally than found nationally on average. Agriculture, Food, and Natural Resources careers are more concentrated in the Northwest region than what is typically observed nationwide (LQ of 1.69), playing a more prominent role in the local workforce dynamics than for many other regions. Arts, Communications, and Information Systems careers are smallest in local employment volume, but offer the highest average entry-level wages. Health Science Technology careers offer the highest average annual wages across all experience levels.

Unemployment is high in Business, Management, and Administration careers and Engineering, Manufacturing, and Technology careers overall as of 2023Q2, at 3.6% and 3.7% respectively. This is largely due to high unemployment in the Hospitality and Tourism cluster as well as the Architecture and Construction career cluster. The Northwest region can expect moderate talent shortages in Health Science Technology and Agriculture, Food, and Natural Resources.

CTE Field Employment and Wages in Northwest Minnesota, 2023Q2¹

CTE Field (occupation overlap exists, will not sum)	Current 2023Q2 Estimates							5-Year History	
	2023Q2 Empl	2023 Avg Entry-Level Wages	2023 Avg Ann Wages	LQ	Unempl	Unempl Rate	Online Job Ads 10/10/2023- 11/10/2023 ³	Empl Change	Ann % Change
Health Science Technology	16,821	\$36,800	\$77,200	1.04	398	2.0%	2,135	-431	-0.5%
Human Services	29,641	\$39,900	\$53,900	1.07	824	2.5%	1,893	311	0.2%
Arts, Communications, and Information Systems	4,823	\$48,200	\$72,100	0.59	135	2.4%	215	-10	0.0%
Business, Management, and Administration	69,895	\$33,900	\$51,300	0.89	3,059	3.6%	3,351	123	0.0%
Engineering, Manufacturing, and Technology	47,770	\$40,000	\$53,400	1.10	2,205	3.7%	1,839	1,328	0.6%
Agriculture, Food, and Natural Resources*	15,679	\$37,300	\$53,900	1.69	502	2.9%	347	-73	-0.1%
Total - All Occupations	177,841	\$30,800	\$55,600	1.00	6,859	3.2%	9,584	691	0.1%

Data as of 2023Q2 unless noted otherwise

Note: Figures may not sum due to rounding. 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 within the last thirty days 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, 2028Q2

CTE Field (occupation overlap exists, will not sum)	Current	5-Year Growth 2028Q2				
	2023Q2 Empl	Total Demand	Exits	Transfers	Empl Change	Ann % Change
Health Science Technology	16,821	7,572	3,375	3,934	263	0.3%
Human Services	29,641	15,743	7,177	8,344	222	0.1%
Arts, Communications, and Information Systems	4,823	2,064	762	1,333	-32	-0.1%
Business, Management, and Administration	69,895	44,042	19,677	26,241	-1,876	-0.5%
Engineering, Manufacturing, and Technology	47,770	24,764	9,612	16,069	-917	-0.4%
Agriculture, Food, and Natural Resources*	15,679	8,834	3,963	5,310	-439	-0.6%
Total - All Occupations	177,841	99,150	43,123	58,679	-2,651	-0.3%

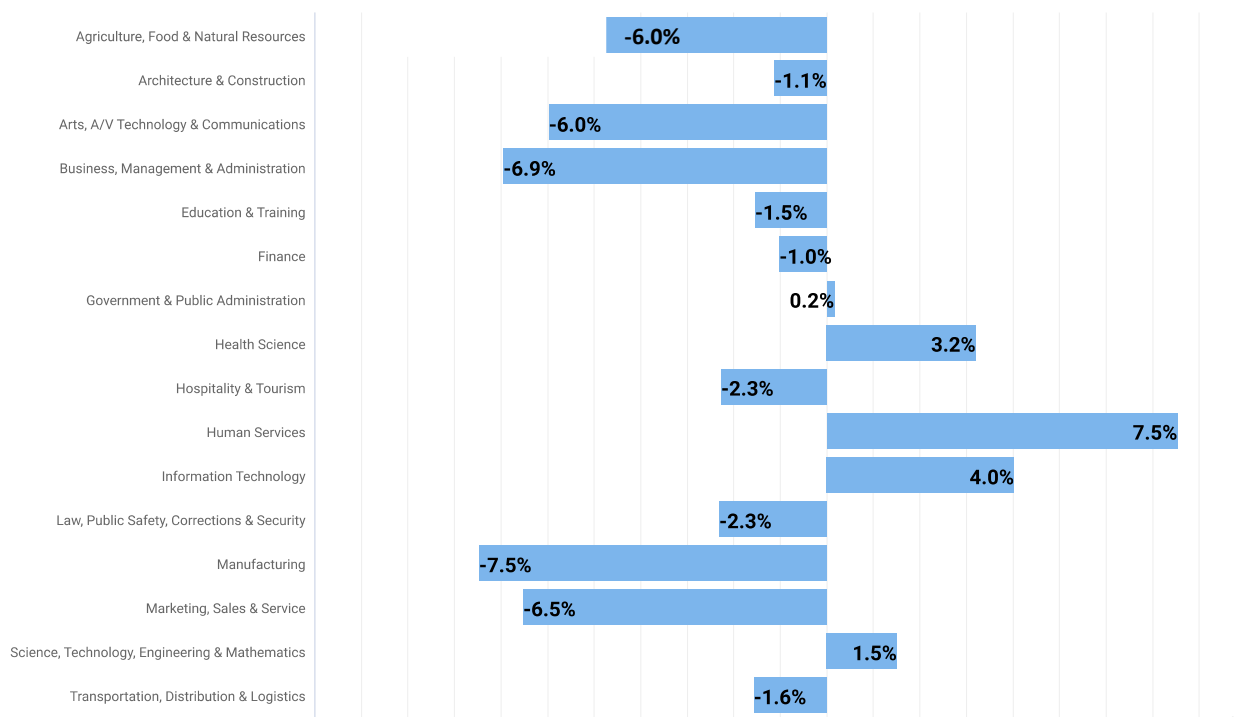
*Supply gaps in parentheses indicate the number of trained workers we expect to fall short of the baseline talent needed to see the employment growth officially forecasted by the Bureau of Labor Statistics (BLS) and MN DEED. Represents skill mismatch in the region. Positive number indicates likely unemployment due to talent surplus. ** This focused, or narrow definition of Agriculture, Food, and Natural Resources (AFNR) aligns with classic definitions of the sector by MN DEED and BLS Agriculture, Fishing, and Forestry specific roles. The sector analysis found further in this report highlights a broader, more inclusive definition of AFNR, which is reflected in the sub-industry definition of AFNR included here.



Career Cluster Detail

Of the sixteen career clusters used by Career and Technical Education (CTE), eleven are forecast to decline in overall employment over the next ten years as of 2023Q2 estimates (last year's estimates showed eleven facing forecasted growth). The five clusters forecasting growth are Human Services (7.5%), Information Technology (4.0%), Health Science (3.2%), Science Technology, Engineering, and Mathematics (1.5%), and Government and Public Relations (0.2%). All clusters saw noticeable declines in forecast employment outlook. Ten of the sixteen career clusters have average wages above the average occupation wage in the region (\$56,500 in 2023—an increase of \$6,000 from 2022).⁴

Baseline 10-Year Forecasts by Career Cluster, Northwest Minnesota, 2023Q2



Cluster forecasts estimated using Chmura, JobsEQ, based on 2023Q2 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, Human Services, Information Technology, and Health Science are expected to have the highest annual job demand by volume of opportunities—due to retirements and job changes.

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

⁴ Clusters paying an average salary higher than the regional average occupation wage include Science, Technology, Engineering, and Mathematics, Information Technology, Finance, Health Science, Government and Public Administration, Law, Public Safety, Corrections, and Security, Business, Management, and Administration, and Architecture and Construction.



Employment, Wages, and Forecast by Career Cluster, 2023Q2

Career Cluster	Employment	Avg Ann Wages	Job Ads	Baseline 10-Year Forecasted Empl Change	Ann Empl Change	Ann Total Demand
Science, Technology, Engineering & Mathematics	1,953	\$90,500	176	1.5%	2	134
Information Technology	2,412	\$85,100	140	4.0%	9	182
Finance	4,217	\$78,600	236	-1.0%	-5	358
Health Science	16,821	\$77,200	2,106	3.2%	52	1,509
Government & Public Administration	1,557	\$62,300	55	0.2%	0	154
Business, Management & Administration	27,379	\$62,200	1,133	-6.9%	-199	2,826
Law, Public Safety, Corrections & Security	4,224	\$62,100	182	-2.3%	-10	386
Arts, A/V Technology & Communications	2,411	\$59,100	63	-6.0%	-15	233
Architecture & Construction	13,407	\$58,800	324	-1.1%	-16	1,311
Education & Training	13,227	\$56,900	510	-1.5%	-22	1,175
Agriculture, Food & Natural Resources*	15,679	\$53,900	340	-5.0%	-83	1,770
Manufacturing	18,707	\$49,000	704	-7.5%	-149	1,876
Transportation, Distribution & Logistics	13,703	\$48,700	606	-1.6%	-23	1,649
Marketing, Sales & Service	18,155	\$48,500	918	-6.5%	-123	2,254
Human Services	10,633	\$45,800	1,147	7.5%	76	1,426
Hospitality & Tourism	20,144	\$33,300	1,103	-2.3%	-48	3,421
Total - All Occupations	177,841	\$55,600	9,515	-3.0%	-542	19,888

*Cluster forecasts estimated using Chmura, JobsEQ, based on 2023Q2 employment data. All clusters are distinct occupations except for Agriculture, Food, and Natural Resources, which overlaps with other clusters. (+) indicates an improved forecast from 2022Q2 estimates.



Priorities by Career Field

Health Science Technology

Critical Issues:

- Continued shortage of nurses (projected annual talent shortage of at least 16 Registered Nurses in most favorable scenario)
- Award gaps in critical nursing roles (shortage of at least 29 graduates to fill Medical Assistants and 20 graduates to fill Nurse Practitioners roles)
- Unique high local concentration
- Forecasted growth of 0.3% in the next five years in a pessimistic scenario (the field with the greatest growth forecasted)

Human Services

Critical Issues:

- High share of workforce over-credentialed for the roles they currently hold
- Critical occupations of shortage such as Secondary School Teachers and Mental Health Counselors
- Graduates needed to fill Childcare Worker roles are the second highest forecasted award gap (shortage of at least 35 graduates to fill this role)

Arts, Communications, and Information Technology

Critical Issues:

- Occupations in this field offer the highest average entry-level wages
- Continued shortage of software developers expected (at least ten) – employment growth continues to outpace demand
- An award gap of at least 19 graduates needed to fill Computer User Support Specialist roles
- Hybrid remote roles increased by seven percentage points from prior year estimates

Business, Management, and Administration

Critical Issues:

- Largest share of employment by career field
- High unemployment (3.6%)
- Nine out of the ten top occupations by employment volume have forecasted declines over the next ten years
- Moderate growth and retirement rates are outpacing demand – particular shortage in management roles

Engineering, Manufacturing, and Technology

Critical Issues:

- Engineering award gaps are in the top ten for the region overall – projected shortage of at least 25 graduates to fill Industrial Engineer and 19 graduates to fill Mechanical Engineer roles
- High unemployment (3.7%)
- Exacerbation of talent shortage due to upcoming retirements with 48.8% of workers in this field 45 years or older

Agriculture, Food, and Natural Resources

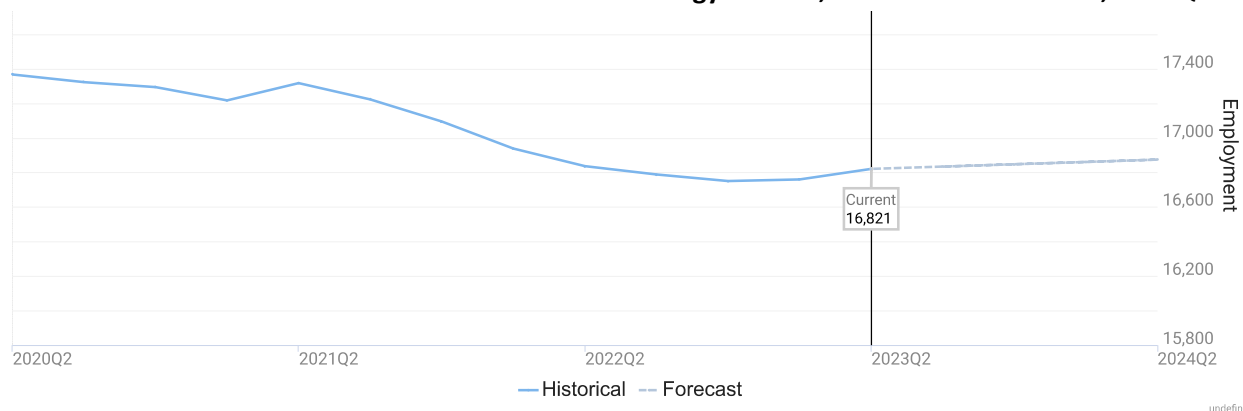
Critical Issues:

- Zero trained Veterinarians in the region are unemployed
- Most industries in this field only touch less than 1% of total talent skilled in this field, suggesting that education and training programs will need to build broad strategies that cross each sector
- In a pessimistic scenario, this is the career field with the greatest decline forecasted in the next five years (-0.6%)

Health Science Technology

Over the next three years, Health Science Technology employment is forecast to increase by 0.3% on average annually, a slight drop from last year's projected 0.7% growth.

Baseline 3-Year Forecast for Health Science Technology Careers, Northwest Minnesota, 2023Q2



Top Ten Health Science Technology Occupations by Employment Volume in Northwest Minnesota, 2023Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Change
Registered Nurses	3,958	\$83,500	1.14	-102	224	0.0%
Nursing Assistants	2,350	\$38,200	1.58	-238	339	-0.3%
Licensed Practical and Licensed Vocational Nurses	1,121	\$52,500	1.57	-141	87	-0.3%
Home Health Aides	973	\$33,300	0.91	-283	127	1.4%
Medical Secretaries and Administrative Assistants	671	\$43,600	0.88	13	79	0.2%
Medical and Health Services Managers	543	\$106,300	0.98	14	56	2.0%
Pharmacy Technicians	516	\$42,900	1.05	41	47	0.1%
Medical Assistants	485	\$43,500	0.57	9	74	0.9%
Pharmacists	399	\$135,500	1.10	18	15	-0.1%
Dental Assistants	379	\$54,600	0.93	39	56	0.4%
Remaining Component Occupations	5,428	\$107,100	0.92	86	405	0.5%
Health Science (CTE Field)	16,821	\$77,200	1.04	-547	1,509	0.3%

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

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

Most individuals in Northwest Minnesota that are working in Health Science Technology roles are employed by General Medical and Surgical Hospitals (37.5%, an increase of 2.4 percentage points from last year) or Nursing Care Facilities (Skilled Nursing Facilities) 18.5%.

Health Science Technology Field Employment by Industry, Northwest Minnesota, 2023Q2

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	37.5%	6,303	4,616	93	4,709
Nursing Care Facilities (Skilled Nursing Facilities)	18.5%	3,105	3,336	-183	3,153
Offices of Physicians	8.3%	1,402	1,084	92	1,177



Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Offices of Dentists	5.2%	873	862	33	895
Individual and Family Services	3.5%	593	690	155	845
Offices of Other Health Practitioners	3.5%	588	470	68	538
Health and Personal Care Retailers	3.0%	513	389	-12	377
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	2.6%	429	518	49	567
Home Health Care Services	2.4%	406	399	66	465
Outpatient Care Centers	2.4%	397	336	89	426
Elementary and Secondary Schools	1.8%	306	218	-2	216
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	1.8%	298	301	7	309
Other Professional, Scientific, and Technical Services	1.6%	272	292	48	340
Executive, Legislative, and Other General Government Support	1.0%	175	146	2	148
Colleges, Universities, and Professional Schools	1.0%	162	116	10	126
Other Ambulatory Health Care Services	0.7%	124	123	22	145
Psychiatric and Substance Abuse Hospitals	0.6%	107	94	-3	91
Warehouse Clubs, Supercenters, and Other General Merchandise Retailers	0.6%	106	81	-5	77
All Others	3.9%	661	547	9	557

Career Field Demographics

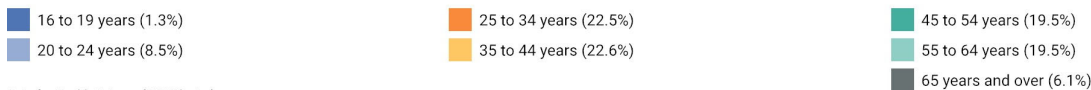
The Health Science Technology field is predominantly female (81.6%) and white (90.4%), but racial diversity grew by another percentage point from the prior years' estimates. The age distribution of talent in Health Science Technology is relatively even from age 25 through 64, but with the largest proportion of talent between the ages of 35 and 44 years (22.6% of talent). The share of talent 65 or older increased by 0.2 percentage points from the prior years' estimates.

Age

Northwest Minnesota



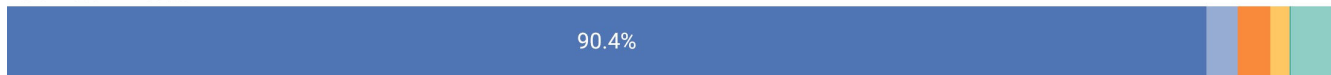
Minnesota



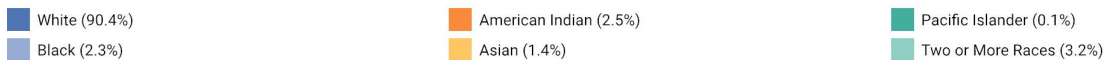
Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2023Q2.

Race

Northwest Minnesota



Minnesota

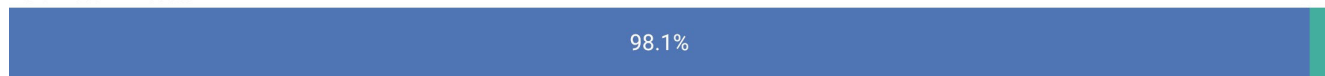


Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2023Q2.

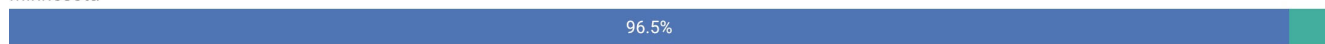


Ethnicity

Northwest Minnesota



Minnesota



■ Non-Hispanic/Latino (98.1%)

■ Hispanic or Latino (of any race) (1.9%)

Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2023Q2.

Gender

Northwest Minnesota



Minnesota



■ Male (18.4%)

■ Female (81.6%)

Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2023Q2.

Educational Attainment and Requirements

The stacked bar charts here illustrate the estimated mix of educational attainment of the workers in this career field in aggregate, followed by the typical education and training requirements in the field. Generally, the Northwest Minnesota Health Science Technology workforce has a close match to the education and training required for existing roles. For example, 16.3% of Health Science Technology positions require no educational award (down 0.1 percentage points from the prior years' estimates), and about 14.3% of the workforce holds only a high school diploma or less. About 30.8% of the Health Science Technology workforce hold a two-year degree and 14.6% completed some college (such as a certificate), or 45.4% in all, compared to about 37.1% of local jobs in Health Science Technology that typically require a certificate two-year degree.

Educational Attainment

Northwest Minnesota



Minnesota



■ < High School (1.6%)

■ Some College (14.6%)

■ Four-Year (24.2%)

■ High School (12.7%)

■ Two-Year (30.8%)

■ Master's (7.3%)

■ PhD (8.8%)

Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2023Q2.

Education and Training Requirements

Northwest Minnesota



Minnesota



■ Short-term OJT, no exp, no award (8.1%)

■ Long-term training, no exp, no award (0.6%)

■ 2-year degree or certificate (37.1%)

■ Moderate-term OJT, no exp, no award (7.6%)

■ Previous work experience, no award (0.0%)

■ Bachelor's degree (29.7%)

■ Postgraduate degree (16.9%)

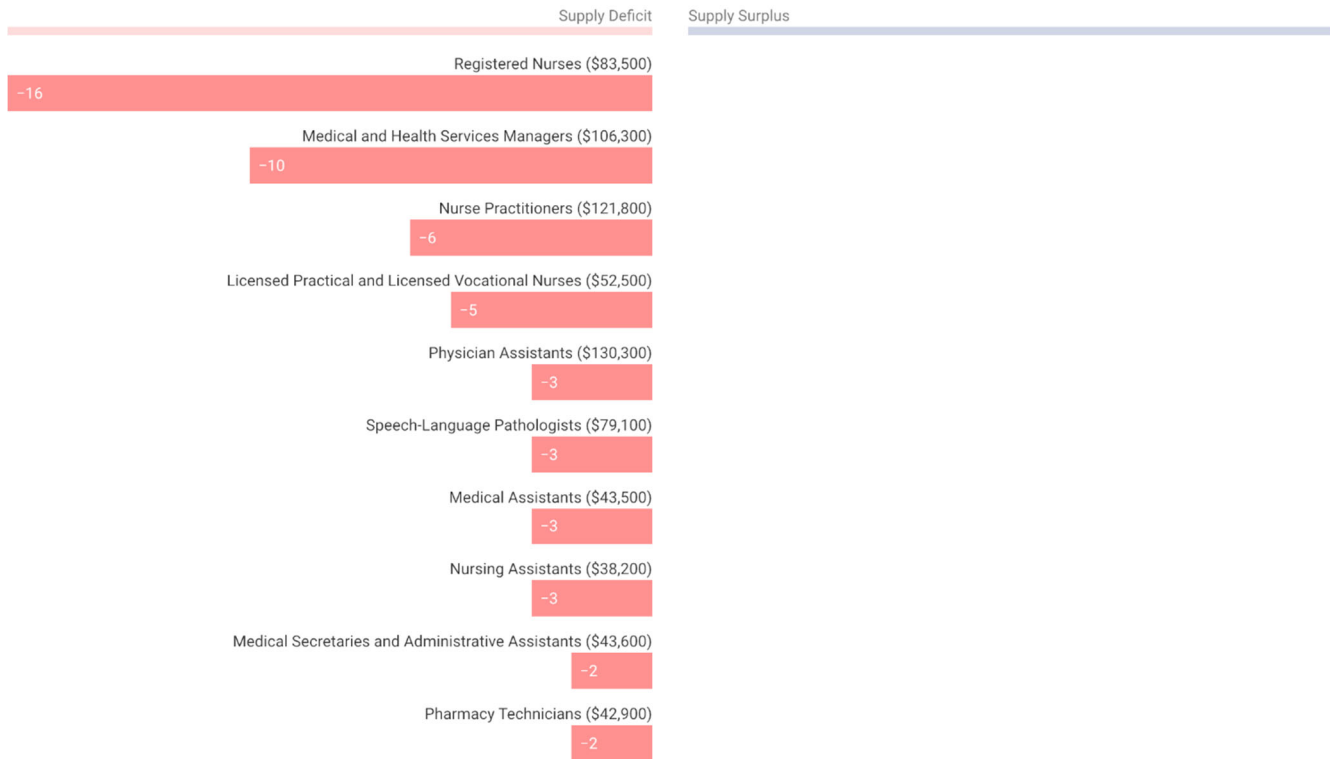
Data for Health Science (CTE Cluster)
Source: JobsEQ®. Data as of 2023Q2.



Occupation Gaps

In Health Science Technology, Registered Nurses and Medical and Health Service Managers are the two occupations with the greatest annual shortages in the Northwest. Other occupations of high shortage have mostly remained consistent with prior estimates, with the exception of Physical Therapists, Respiratory Therapists, and Dental Hygienists no longer being in the top ten occupations of shortage.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Health Science Technology, Northwest Minnesota, 2023Q2

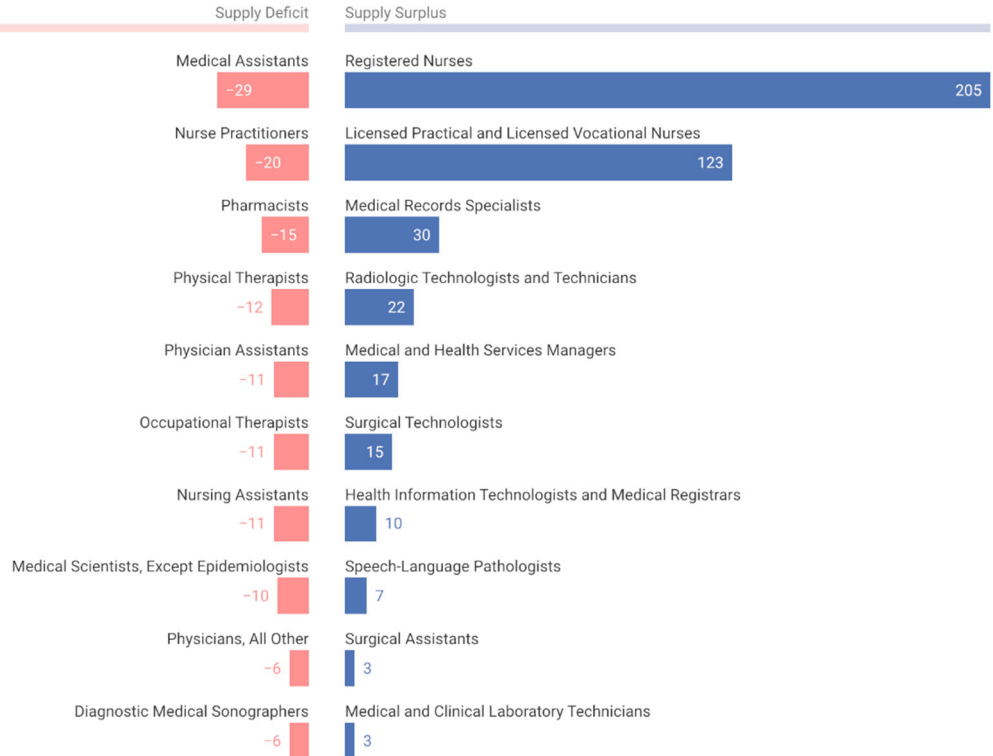


Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate a few moderate shortages and some general misalignments. The Northwest has several Health Science Technology award gaps, meaning that the region is underproducing local talent in relation to employer demand. Northwest colleges and universities are underproducing about 29 Medical Assistant, and 20 Nurse Practitioner graduates annually that are needed to fill positions open with employers in the region. Occupations that show higher awards given than what is currently needed in the local talent market are examples of programs that serve other parts of the state where talent demand is high but relevant programs may not exist, such as Registered Nurses and Licensed Practical and Licensed Vocational Nurses. The oversupply of graduates in the Northwest is likely helping to meet award gaps found in the 7-county MSP Metro and elsewhere.



Award Gaps in Health Science Technology, Northwest Minnesota, 2023Q2



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, taking into account automation, remote work, and the changing work environment.



Origin-to-Gateway-to-Target Occupations for Health Science Technology, Northwest Minnesota, 2023Q2

Target Occupations (all HW, HD, HS)

Registered Nurses (OG)
 Medical & Health Services Managers (OG)
 Pharmacists (OG, AG)
 Dental Hygienists (OG)
 Physical Therapists (OG, AG)

Gateway Occupations

Licensed Practical Nurses (HS, OG)
 Dental Assistants (HS, HD, OG)
 Medical Records Specialists (HS, HD, OG)
 Ophthalmic Medical Technicians (HS, HD, OG)
 Therapists, All Other (HS, HD, AG)

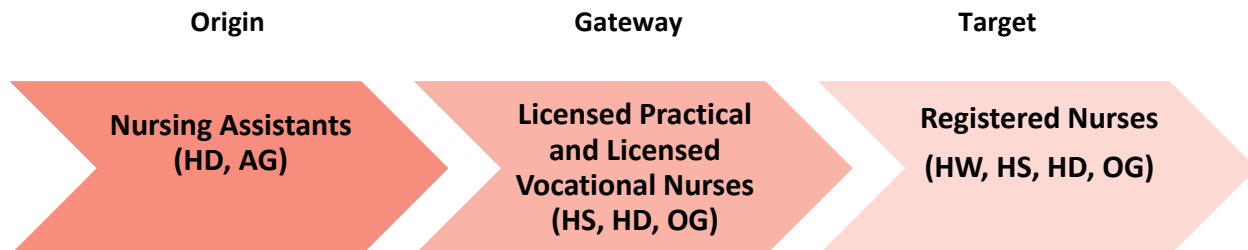
Origin Occupations

Nursing Assistants (HS, OG, AG)
 Home Health Aides (HD)
 Medical Secretaries & Administrative Assistants (HD, OG)
 Pharmacy Technicians (OG, AG)
 Medical Assistants (HS, HD, OG, AG)

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

Featured Pathway

A promising Health Science Technology pathway in the Northwest region is the pathway to become a Registered Nurse. The Target occupation of Registered Nurse is 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 Nurses are also locally concentrated in the Northwest region (LQ 1.57) and are also experiencing an occupation gap and are in high demand. The Origin occupation of Nursing Assistant (also highly locally concentrated LQ 1.58) 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.

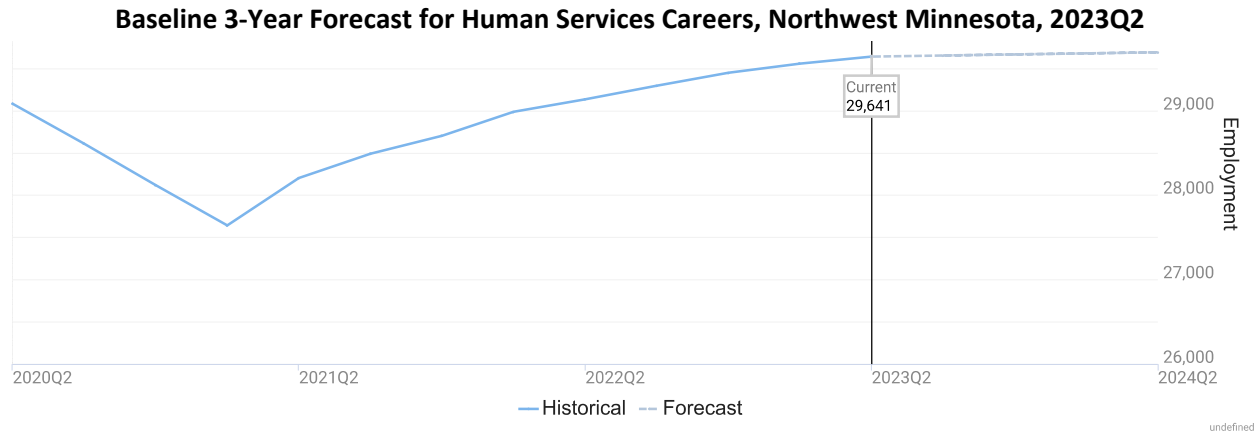


OGT Wages and Experience Level Requirements, Health Science Technology, Health Science Technology, 2023Q2

SOC	Occupation	Empl Count	Mean	Entry Level	Experienced	10%	25%	50% (Median)	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
29-1141	Registered Nurses	3,958	\$83,500	\$68,800	\$90,900	\$66,000	\$74,200	\$80,900	\$98,500	\$102,000	BA	None	None
11-9111	Medical and Health Services Managers	543	\$106,300	\$73,300	\$122,800	\$70,700	\$80,900	\$101,000	\$118,400	\$144,500	BA	< 5 years	None
29-1051	Pharmacists	399	\$135,500	\$112,400	\$147,100	\$98,800	\$130,500	\$136,300	\$152,600	\$163,100	PhD	None	None
29-1292	Dental Hygienists	269	\$83,600	\$79,300	\$85,800	\$78,600	\$80,800	\$83,500	\$84,200	\$94,400	AS	None	None
29-1123	Physical Therapists	253	\$89,100	\$79,000	\$94,200	\$77,900	\$81,600	\$86,700	\$100,900	\$104,200	PhD	None	None
29-2061	Licensed Practical and Licensed Vocational Nurses	1,121	\$52,500	\$46,800	\$55,400	\$45,100	\$49,600	\$51,000	\$57,400	\$61,300	Certificate	None	None
31-9091	Dental Assistants	379	\$54,600	\$49,000	\$57,400	\$48,400	\$50,200	\$51,500	\$61,000	\$63,800	Certificate	None	None
29-2072	Medical Records Specialists	158	\$51,500	\$41,700	\$56,400	\$39,200	\$46,200	\$50,100	\$57,000	\$61,800	Certificate	None	None
29-2057	Ophthalmic Medical Technicians	52	\$48,400	\$37,100	\$54,000	\$36,300	\$39,900	\$47,800	\$55,100	\$66,600	Certificate	None	None
29-1129	Therapists, All Other	45	\$54,000	\$37,500	\$62,300	\$36,500	\$40,700	\$51,100	\$56,300	\$83,900	BA	None	None
31-1131	Nursing Assistants	2,350	\$38,200	\$34,000	\$40,300	\$32,500	\$36,400	\$37,700	\$39,100	\$45,400	Certificate	None	None
31-1121	Home Health Aides	973	\$33,300	\$28,300	\$35,800	\$27,600	\$29,800	\$32,600	\$36,700	\$38,500	HS/GED	None	Short-term OJT
43-6013	Medical Secretaries and Administrative Assistants	671	\$43,600	\$37,100	\$46,900	\$37,000	\$38,100	\$42,600	\$47,100	\$52,900	HS/GED	None	Mod-term OJT
29-2052	Pharmacy Technicians	516	\$42,900	\$34,400	\$47,200	\$32,900	\$37,500	\$42,700	\$48,600	\$51,200	HS/GED	None	Mod-term OJT
31-9092	Medical Assistants	485	\$43,500	\$34,100	\$48,300	\$32,400	\$37,600	\$44,600	\$48,300	\$56,300	Certificate	None	None

Human Services

A total of 29,641 people are employed in Human Services roles regionally, accounting for 16.6% of all regional employment. Over the next three years, Human Services employment is forecast to grow by 0.1% annually – a dip from last year’s 2022Q2 estimated 0.8% growth. The field’s average wage is \$53,900 somewhat below the regional average across all occupations (\$55,600).



Top Ten Human Services Occupations by Employment Volume in Northwest Minnesota, 2023Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Change
Personal Care Aides	2,761	\$33,300	0.91	80	437	1.4%
Teaching Assistants, Except Postsecondary	2,597	\$35,300	1.89	104	293	-0.3%
Elementary School Teachers, Except Special Education	2,012	\$59,700	1.34	63	137	-0.4%
Secondary School Teachers, Except Special and Career/Technical Education	1,515	\$62,200	1.33	69	96	-0.3%
Childcare Workers	1,220	\$30,100	1.37	-29	196	-0.4%
Police and Sheriff’s Patrol Officers	865	\$66,000	1.22	-90	69	-0.1%
Middle School Teachers, Except Special and Career/Technical Education	845	\$61,400	1.29	25	58	-0.4%
Social and Human Service Assistants	739	\$43,700	1.62	126	94	1.0%
Preschool Teachers, Except Special Education	679	\$40,000	1.25	32	73	0.1%
Child, Family, and School Social Workers	584	\$62,400	1.52	107	61	0.9%
Remaining Component Occupations	15,828	\$60,600	1.04	77	1,621	0.1%
Human Services (CTE Field)	29,641	\$53,900	1.07	558	3,137	0.1%

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

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



The largest share of regional Human Services talent in the Northwest are employed by Elementary and Secondary Schools (33.1%, a slight decrease from last year's 34.1%) or Executive, Legislative, and Other General Government Support (11.8%). Individual and Family Services continues to have high forecasted growth and replacement demand needs.

Human Services Field Employment by Industry, Northwest Minnesota, 2023Q2

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Elementary and Secondary Schools	33.1%	9,825	8,693	-353	8,340
Executive, Legislative, and Other General Government Support	11.8%	3,483	3,236	-56	3,181
Individual and Family Services	9.7%	2,871	3,752	724	4,476
Colleges, Universities, and Professional Schools	4.3%	1,265	1,144	67	1,211
Religious Organizations	4.2%	1,258	1,334	-29	1,305
Child Care Services	3.5%	1,029	1,441	-56	1,386
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	2.8%	816	1,031	15	1,046
Personal Care Services	2.1%	614	845	38	883
Junior Colleges	2.0%	604	529	-8	521
Justice, Public Order, and Safety Activities	1.7%	507	462	-17	445
Legal Services	1.5%	435	326	-7	319
General Medical and Surgical Hospitals	1.5%	431	422	-3	419
Home Health Care Services	1.5%	431	621	67	687
Civic and Social Organizations	1.3%	394	599	-6	594
Other Schools and Instruction	1.2%	363	450	7	457
Nursing Care Facilities (Skilled Nursing Facilities)	1.2%	349	429	-24	404
Administration of Human Resource Programs	1.1%	339	314	-4	310
Other Residential Care Facilities	1.1%	331	413	-6	407
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	1.1%	325	478	59	537
Administration of Environmental Quality Programs	1.0%	300	272	-10	262
All Others	12.4%	3,670	4,252	105	4,357

Career Field Demographics

The Human Services field is predominantly female (65.9%) and white (90.3%). The share of BIPOC Human Services workforce increased by 0.9 percentage points from the 2022Q2 estimates. The age of the workforce is evenly distributed between 25 and 64 years of age, but the share that is 65 and older decreased by 0.6 percentage points from the prior years' estimates.

Age

Northwest Minnesota



Minnesota



16 to 19 years (2.3%)

25 to 34 years (19.6%)

45 to 54 years (21.3%)

20 to 24 years (7.8%)

35 to 44 years (22.1%)

55 to 64 years (19.7%)

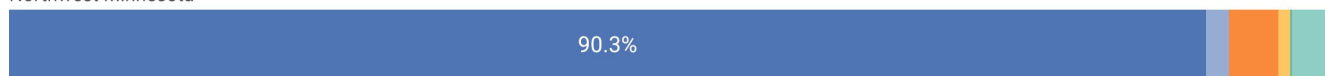
65 years and over (7.1%)

Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.



Race

Northwest Minnesota



Minnesota



- White (90.3%)
- American Indian (3.7%)
- Pacific Islander (0.1%)
- Black (7.1%)
- Asian (1.0%)
- Two or More Races (3.3%)

Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Ethnicity

Northwest Minnesota



Minnesota



- Non-Hispanic/Latino (97.7%)
- Hispanic or Latino (of any race) (2.3%)

Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Gender

Northwest Minnesota



Minnesota



- Male (34.1%)
- Female (65.9%)

Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Educational Attainment and Requirements

The stacked bar charts here illustrate the estimated mix of educational attainment of the workers in this career field in aggregate, 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 entry-level positions. For example, 2.0% of the Human Services workforce have no diploma at all, and 13.6% hold a high school diploma as their highest credential. In contrast, about 41.6% of positions in this field do not require any kind of postsecondary award or credential.

Educational Attainment

Northwest Minnesota



Minnesota



- < High School (2.0%)
- Some College (13.3%)
- Four-Year (31.4%)
- High School (13.6%)
- Two-Year (16.7%)
- Master's (17.6%)
- PhD (5.5%)

Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.



Education and Training Requirements

Northwest Minnesota



Minnesota



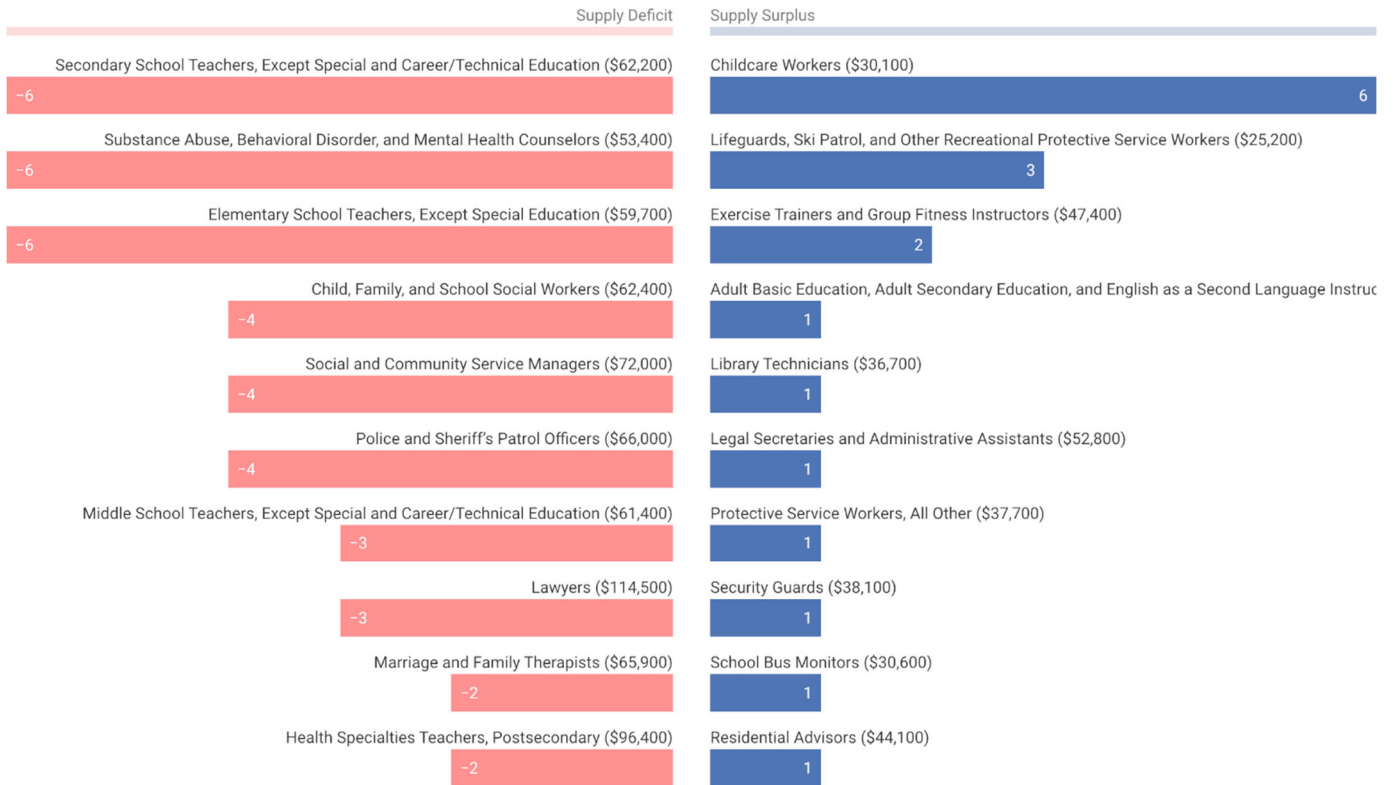
- Short-term OJT, no exp, no award (30.2%)
- Moderate-term OJT, no exp, no award (5.9%)
- Long-term training, no exp, no award (1.7%)
- Previous work experience, no award (3.8%)
- 2-year degree or certificate (9.1%)
- Bachelor's degree (36.1%)
- Postgraduate degree (13.1%)

Data for Human Services (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Occupation Gaps

The chart below shows the potential average annual talent shortages over ten years. In Human Services, Secondary School Teachers, Except Special and Career/Technical Education, Substance Abuse, Behavioral Disorder, and Mental Health Counselors, and Elementary School Teachers, Except Special Education are the top occupations of shortage in the region. These critical talent shortages in education and mental health counseling have shifted due in large part to forecasted employment growth and replacement demand needs due to retirements combined with insufficient talent coming through both secondary education and mental health counseling programs.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Human Services, Northwest Minnesota, 2023Q2

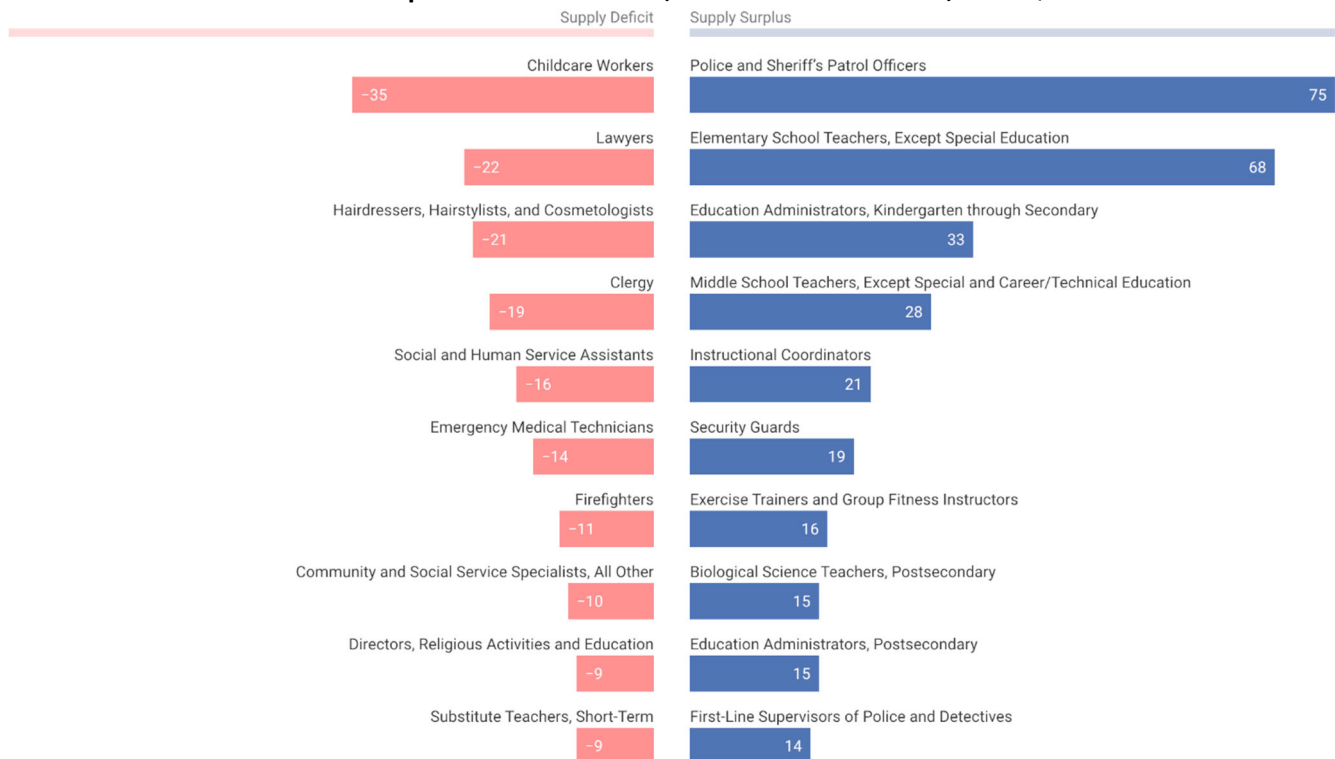




Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate several shortages. Northwest Minnesota faces several notable Human Services award gaps, meaning that the region is underproducing local talent in relation to employer demand. Northwest colleges and universities are underproducing about 35 graduates annually that are needed to fill Childcare Worker positions open with employers based in the region, a decrease of nine graduates from last year's estimates. They are also underproducing at least 22 Lawyer roles, and at least 21 Cosmetologists. Occupations that show higher awards given than what is currently needed in the local talent market are examples of programs that serve other parts of the state where talent demand is high but relevant programs may not exist.

Award Gaps in Human Services, Northwest Minnesota, 2023Q2



Origin-Gateway-Target

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, 2023Q2

Target Occupations (all HW, HS, HD)

Child, Family, & School Social Workers (OG)
 Lawyers (OG, AG)
 Social & Community Service Managers (OG)
 Directors, Religious Activities & Education (AG)
 Guidance & Career Counselors (OG)

Gateway Occupations

License Clerks (HD, OG)
 Substance Abuse, Behavioral Disorder, & Mental Health Counselors (HS, HD, OG)
 Clergy (HS, HD, OG, AG)
 Correctional Officers (AG)
 Exercise Trainers & Group Fitness Instructors (HD)

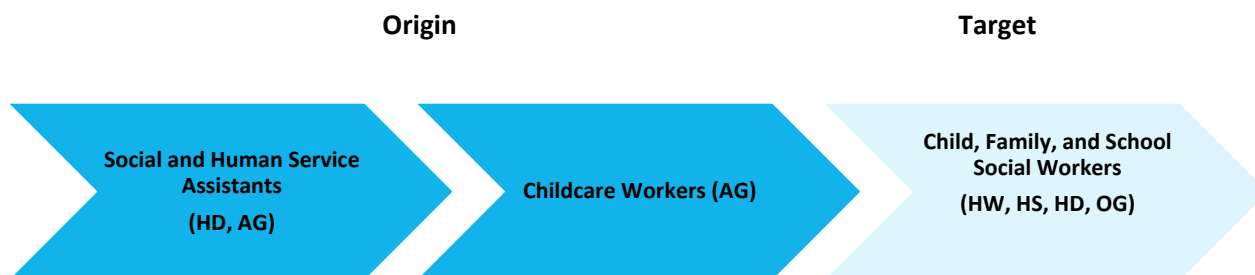
Origin Occupations

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

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

Featured Pathway

A potential pathway to explore in the Northwest region is Child, Family, and School Social Workers. The Target occupation is highly concentrated in the Northwest region with a location quotient of 1.52. This role is in high demand and currently experiencing an occupation gap. Childcare Workers and Social and Human Service Assistants are both facing award gaps and are also highly concentrated locally in the region (LQ 1.37 and 1.62). Forecast employment growth coupled with replacement demand due to retirement and insufficient graduate supply make this an important pathway to explore.



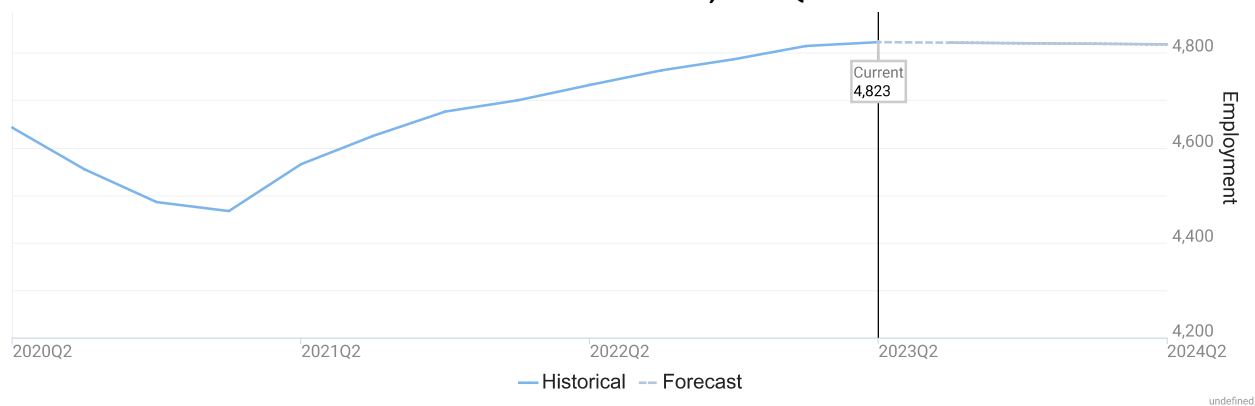
OGT Wages and Experience Level Requirements, Human Services, Northwest Minnesota, 2023Q2

SOC	Occupation	Empl Count	Mean	Entry Level	Experienced	10%	25%	50% (Median)	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
21-1021	Child, Family, and School Social Workers	584	\$62,400	\$45,200	\$71,000	\$42,000	\$51,800	\$62,500	\$73,500	\$80,100	BA	None	None
23-1011	Lawyers	447	\$114,500	\$71,000	\$136,300	\$64,800	\$83,400	\$101,700	\$131,500	\$173,800	JD	None	None
11-9151	Social and Community Service Managers	367	\$72,000	\$46,100	\$84,900	\$43,200	\$53,100	\$69,400	\$86,300	\$103,800	BA	<5 years	None
21-2021	Directors, Religious Activities and Education	302	\$58,900	\$39,300	\$68,700	\$37,600	\$43,900	\$55,400	\$70,000	\$87,600	BA	<5 years	None
21-1012	Educational, Guidance, and Career Counselors and Advisors	295	\$57,800	\$45,200	\$64,100	\$43,800	\$49,200	\$58,900	\$63,000	\$76,000	MA	None	None
43-4031	Court, Municipal, and License Clerks	513	\$51,200	\$39,200	\$57,200	\$37,800	\$42,600	\$50,000	\$59,000	\$64,600	HS/GED	None	Long-term OJT
21-1018	Substance Abuse, Behavioral Disorder, and Mental Health Counselors	490	\$53,400	\$42,700	\$58,700	\$41,500	\$45,400	\$50,300	\$62,700	\$69,500	BA	None	None
21-2011	Clergy	424	\$51,800	\$31,900	\$61,700	\$30,900	\$35,000	\$51,900	\$62,800	\$73,800	BA	None	Mod-term OJT
33-3012	Correctional Officers and Jailers	365	\$52,000	\$45,100	\$55,500	\$44,900	\$46,200	\$50,600	\$58,500	\$62,400	HS/GED	None	Mod-term OJT
39-9031	Exercise Trainers and Group Fitness Instructors	320	\$47,400	\$31,900	\$55,100	\$32,200	\$32,700	\$39,200	\$49,600	\$72,500	HS/GED	None	Short-term OJT
31-1122	Personal Care Aides	2,761	\$33,300	\$28,300	\$35,800	\$27,600	\$29,800	\$32,600	\$36,700	\$38,500	HS/GED	None	Short-term OJT
25-9045	Teaching Assistants, Except Postsecondary	2,597	\$35,300	\$29,400	\$38,200	\$29,000	\$31,100	\$36,600	\$38,100	\$40,400	Certificate	None	None
39-9011	Childcare Workers	1,220	\$30,100	\$25,200	\$32,500	\$24,300	\$26,800	\$28,700	\$31,000	\$38,800	HS/GED	None	Short-term OJT
21-1093	Social and Human Service Assistants	739	\$43,700	\$32,500	\$49,300	\$32,200	\$34,200	\$41,000	\$49,600	\$58,300	HS/GED	None	Short-term OJT
25-2011	Preschool Teachers, Except Special Education	679	\$40,000	\$29,700	\$45,200	\$28,800	\$32,000	\$36,900	\$46,000	\$56,200	AS	None	None

Arts, Communications, and Information Systems

Arts, Communications, and Information Systems is a diverse career field with artistic careers as well as Information Technology career paths. Current employment sits at 4,823 for talent in this field, with about 180 unemployed, trained professionals in the region (2.4% unemployment rate, an increase of 0.4 percentage points from last year). Over the next three years, Arts, Communications, and Information Systems Field employment is forecast to decline by -0.2% annually, a drop from last year's projection of 0.2% annual growth. A total of 2,064 new professionals in this field will be needed over the next five years to meet growth, replacement, and turnover demand. Wage gains were significant in this field, jumping from \$67,000 on average in 2022Q2 to \$72,100 in 2023Q2.

Baseline Worst-Case Scenario 3-Year Forecast for Arts, Communications, and Information Systems Careers, Northwest Minnesota, 2023Q2



Top Ten Arts, Communications, and Information Systems Occupations by Employment Volume in Northwest Minnesota, 2023Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Change
Software Developers	680	\$103,900	0.38	89	58	1.6%
Computer User Support Specialists	429	\$59,500	0.54	23	30	-0.5%
Computer Systems Analysts	317	\$88,000	0.56	-3	22	0.0%
Graphic Designers	252	\$51,400	0.85	18	21	-0.5%
Printing Press Operators	245	\$44,300	1.45	11	22	-1.5%
Computer Network Support Specialists	233	\$69,200	1.22	7	17	-0.2%
Musicians and Singers	192	\$102,200	1.02	-16	24	-0.2%
Network and Computer Systems Administrators	174	\$85,100	0.47	-2	10	-0.6%
Telecommunications Equipment Installers and Repairers, Except Line Installers	165	\$60,900	0.88	12	19	0.2%
Photographers	156	\$55,100	0.95	6	14	0.2%
Remaining Component Occupations	1,985	\$66,100	0.72	30	175	-0.5%
Arts, Communications, & Information Systems (CTE Field)	4,823	\$72,100	0.59	180	412	-0.2%

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

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



The largest share of talent in the Northwest that is working in Arts, Communications, and Information Systems roles are employed by the Printing Industry (7.7%) and Telecommunications Carriers (7.1%). Overall, employment is relatively spread out across many different industries.

Arts, Communications, and Information Systems Field Employment by Industry, Northwest Minnesota, 2023Q2

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	7.7%	370	364	-67	297
Wired and Wireless Telecommunications (except Satellite)	7.1%	340	318	-4	314
Religious Organizations	5.2%	253	275	-7	268
Independent Artists, Writers, and Performers	5.1%	244	253	2	256
Newspaper, Periodical, Book, and Directory Publishers	4.4%	211	196	-34	162
Computer Systems Design and Related Services	4.2%	201	151	31	182
Depository Credit Intermediation	3.4%	165	118	13	131
Executive, Legislative, and Other General Government Support	2.9%	141	105	-1	104
Other Professional, Scientific, and Technical Services	2.9%	138	120	5	125
Colleges, Universities, and Professional Schools	2.7%	132	105	3	108
Elementary and Secondary Schools	2.6%	127	95	-7	88
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	2.6%	125	99	-4	95
Web Search Portals, Libraries, Archives, and Other Information Services	2.5%	122	95	31	126
General Medical and Surgical Hospitals	2.4%	118	85	0	85
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	2.2%	104	73	6	80
Radio and Television Broadcasting Stations	2.1%	99	87	-21	66
Management of Companies and Enterprises	1.4%	68	52	7	58
Florists	1.4%	68	69	-19	50
Specialized Design Services	1.1%	55	53	1	54
Other Miscellaneous Manufacturing	1.1%	53	47	0	47
All Others	35.0%	1,688	1,428	18	1,445

Career Field Demographics

The Arts, Communications, and Information Systems field is predominantly male (68.8%, decreasing by 2.5 percentage points from the prior year) and white (91.1%), although diversity increased with now 8.9% of talent in the field BIPOC by race compared to 8.0% in the year prior. Over half of the Arts, Communications, and Information Systems workforce in the region is under 45 years of age (56%) and averaging younger each year.

Age

Northwest Minnesota



Minnesota



16 to 19 years (1.2%)

25 to 34 years (24.4%)

45 to 54 years (19.2%)

20 to 24 years (6.7%)

35 to 44 years (23.7%)

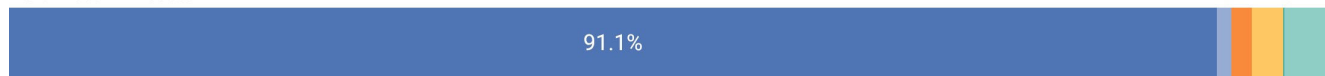
55 to 64 years (18.7%)

65 years and over (6.0%)

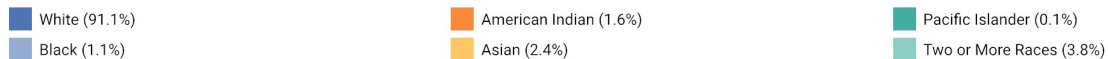


Race

Northwest Minnesota



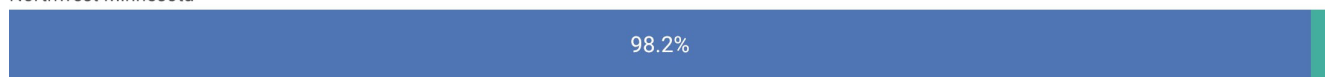
Minnesota



Data for Arts, Communications, & Information Systems (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Ethnicity

Northwest Minnesota



Minnesota



Data for Arts, Communications, & Information Systems (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Gender

Northwest Minnesota



Minnesota



Data for Arts, Communications, & Information Systems (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Educational Attainment and Requirements

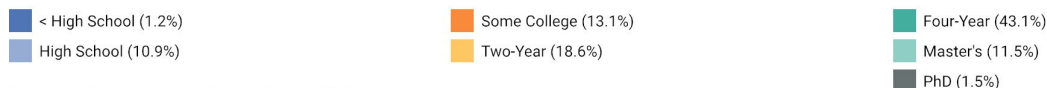
The stacked bar charts here illustrate the estimated mix of educational attainment of the workers in this career field in aggregate, followed by the typical education and training requirements in the field. Nearly two-thirds (57.8%, down 3.4 percentage points from the prior years' estimates) of all occupations in this field require a Bachelor's degree, while 43.1% of the workforce hold a four-year degree as their highest credential. Another 13.0% hold a Master's or PhD.

Educational Attainment

Northwest Minnesota



Minnesota



Data for Arts, Communications, & Information Systems (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.



Education and Training Requirements

Northwest Minnesota



Minnesota



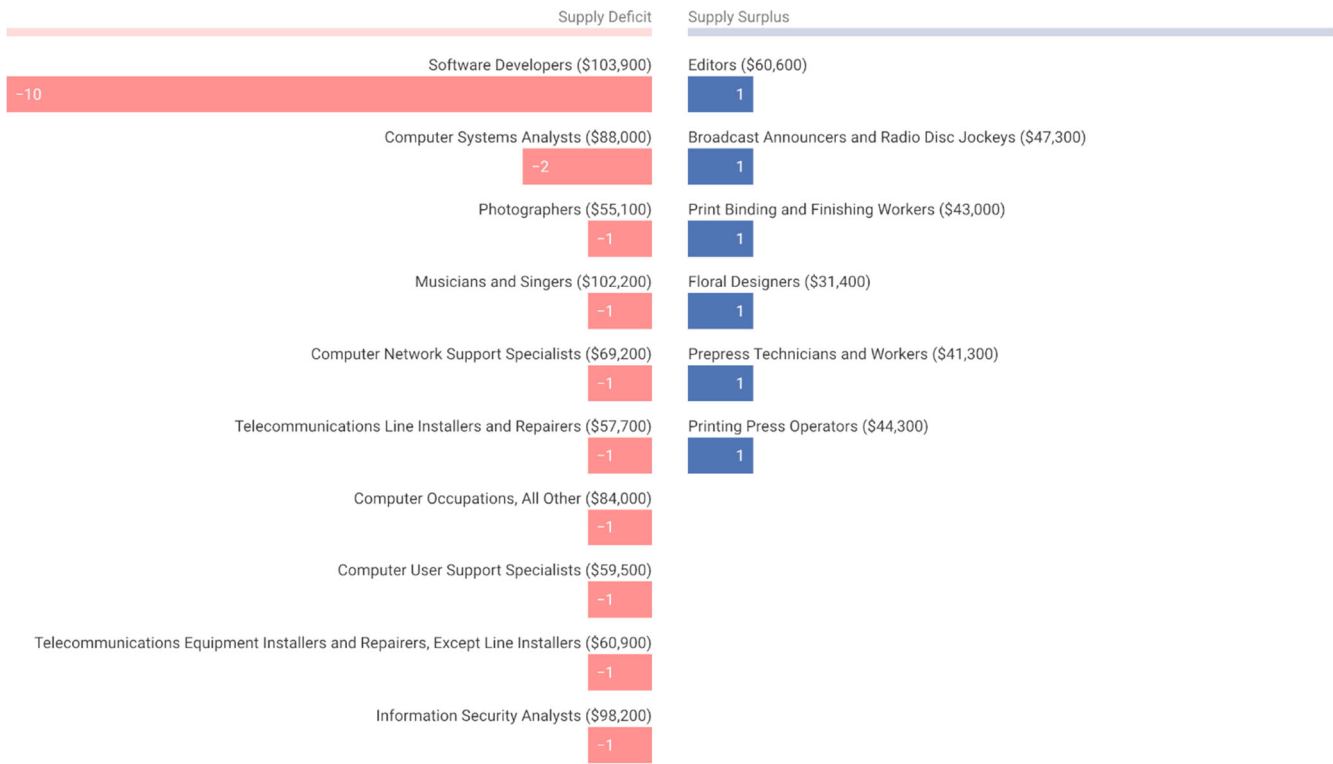
- Short-term OJT, no exp, no award (1.3%)
- Long-term training, no exp, no award (8.1%)
- 2-year degree or certificate (12.1%)
- Moderate-term OJT, no exp, no award (20.5%)
- Previous work experience, no award (0.1%)
- Bachelor's degree (57.8%)
- Postgraduate degree (0.0%)

Data for Arts, Communications, & Information Systems (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Occupation Gaps

The chart below shows the potential average annual talent shortages over ten years. Software Developers are the top occupation of shortage in this field, falling short at least ten skilled workers needed annually (averaged over the next ten years) to meet employer demand. This moderate talent shortage is primarily due to employment growth which is outpacing the growth in supply of trained software professionals in this region. Computer Systems Analysts has the second greatest forecasted shortage.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Arts, Communications. And Information Systems, Northwest Minnesota, 2023Q2

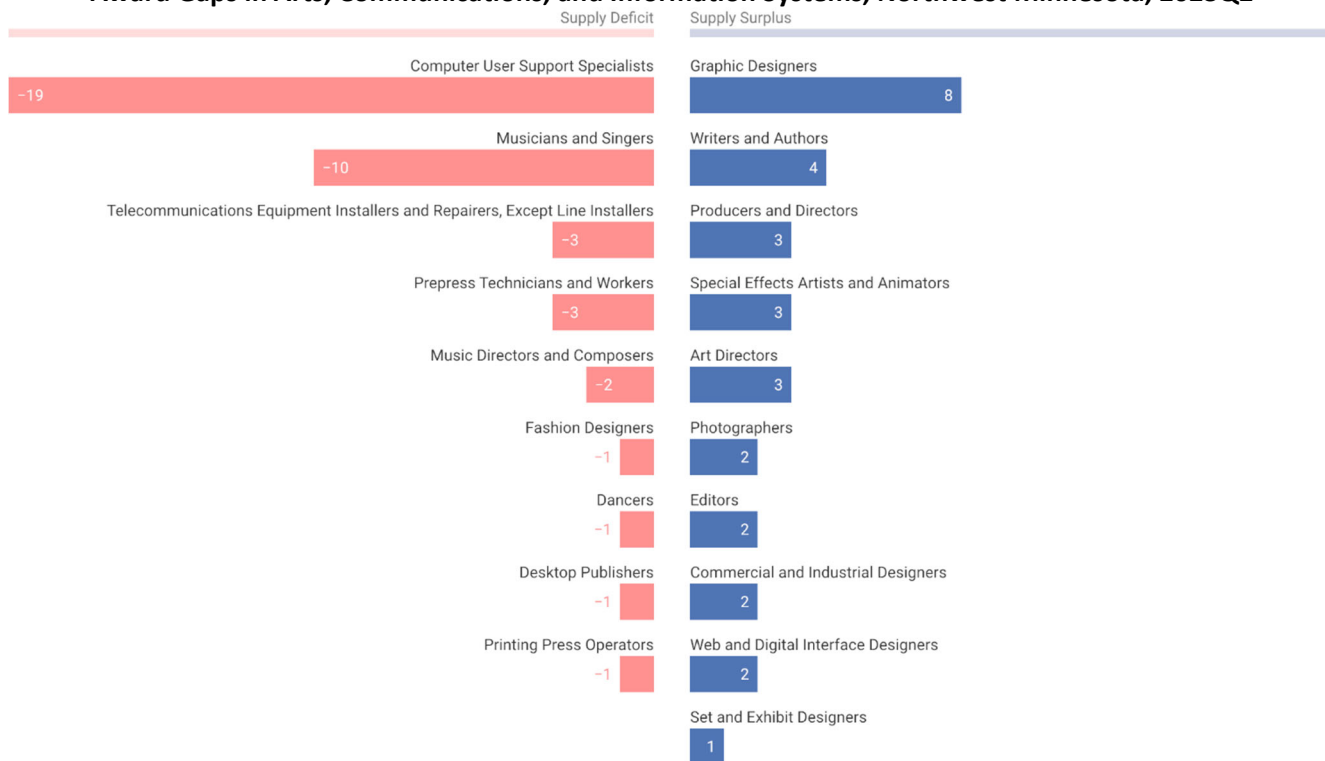




Award Gaps

A comparison of the graduate talent pipeline obtaining a certificate or postsecondary degree to the current estimated openings by occupation illuminate several regional shortages. The Northwest is underproducing graduates in several Arts, Communications and Information Systems programs in comparison to national benchmarks, meaning that the region is underproducing local talent in relation to what a typical community with a similar local mix of job opportunities would have. Northwest Minnesota colleges and universities are underproducing trained Computer User Support Specialists and Musicians and Singers measured against national benchmarks. Occupations that show higher awards given than what is currently needed in the local talent market are examples of programs that serve other parts of the state where talent demand is high but relevant programs may not exist.

Award Gaps in Arts, Communications, and Information Systems, Northwest Minnesota, 2023Q2



Origin-Gateway-Target

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, 2023Q2

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

Gateway Occupations
 Graphic Designers (HS)
 Photographers (OG)
 Broadcast Announcers (HS)
 Designers, All Other (HS, HD)
 Broadcast Technicians (HS)

Origin Occupations
 Printing Press Operators (AG)
 Floral Designers
 Prepress Technicians & Workers (HS, AG)
 Print Binding & Finishing
 Reporters & Journalists (HS)

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

Featured Pathway

With a projected occupation gap, high wages, and high demand, the occupation of Computer Network Support Specialists is a promising pathway to explore in the Northwest region. This occupation is highly concentrated in the region with a location quotient of 1.22. Another Target occupation with related skillsets is Telecommunications Line Installers and Repairers. This occupation is relatively concentrated locally 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 both of these roles, has a projected shortage of graduates to fill these roles, and is considered high skill. There are not in-field Origin occupations, but entry-level customer services and office support roles may have transferrable skills.



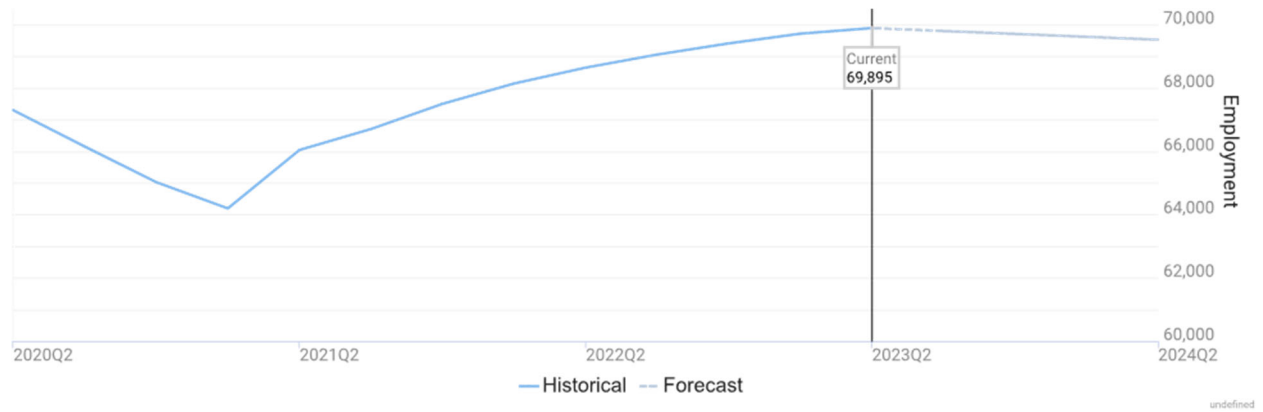
OGT Wages and Experience Level Requirements, Arts, Communications, and Information Systems, Northwest Minnesota, 2023Q2

SOC	Occupation	Empl Count	Mean	Entry Level	Experienced	10%	25%	50% (Median)	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
15-1252	Software Developers	680	\$103,900	\$67,300	\$122,200	\$61,400	\$79,100	\$98,800	\$124,300	\$151,600	BA	None	None
15-1211	Computer Systems Analysts	317	\$88,000	\$63,200	\$100,500	\$60,900	\$69,600	\$85,500	\$102,700	\$117,000	BA	None	None
15-1231	Computer Network Support Specialists	233	\$69,200	\$52,500	\$77,600	\$49,100	\$59,400	\$68,900	\$77,300	\$89,600	AS	None	Mod-term OJT
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	165	\$60,900	\$43,800	\$69,500	\$40,700	\$50,200	\$60,000	\$74,400	\$77,800	Certificate	None	Mod-term OJT
15-1299	Computer Occupations, All Other	154	\$84,000	\$51,600	\$100,200	\$47,500	\$60,600	\$79,400	\$99,600	\$123,800	BA	None	None
27-1024	Graphic Designers	252	\$51,400	\$37,900	\$58,100	\$36,900	\$41,000	\$49,400	\$60,500	\$67,900	BA	None	None
27-4021	Photographers	156	\$55,100	\$31,300	\$67,000	\$29,000	\$35,100	\$44,700	\$70,700	\$89,700	HS/GED	None	Mod-term OJT
27-3011	Broadcast Announcers and Radio Disc Jockeys	63	\$47,300	\$25,100	\$58,400	\$24,700	\$25,900	\$38,300	\$43,000	\$62,600	BA	None	None
27-1029	Designers, All Other	34	\$47,200	\$29,300	\$56,200	\$27,900	\$31,500	\$34,500	\$61,100	\$87,100	BA	None	None
27-4012	Broadcast Technicians	23	\$45,900	\$25,400	\$56,100	\$23,700	\$27,200	\$39,400	\$55,000	\$73,500	AS	None	Short-term OJT
51-5112	Printing Press Operators	245	\$44,300	\$33,400	\$49,700	\$31,200	\$36,900	\$40,800	\$51,500	\$60,400	HS/GED	None	Mod-term OJT
27-1023	Floral Designers	90	\$31,400	\$25,800	\$34,200	\$24,400	\$27,800	\$31,000	\$32,800	\$39,300	HS/GED	None	Mod-term OJT
51-5111	Prepress Technicians and Workers	74	\$41,300	\$29,800	\$47,000	\$29,900	\$31,400	\$41,500	\$46,900	\$54,100	Certificate	None	None
51-5113	Print Binding and Finishing Workers	71	\$43,000	\$34,600	\$47,200	\$35,300	\$35,700	\$45,900	\$46,500	\$55,400	HS/GED	None	Mod-term OJT
27-3023	News Analysts, Reporters, and Journalists	49	\$44,300	\$30,800	\$51,000	\$29,700	\$33,400	\$39,000	\$52,600	\$58,700	BA	None	None

Business, Management, and Administration

Business, Management, and Administration is a broad career field with Hospitality and Tourism, Finance, Administration, Human Resources, and Marketing careers, which all experienced somewhat diverging trends early in the pandemic and have seen different timing of recovery. As of 2023Q2, employment in occupations aligned to this career field sits at about 69,895 (an increase from last year’s 68,887 workers) workers in the Northwest, with an estimated unemployment rate of 3.6% (an increase of 0.3 percentage points). Over the next three years, Business, Management, and Administration Field employment is forecast to decline by -0.6% on average annually, a dip from last year’s forecasted growth of 0.2%. Most of the growth is attributable to the Hospitality and Tourism Cluster careers in this field. Wages average \$51,300 annually, compared to \$56,500 across all career fields.

Baseline Worst-Case Scenario 3-Year Forecast for Business, Management, and Administration Careers, Northwest Minnesota 2023Q2



Top Ten Business, Management, and Administration Systems Occupations by Employment Volume in Northwest Minnesota, 2023Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Change
Cashiers	4,692	\$29,500	1.28	8	784	-1.3%
Retail Salespersons	4,030	\$34,900	0.99	161	553	-0.5%
General and Operations Managers	3,692	\$85,300	0.96	481	310	-0.2%
Fast Food and Counter Workers	3,109	\$29,000	0.83	-23	655	-0.3%
Office Clerks, General	2,978	\$43,400	1.03	-1	325	-1.2%
Stockers and Order Fillers	2,839	\$38,200	0.91	293	493	0.2%
Customer Service Representatives	2,349	\$43,500	0.73	165	285	-1.2%
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2,301	\$37,200	0.88	33	308	-0.3%
Waiters and Waitresses	2,193	\$26,800	0.90	26	419	-0.6%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	2,051	\$70,700	1.40	88	190	-0.5%
Remaining Component Occupations	39,662	\$57,300	0.96	1,362	4,513	-0.5%
Business, Management, & Administration (CTE Field)	69,895	\$51,300	0.89	2,593	8,844	-0.6%

“Annual Demand” is the projected need for new entrants into an occupation. New entrants are needed due to expected growth and to replace workers who left the occupation due to factors such as retirement or switching careers. “Forecast Ann Growth” is the expected baseline (most pessimistic) yearly change in employment due to national, long-term trend projections (per the BLS) as well as local factors such as industry mix, labor force participation rates, and population growth (as computed and modeled by RealTime Talent in JobsEQ).



Employment in Business, Management, and Administration careers is spread across a number of different industries. In the Northwest, the industries with the greatest share of Business, Management, and Administration talent are Restaurants (12.9% - the same as the previous year) and Warehouse Clubs (4.7%). These two industries account for a substantial amount of talent demand over the next ten years (restaurants alone accounts for well over half of future positions needing to be filled in this field), but overall both current employment and future growth are relatively spread out over many different industries.

Business, Management, and Administration Field Employment by Industry, Northwest Minnesota, 2023Q2

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	12.9%	9,043	16,291	-146	16,144
Warehouse Clubs, Supercenters, and Other General Merchandise Retailers	4.7%	3,266	4,899	-205	4,694
Gasoline Stations	3.9%	2,751	4,472	-297	4,175
Grocery and Convenience Retailers	3.8%	2,674	4,246	-163	4,083
Traveler Accommodation	3.1%	2,198	3,327	-50	3,277
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	3.1%	2,148	2,240	-168	2,071
Elementary and Secondary Schools	2.7%	1,917	2,469	-185	2,284
Depository Credit Intermediation	2.7%	1,895	1,777	-110	1,667
Executive, Legislative, and Other General Government Support	2.6%	1,796	2,134	-128	2,006
Building Material and Supplies Dealers	2.4%	1,656	2,335	-33	2,302
General Medical and Surgical Hospitals	2.1%	1,503	1,834	-89	1,745
Nursing Care Facilities (Skilled Nursing Facilities)	2.0%	1,418	1,963	-144	1,819
Drinking Places (Alcoholic Beverages)	1.5%	1,067	1,785	-18	1,767
Agencies, Brokerages, and Other Insurance Related Activities	1.5%	1,041	1,028	7	1,035
Religious Organizations	1.4%	991	1,106	-79	1,027
Other Amusement and Recreation Industries	1.3%	934	1,694	43	1,737
Services to Buildings and Dwellings	1.2%	856	1,088	-24	1,064
Civic and Social Organizations	1.2%	831	1,218	-27	1,191
Colleges, Universities, and Professional Schools	1.1%	738	821	-31	791
Grocery and Related Product Merchant Wholesalers	1.0%	732	845	-20	825
All Others	43.6%	30,439	34,188	-1,717	32,471

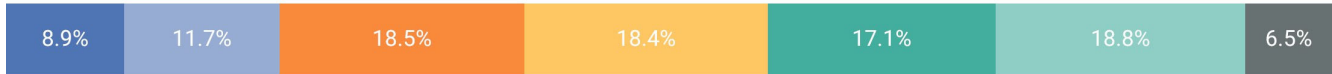
Career Field Demographics

The Business, Management, and Administration field is about 91% white, seeing racial diversity increase by 0.7 percentage points from the prior year's estimates. By gender, the field flipped from being majority male in 2021 to being 57.2% females employed in 2022, and now 56% of the field's talent are females as of 2023Q2. About 42.4% of workers in Business, Management, and Administration roles are over 45 years old, a slight decrease of 0.6 percentage points from the prior year.

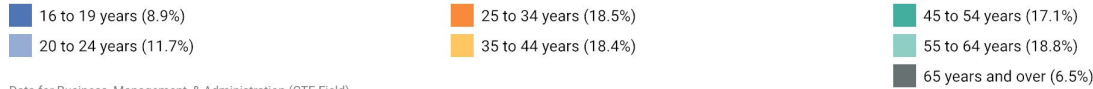
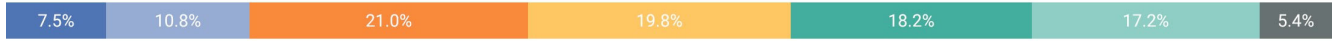


Age

Northwest Minnesota



Minnesota



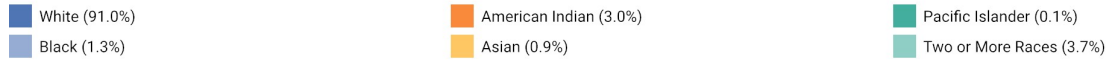
Data for Business, Management, & Administration (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Race

Northwest Minnesota



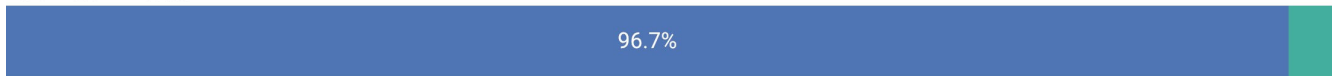
Minnesota



Data for Business, Management, & Administration (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Ethnicity

Northwest Minnesota



Minnesota



Data for Business, Management, & Administration (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Gender

Northwest Minnesota



Minnesota



Data for Business, Management, & Administration (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Educational Attainment and Requirements

The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this career field in aggregate. In general, consistent with data from 2022Q2, the Northwest Minnesota Business, Management, and Administration workforce is more likely to have a two-year degree than what is in demand. While 18.8% of the workforce holds a two-year degree, just 0.2% of the occupations in this field require a two-year degree. Over half of all positions in this field (57.6%) require no degree, no experience, and only short-term on-the-job training. Another 20.7% require experience or some on-the-job training, but still no degree. In contrast, only 4.5% of the workforce in this field has no degree at all, and 25.9% hold a high school diploma as their highest credential. Overall, the share of local jobs requiring a Bachelor’s degree increased by 0.7 percentage points.



Educational Attainment

Northwest Minnesota



Minnesota



- < High School (4.5%)
- Some College (19.0%)
- Four-Year (25.9%)
- High School (25.9%)
- Two-Year (18.8%)
- Master's (5.0%)
- PhD (0.8%)

Data for Business, Management, & Administration (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Education and Training Requirements

Northwest Minnesota



Minnesota



- Short-term OJT, no exp, no award (57.6%)
- Long-term training, no exp, no award (0.1%)
- 2-year degree or certificate (0.2%)
- Moderate-term OJT, no exp, no award (9.9%)
- Previous work experience, no award (10.7%)
- Bachelor's degree (21.5%)
- Postgraduate degree (0.0%)

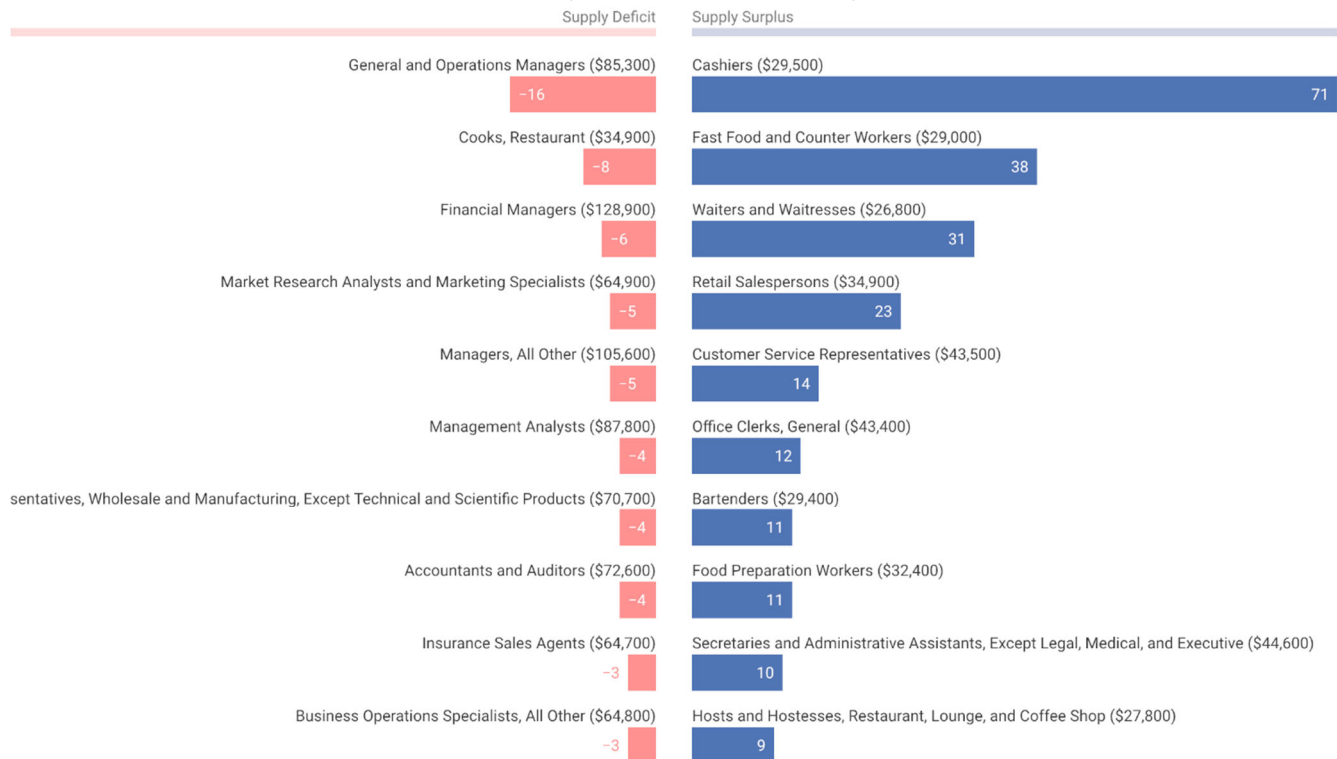
Data for Business, Management, & Administration (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Occupation Gaps

The chart below shows the potential average annual gaps over ten years. A number of management roles indicate significant shortages in the years ahead, with the General and Operations Manager talent pool likely falling short at least 16 skilled workers needed annually (averaged over the next ten years) to meet employer demand—a decrease of three short estimated the year prior. Hospitality and Tourism cluster careers have rebounded from the pandemic and several are now forecasting talent shortages, with Cooks jumping into first place as of 2022Q2 and second place as of 2023Q2. This critical talent shortage is primarily due to moderate growth and retirements which far outpace demand.



Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Business, Management, and Administration, Northwest Minnesota, 2023Q2

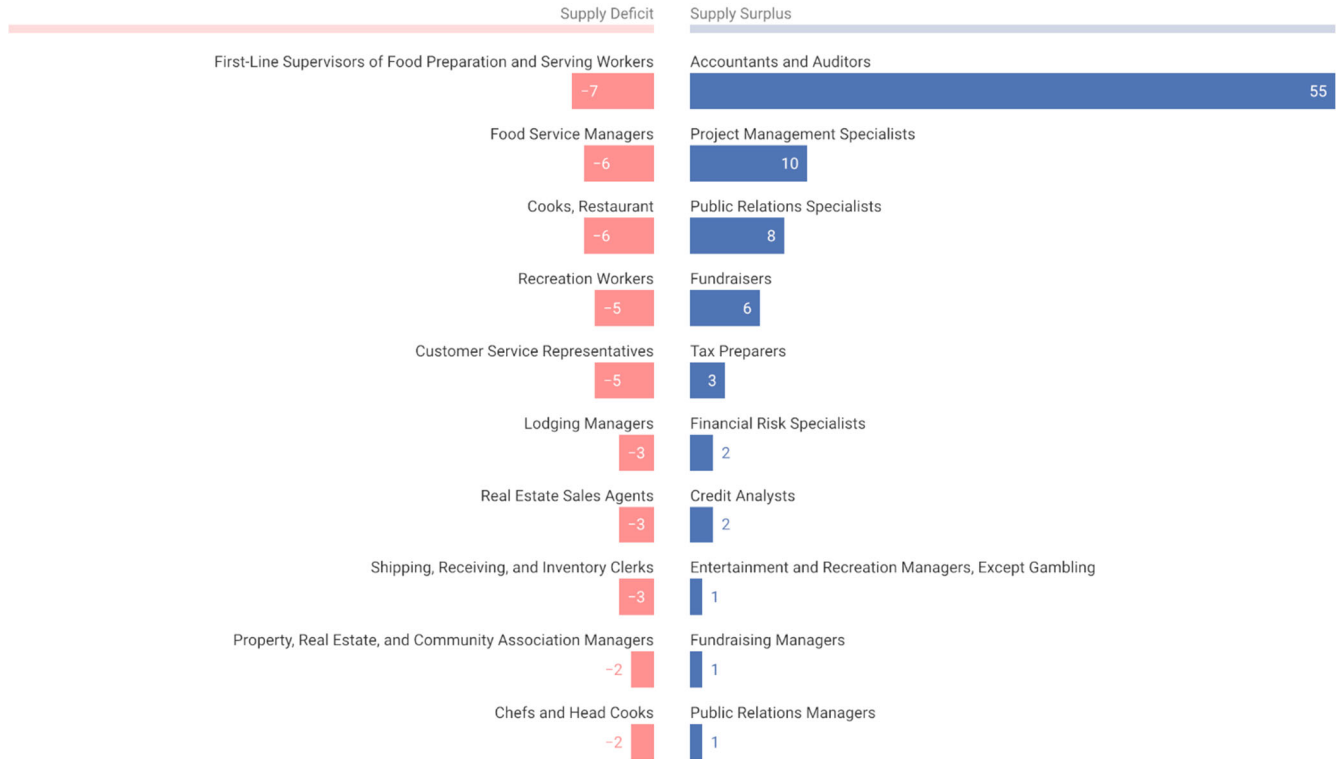


Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate a few shortfalls in graduate awards needed to meet local demand for credentialed talent. Colleges and universities in the Northwest currently under-train talent in Business, Management, and Administration when compared to national benchmarks. Specifically, regional colleges and universities are underproducing around seven graduates annually that are needed to fill Supervisors of Food Preparation and Serving Workers positions open with employers based in the Northwest alone. Award gaps in the Northwest are fairly similar to the previous year's estimates.



Award Gaps in Business, Management, and Administration, Northwest Minnesota, 2023Q2



Promising Pathways

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, 2023Q2

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

General & Operations Managers
 Accountants & Auditors
 Managers, All Other
 Business Operations Specialists
 Market Research Analysts & Marketing Specialists (AG)

Gateway Occupations

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

Origin Occupations

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

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

Featured Pathway

With a projected occupation gap, award gap, and high demand the occupation of Market Research Analysts and Marketing Specialists is a promising pathway to explore in the Northwest region. This occupation is relatively concentrated in the region with a location quotient of 0.96. The Gateway occupation of Real Estate Managers is also in high demand, and facing both projected award and occupation gap. The Origin occupation that feeds into that gateway occupation is highly concentrated locally (LQ of 1.03) and also both in high demand and facing an award gap. These Origin and Gateway occupations are a potential entry point for the Target occupation of Market Research Analysts and Marketing Specialists, recognizing that this role typically has an education requirement of a Bachelor's degree, but that there is a shift towards skill-based hiring across the state.



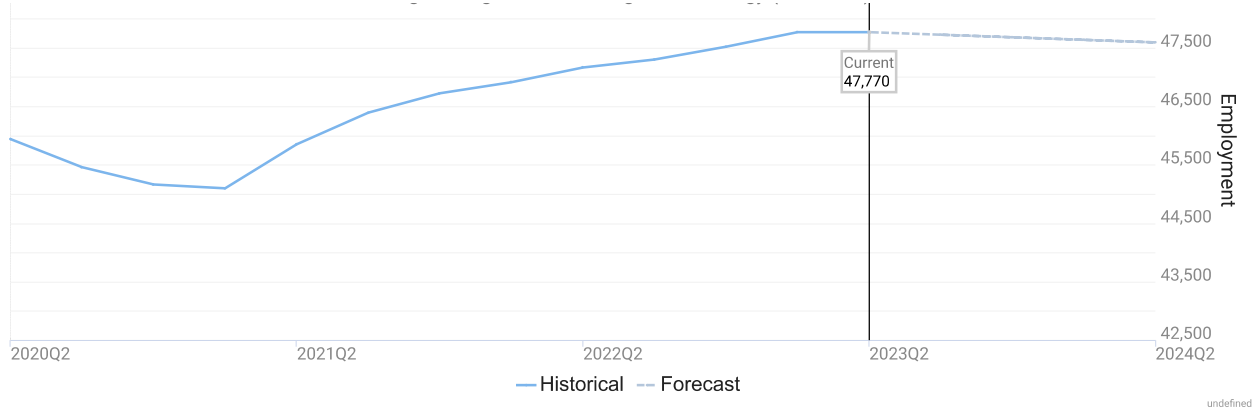
OGT Wages and Experience Level Requirements, Business, Management, and Administration, Northwest Minnesota, 2023Q2

SOC	Occupation	Empl Count	Mean	Entry Level	Experienced	10%	25%	50% (Median)	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
11-1021	General and Operations Managers	3,692	\$85,300	\$43,700	\$106,100	\$39,900	\$51,800	\$71,000	\$106,400	\$146,500	BA	>5 years	None
13-2011	Accountants and Auditors	1,195	\$72,600	\$48,500	\$84,600	\$46,100	\$54,200	\$65,300	\$82,700	\$104,800	BA	None	None
11-9199	Managers, All Other	1,040	\$105,600	\$65,100	\$125,900	\$61,800	\$75,100	\$102,500	\$125,000	\$157,600	BA	<5 years	None
13-1199	Business Operations Specialists, All Other	737	\$64,800	\$43,800	\$75,300	\$41,300	\$49,700	\$61,900	\$75,100	\$93,200	BA	None	None
13-1161	Market Research Analysts and Marketing Specialists	733	\$64,900	\$42,200	\$76,200	\$38,700	\$49,200	\$61,800	\$77,200	\$96,500	BA	None	None
41-1011	First-Line Supervisors of Retail Sales Workers	1,829	\$47,600	\$34,500	\$54,100	\$32,700	\$38,200	\$45,000	\$53,400	\$65,200	HS/GED	<5 years	None
43-3031	Bookkeeping, Accounting, and Auditing Clerks	1,642	\$46,500	\$34,400	\$52,600	\$32,800	\$37,900	\$46,000	\$52,300	\$61,800	Certificate	None	Mod-term OJT
11-9141	Property, Real Estate, and Community Association Managers	302	\$53,600	\$33,100	\$63,800	\$30,200	\$38,300	\$50,500	\$61,400	\$74,000	HS/GED	<5 years	Short-term OJT
43-3021	Billing and Posting Clerks	281	\$46,500	\$37,600	\$51,000	\$36,700	\$40,000	\$45,700	\$50,100	\$60,200	HS/GED	None	Mod-term OJT
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	226	\$48,000	\$33,600	\$55,200	\$31,400	\$37,600	\$43,400	\$58,800	\$68,400	HS/GED	<5 years	None
41-2011	Cashiers	4,692	\$29,500	\$25,300	\$31,500	\$24,300	\$26,900	\$28,900	\$31,200	\$35,300	None	None	Short-term OJT
41-2031	Retail Salespersons	4,030	\$34,900	\$25,900	\$39,400	\$24,300	\$28,100	\$31,300	\$37,600	\$48,300	None	None	Short-term OJT
35-3023	Fast Food and Counter Workers	3,109	\$29,000	\$25,400	\$30,800	\$24,000	\$27,400	\$28,500	\$29,900	\$34,800	None	None	Short-term OJT
43-9061	Office Clerks, General	2,978	\$43,400	\$31,000	\$49,600	\$29,400	\$34,300	\$41,200	\$49,400	\$61,100	HS/GED	None	Short-term OJT
53-7065	Stockers and Order Fillers	2,839	\$38,200	\$28,900	\$42,900	\$28,400	\$30,800	\$38,800	\$44,900	\$46,700	HS/GED	None	Short-term OJT

Engineering, Manufacturing, and Technology

Engineering, Manufacturing, and Technology is a wide career field with transportation, logistics, STEM, architecture, construction, manufacturing, and machining careers, which all experienced somewhat diverging trends in the early months of the COVID-19 pandemic. Previously, employment sat at 46,683 in this field, which has rebounded further to 47,770 as of 2023Q2 in the Northwest. Over the next three years, this career field’s employment is forecast to decline moderately (-0.4% annually), a drop from the flat (0.0%) forecast estimated in 2022Q2. All occupations except for Light Truck Drivers have forecasted declines or will remain flat over the next three years.

3-Year Forecast for Engineering, Manufacturing, and Technology Careers, Northwest Minnesota, 2023Q2



Top Ten Engineering, Manufacturing, and Technology Occupations by Employment Volume in Northwest Minnesota, 2023Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Change
Laborers and Freight, Stock, and Material Movers, Hand	2,925	\$39,900	0.91	197	396	-0.3%
Heavy and Tractor-Trailer Truck Drivers	2,850	\$55,600	1.19	125	325	-0.2%
Team Assemblers	2,219	\$43,100	1.63	90	199	-2.0%
Construction Laborers	2,218	\$48,600	1.41	203	218	0.0%
Maintenance and Repair Workers, General	1,830	\$47,600	1.04	28	170	-0.3%
Landscaping and Groundskeeping Workers	1,600	\$38,500	1.25	158	206	-0.1%
Carpenters	1,378	\$51,600	1.33	11	122	-0.3%
Light Truck Drivers	1,113	\$46,800	0.90	16	134	0.3%
Welders, Cutters, Solderers, and Brazers	1,002	\$51,300	2.10	84	93	-1.1%
First-Line Supervisors of Production and Operating Workers	974	\$68,500	1.30	38	92	-0.7%
Remaining Component Occupations	29,663	\$56,700	0.99	882	3,005	-0.4%
Engineering, Manufacturing, & Technology (CTE Field)	47,770	\$53,400	1.10	1,830	4,964	-0.4%

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

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



Many different industries employ Engineering, Manufacturing, and Technology talent in the Northwest. Locally, the industries with the greatest share of this field's talent are Other Transportation Equipment Manufacturing (4.4%) and Other Wood Product Manufacturing (4.2%) – the same two industries highlighted in 2022Q2. Most industries employing talent in this field only touch less than 1% of total talent skilled in this field, suggesting that education and training programs will need to build broad strategies that cross each of these sectors.

Engineering, Manufacturing, and Technology Field Employment by Industry, Northwest Minnesota, 2023Q2

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Other Transportation Equipment Manufacturing	4.4%	2,087	1,898	-602	1,296
Other Wood Product Manufacturing	4.2%	2,012	2,123	-207	1,916
Building Equipment Contractors	4.1%	1,960	1,950	15	1,965
Animal Slaughtering and Processing	4.0%	1,924	2,379	-55	2,324
Highway, Street, and Bridge Construction	3.1%	1,503	1,472	-18	1,454
Executive, Legislative, and Other General Government Support	3.1%	1,468	1,532	-9	1,523
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	3.0%	1,428	1,610	-89	1,521
Other General Purpose Machinery Manufacturing	2.7%	1,303	1,344	18	1,362
Residential Building Construction	2.7%	1,285	1,163	-18	1,145
General Freight Trucking	2.6%	1,257	1,455	-15	1,440
Other Specialty Trade Contractors	2.5%	1,216	1,207	-24	1,183
Foundation, Structure, and Building Exterior Contractors	2.3%	1,123	1,065	-19	1,046
Building Finishing Contractors	2.3%	1,075	953	-28	925
Automotive Repair and Maintenance	2.2%	1,073	1,146	-17	1,129
Services to Buildings and Dwellings	2.2%	1,039	1,272	-19	1,254
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1.9%	902	941	-52	889
Sugar and Confectionery Product Manufacturing	1.6%	773	971	-32	939
Utility System Construction	1.4%	662	645	-4	641
School and Employee Bus Transportation	1.3%	601	871	-3	868
Other Food Manufacturing	1.3%	598	796	85	881
All Others	47.1%	22,483	24,531	-641	23,890

Career Field Demographics

The Engineering, Manufacturing, and Technology field is heavily male (81.7% male; female representation increased by 1.1 percentage points) and White (92.0%), with a slight increase this year in the share of talent that is BIPOC by race (0.7%) from the prior years' estimates. Just under half of workers (48.8%) in this field are 45 years or older, signaling potential exacerbation of the talent shortage due to impending retirements.

Age

Northwest Minnesota



Minnesota



16 to 19 years (3.0%)
20 to 24 years (8.6%)

25 to 34 years (19.1%)
35 to 44 years (20.6%)

45 to 54 years (20.6%)
55 to 64 years (22.0%)
65 years and over (6.2%)

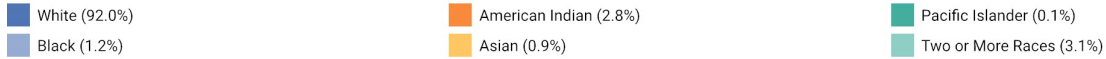


Race

Northwest Minnesota



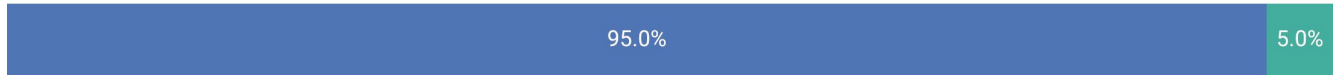
Minnesota



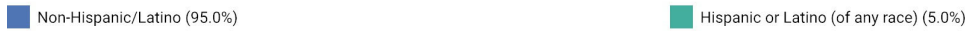
Data for Engineering, Manufacturing, & Technology (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Ethnicity

Northwest Minnesota



Minnesota



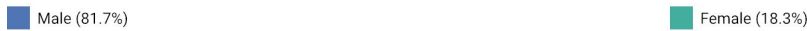
Data for Engineering, Manufacturing, & Technology (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Gender

Northwest Minnesota



Minnesota



Data for Engineering, Manufacturing, & Technology (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Educational Attainment and Requirements

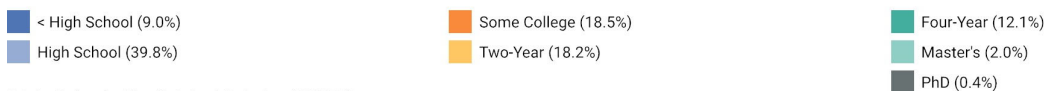
The stacked bar charts here illustrate the estimated mix of educational attainment of the workers in this career field in aggregate, followed by the typical education and training requirements in the field. In general, the Northwest Minnesota Engineering, Manufacturing, and Technology workforce is well-aligned for the typical credentials of entry-level positions. Just over one in four of all positions in this field (27.7%) require no degree, no experience, and only short-term on-the-job training. About 53.3% require experience or some on-the-job training, but still no degree. Almost one in ten people working in this field have no degree at all (9.0%), and just about two in every five (39.8%) hold a high school diploma as their highest credential. In all, 67.3% of the Engineering, Manufacturing, and Technology workforce have not completed a postsecondary credential.

Educational Attainment

Northwest Minnesota



Minnesota



Data for Engineering, Manufacturing, & Technology (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.



Education and Training Requirements

Northwest Minnesota



Minnesota



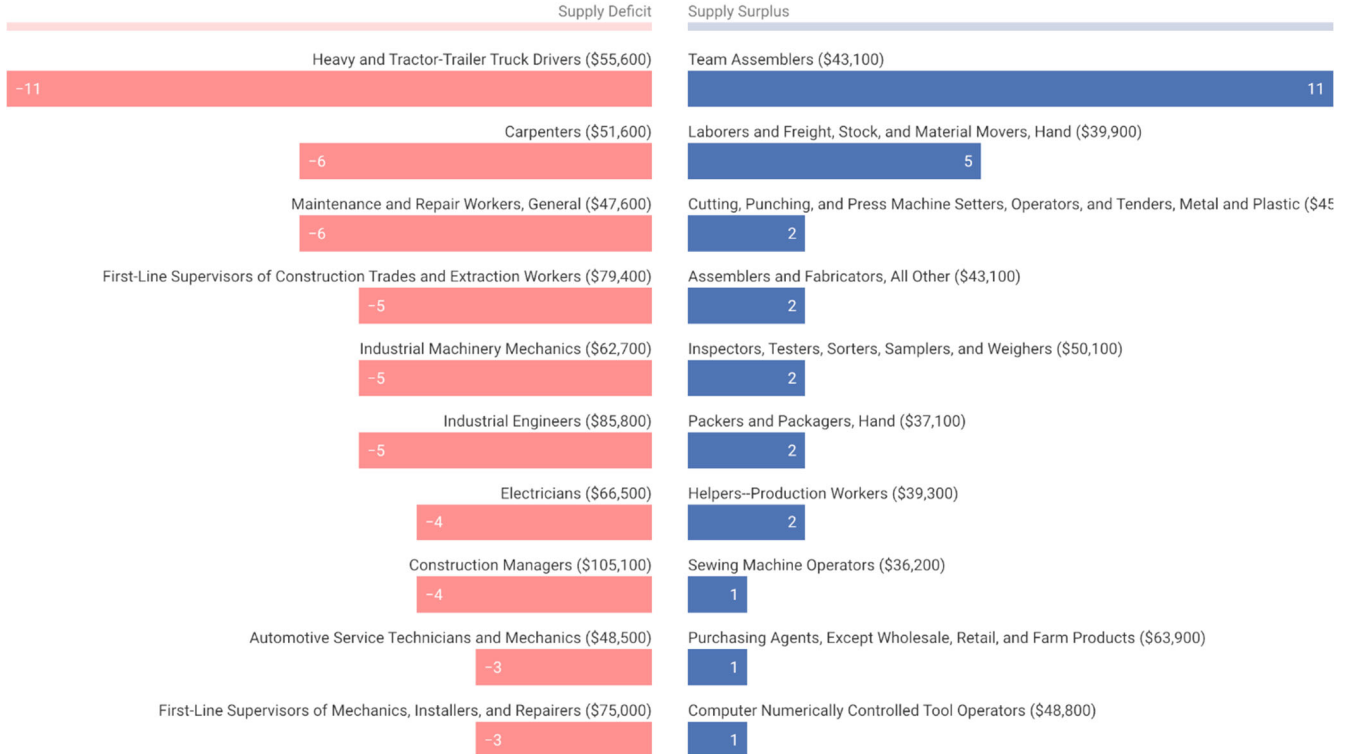
- Short-term OJT, no exp, no award (27.7%)
- Moderate-term OJT, no exp, no award (32.5%)
- Long-term training, no exp, no award (12.9%)
- Previous work experience, no award (7.9%)
- 2-year degree or certificate (11.2%)
- Bachelor's degree (7.6%)
- Postgraduate degree (0.1%)

Data for Engineering, Manufacturing, & Technology (CTE Field)
Source: JobsEQ®. Data as of 2023Q2.

Occupation Gaps

The chart below shows the potential average talent shortages over ten years. Heavy and Tractor-Trailer Truck Drivers jumped to the top occupation of forecasted shortage – falling short at least eleven skilled workers needed annually (averaged over the next ten years) to meet employer demand. A number of management, maintenance, construction, and automotive roles indicate shortages in the years ahead, with the Maintenance and Repair Worker talent pool likely falling short at least six skilled workers needed annually (averaged over the next ten years) to meet employer demand. This talent shortage is primarily due to growth in demand and retirements which far outpace the talent pipeline. All other forecasted shortages and talent surpluses are fairly similar to what was observed in 2022Q2.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Engineering, Manufacturing, and Technology, Northwest Minnesota, 2023Q2



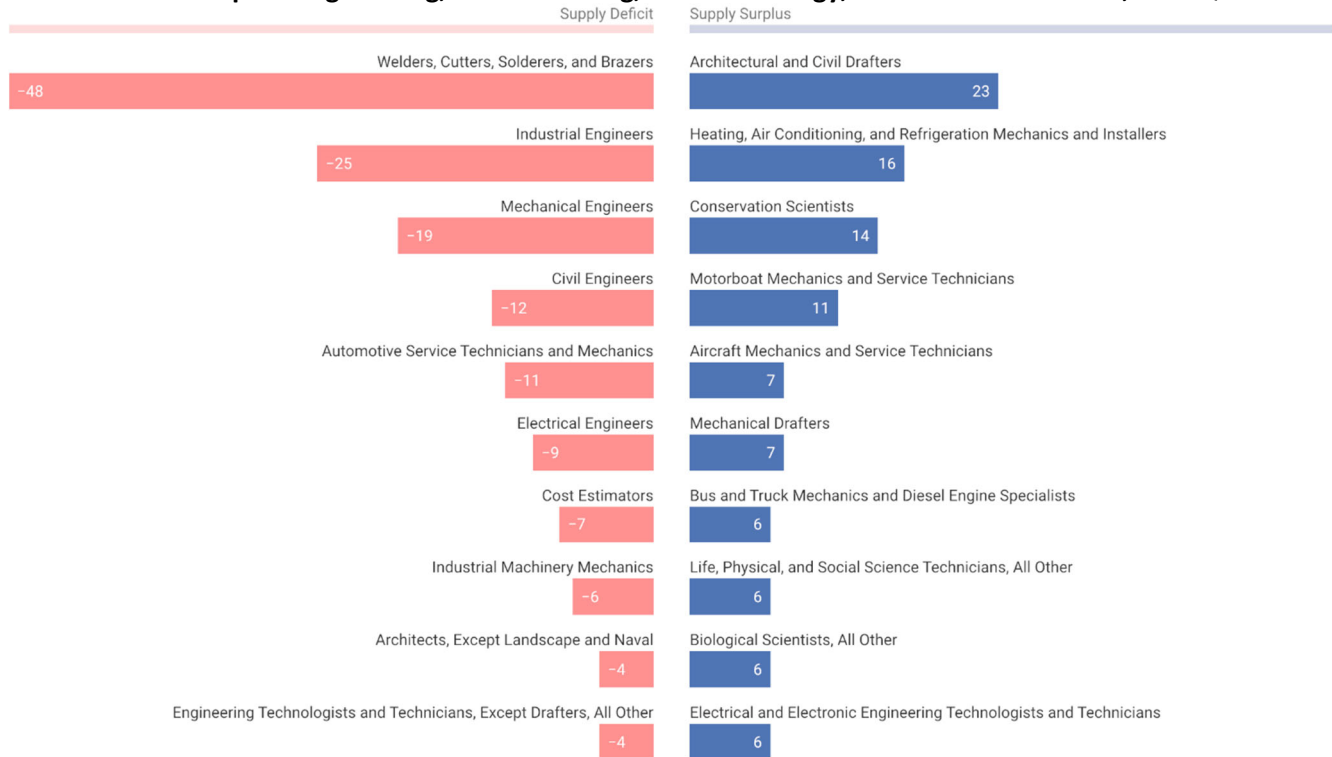


Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation reveal several important shortages. The Northwest currently under-trains some talent in Engineering, Manufacturing, and Technology when compared to national benchmarks. Top Award gaps are forecasted for Welders, Industrial Engineers, and Mechanical Engineers.

Northwest Minnesota colleges and universities are underproducing around 48 graduates annually that are needed to fill Welders positions open with employers based in this region alone – this increased by nine from the previous year.

Award Gaps in Engineering, Manufacturing, and Technology, Northwest Minnesota, 2023Q2



Promising Pathways

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, 2023Q2

Target Occupations (all HW, HD, HS, OG)
 Industrial Engineers (AG)
 Construction Managers
 Heating, Air Conditioning, & Refrigeration Mechanics
 Mechanical Engineers (AG)
 Civil Engineers (AG)

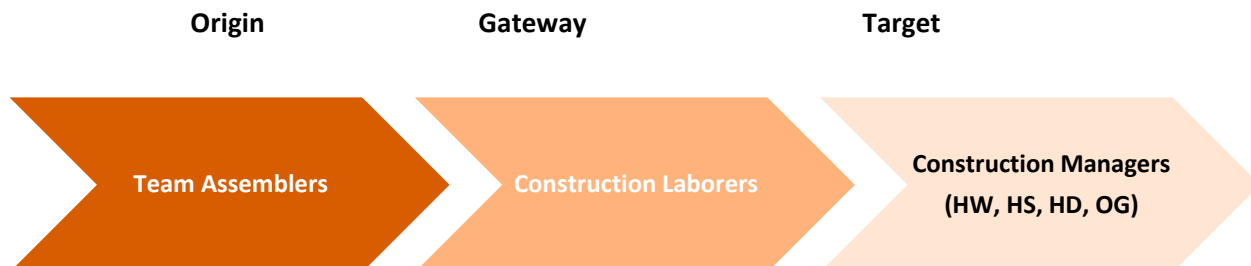
Gateway Occupations
 Heavy & Tractor Trailer Drivers (HS, HD, OG)
 Construction Laborers
 Maintenance & Repair Workers, General (OG, AG)
 Carpenters (OG)
 Light Truck Drivers (HD)

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

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

Featured Pathway

With a projected occupation gap, and high demand the pathway to the occupation of Construction Managers should be considered in the Northwest region. This occupation is highly concentrated in the region with a location quotient of 1.13. The Gateway occupation of Construction Laborers is also highly concentrated in the region (location quotient of 1.41). Construction Laborer roles are a potential entry point for the Target occupation of Construction Managers, recognizing that this role typically has an education requirement of a Bachelor's degree, but that there is a shift towards skill-based hiring across the state. The pathway of the gateway occupation of Welders could also be explored as it is very highly concentrated in the Northwest region with a location quotient of 2.10 and there is an award gap.



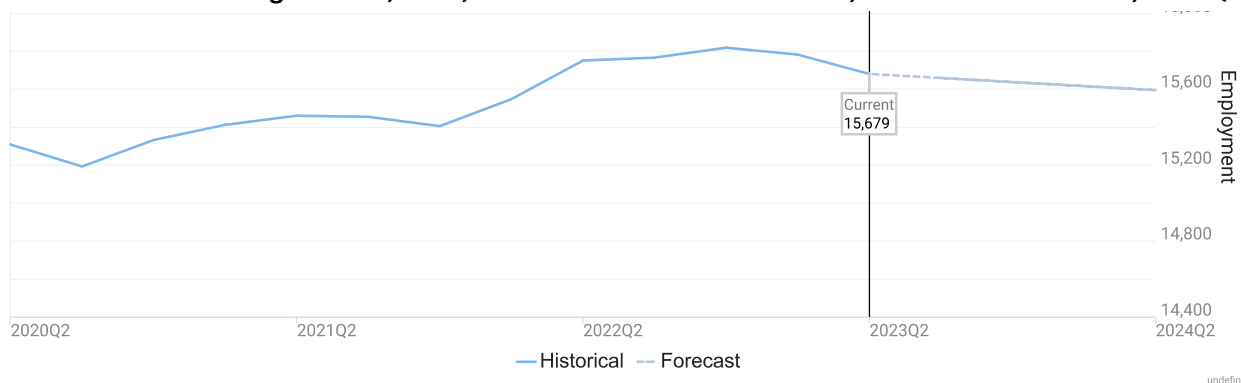
OGT Wages and Experience Level Requirements, Engineering, Manufacturing, and Technology, Northwest Minnesota, 2023Q2

SOC	Occupation	Empl Count	Mean	Entry Level	Experienced	10%	25%	50% (Median)	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
17-2112	Industrial Engineers	680	\$85,800	\$57,900	\$99,800	\$54,200	\$66,500	\$82,700	\$100,900	\$121,400	BA	None	None
11-9021	Construction Managers	623	\$105,100	\$68,900	\$123,200	\$64,500	\$79,100	\$98,400	\$109,700	\$141,500	BA	None	Mod-term OJT
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	412	\$61,900	\$41,600	\$72,000	\$37,500	\$49,200	\$62,600	\$75,100	\$89,300	Certificate	None	Long-term OJT
17-2141	Mechanical Engineers	319	\$81,500	\$62,200	\$91,200	\$59,800	\$67,100	\$75,200	\$86,500	\$105,200	BA	None	None
17-2051	Civil Engineers	182	\$92,300	\$68,000	\$104,400	\$66,000	\$74,100	\$90,300	\$107,400	\$126,700	BA	None	None
53-3032	Heavy and Tractor-Trailer Truck Drivers	2,850	\$55,600	\$43,000	\$61,800	\$40,400	\$47,800	\$52,500	\$61,300	\$76,500	Certificate	None	Short-term OJT
47-2061	Construction Laborers	2,218	\$48,600	\$35,900	\$54,900	\$34,800	\$39,000	\$46,200	\$57,400	\$66,900	None	None	Short-term OJT
49-9071	Maintenance and Repair Workers, General	1,830	\$47,600	\$33,300	\$54,700	\$30,600	\$38,200	\$47,600	\$55,800	\$63,200	HS/GED	None	Mod-term OJT
47-2031	Carpenters	1,378	\$51,600	\$38,600	\$58,200	\$37,300	\$42,200	\$51,300	\$60,800	\$64,500	HS/GED	None	Apprenticeship
53-3033	Light Truck Drivers	1,113	\$46,800	\$30,900	\$54,800	\$26,600	\$36,200	\$45,900	\$52,000	\$78,900	HS/GED	None	Short-term OJT
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2,925	\$39,900	\$31,400	\$44,200	\$30,500	\$33,500	\$39,100	\$43,800	\$49,600	None	None	Short-term OJT
51-2092	Team Assemblers	2,219	\$43,100	\$35,100	\$47,200	\$33,600	\$38,100	\$42,300	\$48,200	\$52,700	HS/GED	None	Mod-term OJT
37-3011	Landscaping and Groundskeeping Workers	1,600	\$38,500	\$28,100	\$43,700	\$26,800	\$30,600	\$38,200	\$45,500	\$51,500	None	None	Short-term OJT
51-3092	Food Batchmakers	761	\$39,300	\$31,900	\$43,000	\$31,800	\$32,900	\$36,700	\$43,800	\$54,400	HS/GED	None	Mod-term OJT
51-9111	Packaging and Filling Machine Operators and Tenders	635	\$40,000	\$34,200	\$42,900	\$32,700	\$36,700	\$38,700	\$43,200	\$48,700	HS/GED	None	Mod-term OJT

Agriculture, Food, and Natural Resources

There are eight career pathways within Agriculture, Food, and Natural Resources: 1) Food Products and Processing Systems, 2) Plant Systems, 3) Animal Systems, 4) Natural Resources Systems, 5) Agribusiness Systems, 6) Environmental Services Systems, 7) Power, Structural and Technical Systems, and 8) Biotechnology Systems. These roles represent positions that are at least 50% or more concentrated in Agriculture, Food, and Natural Resources industries, and as such exclude some occupations that are critical to the industry but may have smaller in-industry employment numbers (such as Ag Loan Officers, Ag Financing, or some trades). About 15,679 people are employed in Agriculture, Food, and Natural Resources roles in the region as of 2023Q2. Over the next three years, this career field’s employment is forecast to decline by about -0.6% in the Northwest, a drop from last year’s forecast of -0.1%.

3-Year Forecast for Agriculture, Food, and Natural Resources Careers, Northwest Minnesota, 2023Q2



Top Ten Agriculture, Food, and Natural Resources Occupations by Employment Volume in Northwest Minnesota, 2023Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Change
Farmers, Ranchers, and Other Agricultural Managers	4,833	\$66,200	5.69	-260	414	-1.4%
Landscaping and Groundskeeping Workers	1,600	\$38,500	1.25	158	206	-0.1%
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1,532	\$37,900	2.43	77	222	-0.9%
Food Batchmakers	761	\$39,300	4.05	89	106	0.1%
Plumbers, Pipefitters, and Steamfitters	617	\$62,200	1.16	103	62	-0.1%
Meat, Poultry, and Fish Cutters and Trimmers	463	\$35,700	3.03	18	57	-0.2%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	412	\$61,900	0.90	84	40	0.2%
Farmworkers, Farm, Ranch, and Aquacultural Animals	399	\$35,000	2.46	-3	57	-1.1%
Animal Caretakers	282	\$31,100	0.76	51	57	1.1%
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	280	\$57,300	1.11	29	28	-0.1%
Remaining Component Occupations	4,496	\$57,000	1.18	29	520	-0.2%
AFNR - Agriculture, Food, and Natural Resources (CTE Field)	15,679	\$53,900	1.69	371	1,773	-0.6%

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

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



Many different industries employ Agriculture, Food, and Natural Resources talent in the Northwest. Locally, the industries with the greatest share of this field's talent are Crop Production (14.8%, down 1.1 percentage points) and Animal Production (13.7%, down 2.2 percentage points). Most industries employing talent in this field only touch less than 1% of total talent skilled in this field, and span from grocery to ranching to electric power generation.

Agriculture, Food, and Natural Resources Field Employment by Industry, Northwest Minnesota, 2023Q2

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Change	10-Year Total Demand
Crop Production (Proprietors)	14.8%	2,315	2,321	-359	1,963
Animal Production (Proprietors)	13.7%	2,142	2,107	-299	1,808
Services to Buildings and Dwellings	6.6%	1,030	1,286	-19	1,267
Building Equipment Contractors	5.3%	829	826	12	838
Oilseed and Grain Farming	5.0%	778	1,082	-41	1,042
Animal Slaughtering and Processing	3.8%	589	756	-10	746
Support Activities for Crop Production	3.5%	545	806	-43	764
Executive, Legislative, and Other General Government Support	3.3%	511	553	-9	544
Sugar and Confectionery Product Manufacturing	2.5%	390	532	-19	513
Vegetable and Melon Farming	2.3%	358	507	-6	501
Other Crop Farming	2.2%	345	477	-21	457
Cattle Ranching and Farming	2.2%	342	460	-27	433
Other Professional, Scientific, and Technical Services	1.9%	301	347	52	399
Machinery, Equipment, and Supplies Merchant Wholesalers	1.5%	230	220	1	222
Other Personal Services	1.4%	226	408	34	442
Grocery and Convenience Retailers	1.4%	216	274	-13	261
Electric Power Generation, Transmission and Distribution	1.4%	215	181	-28	153
Other Amusement and Recreation Industries	1.3%	210	274	12	286
Other Food Manufacturing	1.3%	203	305	27	331
Wired and Wireless Telecommunications (except Satellite)	1.3%	197	220	8	228
All Others	23.6%	3,708	4,587	-86	4,501



Career Field Demographics

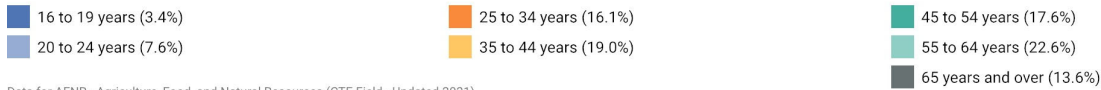
The Agriculture, Food, and Natural Resources field remains predominantly male (74.6%, a slight decrease from last year's 74.8%) and White (93.3%, decreasing by 0.1 percentage points), but with variation by career pathway. Overall, the age of the workforce in this field is distributed evenly from 25 through 64 years, but key career pathways in Animal Systems and Food Products and Processing Systems in particular have a rapidly aging workforce with limited new talent entering.

Age

Northwest Minnesota



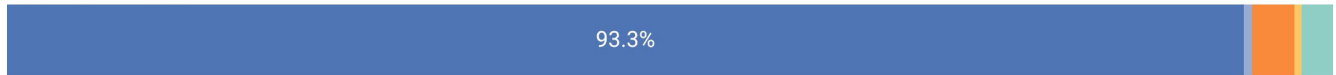
Minnesota



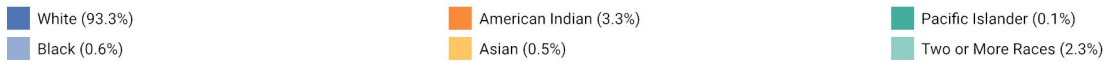
Data for AFNR - Agriculture, Food, and Natural Resources (CTE Field - Updated 2021)
Source: JobsEQ®. Data as of 2023Q2.

Race

Northwest Minnesota



Minnesota



Data for AFNR - Agriculture, Food, and Natural Resources (CTE Field - Updated 2021)
Source: JobsEQ®. Data as of 2023Q2.

Ethnicity

Northwest Minnesota



Minnesota



Data for AFNR - Agriculture, Food, and Natural Resources (CTE Field - Updated 2021)
Source: JobsEQ®. Data as of 2023Q2.

Gender

Northwest Minnesota



Minnesota



Data for AFNR - Agriculture, Food, and Natural Resources (CTE Field - Updated 2021)
Source: JobsEQ®. Data as of 2023Q2.



Educational Attainment and Requirements

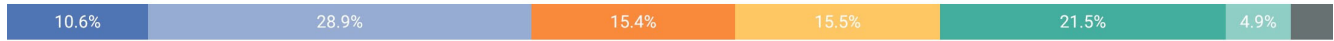
The stacked bar charts here illustrate the estimated mix of educational attainment of the workers in this career field in aggregate, followed by the typical education and training requirements in the field. Nearly one in three positions in this field regionally (30.0% - decreased by 0.6 percentage points from the prior year) require no degree, no experience, and only short-term on-the-job training—similar to the share of jobs statewide with no requirements (30.3%). Almost two out of three (56.2%) require experience or some on-the-job training, but still no degree; in all, 86.2% of positions require no formal education (down 2.3 percentage point from the prior year). About 11.3% of the workforce in this field has no degree at all, and about one in three workers in this field (33.0%) hold a high school diploma as their highest credential. In all, 60.0% of the Agriculture, Food, and Natural Resources workforce have not completed a postsecondary credential.

Educational Attainment

Northwest Minnesota



Minnesota



- < High School (11.3%)
- High School (33.0%)
- Some College (15.7%)
- Two-Year (19.1%)
- Four-Year (16.9%)
- Master's (2.6%)
- PhD (1.4%)

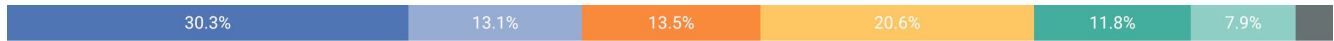
Data for AFNR - Agriculture, Food, and Natural Resources (CTE Field - Updated 2021)
Source: JobsEQ®. Data as of 2023Q2.

Education and Training Requirements

Northwest Minnesota



Minnesota



- Short-term OJT, no exp, no award (30.0%)
- Moderate-term OJT, no exp, no award (12.9%)
- Long-term training, no exp, no award (10.8%)
- Previous work experience, no award (35.2%)
- 2-year degree or certificate (6.3%)
- Bachelor's degree (3.2%)
- Postgraduate degree (1.5%)

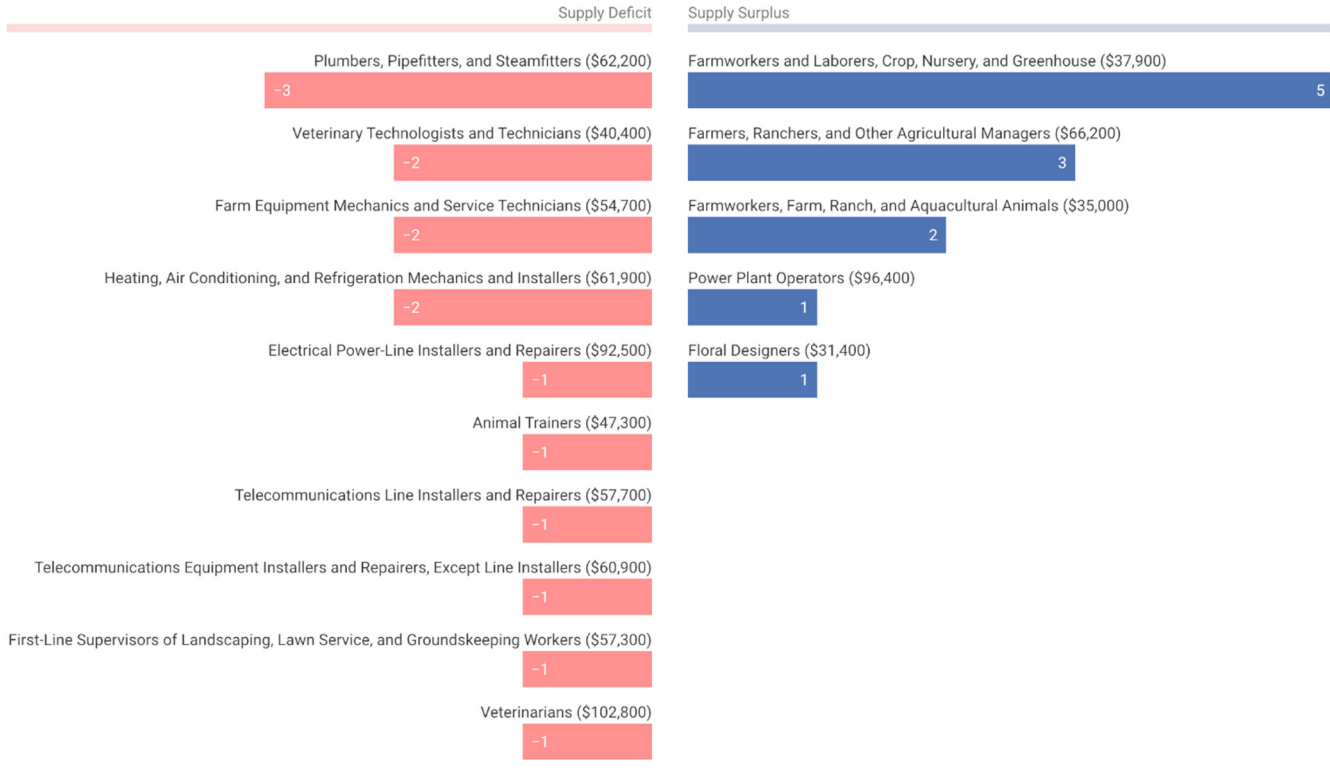
Data for AFNR - Agriculture, Food, and Natural Resources (CTE Field - Updated 2021)
Source: JobsEQ®. Data as of 2023Q2.



Occupation Gaps

The chart below shows the potential average annual gaps over ten years in a conservative estimate of talent shortfall. A number of crucial trades, veterinary, environmental services, and natural sciences roles indicate shortages in the years ahead, matching with statewide shortages. In 2022Q2, Farmers, Ranchers, and Other Agricultural Managers were forecasting the highest shortage, but now forecast a slight surplus as of 2023Q2. Retirements and growing demand unmet by the local talent supply chain are both contributing factors. While forecasted growth remains small, there is continued demand for replacement talent to fill job openings that will be challenging to meet with the supply of local talent currently available.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Agriculture, Food, and Natural Resources, Northwest Minnesota, 2023Q2

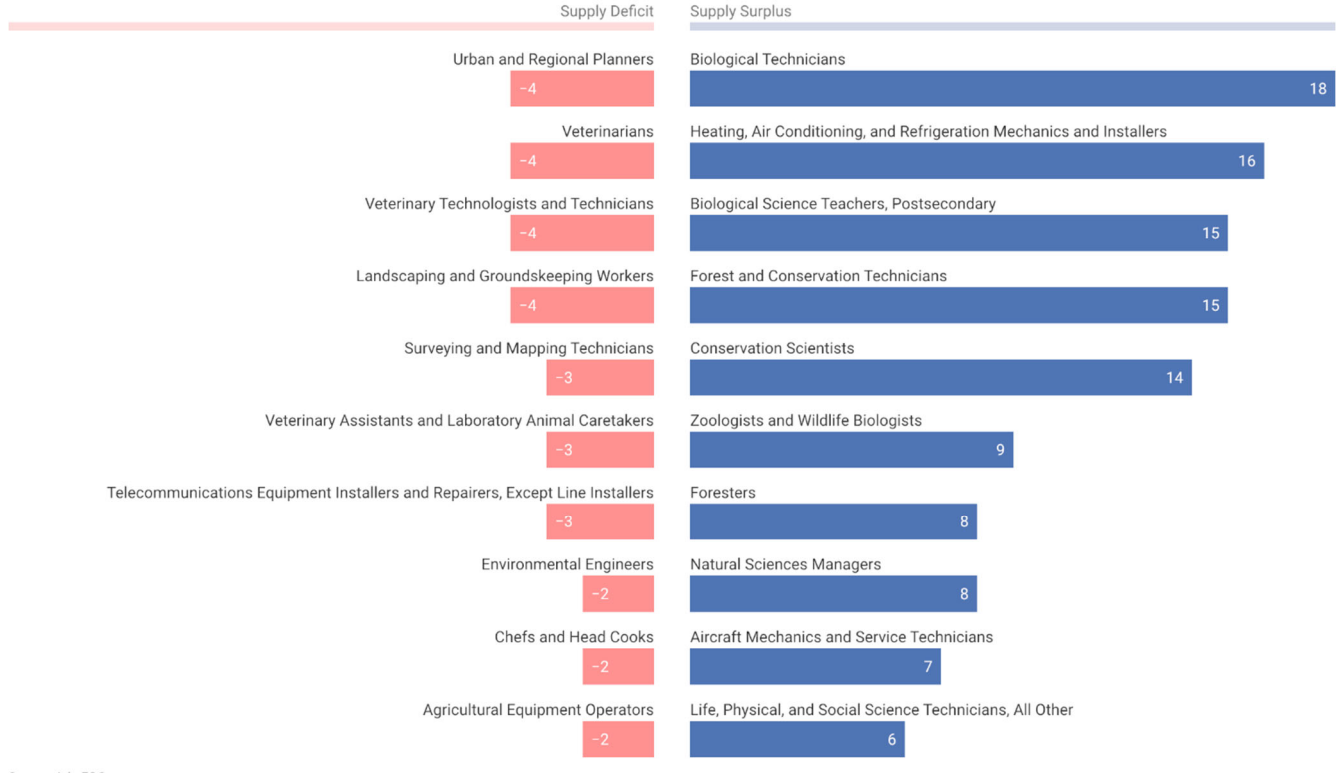


Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation reveal several moderate shortages. Postsecondary institutions in the Northwest currently prepare a smaller volume of talent in Agriculture, Food, and Natural Resources when compared to national benchmarks. Northwest Minnesota colleges and universities are underproducing at least four graduates annually that are needed to fill Urban and Regional Planner, Veterinarian, Vet Tech, and Landscaping and Groundskeeping Worker positions open with employers based in the Northwest. The majority of Animal Systems completions are made in the MSP Metro.



Award Gaps in Agriculture, Food, and Natural Resources, Northwest Minnesota, 2023Q2



Promising Pathways

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, 2023Q2

Target Occupations (all HW, HD, HS)

Heating, Air Conditioning, & Refrigeration Mechanics (OG, AG)
 Telecommunications Equipment Installers & Repairers (OG, AG)
 Urban & Regional Planners (AG)
 Biological Science Teachers, Postsecondary
 Aircraft Mechanics

Gateway Occupations

Farm Equipment Mechanics (HD, OG)
 Chefs & Head Cooks (HD, AG)
 Refuse & Recyclable Material Collectors (HD)
 Logging Equipment Operators (HD)
 Tree Trimmers and Pruners (HD)

Origin Occupations

Landscaping & Groundskeeping Workers (HD, AG)
 Farmworkers & Laborers
 Food Batchmakers (HD, 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

Featured Pathway

There is an opportunity to develop a pipeline for Veterinarians. There is zero unemployment for the occupation of Veterinarian and there are no Gateway occupations for this pathway as the credentials for these roles don't stack. Effectively, this is a broken pathway. Each of the roles below shows a projected 5-year growth forecast of 1.5%. Veterinary Assistants and Laboratory Animal Caretakers have an average annual salary of \$34,200 and are in high demand. The Veterinary Technician and Technologists occupation, with an average annual salary of \$40,400, is both in high demand and considered a high skill role – there is also a uniquely high local concentration of Veterinary Techs in the Northwest region with a location quotient of 1.10. Each of these occupations has a shortage of graduates and both Veterinarians and Vet Techs are also facing occupation shortages as well.



OGT Wages and Experience Level Requirements, Agriculture, Food, and Natural Resources, Northwest Minnesota, 2023Q2

SOC	Occupation	Empl Count	Mean	Entry Level	Experienced	10%	25%	50% (Median)	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	412	\$61,900	\$41,600	\$72,000	\$37,500	\$49,200	\$62,600	\$75,100	\$89,300	Certificate	None	Long-term OJT
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	165	\$60,900	\$43,800	\$69,500	\$40,700	\$50,200	\$60,000	\$74,400	\$77,800	Certificate	None	Mod-term OJT
19-3051	Urban and Regional Planners	53	\$71,000	\$55,700	\$78,600	\$54,800	\$58,400	\$66,000	\$76,100	\$99,000	MA	None	None
25-1042	Biological Science Teachers, Postsecondary	51	\$81,500	\$57,800	\$93,300	\$56,000	\$63,700	\$81,200	\$86,400	\$109,100	PhD	None	None
49-3011	Aircraft Mechanics and Service Technicians	45	\$55,800	\$40,900	\$63,300	\$40,700	\$42,800	\$51,300	\$63,300	\$78,500	Certificate	None	None
49-3041	Farm Equipment Mechanics and Service Technicians	274	\$54,700	\$40,700	\$61,800	\$35,300	\$49,000	\$54,200	\$62,600	\$69,400	HS/GED	None	Long-term OJT
35-1011	Chefs and Head Cooks	159	\$53,000	\$34,700	\$62,200	\$32,100	\$39,700	\$49,900	\$62,700	\$79,500	HS/GED	>5 years	None
53-7081	Refuse and Recyclable Material Collectors	155	\$48,600	\$34,900	\$55,400	\$32,500	\$39,600	\$49,800	\$58,000	\$63,900	None	None	Short-term OJT
45-4022	Logging Equipment Operators	98	\$47,900	\$39,800	\$52,000	\$40,300	\$40,900	\$49,800	\$51,000	\$59,400	HS/GED	None	Mod-term OJT
37-3013	Tree Trimmers and Pruners	91	\$55,300	\$41,100	\$62,400	\$39,300	\$46,200	\$60,200	\$62,500	\$65,300	HS/GED	None	Short-term OJT
37-3011	Landscaping and Groundskeeping Workers	1,600	\$38,500	\$58,600	\$43,700	\$26,800	\$30,600	\$38,200	\$45,500	\$51,500	None	None	Short-term OJT
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1,532	\$37,900	\$95,400	\$41,900	\$28,300	\$32,700	\$38,000	\$44,300	\$46,800	None	None	Short-term OJT
51-3092	Food Batchmakers	761	\$39,300	\$66,400	\$43,000	\$31,800	\$32,900	\$36,700	\$43,800	\$54,400	HS/GED	None	Mod-term OJT
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	463	\$35,700	\$30,800	\$38,100	\$30,800	\$32,100	\$35,900	\$40,000	\$40,400	None	None	Short-term OJT
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	399	\$35,000	#N/A	\$38,700	\$26,100	\$29,700	\$33,900	\$37,500	\$47,300	None	None	Short-term OJT

Conclusion

A variety of new occupations of need have emerged, which signals some rebounding and recovery following the pandemic, and reflects the tight labor market across all industry sectors. What continues to be true is the most in-demand occupations of the future typically require a two-year degree or higher, offer higher average wages, and will likely experience talent shortages within the next three years and beyond due to a low qualified talent pool located within the region. An exciting new development likely to have impact across all industries is the Governor's decision to remove degree requirements for most Minnesota government jobs.

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

In the Northwest region, nine out of ten of the top occupations in the Business, Management, and Administration field are forecasting declines over the next ten years and this field faces a particular shortage of management roles. Engineering award gaps are in the top ten for the region overall and there is an exacerbation of talent shortages in this field with nearly 50% of the workers 45 years or older. The region is poised to see changes in demand for talent over the next five years and beyond as the region continues to wrestle with deepening talent shortages and face the possibility of recession as interest rates continue to rise. There is urgency to address these talent shortages now by leveraging new ways of working remotely and leveraging new technologies wherever possible.

Data Notes

- This 2023 publication was compiled by Julia Diaz, Research Analyst for RealTime Talent in November 2023. She can be reached at julia@realtimetalentmn.org
- Occupation employment by default indicates employment by place of work. Occupation employment is as of 2023Q2 and based on industry employment and local staffing patterns calculated by Chmura and utilizing BLS OES data. Employment forecasts are by RealTime Talent using models provided by Chmura and are consistent with BLS national-level 10-year forecasts. Occupation wages (mean, median, and percentiles) are derived from BLS OES data as of 2022 and represent the average for all Covered Employment. Entry-level and experienced wages are derived from these source data, computed by Chmura.
- Industry employment is as of 2023Q2 and based upon BLS QCEW data that are imputed by Chmura 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 Chmura for 2023Q2 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 2021-2022 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.
- General job ads data are online job posts from the Real-Time Intelligence (RTI) data set, produced by Chmura and gleaned from over 40,000 websites. Data reflect ads active during September 2023 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. The sections on Employer Demand include Job ads data from Gartner TalentNeuron Plan, 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 Chmura, 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 2023Q2 and modeled by Chmura 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.



- 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. <https://careertech.org/career-clusters> and viewable on ONET <https://www.onetonline.org/find/career?c=8>, but updated to the 2020 SOC classification system.
- Figures may not sum due to rounding.



Definitions and Methodology

High-Wage

High-Wage occupations are defined as occupations that have average annual wages greater than the overall regional average wage (\$55,600 in the region as of 2023Q2).

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 Chmura using U.S. Census Bureau Educational Attainment data projected to 2023Q2 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 2023Q2 (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 2023Q2 (i.e. high employer retention demand)

D4: Unempl: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 2023 (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 2023 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 Chmura and use a multitude of data sources. Employment supply and demand projections are based on a starting date of 2023Q2 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 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 2021-2022 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 Chmura. 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.