

Southeast Minnesota

CAREER & TECHNICAL EDUCATION

Workforce Trends & Careers of Tomorrow

RealTime Talent

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RealTime Talent

Using data to build the
world's best workforce

Workforce Trends & Careers of Tomorrow

Overview

A year and a half after COVID-19 first appeared, the impacts of shutdowns, business closures, and shifting workforce needs worldwide have been ongoing and cumulative. Approximately 1.5 million Minnesotans have made initial unemployment claims since the beginning of the COVID-19 pandemic—about 47% of the state’s employed workforce just before the pandemic hit.¹ Many of the economic impacts of the COVID-19 pandemic will be felt far into the future, and in ways that may still be yet unknown.

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. Each of the six regional reports—and statewide report—include:

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

About This Report

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

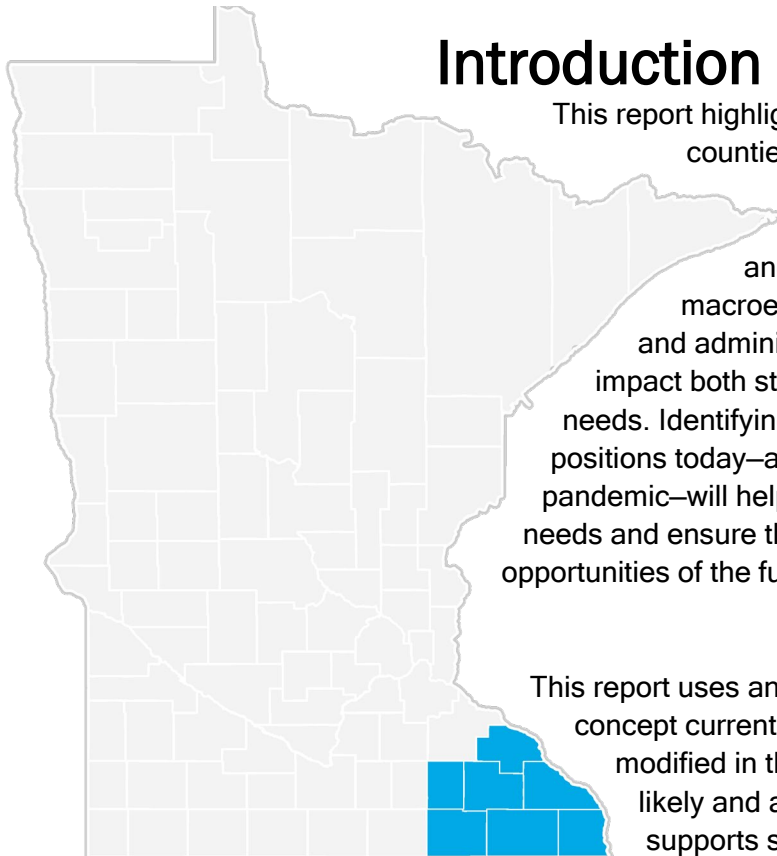
¹ Unemployment Statistics, MN Department of Employment and Economic Development. March 16, 2020 - August 27, 2020. Accessed 9/4/2020 at <https://mn.gov/deed/data/data-tools/unemployment-insurance-statistics/>

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Southeast Minnesota

Introduction



This report highlights the current and future talent needs in the seven counties of Southeast Minnesota.² Starting from the community demographics, unique vulnerabilities and opportunities, and the critical occupations and industries underpinning the regional economy, this macroeconomic overview is intended to support educators and administrators who seek to go beyond compliance to impact both student lives and local businesses most pressing needs. Identifying the skills, certifications, and qualifications for positions today—and how they have been disparately impacted by the pandemic—will help the education community anticipate community needs and ensure that curriculum prepares students for relevant job opportunities of the future here in Southeast Minnesota.

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

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

Target Occupations

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

Gateway Occupations

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

Origin Occupations

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

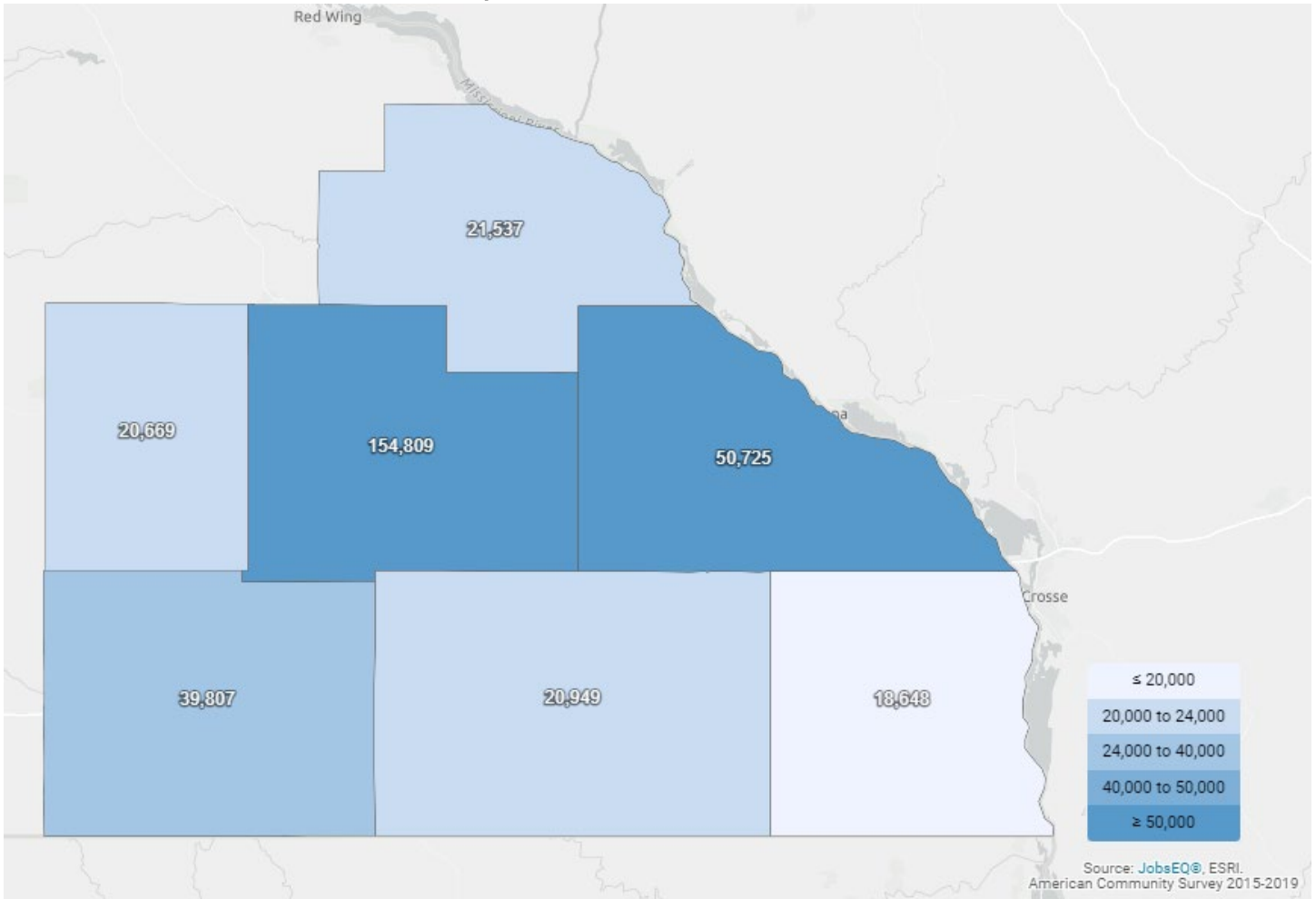
The cities of Rochester, Winona, Austin, Byron and Lake City are home to the largest local concentrations of population and are economic hubs for the region. In all, 327,144 people live in Southeast Minnesota, according to 2015-2019 American Community Survey Estimates—an increase of about 2,000 people from the prior year's estimates (325,147 people). Based on year-over-year population change, about 332,329 people are estimated to live in the region as of 2021. About 23.4% of

Southeast Minnesota's population are minors under 18 years of age—a smaller share than in the Central and

² Dodge, Fillmore, Houston, Mower, Olmsted, Wabasha, Winona Counties.

MSP Metro regions, and similar to Southwest Minnesota. The region's median age of 38.5 years is similar to the statewide median (38 years).

Resident Population of Southeast Minnesota Counties

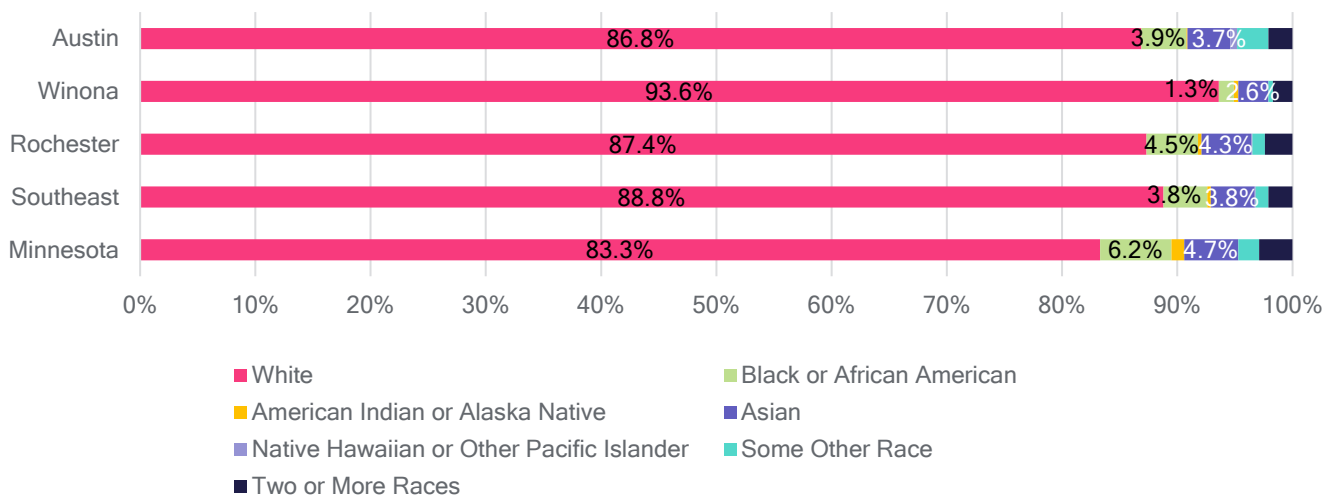


Community Profile

Demographics

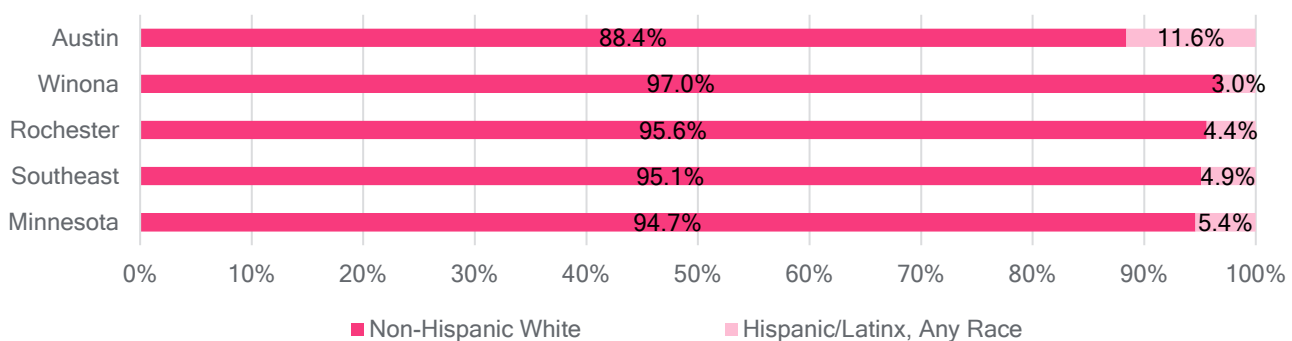
Population diversity increased between the two most recent population estimates statewide and in the Southeast by half of a percentage point. Across the region overall, 11.2% of the population identify as Black, Asian, American Indian, Native Hawaiian, or some other race. The demographic makeup of communities across the Southeast look quite different from one another; 1.3% of people living in the Winona μSA identify as Black or African American, compared to 4.5% in the Rochester MSA. Approximately 4.9% of Southeast Minnesota's residents are Hispanic or Latinx, compared to 5.4% statewide. Austin, MN has the largest concentration of the metro and micropolitan areas listed below with 11.6% of the local population being Hispanic or Latinx. This was a decrease for Austin compared to last year's estimates.

Population Race, All Ages



American Community Survey 2015-2019.

Population Ethnicity, All Ages



American Community Survey 2015-2019.

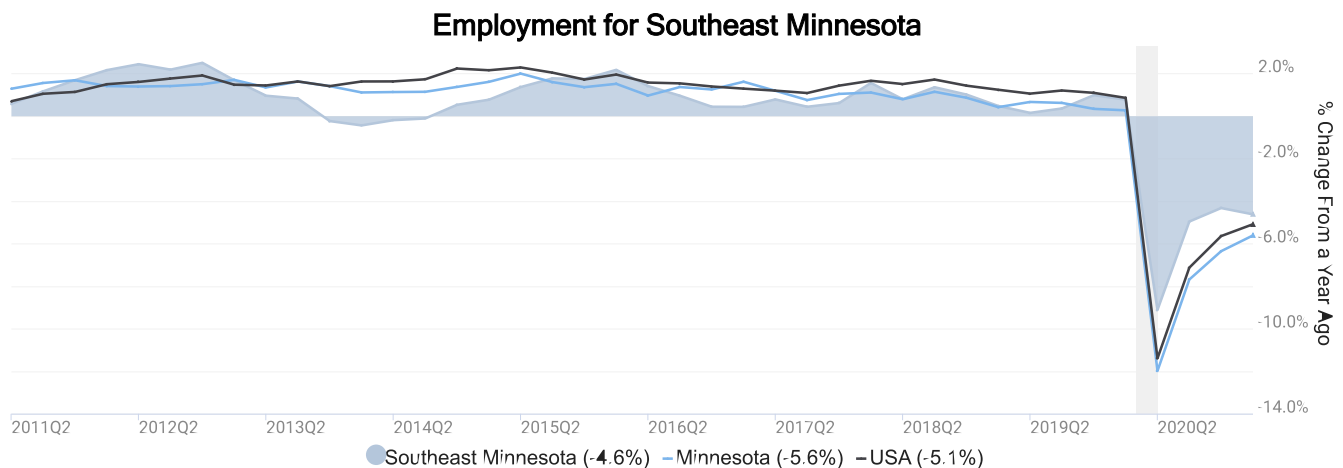
Community Demographics

Demographics	Percent			Value		
	Southeast Minnesota	Minnesota	USA	Southeast Minnesota	Minnesota	USA
Population (ACS)	—	—	—	327,144	5,563,378	324,697,795
Male	49.5%	49.8%	49.2%	161,984	2,770,873	159,886,919
Female	50.5%	50.2%	50.8%	165,160	2,792,505	164,810,876
Median Age ²	—	—	—	38.5	38.0	38.1
Under 18 Years	23.4%	23.3%	22.6%	76,453	1,295,848	73,429,392
18 to 24 Years	9.5%	9.0%	9.4%	30,956	500,630	30,646,327
25 to 34 Years	12.8%	13.6%	13.9%	41,775	756,337	45,030,415
35 to 44 Years	12.1%	12.5%	12.6%	39,635	697,077	40,978,831
45 to 54 Years	12.1%	12.7%	13.0%	39,479	708,668	42,072,620
55 to 64 Years	13.5%	13.4%	12.9%	44,148	746,120	41,756,414
65 to 74 Years	9.1%	8.8%	9.1%	29,682	490,739	29,542,266
75 Years, and Over	7.6%	6.6%	6.5%	25,016	367,959	21,241,530
Race: White	88.8%	82.8%	72.5%	290,459	4,609,049	235,377,662
Race: Black or African American	3.8%	6.4%	12.7%	12,332	356,515	41,234,642
Race: American Indian and Alaska Native	0.3%	1.0%	0.8%	984	58,011	2,750,143
Race: Asian	3.8%	4.8%	5.5%	12,307	268,181	17,924,209
Race: Native Hawaiian and Other Pacific Islander	0.1%	0.0%	0.2%	382	2,194	599,868
Race: Some Other Race	1.1%	1.9%	4.9%	3,651	104,032	16,047,369
Race: Two or More Races	2.1%	3.0%	3.3%	7,029	165,396	10,763,902
Hispanic or Latino (of any race)	4.9%	5.4%	18.0%	15,952	299,556	58,479,370

American Community Survey 2015-2019 unless noted otherwise.

Employment

As of 2020Q1, total employment in Southeast Minnesota was 176,712 (based on a four-quarter moving average). By 2021Q1, employment in the region dropped to 167,326 (based on a four-quarter moving average). Over the year ending 2021Q1, employment declined an average of 4.6% in the region.

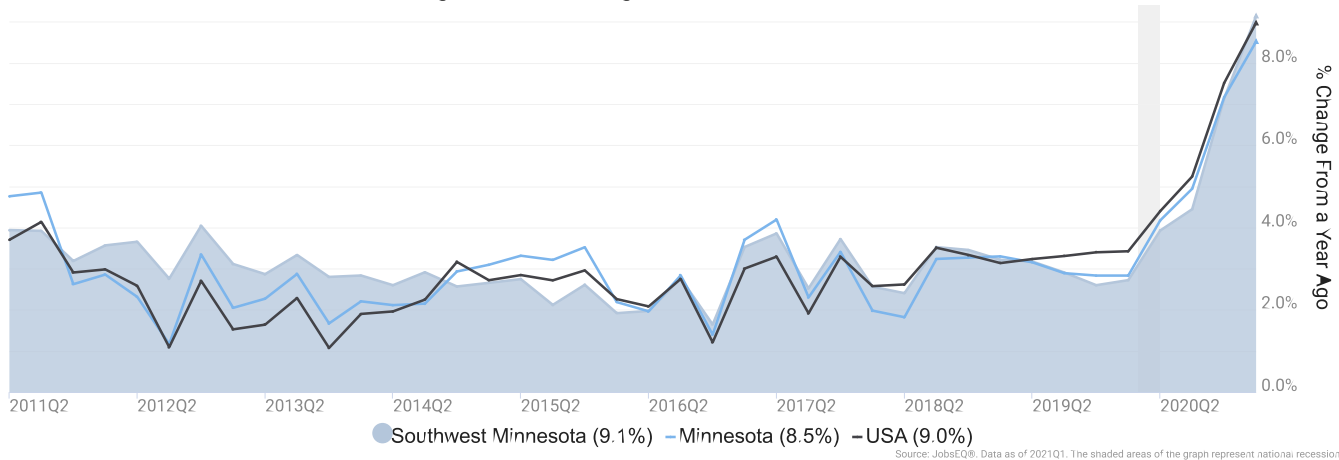


Employment data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and imputed where necessary. Data are updated through 2020Q4 with preliminary estimates updated to 2021Q1.

The average worker in Southeast Minnesota earned annual wages of \$59,666 as of 2021Q1, an increase of about \$4,300 from one year prior, 2020Q1. Average annual wages per worker increased 7.8% in the region over the preceding four quarters. Wages rose similarly nationwide, where annual average wages were \$63,393 as of 2021Q1 compared to \$57,624 as of 2020Q1. This is due in part to the loss of low-wage workers

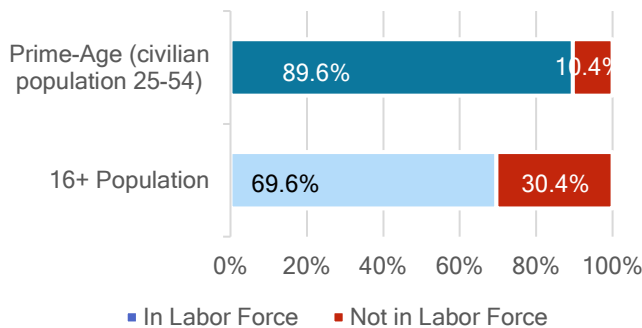
during the COVID-19 pandemic and the ongoing challenge of recruiting and hiring talent for entry-level, lower-wage jobs, particularly in sectors like hospitality, tourism, retail that were hit hardest by the pandemic.

Average Annual Wages for Southeast Minnesota



Annual average wages per worker data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and imputed where necessary. Data are updated through 2020Q4 with preliminary estimates updated to 2021Q1.

Labor Force Participation Rate



The region has a civilian labor force of 180,179 with a participation rate of 69.6%, exactly the same as the statewide participation rate for the population over 16. The participation rate of the prime working age population (between the ages of 25 and 64) is just ahead of the statewide rate—89.6% compared to the statewide 88.4%.

The Southeast area has a slightly higher share of veterans in the region, at 4.0% of the regional population compared to 3.8% broadly across the state. Veteran labor force participation is slightly higher in the Southeast region than

American Community Survey 2015-2019 unless noted otherwise.

the statewide average, 81.1% compared to 80.4% statewide. In the Southeast, 8.2% of the adult population under 65 has a disability (8.7% statewide), and 57.3% of adults with a disability are in the labor force (53.0% statewide). The Southeast region has a higher share of disconnected youth (2.3% of youth) compared to the rate statewide (1.7%). The share of youth who are disconnected from work or school is highest in Austin, MN where 9.4% of youth are disconnected (about 185 youth total).

Economic and Social Characteristics of Southeast Minnesota

Economic and Social Characteristics	Percent			Values		
	Southeast Minnesota	Minnesota	USA	Southeast Minnesota	Minnesota	USA
Labor Force Participation Rate and Size (civilian population 16 years and over)	69.6%	69.6%	63.2%	180,179	3,069,730	163,555,585
Prime-Age Labor Force Participation Rate and Size (civilian population 25-54)	89.6%	88.4%	82.1%	108,319	1,908,936	104,634,905
Armed Forces Labor Force	0.1%	0.1%	0.4%	134	2,514	1,073,907

Veterans, Age 18-64	4.0%	3.8%	4.6%	7,801	130,320	9,143,042
Veterans Labor Force Participation Rate and Size, Age 18-64	81.1%	80.4%	76.6%	6,330	104,731	7,003,778
Median Household Income ²	–	–	–	\$68,601	\$71,306	\$62,843
Per Capita Income	–	–	–	\$35,973	\$37,625	\$34,103
Poverty Level (of all people)	9.6%	9.7%	13.4%	30,571	526,065	42,510,843
Households Receiving Food Stamps/SNAP	7.1%	7.9%	11.7%	9,243	172,477	14,171,567
Enrolled in Grade 12 (% of total population)	1.4%	1.4%	1.4%	4,580	80,319	4,422,344
Disconnected Youth ³	2.3%	1.7%	2.5%	394	4,961	423,273
Children in Single Parent Families (% of all children)	25.9%	28.1%	34.1%	19,155	350,236	23,790,005
Uninsured	5.0%	4.5%	8.8%	16,130	246,184	28,248,613
With a Disability, Age 18-64	8.2%	8.7%	10.3%	15,916	293,656	20,187,604
With a Disability, Age 18-64, Labor Force Participation Rate and Size	57.3%	53.0%	42.2%	9,125	155,592	8,509,463
Poverty Level (of all people)	9.6%	9.7%	13.4%	30,571	526,065	42,510,843

American Community Survey 2015-2019 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



94.1% of prime working age adult residents have at least a high school diploma or GED.

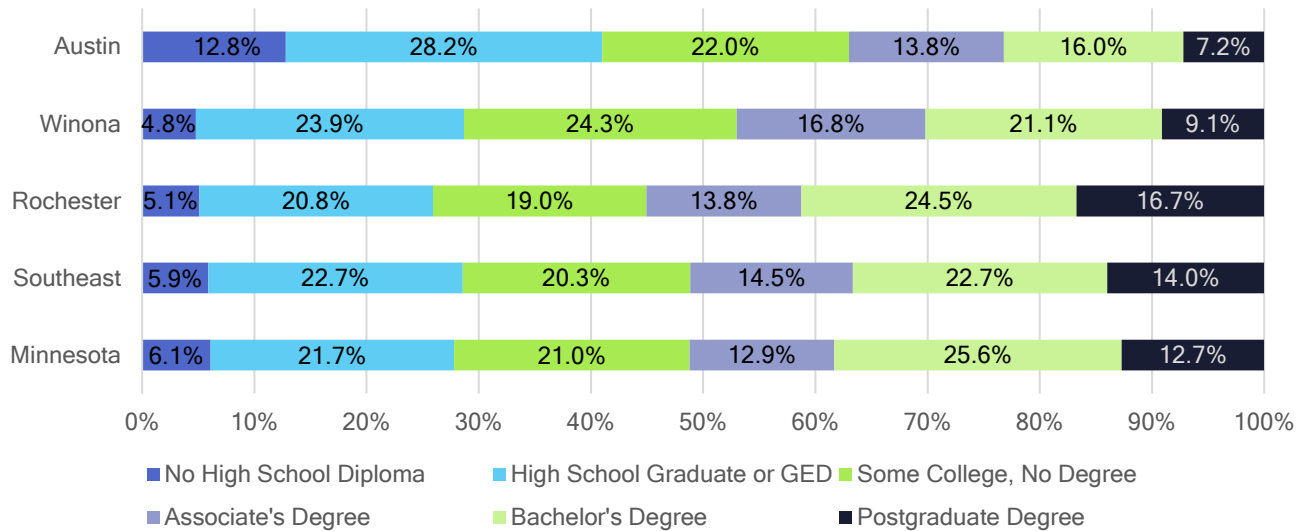
Overall, the Southeast has a similar average level of education than observed at the statewide level. In Southeast Minnesota, just 5.9% of adults between the ages of 25 and 64 do not have a high school diploma or equivalent (6.1% statewide), and 22.7% have a high school diploma as their highest level of education (compared with 21.7% statewide). Nationwide, 10.9% 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 the Austin μSA has a larger share of residents with a high school diploma or less; Winona has the smallest share of residents with no high school diploma, and also the largest share with an Associate's degree (16.8%) as their highest level of educational attainment.

Educational Characteristics of Southeast Minnesota

Educational Characteristics	Percent			Values		
	Southeast Minnesota	Minnesota	USA	Southeast Minnesota	Minnesota	USA
No High School Diploma	5.9%	6.1%	10.9%	9,668	178,196	18,550,150
High School Graduate	22.7%	21.7%	25.7%	37,418	632,253	43,627,868
Some College, No Degree	20.3%	21.0%	20.7%	33,482	610,250	35,174,790
Associate's Degree	14.5%	12.9%	9.1%	23,904	374,770	15,526,064
Bachelor's Degree	22.7%	25.6%	21.2%	37,532	744,024	35,997,848
Postgraduate Degree	14.0%	12.7%	12.3%	23,033	368,709	20,961,560

American Community Survey 2015-2019 unless noted otherwise.

Educational Attainment, Age 25-64



American Community Survey 2015-2019.

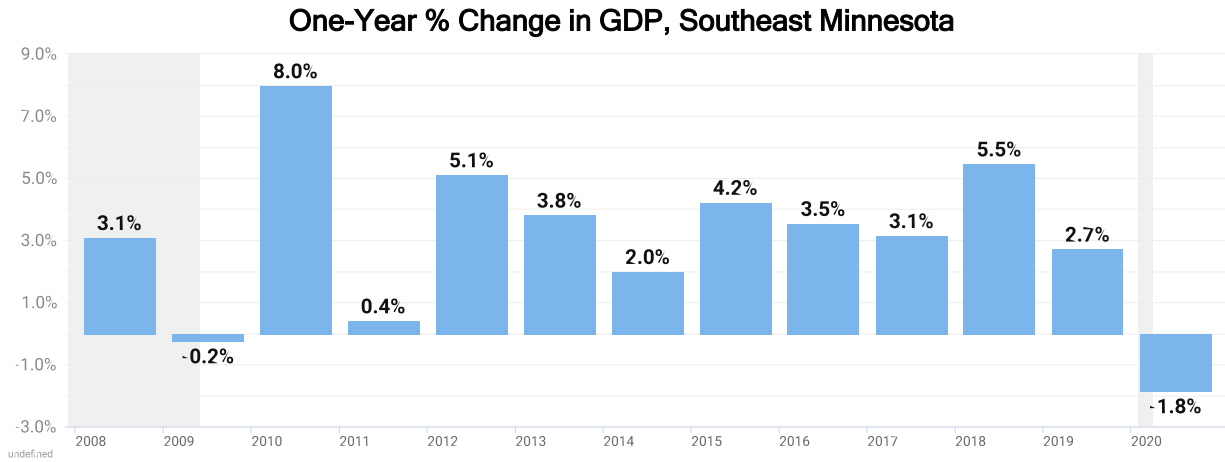
Regional Colleges and Universities

Southeast Minnesota has eight institutions of higher education that offer non-degree awards, two-year degrees, and four-year degrees. The table below shows these postsecondary institutions sorted by enrollment size in during the 2017-18 school year.

School	Certificates and 2yr Awards	4yr Awards	Total School Enrollment	Avg Net Price
Winona State University	44	1,876	7,792	\$16,401
Saint Mary's University of Minnesota	0	419	5,560	\$21,370
Rochester Community and Technical College	984	0	5,129	\$13,645
Riverland Community College	608	0	3,263	\$9,472
Minnesota State College Southeast	451	0	1,850	\$12,854
Mayo Clinic College of Medicine and Science	169	25	1,123	n/a
University of Minnesota-Rochester	0	84	533	\$15,469
Nova Academy of Cosmetology	99	0	111	\$14,458
Total	2,355	2,404	25,361	n/a

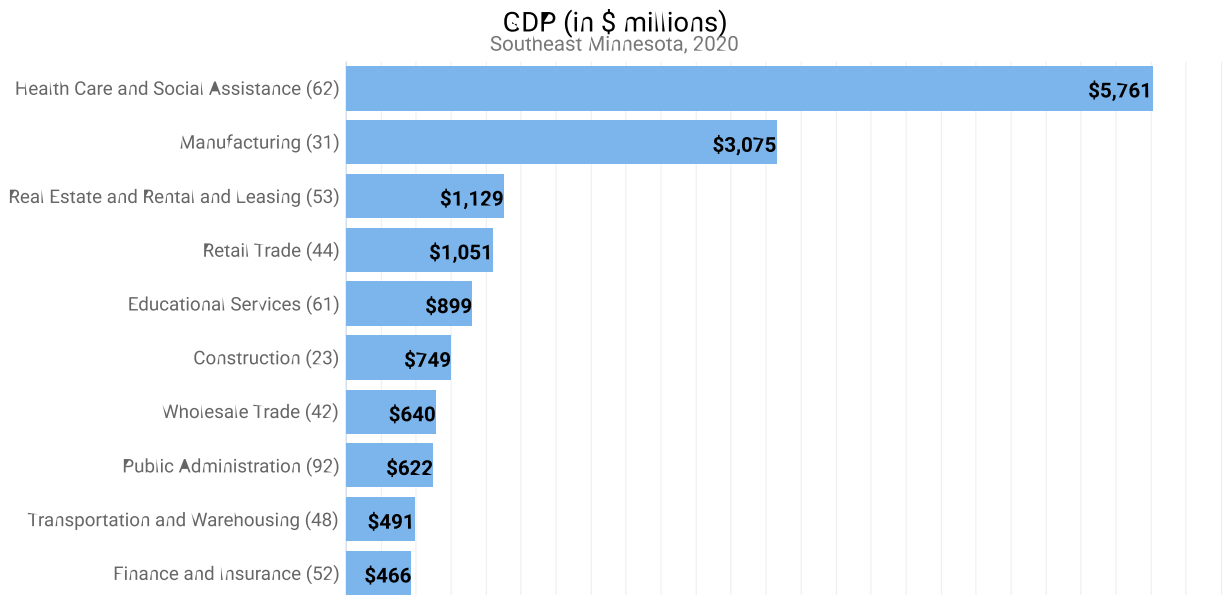
Economic Indicators

Gross Domestic Product (GDP) is the total value of goods and services produced by a region. In 2020, nominal GDP in the Southeast Minnesota contracted 1.8%. This follows growth of 2.7% in 2019. As of 2020, total GDP in the Southeast Minnesota was \$17,801,577,000.



Gross Domestic Product data are provided by the Bureau of Economic Analysis, imputed by Chmura where necessary, updated through 2020.

Of the industries represented in the Southeast, Health Care and Social Assistance contributed the largest portion of GDP in 2020, \$5,761,307,000. The next-largest contributions came from Manufacturing (\$3,074,854,000); Real Estate and Rental and Leasing (\$1,128,520,000); and Retail Trade (\$1,050,888,000).



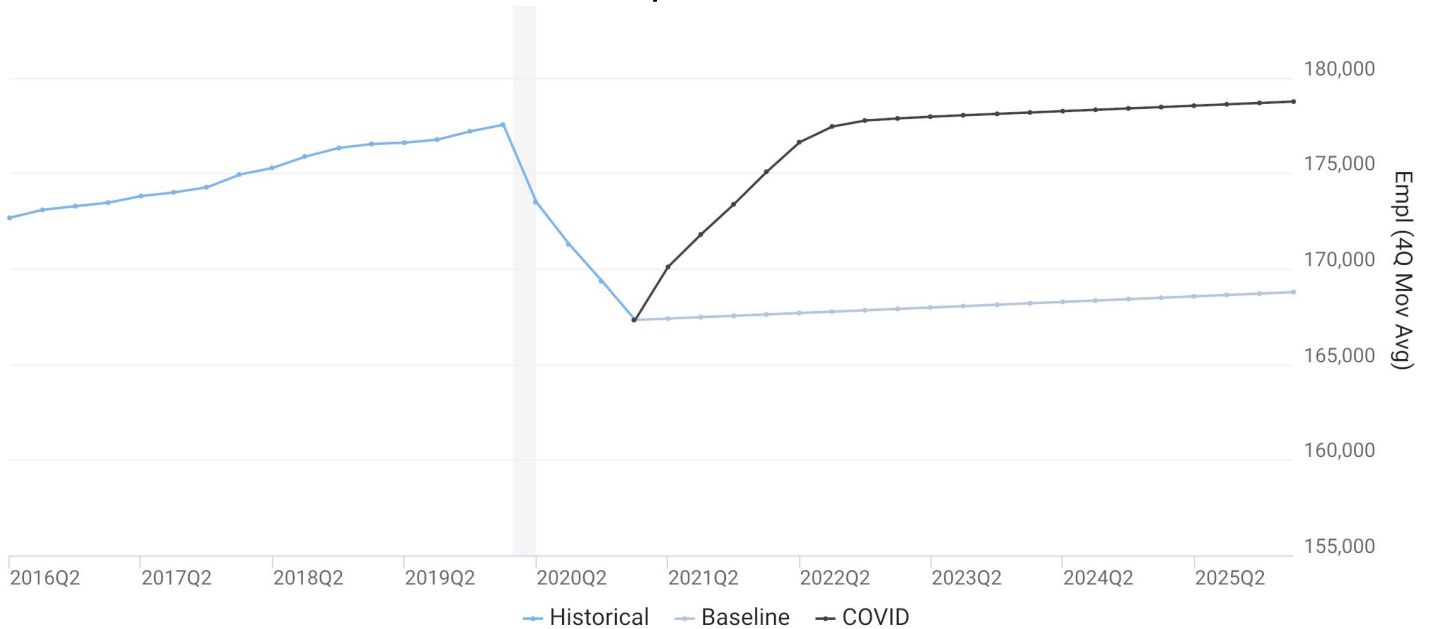
Gross Domestic Product data are provided by the Bureau of Economic Analysis, imputed by Chmura where necessary, updated through 2020.

The Workforce of Today and Tomorrow

Workforce Forecast

The pandemic has been anything but “sharp and short.” Instead, many businesses have sustained ongoing impacts which have translated into business closures and reduction in workforce. Additionally, some individuals have chosen to exit the workforce entirely to care for family members or support children who are attending school remotely. Employment dropped by -8.5% between 2020Q1 and 2021Q1, with an estimated 7.1% of the Southeast region’s labor force being unemployed by 2021Q1. Future employment in the region is forecasted to grow by about 1.6% averaged annually through 2025 in the most optimistic scenario shown below in black, though lagging behind employment in prior years considerably. A pessimistic forecast based on baseline data from the Bureau of Labor Statistics and the MN Department of Employment and Economic Development, assuming the pandemic’s effects do not worsen nor get better, puts employment rising by an annual average of 0.2%.

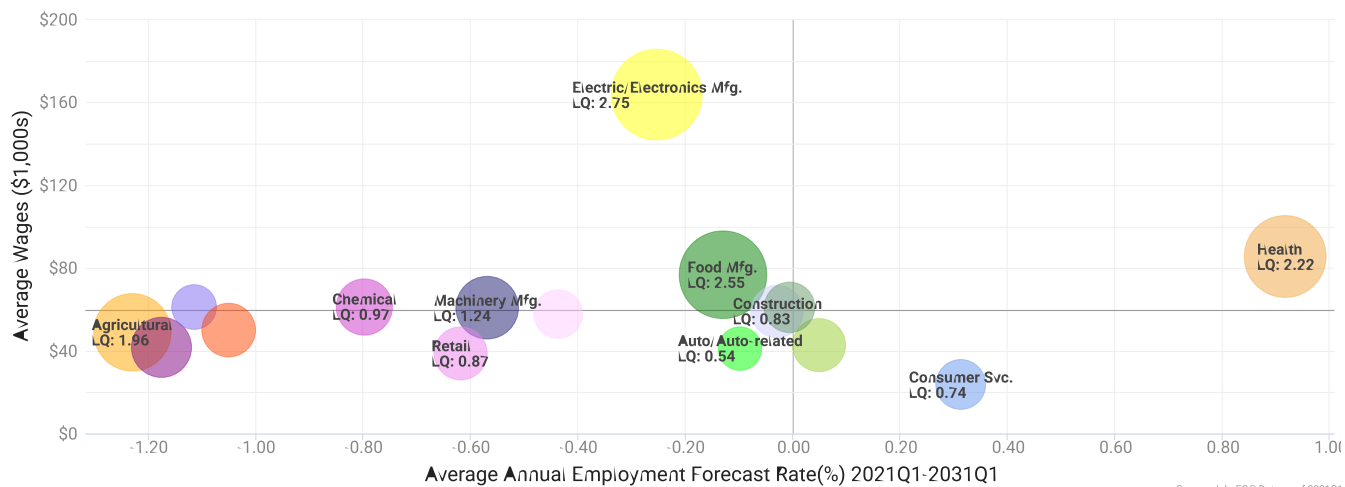
5-Year Forecast Comparison in Southeast Minnesota



Source: JobsEQ®, Data as of 2021Q1

An industry cluster is a geographic concentration of interrelated industries or occupations. The industry cluster in the Southeast Minnesota region with the highest relative concentration is Electric/Electronics Mfg. with a location quotient of 2.75. This cluster employs 5,066 workers in the region with an average wage of \$163,696. Employment in the Electric/Electronics Mfg. cluster is projected to contract in the region about 0.3% per year over the next ten years.

Industry Clusters for Southeast Minnesota as of 2021Q1



Mid-Term Occupational Impacts

HIGH CONTACT-INTENSITY OCCUPATIONS

The pandemic has had some surprising impacts on talent demand due to changing healthcare, human services, supply chain, and customer service needs. For roles that require close contact with the public, high growth was forecast in the Southeast just prior to the pandemic, but quickly shifted as businesses temporarily or permanently closed their doors. One year ago, we had estimated that about 4,818 (-8.2%) of the workers employed locally in high contact-intensity roles during 2020Q1 would lose their employment by 2021Q1. Actual losses were lower than expected in these roles; employment in these high contact-intensity roles dropped to 55,289 across the region, about 3,574 workers in losses (-6.1%). About 3,071 people are currently unemployed but skilled in these high contact-intensity positions locally, a combined unemployment rate across these positions of 5.4%.

Roles that saw some of the biggest losses in employment were Bartenders (-371 or -34.4%), Waiters and Waitresses (-762 or -31.8%), and Transit and Intercity Bus Drivers (-97 or -36.0%). Bartenders and Waiters also have the highest estimated unemployment rates. Paramedics (+9.3%), Pharmacy Aides (+8.7%), EMTs (+8%), Pharmacy Technicians (+7.7%), Veterinarians (+5.7%), Pharmacists (+5.6%), and other similar high contact-intensity roles actually saw increases in employment over the past year.

Top 15 High Contact-Intensity Occupations by Total Employment with Optimistic COVID-19 Modeled Forecast, 2021Q1

		2021Q1						1-Year History		Optimistic 5-Year Forecast				
SOC	Occupation	Empl	Mean Ann Wages ²	LQ	Unempl	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
29-1141	Registered Nurses	7,343	\$72,400	2.15	123	1.7%	498	-61	-0.8%	2,266	1,053	978	234	0.6%
35-3023	Fast Food and Counter Workers	3,612	\$26,200	0.96	412	10.1%	302	-554	-13.3%	5,042	1,866	2,198	978	4.9%
31-9092	Medical Assistants	3,474	\$42,200	4.27	128	4.0%	29	-27	-0.8%	2,384	732	1,333	319	1.8%
31-1122	Personal Care Aides	3,389	\$29,800	1.19	158	4.5%	97	111	3.4%	3,123	1,406	1,235	483	2.7%
31-1131	Nursing Assistants	2,331	\$34,900	1.49	97	4.0%	173	-131	-5.3%	1,502	658	707	138	1.2%
29-1228	Physicians, All Other; and Ophthalmologists, Except Pediatric	2,290	\$250,900	5.07	12	0.5%	59	-15	-0.7%	430	189	154	87	0.7%
53-3032	Heavy and Tractor-Trailer Truck Drivers	2,045	\$50,300	0.93	102	4.6%	222	-21	-1.0%	1,201	423	753	25	0.2%
29-2061	Licensed Practical and Licensed Vocational Nurses	1,652	\$51,100	2.18	40	2.5%	125	-99	-5.6%	744	293	362	89	1.1%
35-3031	Waiters and Waitresses	1,636	\$30,900	0.82	342	17.0%	51	-762	-31.8%	2,470	712	1,270	487	5.3%
25-2021	Elementary School Teachers, Except Special Education	1,380	\$59,400	0.96	50	3.5%	59	-148	-9.7%	644	227	316	101	1.4%
31-1121	Home Health Aides	1,189	\$29,800	1.19	51	4.1%	30	-108	-8.3%	917	360	387	170	2.7%
39-9011	Childcare Workers	1,139	\$25,700	1.21	126	10.0%	87	-107	-8.6%	1,168	484	491	193	3.2%
29-1171	Nurse Practitioners	1,095	\$114,200	4.42	10	0.9%	37	18	1.7%	680	138	235	306	5.1%
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	1,062	\$62,300	1.00	27	2.4%	55	-112	-9.6%	473	158	237	78	1.4%
High Contact-Intensity Occupations		55,289	\$68,200	1.45	3,071	5.4%	3,430	-3,574	-6.1%	36,013	13,058	17,041	5,915	2.1%
Total - All Occupations		167,326	\$57,800	1.00	9,439	5.4%	10,063	-10,211	-5.8%	108,415	38,108	58,932	11,374	1.3%

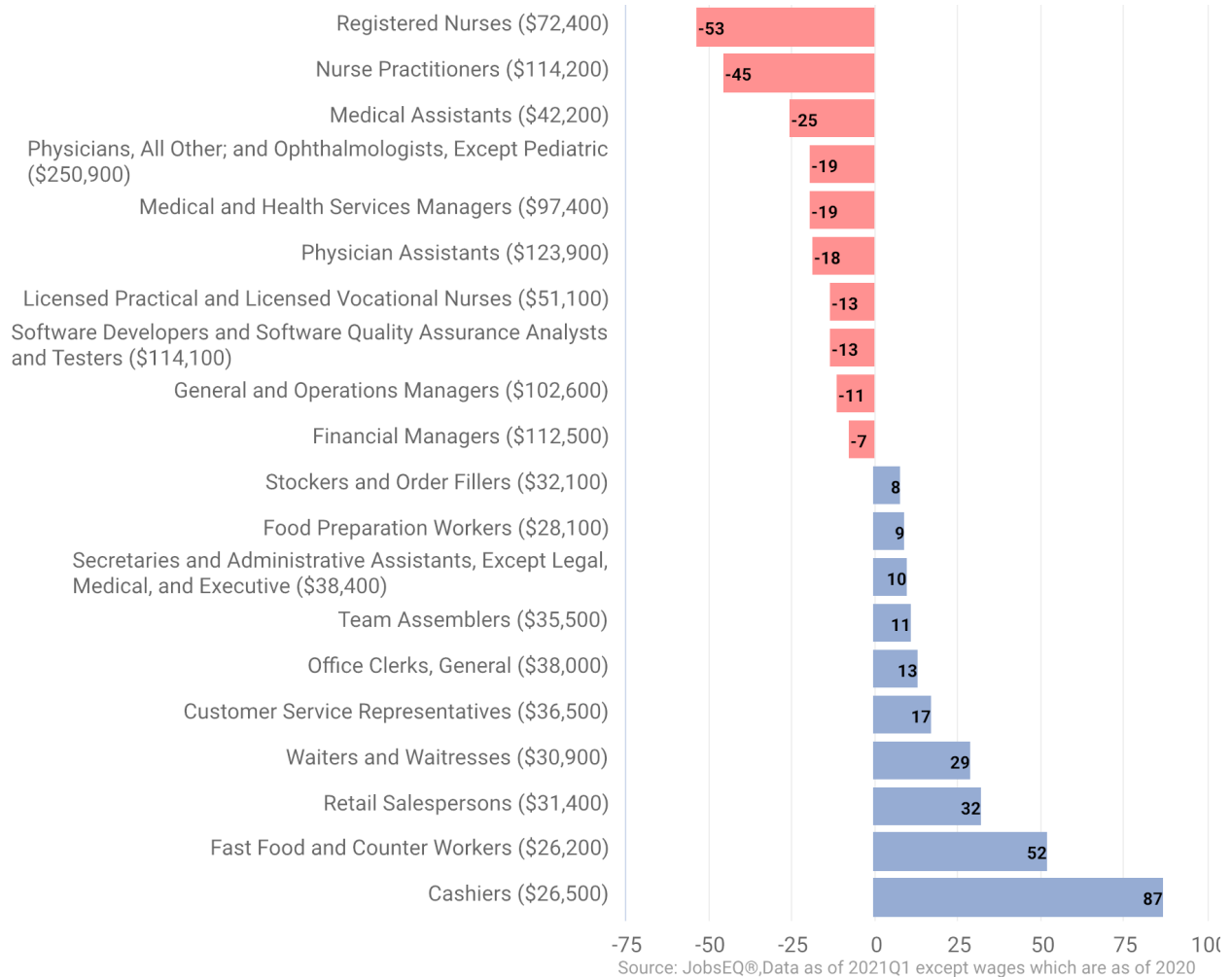
SEVERE OCCUPATION GAPS

Estimation of mid-term and long-term recovery of critical local occupations is based on our most reasonable hypothesis given current conditions. In Southeast Minnesota, an analysis of local labor market occupational gaps as of the first quarter of 2020 showed that there was a shortage of Nurses, Physicians, Physician Assistants, Medical Managers, and more. By the first quarter of 2021, forecasted talent gaps for each of these occupations remained, but with some changes to the volume of anticipated gaps. Seven out of ten occupations in highest shortages are in Health Science Technology. Registered Nurses remained ranked as the occupation with highest forecasted shortages in the region. Software Developers and Financial Managers joined the list of top ten occupations with highest forecasted shortages.

Based on forecasted growing demand for health, education, human services, and remote work-friendly management positions, these occupations of shortage are likely to rebound and grow in demand as the pandemic subsides, possibly beyond initial forecasts. All of the top ten positions of highest forecasted talent shortage pay wages over \$42,000 per year on average. Most occupations of shortage require an Associate's degree or higher; just two pay less than the area median wage of \$57,800 annually on average (LPNs and Medical Assistants).

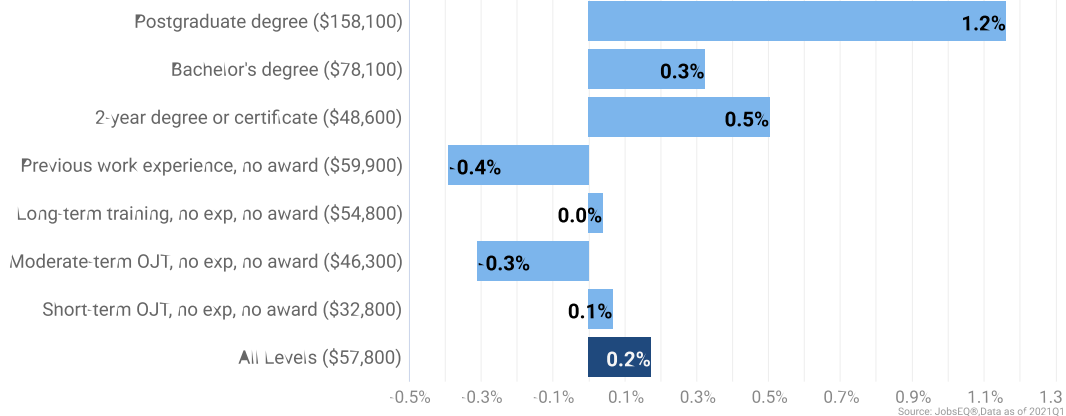
Conversely, none of the ten positions forecast to have the highest surplus of talent in the Southeast as of the first quarter of 2020 or 2021 typically require an advanced degree, and none of them pay over \$38,000 on average. Seven out of ten of these positions typically cannot be done remotely, and the four positions of greatest talent surplus are considered high contact-intensity. Given the impacts of the COVID-19 pandemic on local industry, these occupations of anticipated high talent excess will likely decline in overall local demand and shift dramatically in how work is done on a daily basis.

Average Annual Occupation Gaps (i.e. Talent Shortage), 2021Q1 through 2031Q1



Expected growth rates for occupations vary by the education and training required. While all employment in Southeast Minnesota is projected to grow by about 0.2% annually over the next ten years under baseline estimates, occupations typically requiring a postgraduate degree are expected to grow 1.2% per year. Estimated wages have increased across careers at each education level requirement.

Annual Average Projected Job Growth by Training Required for Southeast Minnesota

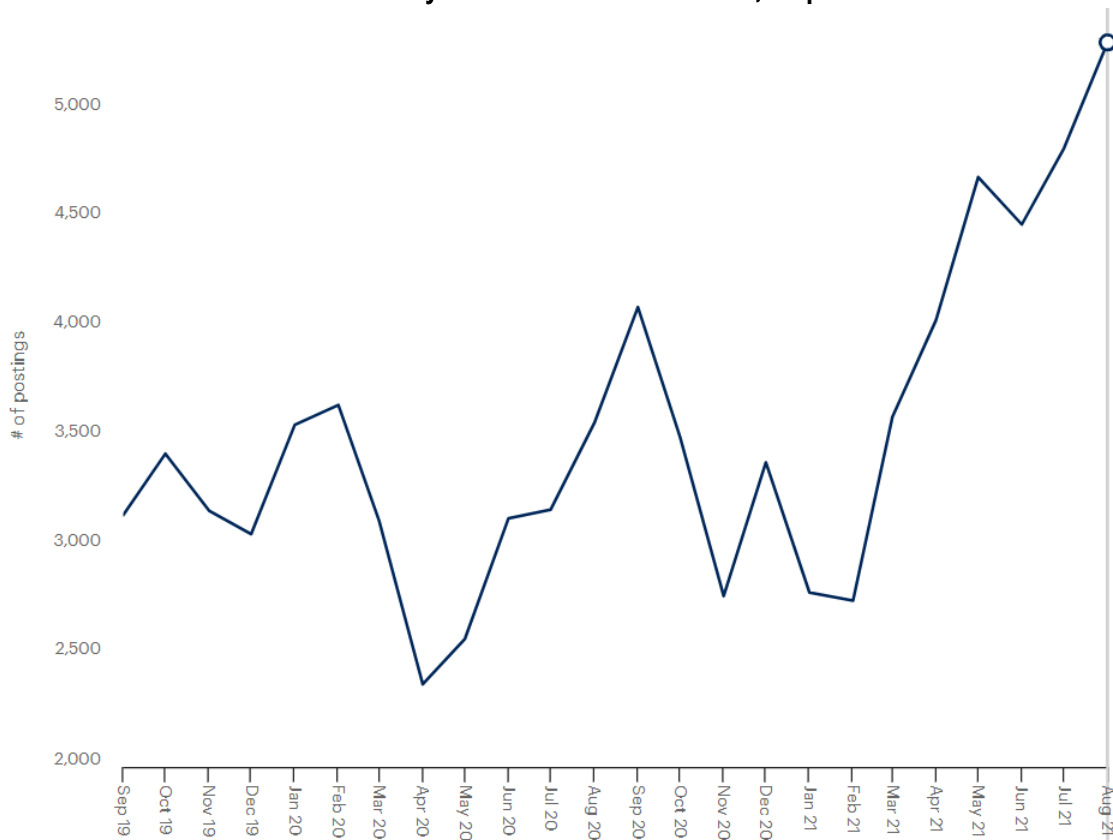


Employment by occupation data are estimates as of 2021Q1. Education levels of occupations are based on BLS assignments. Forecast employment growth uses national projections from the Bureau of Labor Statistics adapted for regional growth patterns.

EMERGING CAREER PATHS

Online job posting data can tell us a lot about employer demand for certain skills, certifications, qualifications, and occupational competencies. Too often jobseekers limit their search to careers matching prior job titles or formal education. However, taking a non-traditional education path doesn't mean a person doesn't have the skills necessary for in-demand jobs or career paths outside their formal education. And increasingly, employers are more focused on skills than degrees.

Total Jobs Advertised Monthly in Southeast Minnesota, September 2019 - 2021



During the first five months of the COVID-19 pandemic,³ there were 22,049 new jobs advertised in the region—a decline of 3% from the same six months in 2019. The top three positions advertised by volume were for Registered Nurses, Heavy Truck Drivers, and Personal Care Aides. Most roles saw dramatic decreases in overall posting activity in this region.

Volume of job postings increased dramatically starting in March 2021, continuing through August. Over the past 12 months as a whole, several occupations have continued to see sustained growth in postings, including Heavy Truck Drivers, Registered Nurses, and Laborers. Overall, healthcare, transportation, shipping/logistics, and service roles have spiked in volume considerably, showing much higher demand since March 2021 compared to early months of the pandemic. Supervisory roles across food service, hospitality, manufacturing, production, and healthcare have all been rising in demand.

³ March 15-June 15, 2020.

Top Emerging Occupations in Southeast Minnesota, March 1-August 31, 2021 compared to the same dates in 2020 (high-growth occupations by order of volume of postings)

1. Licensed Practical and Licensed Vocational Nurses (+249%)
2. Combined Food Preparation and Serving Workers (+78%)
3. Light Truck or Delivery Services Drivers (+291%)
4. Demonstrators and Product Promoters (+684%)
5. Surgical Technologists (+438%)
6. Supervisors of Office and Administrative Support Workers (+115%)
7. Software Developers (+145%)
8. Social and Human Service Assistants (+58%)
9. Food Preparation Workers (+167%)
10. Computer Occupations, All Other (+144%)

Top Sustaining Occupations in Southeast Minnesota September 2020 - 2021

1. Registered Nurses (+55%)
2. Heavy and Tractor-Trailer Truck Drivers (+54%)
3. Laborers and Freight, Stock, and Material Movers (+93%)
4. Supervisors of Retail Service Workers (+30%)
5. Customer Service Representatives (+31%)

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

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

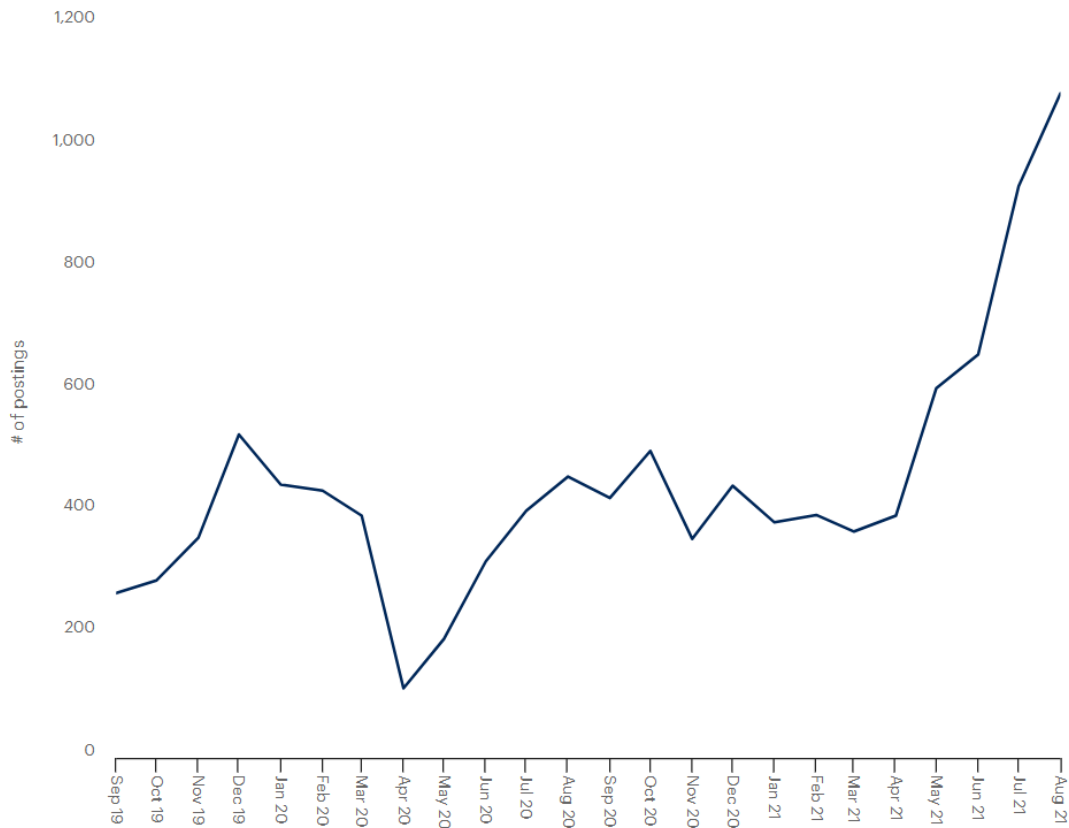
Human skills and other competencies like scheduling, managing a flexible work environment, and handling general healthcare needs were mentioned in job postings as required competencies for candidates in higher volumes from March through August in comparison to early 2020 or any point in 2019, but declined moderately from September 2020 through August 2021. The majority of rising skills are focused in general skill areas and in Information Technology, Logistics, or Business, Management, and Administration capacities.

Top Emerging Skills in Southeast Minnesota in Order of Frequency, with percent change from prior year in Job Postings, September 2020 - 2021

1. Communication (+11%)
2. Leadership (+17%)
3. Basic Computer Skills (+6%)
4. Supervision (+64%)
5. Problem Solving (+10%)

Telecommuting and work-from-home continues to appear in job posting requirements locally, increasing 55% in Southeast Minnesota in the past 12 months (September 2020-2021) compared to the prior year (September 2019-2020).

Trends in Remote Work Opportunities Advertised Online, Southeast Minnesota 2021Q1



Remote work opportunities increased significantly among Business, Management, and Administration and Information Technology roles over the past 12 months compared to the 12 months prior. For example, the volume of remote job postings for Marketing Managers increased by 600%.

Change in Volume of Remote Work Opportunities by Occupation in Southeast Minnesota, September 2020-2021 Compared to 12 months prior

1. Registered Nurses (+45%)
2. Insurance Sales Agents (+100%)
3. Customer Service Representatives (+148%)
4. Computer Occupations, All Other (+186%)
5. Software Developers (+316%)

Currently, the occupations with highest estimated unemployment rates in Southeast Minnesota are Choreographers (32.3%) and Dancers (30.7%), but by volume, Retail Salespersons (9.7% or 437 people), Fast Food and Counter Workers (10.1% or 412 people), and Cashiers (8.5% or 399 people) have the largest number of people currently unemployed in Southeast Minnesota.

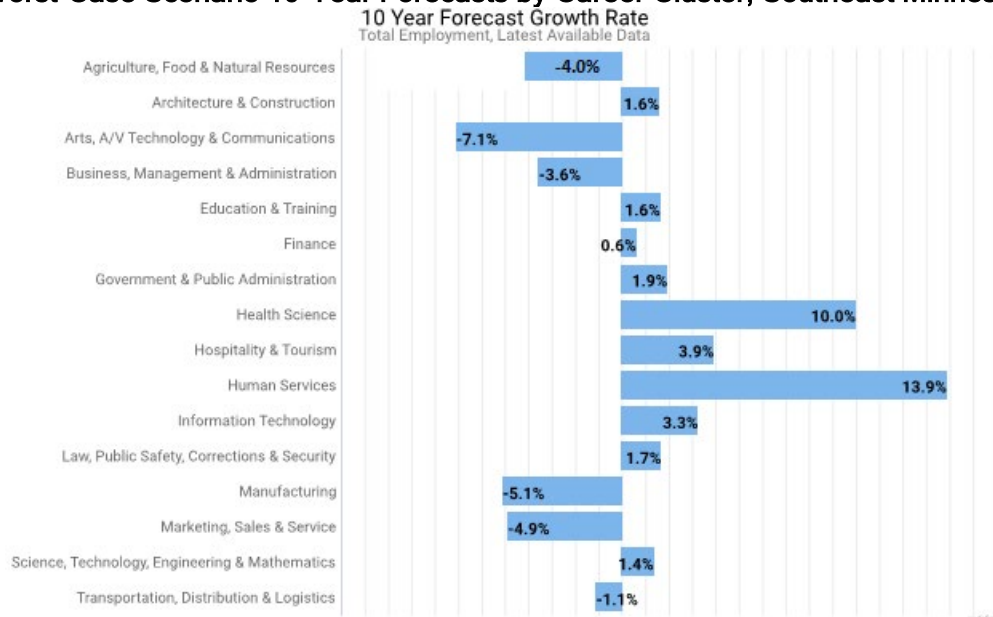
Career Field Insights

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

Of sixteen career clusters used by Career and Technical Education (CTE), ten are forecast in a pessimistic scenario model to grow in overall employment over the next ten years. The clusters forecasting the highest growth are Human Services (13.9%), Health Science (10.0%), and Hospitality and Tourism (3.9%) in a worst-case scenario outlook. Ten of the career clusters have average annual wages that are below the average occupation wage in the region (\$57,800 in 2020).⁴

Comparing current baseline forecasts to the same forecasts modeled one year ago, all but Agriculture, Food, and Natural Resources, Architecture and Construction, Hospitality and Tourism, and Marketing, Sales, and Service clusters have improved employment forecasts over ten years than what was estimated last year.

Baseline Worst-Case Scenario 10-Year Forecasts by Career Cluster, Southeast Minnesota 2021Q1



Cluster forecasts estimated using Chmura, JobsEQ, based on 2020Q1 employment data. All clusters are distinct occupations except for Agriculture, Food, and Natural Resources, which overlaps with other clusters.

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

Information Technology has the highest wages of the Career Clusters followed by the STEM and Health Science 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.

Career Cluster	Employment	Avg Ann Wages	Job Ads	Baseline 10-Year Forecasted Empl Change	Ann Empl Growth	Ann Total Demand
Information Technology	3,335	\$90,400	434	3.3% (+)	10	257
Science, Technology, Engineering & Mathematics	1,911	\$88,900	188	1.4% (+)	2	144
Health Science	35,039	\$88,200	2,191	10.0% (+)	334	2,954
Finance	3,715	\$75,200	353	0.6% (+)	2	346
Agriculture, Food & Natural Resources	5,157	\$64,700	113	-4.0%	-55	540
Government & Public Administration	1,146	\$60,900	50	1.9% (+)	2	103
Architecture & Construction	8,756	\$57,700	254	1.6% (+)	13	958
Education & Training	9,524	\$54,900	547	1.6% (+)	14	879
Law, Public Safety, Corrections & Security	4,028	\$54,800	122	-1.7% (+)	7	364
Business, Management & Administration	26,089	\$54,400	1,134	-3.6% (+)	-97	2,755
Arts, A/V Technology & Communications	1,917	\$50,600	77	-7.1% (+)	-14	189
Manufacturing	14,419	\$43,900	721	-5.1% (+)	-77	1,507
Transportation, Distribution & Logistics	10,286	\$43,400	647	-7.7% (+)	-12	1,205
Marketing, Sales & Service	15,513	\$42,900	1,361	-4.9%	-79	2,044
Human Services	10,345	\$40,700	568	13.9% (+)	135	1,489
Hospitality & Tourism	16,147	\$30,300	1,329	3.9%	62	2,713
Total - All Occupations	167,326	\$57,800	10,088	2.0%	272	18,472

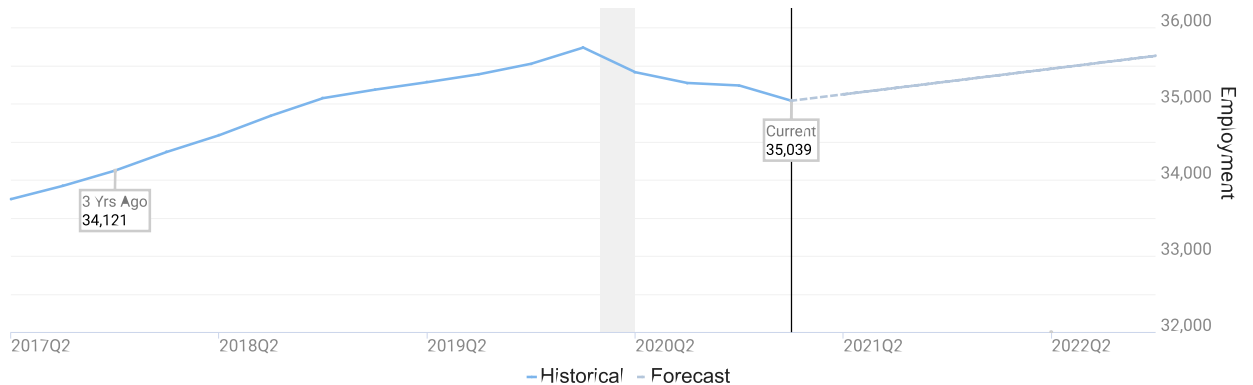
*Cluster forecasts estimated using Chmura, JobsEQ, based on 2021Q1 employment data. All clusters are distinct occupations except for Agriculture, Food, and Natural Resources, which overlaps with other clusters. (+) indicates an improved forecast from 2020Q1 estimates.

HEALTH SCIENCE TECHNOLOGY

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

Over the next three years, under a pessimistic baseline forecast, Health Science Technology employment is forecast to grow by about 1.0% on average annually. In the most optimistic scenario feasible based on employer demand and given the existing talent shortage and talent pipelines in place, employment growth of 1.2% annually in this field could be possible.

Baseline Worst-Case Scenario 3-Year Forecast for Health Science Technology Careers, Southeast Minnesota 2021Q1



Top Ten Health Science Technology Occupations by Employment Volume in Southeast Minnesota, 2021Q1

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year		Baseline Forecast
				Empl Change	Annual Demand	Ann Growth
Registered Nurses	7,343	\$72,400	2.15	310	428	0.4%
Medical Assistants	3,474	\$42,200	4.27	248	462	1.7%
Medical Secretaries and Administrative Assistants	2,532	\$43,600	3.69	92	306	0.7%
Nursing Assistants	2,331	\$34,900	1.49	-191	273	0.4%
Physicians, All Other; and Ophthalmologists, Except Pediatric	2,290	\$250,900	5.07	163	83	0.6%
Licensed Practical and Licensed Vocational Nurses	1,652	\$51,100	2.18	-146	138	0.6%
Home Health Aides	1,189	\$29,800	1.19	-217	173	2.4%
Nurse Practitioners	1,095	\$114,200	4.42	152	125	4.9%
Medical and Health Services Managers	1,001	\$97,400	2.14	73	112	2.5%
Medical Dosimetrists, Medical Records Specialists, and Health Technologists and Technicians, All Other	799	\$54,100	2.20	28	56	0.4%
Remaining Component Occupations	11,334	\$111,300	2.24	163	786	0.6%
Health Science (CTE Cluster)	35,039	\$88,200	2.24	671	2,954	1.0%

“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).

Just over half of all talent in Southeast Minnesota that is working in Health Science Technology roles are employed by Offices of Physicians (52%) and another one in four are employed by General Medical and Surgical Hospitals (26.7%).

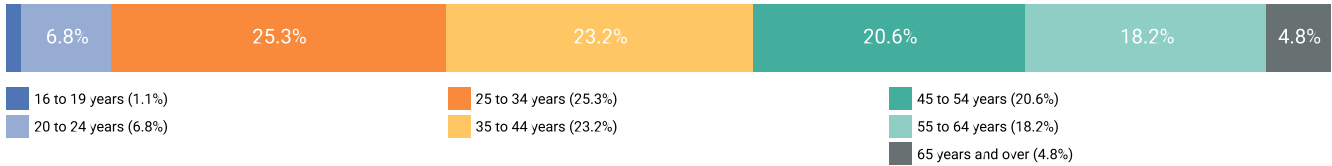
Health Science Technology Field Employment by Industry, 2021Q1, Southeast Minnesota

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Offices of Physicians	52.0%	18,225	13,525	2,457	15,982
General Medical and Surgical Hospitals	26.7%	9,367	6,264	251	6,514
Nursing Care Facilities (Skilled Nursing Facilities)	4.5%	1,573	1,407	-64	1,343
Offices of Dentists	2.2%	767	661	27	689
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	2.0%	699	755	176	931
Individual and Family Services	1.8%	615	761	266	1,027
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	1.3%	459	486	52	538
Home Health Care Services	1.3%	450	433	124	557
Offices of Other Health Practitioners	1.2%	403	298	63	361
Other Professional, Scientific, and Technical Services	0.9%	299	278	38	316
Health and Personal Care Stores	0.8%	283	188	-26	162
Medical and Diagnostic Laboratories	0.7%	238	188	40	227
Elementary and Secondary Schools	0.5%	189	116	8	124
All Others	4.2%	1,471	1,132	89	1,221

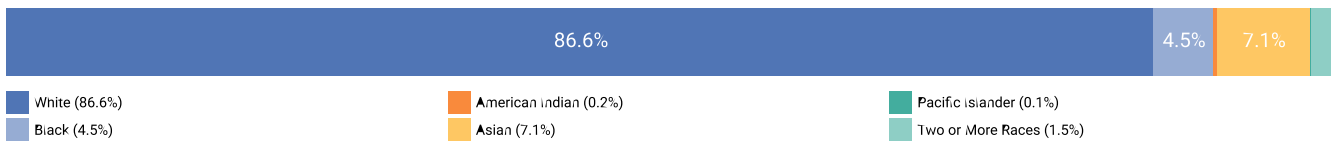
Career Field Demographics

The Health Science Technology field is heavily female (71.5%) and white (86.6%), but generally more diverse than what is observed in other regions of Minnesota. The age distribution of talent in Health Science Technology skews slightly young, with one in four between the ages of 25 and 34 years (25.3% of talent).

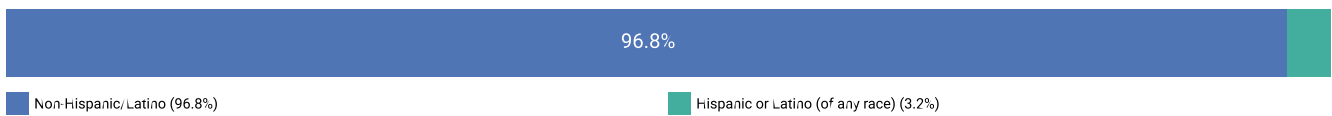
Age



Race



Ethnicity



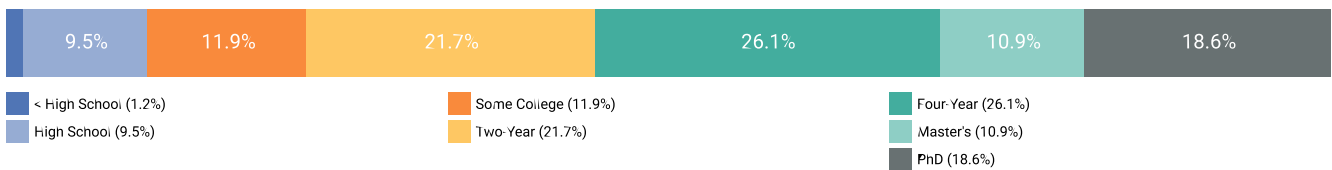
Gender



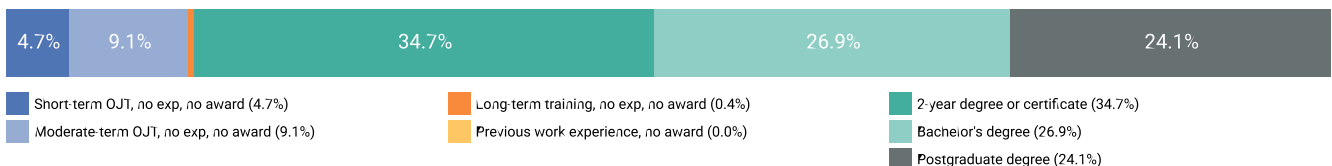
Educational Attainment and Requirements

The stacked bar charts here illustrate the estimated mix of educational attainment of the workers in this career field in aggregate, as well as the typical education and training requirements for positions in the field. In general, the Southeast Minnesota Health Science Technology workforce has a close match to the education and training required for existing roles. For example, just 14.2% of Health Science Technology positions require no educational award, and about 10.7% of the workforce holds only a high school diploma or less. About 21.7% of the Health Science Technology workforce hold a two-year degree and 11.9% completed some college (such as a certificate), or 33.6% in all, compared to about 34.7% of local jobs in Health Science Technology that typically require a certificate two-year degree. The table below indicates typical education and training requirements rather than the mix of attainment of workers in such positions.

Educational Attainment



Education and Training Requirements



Typical Education Requirements for Top Occupations by Volume, 2021Q1

Occupation	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Registered Nurses	Bachelor's degree	None	None
Medical Assistants	Postsecondary non-degree award	None	None
Medical Secretaries and Administrative Assistants	High school diploma or equivalent	None	Moderate-term on-the-job training
Nursing Assistants	Postsecondary non-degree award	None	None
Physicians, All Other; and Ophthalmologists, Except Pediatric	Doctoral or professional degree	None	Internship/residency
Licensed Practical and Licensed Vocational Nurses	Postsecondary non-degree award	None	None
Home Health Aides	High school diploma or equivalent	None	Short-term on-the-job training
Nurse Practitioners	Master's degree	None	None
Medical and Health Services Managers	Bachelor's degree	Less than 5 years	None
Medical Dosimetrists, Medical Records Specialists, and Health Technologists and Technicians, All Other	Postsecondary non-degree award	None	None

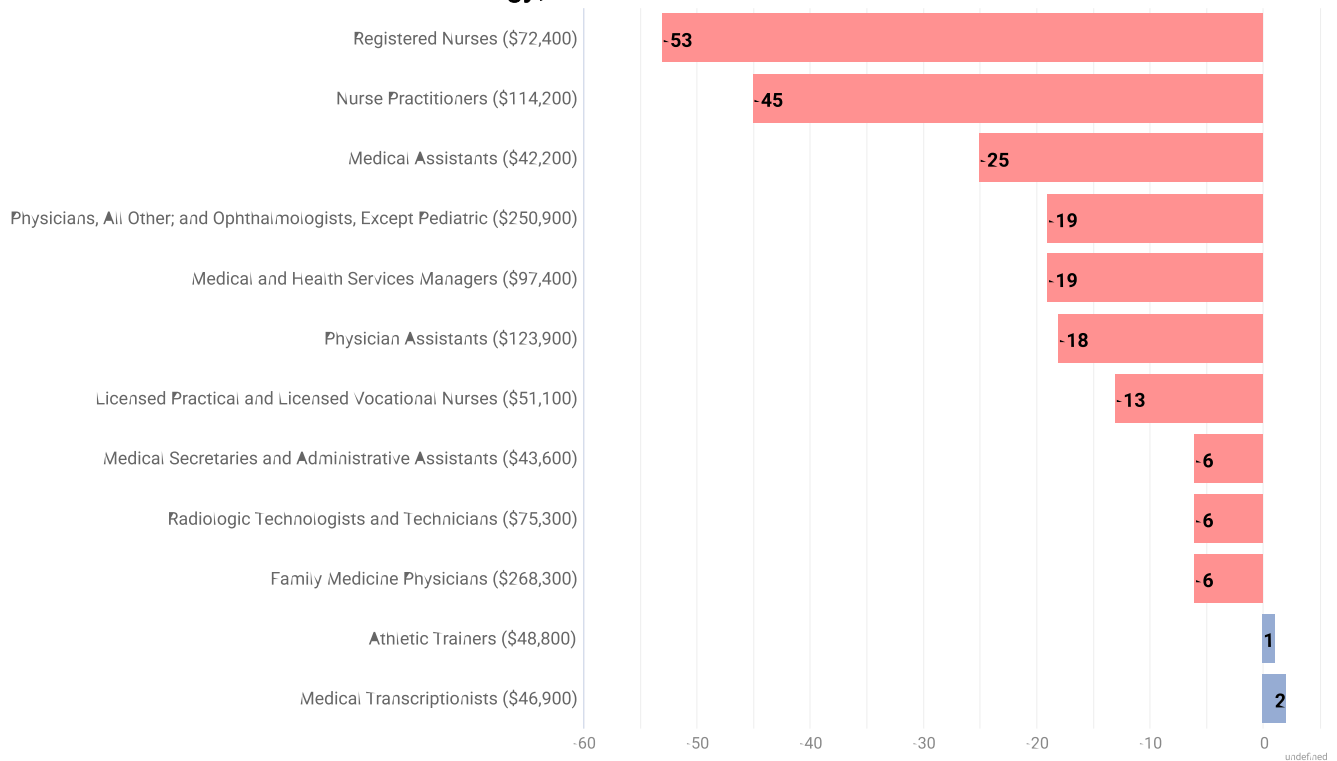
Occupation Gaps

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

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

In Health Science Technology, Registered Nurses are the occupation with the greatest annual shortages in the Southeast region and #1 statewide. This critical talent shortage is due in large part to forecasted employment growth and replacement demand needs due to retirements and turnover.

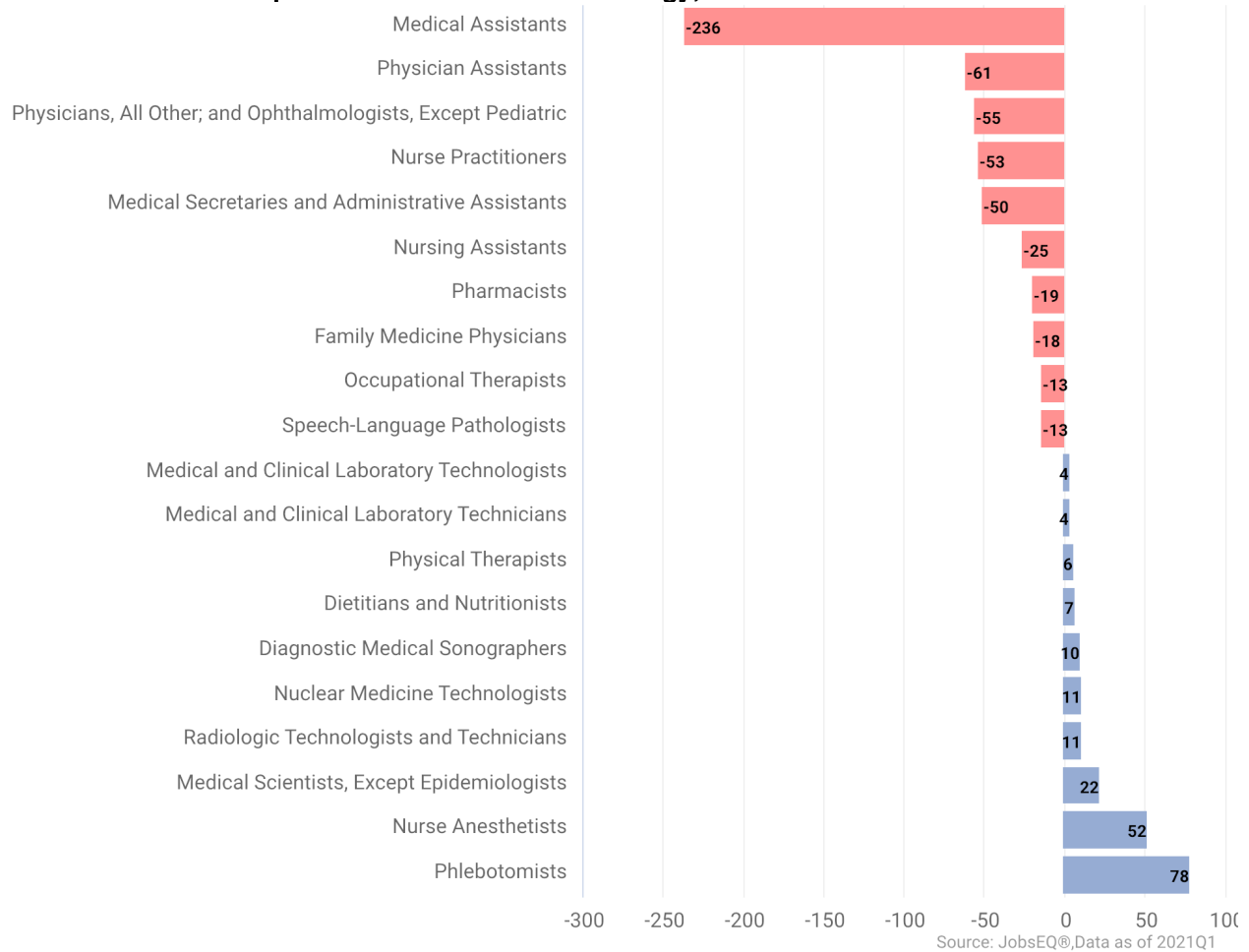
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Health Science Technology, Southeast Minnesota 2021Q1



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 Southeast region has several Health Science Technology award gaps, meaning that the region is underproducing local talent in relation to employer demand. For instance, Southeast colleges and universities are underproducing about 236 graduates annually that are needed to fill Medical Assistant positions open with employers in the region. Several important occupations that require advanced education, including doctorates also have local award gaps, such as Physician Assistants, Physicians, Nurse Practitioners, and Medical Secretaries. 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, as is the case with Phlebotomist programs. The oversupply of graduates in the Southeast region is likely helping to meet award gaps found in the 7-county MSP Metro and elsewhere.

Award Gaps in Health Science Technology, Southeast Minnesota 2021Q1



Certification Gaps

Similar to award gaps, an analysis of certification gaps identify where the existing talent pool lacks particular credentials in comparison to current openings. However, this analysis uses real-time labor market data in the form of online candidate profiles and job postings to analyze the alignment between the available workforce and local opportunities. In the table below, it is apparent that the programs aligned to the occupations above as well as shorter training programs are both needed to connect local talent with opportunities.

Top 10 Certification Gaps in the Southeast Region, September 2021

Name	Candidates	Openings	Gap
Licensed Practical Nurse (LPN)	78	161	-83
Family Nurse Practitioner (FNP-BC)	7	86	-79
Registered Nurse (RN)	253	327	-74
Certified Nursing Assistant (CNA)	170	241	-71
Acute Care Nurse Practitioner (ACNP-BC)	1	43	-43
Adult Nurse Practitioner (ANP-BC)	2	44	-42
National Phlebotomy Association Certified Phlebotomist	6	28	-22
The American Registry of Radiologic Technologists (ARRT) Certification	23	36	-14
Medical Technologist (Medical Technologists)	10	22	-12
Certification in Pathology: Neuropathology (NP)	0	12	-12

Skill Gaps

Likewise, there is a degree of misalignment between the skills of the available workforce and the skills advertised by local employers. The ten skills listed below are examples of the skills in most high demand among Southeast region employers hiring Health Science Technology talent that potential candidates have not indicated in their professional networking platforms as a strength.

Top 10 Skill Gaps in the Southeast Region, September 2021

Name	Candidates	Openings	Gap
Automated External Defibrillators (AED)	11	108	-97
Keyboarding/Typing	66	151	-85
Electronic Health Record (EHR)	47	118	-70
Patient Care	86	155	-69
Home Health Care	78	130	-52
Medication Administration	69	113	-44
Long-Term Care	83	125	-42
Local Area Network Software (LAN Software)	0	39	-39
Anatomy	26	63	-37
Unity	6	39	-33

Promising Pathways

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

Origin-to-Gateway-to-Target Occupations for Health Science Technology, Southeast Minnesota 2021Q1

Target Occupations (all HW, HD, HS)

Registered Nurses (OG, AG)
Nurse Practitioners (OG, AG)
Medical and Health Services Managers (OG)
Physical Assistants (OG, AG)
Diagnostic Medical Sonographers (OG)

Gateway Occupations

Medical Assistants (HS, HD, OG, AG)
Medical Secretaries and Administrative Assistants (OG, AG)
Licensed Practical and Licensed Vocational Nurses (HS, OG)
Medical Dosimetrists (HS, OG, AG)
Dental Assistants (HS, HD)

Origin Occupations

Likely

Nursing Assistants (HS, OG, AG)
Home Health Aides (HD)
Pharmacy Technicians (OG)
Phlebotomists (HS, OG)
Opticians, Dispensing (OG, AG)

Aligned

Personal Care Aides
Childcare Workers
Secretaries
Customer Service Reps
Cooks

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without 4-year degrees. Below are a few Origin Occupations that are likely entrypoints into Health Science Technology locally, or aligned opportunities that share a large number of skillsets in-demand in Health Science Technology.

Likely Origins	Aligned Origins
Nursing Assistants	Personal Care Aides
Home Health Aides	Childcare Workers
Pharmacy Technicians	Secretaries or Executive Assistants
Phlebotomists	Customer Service Representatives
Opticians, Dispensing	Cooks

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$57,800 in the Southeast region). Below are a few Gateway Occupations in Health Science Technology locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences.

Likely Gateways	Aligned Gateways
Medical Assistants	Postsecondary Teachers
Medical Secretaries and Administrative Assistants	Social and Human Services Assistants
Licensed Practical and Licensed Vocational Nurses	Supervisors of Office and Administrative Support Workers
Medical Dosimetrists	Eligibility Interviewers
Dental Assistants	Residential Advisors

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$57,800 in the Southeast region). 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. Only occupations that hit the designated high-wage, high-skill, and high-demand thresholds have been included in this chart, thus putting extra weight and emphasis on current demand rather than future shortage. Some critical occupations for the region that forecast high gaps, but perhaps not currently high-demand should also be included in Career and Technical Education programs of study.

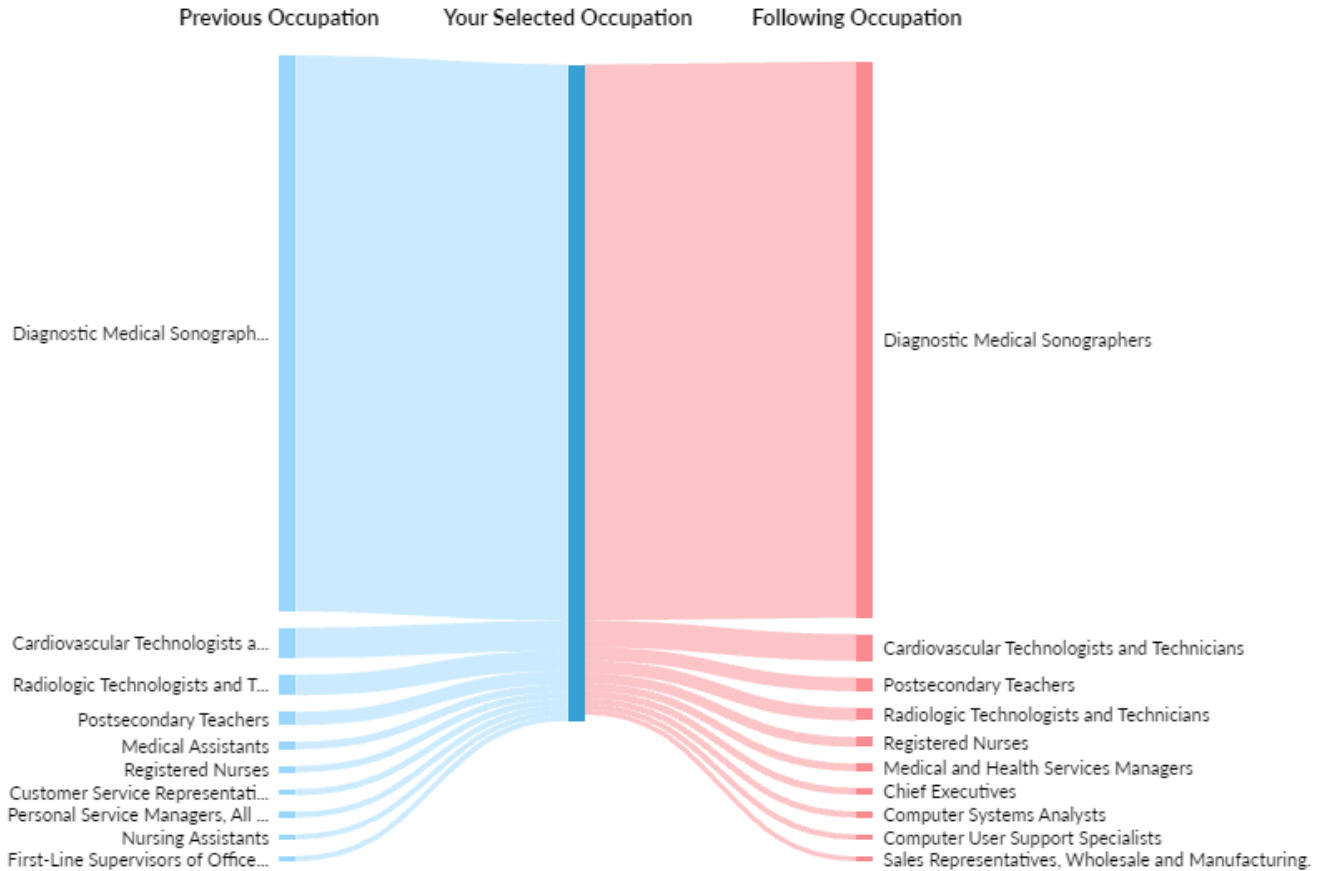
Top Target Occupations in Health Science Technology, Southeast Minnesota 2021Q1

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
29-1141	Registered Nurses	7,343	\$72,400	HW	HS	HD	OG	AG
29-1171	Nurse Practitioners	1,095	\$114,200	HW	HS	HD	OG	AG
11-9111	Medical and Health Services Managers	1,001	\$97,400	HW	HS	HD	OG	
29-1071	Physician Assistants	732	\$123,900	HW	HS	HD	OG	AG
29-2032	Diagnostic Medical Sonographers	251	\$86,900	HW	HS	HD	OG	
29-1126	Respiratory Therapists	238	\$69,000	HW	HS	HD	OG	
29-1127	Speech-Language Pathologists	179	\$64,600	HW	HS	HD	OG	AG
29-1131	Veterinarians	110	\$94,400	HW	HS	HD	OG	AG
29-1223	Psychiatrists	99	\$253,800	HW	HS	HD	OG	AG
29-1011	Chiropractors	82	\$80,000	HW	HS	HD		AG

The Diagnostic Medical Sonographer occupation is three times more concentrated in Southeast Minnesota than in a typical community of its size nationally (LQ of 2.95). This occupation is analyzed below in more detail for better understanding of occupation “gain and

drain.” The chart below illustrates the national profiles of current and past people in this occupation. The left column shows job transitions from other occupations to Diagnostic Medical Sonography. The right column shows job transitions from Medical Sonography to other occupations.

Diagnostic Medical Sonographer Talent Gain and Drain, 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for Medical and Health Services Managers, Southeast Minnesota 2021

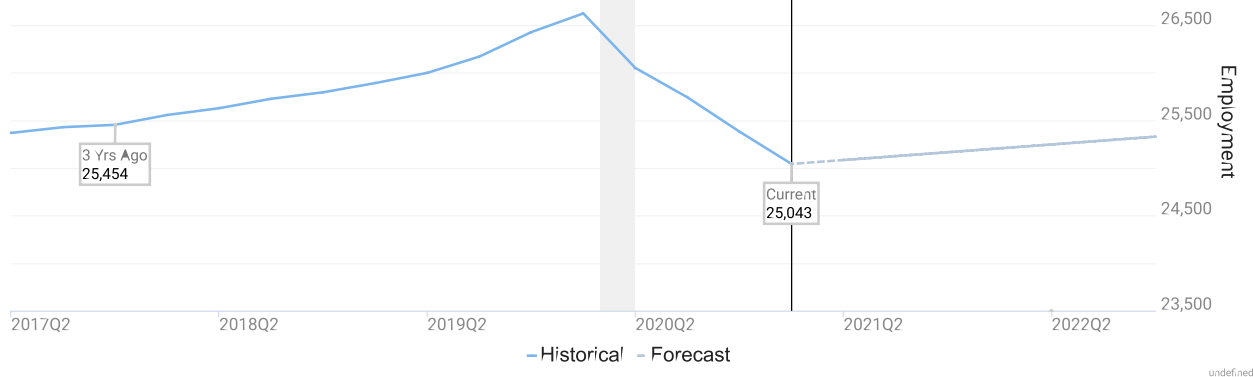


2020 IPEDS Completions Data; Visualizations from Emsi 2021Q3 dataset.

HUMAN SERVICES

Human Services is the career field forecast to grow the most over the next ten years. Over the next three years, under a pessimistic baseline forecast, Human Services employment is forecast to grow by 0.6% annually. In the most optimistic scenario feasible based on employer demand, and given the existing talent pipelines in place, employment growth of 1.8% annually in this field could be possible.

Baseline Worst-Case Scenario 3-Year Forecast for Human Services Careers, Southeast Minnesota 2021Q1



Top Ten Human Services Occupations by Employment Volume in Southeast Minnesota, 2021Q1

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-	Annual	Baseline
				Year Empl Change	Demand	Forecast Ann Growth
Personal Care Aides	3,389	\$29,800	1.19	559	592	2.4%
Teaching Assistants, Except Postsecondary	1,855	\$32,100	1.36	-204	197	0.1%
Elementary School Teachers, Except Special Education	1,380	\$59,400	0.96	-162	103	0.0%
Childcare Workers	1,139	\$25,700	1.21	-53	170	0.0%
Secondary School Teachers, Except Special and Career/Technical Education	1,062	\$62,300	1.00	-121	75	0.1%
Emergency Medical Technicians	693	\$42,100	3.34	197	51	0.5%
Social and Human Service Assistants	618	\$38,600	1.35	-7	86	1.4%
Police and Sheriff's Patrol Officers	556	\$65,800	0.78	1	41	0.3%
Middle School Teachers, Except Special and Career/Technical Education	555	\$60,600	0.89	-66	41	0.0%
Preschool Teachers, Except Special Education	551	\$34,400	1.16	-41	56	0.1%
Remaining Component Occupations	13,251	\$56,900	0.80	-617	1,414	0.4%
Human Services (CTE Field)	25,043	\$49,300	0.94	-514	2,829	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).

Most talent in the Southeast region that is working in Human Services roles are employed by Elementary and Secondary Schools (26.6%) or Individual and Family Services (8.7%).

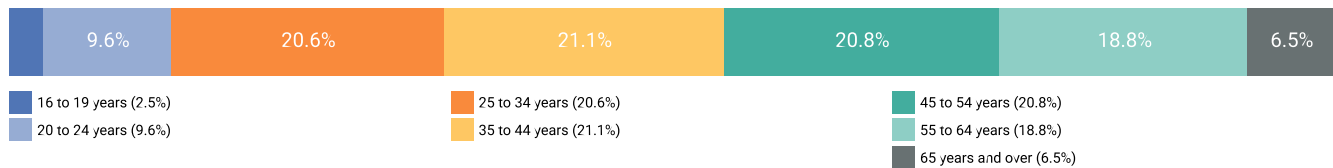
Human Services Field Employment by Industry, 2021Q1, Southeast Minnesota

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Elementary and Secondary Schools	26.6%	6,673	5,917	23	5,941
Individual and Family Services	8.7%	2,190	3,277	921	4,198
Executive, Legislative, and Other General Government Support	8.0%	2,009	1,762	39	1,801
Child Day Care Services	4.9%	1,224	1,533	-24	1,510
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	4.6%	1,164	1,577	125	1,702
Colleges, Universities, and Professional Schools	3.8%	953	851	12	863
Religious Organizations	3.5%	888	1,026	30	1,056
Other Ambulatory Health Care Services	3.3%	817	574	46	620
Offices of Physicians	3.1%	776	808	61	869
Other Residential Care Facilities	2.8%	697	837	-26	812
Personal Care Services	2.6%	661	806	20	825
General Medical and Surgical Hospitals	2.6%	655	661	8	670
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	1.9%	465	712	136	848
Home Health Care Services	1.8%	453	698	138	836
Justice, Public Order, and Safety Activities	1.8%	446	382	-14	368
Administration of Human Resource Programs	1.7%	428	379	13	392
Junior Colleges	1.7%	414	379	29	408
Other Amusement and Recreation Industries	1.5%	379	640	51	691
Legal Services	1.2%	311	229	-8	220
Other Schools and Instruction	1.2%	300	374	30	403
All Others	12.5%	3,141	3,569	70	3,639

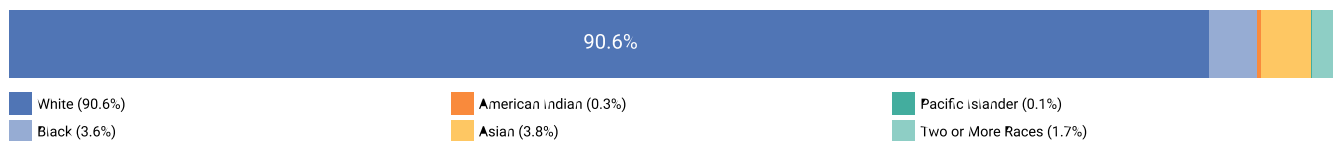
Career Field Demographics

The Human Services field is predominantly female (63.7%) and white (90.6%). Just over 46% of the field's workforce is over 44 years of age.

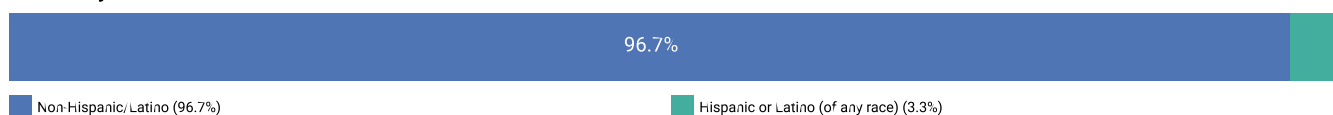
Age



Race



Ethnicity



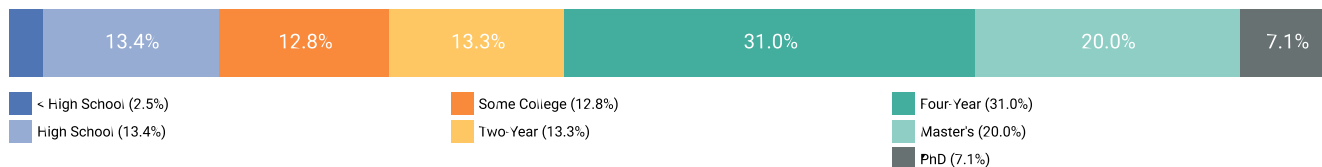
Gender



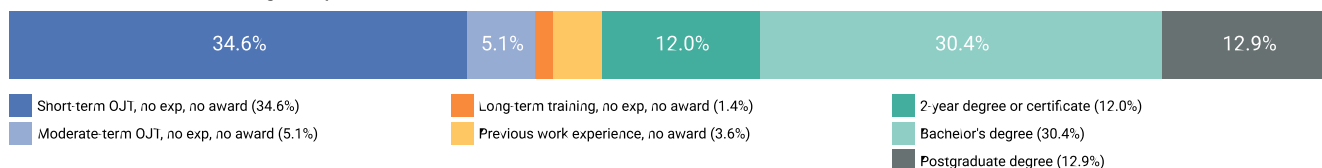
Educational Attainment and Requirements

The stacked bar charts here illustrate the estimated mix of educational attainment of the workers in this career field in aggregate. In general, the Southeast region Human Services workforce is overskilled for the typical credentials of entry-level positions. For example, 2.5% of the Human Services workforce has no diploma at all, and 13.4% hold a high school diploma as their highest credential. In contrast, about 44.7% of positions in this field do not require any kind of postsecondary award. The table below indicates typical education and training requirements rather than the mix of attainment of workers in some key positions in this field.

Educational Attainment



Education and Training Requirements



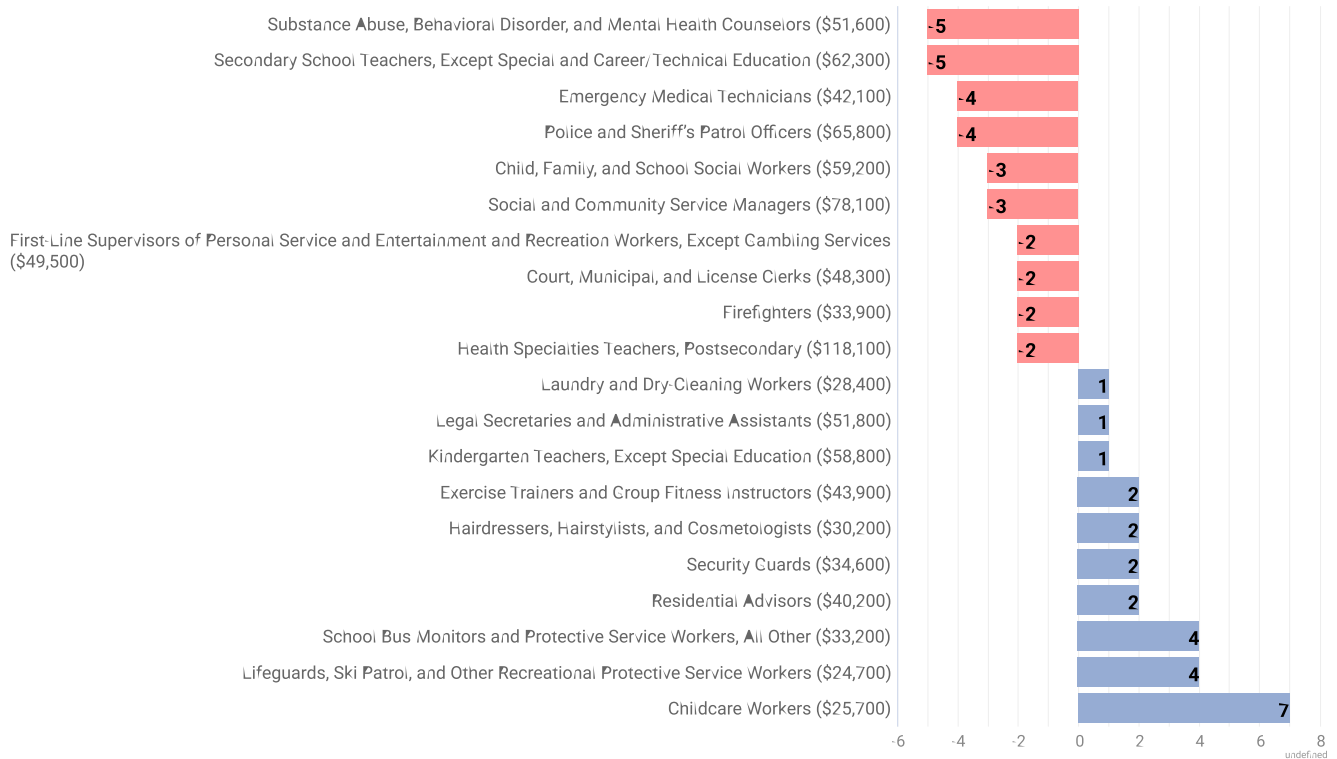
Typical Education Requirements for Top Occupations by Volume, 2021Q1

Occupation	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Personal Care Aides	High school diploma or equivalent	None	Short-term on-the-job training
Teaching Assistants, Except Postsecondary	Some college, no degree	None	None
Elementary School Teachers, Except Special Education	Bachelor's degree	None	None
Childcare Workers	High school diploma or equivalent	None	Short-term on-the-job training
Secondary School Teachers, Except Special and Career/Technical Education	Bachelor's degree	None	None
Emergency Medical Technicians	Postsecondary non-degree award	None	None
Social and Human Service Assistants	High school diploma or equivalent	None	Short-term on-the-job training
Police and Sheriff's Patrol Officers	High school diploma or equivalent	None	Moderate-term on-the-job training
Middle School Teachers, Except Special and Career/Technical Education	Bachelor's degree	None	None
Preschool Teachers, Except Special Education	Associate's degree	None	None

Occupation Gaps

The chart below shows the potential average annual gaps over ten years. In Human Services, Mental Health Counselors and Secondary School Teachers are the top occupations of shortage in the region. These critical talent shortages due in large part to forecasted employment growth and replacement demand needs due to retirements combined with insufficient talent coming into these careers.

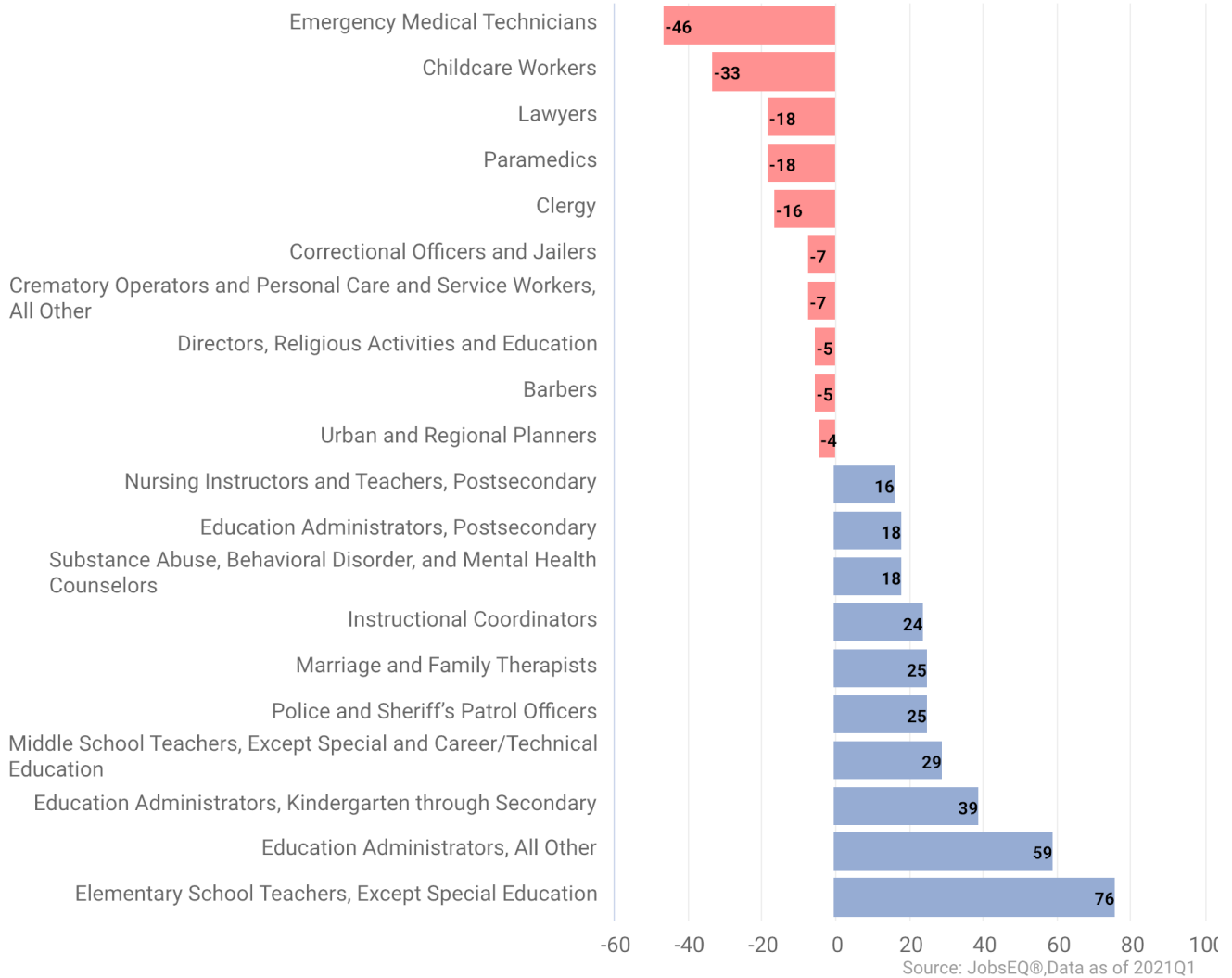
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Human Services, Southeast Minnesota 2021Q1



Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate a number of shortages. Southeast Minnesota faces several moderate Human Services award gaps, meaning that the region is underproducing local talent in relation to employer demand. Southeast Minnesota colleges and universities are underproducing about 46 graduates annually that are needed to fill Emergency Medical Technician (EMT) positions open with employers based in the region. Several occupations that typically require a certificate or industry credential also have local award gaps, including Childcare Workers and Barbers. 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, Southeast Minnesota 2021Q1



Certification Gaps

Similar to award gaps, an analysis of certification gaps identify where the existing talent pool lacks particular credentials in comparison to current openings. However, this analysis uses real-time labor market data in the form of online candidate profiles and job postings to analyze the alignment between the available workforce and local opportunities. In the table below, it is apparent that the programs aligned to the occupations above as well as shorter training programs are both needed to connect local talent with opportunities.

Top 10 Certification Gaps in the Southeast September 2021

Name	Candidates	Openings	Gap
Licensed Clinical Social Worker (LCSW)	7	15	-8
Advanced Cardiac Life Support Certification (ACLS)	10	15	-5
Licensed Professional Counselor (LPC)	7	11	-4
Pediatric Advanced Life Support (PALS)	9	12	-3
Secret Clearance	2	5	-3
Neonatal Resuscitation Program (NRP)	3	5	-2
Licensed Massage Therapist (LMT)	0	2	-2
Medical Technologist (Medical Technologists)	2	4	-2
First Responder Certification	1	3	-2
Emergency Medical Technician (EMT)	24	26	-2

Skill Gaps

Likewise, there is a degree of misalignment between the skills of the available workforce and the skills advertised by local employers. The ten skills listed below are examples of the skills in most high demand among Southeast Minnesota employers hiring Human Services talent that potential candidates have not indicated in their professional networking platforms as a strength.

Top 10 Skill Gaps in the Southeast, September 2021

Name	Candidates	Openings	Gap
Medication Administration	147	285	-138
Classroom Management	12	55	-43
Food Preparation	1	13	-12
Defibrillators	2	10	-8
Electronic Health Record (EHR)	5	12	-7
Social Services	8	14	-6
Lesson Planning	8	13	-6
Calculators	5	11	-6
Microsoft Windows XP	0	6	-5
Driving/Operating Ambulances	1	6	-5

Promising Pathways

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

Origin-to-Gateway-to-Target Occupations for Human Services, Southeast Minnesota 2021Q1

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

Secondary School Teachers
 Child, Family, and School Social Workers
 Social and Community Service Managers
 K-12 Education Administrators
 Instructional Coordinators

Gateway Occupations

Emergency Medical Technicians (HS, OG, AG)
 Substance, Behavioral, & Mental Health Counselors (HS, HD, OG)
 Court, Municipal, and License Clerks (OG)
 Healthcare Social Workers (HS, HD, OG, AG)
 Correctional Officers and Jailers (AG)

Origin Occupations

Likely

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

Aligned

Home Health Aides
 Medical Assistants
 Waiters and Waitresses
 Cashiers
 Cooks

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

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without 4-year degrees. Below are a few Origin

Occupations that are likely entrypoints into Human Services locally, or aligned opportunities that share a large number of skillsets in-demand in Human Services.

Likely Origins	Aligned Origins
Personal Care Aides	Home Health Aides
Teaching Assistants	Medical Assistants
Childcare Workers	Waiters and Waitresses
Social and Human Service Assistants	Cashiers
Preschool Teachers	Cooks

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$57,800 in the Southeast region). Below are a few Gateway Occupations in Human Services locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences.

Likely Gateways	Aligned Gateways
Emergency Medical Technicians	Licensed Practical Nurses
Substance, Behavioral, and Mental Health Counselors	Medical Secretaries
Court, Municipal, and License Clerks	Human Resources Assistants
Healthcare Social Workers	Financial Advisors
Correctional Officers and Jailers	

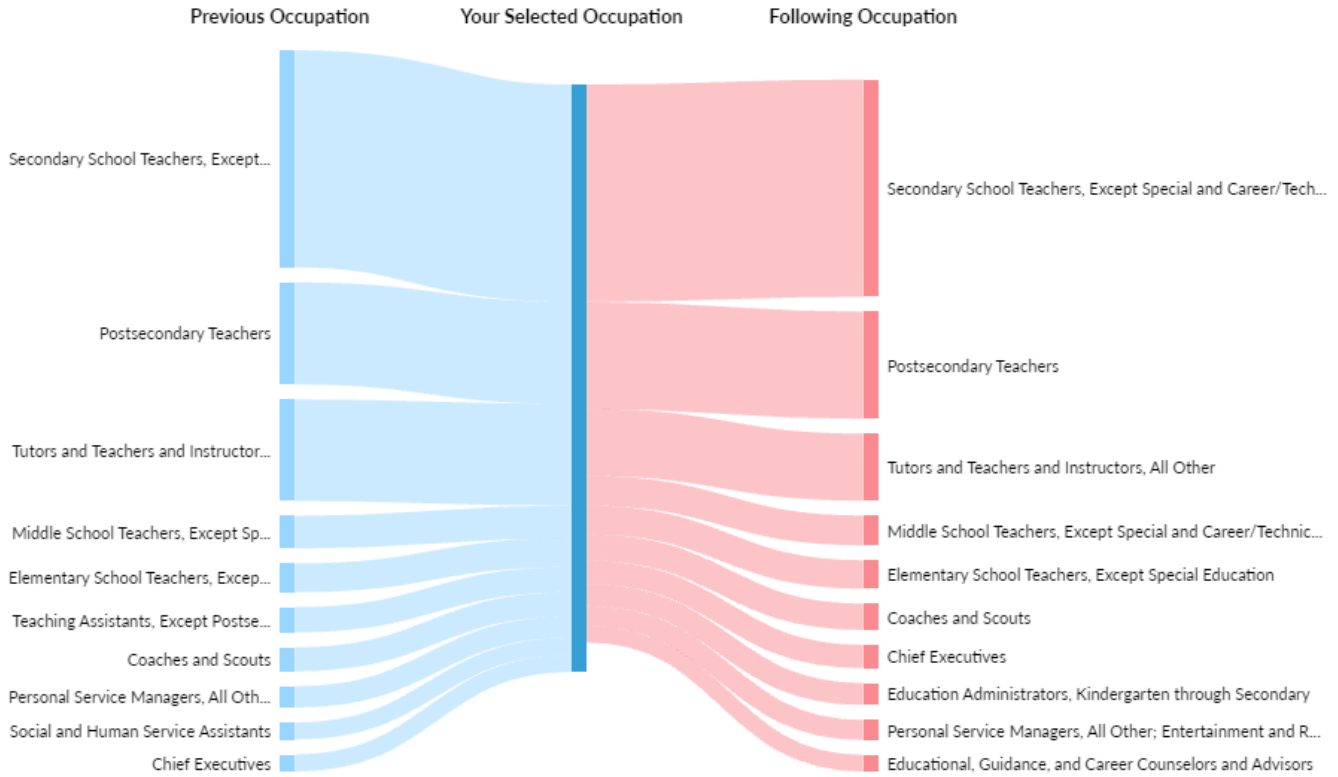
Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$57,800 in the Southeast region). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively. The majority of target occupations in this career field are in the education career cluster. Only occupations that hit the designated high-wage, high-skill, and high-demand thresholds have been included in this chart, thus putting extra weight and emphasis on current demand rather than future shortage. Some critical occupations for the region that forecast high gaps, but perhaps not currently high-demand should also be included in Career and Technical Education programs of study.

Top Target Occupations in Human Services, Southeast Minnesota 2021Q1

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	1,062	\$62,300	HW	HS	HD	OG	
21-1021	Child, Family, and School Social Workers	384	\$59,200	HW	HS	HD	OG	
11-9151	Social and Community Service Managers	238	\$78,100	HW	HS	HD	OG	
11-9032	Education Administrators, Kindergarten through Secondary	217	\$105,400	HW	HS	HD	OG	
25-9031	Instructional Coordinators	172	\$71,900	HW	HS	HD	OG	
25-2012	Kindergarten Teachers, Except Special Education	161	\$58,800	HW	HS	HD		
25-1071	Health Specialties Teachers, Postsecondary	157	\$118,100	HW	HS	HD	OG	
21-2021	Directors, Religious Activities and Education	143	\$63,700	HW	HS	HD		AG
21-1091	Health Education Specialists	129	\$63,900	HW	HS	HD		
25-4022	Librarians and Media Collections Specialists	121	\$60,000	HW	HS	HD	OG	

Secondary School Teachers will be in shortage in the Southeast over the next five years, and is a high-skill, high-demand, high-wage occupation. This role is analyzed below in more detail for better understanding of occupation “gain and drain.” The chart below illustrates the national profiles of current and past people in this occupation. The left column shows job transitions from other occupations to Secondary Education. The right column shows job transitions from this role to other occupations.

Secondary Education Talent Gain and Drain, 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for Secondary Educators, Southeast Minnesota 2021

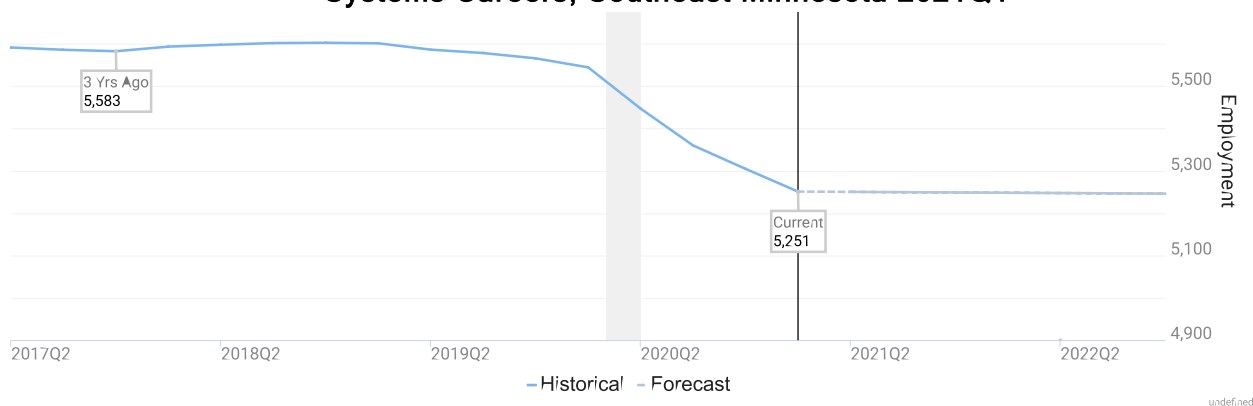


2020 IPEDS Completions Data; Visualizations from Emsi 2021Q3 dataset.

ARTS, COMMUNICATIONS, AND INFORMATION SYSTEMS

Arts, Communications, and Information Systems is a diverse career field with artistic careers as well as Information Technology career paths, which experienced somewhat diverging trends during over the course of the COVID-19 pandemic thus far. Over the next three years, under a pessimistic baseline forecast, Arts, Communications, and Information Systems Field employment is forecast to decline by -0.1% annually. In the most optimistic scenario likely based on employer demand, potential for recovery, and given the existing talent shortage, employment growth of 0.9% annually in this field could be possible.

Baseline Worst-Case Scenario 3-Year Forecast for Arts, Communications, and Information Systems Careers, Southeast Minnesota 2021Q1



Top Ten Arts, Communications, and Information Systems Occupations by Employment Volume in Southeast, 2021Q1

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Software Developers and Software Quality Assurance Analysts and Testers	1,248	\$114,100	0.73	51	104	1.0%
Computer Systems Analysts	543	\$86,700	0.81	9	38	-0.2%
Computer User Support Specialists	444	\$55,700	0.61	0	36	-0.1%
Network and Computer Systems Administrators	270	\$79,100	0.70	-16	18	-0.3%
Telecommunications Equipment Installers and Repairers, Except Line Installers	238	\$50,100	1.09	-52	24	-0.7%
Graphic Designers	191	\$46,800	0.66	-17	16	-1.0%
Computer Network Support Specialists	185	\$59,000	0.89	-8	15	-0.2%
Computer Occupations, All Other	175	\$72,600	0.39	-5	13	-0.1%
Printing Press Operators	144	\$43,500	0.79	-47	12	-1.9%
Musicians and Singers	140	\$53,100	0.77	-13	17	0.0%
Remaining Component Occupations	1,674	\$62,600	0.68	-245	154	-0.5%
Arts, Communications, & Information Systems (CTE Field)	5,251	\$75,900	0.68	-342	444	-0.1%

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

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

The largest share of talent in the Southeast that is working in Arts, Communications, and Information Systems roles are employed by the Computer and Peripheral Equipment Manufacturing industry (15.9%) or Telecommunications Carriers (9.1%). Overall, employment is relatively spread out across many different industries.

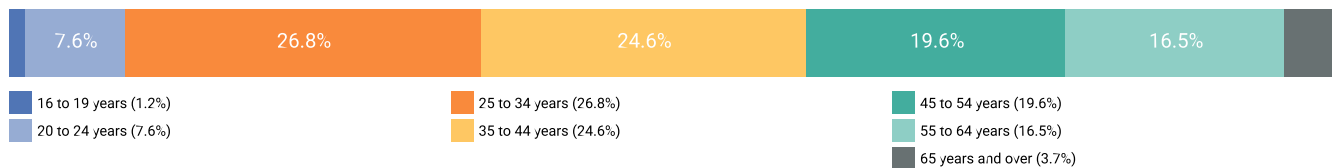
Arts, Communications, and Information Systems Field Employment by Industry, 2021Q1, Southeast Minnesota

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Computer and Peripheral Equipment Manufacturing	15.9%	835	622	61	683
Wired and Wireless Telecommunications Carriers	9.1%	478	437	-64	372
Management of Companies and Enterprises	6.3%	330	252	9	261
Independent Artists, Writers, and Performers	4.2%	220	234	-7	227
Computer Systems Design and Related Services	3.6%	191	153	33	186
General Medical and Surgical Hospitals	3.4%	181	134	-3	132
Offices of Physicians	3.4%	179	140	9	149
Printing and Related Support Activities	3.3%	171	174	-36	138
Religious Organizations	3.1%	164	185	5	190
Radio and Television Broadcasting	2.9%	155	163	-2	161
Software Publishers	2.6%	135	110	26	137
Semiconductor and Other Electronic Component Manufacturing	2.4%	128	92	-6	86
Depository Credit Intermediation	2.4%	124	90	0	91
Office Administrative Services	2.0%	107	89	23	112
Newspaper, Periodical, Book, and Directory Publishers	2.0%	103	87	-42	46
Colleges, Universities, and Professional Schools	1.9%	97	79	-4	74
Elementary and Secondary Schools	1.7%	87	70	-2	68
Sound Recording Industries	1.6%	87	85	-9	76
Other Professional, Scientific, and Technical Services	1.6%	83	79	-3	76
Executive, Legislative, and Other General Government Support	1.5%	77	60	0	61
All Others	25.1%	1,320	1,148	-17	1,131

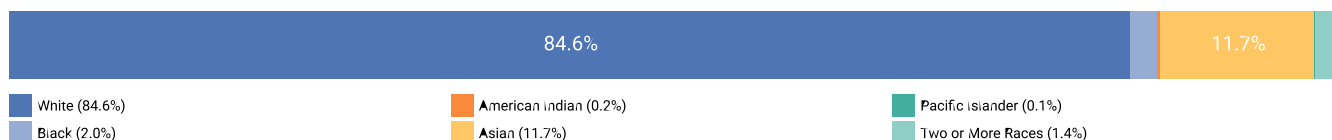
Career Field Demographics

The Arts, Communications, and Information Systems field is predominantly male (76.3%) and white (84.6%) and Asian (11.7%). Over one in three workers employed in the Arts, Communications, and Information Systems workforce in the region is 34 or younger.

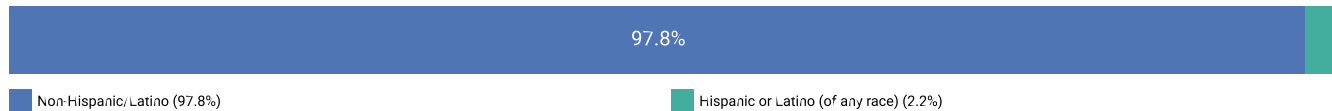
Age



Race



Ethnicity



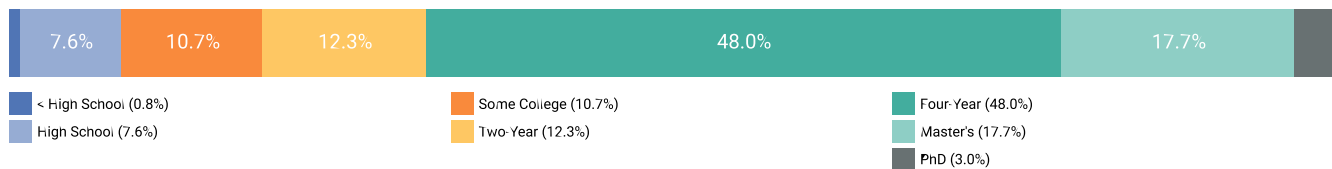
Gender



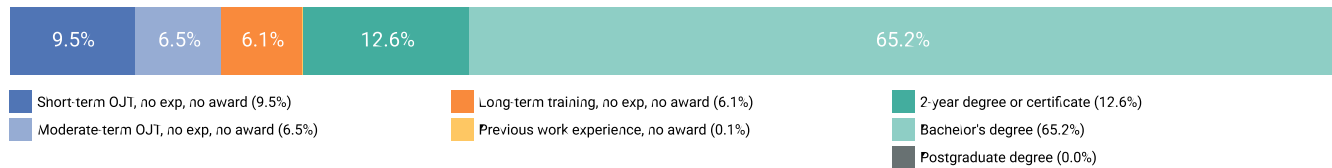
Educational Attainment and Requirements

The stacked bar charts here illustrate the estimated mix of educational attainment of the workers in this career field in aggregate and the typical requirements for roles in this field. The Arts, Communications, and Information Systems workforce of Southeast Minnesota is much more highly educated than in the Southwest. Nearly two out of three (65.2%) jobs in this field require a Bachelor's degree, while 48.0% of the workforce hold a four-year degree as their highest credential. Another 20.7% hold a Master's or PhD.

Educational Attainment



Education and Training Requirements



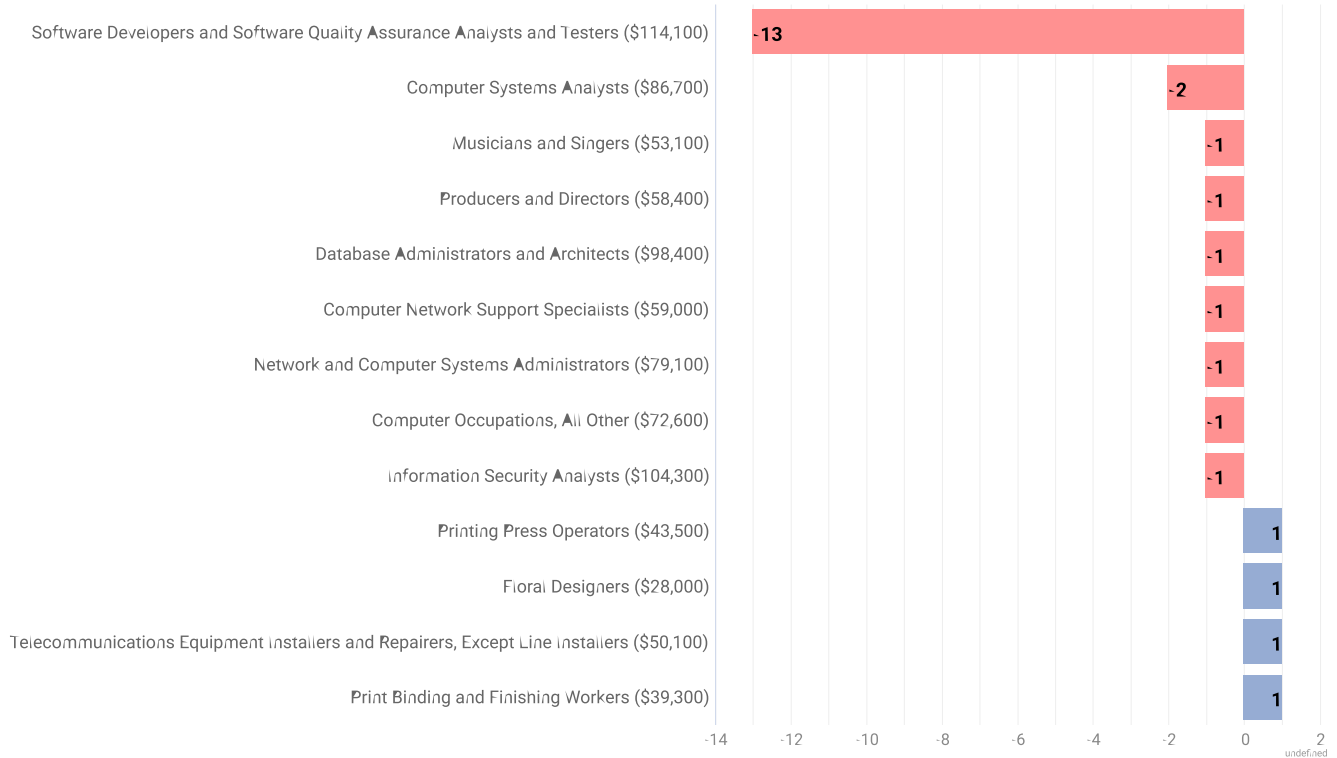
Typical Education Requirements for Top Occupations by Volume, 2021Q1

Occupation	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Software Developers and Software Quality Assurance Analysts and Testers	Bachelor's degree	None	None
Computer Systems Analysts	Bachelor's degree	None	None
Computer User Support Specialists	Some college, no degree	None	None
Network and Computer Systems Administrators	Bachelor's degree	None	None
Telecommunications Equipment Installers and Repairers, Except Line Installers	Postsecondary non-degree award	None	Moderate-term on-the-job training
Graphic Designers	Bachelor's degree	None	None
Computer Network Support Specialists	Associate's degree	None	None
Computer Occupations, All Other	Bachelor's degree	None	None
Printing Press Operators	High school diploma or equivalent	None	Moderate-term on-the-job training
Musicians and Singers	None	None	Long-term on-the-job training

Occupation Gaps

The chart below shows the potential average annual gaps over ten years. Software Developers are the top occupation of shortage in this field, falling short at least 13 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, which is a trend affecting all regions of Minnesota.

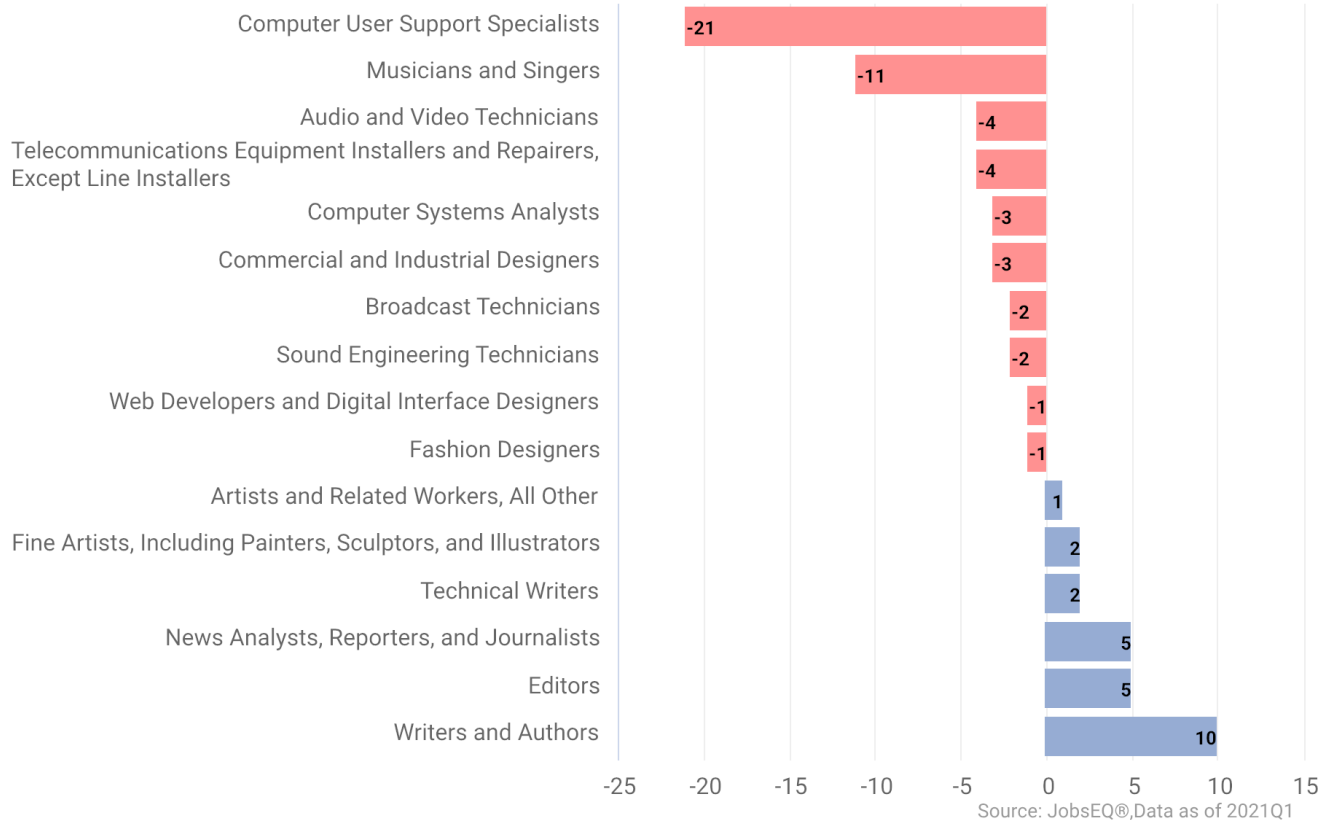
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Arts, Communications, and Information Systems, Southeast Minnesota 2021Q1



Award Gaps

A comparison of the graduate talent pipeline obtaining a certificate or postsecondary degree to the current estimated openings by occupation illuminate a number of regional shortages. The Southeast region 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. Specifically, Southeast Minnesota colleges and universities are underproducing trained Computer User Support Specialists (certifications) and Musicians needed in the local talent market.

Award Gaps in Arts, Communications, and Information Systems, Southeast Minnesota 2021Q1



Certification Gaps

Similar to award gaps, an analysis of certification gaps identify where the existing talent pool lacks particular credentials in comparison to current openings. However, this analysis uses real-time labor market data in the form of online candidate profiles and job postings to analyze the alignment between the available workforce and local opportunities. In the table below, it is apparent that the programs aligned to the occupations above as well as shorter training programs are both needed to connect local talent with opportunities.

Top 10 Certification Gaps in the Southeast, September 2021

Name	Candidates	Openings	Gap
Certified Scrum Developer (CSD)	0	4	-4
Certified Senior Technical Professional (CSTP)	0	3	-3
Project Management Professional (PMP)	1	3	-2
Certified ScrumMaster (CSM)	0	2	-1
Microsoft Certified Solutions Expert (MCSE)	1	2	-1
Certified Information Security Manager (CISM)	1	2	-1
Registered Health Information Administrator (RHIA)	0	1	-1
Certified Professional in Healthcare Information and Management Systems (CPHIMS)	0	1	-1
Certified Scrum Product Owner (CSPO)	0	1	-1
Cisco Certified Network Associate (CCNA)	8	8	0

Skill Gaps

Likewise, there is a degree of misalignment between the skills of the available workforce and the skills advertised by local employers. The ten skills listed below are examples of the skills in most high

demand among Southeast Minnesota employers hiring Arts, Communications, and Information Systems talent that potential candidates have not indicated in their professional networking platforms as a strength.

Top 10 Skill Gaps in the Southeast, September 2021

Name	Candidates	Openings	Gap
Google	6	15	-8
Modems	2	8	-7
Computer Operating Systems	2	8	-6
Epic Systems	4	9	-6
Personal Computers (PC)	12	18	-5
Mocha	1	5	-5
Jasmine	1	6	-5
Routers	15	20	-5
Power Tools	4	8	-5
Software Testing	3	7	-4

Promising Pathways

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

Origin-to-Gateway-to-Target Occupations for Arts, Communications, and Information Systems, Southeast Minnesota 2021Q1

Target Occupations (all HW, HD, HS)

Software Developers (OG)
Writers & Authors
Computer Network Architects
Producers & Directors (OG)
Information Security Analysts (OG)

Gateway Occupations

Telecommunications Equipment Installers & Repairers (HS, AG)
Telecommunications Line Installers & Repairers (HD)
Prepress Technicians & Workers (HS, AG)
News Analysts, Reporters, & Journalists (HS)
Audio & Video Technicians (HS, HD, OG, AG)

Origin Occupations

Likely

Graphic Designers (HS, AG)
Print Binding & Finishing Workers (HS, HD)
Broadcast Announcers & Radio Disc Jockeys (HS, HD)
Floral Designers
Music Directors & Composers (HS, HD, OG)

Aligned

Library Technicians
Recreation Attendants
Hosts and Hostesses
Customer Service Reps
Photo Process Machine Ops

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

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without 4-year degrees. Below are a few Origin Occupations that are likely entrypoints into Arts, Communications, and Information Systems careers locally, or aligned opportunities that share a large number of skillsets in-demand in the field.

Likely Origins	Aligned Origins
Floral Designers	Library Technicians
Broadcast Announcers and Radio Disc Jockeys	Amusement and Recreation Attendants
Print Binding and Finishing Workers	Hosts and Hostesses
Broadcast Technicians	Customer Service Representatives
Actors	Photo Process Machine Operators

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$57,800 in the Southeast region). Below are a few Gateway Occupations in Arts, Communications, and Information Systems locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences.

Likely Gateways	Aligned Gateways
Computer User Support Specialists	Supervisors of Office and Administrative Support Workers
Telecommunications Line Installers and Repairers	Painting, Coating, and Decorating Workers
Graphic Designers	Window Trimmers
Printing Press Operators	Forest and Conservation Technicians
Musicians and Singers	

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$57,800 in the Southeast region). 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. Only occupations that hit the designated high-wage, high-skill, and high-demand thresholds have been included in this chart, thus putting extra weight and emphasis on current demand rather than future shortage. Some critical occupations for the region that forecast high gaps, but perhaps not currently high-demand should also be included in Career and Technical Education programs of study.

It is important to recognize in this field that many important Information Technology careers may not hit the specified high-demand threshold in the Southeast region, but are likely to see higher demand in the years ahead. A full list of occupations in the career field is available upon request.

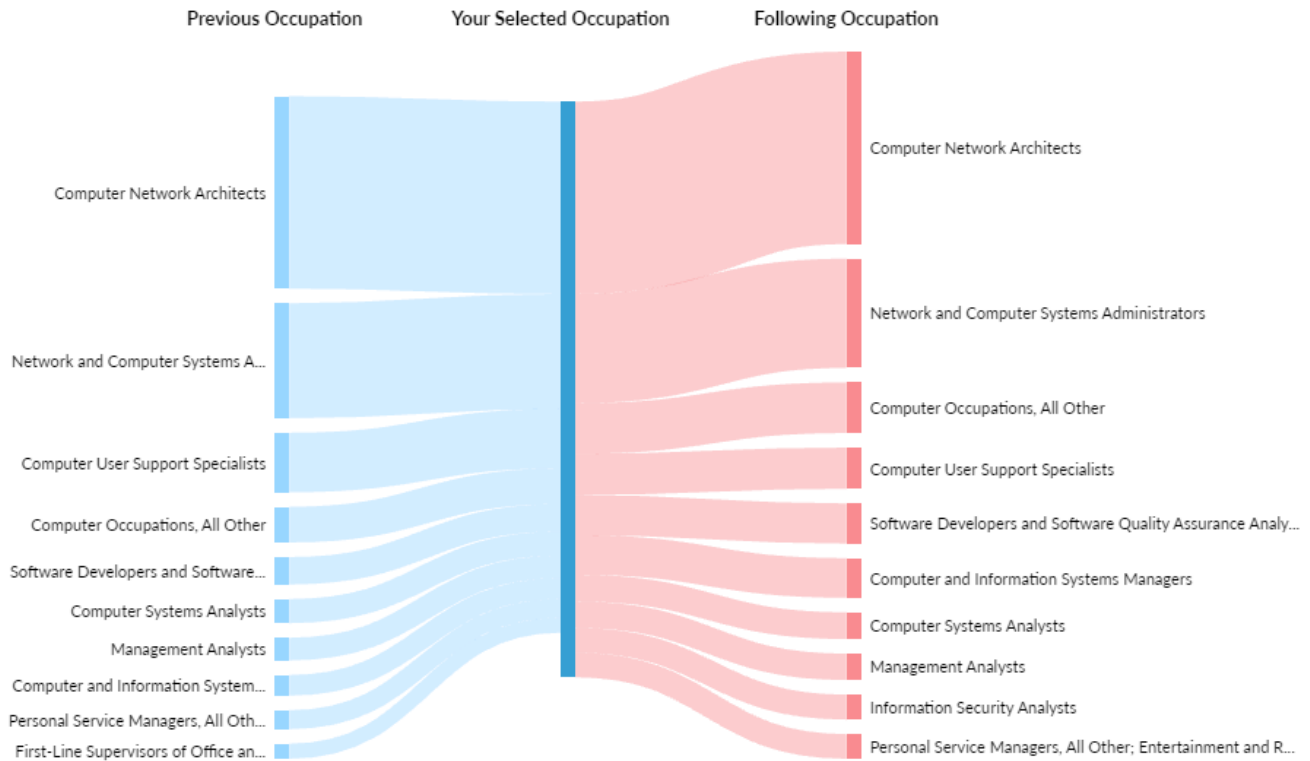
Top Target Occupations in Arts, Communications, and Information Systems, Southeast Minnesota 2021Q1

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
15-1241	Computer Network Architects	111	\$113,000	HW	HS	HD		
27-3043	Writers and Authors	91	\$58,000	HW	HS	HD		
27-2012	Producers and Directors	87	\$58,400	HW	HS	HD	OG	
15-1212	Information Security Analysts	77	\$104,300	HW	HS	HD	OG	
27-1021	Commercial and Industrial Designers	41	\$71,300	HW	HS	HD		AG
27-1014	Special Effects Artists and Animators	32	\$60,800	HW	HS	HD		

Computer Network Architects are high-wage, high-skill, high-demand in Southeast Minnesota. On average, Computer Network Architects make about \$113,000 per year in the region. Several other Information Technology careers in the region are high-skill and high-wage, and low unemployment, but did not have high volumes of growth, job postings, or turnover demand in the next few years.

Below, this occupation is analyzed in more detail for better understanding of occupation “gain and drain.” The chart below illustrates the national profiles of current and past people in this occupation. The left column shows job transitions from other occupations to Computer Network Architect. The right column shows job transitions from Computer Network Architect to other occupations.

Computer Network Architect Talent Gain and Drain, 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

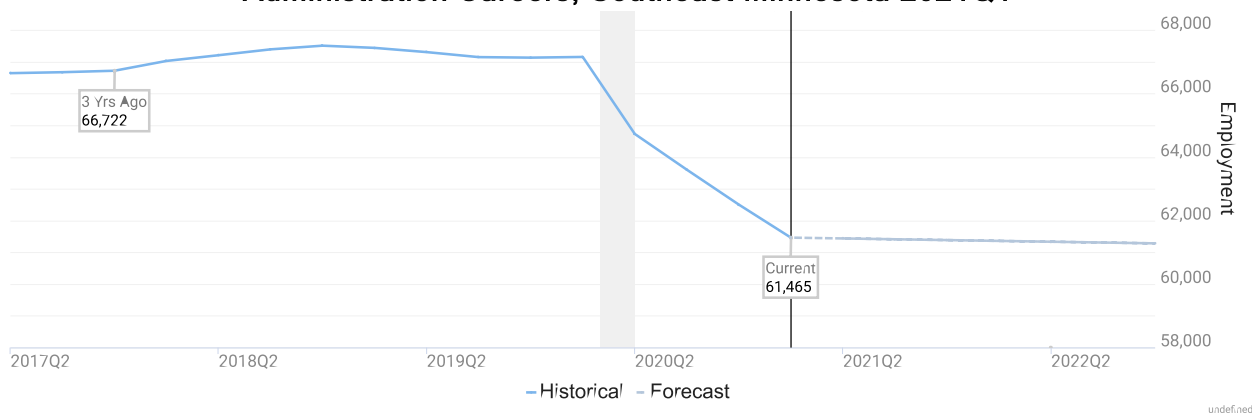
Graduate Pipeline for Computer Network Architect, Southeast Minnesota 2021



BUSINESS, MANAGEMENT, AND ADMINISTRATION

Business, Management, and Administration is a diverse career field with Hospitality and Tourism, Finance, Administration, Human Resources, and Marketing careers, which all experienced somewhat diverging trends during over the course of the COVID-19 pandemic thus far. Over the next three years, under a pessimistic baseline forecast, Business, Management, and Administration Field employment is forecast to decline by -0.2% on average annually. In the most optimistic scenario feasible over the next three years based on employer demand and given the existing talent shortage and talent pipelines in place, employment growth of 2.9% annually in this field could be possible. Most of the potential growth is attributable to rebounding hospitality and tourism occupations in this career field.

Baseline Worst-Case Scenario 3-Year Forecast for Business, Management, and Administration Careers, Southeast Minnesota 2021Q1



Top Business, Management, and Administration Systems Occupations by Employment Volume in Southeast Minnesota, 2021Q1

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-	Annual	Baseline
				Year Empl Change	Demand	Forecast Ann Growth
Cashiers	4,363	\$26,500	1.15	-192	748	-1.0%
Retail Salespersons	3,828	\$31,400	0.90	-625	540	-0.3%
Fast Food and Counter Workers	3,612	\$26,200	0.96	-447	700	0.7%
Office Clerks, General	2,883	\$38,000	0.90	-104	317	-0.7%
Customer Service Representatives	2,420	\$36,500	0.76	77	295	-0.8%
Receptionists and Information Clerks	2,189	\$30,800	1.92	-25	311	0.6%
Stockers and Order Fillers	2,177	\$32,100	0.86	-124	282	-0.2%
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2,148	\$32,800	0.90	-172	289	0.2%
General and Operations Managers	1,930	\$102,600	0.73	45	173	0.2%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	1,895	\$38,400	0.86	-121	178	-1.3%
Remaining Component Occupations	34,021	\$54,300	0.75	-3,884	4,011	-0.1%
Business, Management, & Administration (CTE Field)	61,465	\$46,400	0.85	-5,566	7,846	-0.2%

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

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

Employment in Business, Management, and Administration careers is spread out across a number of different industries. In the Southeast region, the industries with the greatest share of Business, Management, and Administration talent are Restaurants (11.5%) and Offices of Physicians (10.0%). These two industries account for more than half of all talent demand over the next ten years.

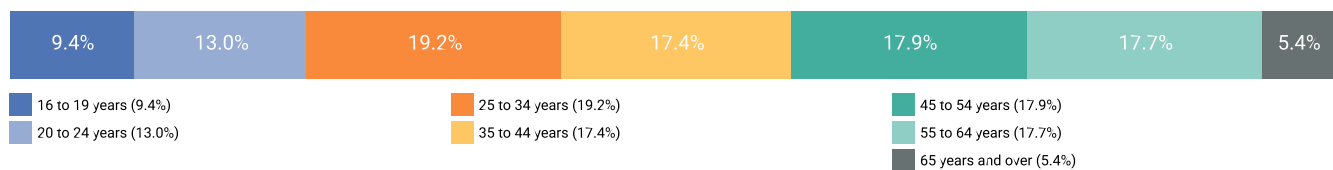
Business, Management, and Administration Field Employment by Industry, 2021Q1, Southeast Minnesota

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Restaurants and Other Eating Places	11.5%	7,091	12,364	368	12,732
Offices of Physicians	10.0%	6,124	7,324	183	7,507
Grocery Stores	4.3%	2,624	3,966	-132	3,833
General Merchandise Stores, including Warehouse Clubs and Supercenters	4.0%	2,430	3,494	-153	3,341
Gasoline Stations	3.7%	2,269	3,784	-155	3,629
General Medical and Surgical Hospitals	3.5%	2,172	2,623	-74	2,550
Management of Companies and Enterprises	2.6%	1,576	1,574	-5	1,569
Depository Credit Intermediation	2.3%	1,430	1,412	-103	1,309
Elementary and Secondary Schools	2.3%	1,387	1,762	-77	1,685
Building Material and Supplies Dealers	2.1%	1,290	1,761	-50	1,711
Traveler Accommodation	2.0%	1,204	1,754	-39	1,715
Office Administrative Services	1.7%	1,057	1,199	161	1,361
Computer and Peripheral Equipment Manufacturing	1.6%	996	977	11	987
Executive, Legislative, and Other General Government Support	1.6%	995	1,189	-34	1,155
Special Food Services	1.6%	959	1,560	1	1,561
Services to Buildings and Dwellings	1.4%	872	1,137	35	1,172
Automobile Dealers	1.4%	854	1,066	-22	1,044
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	1.2%	757	1,204	155	1,359
Other Amusement and Recreation Industries	1.2%	756	1,322	73	1,395
Religious Organizations	1.1%	676	796	-21	775
All Others	39.0%	23,944	27,259	-1,148	26,111

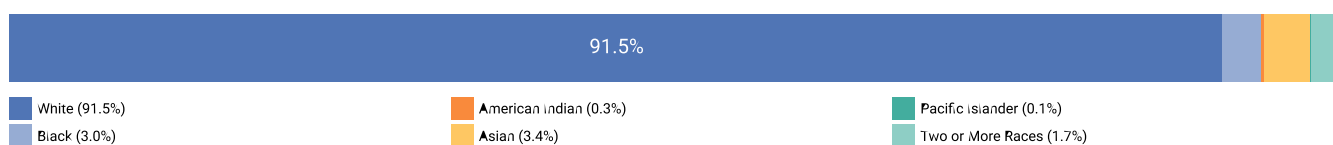
Career Field Demographics

The Business, Management, and Administration field has a slightly higher concentration of female workers (54.2%) than male, and is 91.5% White. About 4.5% of the workforce is Hispanic or Latinx. The age of the workforce is fairly evenly dispersed, with about 22.4% of the field's workforce 24 years old or younger, and 23.1% 55 or older.

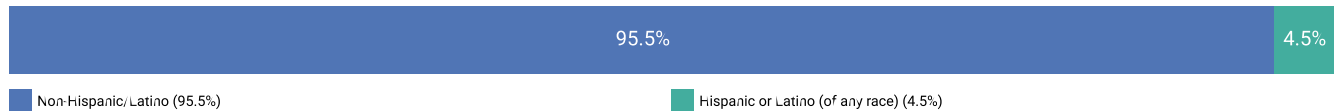
Age



Race



Ethnicity



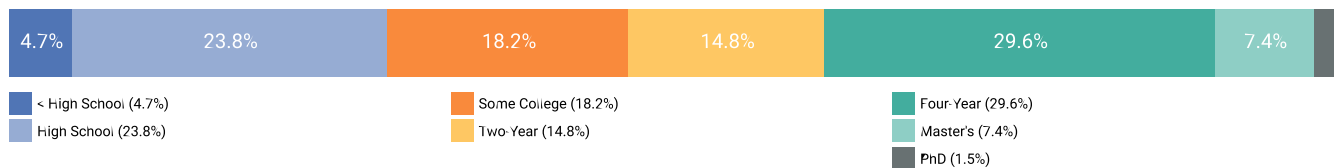
Gender



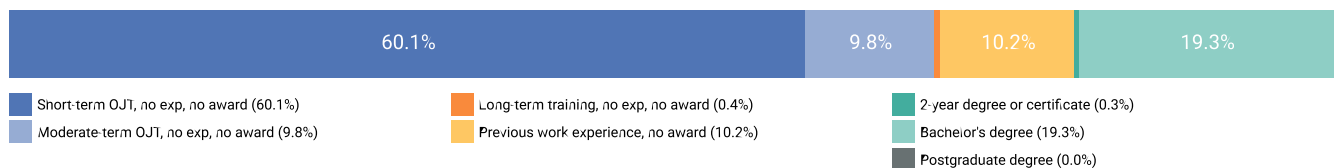
Educational Attainment and Requirements

The stacked bar charts here illustrate the estimated mix of educational attainment of the workers in this career field in aggregate, next to the typical education and training requirements in the field overall. In general, the Southeast Minnesota Business, Management, and Administration workforce is more likely to have a 2-year degree than what is in demand. While 14.8% of the workforce holds a 2-year degree, just 0.3% of the positions in this field require a 2-year degree. Nearly two-thirds of all positions in this field (60.1%) require no degree, no experience, and only short-term on-the-job training. Another 20.4% require experience or some on-the-job training, but still no degree. In contrast, only 4.7% of the workforce in this field has no degree at all, and 23.8% hold a high school diploma as their highest credential. The table below indicates typical education and training requirements rather than the mix of attainment of workers in some key positions in this field.

Educational Attainment



Education and Training Requirements



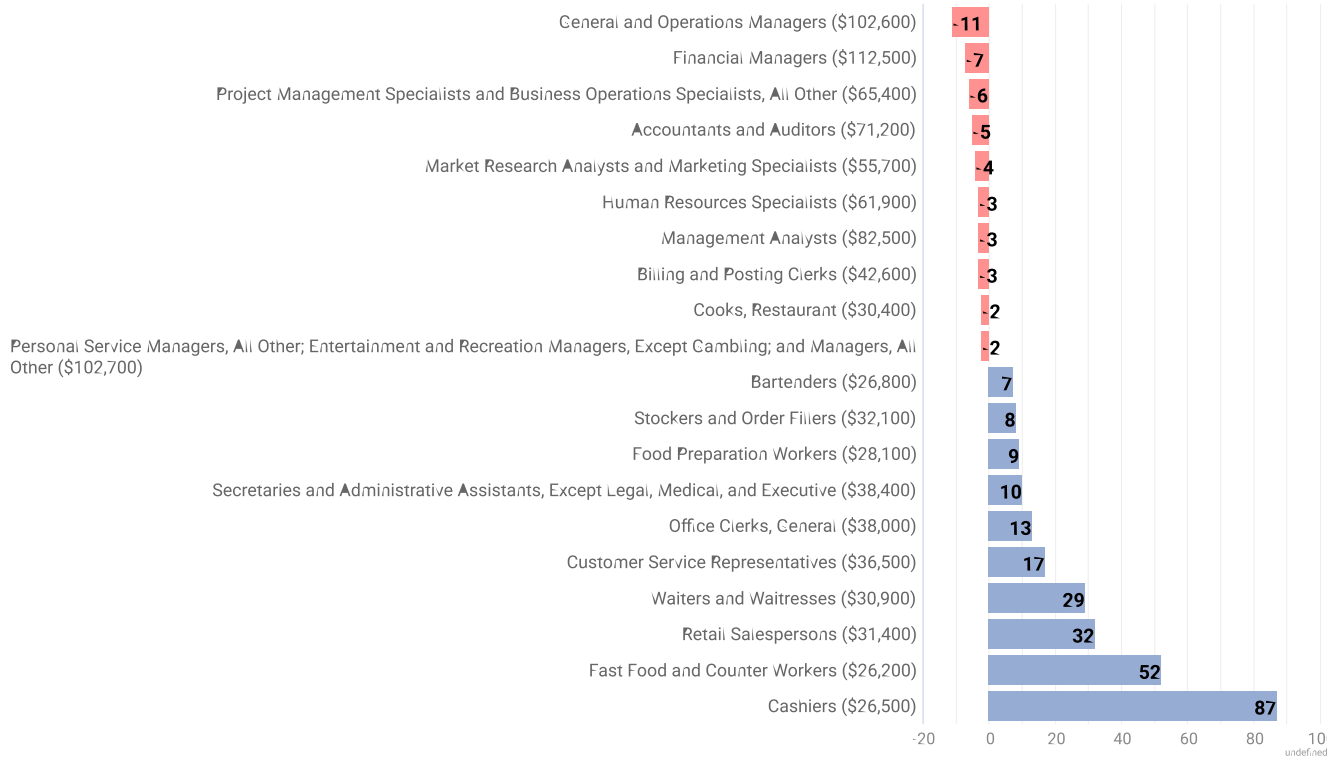
Typical Education Requirements for Top Occupations by Volume, 2021Q1

Occupation	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Cashiers	None	None	Short-term on-the-job training
Retail Salespersons	None	None	Short-term on-the-job training
Fast Food and Counter Workers	None	None	Short-term on-the-job training
Office Clerks, General	High school diploma or equivalent	None	Short-term on-the-job training
Customer Service Representatives	High school diploma or equivalent	None	Short-term on-the-job training
Receptionists and Information Clerks	High school diploma or equivalent	None	Short-term on-the-job training
Stockers and Order Fillers	High school diploma or equivalent	None	Short-term on-the-job training
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	None	None	Short-term on-the-job training
General and Operations Managers	Bachelor's degree	5 years or more	None
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	High school diploma or equivalent	None	Short-term on-the-job training

Occupation Gaps

The chart below shows the potential average annual gaps over ten years. A number of management and finance roles indicate significant shortages in the years ahead, with the General and Operations Manager talent pool likely falling short at least 11 skilled workers needed annually (averaged over the next ten years) to meet employer demand. Financial Managers, Project Management Specialists, and Accountants are other likely regional shortages. These critical talent shortages are primarily due to moderate growth and retirements which outpace demand.

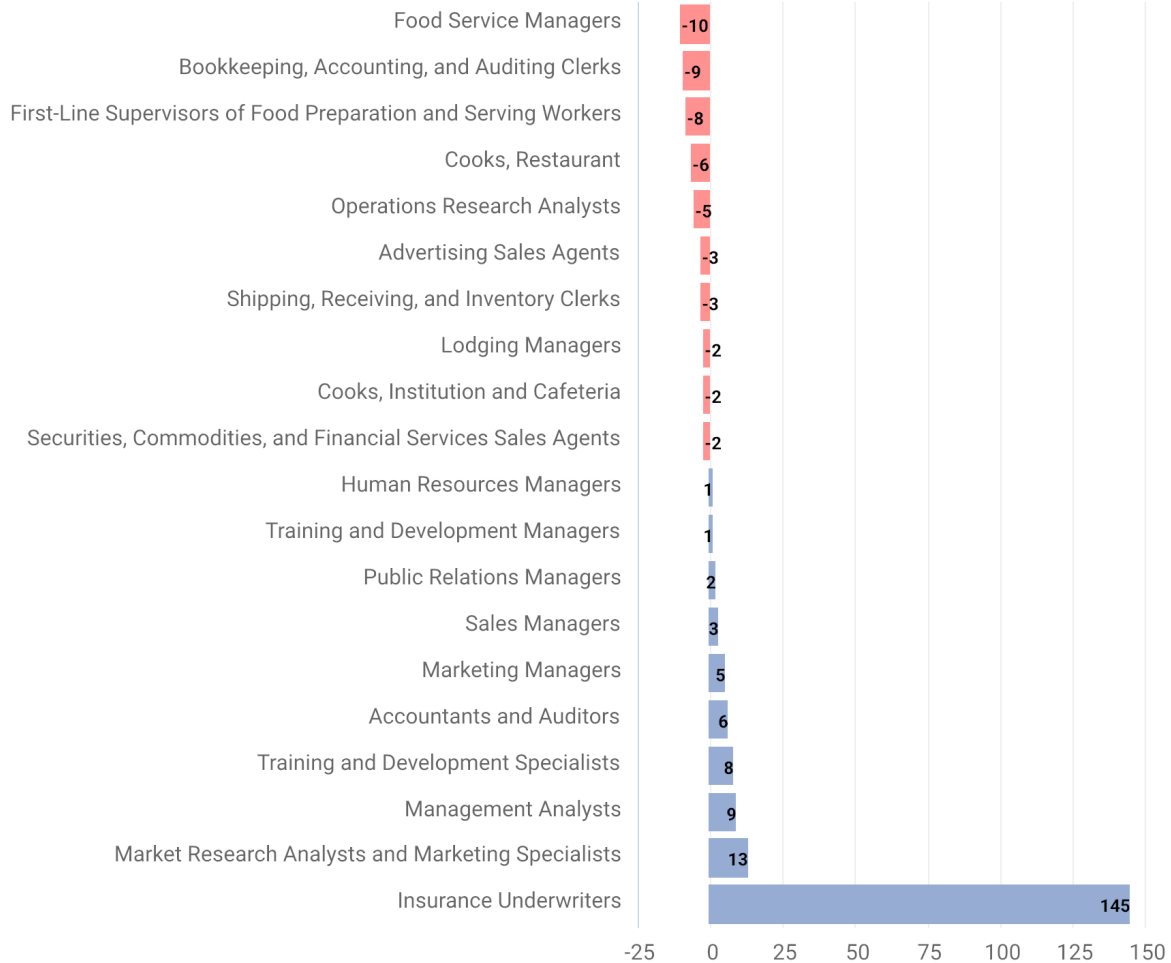
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Business, Management, and Administration, Southeast Minnesota 2021Q1



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 Southeast region currently under-train talent in several entry-level Business, Management, and Administration roles when compared to national benchmarks. Most of the roles with shortages of awards require industry credentials in management, finance, and hospitality. There is a notable difference between the award gaps and occupation gaps in the region.

Award Gaps in Business, Management, and Administration, Southeast Minnesota 2021Q1



Certification Gaps

Similar to award gaps, an analysis of certification gaps identify where the existing talent pool lacks particular credentials in comparison to current openings. However, this analysis uses real-time labor market data in the form of online candidate profiles and job postings to analyze the alignment between the available workforce and local opportunities. In the table below, it is apparent that the programs aligned to the occupations above as well as shorter training programs are both needed to connect local talent with opportunities.

Top 10 Certification Gaps in the Southeast, September 2021

Name	Candidates	Openings	Gap
Certified Public Accountant (CPA)	43	53	-10
Certified Internal Auditor (CIA)	0	10	-10
Certified Management Accountant (CMA)	3	10	-7
Senior Professional in Human Resources (SPHR)	4	10	-6
Professional in Human Resources (PHR)	7	13	-6
Commercial Driver's License (CDL)	6	11	-6
Basic Life Support (BLS)	2	7	-5
Society for Human Resource Management Certified Professional (SHRM-CP)	3	7	-4
Forklift Certified	5	9	-4
Chartered Financial Analyst (CFA)	1	5	-4

Skill Gaps

Likewise, there is a degree of misalignment between the skills of the available workforce and the skills advertised by local employers. The ten skills listed below are examples of the skills in most high demand among Southeast Minnesota employers hiring Business, Management, and Administration talent that potential candidates have not indicated in their professional networking platforms as a strength.

Top 10 Skill Gaps in the Southeast, September 2021

Name	Candidates	Openings	Gap
People Skills	98	312	-214
Retail Sales	328	455	-127
Sales	320	420	-100
Personal Computers (PC)	124	205	-81
Telecommunications	10	74	-64
Word Processing	101	161	-61
Calculators	112	169	-57
Finance	100	154	-54
Culinary Arts	31	82	-51
Medical Terminology	37	78	-41

Promising Pathways

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

Origin-to-Gateway-to-Target Occupations for Business, Management, and Administration, Southeast Minnesota 2021Q1

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

General and Operations Managers
 Project Management Specialists
 Accountants and Auditors
 Financial Managers
 Sales Managers

Gateway Occupations

Bookkeeping, Accounting, and Auditing Clerks (HS, AG)
 First-Line Supervisors of Retail Sales Workers
 Billing and Posting Clerks (OG)
 Sales Representatives and Services (HD, AG)
 Market Research Analysts (HS, HD, OG)

Origin Occupations

Likely

Cashiers
 Retail Salespersons (HD)
 Fast Food and Counter Workers (HD)
 Office Clerks, General (AG)
 Customer Service Representatives (AG)

Aligned

Personal Care Aides
 Eligibility Interviewers
 Childcare Workers
 Library Technicians

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

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without 4-year degrees. Below are a few Origin Occupations that are likely entrypoints into Business, Management, and Administration roles locally, or aligned opportunities that share a large number of skillsets in-demand in the field.

Likely Origins	Aligned Origins
Cashiers	Personal Care Aides
Retail Salespersons	Eligibility Interviewers
Fast Food and Counter Workers	Childcare Workers
Office Clerks, General	Library Technicians
Customer Service Representatives	

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$57,800 in the Southeast region). Below are a few Gateway Occupations in Business, Management, and Administration locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences. None of the gateway occupations in this career field are considered high-skill, meaning that the majority of roles listed here would be accessible to an individual without formal education or training.

Likely Gateways	Aligned Gateways
Bookkeeping, Accounting, and Auditing Clerks	Graphic Designers
Supervisors of Retail Sales Agents	Editors
Billing and Posting Clerks	Writers
Sales Representatives and Services	Computer User Support Specialists
Market Research Analysts	

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$57,800 in the Southeast region). 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. Only occupations that hit the designated high-wage, high-skill, and high-demand thresholds have been included in this chart, thus putting extra weight and emphasis on current demand rather than future shortage. Some critical occupations for the region that forecast high gaps, but perhaps not currently high-demand should also be included in Career and Technical Education programs of study.

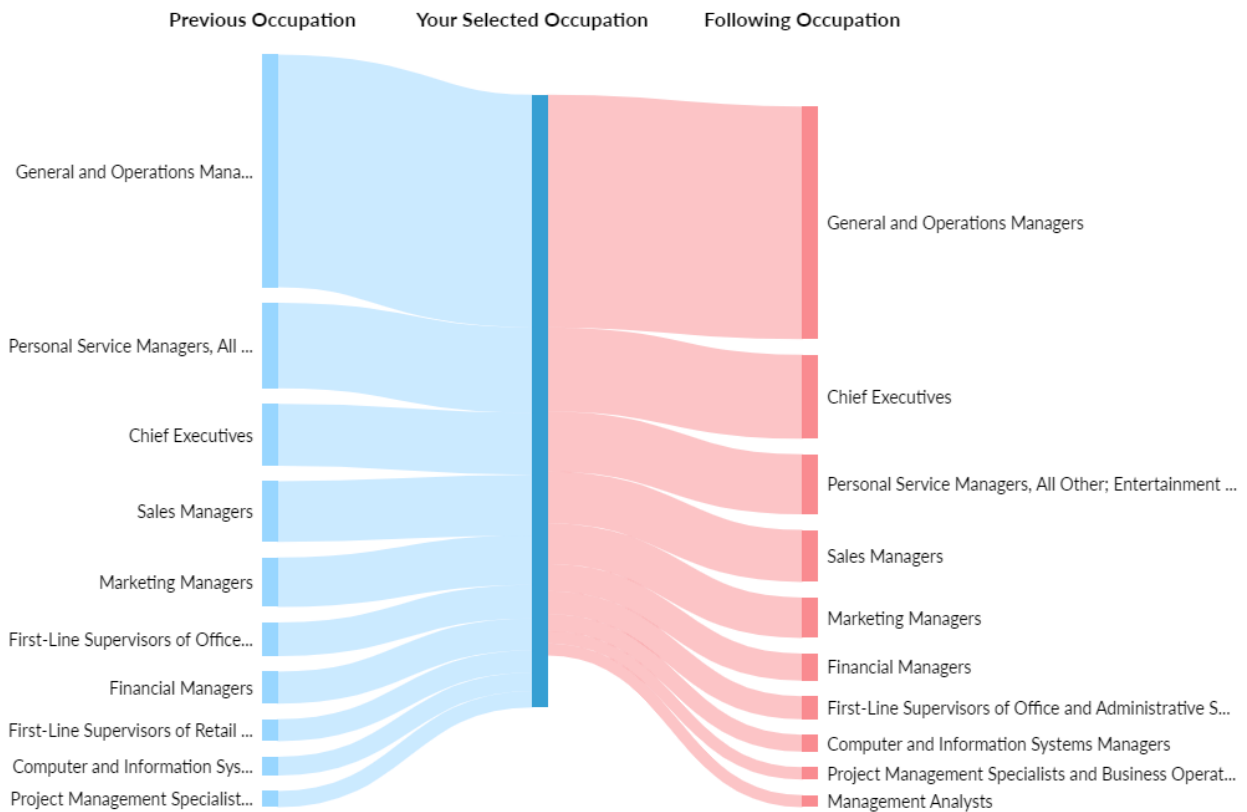
Top Target Occupations in Business, Management, and Administration, Southeast Minnesota 2021Q1

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
11-1021	General and Operations Managers	1,930	\$102,600	HW	HS	HD	OG	
13-1198	Project Management Specialists and Business Operations Specialists, All Other	1,230	\$65,400	HW	HS	HD	OG	
13-2011	Accountants and Auditors	1,024	\$71,200	HW	HS	HD	OG	
11-3031	Financial Managers	539	\$112,500	HW	HS	HD	OG	
11-2022	Sales Managers	373	\$107,400	HW	HS	HD	OG	
13-2052	Personal Financial Advisors	121	\$129,800	HW	HS	HD	OG	
13-1022	Wholesale and Retail Buyers, Except Farm Products	90	\$62,300	HW	HS	HD		AG
15-2031	Operations Research Analysts	72	\$79,400	HW	HS	HD	OG	AG
41-9031	Sales Engineers	63	\$94,800	HW	HS	HD		
11-2033	Fundraising Managers	52	\$99,900	HW	HS	HD		

General and Operations Management roles are in-demand, high-wage, and high-skill opportunities in the Southeast that are forecast to be in shortage. In addition, regional

colleges and universities underproduce General and Operations Management-aligned program graduates in comparison to national benchmarks. Below, this occupation is analyzed in more detail for better understanding of occupation “gain and drain.” The chart below illustrates the national profiles of current and past people in this occupation. The left column shows job transitions from other occupations to General and Operations Manager. The right column shows job transitions from this role to other occupations. Clearly, there are a number of likely entrypoints, such as Marketing Manager or Sales Manager, but there are also a few aligned occupations that may not be initially associated with Operations Management: Personal Service Managers, Financial Managers, and Computer and Information Systems Managers.

General and Operations Manager Talent Gain and Drain, Southeast Minnesota 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for General and Operations Managers, Southeast Minnesota 2021

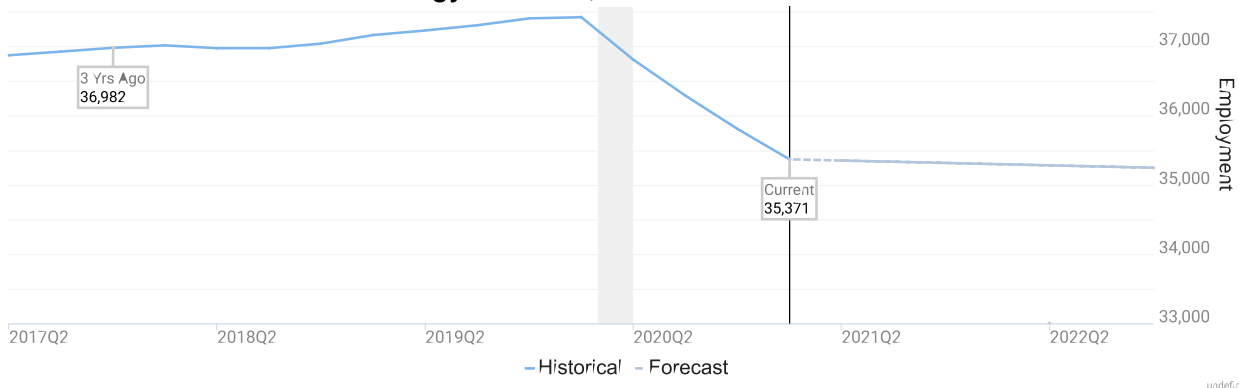


2020 IPEDS Completions Data; Visualizations from Emsi 2021Q3 dataset.

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 during over the course of the COVID-19 pandemic thus far. Over the next three years, under a pessimistic baseline forecast, this career field's employment is forecast to fall moderately (-0.2% annually). In the most optimistic scenario likely based on employer demand, and given the existing talent pipelines in place, employment growth of 1.5% annually in this field could be possible. Most of the growth is attributable to transportation, food production, and manufacturing careers. Slaughterers and Meat Packers, for example, have a 10.21 Location Quotient, meaning that the region has a dramatically higher concentration in shoe machine talent than the nation.

Baseline Worst-Case Scenario 3-Year Forecast for Engineering, Manufacturing, and Technology Careers, Southeast Minnesota 2021Q1



Top Ten Engineering, Manufacturing, and Technology Occupations by Employment Volume in the Southeast, 2021Q1

6-Digit Occupation	Empl	Avg Mean		LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
		Wages	LQ				
Heavy and Tractor-Trailer Truck Drivers	2,045	\$50,300	0.93	-10	224	-0.3%	
Laborers and Freight, Stock, and Material Movers, Hand	2,045	\$35,500	0.64	-20	283	0.0%	
Maintenance and Repair Workers, General	1,207	\$44,900	0.78	-80	120	0.2%	
Team Assemblers	1,108	\$35,500	0.92	-59	94	-2.3%	
Carpenters	975	\$52,900	0.90	25	97	-0.3%	
Construction Laborers	947	\$47,200	0.63	66	108	0.2%	
Passenger Vehicle Drivers, Except Bus Drivers, Transit and Intercity	938	\$35,600	1.16	-192	119	0.4%	
Landscaping and Groundskeeping Workers	884	\$34,800	0.70	-54	124	0.7%	
Slaughterers and Meat Packers	852	\$35,800	10.21	3	105	0.0%	
Meat, Poultry, and Fish Cutters and Trimmers	753	\$33,800	4.45	33	93	0.0%	
Remaining Component Occupations	23,613	\$53,700	0.76	-1,361	2,434	-0.3%	
Engineering, Manufacturing, & Technology (CTE Field)	35,371	\$49,600	0.85	-1,646	3,808	-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).

Many different industries employ Engineering, Manufacturing, and Technology talent in the Southeast region. Locally, the industries with the greatest share of this field's talent are Animal Slaughtering and Processing (8.7%) and Building Equipment Contractors (5.2%). Most industries employing talent in this field only touch less than 2% of total talent skilled in this field, suggesting that education and training programs will need broad strategies that cross each of these sectors.

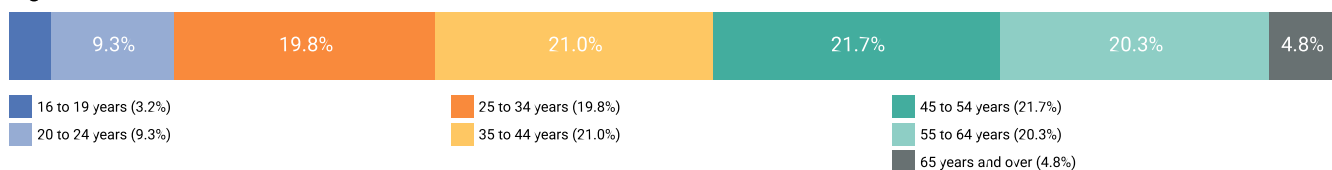
Engineering, Manufacturing, and Technology Field Employment by Industry, 2021Q1, Southeast Minnesota

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Animal Slaughtering and Processing	8.7%	3,070	3,790	-10	3,780
Building Equipment Contractors	5.2%	1,847	2,030	65	2,095
Building Finishing Contractors	3.2%	1,148	1,172	-18	1,154
Agriculture, Construction, and Mining Machinery Manufacturing	3.2%	1,143	1,179	-23	1,156
Semiconductor and Other Electronic Component Manufacturing	3.1%	1,102	1,049	-89	961
General Freight Trucking	2.9%	1,042	1,152	-55	1,096
Computer and Peripheral Equipment Manufacturing	2.2%	791	737	-2	735
Executive, Legislative, and Other General Government Support	2.2%	779	848	24	872
Foundation, Structure, and Building Exterior Contractors	2.2%	761	803	-3	800
Highway, Street, and Bridge Construction	2.0%	702	770	25	795
Specialized Freight Trucking	2.0%	690	773	-19	754
Other Specialty Trade Contractors	1.9%	685	753	0	753
Automotive Repair and Maintenance	1.9%	682	721	-13	708
Services to Buildings and Dwellings	1.8%	630	808	41	849
Residential Building Construction	1.8%	625	604	-8	596
Employment Services	1.7%	605	748	2	750
Automobile Dealers	1.7%	599	669	-14	655
Nonresidential Building Construction	1.6%	550	551	14	565
Dairy Product Manufacturing	1.4%	511	626	7	633
Couriers and Express Delivery Services	1.3%	445	566	33	600
All Others	48.0%	16,965	18,420	-646	17,774

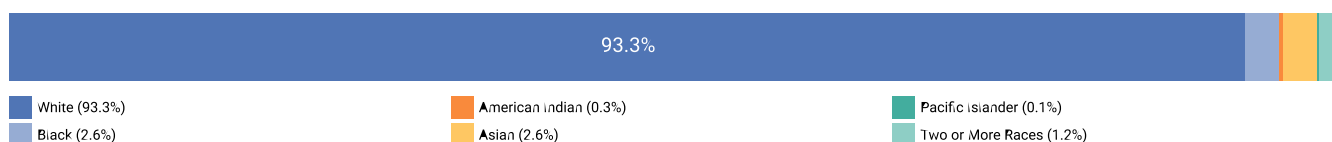
Career Field Demographics

Talent employed in Engineering, Manufacturing, and Technology field is heavily male (83.3%) and White (93.3%). Just under half of workers in this field are 45 years or older (46.8%), pointing to the importance of developing younger talent pipelines into the sector to address retirements likely over the next five to ten years.

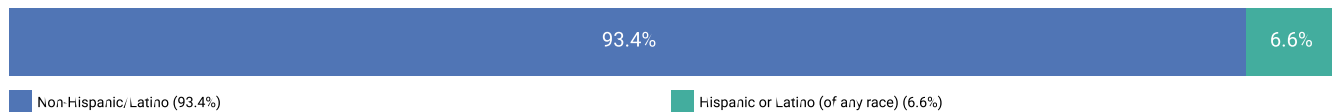
Age



Race



Ethnicity



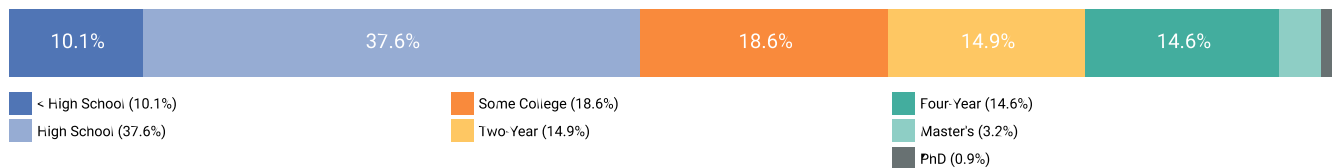
Gender



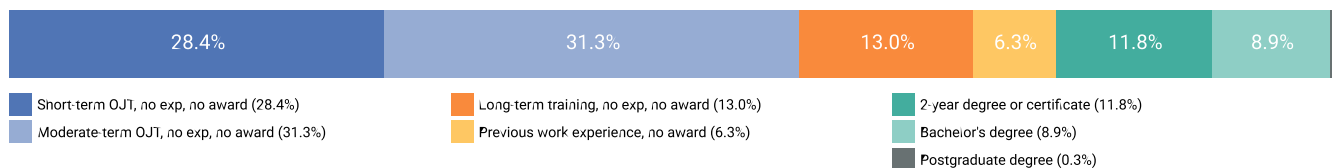
Educational Attainment and Requirements

The stacked bar charts here illustrate the mix of educational attainment of the workers in this career field as well as the typical education requirements for roles in the field. In general, the Southeast Minnesota Engineering, Manufacturing, and Technology workforce is well-aligned for the typical credentials of entry-level positions. About 1 in 4 of all positions in this field (28.8%) require no degree, no experience, and only short-term on-the-job training. About 51.9% require experience or some on-the-job training, but still no degree. Almost 1 in 10 of the workforce in this field has no degree at all (9.7%), and almost 2 in 5 (40.4%) hold a high school diploma as their highest credential. In all, 59.8% of the Engineering, Manufacturing, and Technology workforce have not completed a postsecondary credential. The table below indicates typical education and training requirements rather than the mix of attainment of workers in some key positions in this field.

Educational Attainment



Education and Training Requirements



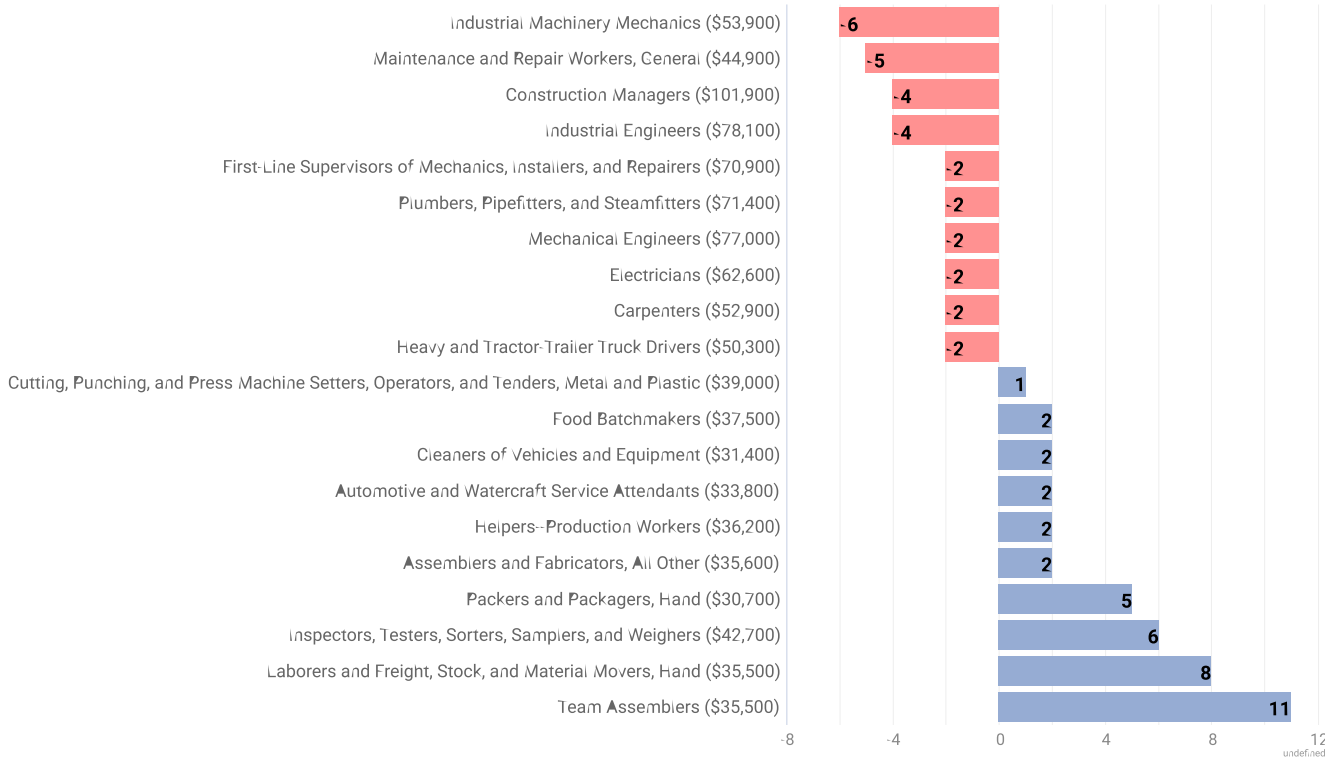
Typical Education Requirements for Top Occupations by Volume, 2021Q1

Occupation	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Heavy and Tractor-Trailer Truck Drivers	Postsecondary non-degree award	None	Short-term on-the-job training
Laborers and Freight, Stock, and Material Movers, Hand	None	None	Short-term on-the-job training
Maintenance and Repair Workers, General	High school diploma or equivalent	None	Moderate-term on-the-job training
Team Assemblers	High school diploma or equivalent	None	Moderate-term on-the-job training
Carpenters	High school diploma or equivalent	None	Apprenticeship
Construction Laborers	None	None	Short-term on-the-job training
Passenger Vehicle Drivers, Except Bus Drivers, Transit and Intercity	None	None	Short-term on-the-job training
Landscaping and Groundskeeping Workers	None	None	Short-term on-the-job training
Slaughterers and Meat Packers	None	None	Short-term on-the-job training
Meat, Poultry, and Fish Cutters and Trimmers	None	None	Short-term on-the-job training

Occupation Gaps

The chart below shows the potential average annual gaps over ten years. Several maintenance, construction, and other trades roles indicate shortages in the years ahead, with the Industrial Machinery Mechanic and Maintenance and Repair Worker talent pools likely falling short of meeting employer demand. These talent shortages are primarily due to growth in demand and retirements which far outpace the local talent pipeline.

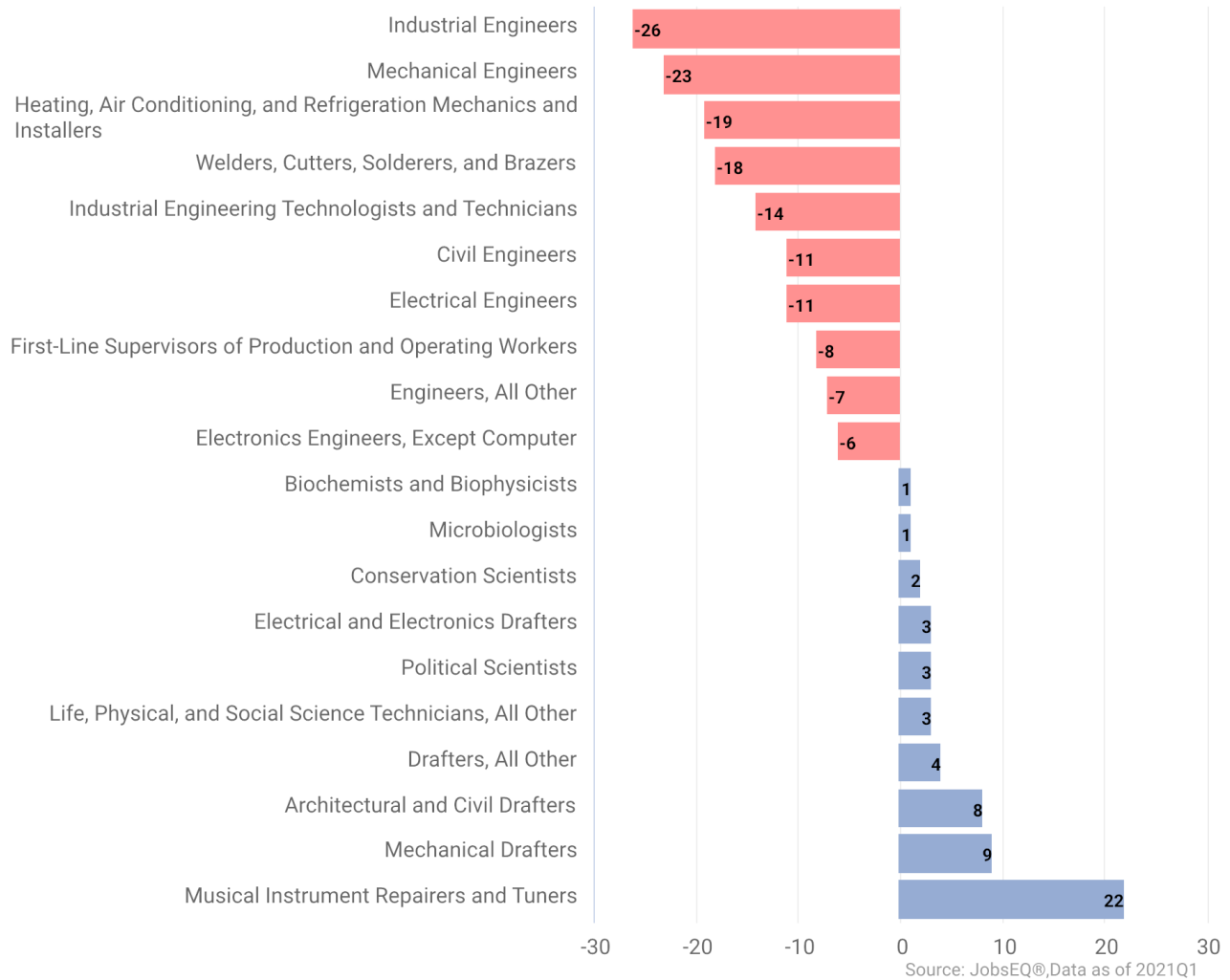
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Engineering, Manufacturing, and Technology, Southeast Minnesota 2021Q1



Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate a number of important shortages. The Southeast currently under-trains some talent in Engineering, Manufacturing, and Technology when compared to national benchmarks. Southeast Minnesota colleges and universities are underproducing around 26 graduates annually that are needed to fill Industrial Engineer positions open with employers based in this region alone. Second, there are at least 23 fewer Mechanical Engineering graduates and 19 fewer HVAC Mechanics graduating locally annually than what employers currently need to support demand.

Award Gaps in Engineering, Manufacturing, and Technology, Southeast Minnesota 2021Q1



Certification Gaps

Similar to award gaps, an analysis of certification gaps identify where the existing talent pool lacks particular credentials in comparison to current openings. However, this analysis uses real-time labor market data in the form of online candidate profiles and job postings to analyze the alignment between the available workforce and local opportunities. In the table below, it is apparent that the programs aligned to the occupations above as well as shorter training programs are both needed to connect local talent with opportunities. The certification gaps listed below reiterate the award gaps above.

Top 10 Certification Gaps in the Southeast, September 2021

Name	Candidates	Openings	Gap
Class A Commercial Driver's License (CDL-A)	77	99	-22
Automotive Service Excellence (ASE) Certification	7	16	-9
Class B Commercial Driver's License (CDL-B)	15	19	-4
Certified Arborist	0	2	-2
Light Commercial Refrigeration Certification (NATE Certified)	0	2	-1
Project Management Professional (PMP)	2	3	-1
Certified Welder	2	3	-1
Certified Pesticide Applicator	0	1	-1
The National Institute for Metalworking Skills (NIMS) Certification (unspecified)	0	1	-1
Automobile Technician: Engine Repair (Test A1)	2	2	-1

Skill Gaps

Likewise, there is a degree of misalignment between the skills of the available workforce and the skills advertised by local employers. The ten skills listed below are examples of the skills in most high demand among Southeast Minnesota employers hiring Engineering, Manufacturing, and Technology talent that potential candidates have not indicated in their professional networking platforms as a strength.

Top 10 Skill Gaps in the Southeast, September 2021

Name	Candidates	Openings	Gap
Hand Trucks	13	38	-25
Telecommunications	8	27	-19
Power Tools	91	102	-10
Microsoft Word	46	56	-10
Food Safety	5	14	-9
Carpentry	49	56	-8
Computer Aided Design Software (CAD Software)	39	46	-7
Cabling	2	8	-7
Calculators	5	12	-7
Knife Skills	0	6	-6

Promising Pathways

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

Origin-to-Gateway-to-Target Occupations for Engineering, Manufacturing, and Technology, Southeast Minnesota Metro 2021Q1

Target Occupations (all HW, HD, HS)

Industrial Engineers (OG, AG)
 Construction Managers (OG)
 Cost Estimators (AG)
 Logisticians
 Computer Hardware Engineers (AG)

Gateway Occupations

Heavy and Tractor-Trailer Truck Drivers (HS, OG)
 Maintenance and Repair Workers, General (HD, OG)
 Carpenters (OG)
 Construction Laborers
 Automotive Service Technicians (HS, AG)

Origin Occupations

Likely

Laborers and Freight, Stock Movers
 Team Assemblers
 Passenger Vehicle Drivers (HD)
 Landscaping and Groundskeeping Workers (HD)
 Slaughterers and Meat Packers (HD)

Aligned

Parking Lot Attendants
 Retail Sales Workers
 Stockers and Order Fillers
 Janitors and Cleaners
 Customer Service Reps

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without 4-year degrees. Below are a few Origin Occupations that are likely entrypoints into Engineering, Manufacturing, and Technology roles locally, or aligned opportunities that share a large number of skillsets in-demand in the field.

Likely Origins	Aligned Origins
Laborers and Freight, Stock, and Material Movers, Hand	Parking Lot Attendants
Team Assemblers	Retail Sales Workers
Passenger Vehicle Drivers	Stockers and Order Fillers
Landscaping and Groundskeeping Workers	Janitors and Cleaners
Slaughterers and Meat Packers	Customer Service Representatives

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$57,800 in the Southeast). Below are a few Gateway Occupations in Engineering, Manufacturing, and Technology locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences.

Likely Gateways	Aligned Gateways
Heavy and Tractor-Trailer Drivers	General Managers
Maintenance and Repair Workers, General	Product Demonstrators
Carpenters	Computer User Support Specialists
Construction Laborers	Supervisors of Retail Workers
Automotive Service Technicians	

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$57,800 in the Southeast region). 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. Only occupations that hit the designated high-wage, high-skill, and high-demand thresholds have been included in this chart, thus putting extra weight and emphasis on current demand rather than future shortage. Some critical occupations for the region that forecast high gaps, but perhaps not currently high-demand should also be included in Career and Technical Education programs of study.

Industrial Engineers and Construction Managers have average annual forecasted growth well above the region's average over the next five years and unemployment under 3%. Cost Estimators and Logisticians also have low unemployment and significant replacement demand need. Computer Hardware Engineers, Aircraft Mechanics, and CNC Tool Programmers all had more than 500 job postings regionally in August 2021.

Top Target Occupations in Engineering, Manufacturing, and Technology, Southeast Minnesota 2021Q1

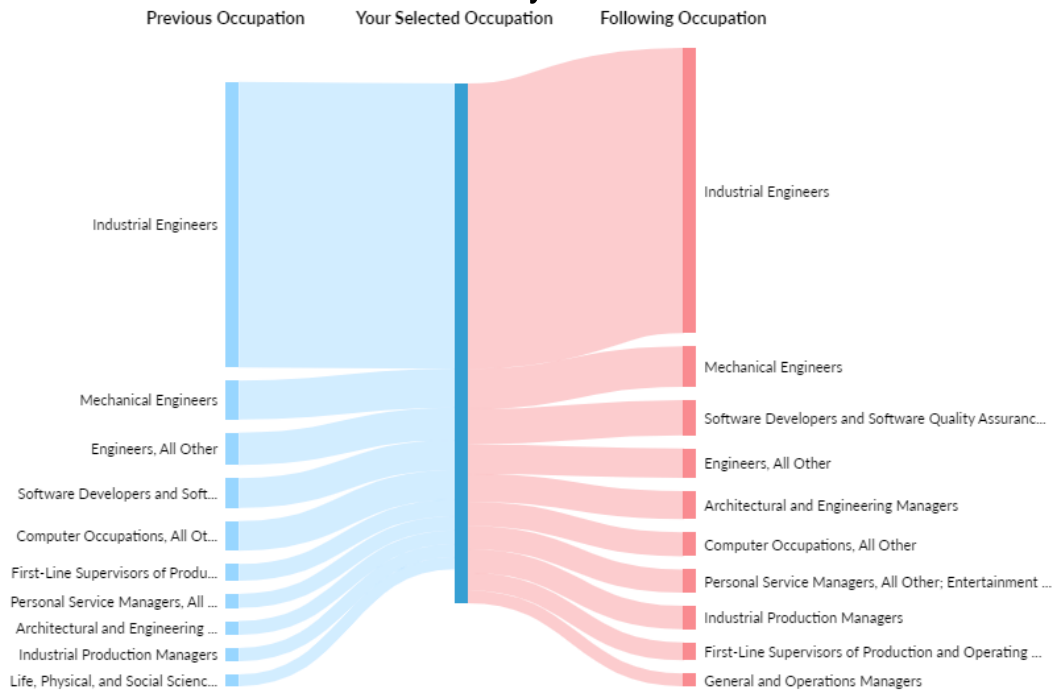
SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
17-2112	Industrial Engineers	473	\$78,100	HW	HS	HD	OG	AG
11-9021	Construction Managers	429	\$101,900	HW	HS	HD	OG	
13-1051	Cost Estimators	182	\$62,900	HW	HS	HD		AG
13-1081	Logisticians	147	\$64,900	HW	HS	HD		
17-2061	Computer Hardware Engineers	54	\$101,200	HW	HS	HD		AG
49-3011	Aircraft Mechanics and Service Technicians	42	\$67,000	HW	HS	HD		AG
51-9162	Computer Numerically Controlled Tool Programmers	39	\$61,100	HW	HS	HD		

15-2098	Data Scientists and Mathematical Science Occupations, All Other	33	\$91,300	HW	HS	HD	OG	
15-2041	Statisticians	29	\$78,700	HW	HS	HD	OG	

Industrial Engineers are more highly concentrated in Southeast Minnesota than in most communities of its size (location quotient of 1.46 for this occupation). Southeast Minnesota will need more of this talent in the years ahead than what is likely to be available in the local talent pool. Wages for Industrial Engineers average \$78,100 in the region, well above the area’s average wage.

Below, this occupation is analyzed in more detail for better understanding of occupation “gain and drain.” The chart below illustrates the national profiles of current and past people in this occupation. The left column shows job transitions from other occupations to Industrial Engineer. The right column shows job transitions from Industrial Engineering to other occupations—including both likely transitions and aligned transitions.

Industrial Engineer Talent Gain and Drain, Southeast Minnesota 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for Industrial Engineers, Southeast Minnesota 2021

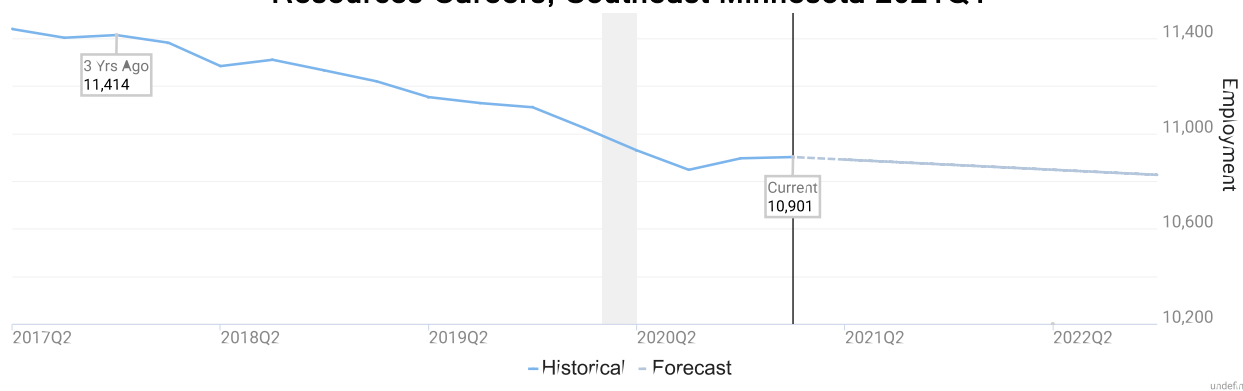


2020 IPEDS Completions Data; Visualizations from Emsi 2021Q3 dataset.

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. Over the next three years, under a pessimistic baseline forecast, this career field's employment is forecast to decline by about -0.4% in Southeast Minnesota. In the most optimistic scenario likely based on employer demand, given the existing talent shortage and talent pipelines in place, a moderate rise in career field employment of about 0.5% annually on average in this field could be possible.

Baseline Worst-Case Scenario 3-Year Forecast for Agriculture, Food, and Natural Resources Careers, Southeast Minnesota 2021Q1



Top Ten Agriculture, Food, and Natural Resources Occupations by Employment Volume in the Southeast, 2021Q1

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year		Baseline Forecast
				Empl Change	Annual Demand	Ann Growth
Farmers, Ranchers, and Other Agricultural Managers	2,868	\$84,000	2.96	-153	223	-1.6%
Landscaping and Groundskeeping Workers	884	\$34,800	0.70	-54	124	0.7%
Meat, Poultry, and Fish Cutters and Trimmers	753	\$33,800	4.45	33	93	0.0%
Farmworkers, Farm, Ranch, and Aquacultural Animals	728	\$30,800	3.88	-45	103	-1.4%
Plumbers, Pipefitters, and Steamfitters	628	\$71,400	1.21	29	72	0.2%
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	363	\$57,800	0.67	-14	39	0.0%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	328	\$56,000	0.78	35	32	0.2%
Food Batchmakers	312	\$37,500	1.79	-115	45	-0.2%
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	284	\$30,500	0.44	-3	45	-0.3%
Telecommunications Equipment Installers and Repairers, Except Line Installers	238	\$50,100	1.09	-52	24	-0.7%
Remaining Component Occupations	3,516	\$52,900	0.79	-143	410	0.1%
AFNR - Agriculture, Food, and Natural Resources (CTE Field - Updated 2021)	10,901	\$57,000	1.12	-480	1,210	-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 Agriculture, Food, and Natural Resources talent in Southeast Minnesota. Locally, the industries with the greatest share of this field's talent are Animal Production (20.7%) and Animal Slaughtering and Processing (8%.5). Most industries employing talent in this field touch less than 2% of total talent skilled in this field, but with a significant share of employment concentrated in crop production, animal husbandry, food processing, and dairy production.

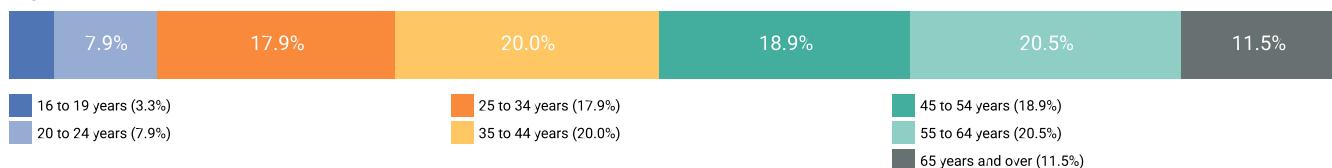
Agriculture, Food, and Natural Resources Field Employment by Industry, 2021Q1, Southeast Minnesota

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Animal Production (Proprietors)	20.7%	2,252	2,047	-355	1,691
Animal Slaughtering and Processing	8.5%	925	1,169	-3	1,166
Cattle Ranching and Farming	8.2%	894	1,184	-115	1,068
Building Equipment Contractors	7.8%	851	918	27	946
Services to Buildings and Dwellings	5.6%	614	802	41	843
Other Professional, Scientific, and Technical Services	3.0%	324	323	41	363
Executive, Legislative, and Other General Government Support	2.8%	301	332	7	339
Wired and Wireless Telecommunications Carriers	2.8%	301	317	-29	288
Grocery Stores	2.3%	255	319	-3	316
Crop Production (Proprietors)	2.3%	248	247	-25	222
Hog and Pig Farming	1.8%	196	263	-19	244
Support Activities for Crop Production	1.5%	165	238	-2	237
Dairy Product Manufacturing	1.4%	149	210	2	212
Fruit and Vegetable Preserving and Specialty Food Manufacturing	1.2%	128	174	-15	159
Other Amusement and Recreation Industries	1.1%	125	166	13	180
Other Personal Services	1.1%	125	215	33	248
Other Chemical Product and Preparation Manufacturing	1.1%	122	120	-10	110
Colleges, Universities, and Professional Schools	1.1%	116	115	-2	113
Support Activities for Animal Production	0.9%	101	152	7	159
Oilseed and Grain Farming	0.9%	100	150	5	155
All Others	23.9%	2,607	3,071	-18	3,053

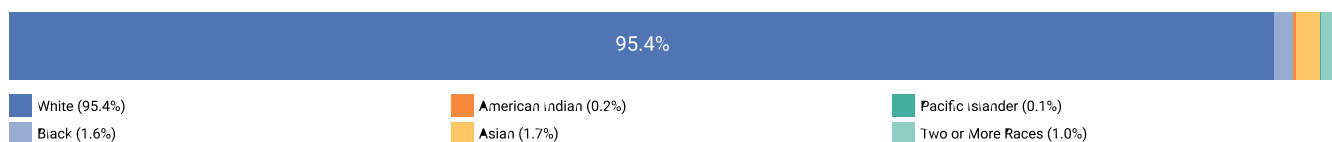
Career Field Demographics

The talent employed in the Agriculture, Food, and Natural Resources field is predominantly male (76.2%) and White (95.4%), but with variation by career pathway. Thirty-two percent (32%) of the workforce is over the age of 44. About 6.6% of the talent in Agriculture, Food, and Natural Resources identify as Hispanic or Latinx.

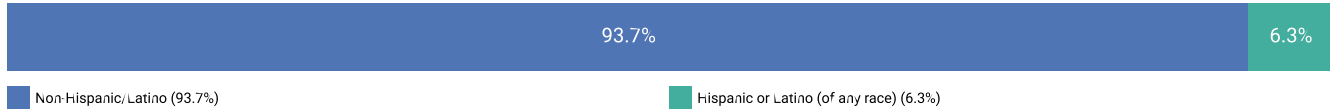
Age



Race



Ethnicity



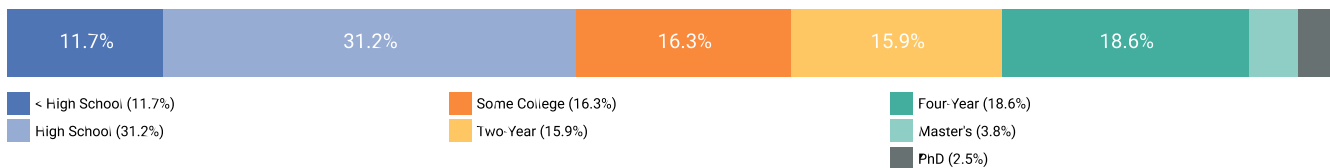
Gender



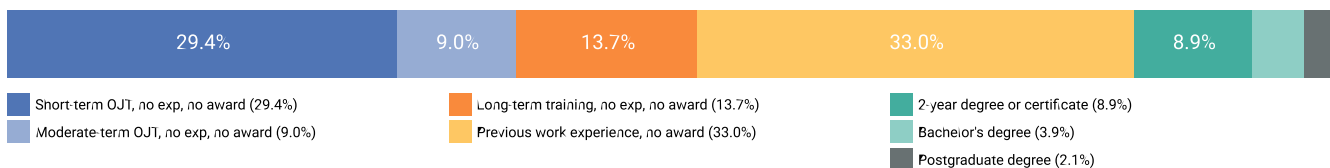
Educational Attainment and Requirements

The stacked bar charts here illustrate the estimated mix of educational attainment of workers in the career field in aggregate, and the typically-required education of positions in the field. Nearly three in ten of all positions in this field regionally (29.4%) require no degree, no experience, and only short-term on-the-job training. Over half (55.7%) require experience or some on-the-job training, but still no degree; in all, 85.1% of positions in this field require no formal education. About 11.7% of the workforce in this field has no degree at all, and just under one in three (31.2%) hold a high school diploma as their highest credential. In all, about 59.2% of the Agriculture, Food, and Natural Resources workforce have not completed a postsecondary credential. The table below indicates typical education and training requirements rather than the mix of attainment of workers in some key positions in this field.

Educational Attainment



Education and Training Requirements



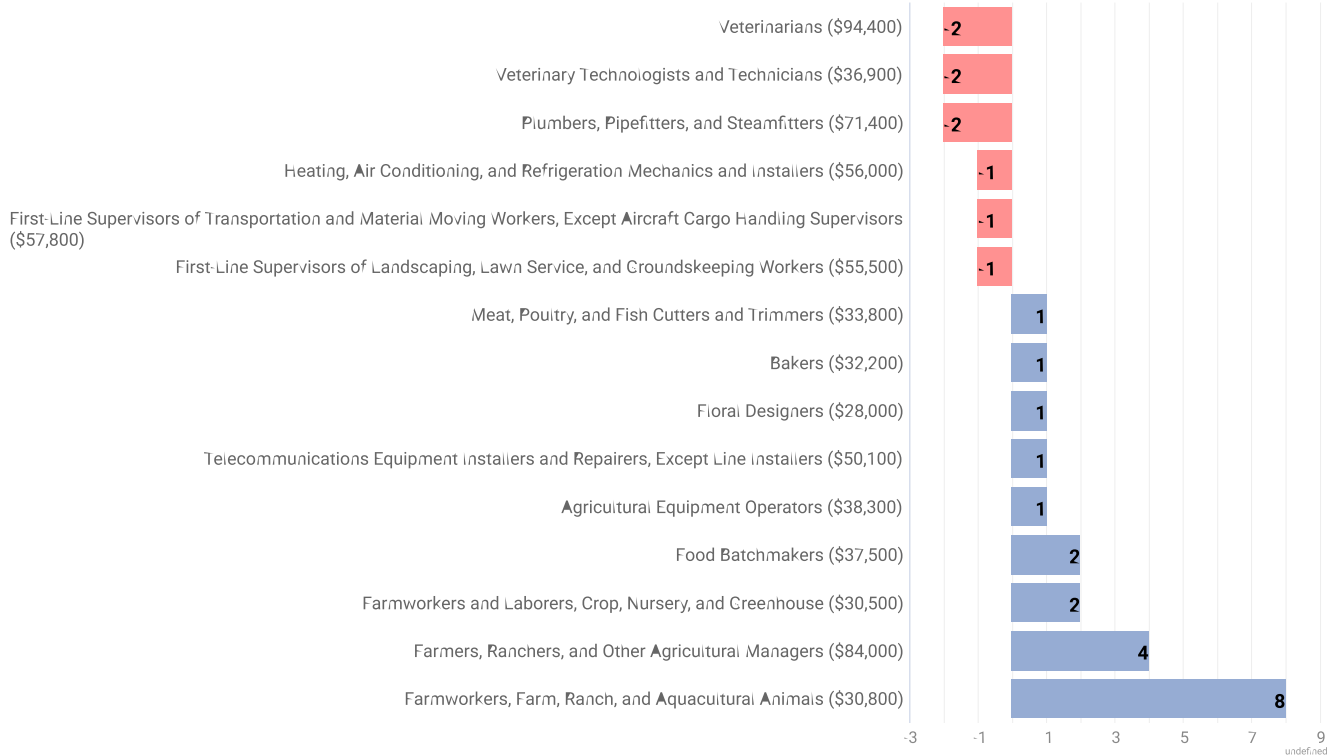
Typical Education Requirements for Top Occupations by Volume, 2021Q1

Occupation	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	5 years or more	None
Landscaping and Groundskeeping Workers	None	None	Short-term on-the-job training
Meat, Poultry, and Fish Cutters and Trimmers	None	None	Short-term on-the-job training
Farmworkers, Farm, Ranch, and Aquacultural Animals	None	None	Short-term on-the-job training
Plumbers, Pipefitters, and Steamfitters	High school diploma or equivalent	None	Apprenticeship
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	High school diploma or equivalent	Less than 5 years	None
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Postsecondary non-degree award	None	Long-term on-the-job training
Food Batchmakers	High school diploma or equivalent	None	Moderate-term on-the-job training
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	None	None	Short-term on-the-job training
Telecommunications Equipment Installers and Repairers, Except Line Installers	Postsecondary non-degree award	None	Moderate-term on-the-job training

Occupation Gaps

The chart below shows the potential average annual gaps over ten years. A number of crucial trades, animal science, environmental services, and natural science roles indicate shortages in the years ahead, with talent pools of Landscaping Supervisors, Veterinarians and Vet Techs, Plumbers, and HVAC Mechanics likely falling behind the most. Retirements and growing demand unmet by the local talent supply chain are both contributing factors.

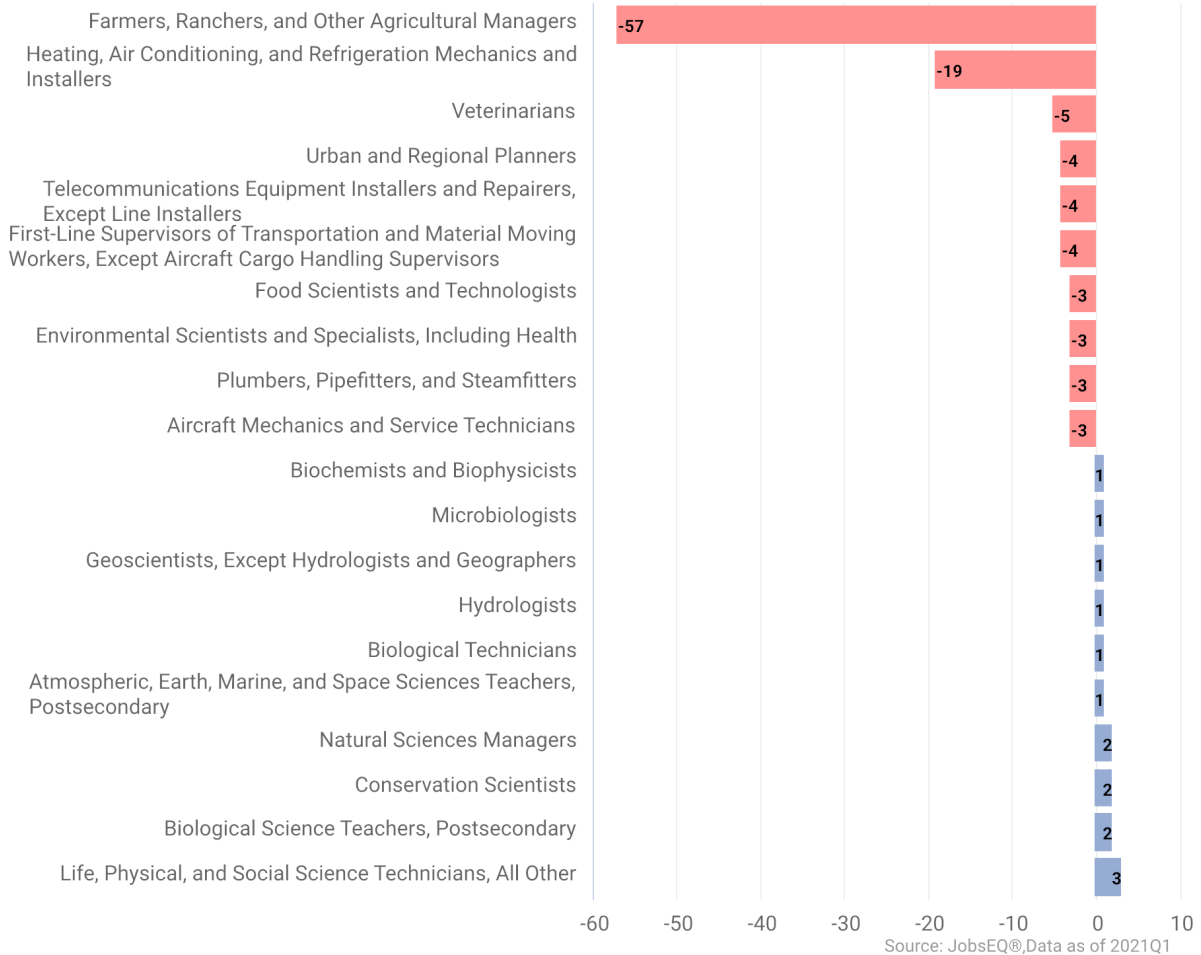
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Agriculture, Food, and Natural Resources, Southeast Minnesota 2021Q1



Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate a number of notable shortages. Schools in Southeast Minnesota currently under-train talent in some career pathways in Agriculture, Food, and Natural Resources when compared to national benchmarks. Southeast Minnesota colleges and universities are underproducing at least 57 graduates annually that are needed to fill farming and agricultural management positions open with employers based in the Southeast region. This is a common shortage across many Minnesota regions and likely a persistent credential shortage in the state. HVAC Mechanics and Veterinarian roles are also lagging in local graduate awards, as the majority of Animal Systems, Food Science, and Plant Systems completions are made in the MSP Metro (only one food science completion was delivered outside the Metro in the 2019-20 school year, and that was at Riverland Community College).

Award Gaps in Agriculture, Food, and Natural Resources, Southeast Minnesota 2021Q1



Certification Gaps

Similar to award gaps, an analysis of certification gaps identify where the existing talent pool lacks particular credentials in comparison to current openings. However, this analysis uses real-time labor market data in the form of online candidate profiles and job postings to analyze the alignment between the available workforce and local opportunities. In the table below, it is apparent that the programs aligned to the occupations above as well as shorter training programs are both needed to connect local talent with opportunities.

Top 10 Certification Gaps in Southeast Minnesota, September 2021

Name	Candidates	Openings	Gap
Certified Pesticide Applicator	1	3	-2
Certified Arborist	1	3	-2
Registered Veterinary Technician (RVT)	0	2	-2
Light Commercial Refrigeration Certification (NATE Certified)	0	2	-1
Certified Professional Dog Trainer (CPDT)	0	1	-1
Laboratory Animal Technician (LAT)	0	1	-1
Class B Commercial Driver's License (CDL-B)	3	4	0
EPA Universal Certification	1	1	0
HAZMAT	1	1	0
EPA Section 608 Certification (EPA 608)	1	1	0

Skill Gaps

Likewise, there is a degree of misalignment between the skills of the available workforce and the skills advertised by local employers. The ten skills listed below are examples of the skills in most high demand among Southeast Minnesota employers hiring Agriculture, Food, and Natural Resources talent that potential candidates have not indicated in their professional networking platforms as a strength.

Top 10 Skill Gaps in Southeast Minnesota, September 2021

Name	Candidates	Openings	Gap
Google	3	25	-22
Production Management	12	30	-19
Microsoft Outlook	17	26	-9
Routers	3	12	-8
Modems	1	8	-7
Microsoft PowerPoint	9	15	-6
Knife Skills	0	6	-6
Animal Care/Animal Handling	22	28	-6
Food Safety	4	10	-6
Computer Operating Systems	1	7	-5

Promising Pathways

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

Origin-to-Gateway-to-Target Occupations for Agriculture, Food, and Natural Resources, Southeast Minnesota 2021Q1

Target Occupations (all HW, HD, HS)

Veterinarians (OG, AG)
 Aircraft Mechanics & Service Technicians (AG)
 Biological Science Teachers
 Urban & Regional Planners (AG)
 Buyers & Purchasing Agents

Gateway Occupations

HVAC Mechanics & Installers (HS, OG, AG)
 Telecommunications Equipment Installers (HS, AG)
 Supervisors of Landscaping Workers (HD, OG)
 Telecommunications Line Installers & Repairers
 Chemical Plant & System Operators (HD, AG)

Origin Occupations

Likely

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

Aligned

Compliance Officers
 Laborers / Freight Movers
 Stockers and Order Fillers
 Cooks
 Customer Service Reps

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

Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without 4-year degrees. Below are a few Origin

Occupations that are likely entrypoints into Agriculture, Food, and Natural Resources roles locally, or aligned opportunities that share a large number of skillsets in-demand in the field.

Likely Origins	Aligned Origins
Landscaping and Groundskeeping Workers	Compliance Officers
Meat, Poultry, and Fish Cutters and Trimmers	Laborers and Freight, Stock Movers
Farmworkers, Farm, Ranch, and Aquacultural Animals	Stockers and Order Fillers
Food Batchmakers	Cooks
Farmworkers & Laborers, Crop, Nursery, & Greenhouse	Customer Service Representatives

Gateway Occupations are good jobs that can lead to Target Occupations as skills and experience are developed. These typically offer between \$42,000 up to the regional average wage (\$57,800 in Southeast Minnesota). Below are a few Gateway Occupations in Agriculture, Food, and Natural Resources locally. Gateway occupations offer a wage uplift to those previously employed in Origin Occupations, and offer longer-term economic mobility and career advancement opportunities. These are most often best-suited for adult workforce programming and first postsecondary experiences.

Likely Gateways	Aligned Gateways
HVAC Mechanics and Installers	Heavy and Trailer-Truck Mechanics
Telecommunications Equipment Installers and Repairers	Automobile Service Technicians
Supervisors of Landscaping Workers	General Managers
Telecommunications Line Installers and Repairers	Engineering Managers
Chemical Plant and System Operators	Machinists

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$57,800 in Southeast Minnesota). 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.

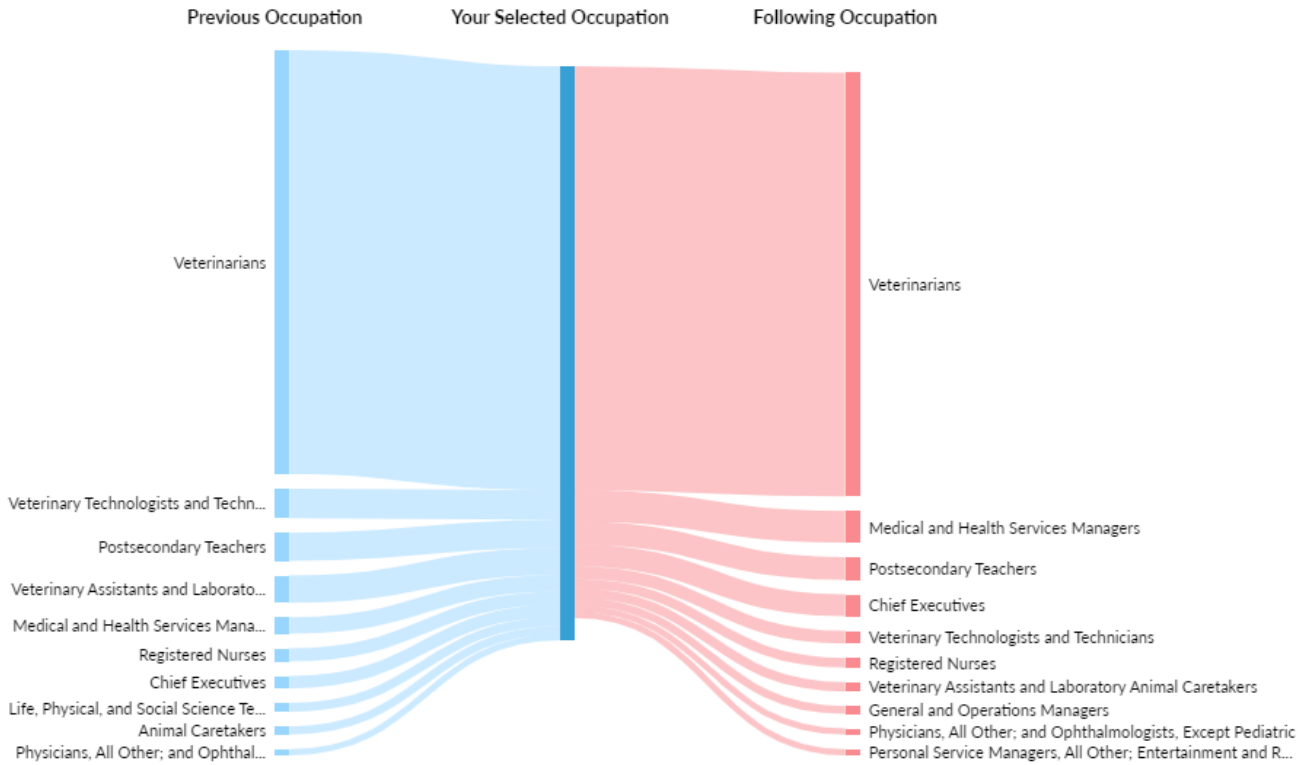
Top Target Occupations in Agriculture, Food, and Natural Resources, Southeast Minnesota 2021Q1

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
29-1131	Veterinarians	110	\$94,400	HW	HS	HD	OG	AG
49-3011	Aircraft Mechanics and Service Technicians	42	\$67,000	HW	HS	HD		AG
25-1042	Biological Science Teachers, Postsecondary	37	\$79,300	HW	HS	HD		
19-3051	Urban and Regional Planners	35	\$79,900	HW	HS	HD		AG

Veterinarians are in high demand, with total employment rising by 5.7% from 2020Q1 to 2021Q1. To meet replacement demand and growth needs, Southeast Minnesota requires a stronger pipeline of Veterinarians in the years ahead. The only program in Minnesota in Veterinary Sciences or Veterinary Medicine is through the University of Minnesota-Twin Cities, which delivered 98 postgraduate awards and 22 Bachelor degrees in the 2019-20 school year.

Below, this occupation is analyzed in more detail for better understanding of occupation “gain and drain.” The chart below illustrates the national profiles of current and past people in this occupation. The left column shows job transitions from other occupations to Veterinarians—which includes a variety of educational fields. The right column shows job transitions from Veterinarians to other occupations—including both likely transitions and aligned transitions.

Veterinarian Talent Gain and Drain, Southeast Minnesota 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for Veterinarians, Southeast Minnesota 2021



0 Programs

36 programs can train for this job, while 0 programs have produced completers in this region.



0 Completions (2020)

The completions from all regional institutions for all degree types.



6 Openings (2020)

The average number of openings for an occupation in the region is 26.

2020 IPEDS Completions Data; Visualizations from Emsi 2021Q3 dataset.

Conclusion

The region's most in-demand occupations of the future require a 2-year degree or higher, offer high average wages, and will likely experience talent shortages within the next three years and beyond due to low qualified talent pool located within the region. All six career and technical education Career Fields are likely to experience talent shortages and oversupply in certain occupations and skill areas in the current anticipated trajectory of workforce demand and overall economic recovery, though much remains uncertain. Overall, digital skills, human skills, and business enablers will be the foundational skills of the future in Southeast Minnesota. Remote work and digital skills have grown in importance during the first year and a half of the COVID-19 pandemic and all signs indicate that these features of the workplace are here to stay.

The region's most in-demand occupations of the future require a 2-year degree or higher, offer high average wages, and will likely experience talent shortages by 2025 due to low qualified talent pool located within the region. All six career and technical education Career Field areas will experience talent shortages and oversupply in certain occupations and skill areas. It is likely that Southeast Minnesota careers that require a Bachelor's degree or higher have some of the largest anticipated shortages and highest wages.

The region is poised to see changes in demand for talent over the next five years and beyond as the region responds to the impacts of COVID-19 on the local population, economy, and business infrastructure. The disruptions of COVID-19, social unrest, and heightened inequalities have exacerbated concerns over the economy, business viability, and workforce opportunities. The region faces an immediate and short-term challenge of high unemployment among high contact-intensity roles and rapidly changing job requirements. However, many of the occupation shortages initially identified prior to the pandemic and early on in the first months of the pandemic's impact continue to be relevant to the current and future needs of Southeast Minnesota businesses. There is greater urgency to address these talent shortages now the pandemic accelerates some businesses to automate, modernize, and reskill the workforce in a changing market.