

MSP Metro
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@realtimetalentmn.org

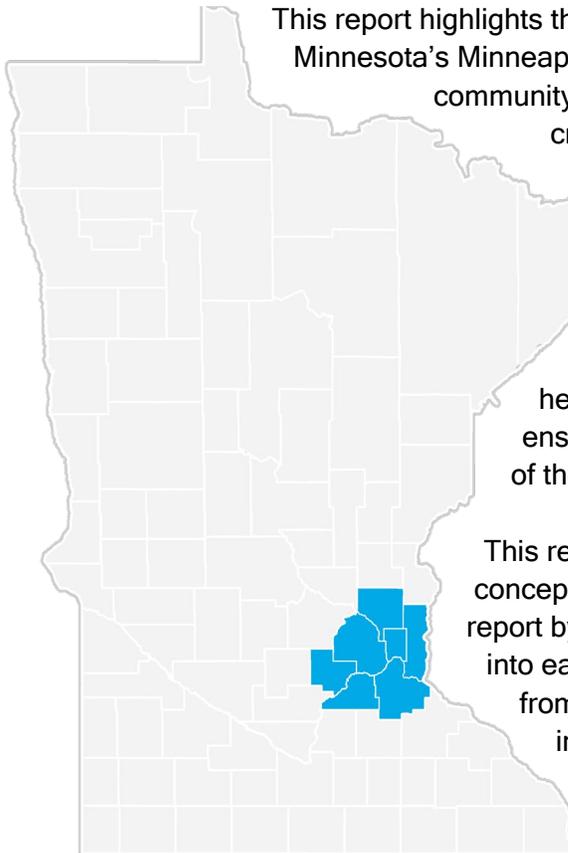
¹ Unemployment Statistics, MN Department of Employment and Economic Development. March 16, 2020 - August 27, 2020. Accessed 9/4/2020 at <https://mn.gov/deed/data/data-tools/unemployment-insurance-statistics/>

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Minneapolis-St. Paul Metro

Introduction



This report highlights the current and future talent needs in the seven counties of Minnesota's Minneapolis-St. Paul Metropolitan Area (MSP Metro).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 the MSP Metro.

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

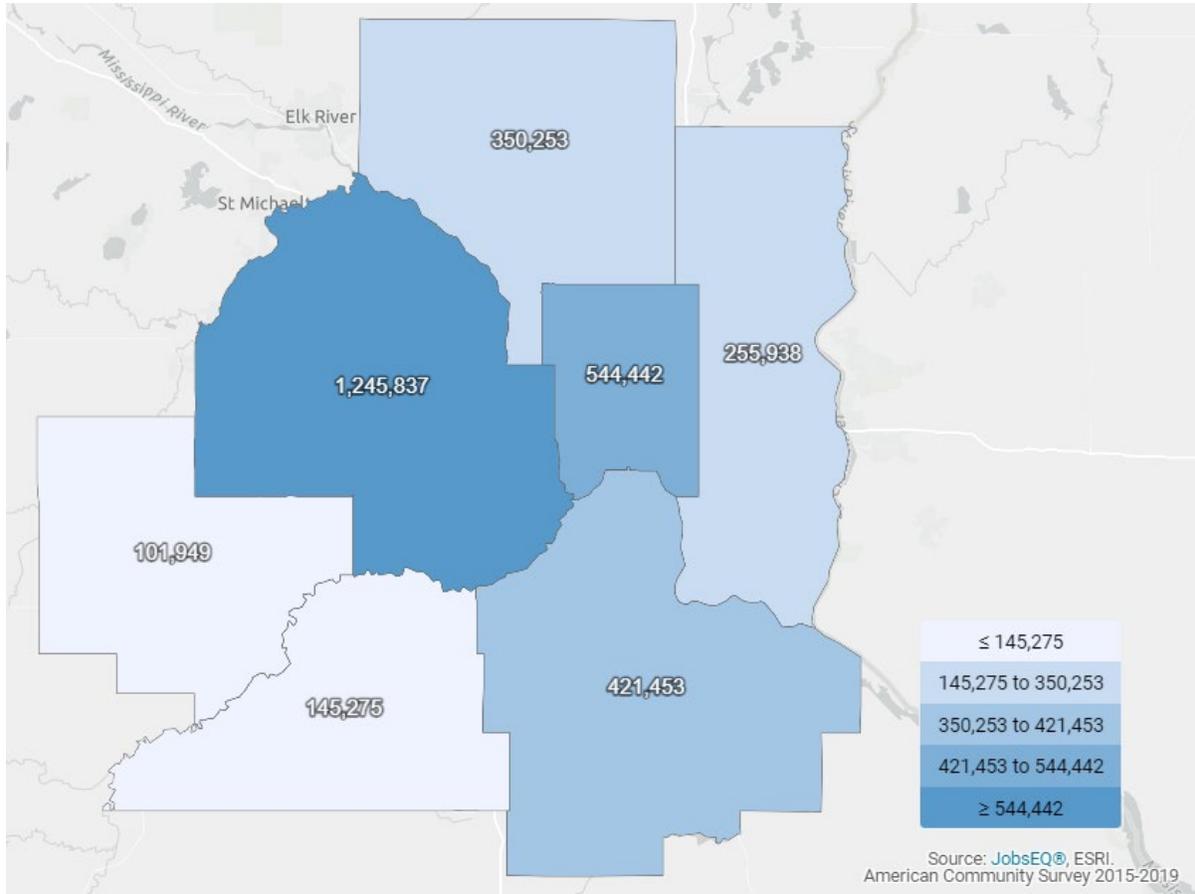
Low wage (<\$42,000/year)
Low skill (no credential)
Low demand (over 5% unemployment, low growth, low replacement demand, and/or low job postings)

The cities of Minneapolis and St. Paul are home to the largest local concentrations of population, and are economic hubs for the region. In all, about 3,065,147 people live in MSP Metro Minnesota, according to 2015-2019 American Community Survey Estimates—an increase of just over 25,000 people from the prior year's estimates. Based on year-over-year population growth, about 3,130,769 people are estimated to live in the MSP Metro as of 2021.

Approximately 23.5% of the MSP Metro's population are minors under 18 years of age. Overall, the MSP Metro's median age is one year younger (37 years) than the statewide median (38 years), mostly attributable to a larger share of 25-34 year-olds calling the MSP Metro home.

² Hennepin, Ramsey, Anoka, Carver, Scott, Dakota, and Washington Counties.

Resident Population of the MSP Metro

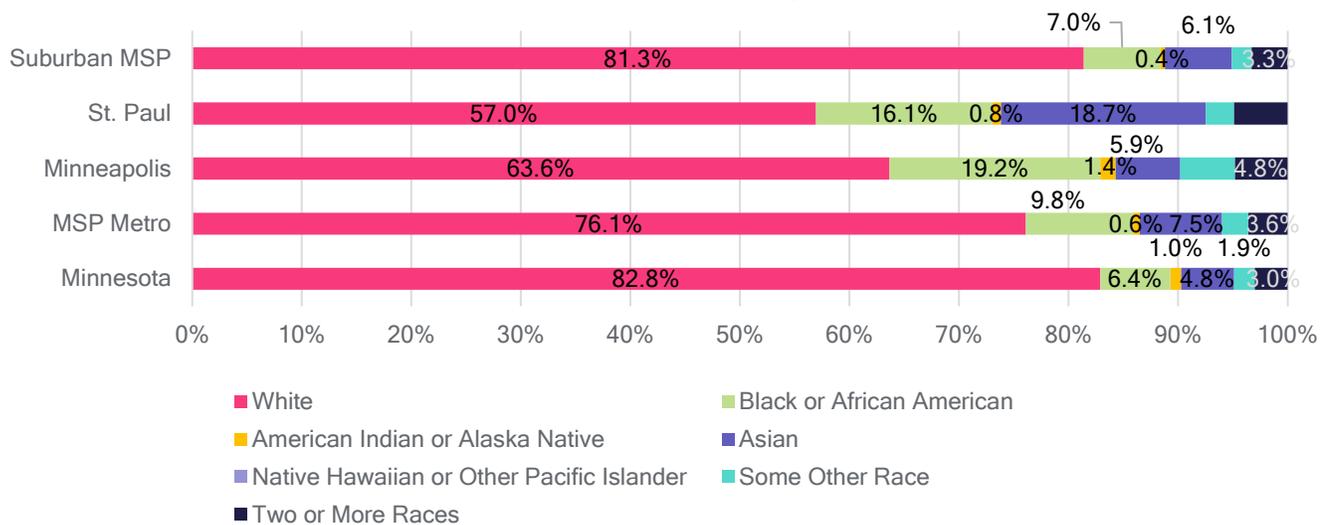


Community Profile

Demographics

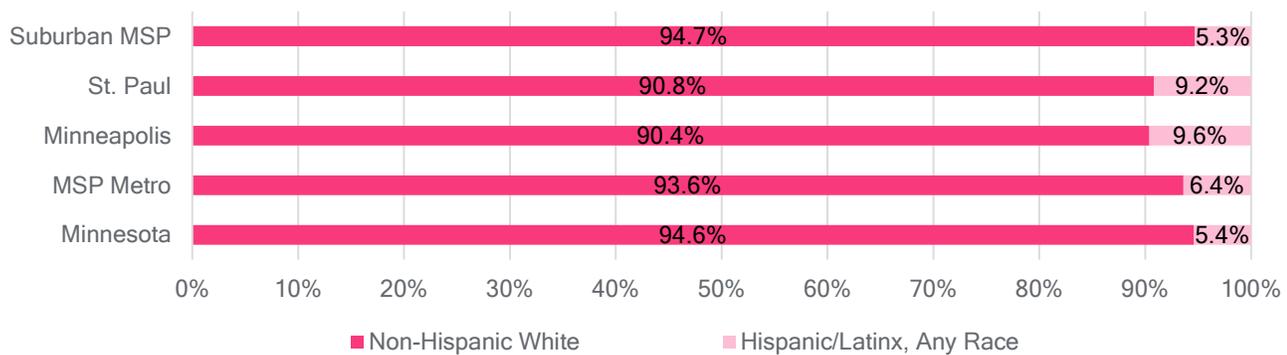
Population diversity increased between the two most recent population estimates for the 7-county MSP Metro by half of a percentage point. Across the region overall, 23.9% of the population identify as Black, Asian, American Indian, Native Hawaiian, or some other race. The demographic makeup of Suburban Twin Cities communities continue to be similar to the average Minnesota population overall, which also became more diverse: In the suburbs, 81.3% of the population identifies as White, compared to 82.5% in the prior population estimates. Within the MSP Metro's urban communities, St. Paul has a greater share of Asian residents than the other areas in the MSP Metro—growing since the most recent population estimates—and Minneapolis has a greater share of Black or African American residents, though the overall share of Black or African American residents declined by 0.2 percentage points in Minneapolis between the most recent population estimates. Approximately 6.4% of the MSP Metro's residents are Hispanic or Latinx, for comparison, this is 1 percentage point ahead of Minnesota overall. The share of the population being Hispanic or Latinx increased in the Suburban Metro, but declined in Minneapolis between the most recent population estimates.

Population Race, All Ages



American Community Survey 2015-2019.

Population Ethnicity, All Ages



American Community Survey 2015-2019.

Community Demographics

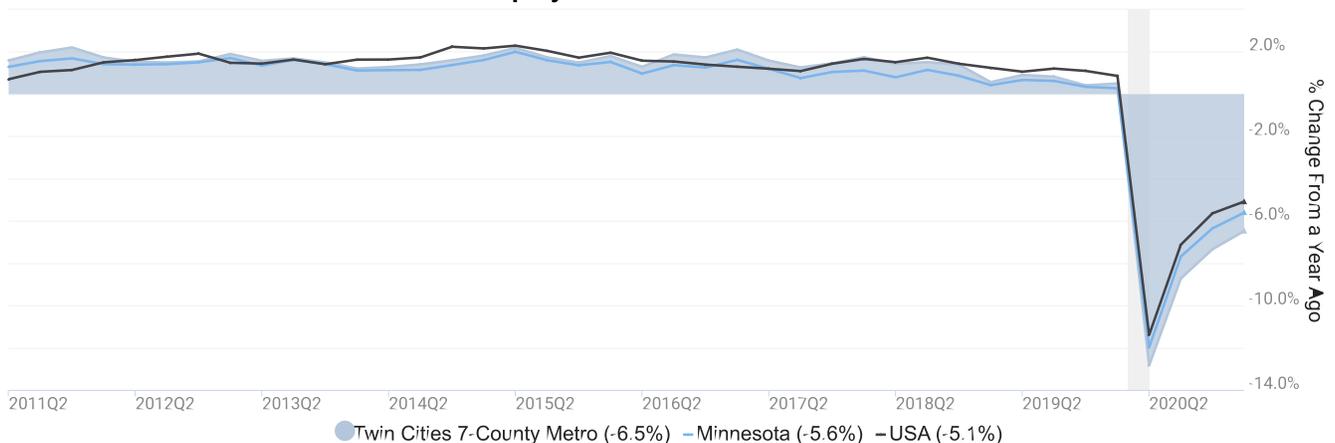
Demographics	Percent			Value		
	MSP Metro Minnesota	Minnesota	USA	MSP Metro Minnesota	Minnesota	USA
Population (ACS)	—	—	—	3,065,147	5,563,378	324,697,795
Male	49.4%	49.8%	49.2%	1,514,230	2,770,873	159,886,919
Female	50.6%	50.2%	50.8%	1,550,917	2,792,505	164,810,876
Median Age ²	—	—	—	37.0	38.0	38.1
Under 18 Years	23.5%	23.3%	22.6%	720,329	1,295,848	73,429,392
18 to 24 Years	8.5%	9.0%	9.4%	261,981	500,630	30,646,327
25 to 34 Years	15.1%	13.6%	13.9%	462,318	756,337	45,030,415
35 to 44 Years	13.3%	12.5%	12.6%	406,324	697,077	40,978,831
45 to 54 Years	13.1%	12.7%	13.0%	402,231	708,668	42,072,620
55 to 64 Years	12.9%	13.4%	12.9%	396,303	746,120	41,756,414
65 to 74 Years	8.0%	8.8%	9.1%	246,111	490,739	29,542,266
75 Years, and Over	5.5%	6.6%	6.5%	169,550	367,959	21,241,530
Race: White	76.1%	82.8%	72.5%	2,331,877	4,609,049	235,377,662
Race: Black or African American	9.8%	6.4%	12.7%	299,059	356,515	41,234,642
Race: American Indian and Alaska Native	0.6%	1.0%	0.8%	17,990	58,011	2,750,143
Race: Asian	7.5%	4.8%	5.5%	230,093	268,181	17,924,209
Race: Native Hawaiian and Other Pacific Islander	0.0%	0.0%	0.2%	1,061	2,194	599,868
Race: Some Other Race	2.4%	1.9%	4.9%	73,211	104,032	16,047,369
Race: Two or More Races	3.6%	3.0%	3.3%	111,856	165,396	10,763,902
Hispanic or Latino (of any race)	6.4%	5.4%	18.0%	195,477	299,556	58,479,370

American Community Survey 2015-2019 unless noted otherwise.

Employment

As of 2020Q1, total employment for the MSP Metro was 1,875,117 (based on a four-quarter moving average). By 2021Q1, employment was hit hard by the COVID-19 pandemic and had moderately climbed again to approximately 1,711,996 (based on a four-quarter moving average). Over the year ending 2021Q1, employment declined an average of 6.5% in the region.

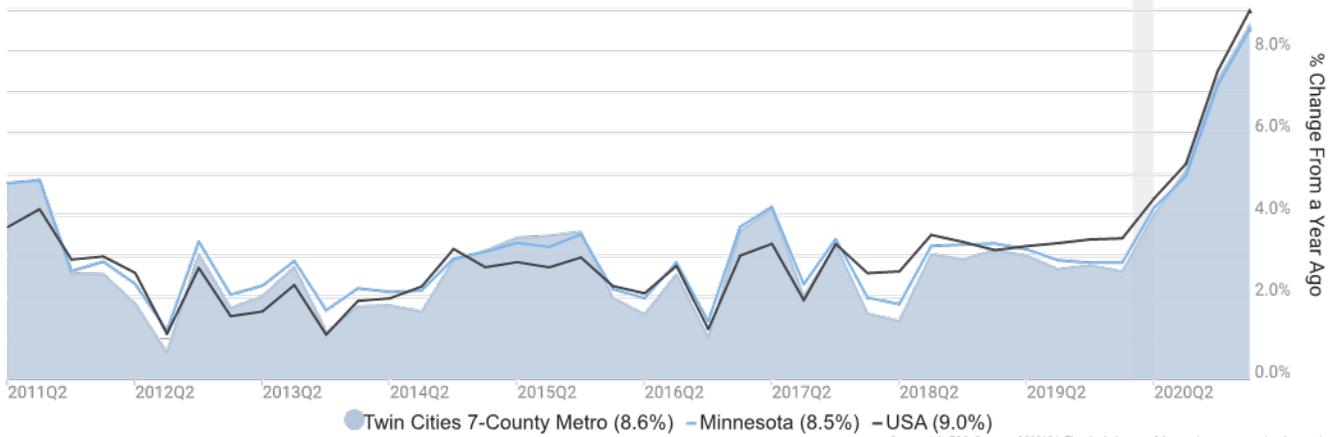
Employment for the MSP Metro



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.

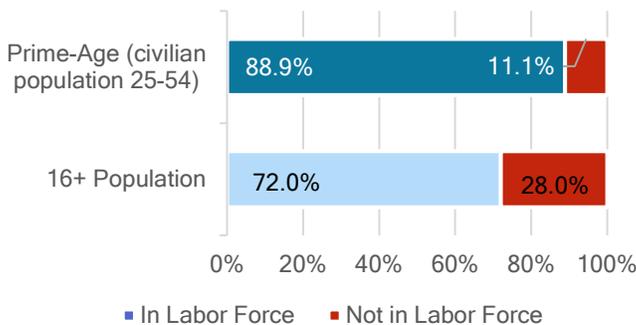
The average worker in the MSP Metro earned annual wages of \$70,842 as of 2020Q1, an increase of about \$6,351 from one year prior, 2019Q1. Average annual wages per worker increased 8.6% in the region over the preceding four quarters. Wages rose similarly nationwide, where annual average wages were \$63,393 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 the MSP Metro



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



American Community Survey 2015-2019 unless noted otherwise.

The region has a civilian labor force of 1,743,704 with a participation rate of 72.0%, which is over two percentage points ahead of Minnesota's labor force participation rate for the population over 16. This may be due, in large part, to the lower median age in the MSP Metro (37 years) than in other parts of the state (38 years statewide). The participation rate of the prime working age population (between the ages of 25 and 64) also is ahead of the statewide rate—88.9% compared to the statewide 88.4%.

The MSP Metro area has a lower share of veterans in the region, at 3.3% of the regional population compared to

3.8% broadly across the state. However, veteran labor force participation rate is higher in the MSP Metro, 82.9% compared to 80.4% statewide. Similarly, the MSP Metro area has a lower share of persons with a disability, 8.0% compared to 8.7% statewide, but a higher labor force participation rate for the population with a disability, 54% compared to 53% statewide. The MSP Metro overall has a small share of disconnected youth (1.5% of youth) compared to statewide (1.8%) and national rates (2.5%), but rates vary significantly between communities. While just 1.4% of Minneapolis' youth are disconnected from school, training, or work, about double this share of youth (2.9%) in Saint Paul are disconnected.

Economic and Social Characteristics of the MSP Metro

Economic and Social Characteristics	Percent			Values		
	MSP Metro Minnesota	Minnesota	USA	MSP Metro Minnesota	Minnesota	USA
Labor Force Participation Rate and Size (civilian population 16 years and over)	72.0%	69.6%	63.2%	1,743,704	3,069,730	163,555,585
Prime-Age Labor Force Participation Rate and Size (civilian population 25-54)	88.9%	88.4%	82.1%	1,128,537	1,908,936	104,634,905
Armed Forces Labor Force	0.0%	0.1%	0.4%	1,207	2,514	1,073,907
Veterans, Age 18-64	3.3%	3.8%	4.6%	63,851	130,320	9,143,042
Veterans Labor Force Participation Rate and Size, Age 18-64	82.9%	80.4%	76.6%	52,903	104,731	7,003,778
Median Household Income ²	–	–	–	\$80,485	\$71,306	\$62,843
Per Capita Income	–	–	–	\$42,155	\$37,625	\$34,103
Poverty Level (of all people)	9.0%	9.7%	13.4%	270,588	526,065	42,510,843
Households Receiving Food Stamps/SNAP	7.8%	7.9%	11.7%	93,168	172,477	14,171,567
Enrolled in Grade 12 (% of total population)	1.5%	1.4%	1.4%	46,762	80,319	4,422,344
Disconnected Youth ³	1.6%	1.7%	2.5%	2,378	4,961	423,273
Children in Single Parent Families (% of all children)	28.1%	28.1%	34.1%	195,824	350,236	23,790,005
Uninsured	4.4%	4.5%	8.8%	132,706	246,184	28,248,613
With a Disability, Age 18-64	8.0%	8.7%	10.3%	153,615	293,656	20,187,604
With a Disability, Age 18-64, Labor Force Participation Rate and Size	54.0%	53.0%	42.2%	82,890	155,592	8,509,463
Foreign Born	12.1%	8.5%	13.6%	370,577	472,849	44,011,870

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



93.8% of prime working age adult residents have at least a high school diploma or GED.

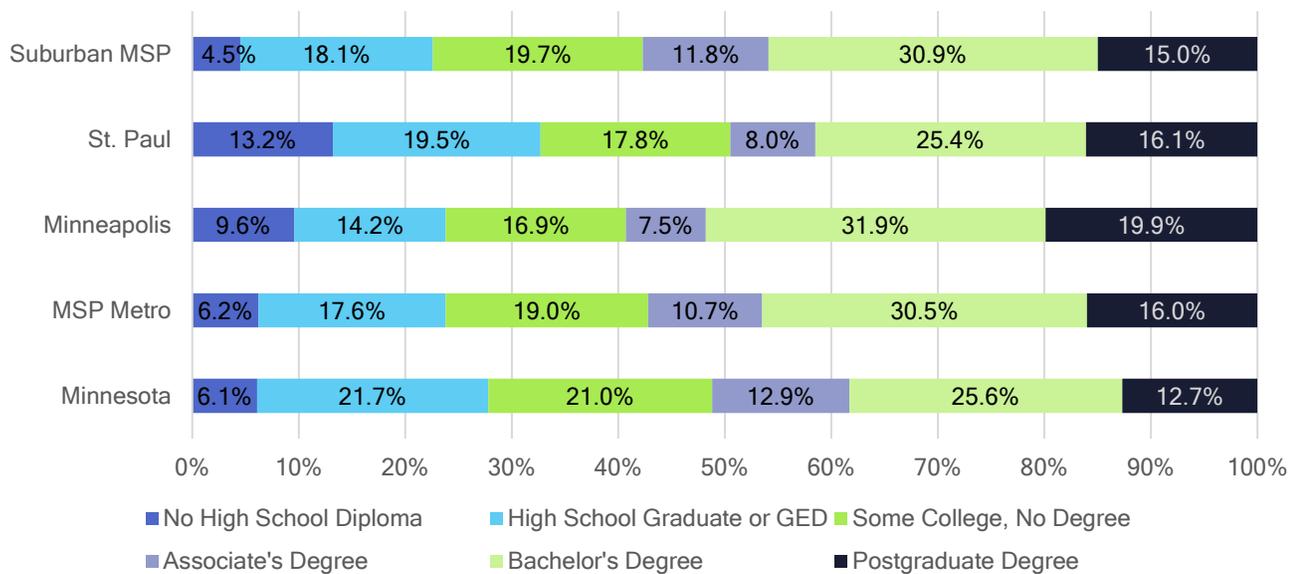
In the MSP Metro, 6.2% of adults between the ages of 25 and 64 do not have a high school diploma or equivalent, and about 17.8% have a high school diploma as their highest level of education (compared with 21.7% statewide). Some communities of the MSP Metro have as high as 20% of prime working age adults in a neighborhood with no high school diploma or GED credential. 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 St. Paul has a larger share of residents with a high school diploma or less (13.2%, or 21,282 people), while Suburban MSP and Minneapolis have a smaller share of residents with lower educational attainment (4.5% or 53,303 in the suburbs and 9.6% or 22,857 people in the City of Minneapolis).

Educational Characteristics of MSP Metro Minnesota

Educational Characteristics	Percent			Values		
	MSP Metro Minnesota	Minnesota	USA	MSP Metro Minnesota	Minnesota	USA
No High School Diploma	6.2%	6.1%	10.9%	103,057	178,196	18,550,150
High School Graduate	17.6%	21.7%	25.7%	293,174	632,253	43,627,868
Some College, No Degree	19.0%	21.0%	20.7%	316,205	610,250	35,174,790
Associate's Degree	10.7%	12.9%	9.1%	178,725	374,770	15,526,064
Bachelor's Degree	30.5%	25.6%	21.2%	509,305	744,024	35,997,848
Postgraduate Degree	16.0%	12.7%	12.3%	266,710	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

The MSP Metro has 26 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 2018-19 school year.

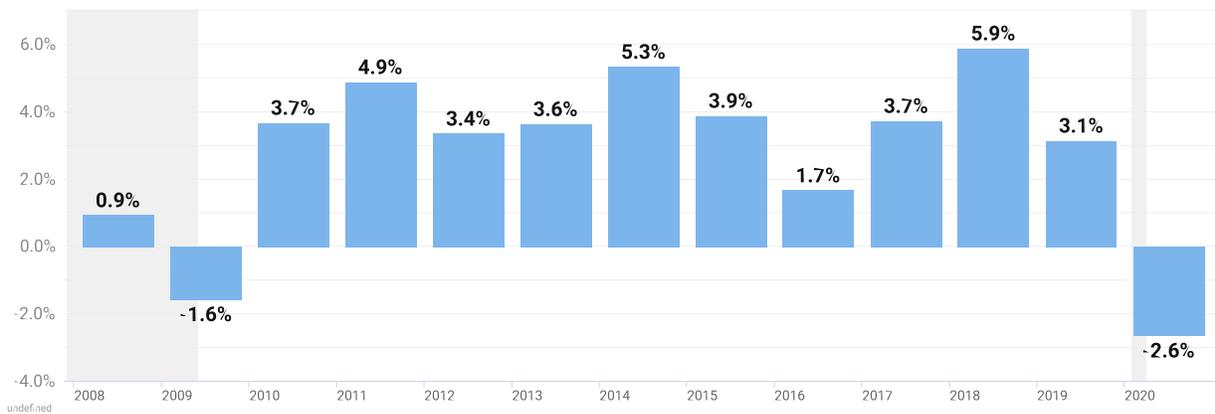
School	Certificates and 2yr Awards	4yr Awards	Total School Enrollment	Avg Net Price
University of Minnesota-Twin Cities	216	9,224	50,734	\$16,691
Walden University	0	2,214	50,360	\$21,276
Capella University	28	3,751	37,171	\$13,387
University of St Thomas	56	1,798	10,035	\$30,183
Normandale Community College	1,339	0	9,784	\$12,248
Century College	2,043	0	8,891	\$10,600
Anoka-Ramsey Community College	1,270	0	8,845	\$11,594
Metropolitan State University	11	1,966	7,861	\$14,900
Minneapolis Community and Technical College	1,280	0	6,951	\$12,868
Saint Paul College	1,350	0	6,912	\$11,973

School	Certificates and 2yr Awards	4yr Awards	Total School Enrollment	Avg Net Price
North Hennepin Community College	1,141	0	6,286	\$10,189
Concordia University-Saint Paul	9	843	5,054	\$18,591
St Catherine University	295	678	4,859	\$20,157
Hennepin Technical College	1,422	0	4,762	\$12,675
Inver Hills Community College	808	0	4,264	\$10,554
Bethel University	26	942	3,692	\$27,085
University of Northwestern-St Paul	20	731	3,623	\$24,286
Hamline University	67	706	3,526	\$22,079
Augsburg University	0	638	3,419	\$24,608
Dakota County Technical College	836	0	2,523	\$10,993
Macalester College	0	679	2,174	\$29,013
Anoka Technical College	916	0	1,844	\$12,368
Crown College	21	274	1,510	\$24,220
Dunwoody College of Technology	397	63	1,316	\$21,797
Mitchell Hamline School of Law	0	0	1,154	n/a
Total	15,025	25,162	254,385	n/a

Economic Indicators

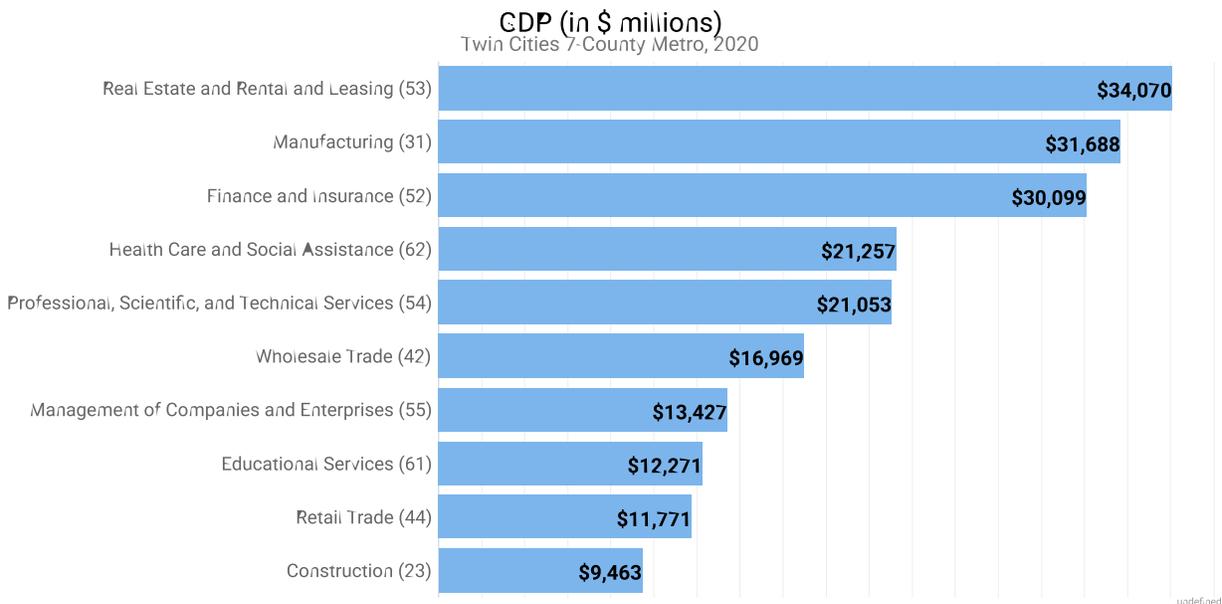
Gross Domestic Product (GDP) is the total value of goods and services produced by a region. In 2020, nominal GDP in the MSP Metro contracted 2.6%. This follows growth of 3.1% in 2019. As of 2020, total GDP in the MSP Metro was \$252,537,469,000.

One-Year % Change in GDP, MSP Metro



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 MSP Metro, Real Estate and Rental and Leasing contributed the largest portion of GDP in 2020, \$34,069,928,000. The next-largest contributions came from Manufacturing (\$31,687,551,000); Finance and Insurance (\$30,098,824,000); and Health Care and Social Assistance (\$21,256,995,000).



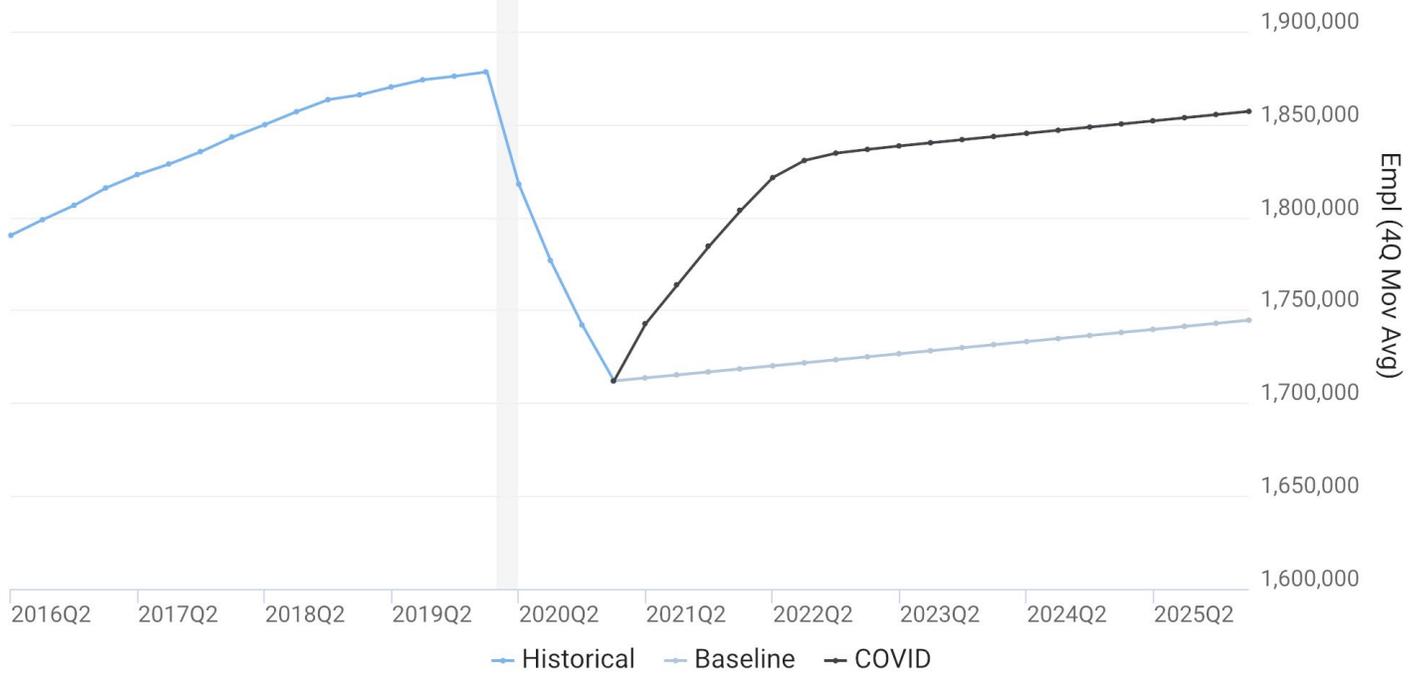
Gross Domestic Product data are provided by the Bureau of Economic Analysis, imputed by Chmura where necessary, updated through 2020.

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 -8.9% between 2020Q1 and 2021Q1, with an estimated 6.7% of the MSP Metro population being unemployed by the start of 2021. Future growth in jobs 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 growth closer to 0.4%.

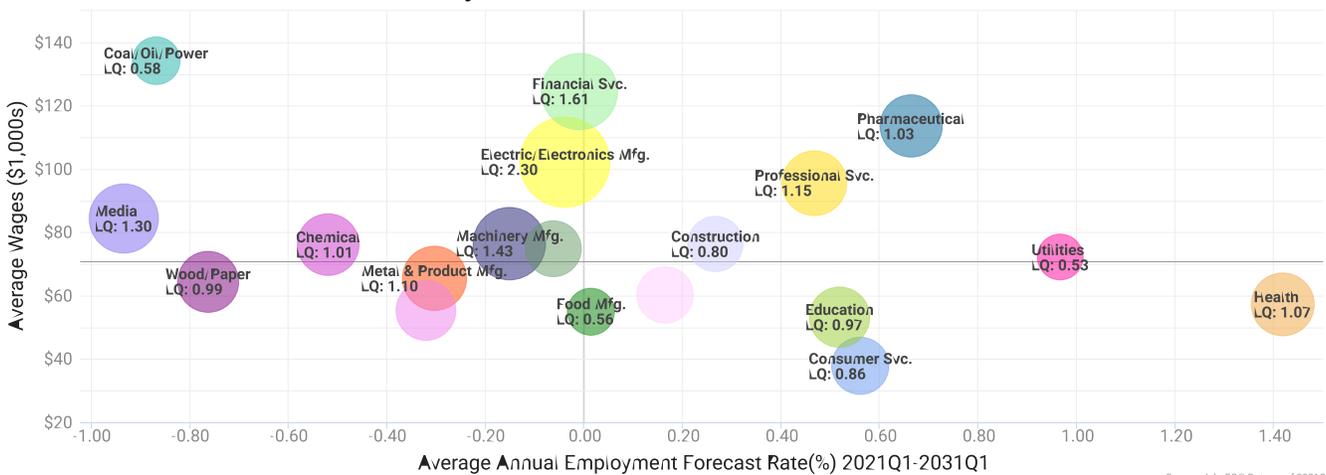
5-Year Forecast Comparison in the MSP Metro



Source: JobsEQ®, Data as of 2021Q1

An industry cluster is a geographic concentration of interrelated industries or occupations. The industry cluster in the MSP Metro with the highest relative concentration is Electric/Electronics Manufacturing with a location quotient of 2.30. This cluster employs 43,438 workers in the region with an average wage of \$102,213. Employment in the Electric/Electronics Manufacturing cluster is projected to remain flat over the next ten years.

Industry Clusters in the MSP Metro, 2021Q1



Source: JobsEQ®, Data 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 MSP Metro just prior to the pandemic, but quickly shifted as businesses temporarily or permanently closed their doors. One year ago, we had estimated that about 41,000 (-9.4%) of the 434,344 people employed locally in high contact-intensity roles during 2020Q1 would lose their employment by 2021Q1. Instead, employment in these high contact-intensity roles dropped to 383,184 across the MSP Metro, closer to 50,000 in losses. About 30,631 people are now unemployed but skilled in these high contact-intensity positions locally, a combined unemployment rate across these positions of 7.8%.

Roles that saw some of the biggest losses in employment were Fast Food and Counter Workers (-8,241 or -18.7%), Waiters and Waitresses (-11,731 or -42.6%), Passenger Vehicle Drivers (-2,421 or -20.6%), and Bartenders (-3,949 or -42.6%). These occupations also have the highest estimated unemployment rates, and many other individuals previously in these roles have taken new career and educational paths since the pandemic began. Just a few high contact-intensity positions in the Human Services and Health Science Technology fields have actually seen increased demand and growth in employment counts between 2020Q1 and 2021Q1, including Personal Care Aides (+4.5%), Pharmacy Technicians (+0.3%), and Phlebotomists (0.4%).

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
31-1122	Personal Care Aides	41,945	\$30,000	1.44	2,259	5.6%	1,008	1,807	4.5%	40,153	17,735	15,578	6,841	3.1%
29-1141	Registered Nurses	36,626	\$87,100	1.05	705	1.9%	2,289	-1,502	-3.9%	11,917	5,317	4,937	1,663	0.9%
35-3023	Fast Food and Counter Workers	35,874	\$27,200	0.93	4,552	12.1%	2,937	-8,241	-18.7%	50,418	18,615	21,930	9,873	5.0%
53-3032	Heavy and Tractor-Trailer Truck Drivers	17,673	\$54,100	0.79	1,041	6.0%	1,142	-766	-4.2%	11,222	3,762	6,698	762	0.8%
35-3031	Waiters and Waitresses	15,802	\$31,600	0.77	3,717	20.1%	494	-11,731	-42.6%	23,403	6,809	12,138	4,456	5.1%
31-1131	Nursing Assistants	15,541	\$39,500	0.97	747	5.0%	1,295	-1,028	-6.2%	10,487	4,463	4,794	1,230	1.5%
31-1121	Home Health Aides	14,849	\$30,000	1.45	742	5.2%	328	-1,109	-7.0%	11,947	4,585	4,925	2,437	3.1%
25-2021	Elementary School Teachers, Except Special Education	12,447	\$67,100	0.84	588	4.3%	420	-751	-5.7%	6,366	2,111	2,928	1,327	2.0%
53-3033	Light Truck Drivers	11,038	\$45,100	0.92	613	5.9%	573	-551	-4.8%	7,689	2,435	4,336	918	1.6%
39-9011	Childcare Workers	9,973	\$30,200	1.03	1,279	12.2%	432	-1,454	-12.7%	10,534	4,302	4,360	1,873	3.5%
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	9,721	\$67,800	0.90	307	3.0%	599	-558	-5.4%	4,767	1,490	2,235	1,043	2.1%
53-3058	Passenger Vehicle Drivers, Except Bus Drivers, Transit and Intercity	9,355	\$38,800	1.13	2,117	20.1%	218	-2,421	-20.6%	8,997	3,997	2,857	2,143	4.2%
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	8,015	\$43,300	0.81	761	9.5%	3,320	-2,654	-24.9%	9,421	2,143	5,308	1,971	4.5%
29-2061	Licensed Practical and Licensed Vocational Nurses	7,559	\$52,900	0.97	207	3.0%	831	-623	-7.6%	3,670	1,370	1,692	608	1.6%
High Contact-Intensity Occupations		383,184	\$54,200	0.98	30,631	7.8%	25,543	-49,188	-11.4%	302,931	109,476	138,165	55,289	2.7%
Total - All Occupations		1,711,996	\$63,000	1.00	114,969	6.7%	112,575	-166,270	-8.9%	1,167,086	386,893	635,319	144,875	1.6%

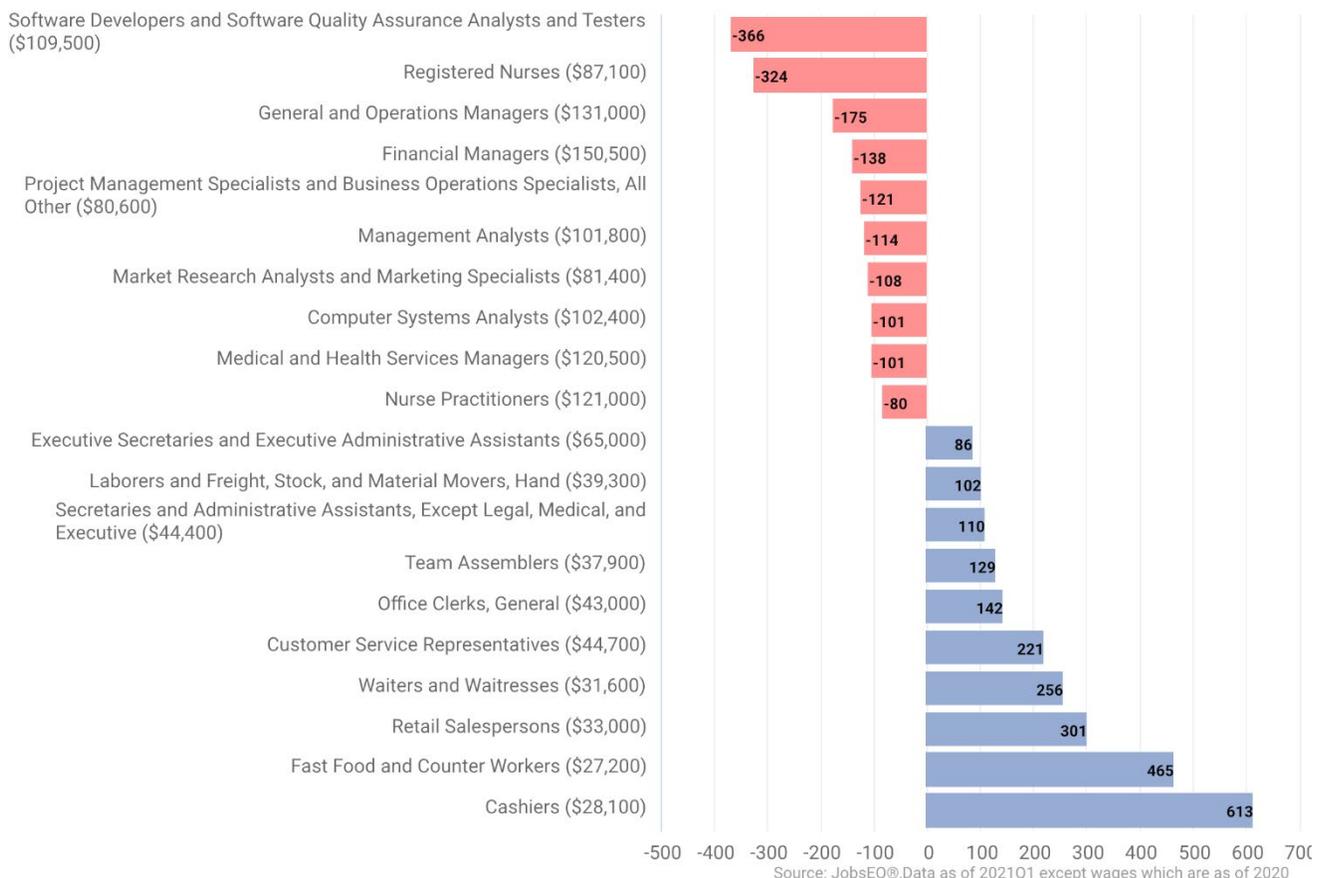
SEVERE OCCUPATION GAPS

Estimation of mid-term and long-term recovery of critical local occupations is based on our most reasonable hypothesis given current conditions. In the MSP Metro, an analysis of local labor market occupational gaps as of the first quarter of 2020 showed that there is a shortage of local Nurses, Software Developers, General and Operations Managers, Computer Systems Analysts, and Financial Managers, among other critical healthcare, information technology, and management occupations. 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. Among high contact-intensity roles in shortage, Registered Nurses, Nurse Practitioners, and Licensed Practical Nurses ranked in the top three spots, while Hospitality and Tourism roles are forecast to have a surplus of talent. 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 \$52,000 per year. Most occupations of shortage require an Associate's degree or higher.

Conversely, none of the ten positions forecast to have the highest surplus of talent in the MSP Metro as of the first quarter of 2020 or 2021 typically require an advanced degree, and only one of the ten pays over \$43,000 on average. Six out of ten of these positions typically cannot be done remotely, and seven out of ten of these positions are considered high contact-intensity. Given the impacts of the COVID-19 pandemic on local industry, these occupations of anticipated high talent excess will likely decline in overall local demand and shift dramatically in how work is done on a daily basis.

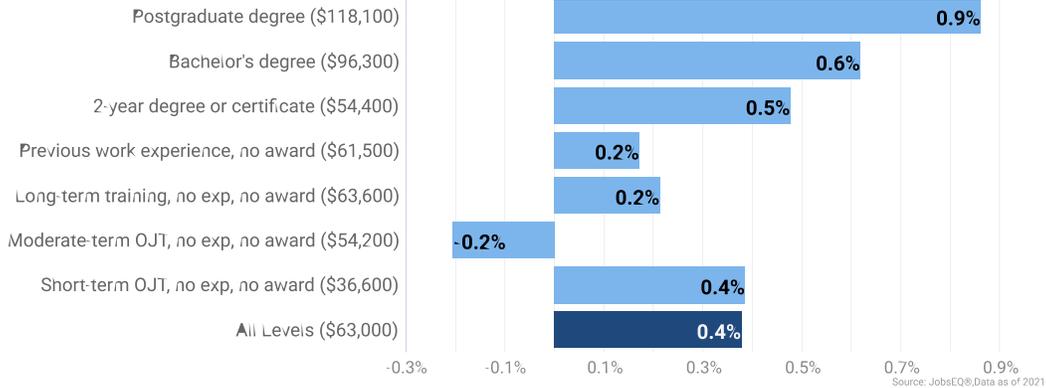
Average Annual Occupation Gaps (i.e. Talent Shortage), 2021Q1 through 2031Q1

Potential Average Annual Occupation Gaps over 10 Years in Twin Cities 7-County Metro



Expected growth rates for occupations vary by the education and training required. Overall, employment forecasts have dropped from last year’s estimate of 0.6% to just 0.4% average annual growth over the next ten years. Growth in occupations typically requiring a postgraduate degree dropped to just 0.9% per year, those requiring a bachelor’s degree are forecast to grow 0.6% per year, and occupations typically needing a 2-year degree or certificate are expected to grow 0.5% per year. Jobs that typically require moderate on-the-job training but no formal degree are now forecast to decline year-over-year on average by about -0.2%. Estimated wages have increased across careers at each education level requirement.

Annual Average Projected Job Growth by Training Required for the MSP Metro

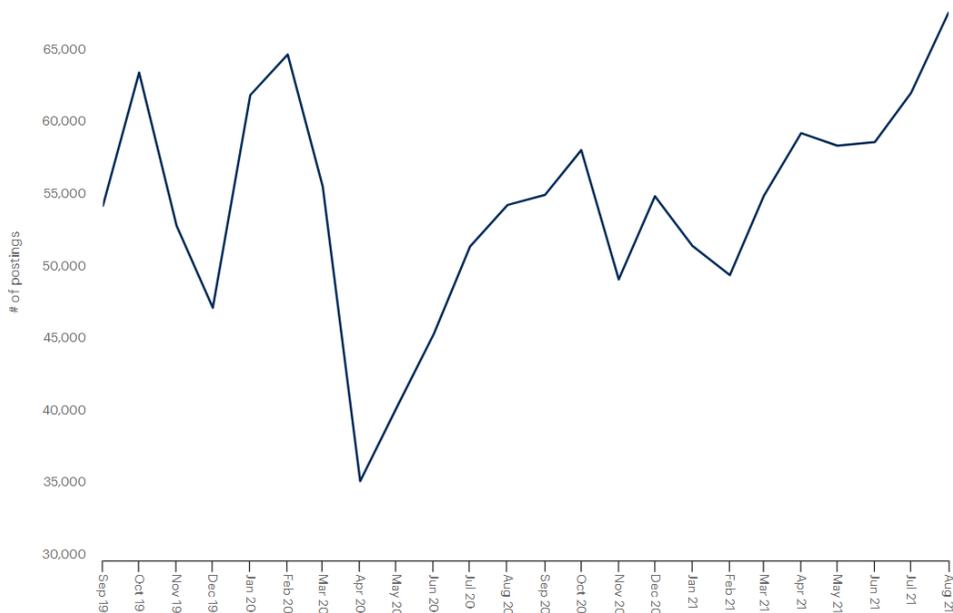


Employment by occupation data are estimates as of 2021Q1. Education levels of occupations are based on BLS assignments. Forecast employment growth uses national projections from the Bureau of Labor Statistics adapted for regional growth patterns.

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 the MSP Metro, September 2019 - 2021



During the first six months of the COVID-19 pandemic,³ there were 308,526 new jobs advertised in the region—a decrease of about 18% from the same six months in 2019. The top three positions advertised by volume were for Software Developers (Applications), Heavy Truck Drivers, Laborers and Freight Movers, and Registered Nurses. Personal Care Aide job posting volumes doubled between 2020 and 2019. This reflects the sudden and growing local demand for entry-level healthcare and human services talent, particularly those with at least a 2-year degree in a related area of study.

Over the past 12 months, several of these occupations have continued to see growth in postings, including Software Developers, general computer occupations, Truck Drivers, and Laborers. Additionally, administrative, management, and marketing roles have begun to spike in volume considerably.

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

1. Software Developers, Applications (+10%)
2. Heavy and Tractor-Trailer and Truck Drivers (+15%)
3. Laborers and Freight, Stock, and Material Movers (+251%)
4. Stock Clerks—Stockroom (+86%)
5. Personal Care Aides (+108%)
6. Insurance Sales Agents (+38%)
7. Computer Systems Engineers (+5%)
8. Nursing Assistants (+1%)
9. Information Security Analysts (+19%)
10. Loan Interviewers and Clerks (+131%)

Top Sustaining Occupations in the MSP Metro September 2020 - 2021

1. Software Developers, Applications (+20%)
2. Registered Nurses (+38%)
3. Computer Occupations (+24%)
4. Heavy and Tractor-Trailer and Truck Drivers (+49%)
5. Marketing Managers (+68%)
6. Management Analysts (+19%)
7. Laborers and Freight, Stock, and Material Movers (+23%)
8. Accountants and Auditors (+5%)
9. Industrial Engineers (+35%)
10. Supervisors of Office and Administrative Support Workers (+3%)

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.

³ March 15-June 15, 2020.

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.

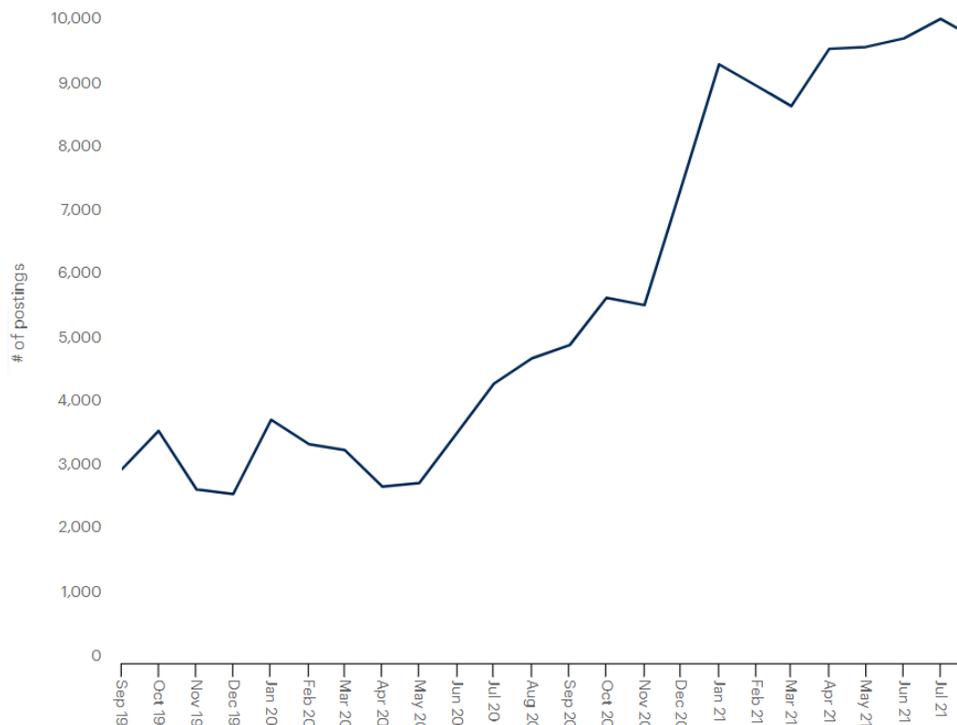
The certifications and technical skills in demand locally match to the customer service, and entry-level health care positions available in high volumes in the region, with Commercial Drivers Licenses, Registered Nurse Certification, Accounting, Licensed Practical Nursing, and Hospice and Palliative Care Certification appearing in high volumes in local job postings during this period compared to a full year prior. In general, most human skills were mentioned in job postings as required competencies for candidates in lower frequencies from throughout the pandemic period thus far. The majority of rising skills are focused in Information Technology capacities.

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

1. Supervision (+40%)
2. Software Engineering (+40%)
3. Product Development (+34%)
4. English Language Skills (+33%)
5. Software Development (+24%)

Telecommuting and work-from-home continues to appear in job posting requirements locally, increasing 144% in the past 12 months (September 2020-2021) compared to the prior year (September 2019-2020).

Trends in Remote Work Opportunities Advertised Online, MSP Metro 2021Q1



Remote work opportunities increased significantly among Information Technology careers and Business, Management, and Administration roles over the past 12 months compared to the 12 months prior.

Change in Volume of Remote Work Opportunities by Occupation in the MSP Metro, September 2020-2021 Compared to 12 months prior

1. Software Developers, Applications (276%)
2. Computer Occupations, All Other (226%)
3. Marketing Managers (366%)
4. Management Analysts (250%)
5. Customer Service Representatives (267%)
6. Accountants and Auditors (425%)
7. Managers, All Other (215%)
8. Computer User Support Specialists (52%)
9. Market Research Analysts and Marketing Specialists (310%)
10. Computer Systems Analysts (144%)

Currently, the occupations with highest estimated unemployment rates in the MSP Metro are Choreographers (39.3%), Dancers (38.5%), Reinforcing Iron and Rebar Workers (32.1%), and Food Preparation and Serving Workers (30.3%). Demonstrators and Product Promoters (29% unemployment) is an occupation that has a high level of alignment in skills and experience for several career pathways and high-skill, high-demand occupations in the region. Likely transitions for local entry-level Product Promoters include a variety of marketing and sales positions like Merchandisers and Window Trimmers, while other aligned positions that could support movement into entirely different career paths that have forecasted talent shortages include Home Health Aides, Personal Care Aides, Barbers, and Postal Service Clerks.

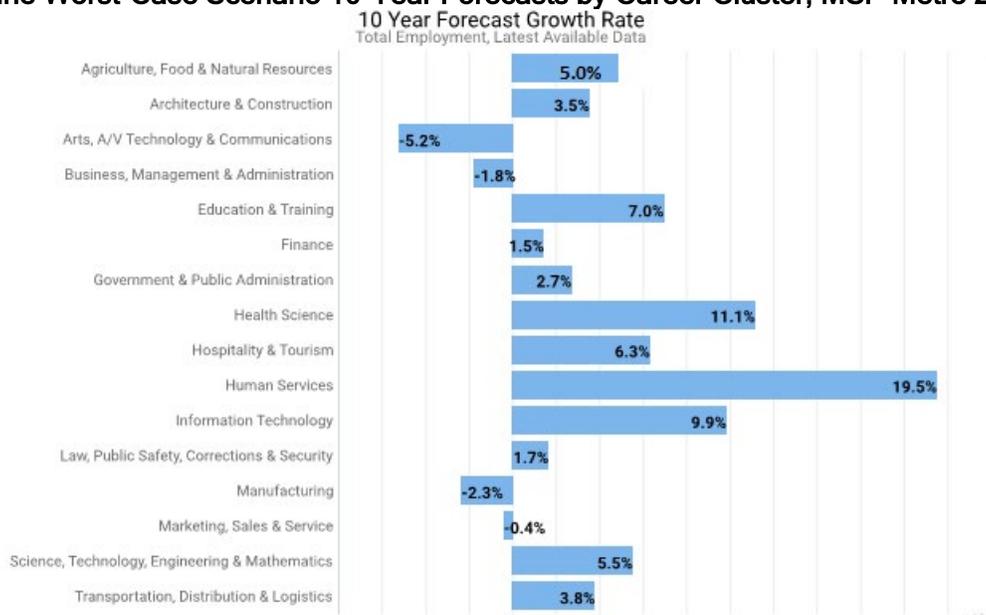
Career Field Insights

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), four are forecast in a worst-case scenario model to decline in overall employment over the next ten years. The clusters expecting the greatest growth are Human Services (19.5%), Health Science (11.1%), and Information Technology (9.9%). The metro is the only region in the state where IT ranks in one of the top three clusters of highest percent growth (though it ranks fourth in the Northeast, Southeast, and Central regions). In contrast, Arts, Audio/Video Technology and Communications (-5.2%) and Manufacturing (-2.3%) are anticipating the greatest declines in overall employment, matching with similar trends seen in other regions of the state. Of the thirteen career clusters expected to grow, eight pay more than the average occupation wage in the region (\$63,000 in 2020—an increase from \$59,700 as of 2019).⁴

Comparing current baseline forecasts to the same forecasts modeled one year ago, all but three Career Clusters are forecasting lower baseline employment growth over ten years than what was estimated last year: 1) Science, Technology, Engineering, and Mathematics, 2) Arts, A/V Technology, and Communications, and 3) Manufacturing all saw employment forecasts improve slightly.

Baseline Worst-Case Scenario 10-Year Forecasts by Career Cluster, MSP Metro 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 MSP Metro, Hospitality & Tourism, Business, Management, and Administration, and Marketing, Sales, and Service clusters are expected to have the highest annual job demand by volume of opportunities—due to retirements and job changes.

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

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
Science, Technology, Engineering & Mathematics	30,001	\$103,600	3,638	5.5% (+)	160	2,484
Information Technology	70,307	\$96,700	9,911	9.9%	661	5,983
Finance	91,254	\$88,700	6,036	1.5%	129	8,568
Health Science	159,600	\$77,100	13,118	11.1%	1,692	14,379
Law, Public Safety, Corrections & Security	46,874	\$74,600	1,903	1.7%	75	4,389
Government & Public Administration	16,647	\$72,100	822	2.7%	43	1,515
Business, Management & Administration	324,665	\$70,200	18,536	-1.8%	-588	34,187
Architecture & Construction	97,659	\$67,100	2,279	3.5%	334	10,829
Arts, A/V Technology & Communications	31,501	\$61,500	1,003	-5.2% (+)	-172	3,189
Education & Training	102,232	\$61,300	5,512	7.0%	690	10,319
Agriculture, Food & Natural Resources*	69,124	\$60,900	3,255	5.0%	349	8,435
Marketing, Sales & Service	188,481	\$58,800	16,258	-0.4%	-84	24,274
Manufacturing	142,229	\$50,600	6,826	-2.3% (+)	-344	15,067
Transportation, Distribution & Logistics	124,148	\$49,700	5,571	3.8%	456	15,375
Human Services	113,580	\$42,000	5,923	19.5%	2,043	17,241
Hospitality & Tourism	156,914	\$33,100	14,303	6.3%	958	26,863
Total - All Occupations	1,711,996	\$63,000	112,575	4.0%	6,433	197,114

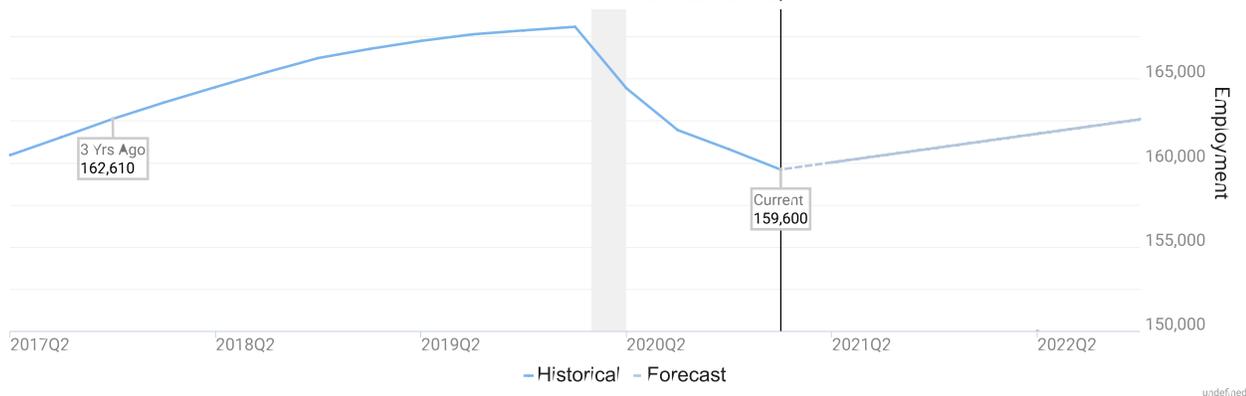
*Cluster forecasts estimated using Chmura, JobsEQ, based on 2021Q1 employment data. All clusters are distinct occupations except for Agriculture, Food, and Natural Resources, which overlaps with other clusters. (+) indicates an improved forecast from 2020Q1 estimates.

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 1.1% 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 1.9% annually in this field could be possible.

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



Top Ten Health Science Technology Occupations by Employment Volume in the MSP Metro, 2021Q1

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Registered Nurses	36,626	\$87,100	1.05	9	2,215	0.6%
Nursing Assistants	15,541	\$39,500	0.97	-926	1,879	0.6%
Home Health Aides	14,849	\$30,000	1.45	-1,670	2,266	2.9%
Licensed Practical and Licensed Vocational Nurses	7,559	\$52,900	0.97	-787	654	0.8%
Medical Secretaries and Administrative Assistants	7,115	\$44,000	1.01	-70	867	0.7%
Medical Assistants	6,476	\$44,400	0.78	29	853	1.6%
Medical and Health Services Managers	4,831	\$120,500	1.01	239	556	2.7%
Pharmacy Technicians	4,751	\$41,300	0.99	36	396	0.2%
Physicians, All Other; and Ophthalmologists, Except Pediatric	4,449	\$237,800	0.96	80	150	0.4%
Pharmacists	3,861	\$131,300	1.03	-4	154	-0.4%
Remaining Component Occupations	53,543	\$88,000	0.97	-921	4,320	1.0%
Health Science (CTE Cluster)	159,600	\$77,100	1.00	-3,987	14,379	1.1%

"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).

Most talent in the MSP Metro that is working in Health Science Technology roles are employed by General Medical and Surgical Hospitals (29.1%) or Offices of Physicians (14.1%). The rest are employed in care facilities, other medical offices, and schools. Hospitals will require the greatest increase in additional talent to fill future roles over the next ten years.

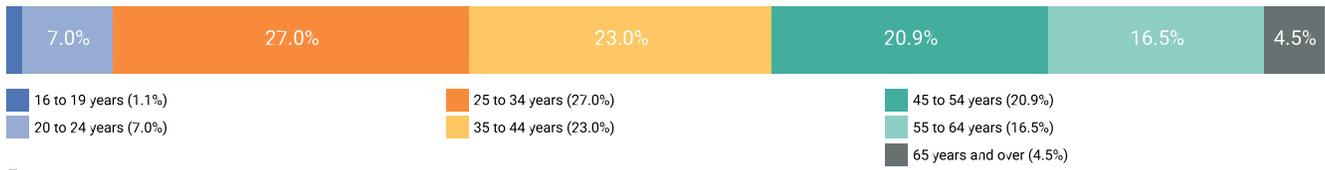
Health Science Technology Field Employment by Industry, 2021Q1, MSP Metro

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
General Medical and Surgical Hospitals	29.1%	46,400	31,048	1,245	32,293
Offices of Physicians	14.1%	22,572	16,608	2,864	19,472
Nursing Care Facilities (Skilled Nursing Facilities)	7.0%	11,243	10,151	-235	9,917
Individual and Family Services	6.3%	10,102	12,548	4,332	16,881
Home Health Care Services	5.4%	8,553	8,201	2,326	10,527
Offices of Dentists	4.7%	7,435	6,438	395	6,833
Offices of Other Health Practitioners	3.6%	5,705	4,314	1,105	5,419
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	3.0%	4,848	5,285	1,327	6,612
Health and Personal Care Stores	2.9%	4,695	3,147	-342	2,805
Outpatient Care Centers	2.9%	4,651	3,693	1,285	4,978
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	2.3%	3,728	3,902	619	4,521
Other Professional, Scientific, and Technical Services	2.0%	3,250	3,054	515	3,570
Management of Companies and Enterprises	1.6%	2,623	1,996	192	2,188
Insurance Carriers	1.4%	2,171	1,452	313	1,765
Employment Services	1.4%	2,167	1,705	37	1,742
Colleges, Universities, and Professional Schools	1.3%	2,126	1,492	51	1,543
Other Ambulatory Health Care Services	1.2%	1,884	1,669	536	2,206
Elementary and Secondary Schools	1.1%	1,685	1,066	179	1,244
Medical and Diagnostic Laboratories	0.9%	1,383	1,085	210	1,295
Specialty (except Psychiatric and Substance Abuse) Hospitals	0.9%	1,357	1,050	363	1,413
All Others	6.9%	11,023	8,575	476	9,051

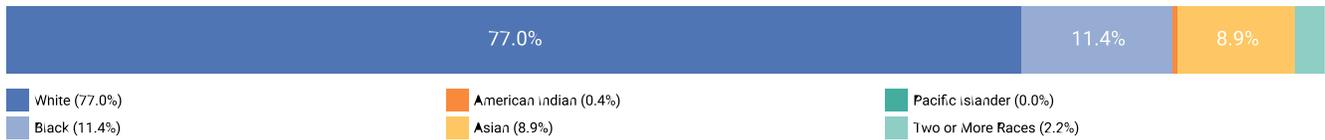
Career Field Demographics

The Health Science Technology field is predominantly female (78%) and white (77%). Half of the Health Science Technology workforce in the region is between the ages of 25 and 44.

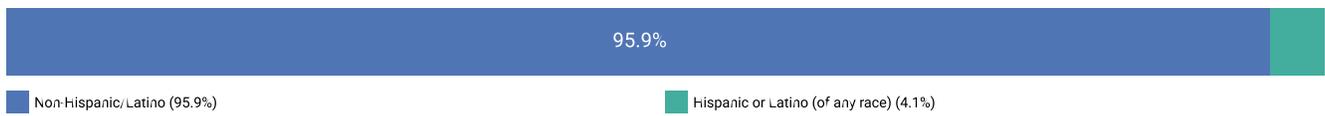
Age



Race



Ethnicity



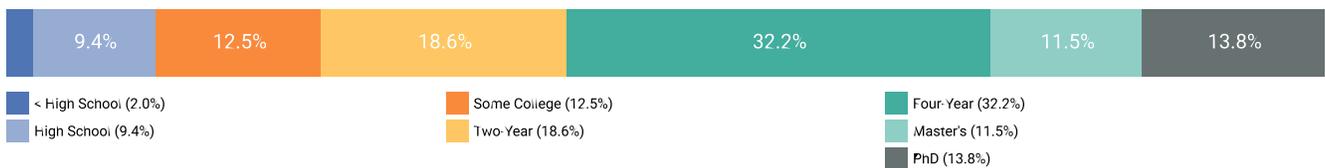
Gender



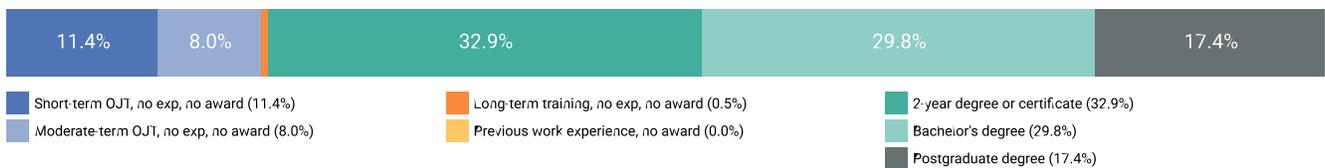
Educational Attainment and Requirements

The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this occupation(s) in aggregate. In general, the MSP Metro Health Science Technology workforce has a close match to the education and training required for existing roles. For example, 18.6% of the Health Science Technology workforce hold a two-year degree and 12.5% completed some college (such as a certificate), or 31.1% in all, compared to about 33% 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	Associate or Bachelor's degree	None	None
Nursing Assistants	Postsecondary non-degree award	None	None

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

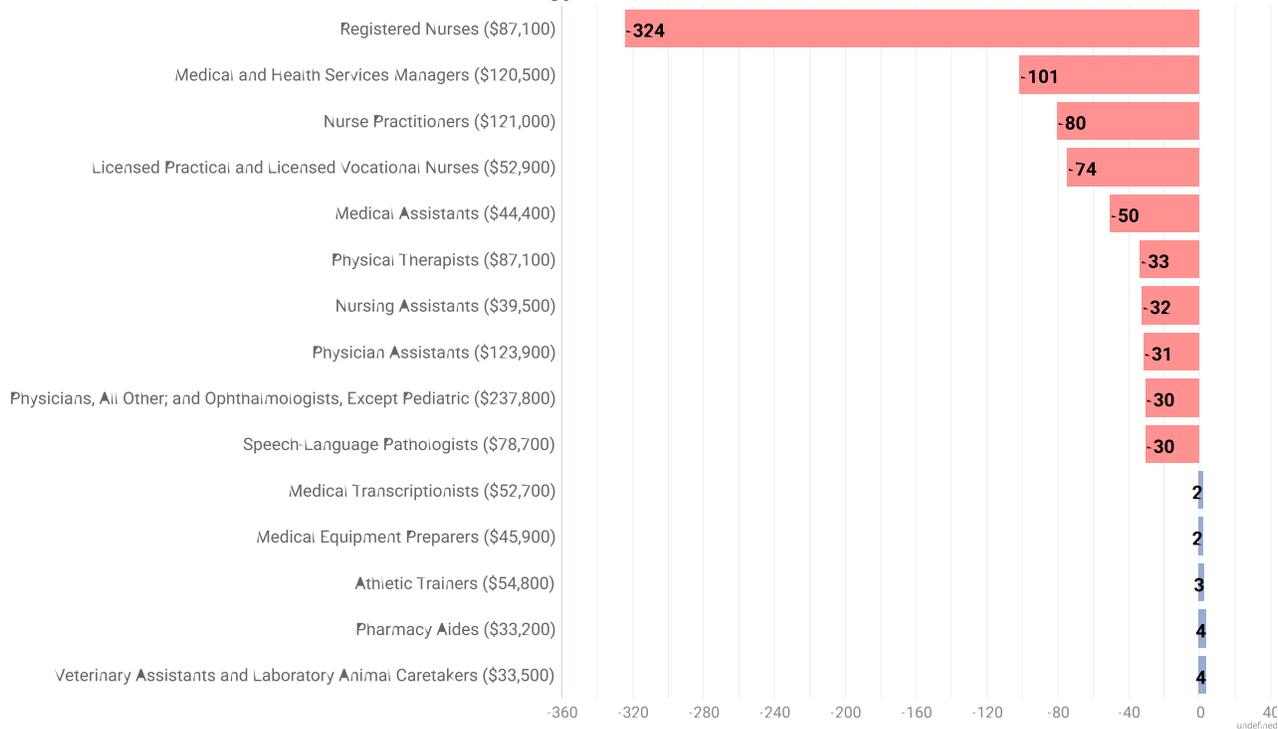
Occupation Gaps

The chart below shows the potential average annual gaps over 10 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 of second-highest annual shortages in the MSP Metro and #1 statewide. This critical talent shortage is due in large part to forecasted employment growth and replacement demand needs due to retirements combined with insufficient talent coming through Registered Nursing programs at both the 2-year and 4-year levels.

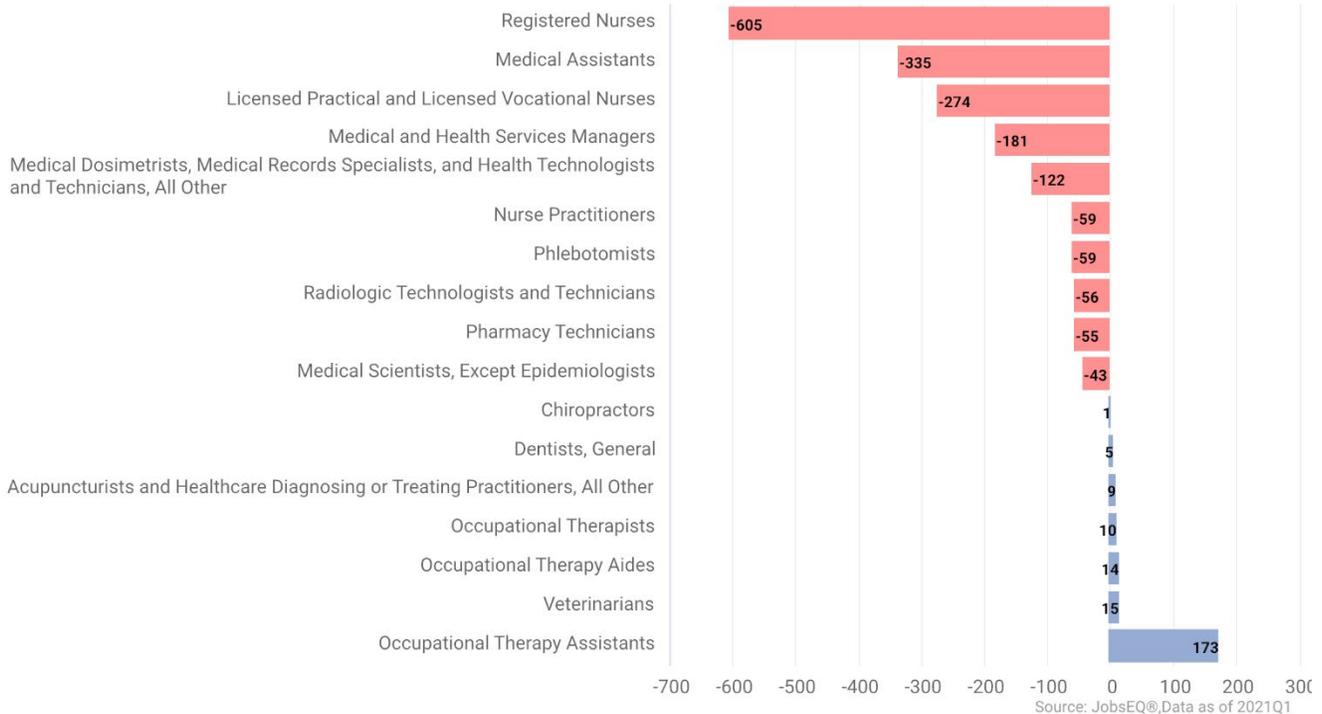
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Health Science Technology, MSP Metro 2021Q1



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 distressing shortages. The MSP Metro faces significant Health Science Technology award gaps, meaning that the region is underproducing local talent in relation to employer demand. For instance, MSP Metro colleges and universities are underproducing about 605 graduates annually that are needed to fill Registered Nursing positions open with employers based in the 7-county MSP Metro. This is a significant shortage of awards, which exacerbates the forecasted occupation gap highlighted above. Several occupations that typically require a certificate or 2-year program also have local award gaps, including LPNs, Medical Managers, Phlebotomists, and a number of Technician roles. 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 Health Science Technology, MSP Metro 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 MSP Metro, August 2021

Name	Candidates	Openings	Gap
Licensed Practical Nurse (LPN)	436	903	-467
Medical Technologist (Medical Technologists)	20	79	-59
Certified Nursing Assistant (CNA)	1,102	1,143	-41
Certified Home Health Aide	35	67	-32
Certified Clinical Medical Assistant (NHA)	13	43	-30
Pediatric Advanced Life Support (PALS)	88	115	-27
Trauma Nursing Core Course (TNCC)	28	55	-26
Registered Dental Assistant (RDA)	15	39	-24
National Phlebotomy Association Certified Phlebotomist	43	67	-24
Registered Respiratory Therapist (RRT)	13	37	-24

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 MSP Metro employers hiring Health Science Technology talent that potential candidates have not indicated in their professional networking platforms as a strength.

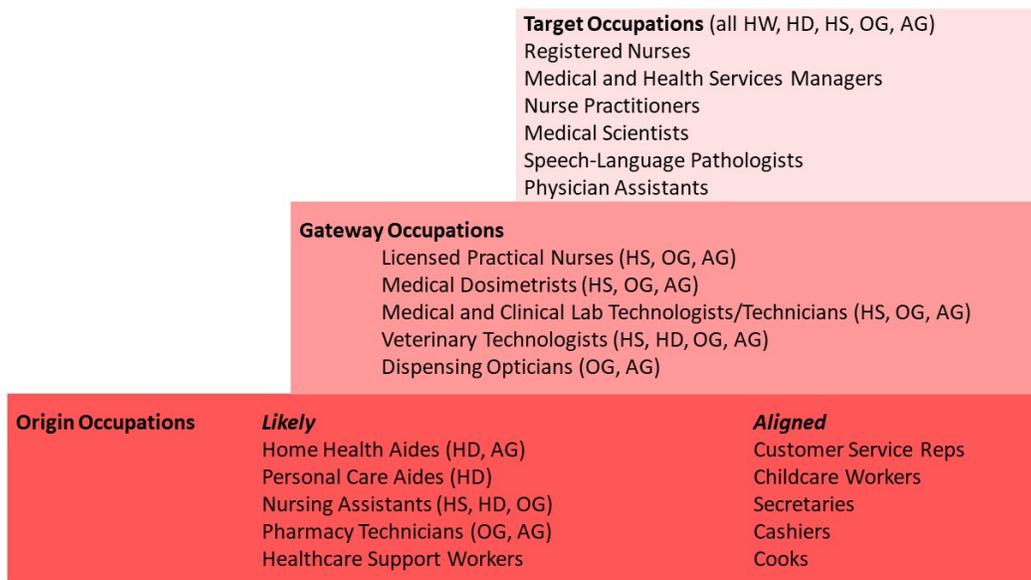
Top 10 Skill Gaps in Twin Cities 7-County Metro

Name	Candidates	Openings	Gap
Home Health Care	937	1,210	-273
Unity	67	295	-228
Keyboarding/Typing	286	484	-197
Electronic Health Record (EHR)	247	443	-197
Teaching/Training, Job	318	507	-189
Microsoft Office	447	574	-127
Microsoft Word	248	359	-110
Medical Terminology	666	760	-94
Microsoft Outlook	271	354	-83
Geriatric	133	216	-83

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, MSP Metro 2021Q1



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 Health Science Technology locally, or aligned opportunities that share a large number of skillsets in-demand in Health Science Technology.

Likely Origins	Aligned Origins
Home Health Aides	Customer Service Representatives
Personal Care Aides	Childcare Workers
Nursing Assistants	Secretaries or Executive Assistants
Pharmacy Aides / Pharmacy Technicians	Cashiers
Healthcare Support Workers	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 (\$63,000 in the MSP Metro). 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
Licensed Practical and Licensed Vocational Nurses	Postsecondary Teachers
Medical Dosimetrists	Social and Human Services Assistants
Medical Equipment Preparers	Supervisors of Office and Administrative Support Workers
Medical and Clinical Lab Technologists / Technicians	Eligibility Interviewers
Veterinary Technologists	Residential Advisors

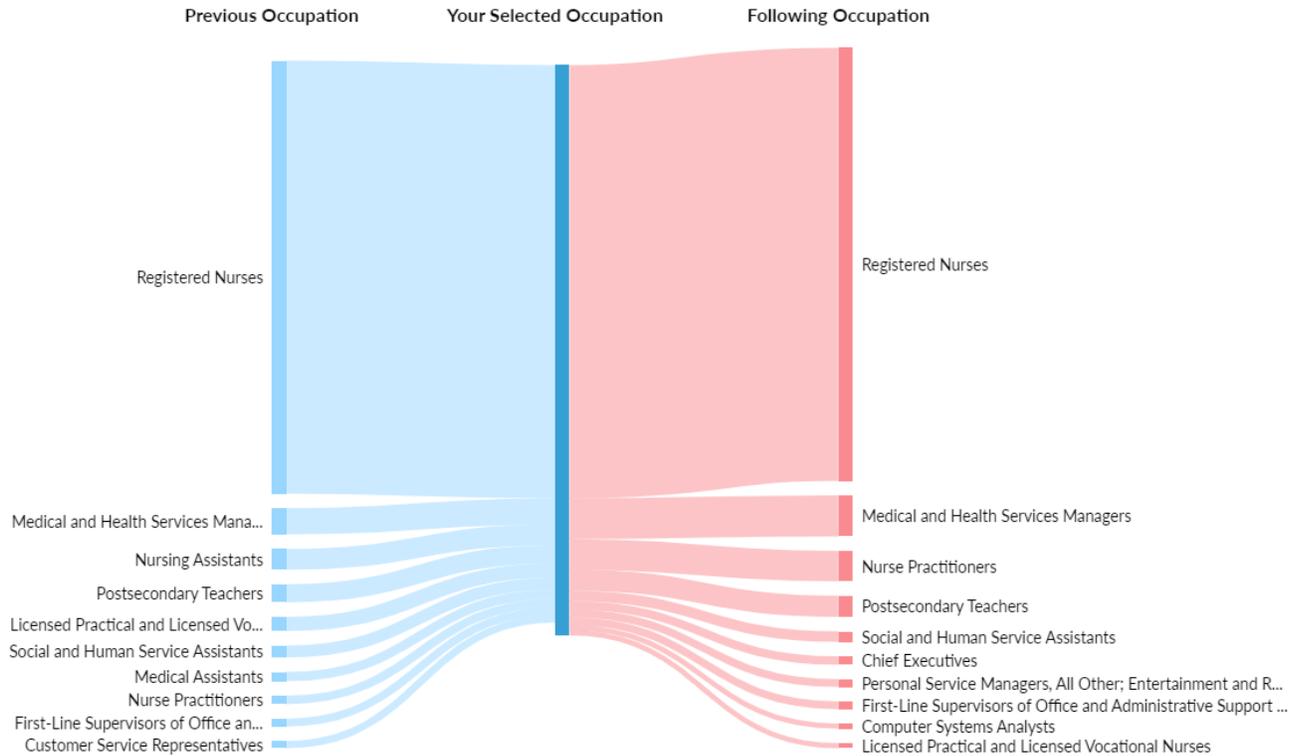
Target Occupations refer to high-wage occupations that pay at or above the region’s average wage (\$63,000 in the MSP Metro). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

Top Target Occupations in Health Science Technology, MSP 2021Q1

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
29-1141	Registered Nurses	36,626	\$87,100	HW	HS	HD	OG	AG
11-9111	Medical and Health Services Managers	4,831	\$120,500	HW	HS	HD	OG	AG
29-1171	Nurse Practitioners	2,282	\$121,000	HW	HS	HD	OG	AG
19-1042	Medical Scientists, Except Epidemiologists	1,732	\$99,500	HW	HS	HD	OG	AG
29-1127	Speech-Language Pathologists	1,543	\$78,700	HW	HS	HD	OG	AG
29-1071	Physician Assistants	1,353	\$123,900	HW	HS	HD	OG	AG
29-1126	Respiratory Therapists	1,236	\$72,100	HW	HS	HD	OG	AG
29-1131	Veterinarians	999	\$94,500	HW	HS	HD	OG	
29-2091	Orthotists and Prosthetists	160	\$89,300	HW	HS	HD	OG	
29-1081	Podiatrists	88	\$158,600	HW	HS	HD		AG

Registered Nurses, as the number-one occupation of shortage in the Career Field, while also being high-wage, high-skill, high-demand, and experiencing a local award gap, 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 Registered Nursing. The right column shows job transitions from Registered Nursing to other occupations.

Registered Nurse Talent Gain and Drain, MSP Metro 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for Registered Nurses, MSP Metro 2021



15 Programs

24 programs can train for this job, while only 15 programs have produced completers in this region.



9,813 Completions (2020)

The completions from all regional institutions for all degree types.



2,239 Openings (2020)

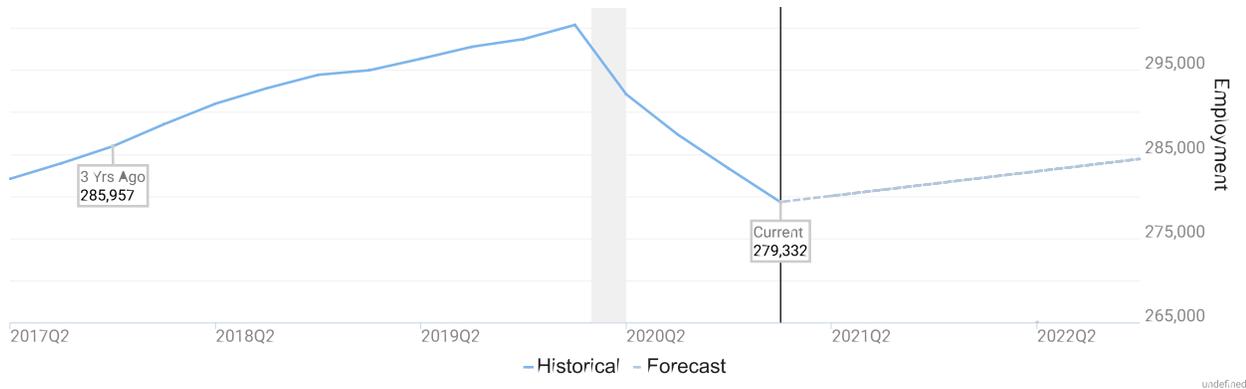
The average number of openings for an occupation in the region is 263.

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 1.0% 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 2.9% annually in this field could be possible.

Baseline Worst-Case Scenario 3-Year Forecast for Human Services Careers, MSP Metro 2021Q1



Top Ten Human Services Occupations by Employment Volume in the MSP Metro, 2021Q1

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Personal Care Aides	41,945	\$30,000	1.44	8,494	7,637	2.9%
Teaching Assistants, Except Postsecondary	17,660	\$35,300	1.26	-1,342	2,013	0.7%
Elementary School Teachers, Except Special Education	12,447	\$67,100	0.84	-596	1,025	0.7%
Childcare Workers	9,973	\$30,200	1.03	-1,235	1,535	0.3%
Lawyers	9,864	\$137,000	1.08	-82	508	0.4%
Secondary School Teachers, Except Special and Career/Technical Education	9,721	\$67,800	0.90	-402	764	0.7%
Security Guards	8,345	\$39,400	0.70	-1,260	1,085	0.1%
Social and Human Service Assistants	6,865	\$38,500	1.46	-465	994	1.8%
Preschool Teachers, Except Special Education	6,235	\$40,800	1.28	-1,016	664	0.4%
Hairdressers, Hairstylists, and Cosmetologists	5,993	\$34,600	0.92	-1,450	700	-0.5%
Remaining Component Occupations	150,281	\$64,200	0.96	-9,901	16,455	0.7%
Human Services (CTE Field)	279,332	\$56,300	1.02	-9,250	33,382	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).

Most talent in the MSP Metro that is working in Human Services roles are employed by Elementary and Secondary Schools (21.5%) or Individual and Family Services (12.2%). These two industries account for the majority of talent demand over the next ten years.

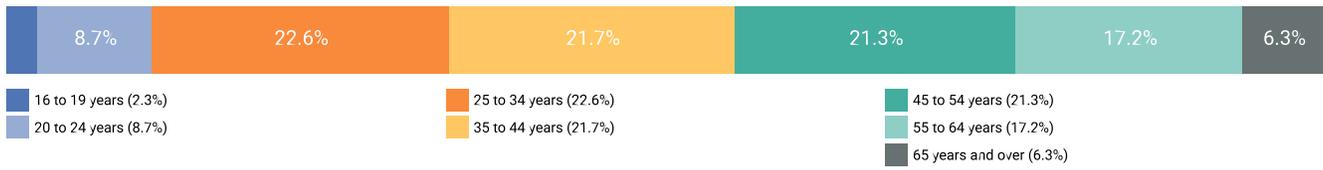
Human Services Field Employment by Industry, 2021Q1, MSP Metro

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Elementary and Secondary Schools	21.5%	59,920	54,775	4,033	58,808
Individual and Family Services	12.2%	34,057	51,275	14,234	65,509
Colleges, Universities, and Professional Schools	6.1%	17,056	15,418	766	16,184
Executive, Legislative, and Other General Government Support	5.1%	14,378	12,743	505	13,248
Legal Services	4.2%	11,823	8,801	-197	8,605
Child Day Care Services	4.1%	11,404	13,888	-14	13,875
Religious Organizations	3.7%	10,417	12,176	617	12,793
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	3.4%	9,593	12,994	1,534	14,528
Personal Care Services	3.3%	9,351	11,475	458	11,933
Home Health Care Services	3.1%	8,760	13,463	2,609	16,072
Justice, Public Order, and Safety Activities	2.7%	7,534	6,581	38	6,619
Other Schools and Instruction	2.5%	7,012	9,001	1,117	10,118
Investigation and Security Services	1.9%	5,428	6,942	100	7,042
Administration of Human Resource Programs	1.7%	4,702	4,065	-151	3,914
Management of Companies and Enterprises	1.5%	4,178	3,966	315	4,281
Offices of Other Health Practitioners	1.5%	4,097	4,332	862	5,194
Other Amusement and Recreation Industries	1.4%	3,784	6,436	571	7,007
General Medical and Surgical Hospitals	1.2%	3,278	3,297	48	3,344
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	1.2%	3,230	4,986	1,021	6,007
Other Residential Care Facilities	1.1%	3,197	3,856	-97	3,758
All Others	16.5%	46,135	49,503	2,159	51,662

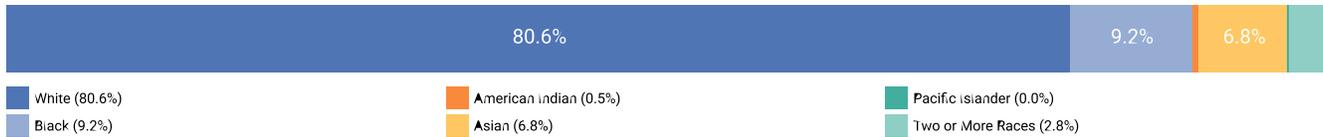
Career Field Demographics

The Human Services field is predominantly female (66%) and white (80.6%). Twenty-two percent of the Human Services workforce in the region is between the ages of 25 and 34.

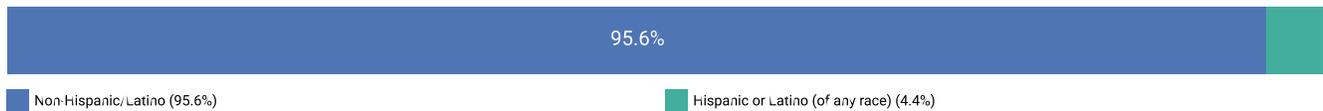
Age



Race



Ethnicity



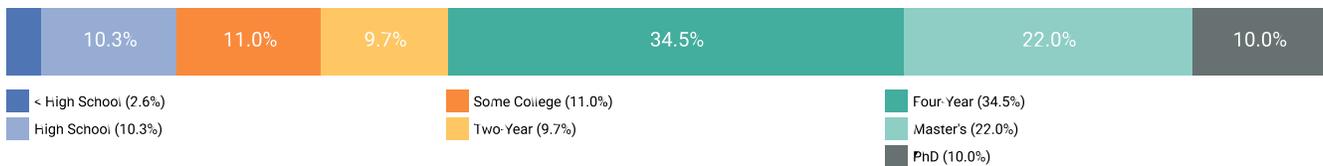
Gender



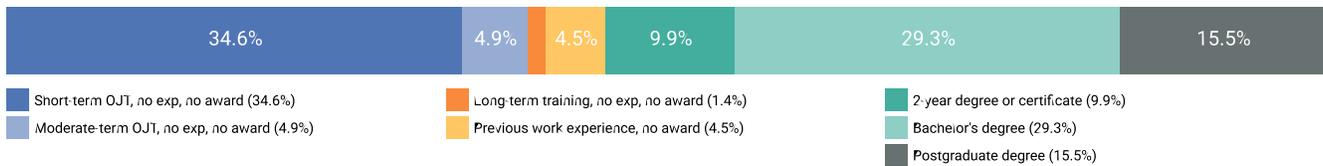
Educational Attainment and Requirements

The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this occupation(s) in aggregate. In general, the MSP Metro Human Services workforce is overskilled for the typical credentials of entry-level positions. For example, 2.6% of the Human Services workforce has no diploma at all, and 10.3% hold a high school diploma as their highest credential. In contrast, about 45% 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



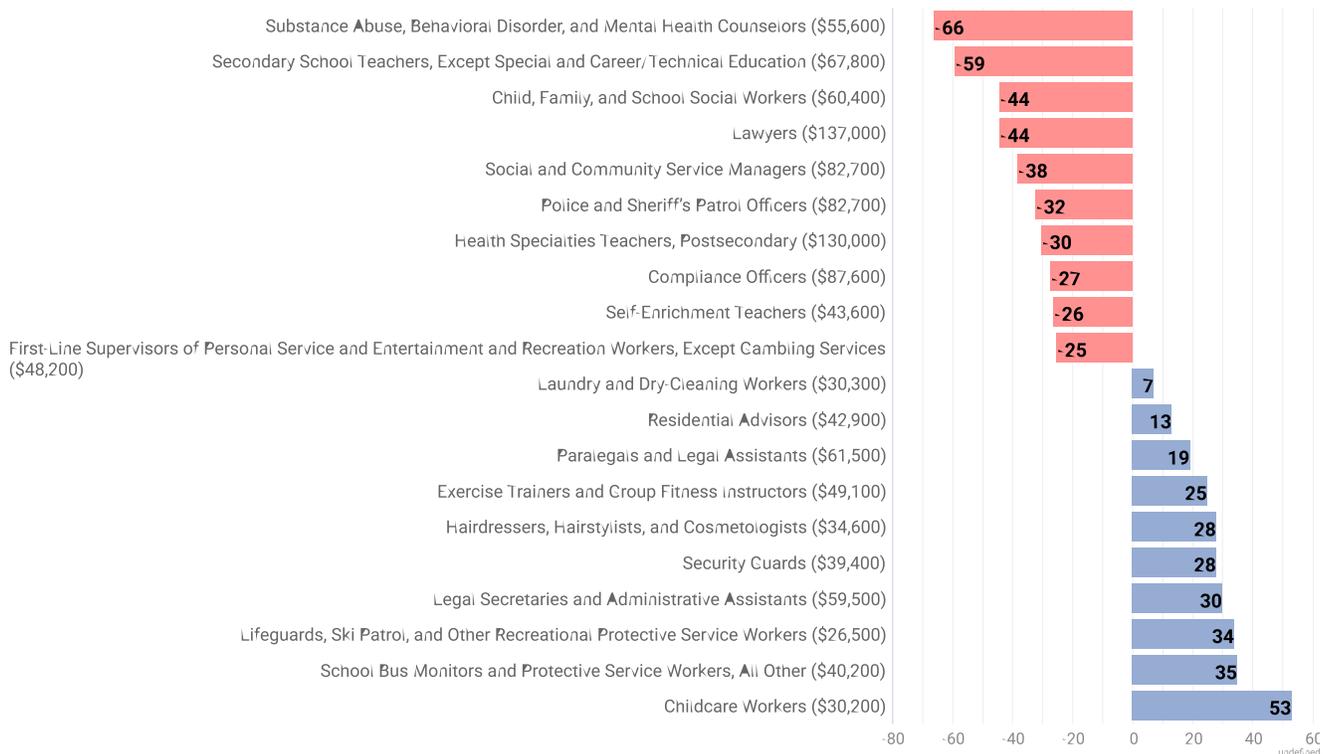
Typical Education Requirements for Top Occupations by Volume, 2021Q1

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
Lawyers	Doctoral or professional degree	None	None
Secondary School Teachers, Except Special and Career/Technical Education	Bachelor's degree	None	None
Security Guards	High school diploma or equivalent	None	Short-term on-the-job training
Social and Human Service Assistants	High school diploma or equivalent	None	Short-term on-the-job training
Preschool Teachers, Except Special Education	Associate's degree	None	None
Hairdressers, Hairstylists, and Cosmetologists	Postsecondary non-degree award	None	None

Occupation Gaps

The chart below shows the potential average annual gaps over 10 years. In Human Services, Mental Health Counselors and Secondary School Teachers are the top occupations of shortage in the region. This critical talent shortage is due in large part to forecasted employment growth and replacement demand needs due to retirements combined with insufficient talent coming through both secondary education and mental health counseling programs.

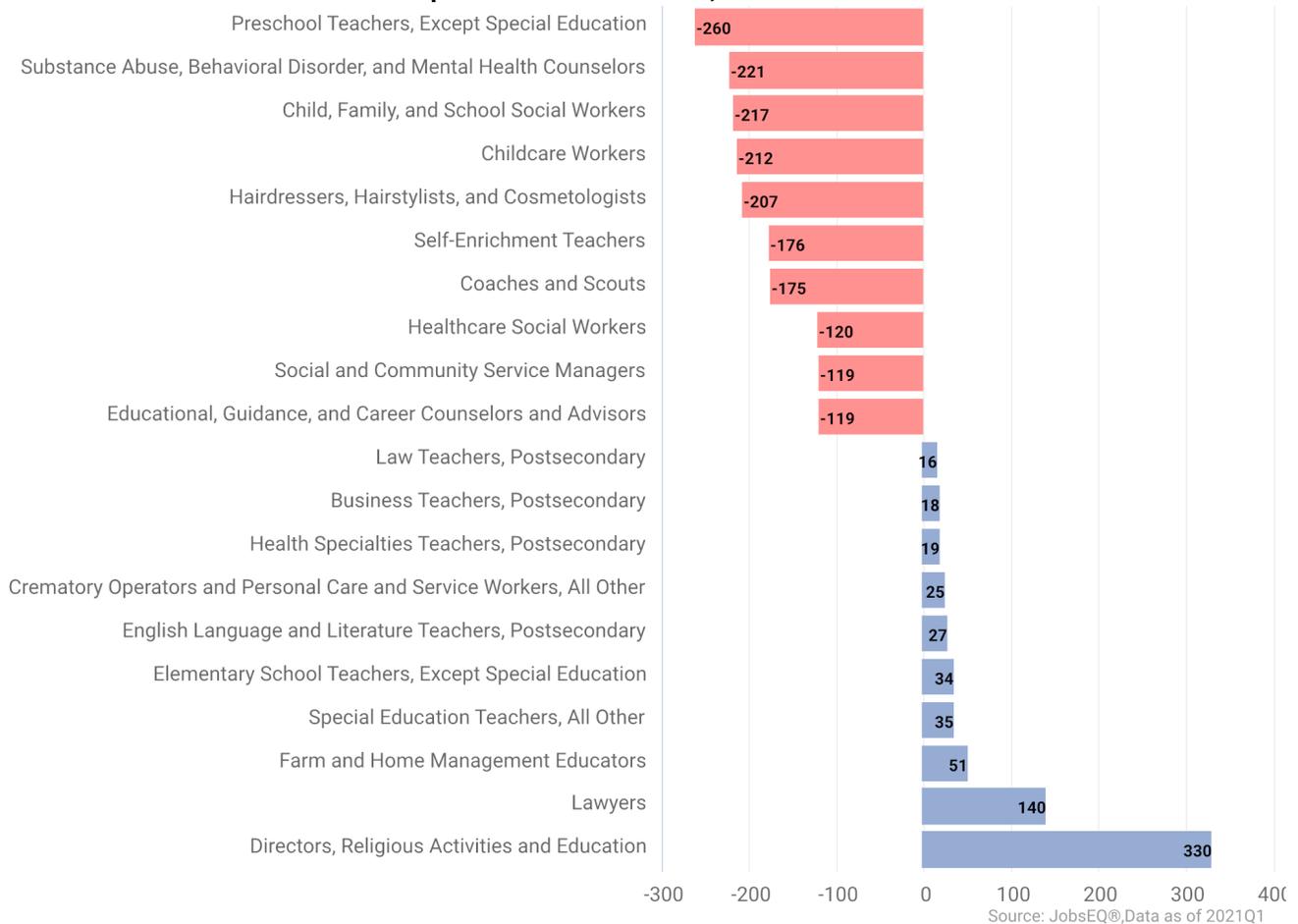
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Human Services, MSP Metro 2021Q1



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 distressing shortages. The MSP Metro faces critical Human Services award gaps, meaning that the region is underproducing local talent in relation to employer demand. MSP Metro colleges and universities are underproducing about 260 graduates annually that are needed to fill Preschool Teacher positions open with employers based in the 7-county MSP Metro. Second, there are about 221 fewer awards conferred for Mental Health Counselors locally than what employers currently need to support demand. Several occupations that typically require a certificate or industry credential also have local award gaps, including hairdressers, childcare workers, and career advisor roles. 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, MSP Metro 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 MSP Metro, September 2021

Name	Candidates	Openings	Gap
AED Essentials	83	138	-55
Basic Life Support (BLS)	118	167	-49
Secret Clearance	27	57	-31
AFAA Personal Fitness Trainer	29	59	-30
Licensed Professional Counselor (LPC)	60	87	-27
Certified Protection Professional (CPP)	4	26	-22
Certified Diabetes Educator (CDE)	7	22	-16
Certified Alcohol and Drug Counselor (ADC)	11	23	-12
Regulatory Affairs Certification - US (RAC)	0	10	-10
Registered Professional Reporter (RPR)	2	11	-9

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 MSP Metro employers hiring Human Services talent that potential candidates have not indicated in their professional networking platforms as a strength.

Top 10 Skill Gaps in Twin Cities 7-County Metro, September 2021

Name	Candidates	Openings	Gap
Medication Administration	1,375	2,712	-1,337
Teaching/Training, School	5,630	5,989	-359
Caregiving	632	923	-291
Automated External Defibrillators (AED)	330	515	-185
Health/Wellness	1,202	1,387	-185
Classroom Management	160	333	-173
Microsoft Office	1,348	1,498	-150
Microsoft Word	740	873	-133
Budgeting	72	189	-117
Medical Terminology	98	207	-109

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, MSP Metro 2021Q1

Target Occupations (all HW, HD, HS)

Middle School Teachers (OG, AG)
 Guidance Counselors and Career Advisors (OG, AG)
 Social and Community Service Managers (OG, AG)
 Instructional Coordinators (OG)
 School Psychologists (OG, AG)
 Education Administrators (OG, AG)

Gateway Occupations

Social and Human Service Assistants(HS, HD)
 Preschool Teachers (HD, OG, AG)
 Self-Enrichment Teachers (HD, OG, AG)
 Child, Family, and School Social Workers (HS, HD, OG, AG)
 Substance Abuse, Behavioral Disorder, and Mental Health Counselors (HS, HD, OG, AG)

Origin Occupations	Likely	Aligned
	Home Health Aides (HD, AG)	Tellers
	Personal Care Aides (HD)	Retail Sales Workers
	Teaching Assistants (HS, HD, AG)	Secretaries
	Childcare Workers(HD, AG)	Cashiers
	Security Guards (HD, AG)	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
Home Health Aides	Tellers
Personal Care Aides	Retail Sales Workers
Teaching Assistants	Secretaries or Executive Assistants
Childcare Workers	Cashiers
Security Guards	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 (\$63,000 in the MSP Metro). 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
Social and Human Service Assistants	Supervisors of Office and Administrative Support Workers
Preschool Teachers	Product Demonstrators
Self-Enrichment Teachers	Human Resources Assistants
Child, Family, and School Social Workers	Financial Advisors
Substance Abuse, Behavioral Disorder, and Mental Health Counselors	
Paralegals and Legal Assistants	

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$63,000 in the MSP Metro). 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

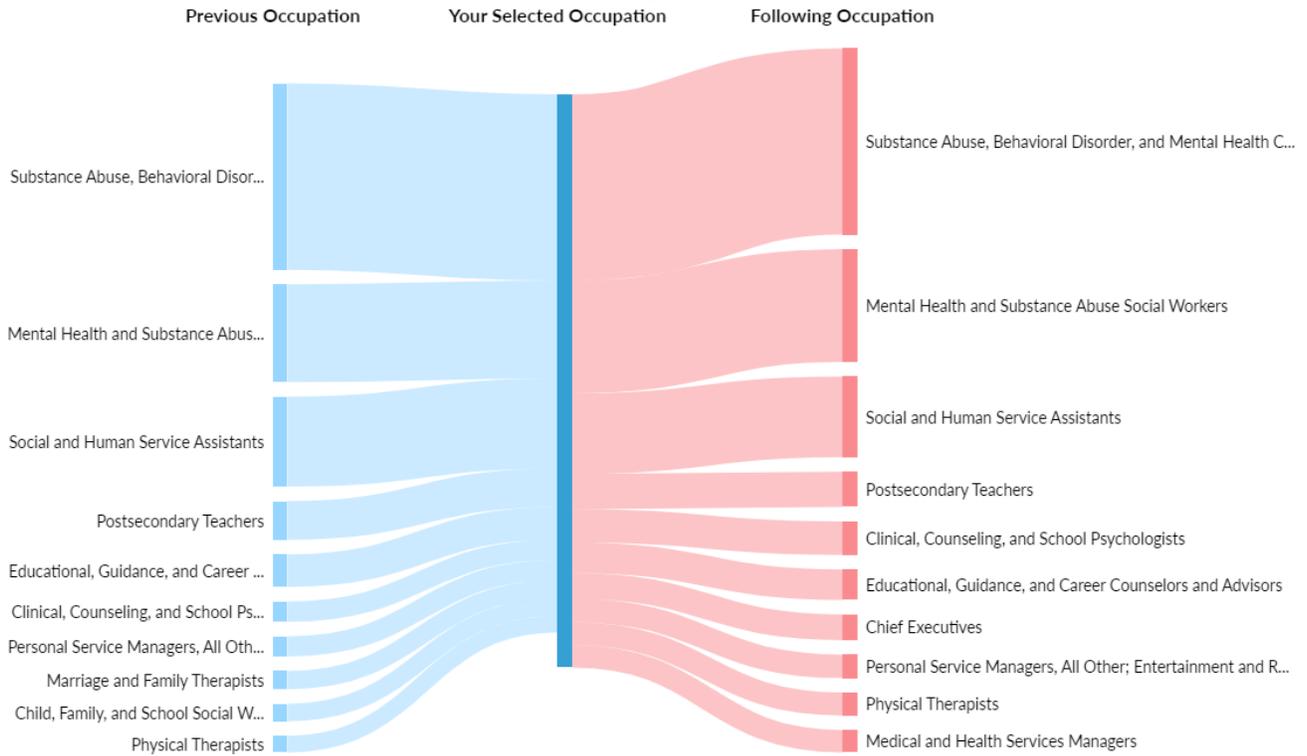
are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

Top Target Occupations in Human Services, MSP 2021Q1

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
25-2022	Middle School Teachers, Except Special and Career/Technical Education	5,000	\$65,500	HW	HS	HD	OG	AG
21-1012	Educational, Guidance, and Career Counselors and Advisors	2,843	\$63,700	HW	HS	HD	OG	AG
11-9151	Social and Community Service Managers	2,730	\$82,700	HW	HS	HD	OG	AG
25-9031	Instructional Coordinators	2,279	\$78,800	HW	HS	HD	OG	
19-3031	Clinical, Counseling, and School Psychologists	2,164	\$86,400	HW	HS	HD	OG	AG
25-1071	Health Specialties Teachers, Postsecondary	2,116	\$130,000	HW	HS	HD	OG	
11-9032	Education Administrators, Kindergarten through Secondary	2,057	\$119,300	HW	HS	HD	OG	AG
21-2021	Directors, Religious Activities and Education	1,681	\$76,300	HW	HS	HD		
21-1023	Mental Health and Substance Abuse Social Workers	1,486	\$66,000	HW	HS	HD	OG	AG
13-2061	Financial Examiners	1,315	\$95,500	HW	HS	HD	OG	

Substance Abuse and Mental Health Counselors, as the number-one occupation of shortage in the Career Field, while also being high-skill, high-demand, and experiencing a local award gap, 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 Mental Health Counseling. The right column shows job transitions from Counseling to other occupations.

Mental Health Counselor Talent Gain and Drain, MSP Metro 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for Mental Health Counselors, MSP Metro 2021

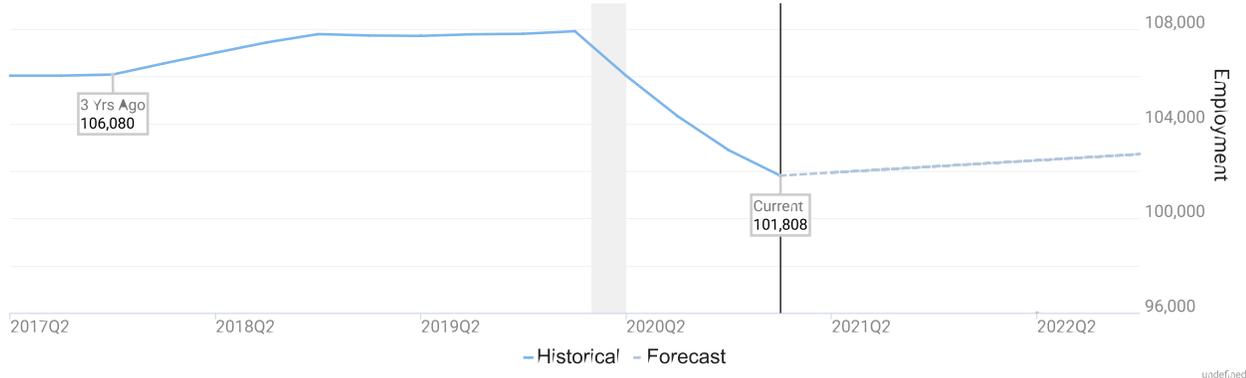


2020 IPEDS Completions Data; Visualizations from Emsi 2021Q3 dataset.

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 grow by 0.4% 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 1.4% annually in this field could be possible. Most of the growth is attributable to the Information Technology careers in this field (see table below).

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



Top Ten Arts, Communications, and Information Systems Occupations by Employment Volume in the MSP Metro, 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	24,552	\$109,500	1.41	1,388	2,266	1.7%
Computer Systems Analysts	13,330	\$102,400	1.95	52	1,033	0.4%
Computer User Support Specialists	9,009	\$59,100	1.21	111	805	0.6%
Network and Computer Systems Administrators	4,777	\$89,500	1.21	-280	349	0.3%
Graphic Designers	4,355	\$57,500	1.47	-397	394	-0.6%
Computer Occupations, All Other	3,897	\$94,400	0.85	-50	326	0.5%
Printing Press Operators	3,747	\$48,000	2.01	-766	320	-1.7%
Computer Network Support Specialists	3,288	\$75,100	1.54	-36	294	0.6%
Computer Programmers	2,621	\$90,400	1.24	-1,199	144	-1.2%
Web Developers and Digital Interface Designers	2,435	\$85,400	1.17	118	202	0.6%
Remaining Component Occupations	29,799	\$75,000	1.14	-3,684	3,009	-0.1%
Arts, Communications, & Information Systems (CTE Field)	101,808	\$85,800	1.29	-4,743	9,141	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).

Most talent in the MSP Metro that is working in Arts, Communications, and Information Systems roles are employed by IT Companies (16.2%) or Management of Companies and Enterprises organizations (10.1%). These two industries account for a substantial amount of talent demand over the next ten years, but overall both current employment and future growth are relatively spread out over many different industries.

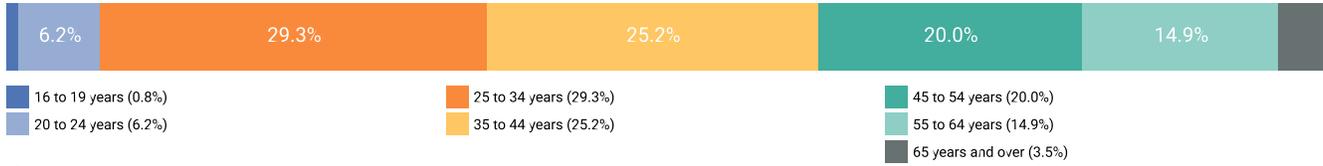
Arts, Communications, and Information Systems Field Employment by Industry, 2021Q1, MSP Metro

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Computer Systems Design and Related Services	16.2%	16,530	13,577	4,068	17,645
Management of Companies and Enterprises	10.1%	10,329	7,988	511	8,499
Printing and Related Support Activities	5.2%	5,254	5,404	-1,017	4,387
Software Publishers	4.1%	4,132	3,371	796	4,167
Independent Artists, Writers, and Performers	4.0%	4,095	4,400	-42	4,358
Insurance Carriers	3.8%	3,853	2,903	246	3,149
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	3.3%	3,335	2,489	171	2,660
Management, Scientific, and Technical Consulting Services	3.2%	3,273	2,806	680	3,486
Depository Credit Intermediation	2.9%	3,000	2,217	71	2,288
Newspaper, Periodical, Book, and Directory Publishers	2.8%	2,848	2,423	-955	1,468
Data Processing, Hosting, and Related Services	2.2%	2,265	1,777	267	2,045
Wired and Wireless Telecommunications Carriers	2.2%	2,195	2,008	-289	1,719
Advertising, Public Relations, and Related Services	2.0%	2,020	1,952	-30	1,923
Professional and Commercial Equipment and Supplies Merchant Wholesalers	2.0%	2,005	1,491	-83	1,408
Employment Services	1.9%	1,953	1,596	35	1,630
Religious Organizations	1.8%	1,878	2,141	107	2,248
Colleges, Universities, and Professional Schools	1.8%	1,804	1,469	-20	1,448
Other Professional, Scientific, and Technical Services	1.4%	1,468	1,355	-64	1,292
Architectural, Engineering, and Related Services	1.3%	1,280	973	7	980
Specialized Design Services	1.3%	1,277	1,220	-153	1,067
All Others	26.5%	27,013	23,532	970	24,502

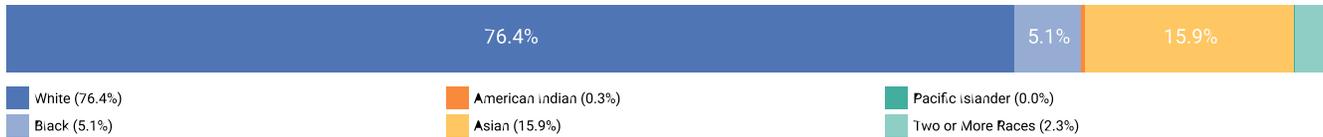
Career Field Demographics

The Arts, Communications, and Information Systems field is predominantly male (72.7%) and white (76.4%). Over half of the Arts, Communications, and Information Systems workforce in the region is between the ages of 25 and 44.

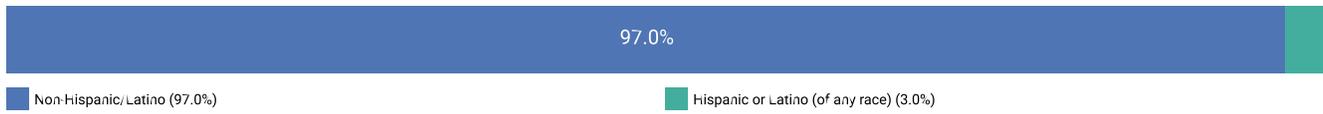
Age



Race



Ethnicity



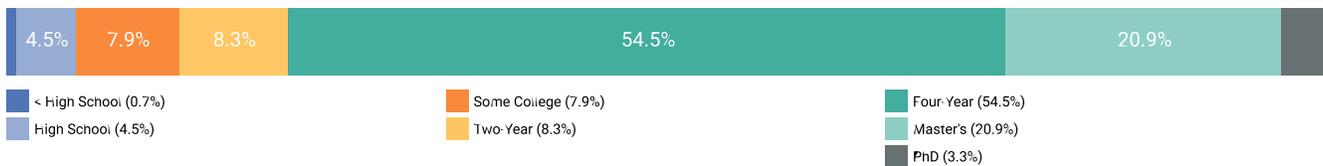
Gender



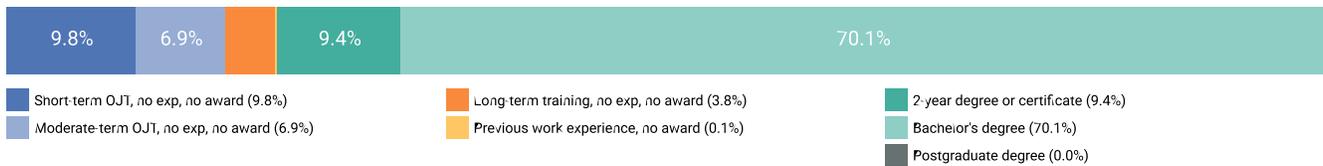
Educational Attainment and Requirements

The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this occupation(s) in aggregate. In general, the MSP Metro Arts, Communications, and Information Systems workforce is overskilled for the typical credentials of entry-level positions. 1 in 5 (20.5%) of positions in this career field do not require any postsecondary certificate or higher credential. In contrast, only 5.2% of the workforce in this field holds a high school diploma or less. 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



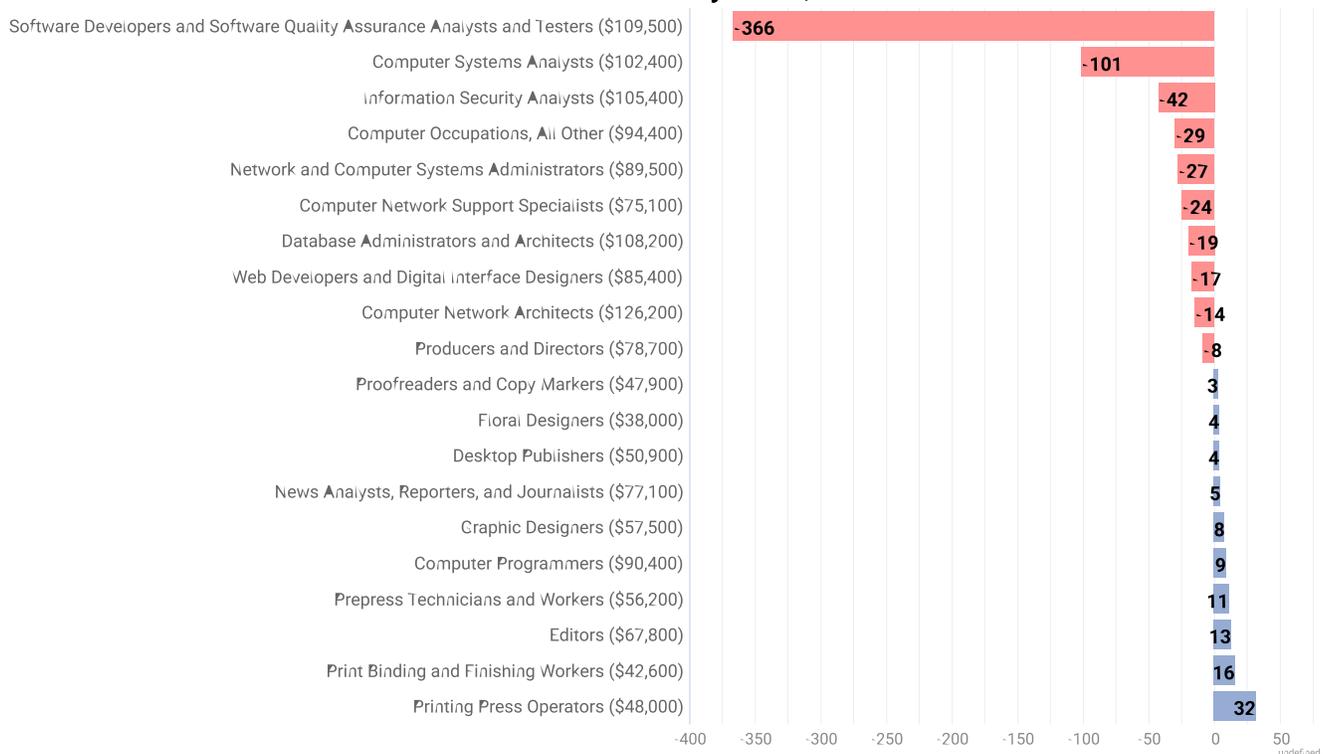
Typical Education Requirements for Top Occupations by Volume, 2021Q1

Occupation	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
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
Graphic Designers	Bachelor'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
Computer Network Support Specialists	Associate's degree	None	None
Computer Programmers	Bachelor's degree	None	None
Web Developers and Digital Interface Designers	Associate's degree	None	None

Occupation Gaps

The chart below shows the potential average annual gaps over 10 years. Software Developers are the top occupation of shortage in the MSP Metro region, falling short at least 366 skilled workers needed annually (averaged over the next ten years) to meet employer demand. This critical talent shortage is primarily due to employment growth which is far outpacing the growth in supply of trained software professionals in this region.

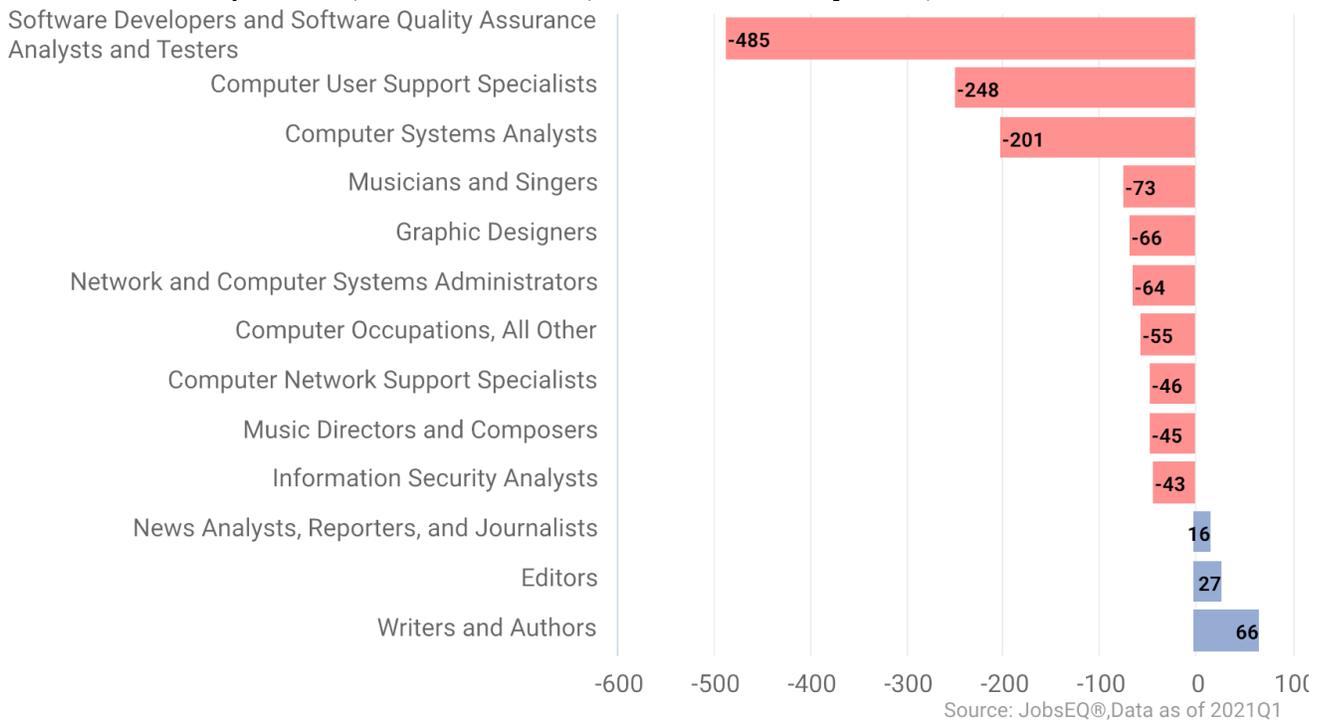
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Arts, Communications, And Information Systems, MSP Metro 2021Q1



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 distressing shortages. The MSP Metro faces critical Arts, Communications, and Information Systems award gaps, meaning that the region is underproducing local talent in relation to employer demand. MSP Metro colleges and universities are underproducing around 485 graduates annually that are needed to fill Software Developer positions open with employers based in the 7-county MSP Metro alone. Second, there are about 248 fewer Computer User Support Specialists certified locally than what employers currently need to support demand, as well as 201 fewer awards conferred for Computer Systems Analysts than needed. Several occupations that typically require other industry-recognized credentials or experience include musicians and singers, graphic designers, and composers. Occupations that show higher awards given than what is currently needed in the local talent market are examples of programs that serve other parts of the state where talent demand is high but relevant programs may not exist.

Award Gaps in Arts, Communications, and Information Systems, MSP Metro 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 MSP Metro, September 2021

Name	Candidates	Openings	Gap
Certified Security Software Lifecycle Professional (CSSLP)	0	7	-7
Microsoft Office Specialist (MOS)	2	6	-5
GAIC Reverse Engineering Malware (GREM)	0	3	-3
Certified Information Systems Auditor (CISA)	16	19	-3
Certified Scrum Product Owner (CSPO)	4	7	-3
Certification in Risk and Information Systems Control (CRISC)	3	6	-3
Basic Life Support (BLS)	1	4	-3
Offensive Security Certified Professional (OSCP)	5	8	-3
Certified Internal Auditor (CIA)	0	3	-3
Check Point Certified Security Administrator (CCSA)	0	3	-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 MSP Metro employers hiring Arts, Communications, and Information Systems talent that potential candidates have not indicated in their professional networking platforms as a strength.

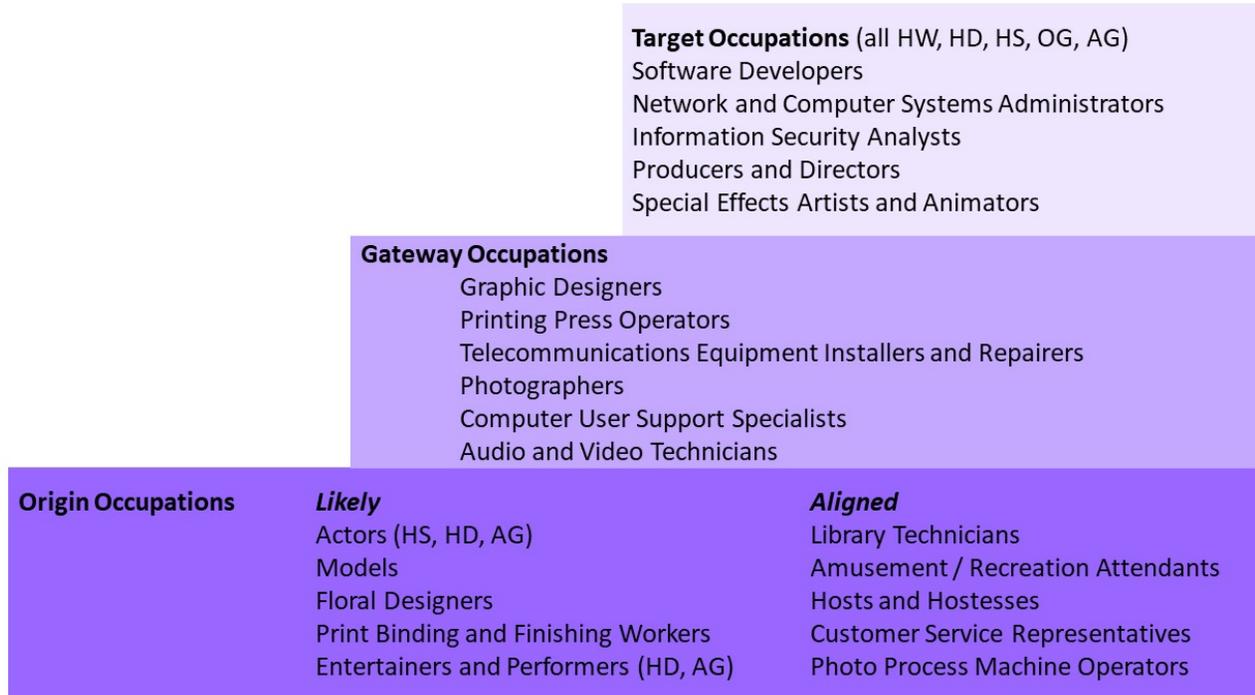
Top 10 Skill Gaps in Twin Cities 7-County Metro, September 2021

Name	Candidates	Openings	Gap
Information Security	242	388	-147
Photography	288	381	-93
Application Development	357	432	-75
Java	1,143	1,201	-58
Microsoft Outlook	170	226	-56
Jenkins	326	375	-49
Microsoft Excel	533	582	-49
Scrum	508	557	-49
Apache Kafka	215	255	-41
SAP	378	415	-37

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, MSP Metro 2021Q1



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
Actors	Library Technicians
Models	Amusement and Recreation Attendants
Floral Designers	Hosts and Hostesses
Print Binding and Finishing Workers	Customer Service Representatives
Entertainers and Performers	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 (\$63,000 in the MSP Metro). 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
Graphic Designers	Supervisors of Office and Administrative Support Workers
Printing Press Operators	Product Demonstrators
Telecommunications Equipment Installers and Repairers	Machinists
Photographers	Painting, Coating, and Decorating Workers
Computer User Support Specialists	
Audio and Video Technicians	

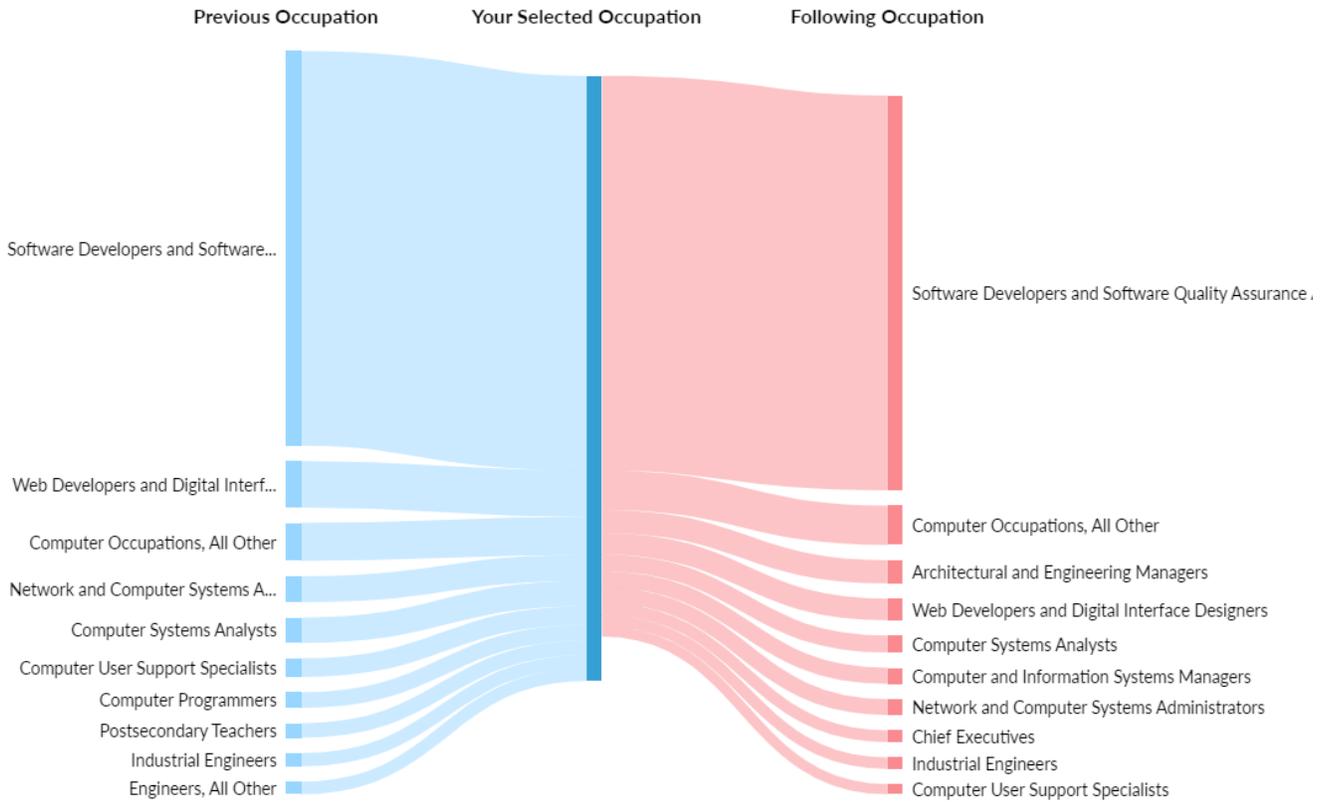
Target Occupations refer to high-wage occupations that pay at or above the region’s average wage (\$63,000 in the MSP Metro). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

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

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
15-1256	Software Developers and Software Quality Assurance Analysts and Testers	24,552	\$109,500	HW	HS	HD	OG	AG
15-1244	Network and Computer Systems Administrators	4,777	\$89,500	HW	HS	HD	OG	AG
15-1212	Information Security Analysts	2,070	\$105,400	HW	HS	HD	OG	AG
27-2012	Producers and Directors	1,234	\$78,700	HW	HS	HD	OG	AG
27-1014	Special Effects Artists and Animators	744	\$68,000	HW	HS	HD	OG	AG
27-1021	Commercial and Industrial Designers	526	\$80,000	HW	HS	HD		AG
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	288	\$71,600	HW	HS	HD	OG	AG
27-1022	Fashion Designers	256	\$75,200	HW	HS	HD		
27-4032	Film and Video Editors	253	\$75,900	HW	HS	HD	OG	AG
13-1011	Agents and Business Managers of Artists, Performers, and Athletes	115	\$64,800	HW	HS	HD		AG

Software Developers is both the number-one occupation of shortage in the Career Field and among all occupations in the MSP Metro. 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 Software Developer. The right column shows job transitions from Software Developer to other occupations.

Software Developer Talent Gain and Drain, MSP Metro 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for Software Developers, MSP Metro 2021

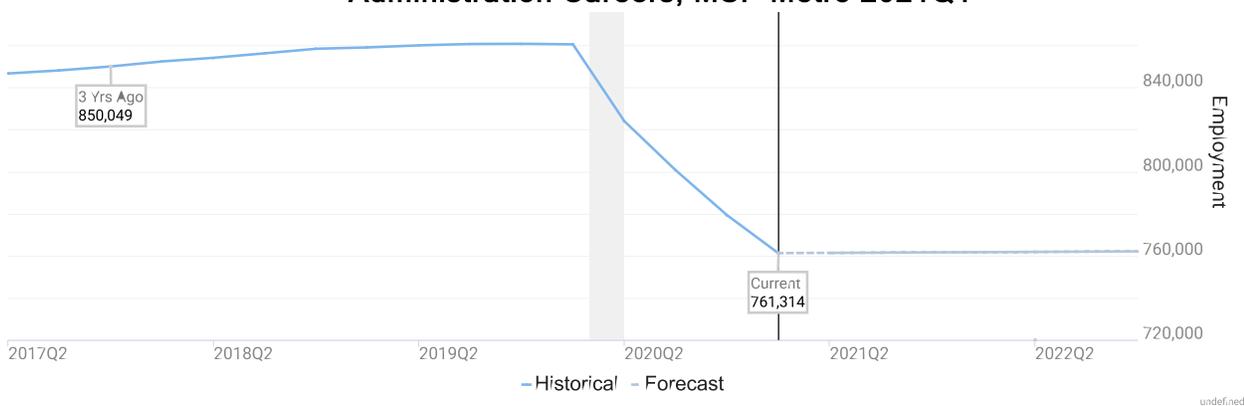


2020 IPEDS Completions Data; Visualizations from Emsi 2021Q3 dataset.

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 remain flat (0.0%). In the most optimistic scenario feasible based on employer demand, and given the existing talent shortage and talent pipelines in place, employment growth of 1.7% annually in this field could be possible. Most of the growth is attributable to the Finance Cluster careers in this field.

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



Top Ten Business, Management, and Administration Systems Occupations by Employment Volume in the MSP Metro, 2021Q1

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Retail Salespersons	41,988	\$33,000	0.97	-8,588	6,086	-0.1%
Customer Service Representatives	39,233	\$44,700	1.20	-430	4,969	-0.4%
Fast Food and Counter Workers	35,874	\$27,200	0.93	-8,101	7,066	0.9%
Cashiers	33,435	\$28,100	0.86	-3,871	5,858	-0.8%
Office Clerks, General	31,754	\$43,000	0.97	-2,919	3,557	-0.6%
General and Operations Managers	27,459	\$131,000	1.01	-338	2,563	0.5%
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	24,730	\$35,700	1.01	-2,872	3,409	0.4%
Stockers and Order Fillers	23,542	\$34,500	0.91	-411	3,150	0.1%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	22,634	\$44,400	1.01	-1,635	2,203	-1.1%
Project Management Specialists and Business Operations Specialists, All Other	21,004	\$80,600	1.26	927	2,181	0.6%
Remaining Component Occupations	459,653	\$71,300	1.09	-62,887	52,669	0.1%
Business, Management, & Administration (CTE Field)	761,314	\$62,000	1.03	-91,121	93,713	0.0%

"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).

Employment in Business, Management, and Administration careers is spread out across a number of different industries. In the MSP Metro, the industries with the greatest share of Business, Management, and Administration talent are Restaurants (10%) and Management of Companies and Enterprises organizations (6.5%). These two industries account for a substantial amount of talent demand over the next ten years (restaurants alone accounts for over 1 in 4 future positions needing to be filled in this field), but overall both current employment and future growth are relatively spread out over many different industries.

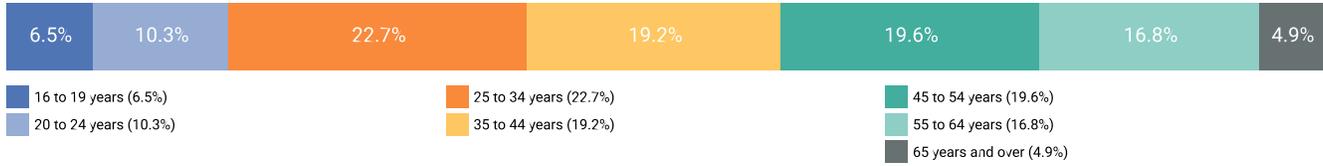
Business, Management, and Administration Field Employment by Industry, 2021Q1, MSP Metro

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	10.0%	76,213	134,092	5,432	139,524
Management of Companies and Enterprises	6.5%	49,409	49,864	962	50,826
Depository Credit Intermediation	4.6%	34,709	34,611	-1,838	32,773
Insurance Carriers	3.2%	24,505	24,690	31	24,721
Grocery Stores	2.9%	21,830	33,366	-606	32,760
Management, Scientific, and Technical Consulting Services	2.7%	20,708	22,045	3,222	25,267
General Merchandise Stores, including Warehouse Clubs and Supercenters	2.3%	17,832	25,967	-672	25,295
Agencies, Brokerages, and Other Insurance Related Activities	2.0%	15,356	15,758	289	16,047
Services to Buildings and Dwellings	2.0%	14,866	19,445	650	20,095
Elementary and Secondary Schools	1.6%	12,331	16,043	43	16,086
Employment Services	1.5%	11,687	13,954	-433	13,521
Department Stores	1.5%	11,426	16,631	-462	16,169
General Medical and Surgical Hospitals	1.4%	10,781	12,980	-365	12,615
Building Material and Supplies Dealers	1.4%	10,692	14,819	-105	14,713
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	1.4%	10,596	10,640	-208	10,432
Computer Systems Design and Related Services	1.4%	10,528	11,427	2,143	13,571
Colleges, Universities, and Professional Schools	1.3%	9,953	11,062	-436	10,625
Activities Related to Real Estate	1.3%	9,750	10,152	-192	9,960
Securities and Commodity Contracts Intermediation and Brokerage	1.2%	9,059	8,431	31	8,462
Professional and Commercial Equipment and Supplies Merchant Wholesalers	1.2%	8,879	9,091	-644	8,447
All Others	48.6%	370,204	439,902	-2,039	437,864

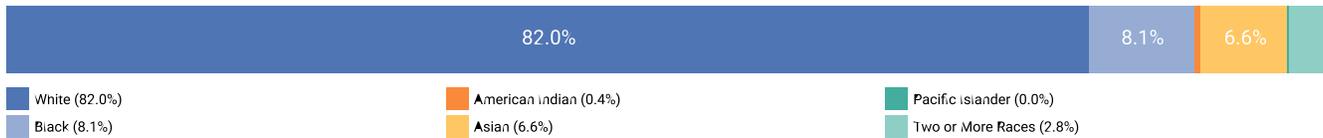
Career Field Demographics

The Business, Management, and Administration field has a slightly higher concentration of female workers (54%) than male, and is 82% White. Nearly 40% of workers in Business, Management, and Administration roles are under 35 years old.

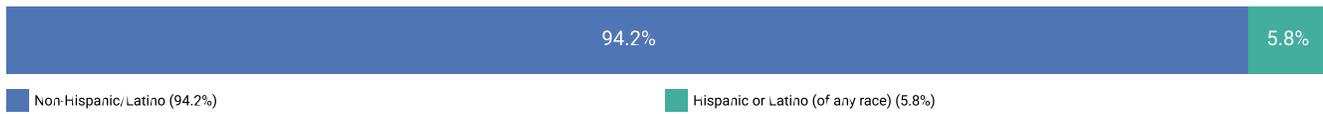
Age



Race



Ethnicity



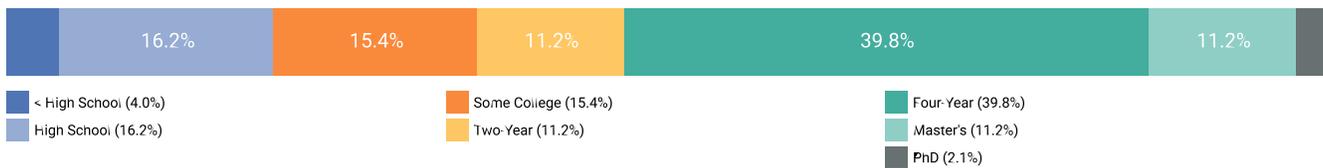
Gender



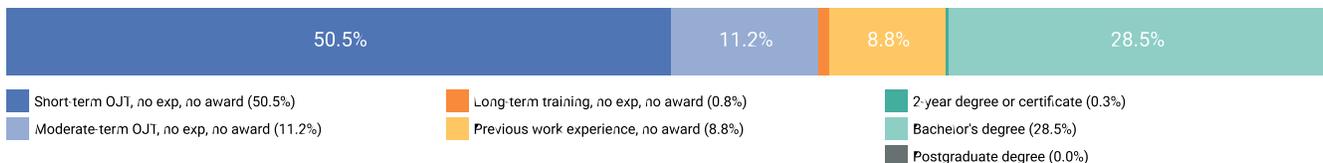
Educational Attainment and Requirements

The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this occupation(s) in aggregate. In general, the MSP Metro Business, Management, and Administration workforce is overskilled for the typical credentials of entry-level positions. Just over half of all positions in this field (50.5%) require no degree, no experience, and only short-term on-the-job training. Another 20.8% require experience or some on-the-job training, but still no degree. In contrast, only 4% of the workforce in this field has no degree at all, and 16.2% hold a high school diploma as their highest credential, suggesting that potentially a large share of talent in low-education roles actually hold postsecondary degrees—in fact, nearly 40% of talent in this field holds a Bachelor’s degree. 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



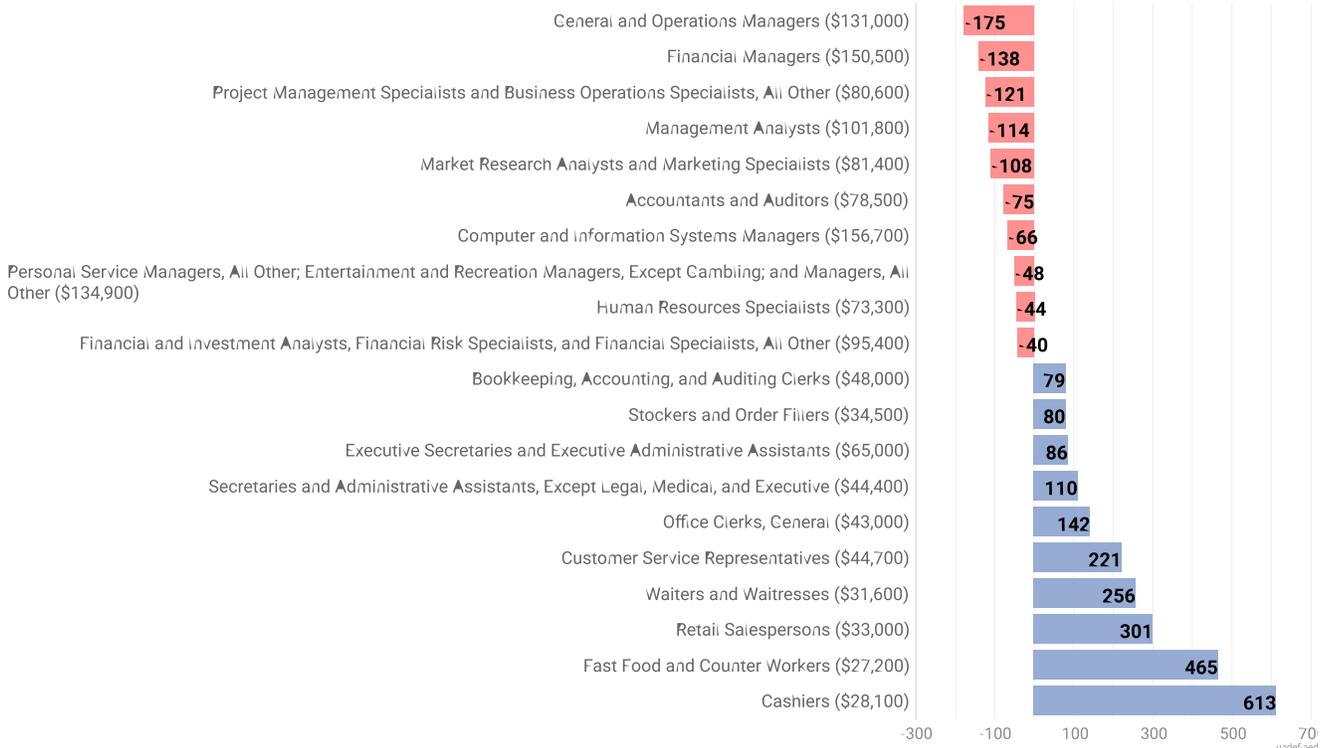
Typical Education Requirements for Top Occupations by Volume, 2021Q1

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

Occupation Gaps

The chart below shows the potential average annual gaps over 10 years. A number of management roles indicate significant shortages in the years ahead, with the General and Operations Manager talent pool likely falling short at least 175 skilled workers needed annually (averaged over the next ten years) to meet employer demand. This critical talent shortage is primarily due to moderate growth and retirements which far outpace demand.

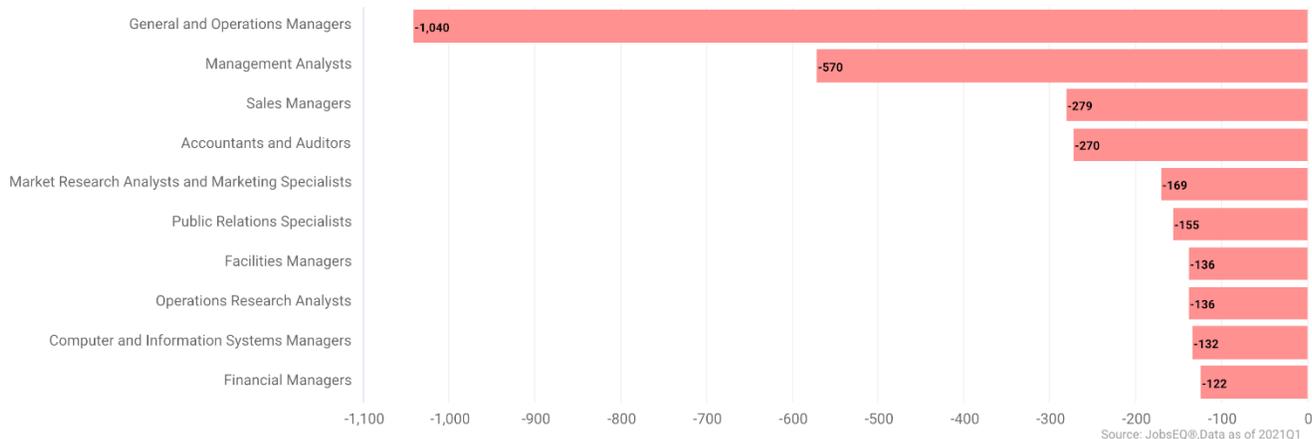
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Business, Management, and Administration, MSP Metro 2021Q1



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 distressing shortages. The MSP Metro currently under-trains talent in Business, Management, and Administration when compared to national benchmarks. MSP Metro colleges and universities are underproducing around 1,040 graduates annually that are needed to fill General and Operations Manager positions open with employers based in the 7-county MSP Metro alone. Second, there are about 570 fewer Management Analysts graduating locally annually than what employers currently need to support demand.

Award Gaps in Business, Management, and Administration, MSP Metro 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 MSP Metro, September 2021

Name	Candidates	Openings	Gap
AED Essentials	32	135	-103
Certified Internal Auditor (CIA)	74	127	-54
Certified Information Systems Auditor (CISA)	49	100	-51
Chartered Property Casualty Underwriter (CPCU)	14	50	-36
Adult CPR	14	44	-29
Certified Public Accountant (CPA)	695	714	-18
First Aid Certification	264	281	-16
Certified Personal Trainer (CPT)	9	23	-14
Certified Facility Manager (CFM)	0	13	-13
Six Sigma Green Belt Certification (SSGB)	13	25	-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 MSP Metro 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 Twin Cities 7-County Metro, September 2021

Name	Candidates	Openings	Gap
Microsoft Office	9,675	11,271	-1,596
Microsoft Excel	10,861	12,337	-1,476
Microsoft PowerPoint	3,276	3,824	-548
Microsoft Outlook	4,818	5,344	-527
Teaching/Training, Job	1,454	1,956	-503
Microsoft Word	3,932	4,413	-481
Finance	2,141	2,599	-457
Culinary Arts	437	829	-392
Word Processing	1,085	1,477	-392
People Skills	973	1,297	-324

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, MSP Metro 2021Q1



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
Retail Salespersons	Library Technicians
Fast Food and Counter Workers	Eligibility Interviewers
Cashiers	Childcare Workers
Janitors and Cleaners	
Stockers and Order Fillers	

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 (\$63,000 in the MSP Metro). 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.

Likely Gateways	Aligned Gateways
Customer Service Reps	Graphic Designers
Office Clerks, General	Product Demonstrators
Secretaries and Administrative Assistants	Medical Secretaries
Bookkeeping, Accounting, and Auditing Clerks	Computer User Support Specialists
Supervisors of Retail Workers	Writers
Shipping, Receiving, and Inventory Clerks	Editors

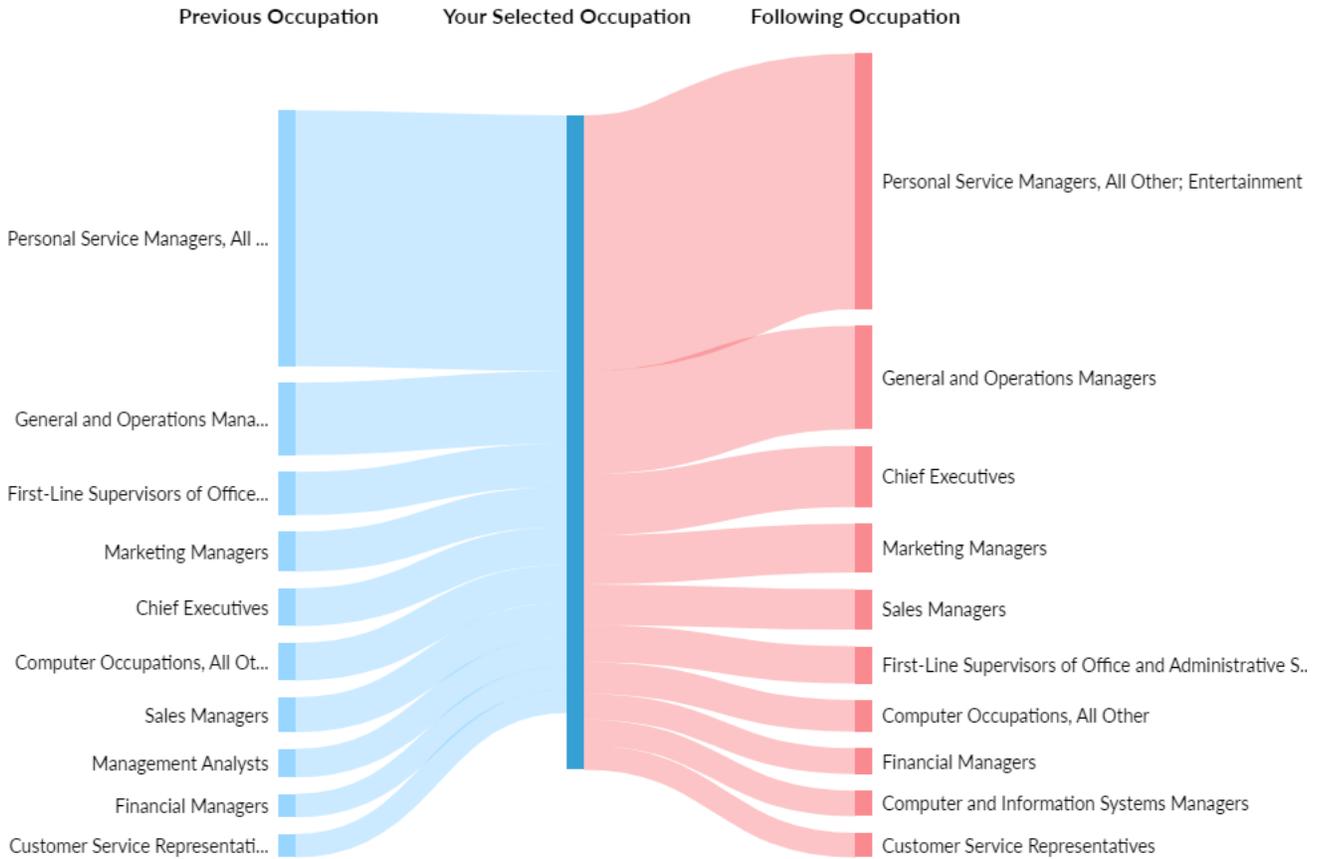
Target Occupations refer to high-wage occupations that pay at or above the region’s average wage (\$63,000 in the MSP Metro). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

Top Target Occupations in Business, Management, and Administration, MSP 2021Q1

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
13-1198	Project Management Specialists and Business Operations Specialists, All Other	21,004	\$80,600	HW	HS	HD	OG	
13-2011	Accountants and Auditors	17,873	\$78,500	HW	HS	HD	OG	AG
13-1111	Management Analysts	13,861	\$101,800	HW	HS	HD	OG	AG
13-1161	Market Research Analysts and Marketing Specialists	12,042	\$81,400	HW	HS	HD	OG	AG
11-3031	Financial Managers	11,042	\$150,500	HW	HS	HD	OG	AG
13-1071	Human Resources Specialists	8,950	\$73,300	HW	HS	HD	OG	
13-2098	Financial and Investment Analysts, Financial Risk Specialists, and Financial Specialists, All Other	7,815	\$95,400	HW	HS	HD	OG	AG
11-2022	Sales Managers	6,727	\$142,900	HW	HS	HD	OG	AG
11-2021	Marketing Managers	5,728	\$154,900	HW	HS	HD	OG	AG
27-3031	Public Relations Specialists	3,909	\$70,600	HW	HS	HD	OG	AG

Project Management roles are growing in value and importance in the MSP Metro. 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 Project Manager. The right column shows job transitions from Project Manager to other occupations. Clearly, there are a number of likely entrypoints, such as General and Operations manager or Sales Manager, but there are also a few aligned occupations that may not be initially associated with Project Management: Personal Service Managers, Customer Service Representations, and Computer Occupations.

Project Manager Talent Gain and Drain, MSP Metro 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for Project Managers, MSP Metro 2021



114 Programs

184 programs can train for this job, while only 114 programs have produced completers in this region.



21,573 Completions (2020)

The completions from all regional institutions for all degree types.



785 Openings (2020)

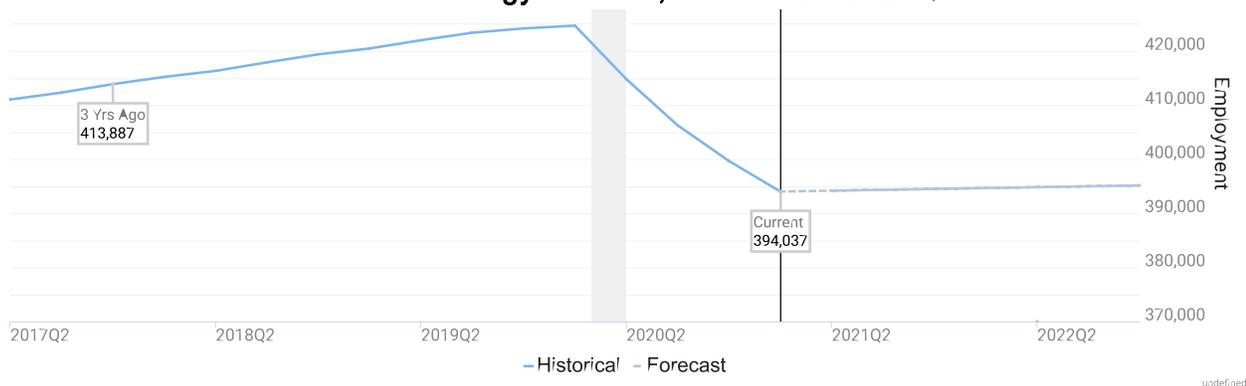
The average number of openings for an occupation in the region is 263.

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 remain relatively flat (0.1%). In the most optimistic scenario feasible based on employer demand, and given the existing talent shortage and talent pipelines in place, employment growth of 2.0% annually in this field could be possible. Most of the growth is attributable to engineering and trades careers in this field.

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



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

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Laborers and Freight, Stock, and Material Movers, Hand	27,986	\$39,300	0.85	-1,591	4,038	0.4%
Heavy and Tractor-Trailer Truck Drivers	17,673	\$54,100	0.79	-341	2,059	0.2%
Maintenance and Repair Workers, General	13,683	\$52,400	0.86	-1,034	1,389	0.3%
Team Assemblers	12,750	\$37,900	1.04	-316	1,180	-1.8%
Light Truck Drivers	11,038	\$45,100	0.92	44	1,398	0.9%
Carpenters	10,785	\$59,300	0.97	-185	1,106	0.0%
Landscaping and Groundskeeping Workers	9,960	\$38,400	0.77	-578	1,421	0.9%
Passenger Vehicle Drivers, Except Bus Drivers, Transit and Intercity	9,355	\$38,800	1.13	-2,114	1,280	1.1%
Construction Laborers	9,235	\$60,800	0.60	145	1,099	0.6%
Automotive Service Technicians and Mechanics	6,851	\$50,200	0.84	-659	627	-0.4%
Remaining Component Occupations	264,723	\$64,100	0.93	-14,557	28,088	0.1%
Engineering, Manufacturing, & Technology (CTE Field)	394,037	\$58,400	0.93	-21,185	43,682	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).

Many different industries employ Engineering, Manufacturing, and Technology talent in the MSP Metro. Locally, the industries with the greatest share of this field's talent are Employment Services (4.6%) and Building Equipment Contractors (4.4%). Most industries employing talent in this field only

touch less than 1% of total talent skilled in this field, suggesting that education and training programs will need to build broad strategies that cross each of these sectors.

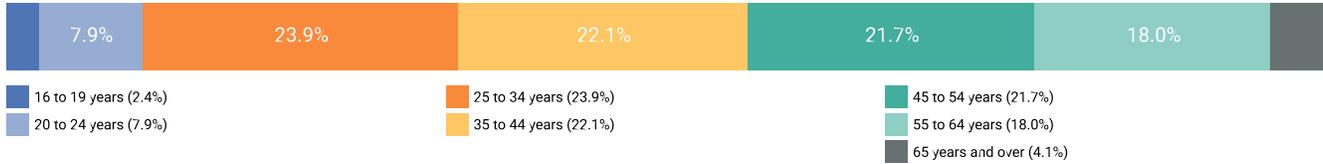
Engineering, Manufacturing, and Technology Field Employment by Industry, 2021Q1, MSP Metro

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Employment Services	4.6%	18,243	22,724	328	23,052
Building Equipment Contractors	4.4%	17,366	19,379	1,007	20,386
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	3.5%	13,793	13,237	25	13,262
Architectural, Engineering, and Related Services	3.2%	12,771	11,017	-160	10,857
Building Finishing Contractors	3.0%	11,951	12,325	54	12,380
Medical Equipment and Supplies Manufacturing	2.8%	10,877	11,712	-139	11,573
Management of Companies and Enterprises	2.4%	9,277	8,939	400	9,339
Couriers and Express Delivery Services	2.3%	8,980	11,480	797	12,277
General Freight Trucking	2.2%	8,832	9,973	-96	9,877
Services to Buildings and Dwellings	2.1%	8,338	10,777	686	11,463
Foundation, Structure, and Building Exterior Contractors	2.0%	7,992	8,617	275	8,892
Scheduled Air Transportation	1.9%	7,498	8,369	461	8,830
Automotive Repair and Maintenance	1.9%	7,359	8,152	201	8,353
Other Specialty Trade Contractors	1.9%	7,293	8,161	289	8,450
Plastics Product Manufacturing	1.8%	7,121	7,584	-677	6,907
Residential Building Construction	1.8%	7,099	7,127	197	7,324
Nonresidential Building Construction	1.8%	6,910	7,036	311	7,347
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1.6%	6,424	6,882	299	7,180
Warehousing and Storage	1.5%	5,945	7,824	891	8,714
Executive, Legislative, and Other General Government Support	1.4%	5,532	6,004	260	6,264
All Others	51.9%	204,438	224,739	1,088	225,827

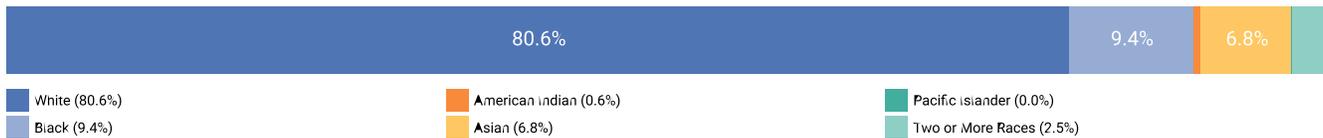
Career Field Demographics

Engineering, Manufacturing, and Technology field is heavily male (81.7%) and White (80.6%). About 46% of workers in this field are between 25 and 44 years old, and over 22% are over 55 years old—signaling potential exacerbation of the talent shortage due to impending retirements.

Age



Race



Ethnicity



Gender



Educational Attainment and Requirements

The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this occupation(s) in aggregate. In general, the MSP Metro Engineering, Manufacturing, and Technology workforce is well-aligned for the typical credentials of entry-level positions. Just over 1 in 4 of all positions in this field (25.5%) require no degree, no experience, and only short-term on-the-job training. About half (49.9%) require experience or some on-the-job training, but still no degree. About 1 in 10 of the workforce in this field has no degree at all, and nearly 1 in 3 (29.9%) hold a high school diploma as their highest credential. In all, 57% 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



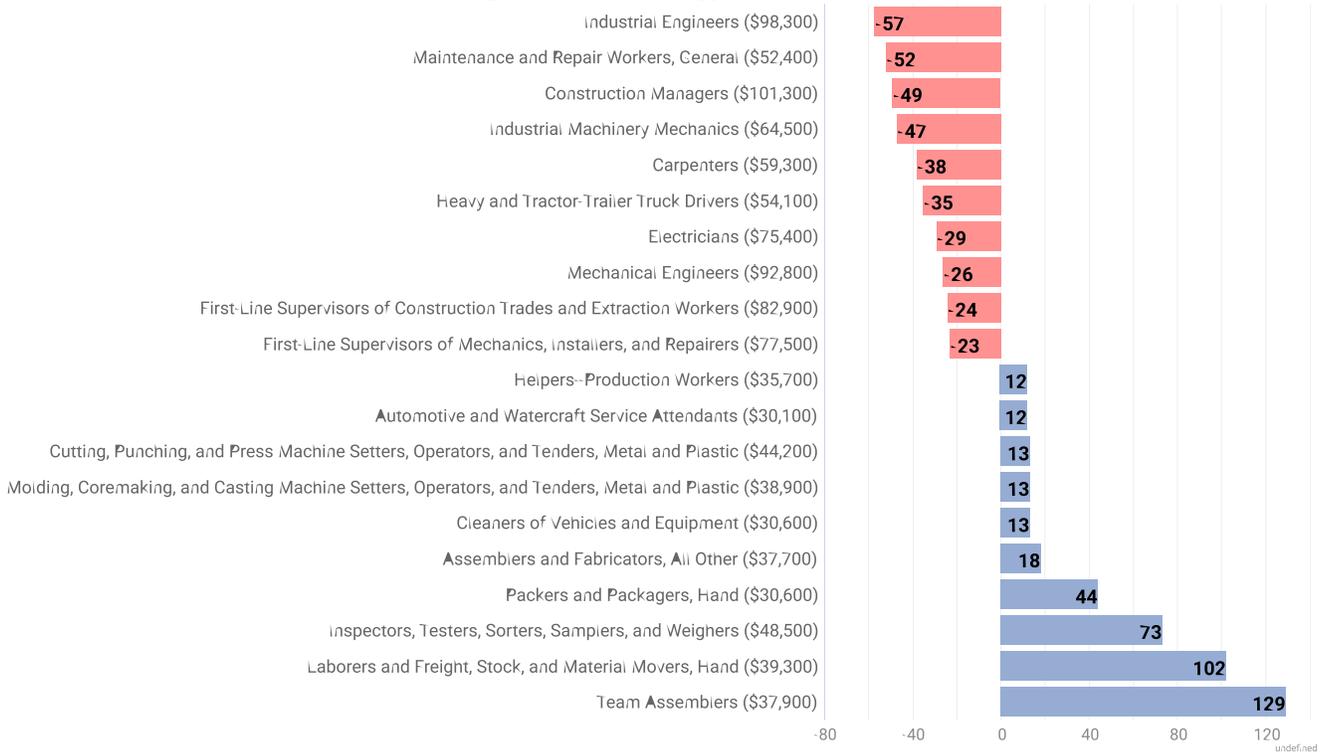
Typical Education Requirements for Top Occupations by Volume, 2021Q1

Occupation	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Laborers and Freight, Stock, and Material Movers, Hand	None	None	Short-term on-the-job training
Heavy and Tractor-Trailer Truck Drivers	Postsecondary non-degree award	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
Light Truck Drivers	High school diploma or equivalent	None	Short-term on-the-job training
Carpenters	High school diploma or equivalent	None	Apprenticeship
Landscaping and Groundskeeping Workers	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
Construction Laborers	None	None	Short-term on-the-job training
Automotive Service Technicians and Mechanics	Postsecondary non-degree award	None	Short-term on-the-job training

Occupation Gaps

The chart below shows the potential average annual gaps over 10 years. A number of crucial engineering, maintenance, construction, and automotive roles indicate shortages in the years ahead, with the Industrial Engineer talent pool likely falling short at least 57 skilled workers needed annually (averaged over the next ten years) to meet employer demand. This critical talent shortage is primarily due to growth in demand and retirements which far outpace the talent pipeline.

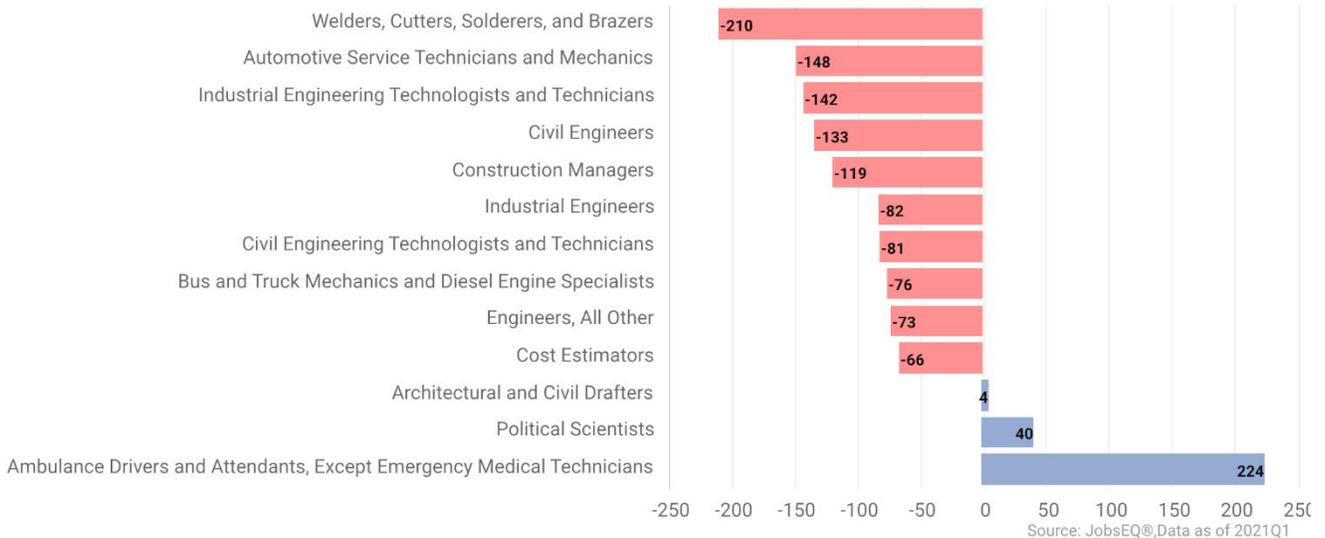
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Engineering, Manufacturing, and Technology, MSP Metro 2021Q1



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 MSP Metro currently under-trains talent in Engineering, Manufacturing, and Technology when compared to national benchmarks. MSP Metro colleges and universities are underproducing around 210 graduates annually that are needed to fill Welder positions open with employers based in the 7-county MSP Metro alone. Second, there are about 148 fewer Auto Service Technicians and Mechanics graduating locally annually than what employers currently need to support demand.

Award Gaps in Engineering, Manufacturing, and Technology, MSP Metro 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 MSP Metro, September 2021

Name	Candidates	Openings	Gap
Class A Commercial Driver's License (CDL-A)	665	832	-167
Commercial Driver's License (CDL)	565	655	-90
40 hour HAZWOPER	1	12	-11
OSHA 10	89	99	-10
Six Sigma Green Belt Certification (SSGB)	10	19	-8
NCIDQ Certification	5	13	-8
AED Essentials	1	7	-6
Commercial Mechanical Inspector (CMI)	0	5	-5
Certified Welder	24	29	-5
Transportation Worker Identification Credential (TWIC)	16	20	-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 MSP Metro 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 Twin Cities 7-County Metro, September 2021

Name	Candidates	Openings	Gap
Hand Trucks	260	589	-329
Assembly	644	889	-245
Mechanical	1,682	1,923	-241
Reading Schematics	368	545	-177
Plumbing	1,414	1,550	-136
Boilers	511	630	-119
Barcode Scanners	93	194	-102
Computer Aided Design Software (CAD Software)	600	698	-98
Lawn Care	351	444	-93
Maintenance	365	455	-90

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, MSP Metro 2021Q1

Target Occupations (all HW, HD, HS)
 Industrial Engineers (OG, AG)
 Architectural and Engineering Managers (OG)
 Logisticians (OG)
 Cost Estimators (OG, AG)
 Aircraft Mechanics and Service Technicians (OG, AG)
 Environmental Scientists and Specialists (OG, AG)

Gateway Occupations

Heavy and Tractor Trailer Drivers (HS, HD, OG, AG)
 Maintenance and Repair Workers, General (HD, OG)
 Carpenters (OG, AG)
 Construction Laborers
 Automotive Service Technicians and Mechanics (HS, AG)
 Supervisors of Production and Operating Workers (HW, HD, OG)

Origin Occupations

Likely

Laborers and Freight, Stock Movers (HD)
 Team Assemblers
 Landscaping and Groundskeeping Workers (HD)
 Light Truck Drivers (HD, AG)
 Passenger Vehicle Drivers (HD, AG)

Aligned

Parking Lot Attendants
 Retail Sales Workers
 Stockers and Order Fillers
 Janitors and Cleaners
 Personal Services Managers

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 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
Landscaping and Groundskeeping Workers	Stockers and Order Fillers
Light Truck Drivers	Janitors and Cleaners
Passenger Vehicle Drivers	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 (\$63,000 in the MSP Metro). 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 Truck Drivers	Parking Lot Attendants
Maintenance and Repair Workers, General	Product Demonstrators
Carpenters	General Managers
Construction Laborers	Computer User Support Specialists
Automotive Service Technicians and Mechanics	Software Developers
Supervisors of Production and Operating Workers	Engineering Managers

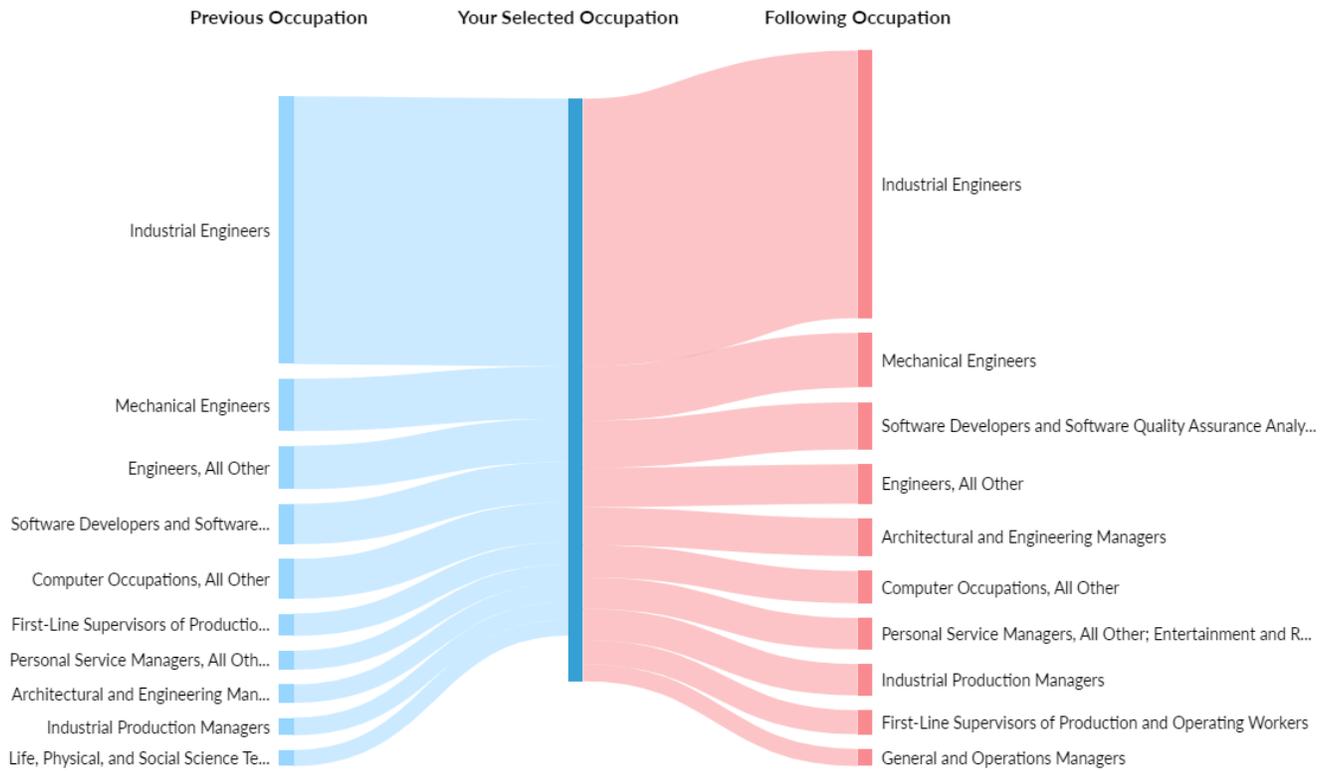
Target Occupations refer to high-wage occupations that pay at or above the region’s average wage (\$63,000 in the MSP Metro). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

Top Target Occupations in Engineering, Manufacturing, and Technology, MSP 2021Q1

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
17-2112	Industrial Engineers	6,190	\$98,300	HW	HS	HD	OG	AG
11-9041	Architectural and Engineering Managers	2,847	\$158,900	HW	HS	HD	OG	
13-1081	Logisticians	2,355	\$80,400	HW	HS	HD	OG	
13-1051	Cost Estimators	2,265	\$73,900	HW	HS	HD	OG	AG
49-3011	Aircraft Mechanics and Service Technicians	1,455	\$82,900	HW	HS	HD	OG	AG
19-2041	Environmental Scientists and Specialists, Including Health	1,199	\$82,000	HW	HS	HD	OG	AG
15-2098	Data Scientists and Mathematical Science Occupations, All Other	865	\$98,800	HW	HS	HD	OG	
15-2041	Statisticians	598	\$90,200	HW	HS	HD	OG	
51-9162	Computer Numerically Controlled Tool Programmers	566	\$69,200	HW	HS	HD	OG	

Businesses in the MSP Metro will need more Industrial Engineers in the years ahead, and there are not sufficient graduates coming out of local educational programs to meet that demand. 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, MSP Metro 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for Industrial Engineers, MSP Metro 2021

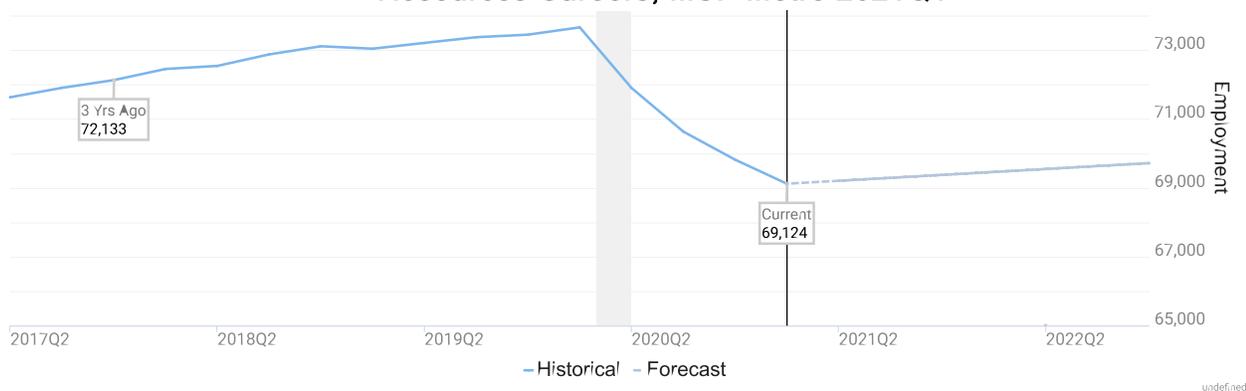


2020 IPEDS Completions Data; Visualizations from Emsi 2021Q3 dataset.

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 increase by about half of a percent (0.5%). In the most optimistic scenario feasible based on employer demand, and given the existing talent shortage and talent pipelines in place, employment growth of 2.0% annually in this field could be possible. Most of the growth is attributable to Animal Systems, Plant Systems, and Food Products and Processing Systems.

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



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

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Landscaping and Groundskeeping Workers	9,960	\$38,400	0.77	-578	1,421	0.9%
Plumbers, Pipefitters, and Steamfitters	5,347	\$83,300	1.01	149	621	0.4%
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	4,414	\$62,400	0.79	-169	501	0.5%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2,795	\$68,200	0.65	229	282	0.3%
Animal Caretakers	2,511	\$32,300	0.82	-409	492	2.1%
Telecommunications Equipment Installers and Repairers, Except Line Installers	1,846	\$52,600	0.82	-353	195	-0.3%
Bakers	1,822	\$36,600	0.88	-173	253	0.1%
Farmers, Ranchers, and Other Agricultural Managers	1,738	\$84,200	0.18	-103	169	-0.1%
Veterinary Technologists and Technicians	1,632	\$39,100	1.23	173	162	1.4%
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1,617	\$35,700	0.24	-19	277	0.5%
Remaining Component Occupations	35,439	\$67,800	0.84	-2,073	3,980	0.3%
AFNR - Agriculture, Food, and Natural Resources (CTE Field - Updated 2021)	69,124	\$60,900	0.69	-3,332	8,358	0.5%

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

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

Many different industries employ Agriculture, Food, and Natural Resources talent in the MSP Metro. Locally, the industries with the greatest share of this field's talent are Services to Buildings and Dwellings (11.7%) and Building Equipment Contractors (10.1%). Most industries employing talent in this field only touch less than 3% of total talent skilled in this field, and span from grocery stores to power generation and recreation services.

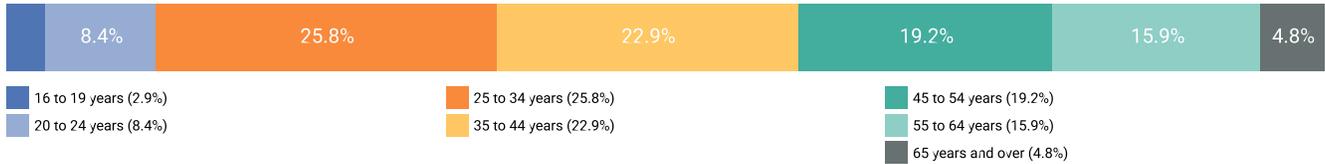
Agriculture, Food, and Natural Resources Field Employment by Industry, 2021Q1, MSP Metro

Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Services to Buildings and Dwellings	11.7%	8,118	10,722	705	11,427
Building Equipment Contractors	10.1%	6,980	7,608	350	7,958
Other Professional, Scientific, and Technical Services	5.1%	3,553	3,603	557	4,160
Architectural, Engineering, and Related Services	3.9%	2,721	2,588	-36	2,552
Colleges, Universities, and Professional Schools	3.3%	2,272	2,282	31	2,313
Executive, Legislative, and Other General Government Support	3.1%	2,159	2,388	87	2,475
Grocery Stores	3.1%	2,122	2,681	23	2,705
Other Personal Services	2.7%	1,847	3,241	565	3,806
Management, Scientific, and Technical Consulting Services	2.4%	1,644	1,829	319	2,148
Greenhouse, Nursery, and Floriculture Production	2.3%	1,595	2,420	143	2,563
Management of Companies and Enterprises	2.2%	1,550	1,579	67	1,646
Wired and Wireless Telecommunications Carriers	2.0%	1,381	1,456	-126	1,330
Electric Power Generation, Transmission and Distribution	2.0%	1,380	1,137	-250	887
Other Amusement and Recreation Industries	1.8%	1,264	1,706	179	1,885
Bakeries and Tortilla Manufacturing	1.8%	1,253	1,744	-11	1,733
Employment Services	1.7%	1,155	1,406	14	1,420
Scientific Research and Development Services	1.7%	1,152	1,133	28	1,161
Justice, Public Order, and Safety Activities	1.5%	1,050	1,140	12	1,153
Waste Collection	1.2%	829	1,214	140	1,354
Crop Production (Proprietors)	1.2%	800	820	-31	790
All Others	35.2%	24,300	28,138	724	28,863

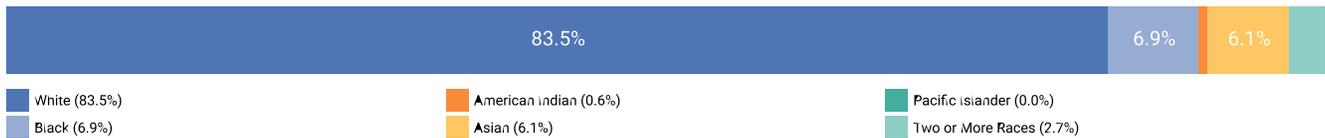
Career Field Demographics

The Agriculture, Food, and Natural Resources field is predominantly male (73.8%) and White (83%.5), but with variation by career pathway. The largest age cohort is between the ages of 25 and 34 (25.8%), but key career pathways in Animal Systems and Food Products and Processing Systems in particular have a rapidly aging workforce with limited new talent entering.

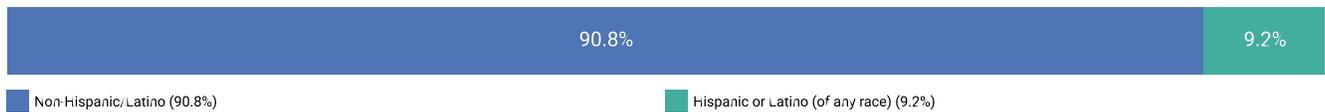
Age



Race



Ethnicity



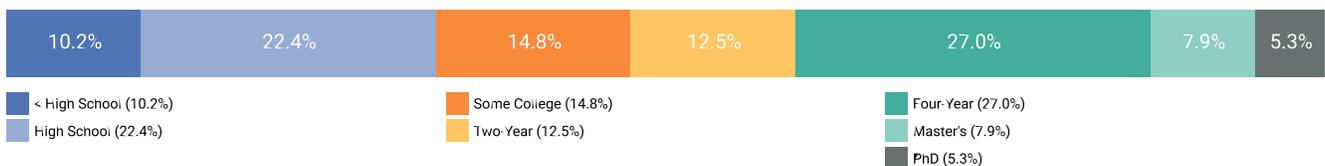
Gender



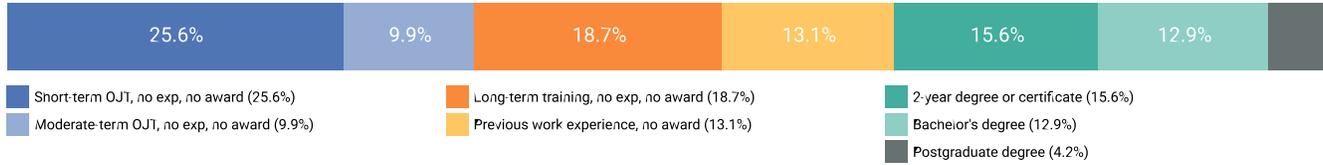
Educational Attainment and Requirements

The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this occupation(s) in aggregate. In general, the MSP Metro Agriculture, Food, and Natural Resources workforce is well-aligned for the typical credentials of entry-level positions. Just over 1 in 4 of all positions in this field (25.6%) require no degree, no experience, and only short-term on-the-job training. About 2 in 5 (41.7%) require experience or some on-the-job training, but still no degree. About 1 in 10 of the workforce in this field has no degree at all, and about 1 in 5 (22.4%) hold a high school diploma as their highest credential. In all, 47.4% 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



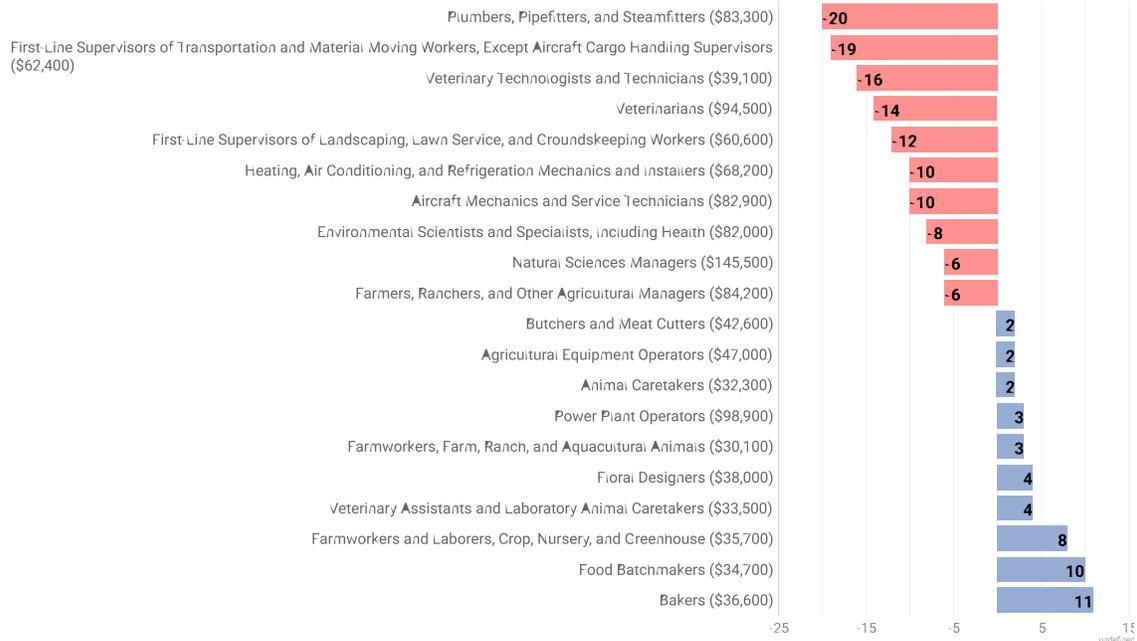
Typical Education Requirements for Top Occupations by Volume, 2021Q1

Occupation	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Landscaping and Groundskeeping Workers	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
Animal Caretakers	High school diploma or equivalent	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
Bakers	None	None	Long-term on-the-job training
Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	5 years or more	None
Veterinary Technologists and Technicians	Associate's degree	None	None
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	None	None	Short-term on-the-job training

Occupation Gaps

The chart below shows the potential average annual gaps over 10 years. A number of crucial trades, veterinary, environmental services, and natural sciences roles indicate shortages in the years ahead, with the Plumber, Transportation Supervisor, and Vet Tech talent pools likely falling behind the most. Retirements and growing demand unmet by the local talent supply chain are both contributing factors.

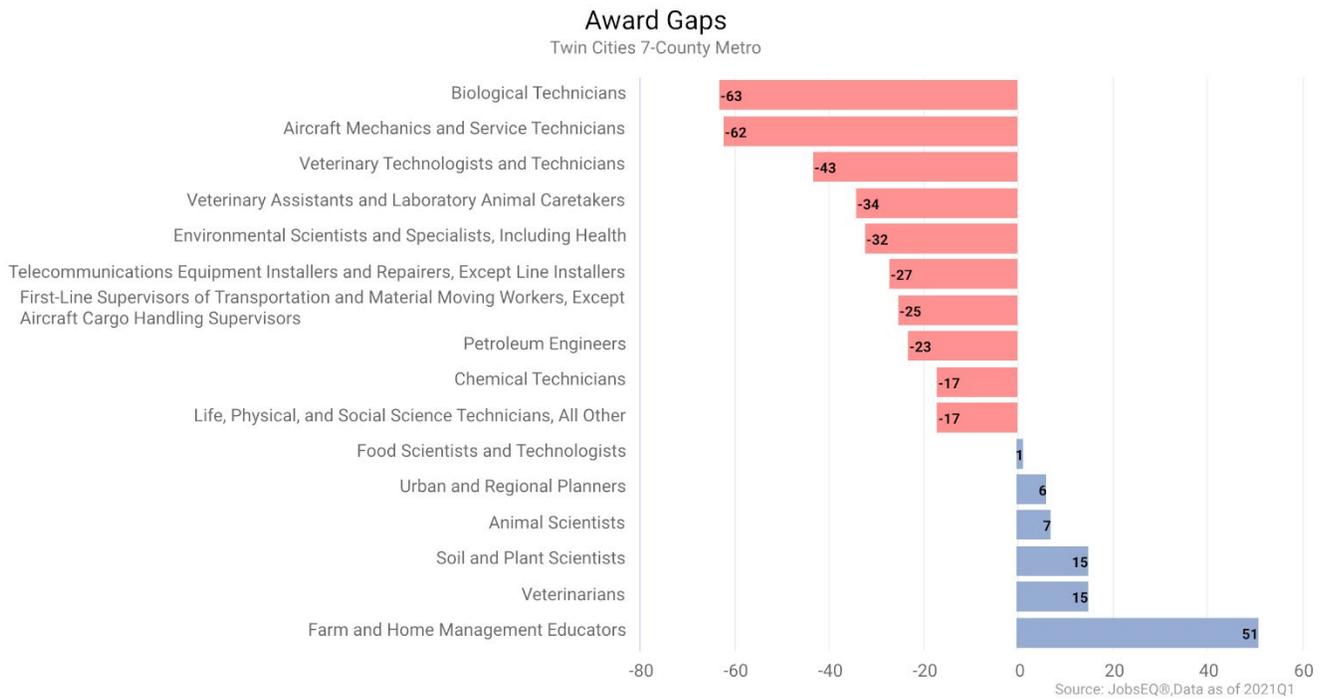
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Agriculture, Food, and Natural Resources, MSP Metro 2021Q1



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 MSP Metro currently under-trains talent in Agriculture, Food, and Natural Resources when compared to national benchmarks. MSP Metro colleges and universities are underproducing around 83 graduates annually that are needed to fill Biological Technician positions open with employers based in the 7-county MSP Metro alone. A number of veterinary support roles are also lagging in local graduate awards; note that the “surplus” in Veterinarian degrees is somewhat misleading, since MSP Metro Veterinary programs serve the entire state’s veterinary workforce.

Award Gaps in Agriculture, Food, and Natural Resources, MSP Metro 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 MSP Metro, September 2021

Name	Candidates	Openings	Gap
Registered Veterinary Technician (RVT)	8	29	-21
Six Sigma Green Belt Certification (SSGB)	0	7	-7
Laboratory Animal Technician (LAT)	5	12	-7
Certified Professional Dog Trainer (CPDT)	0	6	-6
40 hour HAZWOPER	2	8	-5
Class B Commercial Driver's License (CDL-B)	25	30	-4

Top 10 Certification Gaps in the MSP Metro, September 2021

Name	Candidates	Openings	Gap
HAZMAT	10	14	-4
Certified Clinical Research Coordinator (CCRC)	2	6	-4
Emergency Medical Technician - Basic (EMT-B)	0	3	-3
OSHA 10	10	12	-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 MSP Metro 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 Twin Cities 7-County Metro, September 2021

Name	Candidates	Openings	Gap
Plumbing	537	621	-84
Mechanical	197	269	-72
Microsoft Office	455	520	-65
Lawn Care	317	365	-48
Hand Tools	101	131	-30
Microsoft PowerPoint	117	147	-30
Food Safety	29	59	-30
Routers	30	59	-29
Personal Computers (PC)	73	102	-29
Microsoft Outlook	195	223	-28

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, MSP Metro 2021Q1

Target Occupations (all HW, HD, HS)
 Aircraft Mechanics and Service Technicians (OG, AG)
 Environmental Scientists and Specialists (OG, AG)
 Veterinarians (OG)
 Environmental Engineers (OG, AG)
 Surveyors (OG, AG)
 Urban and Regional Planners (OG)

Gateway Occupations

Telecommunications Equipment Installers and Repairers (HS, AG)
 Farmers, Ranchers, and Other Agricultural Managers (HW, HD, OG)
 Supervisors of Groundskeeping Workers (HD, OG, AG)
 Butchers and Meat Cutters
 Refuse and Recyclable Material Collectors- (AG)
 Waste/water Treatment Plant and System Operators (HW, HD, AG)

Origin Occupations

Likely

Landscaping and Groundskeeping Workers (HD)
 Animal Caretakers (HD, AG)
 Bakers (HD, AG)
 Veterinary Techs HS, HD, OG, AG)
 Farmworkers and Laborers (AG)

Aligned

Compliance Officers
 Laborers and 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
Animal Caretakers	Laborers and Freight, Stock Movers
Bakers	Stocker and Order Fillers
Veterinary Technologists and Technicians	Cooks
Farmworkers and Laborers	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 (\$63,000 in the MSP Metro). 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
Telecommunications Equipment Installers and Repairers	Financial Managers
Farmers, Ranchers, and Other Agricultural Managers	Office Clerks
Supervisors of Groundskeeping Workers	General Managers
Butchers and Meat Cutters	Computer User Support Specialists
Refuse and Recyclable Material Collectors	Machinists
Water and Wastewater Treatment Plant and System Operators	Engineering Managers

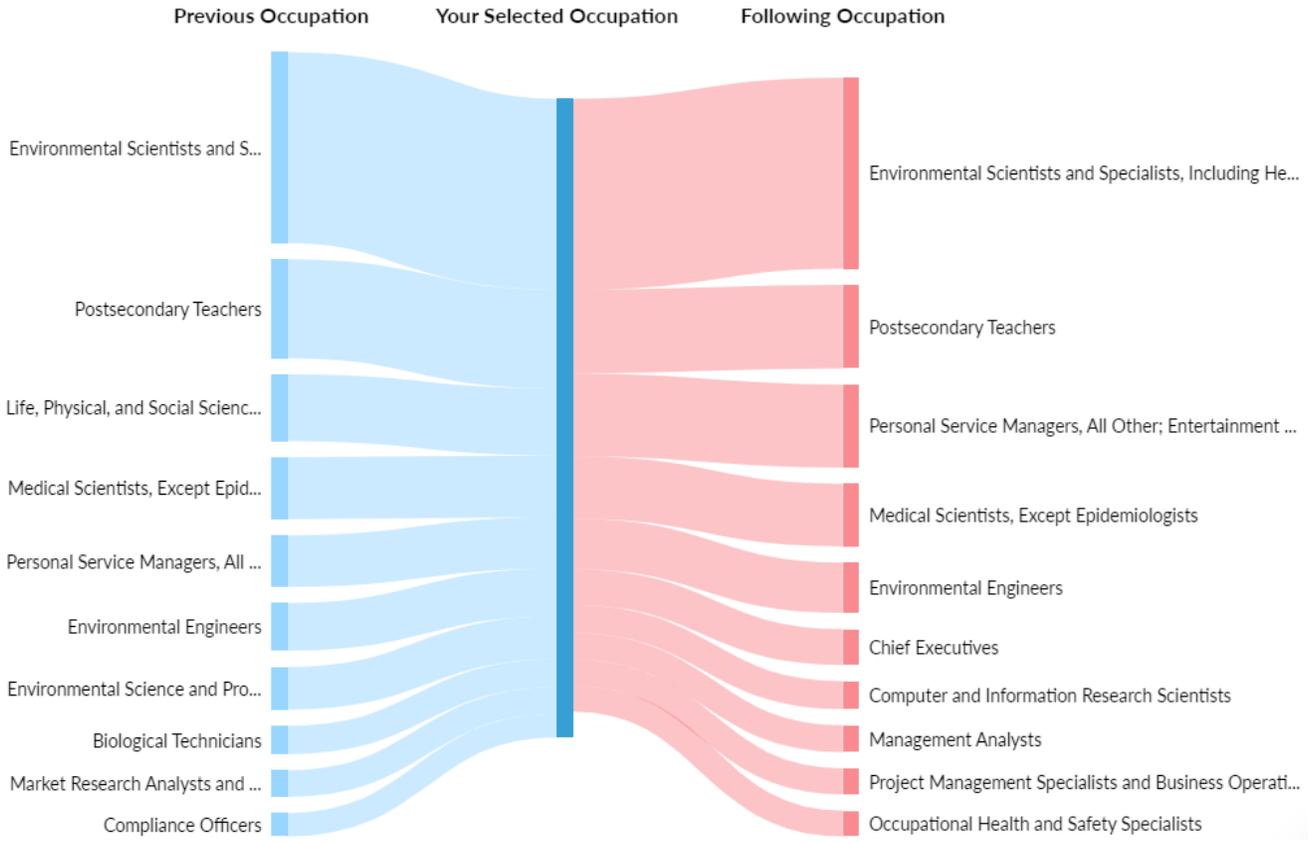
Target Occupations refer to high-wage occupations that pay at or above the region’s average wage (\$63,000 in the MSP Metro). These positions are also high-skill—meaning that they require an industry credential, certification, or higher education—and high-demand. Many of these Target Occupations are also facing Opportunity Gaps and Award Gaps locally, labeled below as “OG” and “AG” respectively.

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

SOC	Occupation	2021Q1 Empl	Mean Ann Wages ²	High-Wage	High-Skill	High-Demand	OG	AG
49-3011	Aircraft Mechanics and Service Technicians	1,455	\$82,900	HW	HS	HD	OG	AG
19-2041	Environmental Scientists and Specialists, Including Health	1,199	\$82,000	HW	HS	HD	OG	AG
29-1131	Veterinarians	999	\$94,500	HW	HS	HD	OG	
17-2081	Environmental Engineers	540	\$114,600	HW	HS	HD	OG	AG
17-1022	Surveyors	526	\$74,400	HW	HS	HD	OG	AG
19-3051	Urban and Regional Planners	400	\$88,400	HW	HS	HD	OG	
17-1012	Landscape Architects	346	\$76,300	HW	HS	HD	OG	
19-4042	Environmental Science and Protection Technicians, Including Health	341	\$72,800	HW	HS	HD	OG	AG
17-1021	Cartographers and Photogrammetrists	243	\$73,100	HW	HS	HD	OG	
17-2041	Chemical Engineers	224	\$111,900	HW	HS	HD	OG	
25-1041	Agricultural Sciences Teachers, Postsecondary	210	\$107,600	HW	HS	HD	OG	
13-1021	Buyers and Purchasing Agents, Farm Products	209	\$75,200	HW	HS	HD		AG
19-2043	Hydrologists	208	\$82,300	HW	HS	HD	OG	AG
19-2042	Geoscientists, Except Hydrologists and Geographers	193	\$83,300	HW	HS	HD	OG	AG
45-2011	Agricultural Inspectors	141	\$67,400	HW	HS	HD		AG
19-2021	Atmospheric and Space Scientists	136	\$88,300	HW	HS	HD	OG	AG
53-5021	Captains, Mates, and Pilots of Water Vessels	96	\$98,300	HW	HS	HD		AG
49-9081	Wind Turbine Service Technicians	93	\$67,300	HW	HS	HD	OG	AG
19-4051	Nuclear Technicians	52	\$90,600	HW	HS	HD		AG

The MSP Metro will need more Environmental Scientists in the years ahead, and there are not sufficient graduates coming out of local educational programs to meet that demand. 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 Environmental Scientists. The right column shows job transitions from Environmental Scientist to other occupations—including both likely transitions and aligned transitions.

Environmental Scientist Talent Gain and Drain, MSP Metro 2021Q3 Candidate Profile Analysis



Candidate profile analysis from Emsi 2021Q3 national dataset.

Graduate Pipeline for Environmental Scientists, MSP Metro 2021



16 Programs

26 programs can train for this job, while only 16 programs have produced completers in this region.



1,581 Completions (2020)

The completions from all regional institutions for all degree types.



130 Openings (2020)

The average number of openings for an occupation in the region is 263.

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 Field areas 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 the MSP Metro. 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.

A significant share of the certificate shortages in the region are in the Information Technology, Marketing, and Health Science clusters, and applicable to positions that require an Associate's degree or less. Entry-level opportunities are less numerous in the Arts, Communications and Information Systems or Business, Management, and Administration fields; it is likely that the MSP Metro will have a surplus of talent in most career pathways in the Arts, Audio/Video Technology, and Communications and Hospitality and Tourism clusters specifically. 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 MSP Metro 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.