

MSP Metro
Minnesota

CAREER & TECHNICAL EDUCATION

Workforce Trends & Careers of Tomorrow

RealTime Talent

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December 7, 2022



RealTime Talent

Using data to build the
world's best workforce

Workforce Trends & Careers of Tomorrow

Overview

Two and a half years after COVID-19 first appeared, the U.S. economy has shifted and strained under the weight of disrupted supply chains and an ever-tightening labor pool. The continuing effects of the pandemic, domestic and international unrest, and shifting economic models have been felt in disparate ways across the nation. Between July and August 2022, unemployment rose in 32 states, fell in 7 states, and remained unchanged in 12. Minnesota's unemployment rate rose by 0.1 percentage point, but remaining the lowest unemployment rate nationwide at just 1.9% compared to the national average of 3.7%.¹ Since August, the market has remained tight with unemployment dropping nationally to an all-time nonwartime low of 3.5% unemployment in September. As of October 2022, US unemployment returned to 3.7% with 261,000 net new jobs added to the economy and about two open jobs for every one jobseeker. Despite the Federal Reserve raising interest rates, significantly high corporate profits throughout 2022 mean that companies are likely to continue to invest in their businesses, hold onto their employees, and seek to hire more workers in this tight market.

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.² 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

¹ Bureau of Labor Statistics (BLS), Dataset released September 16, 2022.

² All labor market data in this report comes from Chmura Economics JobsEQ Dataset 2022Q2 unless otherwise noted. www.jobseq.com

About This Report

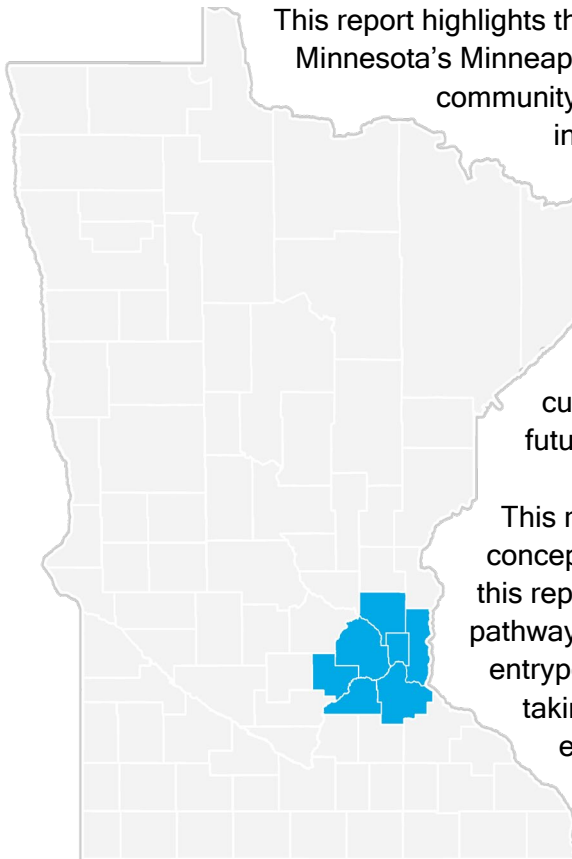
This report was developed by RealTime Talent for the Career and Technical Education Consortia of Minnesota with funding provided by Minnesota State. The contents of this publication were made possible through the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) Federal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

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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).³ Starting from the community demographics, opportunities, and the critical occupations and industries underpinning the regional economy, this macroeconomic overview is intended to support educators and administrators who aim to increase alignment between educational programming and local businesses' most pressing needs. Identifying the skills, certifications, and qualifications for positions today will help the education community anticipate community needs and ensure that curriculum 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)

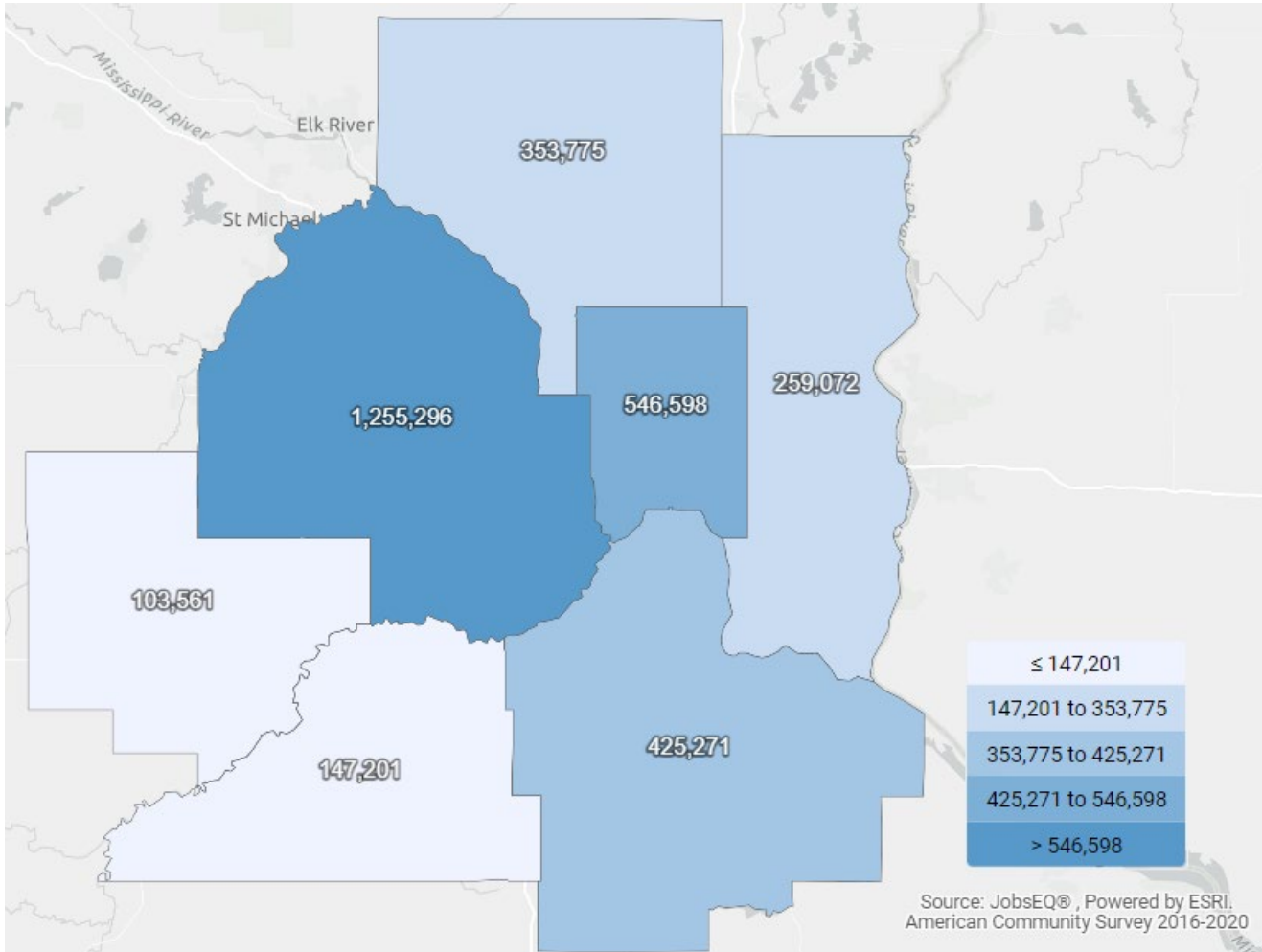
Low skill (no credential)

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

³ Hennepin, Ramsey, Anoka, Carver, Scott, Dakota, and Washington Counties.

The cities of Minneapolis and St. Paul are home to the largest local concentrations of population in the MSP Metro, and are economic hubs for the region. In all, about 3,090,774 people live in the MSP Metro, according to 2016-2020 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 23.4% of the MSP Metro's population are minors under 18 years of age. Overall, the MSP Metro's median age is one year younger (37.1 years) than the statewide median (38.1 years), mostly attributable to a larger share of 25-34 year-olds calling the MSP Metro home.

Resident Population of the MSP Metro

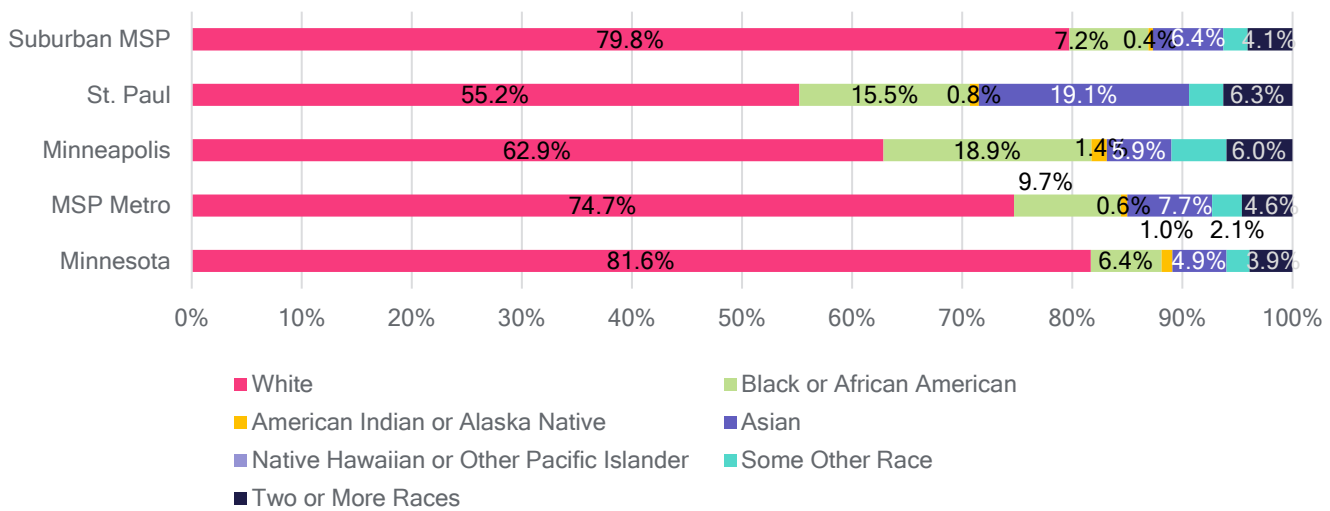


Community Profile

Demographics

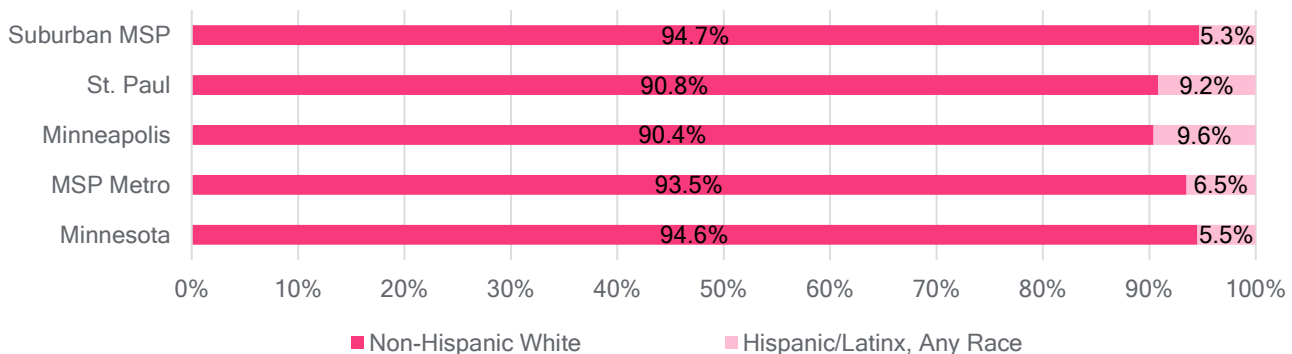
Population diversity increased between the two most recent population estimates for the 7-county MSP Metro by half of a percentage point. Across the region overall, 25.3% the population identify as Black, Asian, American Indian, Native Hawaiian, or some other race—a 1.4 percentage point increase from the prior year's estimates. 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, 20.2% of the population is BIPOC, rising from 18.7% in the 2015-2019 estimates and 17.5% in 2014-2018. Within the MSP Metro's urban communities, St. Paul has a greater share of Asian residents than the other areas in the MSP Metro—and rising steadily. Minneapolis has a greater share of Black or African American residents, though the overall share of Black or African American residents declined each year by 0.3 and 0.2 percentage points in Minneapolis between the most recent population estimates. Approximately 6.5% of the MSP Metro's residents are Hispanic or Latinx, one percentage point ahead of Minnesota overall. The share of the population being Hispanic or Latinx increased in the Suburban Metro to 5.4% but declined in Saint Paul between the most recent population estimates.

Population Race, All Ages



American Community Survey 2016-2020.

Population Ethnicity, All Ages



American Community Survey 2016-2020.

Community Demographics

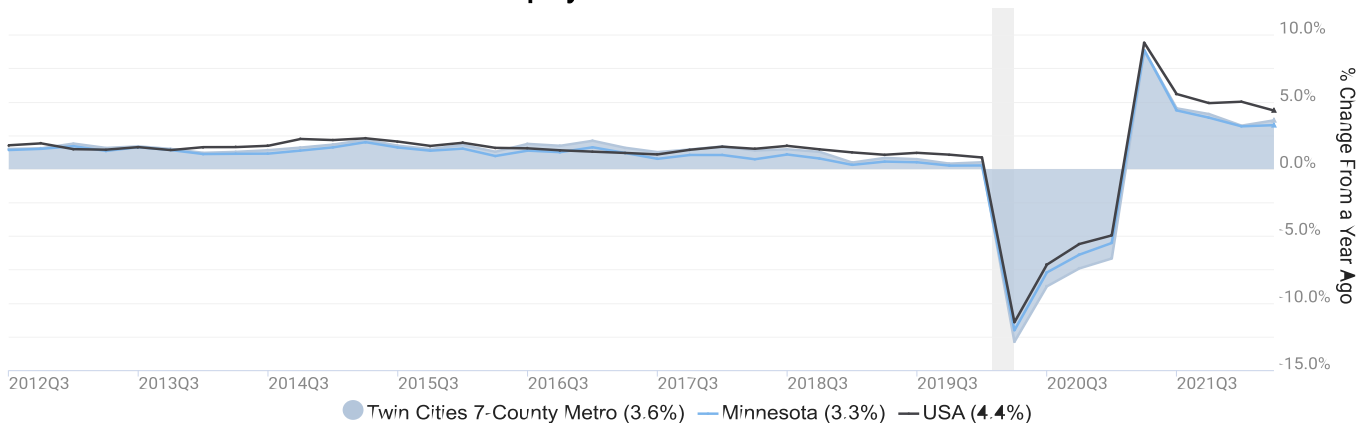
Demographics	Percent			Percent			Value		
	City of Minneapolis, MN	City of St. Paul, MN	Suburban Twin Cities Metro	MSP Metro Minnesota	Minnesota	USA	MSP Metro Minnesota	Minnesota	USA
Population (ACS)	—	—	—	—	—	—	3,090,774	5,600,166	326,569,308
Male	50.7%	48.9%	49.3%	49.4%	49.8%	49.2%	1,527,272	2,789,017	160,818,530
Female	49.3%	51.1%	50.7%	50.6%	50.2%	50.8%	1,563,502	2,811,149	165,750,778
Median Age ²	—	—	—	—	—	—	37.1	38.1	38.2
Under 18 Years	19.8%	24.8%	24.1%	23.4%	23.2%	22.4%	722,609	1,299,284	73,296,738
18 to 24 Years	13.5%	11.0%	7.1%	8.4%	8.9%	9.3%	260,985	498,444	30,435,736
25 to 34 Years	22.2%	18.5%	13.0%	15.0%	13.6%	13.9%	464,981	760,033	45,485,165
35 to 44 Years	14.0%	13.2%	13.4%	13.4%	12.7%	12.7%	415,367	710,985	41,346,677
45 to 54 Years	10.5%	10.9%	13.5%	12.7%	12.4%	12.7%	393,987	692,277	41,540,736
55 to 64 Years	10.1%	10.6%	13.9%	12.9%	13.4%	12.9%	400,072	751,567	42,101,439
65 to 74 Years	6.3%	6.9%	8.8%	8.3%	9.1%	9.4%	257,659	511,127	30,547,950
75 Years, and Over	3.6%	4.0%	6.1%	5.7%	6.7%	6.7%	175,114	376,449	21,814,867
Race: White	62.9%	55.2%	79.8%	74.7%	81.6%	70.4%	2,308,253	4,572,149	229,960,813
Race: Black or African American	18.9%	15.5%	7.2%	9.7%	6.4%	12.6%	300,832	359,817	41,227,384
Race: American Indian and Alaska Native	1.4%	0.8%	0.4%	0.6%	1.0%	0.8%	17,555	54,558	2,688,614
Race: Asian	5.9%	19.1%	6.4%	7.7%	4.9%	5.6%	236,571	275,242	18,421,637
Race: Native Hawaiian and Other Pacific Islander	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1,033	2,201	611,404
Race: Some Other Race	5.0%	3.1%	2.2%	2.7%	2.1%	5.1%	83,038	118,748	16,783,914
Race: Two or More Races	6.0%	6.3%	4.1%	4.6%	3.9%	5.2%	143,492	217,451	16,875,542
Hispanic or Latino (of any race)	9.6%	9.0%	5.4%	6.5%	5.5%	18.2%	199,688	307,675	59,361,020

American Community Survey 2016-2020 unless noted otherwise.

Employment

As of 2020Q1, total employment for the MSP Metro was 1,875,117 (based on a four-quarter moving average). Employment was hit hard by the COVID-19 pandemic and had moderately climbed again to approximately 1,711,996 by 2021Q1 (based on a four-quarter moving average). As of 2022Q2, employment in the MSP Metro now sits at 1,812,189 workers, an increase of 3.6% from 12 months prior.

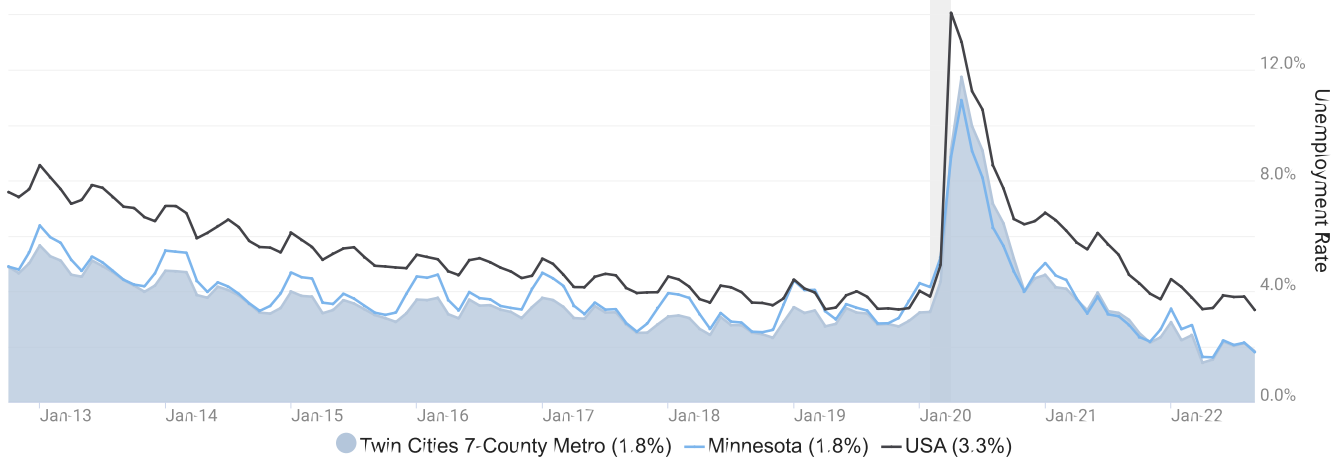
Employment for the MSP Metro



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 2022Q1 with preliminary estimates updated to 2022Q2.

The unemployment rate for the MSP Metro was 1.8% as of September 2022, a significant drop from 3.0% 12 months prior. The regional unemployment rate was lower than the national rate of 3.3%.

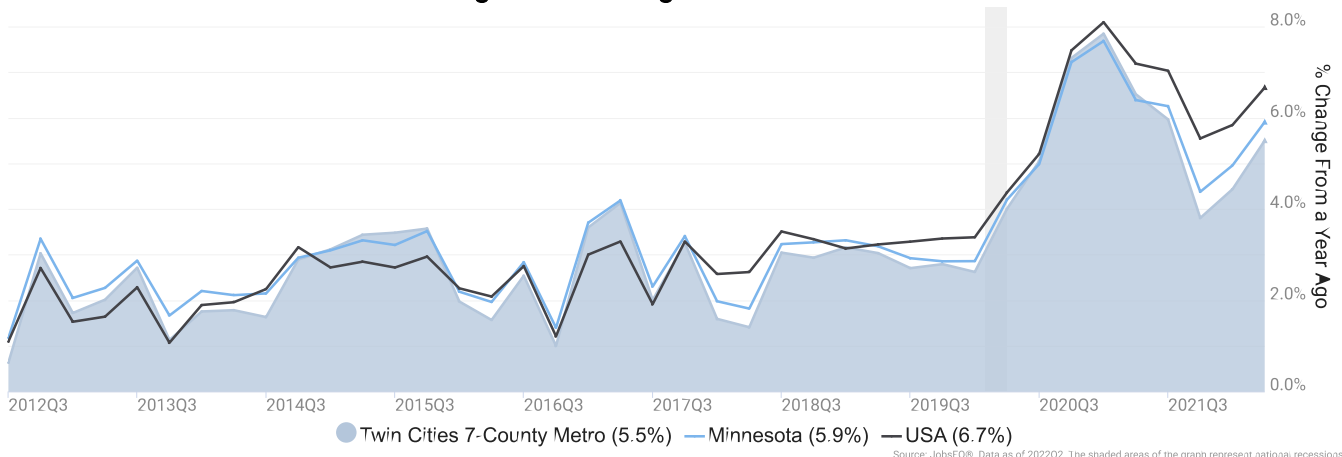
Unemployment for the MSP Metro



Unemployment rate data are from the Local Area Unemployment Statistics, provided by the Bureau of Labor Statistics and updated through September 2022.

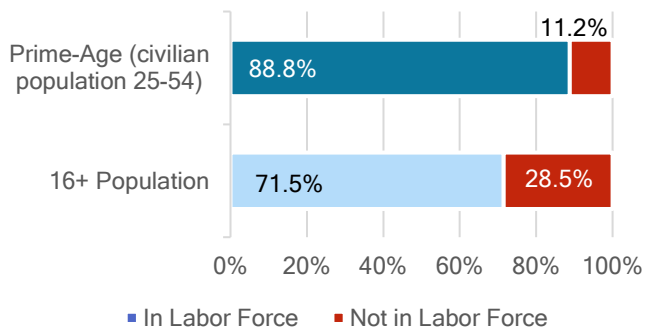
The average worker in the MSP Metro earned annual wages of \$74,848 as of 2022Q2, an increase of 5.5% in the region over the preceding four quarters. Wages rose similarly nationwide, where annual average wages were \$67,777 as of 2022Q2 (compared to \$63,393 as of 2021Q1 and \$57,624 as of 2020Q1). Early shifts were due in part to the loss of low-wage workers during the impacts of 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 and retail. However, often significant wage uplifts have been recorded particularly in roles that have especially low unemployment or require advanced experience or education credentials.

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 2022Q1 with preliminary estimates updated to 2022Q2.

Labor Force Participation Rate



The region has a civilian labor force of 1,747,713 (up about 4,000 workers from the prior year's estimates) with a participation rate of 71.5%, which is over two percentage points ahead of Minnesota's labor force participation rate for the population over 16, but lower than the prior year's estimates by half of a percentage point. The participation rate of the prime working age population (between the ages of 25 and 64) is also ahead of the statewide rate—88.8% compared to the statewide 88.3%. Labor force participation has remained relatively strong in Minnesota compared to most other states, continuing to be a hallmark of Minnesota's high quality local workforce.

American Community Survey 2016-2020 unless noted otherwise.

The MSP Metro area has a lower share of veterans in the region, at 3.2% of the regional population compared to 3.7% broadly across the state. However, veteran labor force participation rate is higher in the MSP Metro, 83.3% compared to 80.9% statewide. Similarly, the MSP Metro area has a lower share of persons with a disability, 8.1% compared to 8.7% statewide, but a higher labor force participation rate for the population with a disability, 54.2% compared to 52.8% statewide. Between the most recent American Community Survey estimates, the labor force participation rate of the MSP Metro's workforce with a disability increased by 0.2 percentage points, but dropped by 0.2 points at the statewide level.

As of the 2016-2020 American Community Survey estimates, the share of youth that are disconnected from school or work increased from 1.5% to 1.8% in the MSP Metro, now matching the statewide rate (1.8%). 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			Percent			Values		
	City of Minneapolis, MN	City of St. Paul, MN	Suburban Twin Cities Metro	MSP Metro Minnesota	Minnesota	USA	MSP Metro Minnesota	Minnesota	USA
Labor Force Participation Rate and Size (civilian population 16 years and over)	74.1%	69.9%	71.3%	71.5%	69.2%	63.2%	1,747,713	3,074,732	164,759,496
Prime-Age Labor Force Participation Rate and Size (civilian population 25-54)	88.1%	84.7%	89.5%	88.8%	88.3%	82.4%	1,130,637	1,908,423	105,137,520
Armed Forces Labor Force	0.1%	0.1%	0.1%	0.1%	0.1%	0.4%	1,792	3,607	1,143,342
Veterans, Age 18-64	2.2%	2.4%	3.5%	3.2%	3.7%	4.5%	61,399	125,683	8,920,267
Veterans Labor Force Participation Rate and Size, Age 18-64	72.6%	76.7%	85.5%	83.3%	80.9%	76.8%	51,155	101,620	6,853,673
Median Household Income ²	—	—	—	—	—	—	\$83,017	\$73,382	\$64,994
Per Capita Income	—	—	—	—	—	—	\$43,640	\$38,881	\$35,384
Poverty Level (of all people)	18.3%	17.9%	5.7%	8.7%	9.3%	12.8%	263,806	511,185	40,910,326
Households Receiving Food Stamps/SNAP	13.6%	15.9%	5.1%	7.4%	7.5%	11.4%	88,702	165,078	13,892,407

Enrolled in Grade 12 (% of total population)	1.1%	1.4%	1.6%	1.5%	1.4%	1.3%	45,653	78,075	4,358,865
Disconnected Youth ³	2.3%	2.9%	1.4%	1.8%	1.8%	2.5%	2,680	5,115	433,164
Children in Single Parent Families (% of all children)	40.9%	39.2%	25.1%	28.5%	28.4%	34.0%	199,163	354,664	23,628,508
Uninsured	6.2%	6.2%	3.7%	4.4%	4.5%	8.7%	133,871	251,900	28,058,903
With a Disability, Age 18-64	9.9%	11.1%	7.3%	8.1%	8.7%	10.3%	155,427	295,441	20,231,217
With a Disability, Age 18-64, Labor Force Participation Rate and Size	53.3%	46.2%	56.4%	54.2%	52.8%	43.2%	84,261	156,039	8,740,236
Foreign Born	15.2%	19.7%	10.2%	12.0%	8.4%	13.5%	369,832	470,687	44,125,628

American Community Survey 2016-2020 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



90.8% of prime working age adult residents have at least a high school diploma or GED.

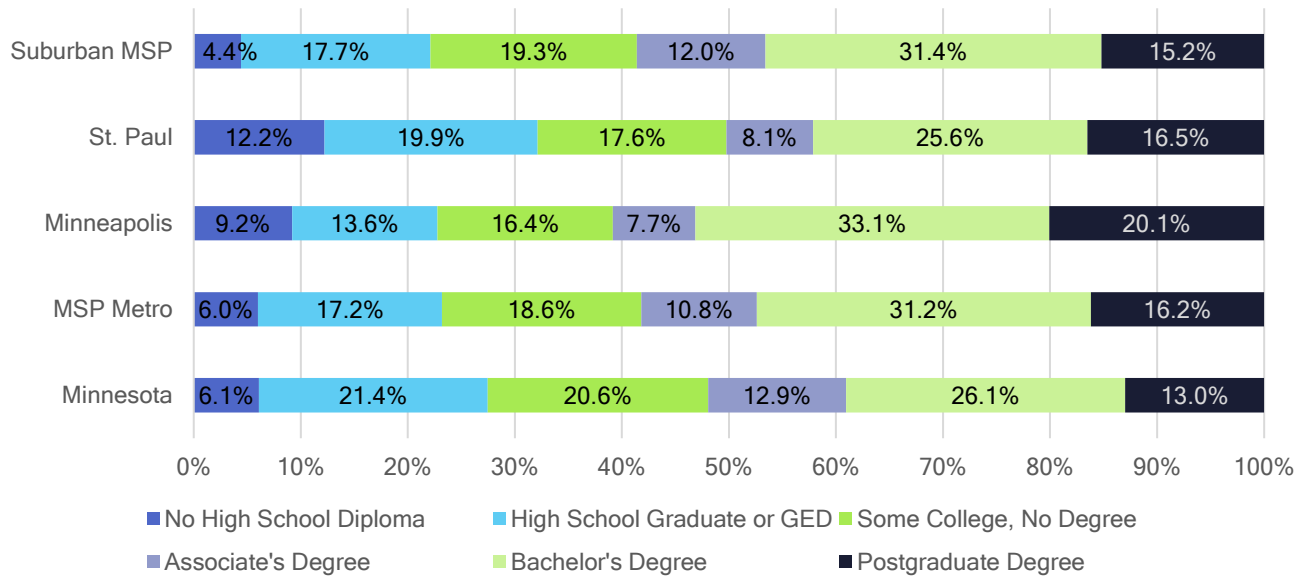
The share of MSP Metro adults between the ages of 25 and 64 that do not have a high school diploma or equivalent increased by three percentage points between the most recent American Community Service estimates, rising from 6.2% to 9.2% as of 2016-2020. Some communities of the MSP Metro have as high as 20% of prime working age adults in a neighborhood with no high school diploma or GED credential. However, the share of the population with a high school diploma as the highest level of education dropped from 17.8% to 13.6% (compared with 19.9% statewide). The prime working age population of St. Paul has a larger share of residents with a high school diploma or less (12.2%, or 19,928 people, a decrease of about 1,700 from the prior year's estimates), while Suburban MSP and Minneapolis have a smaller share of residents with lower educational attainment (4.4% or 52,734 in the suburbs and 9.2% or 22,169 people in the City of Minneapolis).

Educational Characteristics of MSP Metro Minnesota

Educational Characteristics	Percent				Percent		Values		
	City of Minneapolis, MN	City of St. Paul, MN	Suburban Twin Cities Metro	MSP Metro Minnesota	Minnesota	USA	MSP Metro Minnesota	Minnesota	USA
No High School Diploma	9.2%	12.2%	4.4%	6.0%	6.1%	10.5%	99,933	176,478	17,929,220
High School Graduate	13.6%	19.9%	17.7%	17.2%	21.4%	25.4%	288,543	622,379	43,289,555
Some College, No Degree	16.4%	17.6%	19.3%	18.6%	20.6%	20.5%	311,172	600,346	34,959,338
Associate's Degree	7.7%	8.1%	12.0%	10.8%	12.9%	9.3%	181,501	376,942	15,776,790
Bachelor's Degree	33.1%	25.6%	31.4%	31.2%	26.1%	21.6%	522,075	760,576	36,888,244
Postgraduate Degree	20.1%	16.5%	15.2%	16.2%	13.0%	12.7%	271,183	378,141	21,630,870

American Community Survey 2016-2020 unless noted otherwise.

Educational Attainment, Age 25-64



American Community Survey 2016-2020.

Regional Colleges and Universities

The MSP Metro has 44 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 2020-21 school year. There were a total of 71,722 awards conferred in the region (including distance learning opportunities).

School	Certificate < 1 Yr	Certificate 1+ but < 2 Yr	Associate's	Certificate 2+ but < 4 Yr	Bachelor's	Post-Bacc	Master's	Post-Master's	Doctorate	Total Awards	Total School Enrollment	Avg Net Price ¹
University of Minnesota-Twin Cities	288	7	0	0	9,414	212	2,946	0	1,773	14,640	52,017	\$17,729
Walden University	0	0	0	0	1,729	361	8,948	89	1,641	12,768	49,695	
Capella University	12	8	0	0	5,286	1,155	6,772	167	1,437	14,837	38,930	\$16,874
University of St Thomas	0	0	79	4	1,540	263	980	4	196	3,066	9,792	\$31,799
Normandale Community College	171	0	1,208	0	0	0	0	0	0	1,379	9,420	\$10,487
Anoka-Ramsey Community College	46	9	1,071	0	0	0	0	0	0	1,126	8,482	\$11,982
Century College	364	268	1,145	33	0	0	0	0	0	1,810	8,203	\$9,907
Metropolitan State University	20	0	0	0	1,934	27	190	0	16	2,187	7,552	\$15,941
Minneapolis Community and Technical College	449	136	797	14	0	0	0	0	0	1,396	6,429	\$12,599
Saint Paul College	375	270	663	99	0	0	0	0	0	1,407	5,823	\$11,334
North Hennepin Community College	630	12	621	0	0	0	0	0	0	1,263	5,756	\$9,601
Concordia University-Saint Paul	5	0	19	0	1,164	20	763	60	49	2,080	5,585	\$16,521

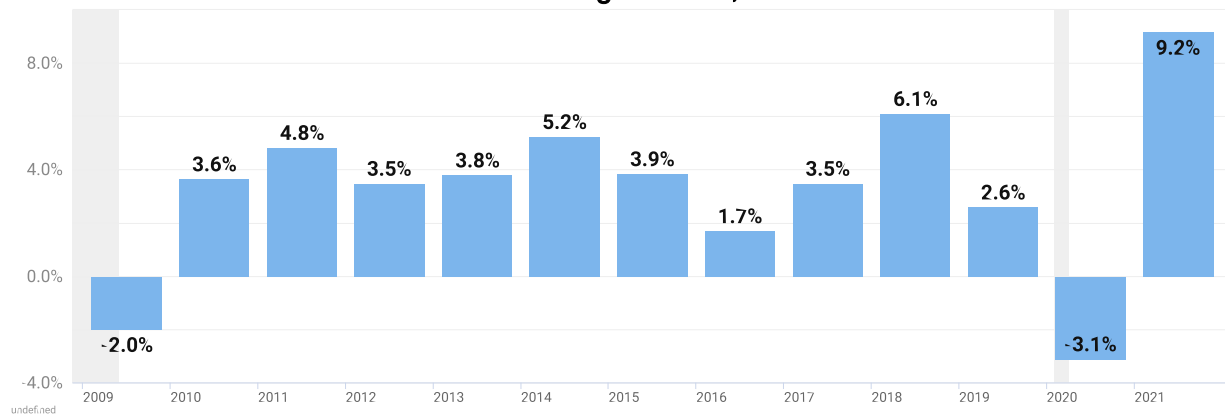
St Catherine University	13	0	354	0	614	45	403	0	73	1,502	4,277	\$18,912
Hennepin Technical College	637	381	498	94	0	0	0	0	0	1,610	4,094	\$10,511
Inver Hills Community College	170	16	494	0	0	0	0	0	0	680	4,071	\$10,699
Bethel University	23	0	23	0	773	41	342	0	30	1,232	3,814	\$29,107
University of Northwestern-St Paul	0	1	16	0	697	4	52	0	0	770	3,506	\$23,967
Augsburg University	0	0	0	0	592	6	296	0	17	911	3,346	\$24,306
Hamline University	10	15	0	0	520	150	394	44	14	1,147	3,113	\$21,528
Dakota County Technical College	161	224	391	18	0	0	0	0	0	794	2,319	\$10,567
Macalester College	0	0	0	0	585	0	0	0	0	585	2,049	\$35,589
Anoka Technical College	509	174	171	64	0	0	0	0	0	918	1,683	\$13,362
Crown College	4	0	24	0	269	2	127	0	0	426	1,485	\$25,977
Dunwoody College of Technology	17	12	299	0	80	0	0	0	0	408	1,281	\$25,881
Mitchell Hamline School of Law	0	0	0	0	0	0	0	0	322	322	1,242	
Northwestern Health Sciences University	0	10	25	0	19	0	21	0	189	264	1,132	\$22,127
North Central University	1	0	9	0	193	0	33	0	0	236	1,062	\$22,259
Minneapolis College of Art and Design	0	0	0	0	148	0	29	0	0	177	760	\$29,347
Herzing University-Minneapolis	0	47	39	0	143	0	2	0	0	231	626	\$21,971
Aveda Arts & Sciences Institute Minneapolis	196	120	0	0	0	0	0	0	0	316	554	\$14,989
Luther Seminary	0	0	0	0	0	1	111	6	10	128	501	
Bethany Global University	16	10	7	0	127	0	9	0	0	169	359	\$21,169
Adler Graduate School	0	0	0	0	0	0	77	5	0	82	267	
Summit Academy Opportunities Industrialization Center	355	0	0	0	0	0	0	0	0	355	257	\$10,161
Bethlehem College & Seminary	0	0	10	0	29	0	28	0	0	67	210	\$5,635
Minnesota School of Cosmetology-Woodbury Campus	72	47	0	0	0	0	0	0	0	119	149	\$18,119
United Theological	0	0	0	0	0	0	19	0	2	21	147	

Seminary of the Twin Cities												
Institute of Production and Recording	0	0	43	0	11	0	0	0	0	54	133	\$24,374
Empire Beauty School-Bloomington	47	41	0	0	0	0	0	0	0	88	129	\$16,115
PCI Academy-Plymouth	41	22	0	0	0	0	0	0	0	63	106	\$9,242
Academy College	0	0	6	0	7	0	0	0	0	13	95	\$17,898
Empire Beauty School-Spring Lake Park	0	29	0	0	0	0	0	0	0	29	79	\$15,816
American Academy of Health and Wellness	0	0	0	0	0	0	26	0	9	35	43	
Hastings Beauty School	0	11	0	0	0	0	0	0	0	11	14	\$13,257
Total	4,632	1,870	8,012	326	25,874	2,287	22,568	375	5,778	71,722		

Economic Indicators

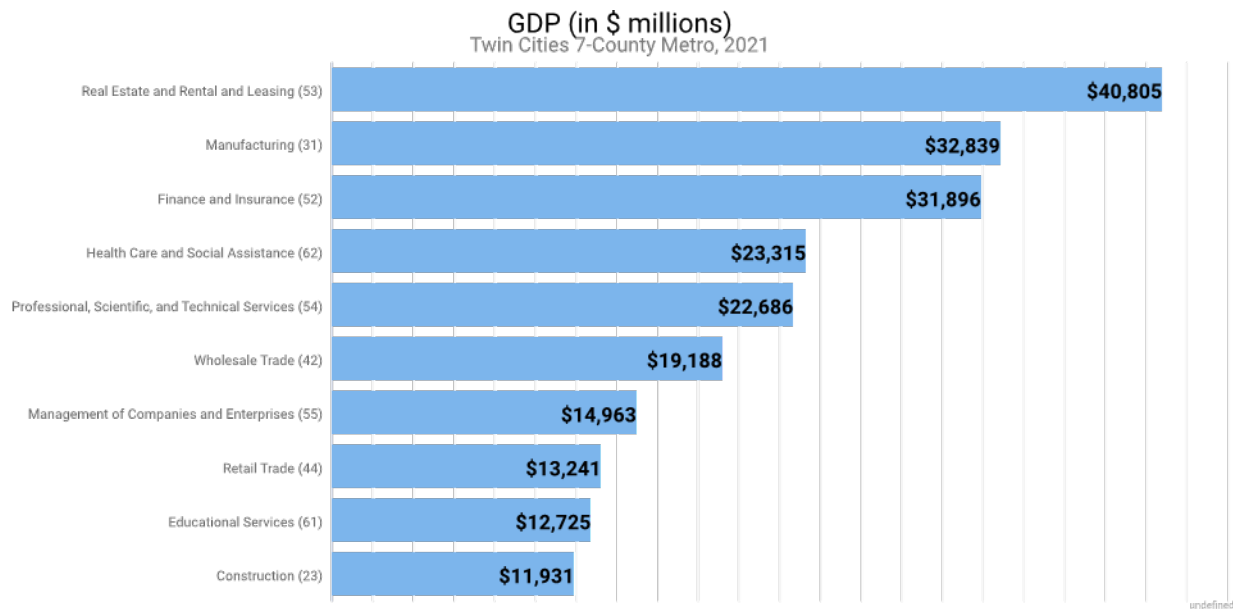
Gross Domestic Product (GDP) is the total value of goods and services produced by a region. In 2021, nominal GDP in the MSP Metro expanded by 9.2%, recovering from a contraction of 3.1% in 2020. As of 2021, total GDP in the MSP Metro was \$275,196,182,000.

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 2021.

Of the industries represented in the MSP Metro, Real Estate and Rental and Leasing contributed the largest portion of GDP in 2021, \$40,804,584,000—an increase of six billion dollars from the prior year. The next-largest contributions came from Manufacturing (\$32,838,575,000), up by one billion from the prior year; Finance and Insurance (\$31,895,591,000), up by 1.8 billion; and Health Care and Social Assistance (\$23,314,784,000), up by about two billion dollars. The mix of prominent industries has remained the same as in 2020, but Retail Trade regained its position as #8th and dropped Educational Services back down to #9th greatest contribution to local GDP.



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

Nationwide, unemployment hit an all-time non-wartime low of 3.5% in October 2022, rising only to 3.7% in November amidst a still hot jobs market. US companies added 261,000 new jobs to the economy in October alone, likely constricted by the immensely tight talent market, where there are approximately two jobs for every one person seeking work. There are signs that companies are going through their inventories of product more quickly than prior months, with warehousing employment down from the prior months nationwide and with the retail industry seeing mixed employment trends. Manufacturing, Healthcare, and Professional and Technical services employment had the largest job gains as of the October 2022 jobs report nationally, all trends apparent for Minnesota as well.

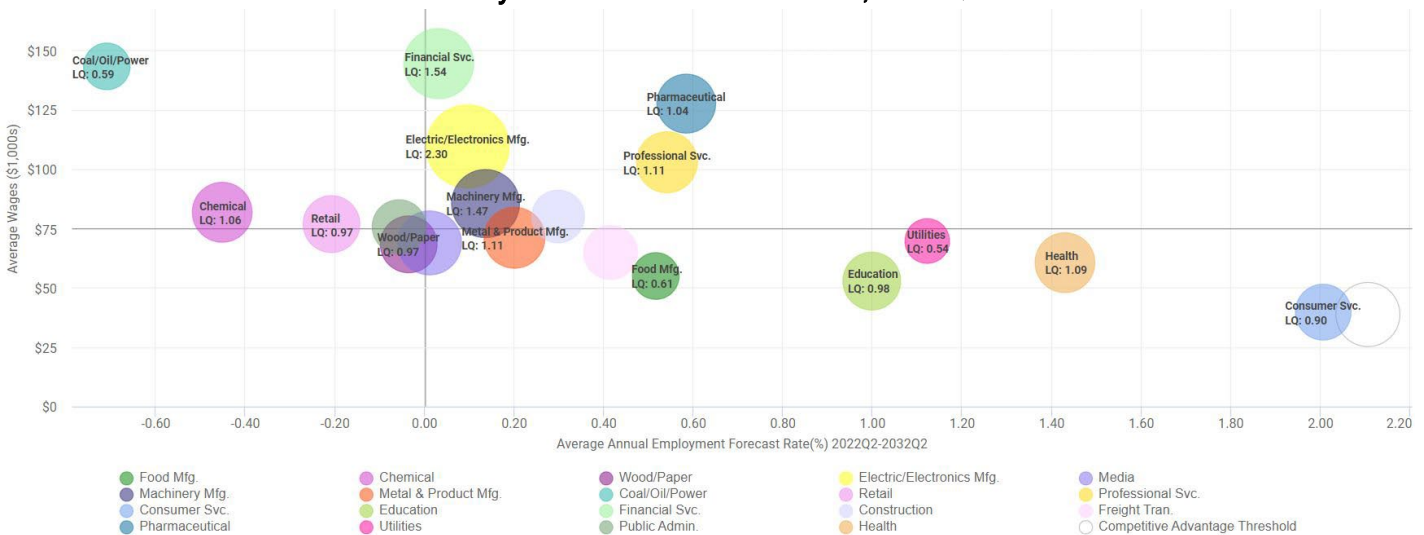
Employment rose by 3.9% in the region between 2021Q2 and 2022Q2 to 1,812,189 employed, not quite keeping on track with the optimistic alternate forecast we modeled 12 months ago, and with only an estimated 2.4% of the MSP Metro workforce being unemployed by July 2022 (about 42,138 people). This low unemployment contrasts with estimates of 6.7% unemployment at the start of 2021. Future growth in jobs in the region is forecast at 0.7% averaged annually through 2027 in a baseline scenario, heavily constrained by the tight labor market. The flatter, more gradual forecasted growth for the region is a more likely scenario now than the sharp rebound in employment first estimated based on 2021Q1 employment growth trends.

5-Year Forecast Comparison in the MSP Metro



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 43,869 workers in the region (up just over 400 workers from 2021) with an average wage of \$109,492 (up from \$102,213 one year prior). Employment in the Electric/Electronics Manufacturing cluster is now projected to grow very moderately at 0.1% on average annually over the next ten years. Nearly all industry clusters saw improvement in the overall employment growth outlook since estimates in 2021Q1, with the exception of the Pharmaceutical sector whose forecasted growth rate cooled to just under 0.6% on average annually over the next ten years. Consumer Services, Utilities, Media, and the Food Manufacturing industry all saw the greatest turnaround in outlook from 2021.

Industry Clusters in the MSP Metro, 2022Q2



Emerging Critical Needs

SECTORS AND OCCUPATIONS OF FOCUS

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

Several occupations that forecast high talent surpluses in 2021 have continued to grow in the estimated size of talent surplus in 2022 (shown in blue below), including Cashiers and Waiters and Waitresses. Talent surplus shrunk slightly between 2021 and 2022 for Fast Food and Counter Workers and Retail Workers, but with moderate excess talent still forecast over the coming decade.

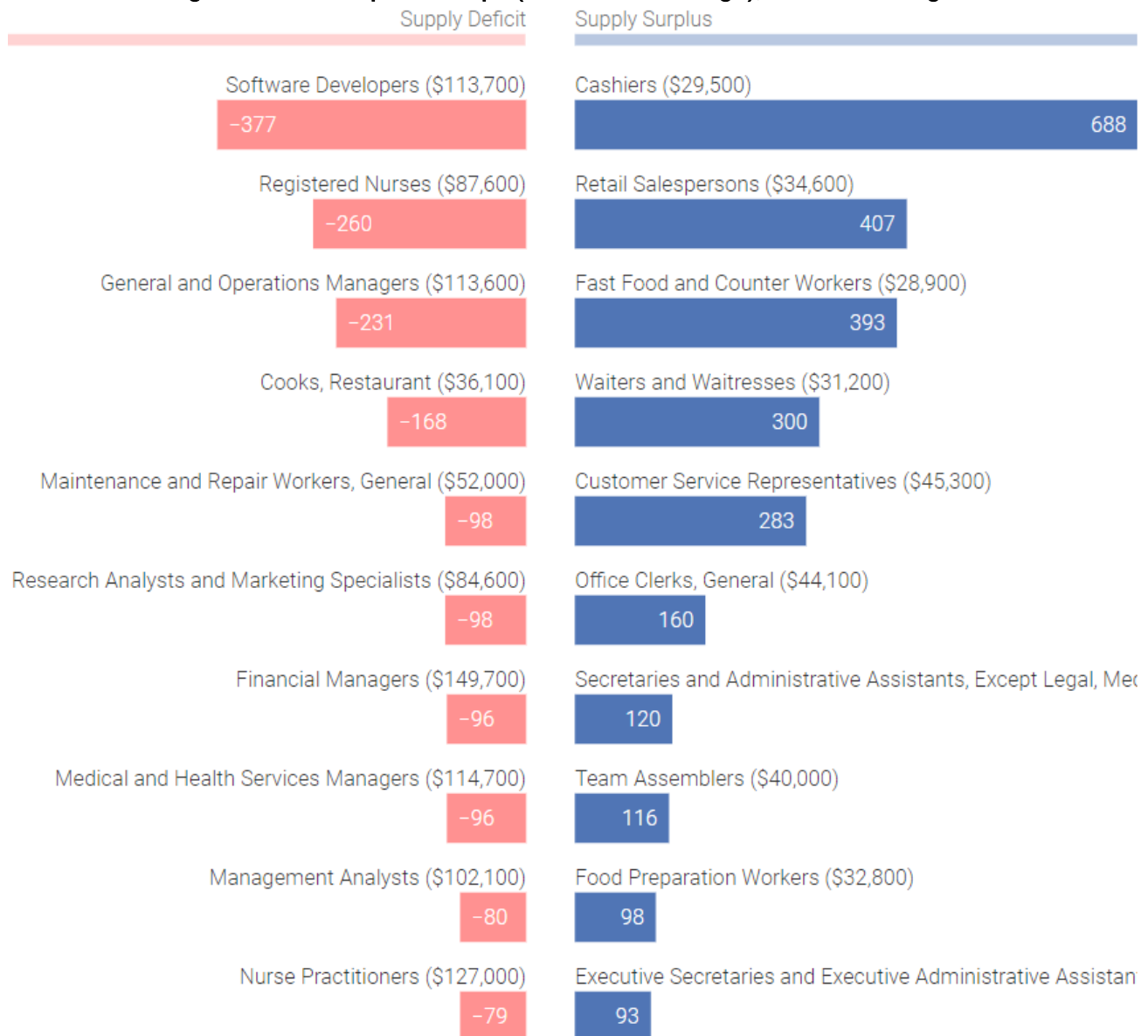
The occupations of highest forecasted shortage in the MSP Metro have remained relatively consistent since the last analysis in October 2021, still showing that there is a shortage of local Software Developers, Nurses, General and Operations Managers, and Medical and Health Services Managers, among other critical healthcare, information technology, and management occupations. Project Management Specialists and Computer Systems Analysts dropped out of the top ten list of occupations in shortage as of 2022, while Restaurant Cooks leapt up into fourth place, and the ranks of Financial Managers and Management Analysts dropped moderately in anticipated talent shortage. Among high contact-intensity roles in shortage, Registered Nurses and Nurse Practitioners still make the top ten list of occupations in highest shortage, while Hospitality and Tourism roles are largely forecast to have a surplus of talent (except for Restaurant Cooks and General Managers from Hospitality Services). As a whole, Healthcare Practitioners and Technical Health Occupations have the highest overall volumes of shortages, as a collective forecasting a shortage of about 800 professionals annually over the next ten years if significant changes are not made to our talent pipelines and sourcing methodologies; an additional 100 professional shortage is estimated across all Healthcare Support Occupations collectively.

The baseline two-year degree requirement and wage expectations of roles in highest shortage are no longer all above \$52,000 per year as observed in 2020 and 2021. In fact, one of the two new occupations that entered into the top ten occupations of highest shortage in 2022—Restaurant Cooks—pays notably below the \$52,000 threshold at \$36,100 annually on average. All roles listed in the top occupations of shortage require a postsecondary credential or industry-recognized credential or certificate beyond high school. The average wage in the MSP Metro as of 2021 was \$64,300; all but the two new occupations added to the top ten occupations of shortage in 2022 (Restaurant Cooks and Maintenance and Repair Workers) typically pay more than the average regional wage.

On the side of talent surplus, none of the positions forecast to have the highest surplus of talent in the metro over the past three years typically require an advanced degree, and only two can be considered Gateway occupations paying over \$42,000 per year on average (Customer Service Representatives and General Office Clerks). Six out of ten of these positions typically cannot be done remotely, and the same roles are also 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.

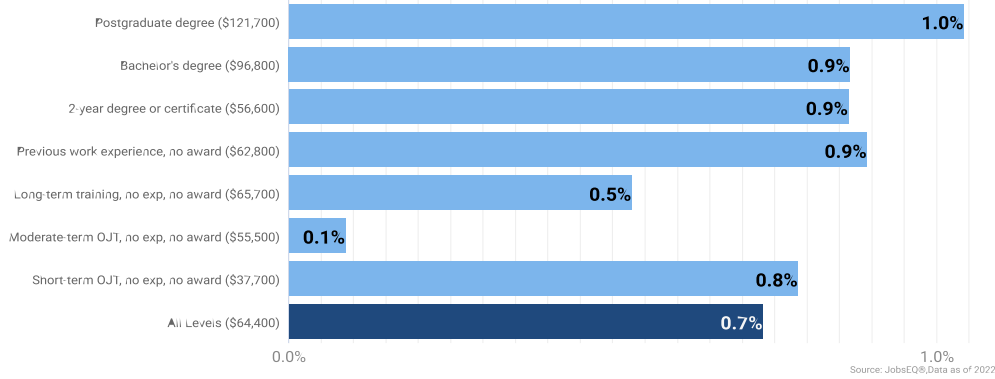
Average Annual Occupation Gaps (i.e. Talent Shortage), 2022Q2 through 2032Q2



SOURCE: Chmura JobsEQ 2022Q2.

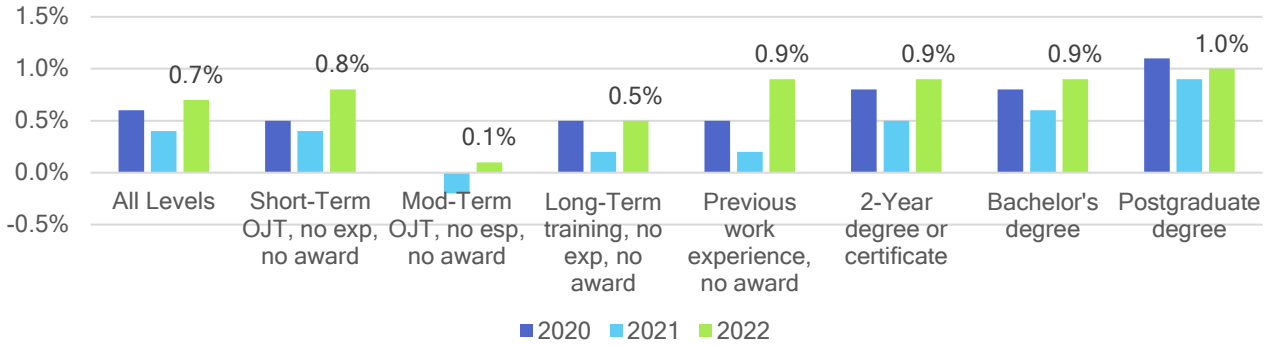
Expected growth rates for occupations vary by the education and training required. Following average forecasted employment growth rates of 0.6% in 2020 and 0.4% in 2021, there has been a marked improvement in outlook with current average annual employment growth forecast at 0.7% on average over the next ten years in the MSP Metro. Growth in occupations typically requiring a postgraduate degree increased from 0.9% to 1.0% per year, those requiring a Certificate, two-year degree, or bachelor's degree are now forecast to grow 0.9% per year. Jobs that require extensive previous work experience but no formal degree have rebounded from the past two years' estimates to an estimated 0.9% average annual growth, and improvements are expected for truly entry-level jobs that do not require any previous experience or award. Estimated wages have increased across careers at each education level requirement, but especially at the postgraduate level.

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



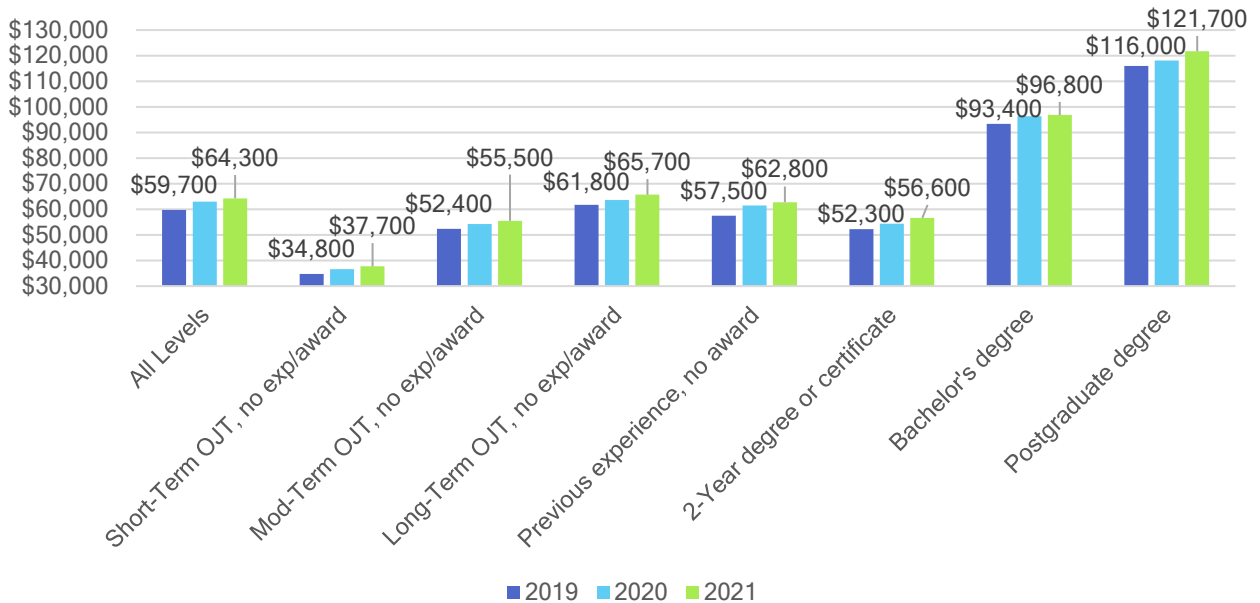
Employment by occupation data are estimates as of 2022Q2. Education levels of occupations are based on BLS assignments. Forecast employment growth uses national projections from the Bureau of Labor Statistics adapted for regional growth patterns.

Average Annual Employment Growth Forecast Estimates in 2020, 2021, and 2022 by Education and Training Requirements, MSP Metro



SOURCE: Chmura JobsEQ 2022Q2.

Average Wage Estimates Annually by Education and Training Requirements, MSP Metro



SOURCE: Chmura JobsEQ 2022Q2. Note wage estimates lag by a full calendar year; 2022Q2 estimates represent 2021 average wages.

Across all occupations of employment in the MSP Metro region, wages increased by \$1,300 from the prior year, and \$4,600 from two years ago. The largest wage gains were seen for roles requiring a postgraduate degree, which increased by \$5,700 between 2019 and 2021. Occupations requiring a Bachelor's degree or higher generally have lower unemployment rates and are more frequently forecasting talent shortages. However, as of 2022Q2, several Gateway Occupations that require experience, an industry credential, or a two-year degree saw talent shortages, award gaps, and low unemployment. Across the MSP Metro, unemployment sat at 2.4% overall as of 2022Q2, but for Gateway Occupations unemployment was 2.3%. Administrative support roles and truck driving positions employ large numbers of talent in the MSP Metro, and were the top Gateway Occupations experiencing talent shortages, award gaps, and low unemployment. These and the top Gateway Occupations of need at the statewide level also align to the sub-industries in the MSP Metro that have high local concentration (LQ) and high demand (either replacement or growth): Manufacturing, Air Transportation, and Insurance.

Regional Summary of Top High-Demand Industries and Gateway Occupations

	Overall Unemployment Rate 2022Q2	Overall Mean Wage	Gateway Occupation Unemployment Rate 2022Q2	Top 4-Digit Sub-Industries of High Local Concentration (LQ) and High Demand (replacement or growth)	Top Gateway Occupations with Occupation Gaps and/or Award Gaps in Order of Total Employment, including Unemployment Rate*
MSP Metro	2.4%	\$64,300	2.3%	<ul style="list-style-type: none"> Medical Equipment and Supplies Manufacturing (4.25) Scheduled Air Transportation (2.37) Insurance Carriers (2.35) Electrical Equipment Manufacturing (2.33) 	<ul style="list-style-type: none"> Customer Service Representatives (2.8%) Office Clerks, General (2.2%) Secretaries & Administrative Assistants (1.7%) Heavy & Tractor Trailer Truck Drivers (2.2%) Bookkeeping, Accounting, & Auditing Clerks (1.8%)
Minnesota Statewide	2.5%	\$60,300	2.3%	<ul style="list-style-type: none"> Hog and Pig Farming (6.05) Metal Ore Mining (5.13) Other Residential Care Facilities (3.28) Farm Product Raw Material Merchant Wholesalers (3.18) 	<ul style="list-style-type: none"> Heavy Tractor-Trailer & Truck Drivers (OG, AG; 2.2%) Bookkeeping, Accounting, & Auditing Clerks (AG; 1.8%) Maintenance & Repair Workers (OG; 1.4%) Carpenters (OG; 3.2%) Light Truck Drivers (AG; 2.2%)

*Table includes 4-digit NAICS code industries that have a high Location Quotient (higher than 1.2) in Minnesota, high-demand, and employment over at least 2,300 workers statewide as of 2022Q2. Color coding of industries correspond with the CTE Career Fields. **Table includes high-demand occupations paying average wages between \$42,000-regional mean wage. High-demand is defined as lower than average unemployment rate (by occupations), higher than average regional growth forecast, greater than 50% total replacement demand, high job posting volumes (by occupations), and/or high posting:unemployment ratio (by occupations) as of 2022Q2.

A troubling number of occupations in the MSP Metro have estimated unemployment of zero professionals as of 2022Q2 estimates. All Career Fields are represented except for Business, Management, and Administration, but Health Science Technology is the overwhelming majority of local roles with zero unemployment estimated. The occupations listed below have nonexistent unemployed talent at the regional level and currently have over 75 people working in these positions in the 7-county region. Many of these roles have low volumes of online job postings due to unique methods of recruiting talent for these specific roles, due to their specialty nature. All but three of these roles are Target Occupations paying well over the regional average of \$64,300 annually. The exceptions are Prepress Technicians (\$49,800 annually), Legislators (\$61,800 annually), and Pharmacy Aides (\$36,300).

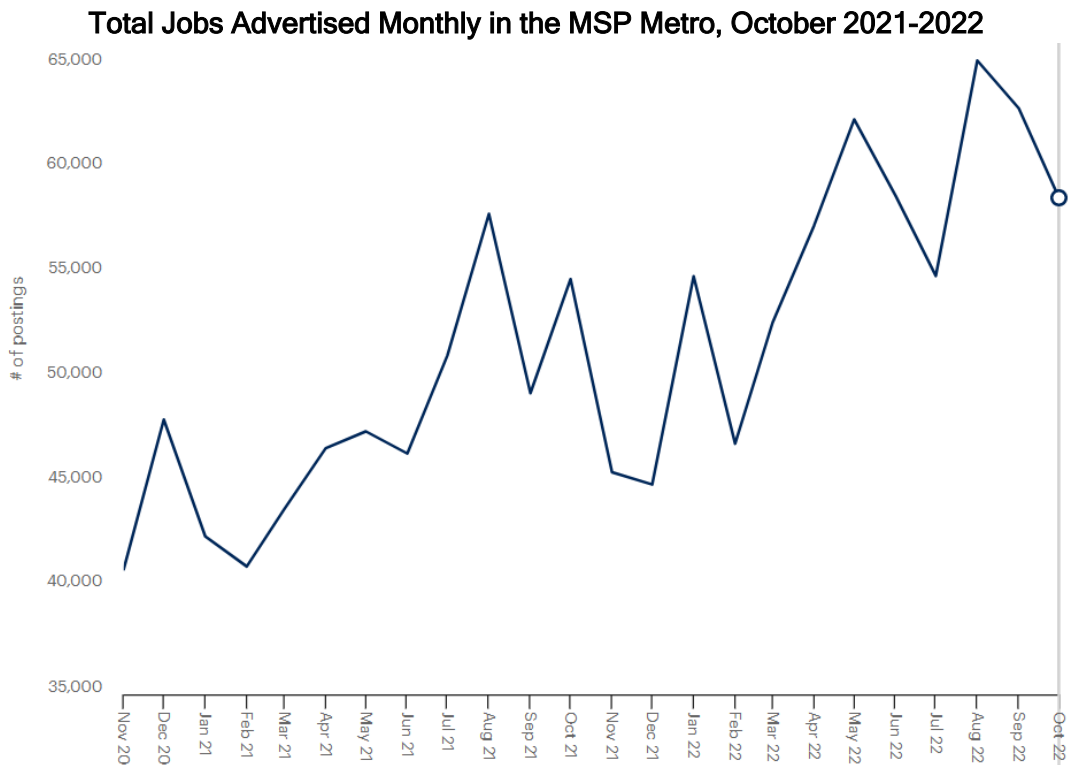
Occupations with No Unemployed Workforce and Employing over 75 Workers, MSP Metro Minnesota 2022Q2

SOC	Occupation	Current						5-Year History		5-Year Forecast				
		Empl	Mean Ann Wages ²	LQ	Unempl	Unempl Rate	30-Day Online Job Ads ³	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
33-1012	First-Line Supervisors of Police and Detectives	916	\$112,400	0.65	0	0.0%	7	1	0.0%	313	102	191	19	0.4%
51-5111	Prepress Technicians and Workers	676	\$49,800	2.19	0	0.0%	27	-321	-7.5%	313	114	287	-88	-2.7%
29-1041	Optometrists	431	\$140,800	0.80	0	0.0%	105	66	3.4%	83	40	27	16	0.7%
29-1211	Anesthesiologists	360	\$352,400	0.91	0	0.0%	20	-46	-2.4%	46	29	20	-2	-0.1%
11-1031	Legislators	314	\$61,800	0.73	0	n/a	n/a	-2	-0.1%	123	37	79	8	0.5%
29-1223	Psychiatrists	283	\$302,500	0.91	0	0.0%	46	3	0.2%	58	24	16	18	1.2%
29-1214	Emergency Medicine Physicians	267	\$280,500	0.59	0	0.0%	4	136	15.2%	44	22	15	7	0.5%
53-4031	Railroad Conductors and Yardmasters	267	\$76,300	0.50	0	0.0%	7	-66	-4.3%	123	30	88	5	0.4%
29-1218	Obstetricians and Gynecologists	256	\$296,800	0.92	0	0.0%	21	-10	-0.8%	30	20	14	-4	-0.3%
29-1242	Orthopedic Surgeons, Except Pediatric	237	\$325,800	1.17	0	0.0%	9	120	15.0%	27	19	13	-4	-0.4%
29-1213	Dermatologists	233	\$339,600	1.92	0	0.0%	6	118	15.2%	38	19	13	6	0.5%
29-1212	Cardiologists	228	\$350,100	0.98	0	0.0%	17	115	15.2%	37	19	13	6	0.5%
53-4011	Locomotive Engineers	200	\$83,000	0.49	0	0.0%	1	-83	-6.7%	96	23	67	7	0.7%
11-9131	Postmasters and Mail Superintendents	177	\$83,400	1.21	0	0.0%	n/a	-14	-1.5%	52	19	41	-9	-1.0%
29-1241	Ophthalmologists, Except Pediatric	160	\$212,500	1.09	0	0.0%	5	83	15.6%	27	13	9	4	0.5%
23-1012	Judicial Law Clerks	140	\$59,200	0.97	0	0.0%	186	-64	-7.3%	47	22	26	-1	-0.1%
29-1222	Physicians, Pathologists	123	\$284,000	0.94	0	0.0%	3	64	15.8%	22	10	7	5	0.8%
31-9095	Pharmacy Aides	120	\$36,300	0.23	0	0.0%	11	-18	-2.8%	64	29	43	-9	-1.5%
29-1224	Radiologists	118	\$374,500	0.32	0	0.0%	13	61	15.7%	20	10	7	3	0.6%
23-1021	Administrative Law Judges, Adjudicators, and Hearing Officers	109	\$103,700	0.69	0	0.0%	n/a	4	0.7%	23	12	13	-3	-0.5%
29-1291	Acupuncturists	102	\$72,200	0.67	0	0.0%	3	47	13.0%	38	23	8	7	1.3%
29-1217	Neurologists	96	\$300,300	0.99	0	0.0%	25	47	14.6%	16	8	5	2	0.5%
51-8012	Power Distributors and Dispatchers	75	\$99,600	0.69	0	0.0%	n/a	4	1.1%	31	9	24	-2	-0.7%
00-0000	Total - All Occupations	1,812,189	\$64,300	1.00	42,138	2.4%	120,050	-11,066	-0.1%	1,062,080	389,807	607,261	65,012	0.7%

EMERGING CAREER PATHS

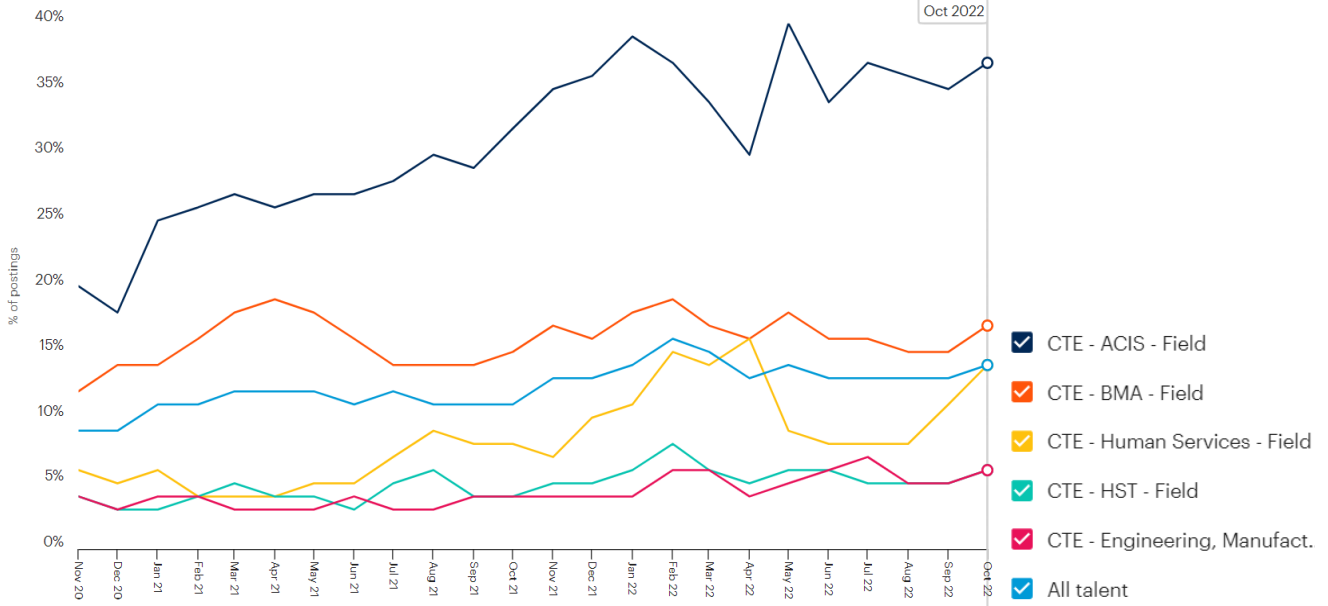
The jobs that employers advertise can reveal a lot about business' demand for certain skills, certifications, qualifications, and occupational competencies. Skills-based hiring continues to trend up in the current tight labor market, particularly in the tech sector, business, and finance industries. Remote and hybrid work environments have also continued to rise well beyond the initial impacts of the pandemic across multiple sectors. However, October 2022 data indicates that there is a slight cooling in the market for all job types statewide, including some remote roles. The October 2022 US Jobs Report observed a similar trend in overall lower job posting volumes, slight dips in remote work opportunities, and a decline in the share of postings that include a signing bonus.

From November 1, 2021 through October 31, 2022 there were 666,152 unique job postings advertised online in the MSP Metro on online job boards, representing 59.5% of all postings statewide, according to analysis using Gartner TalentNeuron Plan (compared to 1,119,315 postings statewide). This was 17% higher than the 12 months prior. August 2022 had the highest volume of new job postings advertised in the region on record, topping out at 65,674 unique postings advertised in that month compared to 57,985 postings in August 2021. About 18% of all positions advertised over the most recent 12-month period were explicitly listed as remote or telecommute roles—either permanently or temporarily. Remote positions increased in prevalence by 38% from the 12 months prior. Remote work opportunities have continued to increase significantly among Information Technology careers and Business, Management, and Administration roles (such as Business Operations Specialists) since the first year of the pandemic, but also Special Education Teachers and Supervisors of Personal Service Workers have seen a rise in remote requirements in their position descriptions. Specifically, 42% of all Information Technology jobs advertised online in the MSP Metro between November 2021 and October 2022 were remote positions—up 12 percentage points from the prior year (27% fully remote, 14% hybrid remote, and 1% temporarily remote).



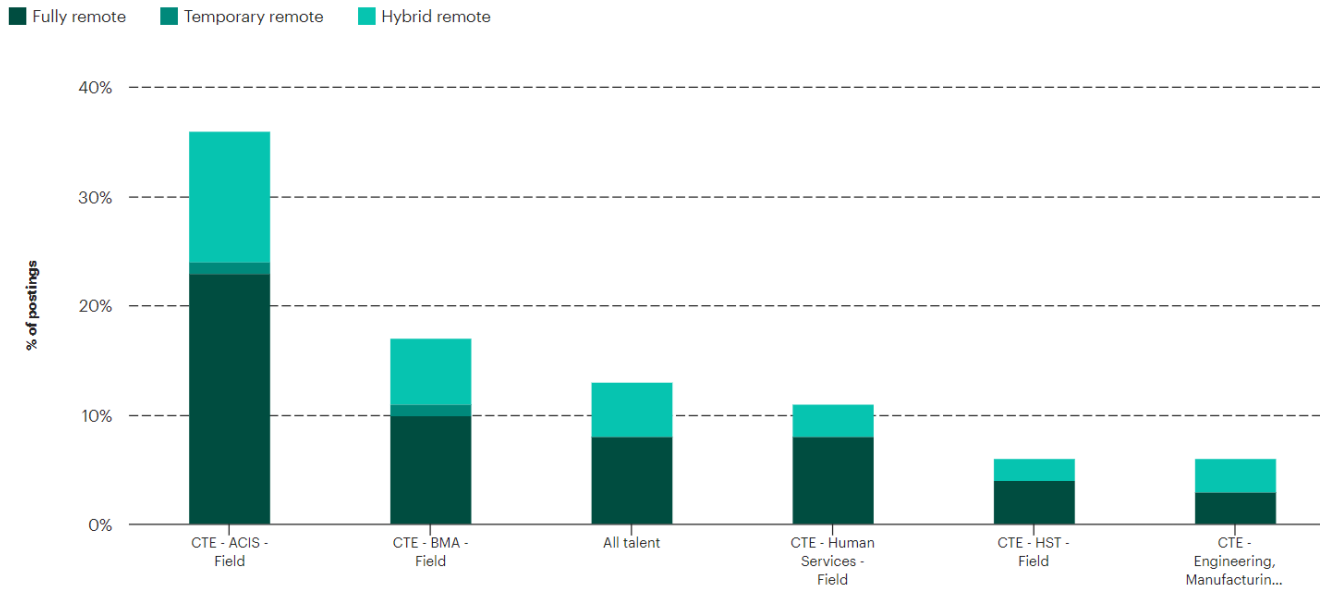
SOURCE: Gartner TalentNeuron Plan accessed 11/10/2022

Total Remote Job Postings Advertised Monthly in the MSP Metro, October 2021-2022



SOURCE: Gartner TalentNeuron Plan accessed 11/10/2022

Remote Job Postings by Career Field Advertised in the MSP Metro, October 2021-2022



Talent Profile ▾	% of postings				
	Unspecified /Onsite ▾	Total remote ▾	Fully remote ▾	Temporary remote ▾	Hybrid remote ▾
CTE - ACIS - Field	64% ▼ -9 pp	36% ▲ 9 pp	23% ▲ 7 pp	1% ▼ -2 pp	12% ▲ 4 pp
CTE - BMA - Field	83% ▼ -1 pp	17% ▲ 1 pp	10% ▼ -1 pp	1% ▲ 0 pp	6% ▲ 2 pp
All talent	87% ▼ -2 pp	13% ▲ 2 pp	8% ▲ 1 pp	0% ▼ -1 pp	5% ▲ 2 pp
CTE - Human Services - Field	89% ▼ -5 pp	11% ▲ 5 pp	8% ▲ 5 pp	0% ▼ -1 pp	3% ▲ 1 pp
CTE - HST - Field	94% ▼ -2 pp	6% ▲ 2 pp	4% ▲ 1 pp	0% ▲ 0 pp	2% ▲ 1 pp
CTE - Engineering, Manufacturing, and Technology - Field	94% ▼ -3 pp	6% ▲ 3 pp	3% ▲ 1 pp	0% ▲ 0 pp	3% ▲ 2 pp

SOURCE: Gartner TalentNeuron Plan accessed 11/10/2022

Remote work opportunities continued to increase significantly across all career fields over the past 12 months compared to the 12 months prior. Last year, the volume of remote Software Developer roles increased by 276% over the year, and by 226% for other general computer occupations; this year's estimates saw the rate of increase in remote opportunities slow moderately, but still rising faster than the overall rate of increase in postings overall.

Change in Volume of Remote Work Opportunities by Occupation in the MSP Metro, October 2021-2022 Compared to 12 months prior

1. Software Developers, 15,027 (+64%)
2. Computer Occupations, All Other, 8,747 (+50%)
3. Customer Service Representatives, 8,702 (+34%)
4. Marketing Managers, 6,326 (+50%)
5. Management Analysts, 5,644 (+43%)

During the first six months of the COVID-19 pandemic,⁴ 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 2019 and 2020. This reflects the early growing local demand for entry-level healthcare and human services talent, particularly those with at least a two-year degree in a related area of study.

Throughout 2021, 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 spiked in volume considerably in early 2021. Between October 2021 and 2022, there were significant increases in demand for talent in a variety of Human Services career pathways, including public safety and public research. Additionally, construction and landscaping talent saw increased demand, along with manufacturing roles such as CNC Machine Operators. The top occupation in demand across all Career Fields was Heavy and

⁴ March 15-June 15, 2020.

Tractor-Trailer Truck Drivers with nearly 25,000 unique job postings in the region between October 2021 and 2022, followed closely by Registered Nurse job postings.

Top Emerging and High Demand Growth Occupations in the MSP Metro Minnesota, October 2021-2022 (by increase in total postings)

1. Survey Researchers, 331 (+1,476%)
2. Firefighters, 239 (+583%)
3. Roofers, 69 (+527%)
4. Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers, 406 (+302%)
5. CNC Machine Operators, 1,439 (+296%)

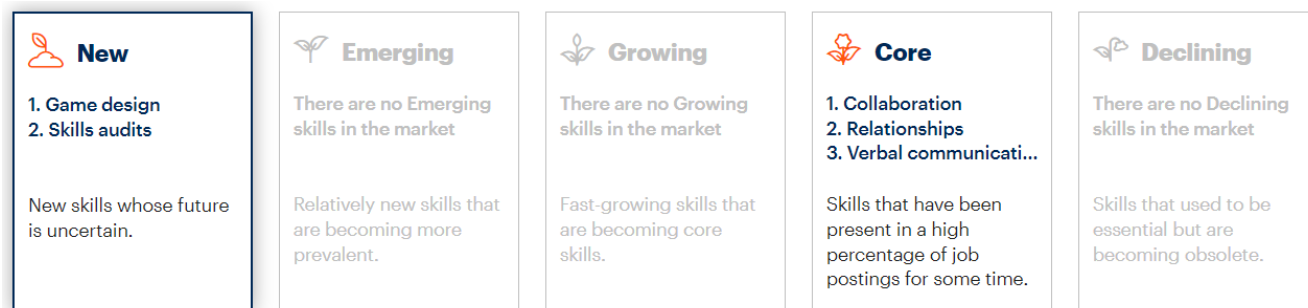
Top Occupations in Growing Demand in the MSP Metro, October 2021-2022 (by volume of total job postings)

1. Heavy and Tractor-Trailer Truck Drivers (+76%)
2. Registered Nurses (25%)
3. Software Developers (+0%)
4. Computer Occupations, All Other (+0%)
5. Stock Clerks and Order Fillers (+28%)

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. Assessing experience in terms of skills unearths a person's qualifications and more clearly identifies training needs. It also helps people recognize the abilities and knowledge they don't know they have. For example, servers trying to move beyond a likely transition (bartending, retail sales, and other hospitality jobs) to an aligned transition like public relations specialist, skills tell us where their current qualifications align and where there are gaps. This kind of gap analysis is possible at the occupation level and supports with postsecondary planning, workforce development, and employer talent strategy.

Soft skills have remained core to the skill requirements advertised in online job postings in the MSP Metro over the past 12 months, while product development and supervision skills have also continued to rise in prominence on-trend with observations in 2020 and 2021. Game Design and Skills Audit capabilities are two skillsets that entered into the MSP Metro market newly between October 2021 and 2022. Other skills that entered the market in 2020 and 2021 have not continued to rise in prominence in a marked way, such as Process Improvement, Data Analysis, and Software Engineering—which all rose by 4-5% over the past twelve months.

Top Evolving Skills in MSP Metro, October 2021-2022



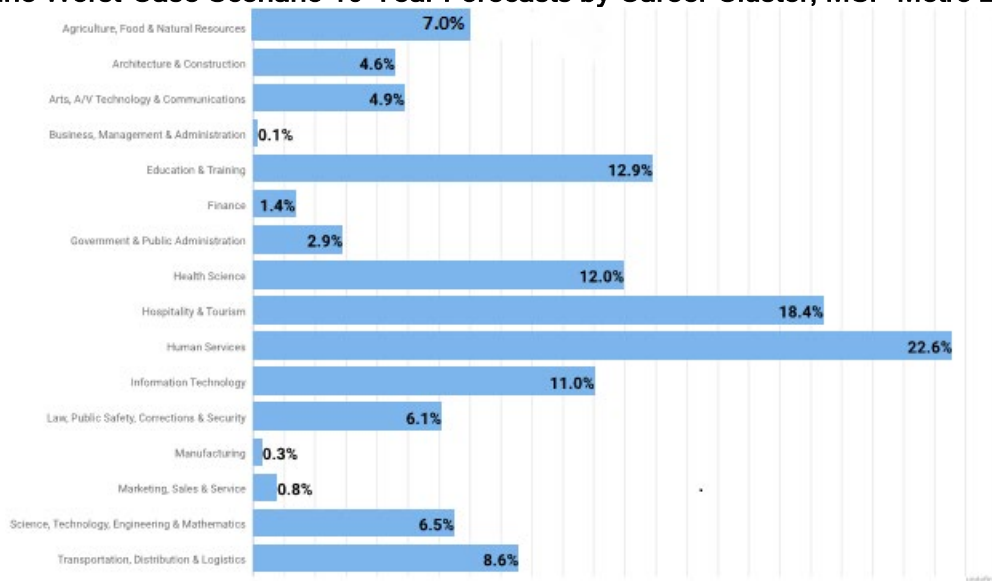
Career Field Insights

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), all are forecast to grow over the next ten years. The clusters expecting the greatest growth are Human Services (22.6%), Hospitality and Tourism (18.4%), Education and Training (12.9%), and Health Science (12.0%). The past two years, Information Technology had ranked in the top three clusters of highest forecasted growth, but as of 2022Q2 it falls in fifth place.⁵

Comparing current baseline forecasts to the same forecasts modeled one year ago, only the Finance Career Cluster is forecasting lower baseline employment growth over ten years than what was estimated last year (but only 0.1 percentage point). All others saw employment forecasts improve.

Baseline Worst-Case Scenario 10-Year Forecasts by Career Cluster, MSP Metro 2022Q2



Cluster forecasts estimated using Chmura, JobsEQ, based on 2022Q2 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. The table below lists statistics about each of the sixteen Career Clusters sorted by average annual wage, with the highest wage clusters at the top of the table.

Career Cluster	Employment	Avg Ann Wages	Job Ads	Baseline 10-Year Forecasted Empl Change	Ann Empl Growth	Ann Total Demand
Science, Technology, Engineering & Mathematics	31,521	\$107,200	4,930	6.5% (+)	197	2,437
Information Technology	78,871	\$99,400	11,365	11.0% (+)	826	6,590

⁵ 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
Finance	88,638	\$89,900	6,761	1.4%	118	7,520
Health Science	164,131	\$79,900	14,750	12.0% (+)	1,864	14,867
Government & Public Administration	15,855	\$76,400	898	2.9% (+)	43	1,422
Law, Public Safety, Corrections & Security	47,550	\$76,100	2,341	6.1% (+)	279	4,823
Business, Management & Administration	343,279	\$71,600	22,698	0.1% (+)	33	34,942
Architecture & Construction	104,856	\$67,000	2,687	4.6% (+)	463	10,864
Arts, A/V Technology & Communications	31,989	\$64,000	1,477	4.9% (+)	152	3,421
Education & Training	105,202	\$63,500	4,618	12.9% (+)	1,284	11,079
Agriculture, Food & Natural Resources	68,191	\$61,700	3,537	7.0% (+)	477	2,537
Marketing, Sales & Service	192,682	\$60,600	16,158	0.8% (+)	142	23,648
Transportation, Distribution & Logistics	133,529	\$52,800	5,417	8.6% (+)	1,097	16,766
Manufacturing	147,417	\$52,000	7,716	0.3% (+)	34	15,409
Human Services	120,848	\$42,700	4,964	22.6% (+)	2,483	18,180
Hospitality & Tourism	188,014	\$34,700	13,068	18.4% (+)	3,193	35,871
Total - All Occupations	1,812,189	\$64,300	120,901	7.0% (+)	12,788	210,706

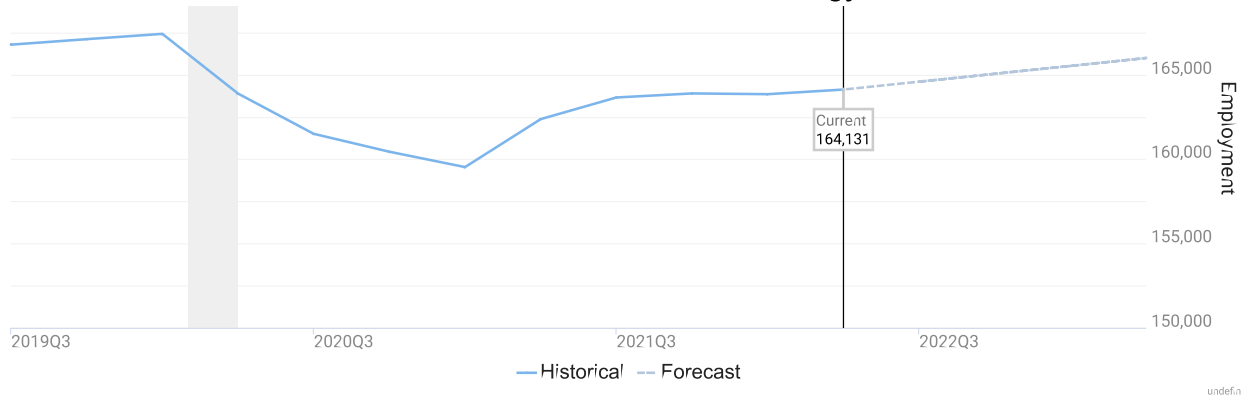
*Cluster forecasts estimated using Chmura, JobsEQ, based on 2022Q2 employment data. All clusters are distinct occupations except for Agriculture, Food, and Natural Resources, which overlaps with other clusters. (+) indicates an improved forecast from 2020Q1 estimates.

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, Health Science Technology employment is forecast to grow by 1.1% annually. Wages sit at about \$79,900 on average in this field in the Metro, and roles are equally concentrated in the region as compared to the national average.

Baseline 3-Year Forecast for Health Science Technology Careers, MSP Metro 2022Q2



Top Ten Health Science Technology Occupations by Employment Volume in the MSP Metro, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Registered Nurses	37,209	\$87,600	1.05	-468	2,227	0.7%
Home Health Aides	16,125	\$30,900	1.49	-2,169	2,417	2.7%
Nursing Assistants	13,577	\$39,500	0.90	-1,441	1,769	0.7%
Medical Secretaries and Administrative Assistants	8,416	\$45,400	1.11	148	984	0.7%
Licensed Practical and Licensed Vocational Nurses	7,345	\$53,500	1.00	-1,089	630	0.8%
Medical Assistants	6,034	\$45,900	0.70	150	824	1.5%
Medical and Health Services Managers	5,423	\$114,700	1.04	255	598	2.7%
Pharmacy Technicians	4,619	\$44,700	0.92	80	337	0.2%
Pharmacists	3,708	\$130,400	1.01	-17	123	-0.3%
Dental Assistants	3,508	\$55,700	0.86	-73	451	0.9%
Remaining Component Occupations	58,167	\$107,700	1.02	2,415	4,450	1.1%
Health Science (CTE Cluster)	164,131	\$79,900	1.00	-2,208	14,867	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 (28.3%, down 0.8 percentage points from 2021Q1) or Offices of Physicians (14.4%). 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, 2022Q2, MSP Metro

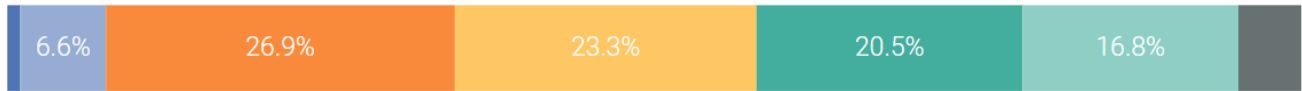
Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
General Medical and Surgical Hospitals	28.3%	46,470	31,519	2,649	34,168
Offices of Physicians	14.4%	23,651	17,200	2,437	19,637
Individual and Family Services	7.1%	11,593	14,462	4,612	19,073
Nursing Care Facilities (Skilled Nursing Facilities)	6.1%	10,027	9,367	-160	9,207
Offices of Dentists	5.0%	8,204	7,121	784	7,905
Home Health Care Services	4.8%	7,844	7,309	1,640	8,949
Offices of Other Health Practitioners	4.0%	6,637	4,963	1,461	6,425
Outpatient Care Centers	3.8%	6,262	4,806	1,281	6,087
Health and Personal Care Retailers	2.7%	4,412	2,602	-131	2,471
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	2.7%	4,396	4,905	1,072	5,978
Other Professional, Scientific, and Technical Services	2.1%	3,507	3,004	454	3,458
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	2.1%	3,501	3,562	514	4,076
Employment Services	1.8%	2,970	2,433	325	2,758
Management of Companies and Enterprises	1.7%	2,856	2,096	56	2,152
Insurance Carriers	1.4%	2,285	1,499	347	1,846
Colleges, Universities, and Professional Schools	1.2%	1,942	1,372	134	1,506
Elementary and Secondary Schools	1.2%	1,899	1,290	288	1,577
Other Ambulatory Health Care Services	1.1%	1,819	1,671	627	2,298
Medical and Diagnostic Laboratories	0.9%	1,470	1,254	343	1,596
Specialty (except Psychiatric and Substance Abuse) Hospitals	0.7%	1,094	866	365	1,231
All Others	6.9%	11,292	8,472	582	9,054

Career Field Demographics

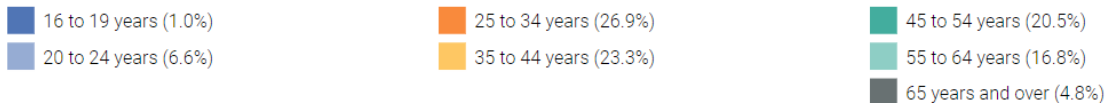
The Health Science Technology field is predominantly female (77.9%, no change) and white (76.4%, a decrease of 0.6 percentage points from 2021Q1 estimates). About 4.3% of the Health Science Technology workforce is Hispanic or Latinx (up 0.2 percentage points from the prior year). Half of the Health Science Technology workforce in the region (50.2%) is between the ages of 25 and 44—a larger share in this age group than seen at the statewide level.

Age :

Twin Cities 7-County Metro



Minnesota

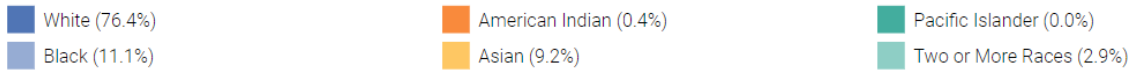


Race :

Twin Cities 7-County Metro

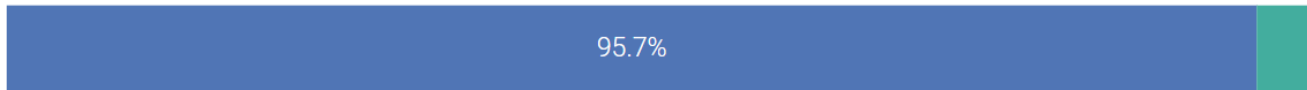


Minnesota

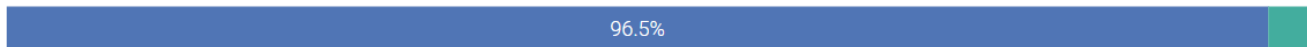


Ethnicity :

Twin Cities 7-County Metro



Minnesota



Gender :

Twin Cities 7-County Metro



Minnesota



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, 18.5% of the Health Science Technology workforce hold a two-year degree and 12.1% completed some college (such as a certificate), or 30.6% in all, compared to about 31.3% of local jobs in Health Science Technology that typically require a certificate or two-year degree. Compared to last year, the Health Science Technology workforce became more highly educated, particularly with Bachelor's degrees (up 0.5 percentage points) and Master's degrees (up 0.7 percentage points). However, the mix of local jobs maintained a similar mix of education and training requirements.

Educational Attainment

Twin Cities 7-County Metro



Minnesota



< High School (1.8%)

Some College (12.1%)

Four-Year (32.7%)

High School (9.0%)

Two-Year (18.5%)

Master's (12.2%)

PhD (13.8%)

Education and Training Requirements

Twin Cities 7-County Metro



Minnesota



Short-term OJT, no exp, no award (11.9%)

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

2-year degree or certificate (31.3%)

Moderate-term OJT, no exp, no award (8.5%)

Previous work experience, no award (0.0%)

Bachelor's degree (29.8%)

Postgraduate degree (18.0%)

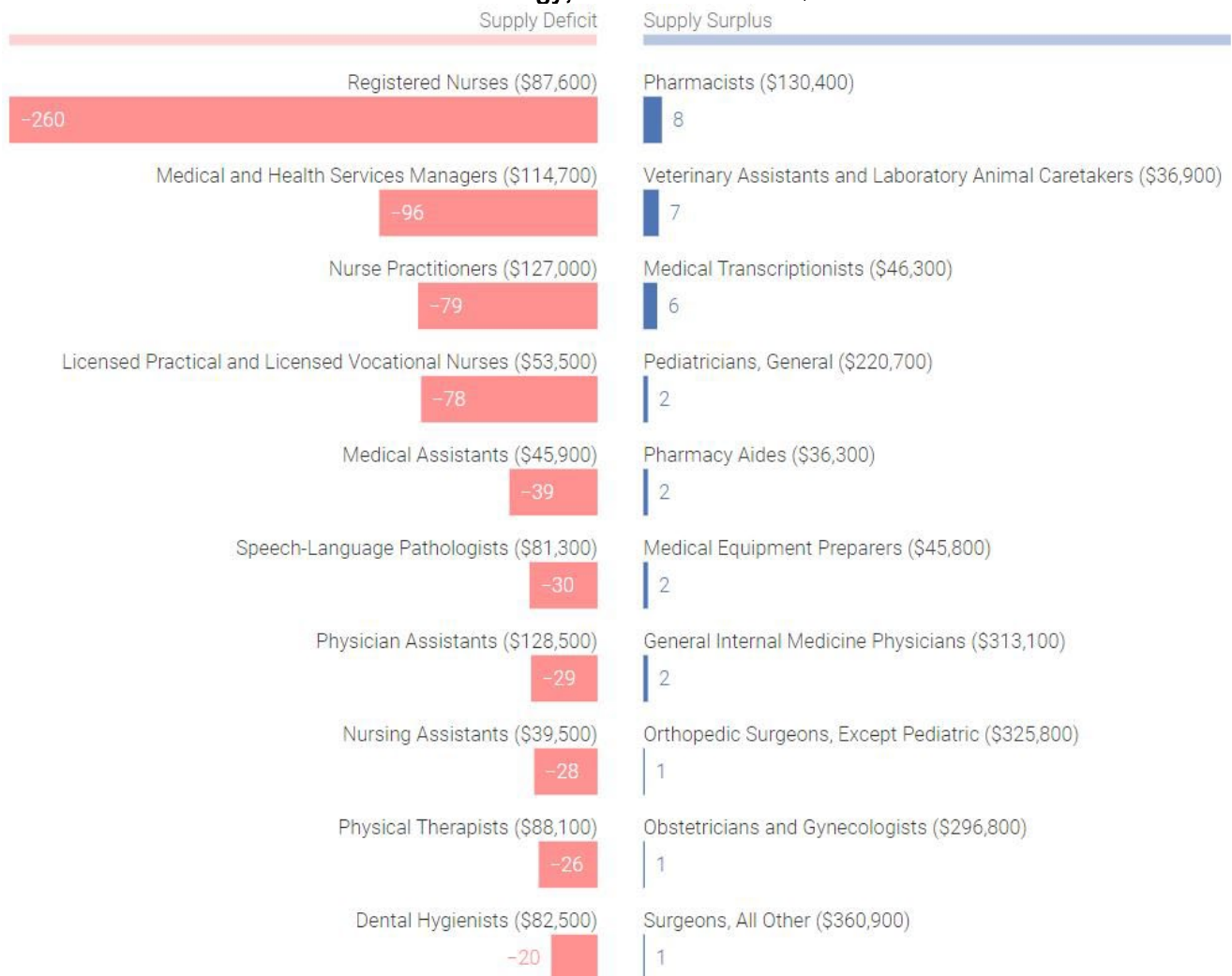
Occupation Gaps

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 continue to be the occupation of second-highest annual shortages in the MSP Metro. 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 two-year and four-year levels. The occupations of highest forecasted shortage have remained consistent with analysis the past two years.

Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Health Science Technology, MSP Metro 2022Q2

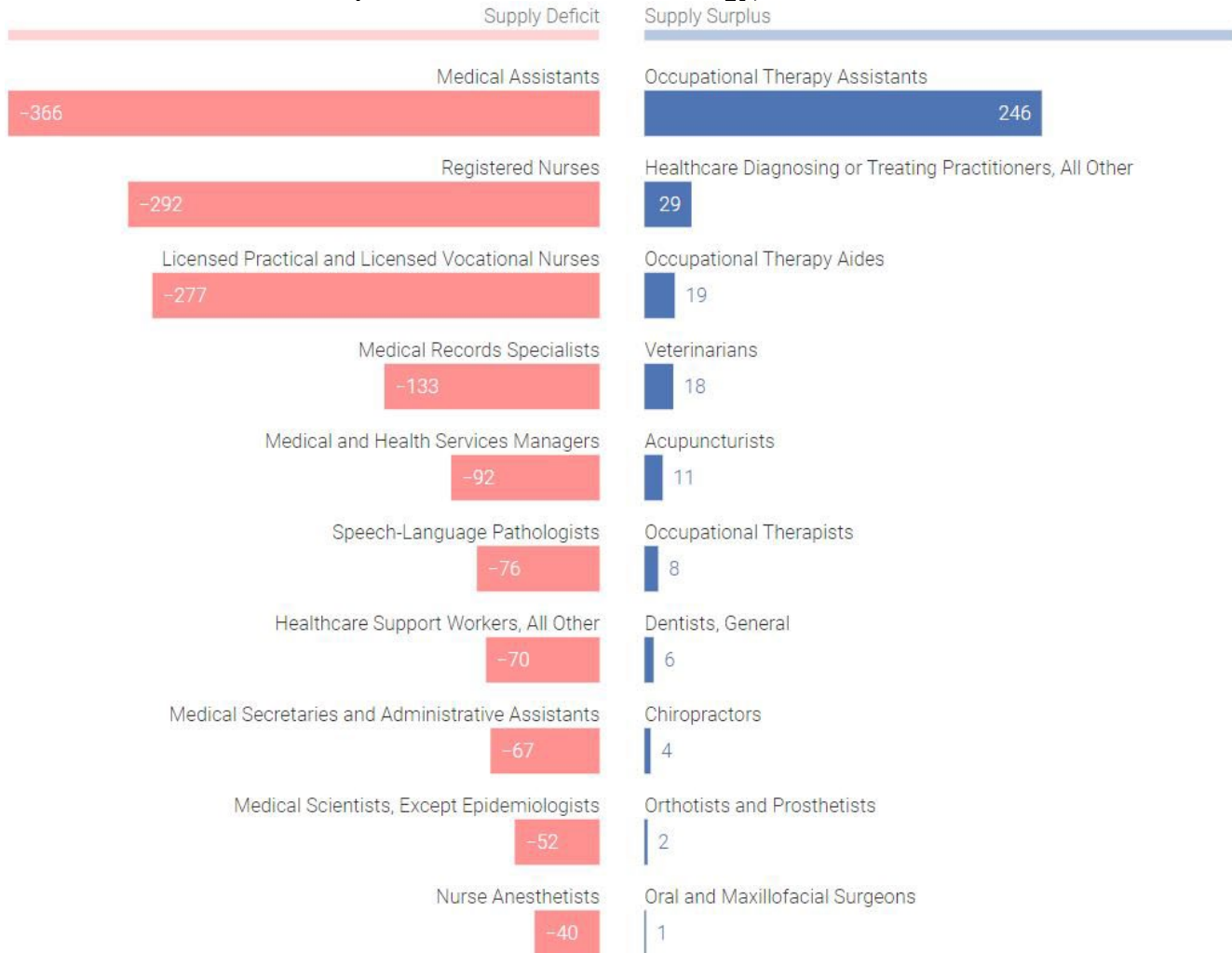


Award Gaps

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. However, the region has made some significant strides in closing the largest award gap, for Registered Nurses; last year, local programs underproduced about 605 graduates needed for entry into Registered Nurse roles in the MSP Metro, but as of 2022Q2 the graduate award gap has fallen to 292 short of current needs. Medical Assistants are now the largest award gap in the MSP Metro at a shortfall of 366 graduates annually. Several occupations that typically require a certificate or two-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 2022Q2



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.

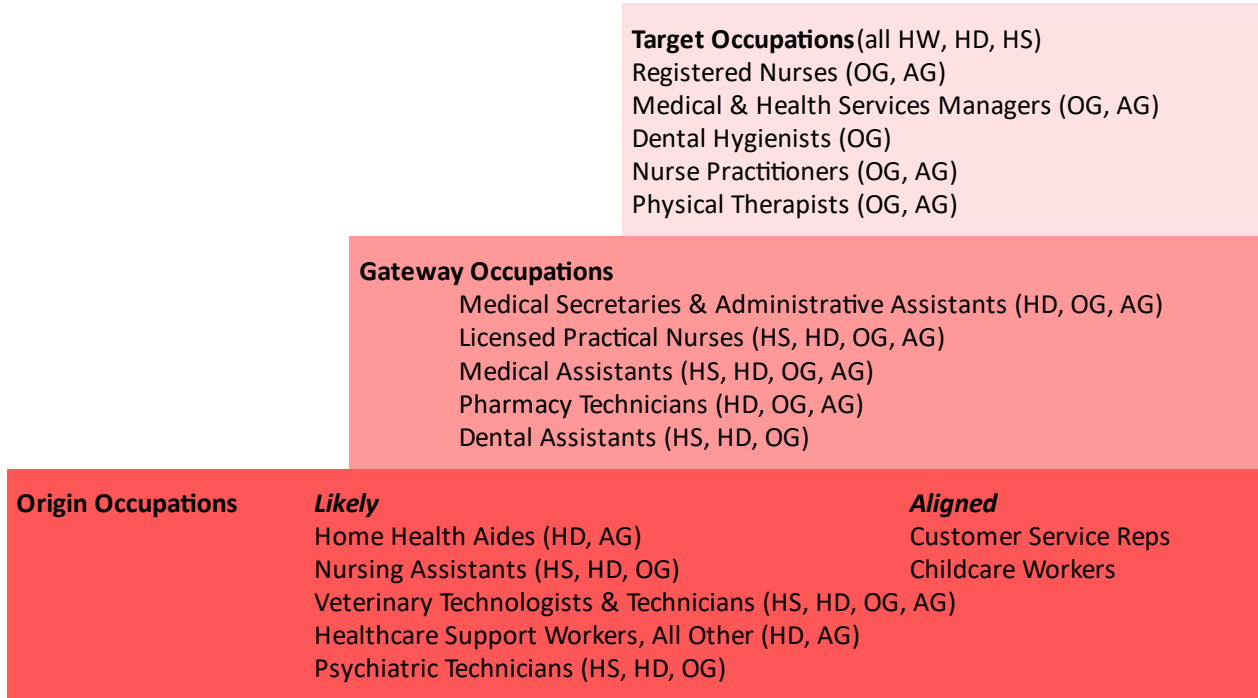
Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without four-year degrees. Below are a few Origin Occupations that are likely entrypoints into Health Science Technology locally, or aligned opportunities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

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 (\$64,300 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.

Target Occupations refer to high-wage occupations that pay at or above the region’s average wage (\$64,300 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.

Origin-to-Gateway-to-Target Occupations for Health Science Technology, MSP Metro 2022Q2



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

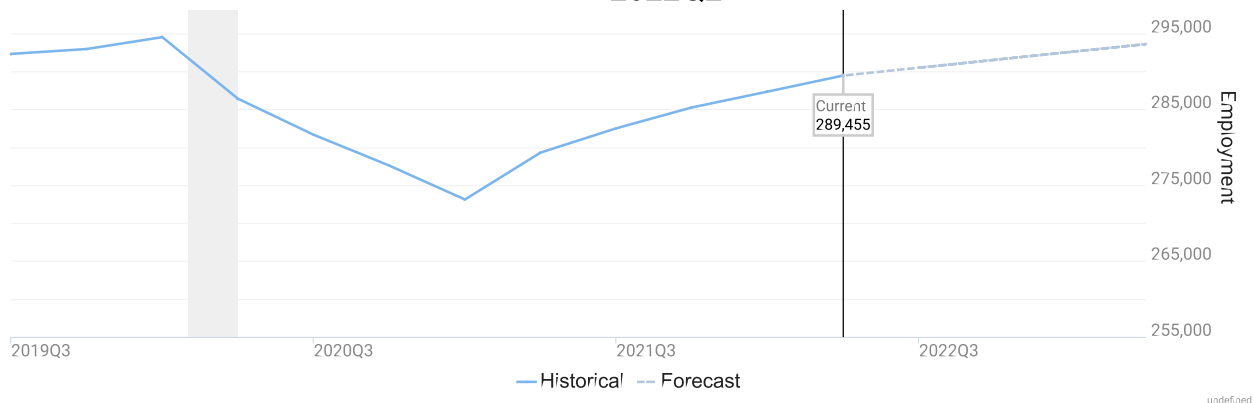
High Location Quotient (LQ) Occupations for Health Science Technology, MSP Metro 2022Q2

- 1) Bioengineers & Biomedical Engineers (2.91)
- 2) Genetic Counselors (2.28)
- 3) Dermatologists (1.92)
- 4) Orthotists & Prosthetists (1.89)
- 5) Nurse Anesthetists (1.88)

HUMAN SERVICES

Over the next three years, Human Services employment is forecast to grow by 1.4% annually—the most of all the six career fields. Human Services roles pay an average annual wage of \$65,400 and have high replacement demand needs in the MSP Metro region. A total of 180,512 new professionals will be needed in this field between now and 2027 to meet total demand for talent.

Baseline Worst-Case Scenario 3-Year Forecast for Human Services Careers, MSP Metro 2022Q2



Top Ten Human Services Occupations by Employment Volume in the MSP Metro, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Personal Care Aides	45,681	\$30,900	1.49	8,483	8,199	2.7%
Teaching Assistants, Except Postsecondary	17,157	\$38,500	1.25	-837	1,829	1.1%
Elementary School Teachers, Except Special Education	12,761	\$73,000	0.83	-276	1,062	1.0%
Childcare Workers	10,403	\$31,100	1.11	-1,268	1,566	0.9%
Lawyers	10,113	\$139,200	1.05	-279	558	0.7%
Secondary School Teachers, Except Special and Career/Technical Education	9,963	\$68,000	0.85	-133	806	1.0%
Security Guards	8,571	\$38,300	0.68	-1,010	1,253	1.1%
Preschool Teachers, Except Special Education	6,777	\$38,500	1.27	-646	836	1.8%
Social and Human Service Assistants	6,459	\$43,700	1.35	-159	893	1.6%
Hairdressers, Hairstylists, and Cosmetologists	6,105	\$37,200	0.94	-1,260	851	2.2%
Remaining Component Occupations	155,465	\$65,400	0.96	-4,368	17,569	1.1%
Human Services (CTE Field)	289,455	\$57,600	1.03	-1,747	35,427	1.4%

“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 Human Services roles are employed by Elementary and Secondary Schools (21.3%) or Individual and Family Services (13.2%, up one percentage point from the prior year’s estimates). These two industries account for the majority of talent demand over the next ten years, collectively needing 132,602 new Human Services professionals to fill replacement and growth demand needs through 2032—a significant share of the total talent needed in this field.

Human Services Field Employment by Industry, 2022Q2, 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	21.3%	61,792	54,030	6,706	60,737
Individual and Family Services	13.2%	38,287	56,844	15,021	71,865
Colleges, Universities, and Professional Schools	6.2%	17,806	17,079	1,157	18,236
Executive, Legislative, and Other General Government Support	5.0%	14,577	12,997	518	13,515
Child Care Services	4.2%	12,172	14,337	1,392	15,729
Legal Services	4.2%	12,023	8,967	208	9,175
Personal Care Services	3.7%	10,678	12,969	3,203	16,171
Religious Organizations	3.4%	9,891	10,869	704	11,573
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	3.1%	9,043	11,848	1,238	13,086
Home Health Care Services	2.7%	7,928	11,802	1,799	13,601
Other Schools and Instruction	2.7%	7,832	10,493	2,484	12,977
Justice, Public Order, and Safety Activities	2.6%	7,399	6,498	-8	6,490
Investigation and Security Services	2.0%	5,687	7,776	874	8,650
Other Amusement and Recreation Industries	1.7%	5,058	9,024	2,205	11,229
Administration of Human Resource Programs	1.6%	4,748	4,080	-190	3,891
Offices of Other Health Practitioners	1.5%	4,414	4,153	673	4,826
Management of Companies and Enterprises	1.3%	3,841	3,374	117	3,491
Other Residential Care Facilities	1.2%	3,528	4,044	-189	3,855
General Medical and Surgical Hospitals	1.1%	3,320	3,271	144	3,415
Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	1.1%	3,277	4,973	932	5,905
All Others	15.9%	46,157	50,161	5,239	55,401

Career Field Demographics

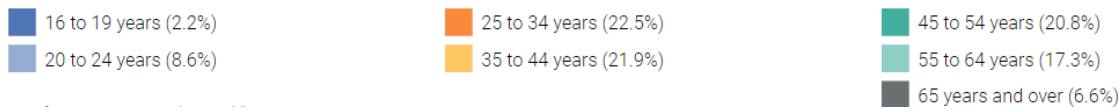
The Human Services field is predominantly female (65.2%) and white (79.6%, a drop of one percentage point from the prior year). Diversity increased in this sector, as the share of Human Services talent in the MSP Metro that are BIPOC by race increased by one percentage point to 20.4% as of 2022Q2—owing most to the rise in local Human Services talent that identifies with two or more races. Nearly 22% of the Human Services workforce in the region is between the ages of 25 and 34.

Age :

Twin Cities 7-County Metro



Minnesota



Race :

Twin Cities 7-County Metro

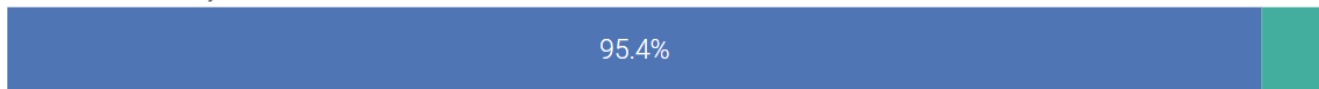


Minnesota



Ethnicity :

Twin Cities 7-County Metro



Minnesota



Gender :

Twin Cities 7-County Metro



Minnesota

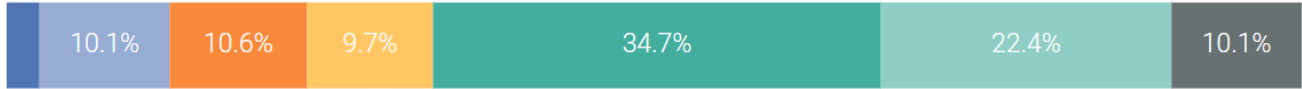


Educational Attainment and Requirements

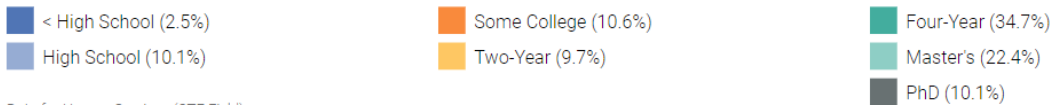
The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this occupation(s) in aggregate. In general, the MSP Metro Human Services workforce is overskilled for the typical credentials of entry-level positions. For example, 2.5% of the Human Services workforce has no diploma at all, and 10.1% hold a high school diploma as their highest credential. In contrast, about 44.9% 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 :

Twin Cities 7-County Metro

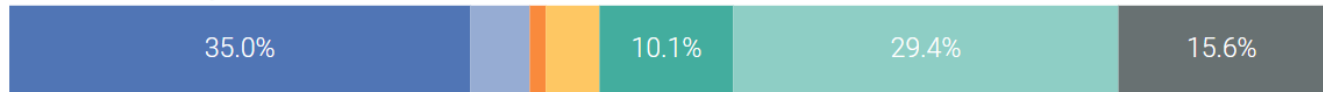


Minnesota

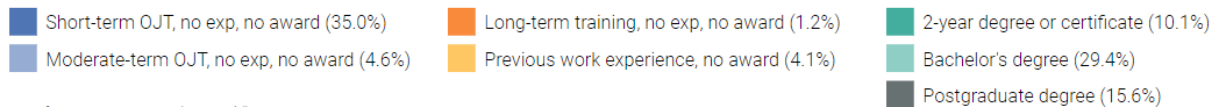
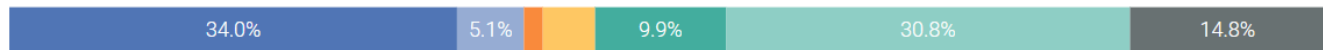


Education and Training Requirements :

Twin Cities 7-County Metro



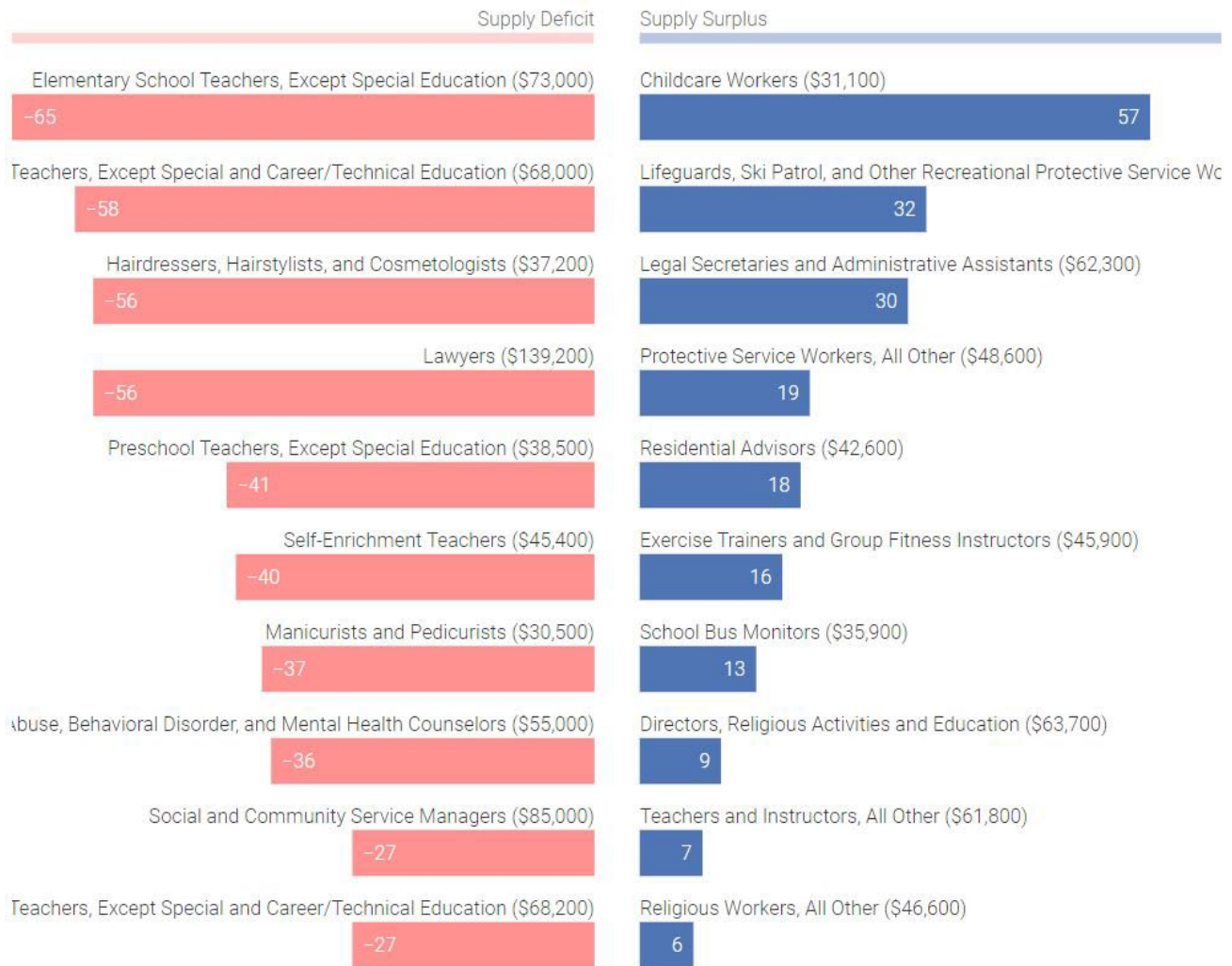
Minnesota



Occupation Gaps

The chart below shows the potential average annual gaps over 10 years. In the MSP Metro Human Services workforce space, teachers are the top occupations of shortage. 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 local teacher training programs. This shortage was acutely created more severe by the pandemic's upset of the teaching profession.

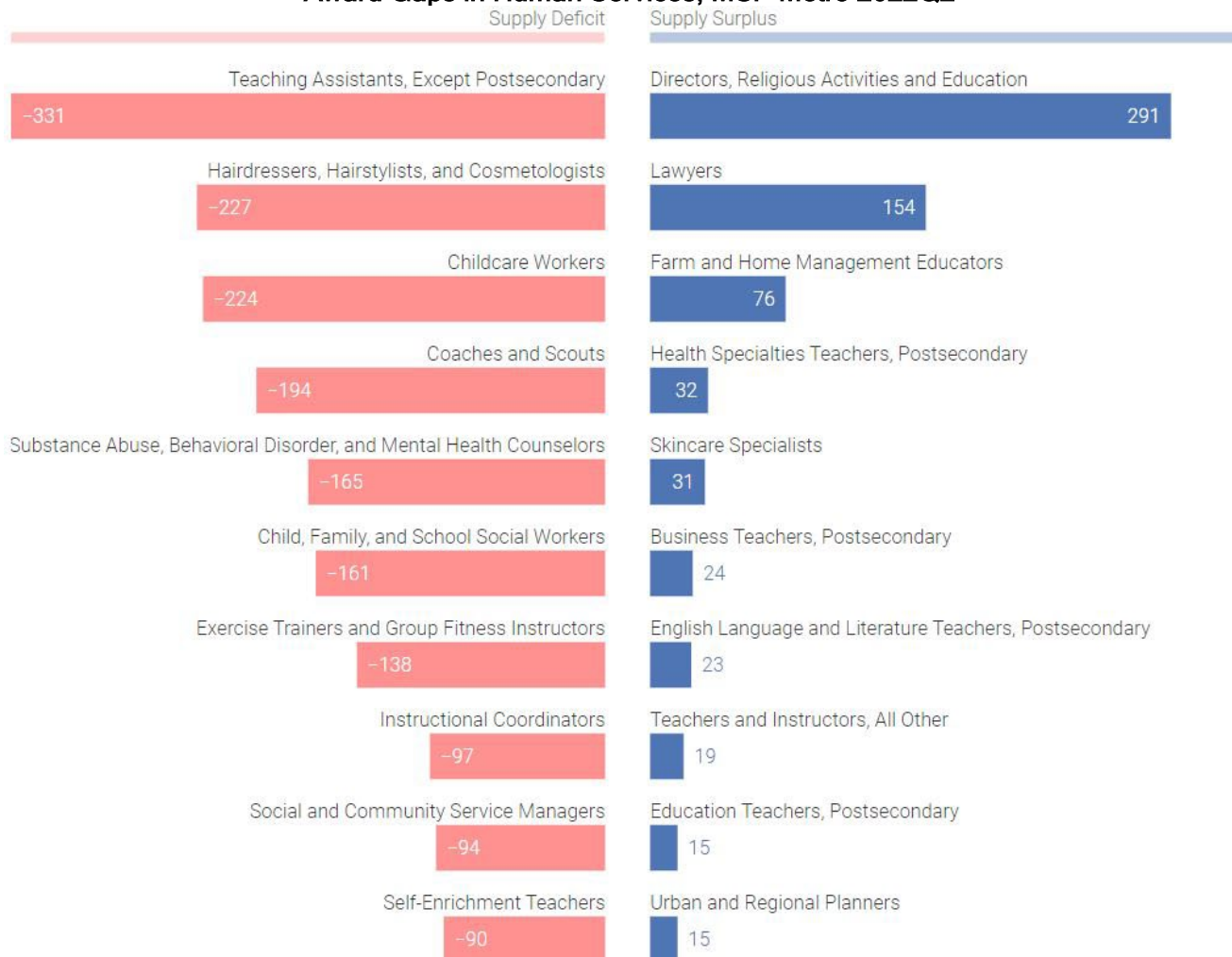
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Human Services, MSP Metro 2022Q2



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—many of which have changed since the prior year’s evaluation of graduate talent supplies. 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 331 graduates annually that are needed to fill Teaching Assistant positions open with employers based in the 7-county MSP Metro. Second, there are about 227 fewer awards conferred for Hairdressers, Hairstylists, and Cosmetologists locally than what is likely needed to support demand, when we compare volumes seen at a national level. Childcare Workers, Coaches, Mental Health Counselors, and School Social Workers are also seeing significant shortages of graduate completions to meet the need for new talent to enter these professional fields. 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 2022Q2



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 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 four-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.

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 (\$64,300 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.

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$64,300 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.

Origin-to-Gateway-to-Target Occupations for Human Services, MSP Metro 2022Q2

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

Elementary School Teachers
Lawyers
Secondary School Teachers
Middle School Teachers
Compliance Officers (AG)

Gateway Occupations

Social & Human Service Assistants (HD)
Self-Enrichment Teachers (HD, OG, AG)
Substance, Behavioral, & Mental Health Counselors (HS, HD, OG, AG)
Child, Family, & School Social Workers (HS, HD, OG, AG)
Paralegals & Legal Assistants (HS, HD, OG, AG)

Origin Occupations

Likely

Personal Care Aides (HD, AG)
Teaching Assistants (HS, HD, AG)
Childcare Workers (HD, AG)
Security Guards (HD, AG)
Preschool Teachers (HS, HD, OG, AG)

Aligned

Retail Sales Workers
Secretaries
Cashiers
Cooks
Customer Service Reps

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

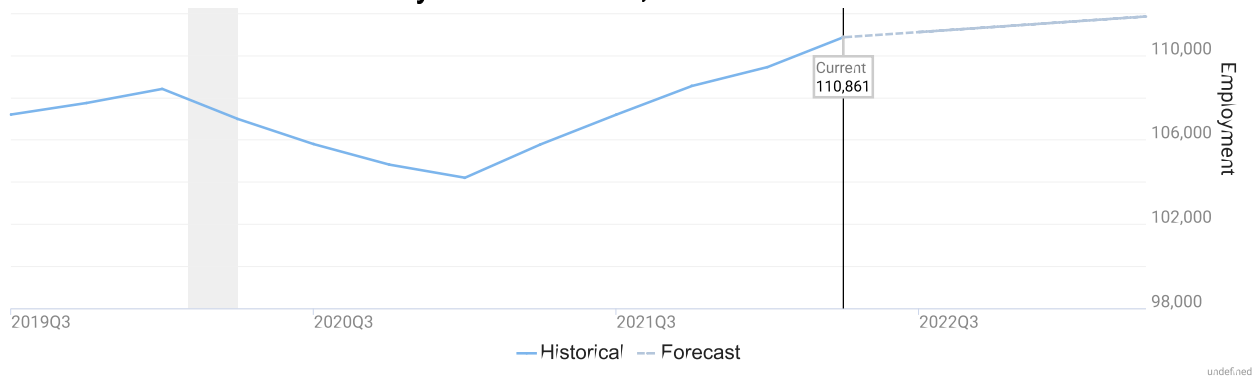
High Location Quotient (LQ) Occupations for Human Services, MSP Metro 2022Q2

- 1) Special Education Teachers, Preschool (2.77)
- 2) Area, Ethic, & Cultural Studies Teachers, Postsecondary (2.04)
- 3) Court, Municipal, & License Clerks (2.03)
- 4) Social Work Teachers, Postsecondary (1.98)
- 5) Social Workers, All Other (1.92)

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. This field saw employment grow by about 9,000 workers between 2021Q1 and 2022Q2, exceeding forecasted growth and bringing current employment in this field beyond pre-pandemic levels. Over the next three years, Arts, Communications, and Information Systems Field employment is forecast to grow by 0.8% annually, an improvement from the estimated 0.4% annual growth in 2021Q1. Careers in this field pay an average annual wage of \$89,200, and roles are more concentrated in the MSP Metro than a typical community nationwide (LQ 1.28).

Baseline Worst-Case Scenario 3-Year Forecast for Arts, Communications, and Information Systems Careers, MSP Metro 2022Q2



Top Ten Arts, Communications, and Information Systems Occupations by Employment Volume in the MSP Metro, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Software Developers	31,317	\$113,700	1.54	9,107	2,971	1.8%
Computer Systems Analysts	10,745	\$103,700	1.74	-787	767	0.2%
Computer User Support Specialists	9,060	\$59,800	1.15	-26	706	0.5%
Computer Network Support Specialists	5,157	\$75,700	2.46	-330	403	0.5%
Computer Occupations, All Other	4,732	\$91,100	0.91	-73	364	0.4%
Graphic Designers	4,165	\$64,100	1.34	-432	370	-0.1%
Network and Computer Systems Administrators	4,027	\$93,800	1.06	-463	266	0.2%
Printing Press Operators	3,831	\$46,000	2.19	-697	326	-1.5%
Computer Network Architects	2,599	\$121,800	1.26	-35	160	0.2%
Writers and Authors	2,398	\$67,700	1.30	-67	250	0.7%
Remaining Component Occupations	32,826	\$77,700	1.09	-1,957	3,376	0.8%
Arts, Communications, & Information Systems (CTE Field)	110,861	\$89,200	1.28	4,242	9,958	0.8%

"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 (15.8%) or Management of Companies and Enterprises organizations (9.6%). 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, 2022Q2, MSP Metro

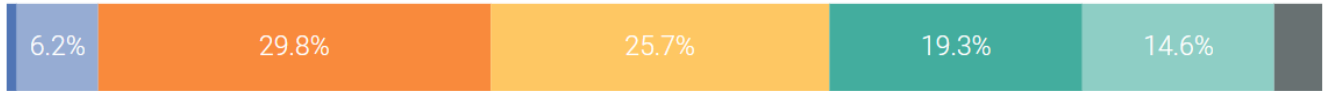
Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Computer Systems Design and Related Services	15.8%	17,557	13,813	4,106	17,919
Management of Companies and Enterprises	9.6%	10,624	7,736	255	7,990
Printing and Related Support Activities	4.8%	5,304	5,052	-1,113	3,939
Independent Artists, Writers, and Performers	4.3%	4,795	4,948	511	5,459
Insurance Carriers	3.7%	4,100	3,021	382	3,403
Software Publishers	3.7%	4,076	3,154	652	3,806
Management, Scientific, and Technical Consulting Services	3.5%	3,923	3,127	666	3,793
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	3.4%	3,813	2,832	308	3,140
Other Professional, Scientific, and Technical Services	3.4%	3,769	3,036	214	3,251
Depository Credit Intermediation	2.8%	3,078	2,191	80	2,271
Employment Services	2.6%	2,900	2,301	382	2,683
Computing Infrastructure Providers, Data Processing, Web Hosting, and Related Services	2.4%	2,643	1,972	275	2,247
Newspaper, Periodical, Book, and Directory Publishers	2.3%	2,504	2,215	-152	2,062
Advertising, Public Relations, and Related Services	2.2%	2,472	2,310	161	2,471
Professional and Commercial Equipment and Supplies Merchant Wholesalers	2.0%	2,235	1,649	132	1,781
Religious Organizations	1.8%	2,024	2,215	163	2,379
Wired and Wireless Telecommunications (except Satellite)	1.6%	1,795	1,559	-225	1,334
Colleges, Universities, and Professional Schools	1.6%	1,769	1,363	43	1,405
Architectural, Engineering, and Related Services	1.4%	1,497	1,093	17	1,110
Performing Arts Companies	1.2%	1,298	1,718	570	2,288
All Others	25.9%	28,685	23,810	2,843	26,652

Career Field Demographics

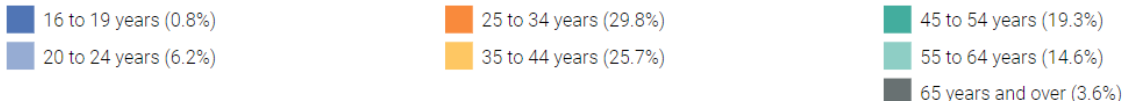
The Arts, Communications, and Information Systems field is predominantly male (73.1%) and about 3 in 4 workers are white (74.5%), though the share of talent that is BIPOC increased by 1.9 percentage points from 2021Q1 estimates. The share of Hispanic and Latinx talent declined by 0.1 percentage points over the past year. Over half of the Arts, Communications, and Information Systems workforce in the region is between the ages of 25 and 44, with more in the younger age brackets as of 2022Q2 compared to one year prior.

Age :

Twin Cities 7-County Metro



Minnesota

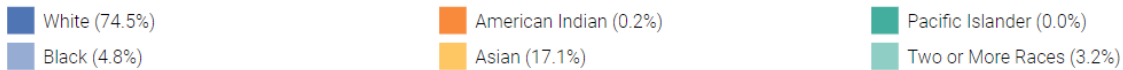


Race :

Twin Cities 7-County Metro

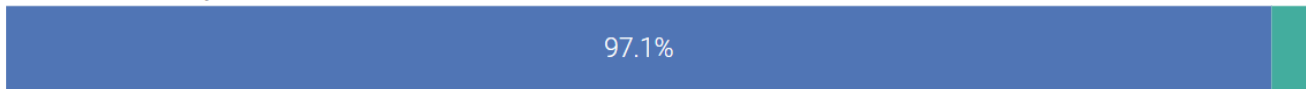


Minnesota

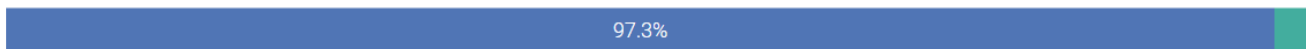


Ethnicity :

Twin Cities 7-County Metro



Minnesota



Gender :

Twin Cities 7-County Metro



Minnesota

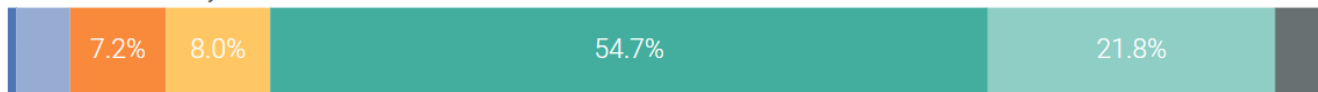


Educational Attainment and Requirements

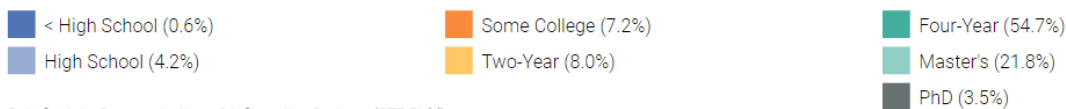
The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this occupation(s) in aggregate. In general, the MSP Metro Arts, Communications, and Information Systems workforce is overskilled for the typical credentials of entry-level positions. Almost 1 in 5 (18.4%) positions in this career field do not require any postsecondary certificate or higher credential. In contrast, only 4.8% of the workforce in this field holds a high school diploma or less.

Educational Attainment :

Twin Cities 7-County Metro



Minnesota

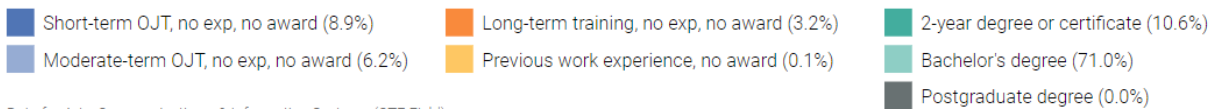


Education and Training Requirements :

Twin Cities 7-County Metro



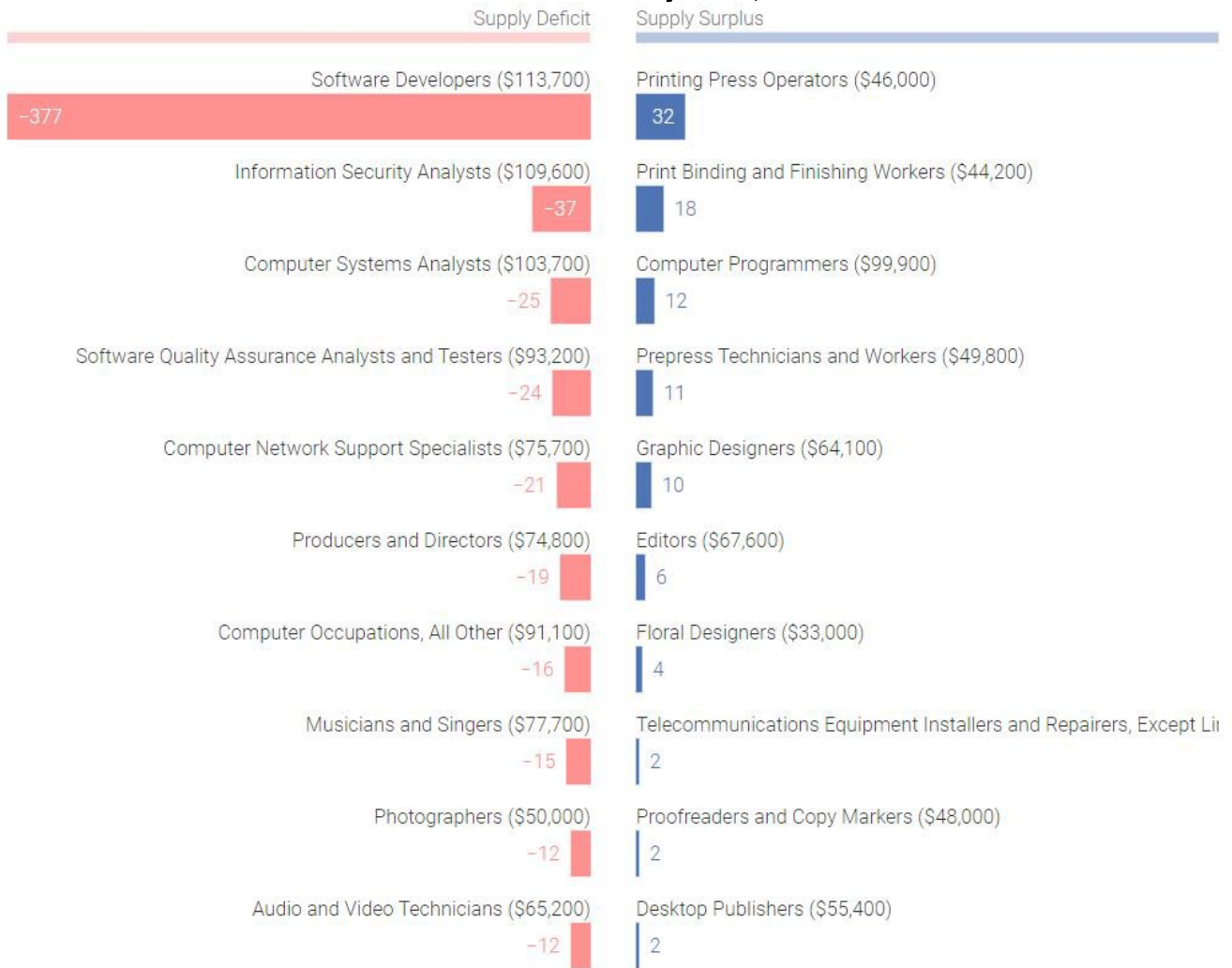
Minnesota



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 377 skilled workers needed annually (averaged over the next ten years) to meet employer demand, increasing from estimates the prior year. 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.

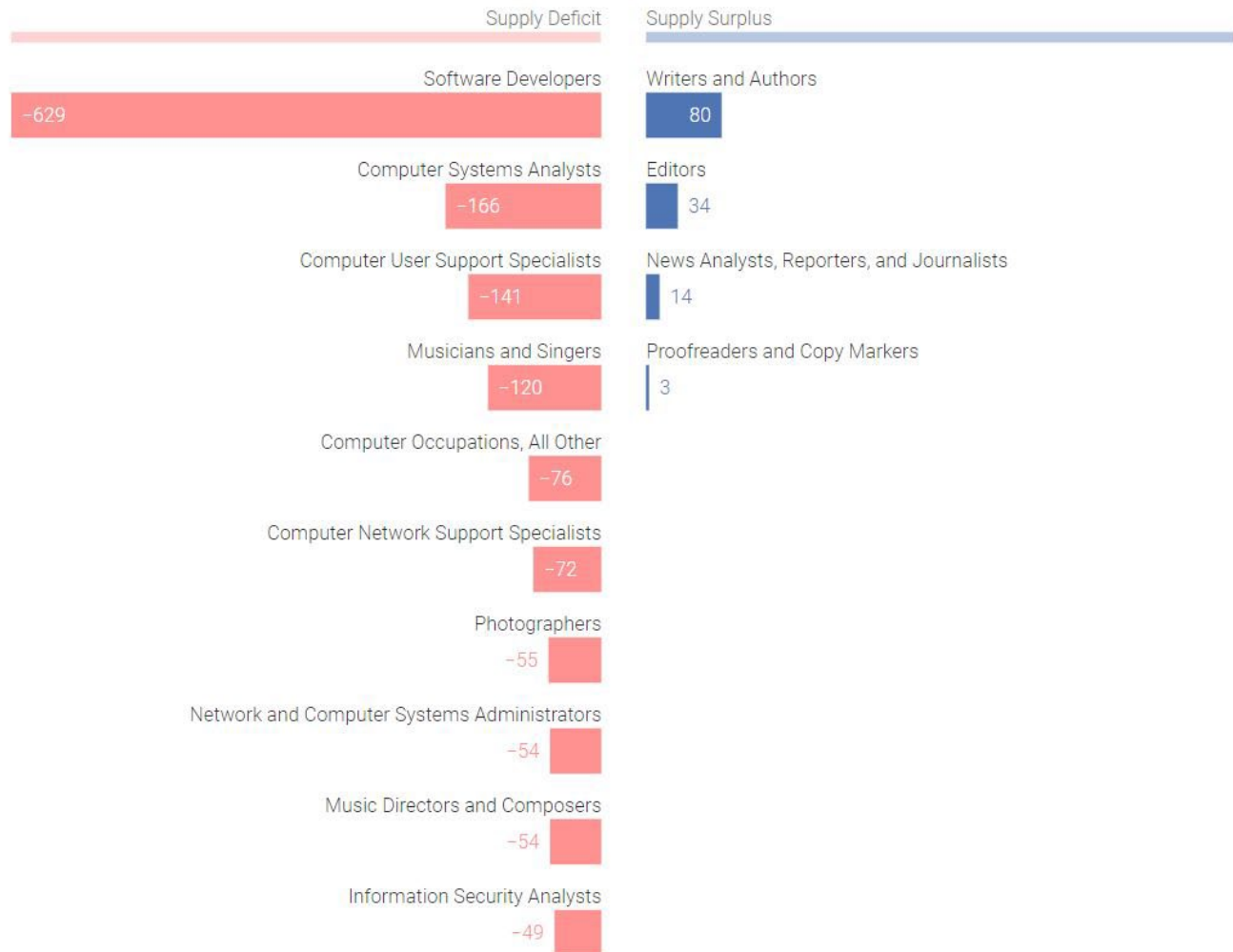
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Arts, Communications. And Information Systems, MSP Metro 2022Q2



Award Gaps

A comparison of the graduate talent pipeline through certificate and other postsecondary degree programs to the current estimated openings by occupation illuminate critical shortages of awards conferred toward Arts, Communications, and Information Systems careers. MSP Metro colleges and universities are underproducing around 629 graduates annually that are needed to fill Software Developer positions open with employers based in the 7-county MSP Metro alone (up from 485 last year). Second, there are about 141 fewer Computer User Support Specialists certified locally than what employers currently need to support demand (down from 248 in 2022Q1), as well as 166 fewer awards conferred for Computer Systems Analysts than needed (down from 201). Several occupations that typically require other industry-recognized credentials or experience include musicians and singers, graphic designers, and composers. The four 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 2022Q2



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.

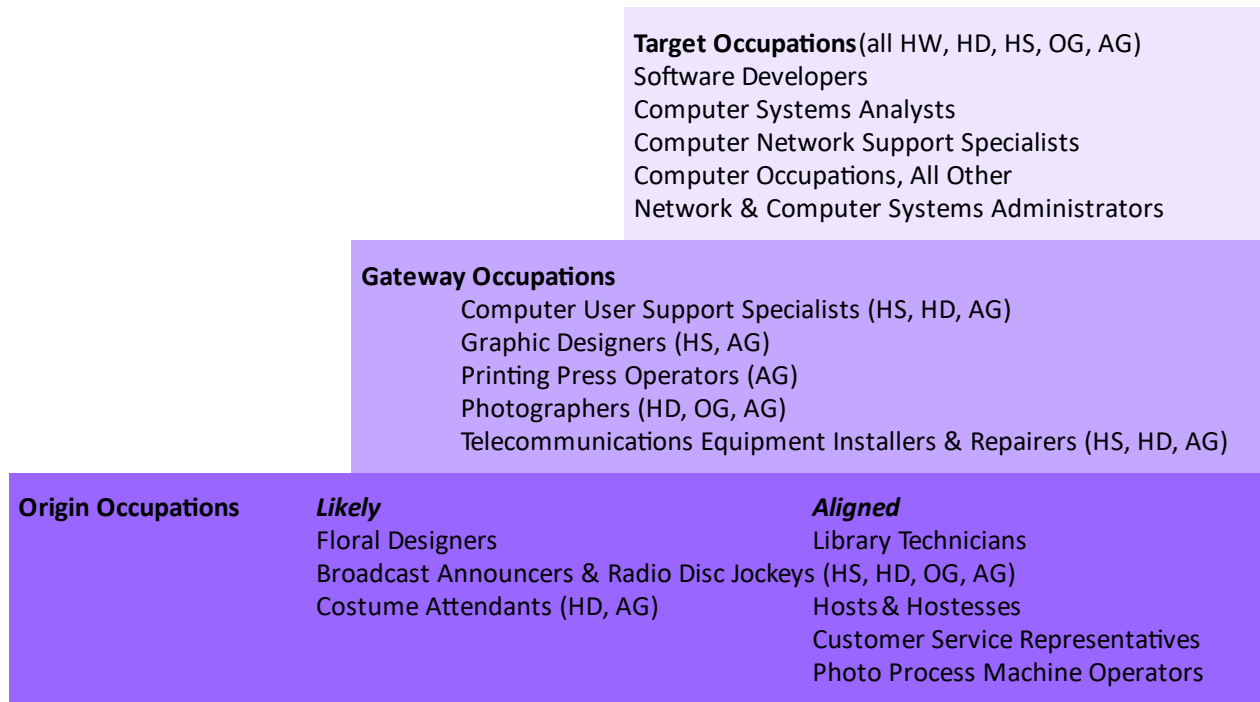
Origin Occupations are roles that are low-wage (<\$37,000 per year) or mid-wage (\$37,000-\$42,000) that have high unemployment locally among workers without four-year degrees. Below are a few Origin Occupations that are likely entrypoints into Arts, Communications, and Information Systems careers locally,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

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 (\$64,300 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.

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$64,300 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.

Origin-to-Gateway-to-Target Occupations for Arts, Communications, and Information Systems, MSP Metro 2022Q2



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

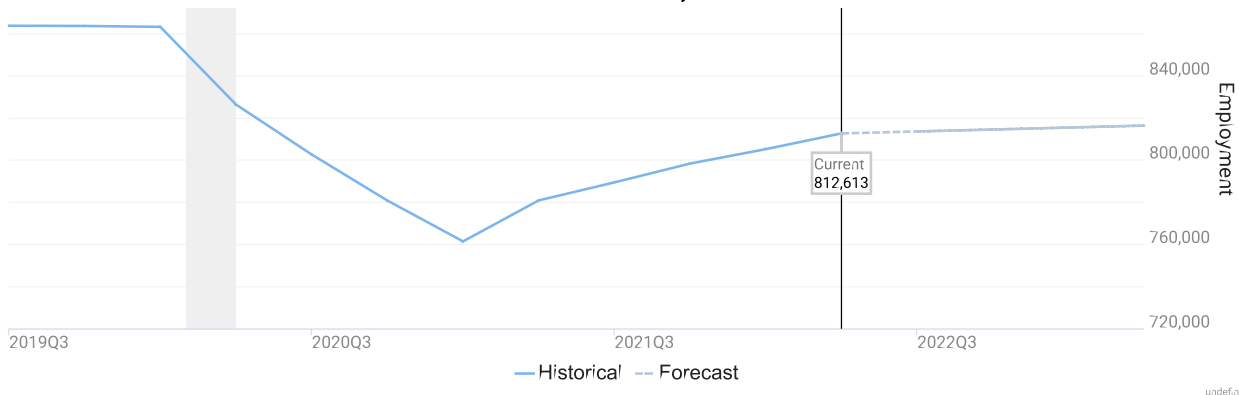
High Location Quotient (LQ) Occupations for Arts, Communications, and Information Systems, MSP Metro 2022Q2

- 1) Computer Network Support Specialists (2.46)
- 2) Print Binding & Finishing Workers (2.34)
- 3) Printing Press Operators (2.19)
- 4) Prepress Technicians & Workers (2.19)
- 5) Computer Systems Analysts (1.74)

BUSINESS, MANAGEMENT, AND ADMINISTRATION

Business, Management, and Administration is a diverse career field with Hospitality and Tourism, Finance, Administration, Human Resources, and Marketing careers. Employment has rebounded significantly, hitting 812,613 employed in Business, Management, and Administration roles as of 2022Q2—an increase of about 51,300 from 2021Q1. Over the next three years Business, Management, and Administration Field employment is forecast to grow by about 0.4% on average annually. Hospitality and Tourism is contributing a large amount to the growth forecast as it has begun rebounding in demand for the past few quarters. Employment remains below the employment volumes pre-pandemic.

Baseline Worst-Case Scenario 3-Year Forecast for Business, Management, and Administration Careers, MSP Metro 2022Q2



Top Ten Business, Management, and Administration Systems Occupations by Employment Volume in the MSP Metro, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Retail Salespersons	43,174	\$34,600	0.97	-5,198	5,911	-0.1%
General and Operations Managers	41,439	\$113,600	1.14	1,470	3,819	0.8%
Customer Service Representatives	36,057	\$45,300	1.09	-1,710	4,284	-0.5%
Office Clerks, General	33,629	\$44,100	1.06	-3,012	3,683	-0.3%
Cashiers	32,999	\$29,500	0.84	-2,984	5,390	-1.1%
Fast Food and Counter Workers	32,570	\$28,900	0.87	-4,676	7,550	1.7%
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	26,719	\$36,000	1.01	-2,016	3,753	0.6%
Stockers and Order Fillers	23,366	\$35,900	0.81	694	3,730	0.3%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	22,566	\$46,700	0.96	-1,304	2,150	-0.9%
Waiters and Waitresses	22,552	\$31,200	0.95	-5,043	4,979	1.7%
Remaining Component Occupations	497,543	\$72,300	1.11	-26,981	56,458	0.5%
Business, Management, & Administration (CTE Field)	812,613	\$62,400	1.02	-50,756	101,705	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).

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 (11.9%, up 1.9 percentage points) and Management of Companies and Enterprises organizations (6.1%). These two industries account for a substantial amount of talent demand over the next ten years. Restaurants will see at least 184,000 separations from roles over the next ten years in addition to growth demand.

Business, Management, and Administration Field Employment by Industry, 2022Q2, MSP Metro

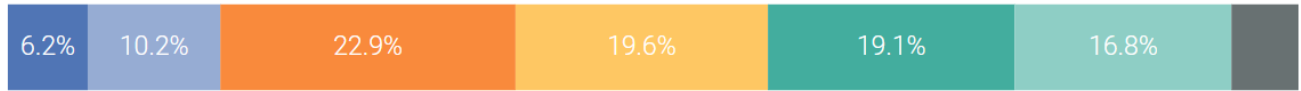
Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Restaurants and Other Eating Places	11.9%	96,921	184,331	21,833	206,163
Management of Companies and Enterprises	6.1%	49,644	45,452	-1,506	43,946
Depository Credit Intermediation	3.7%	30,327	26,509	-2,726	23,783
Insurance Carriers	3.1%	24,840	23,125	684	23,809
Management, Scientific, and Technical Consulting Services	2.7%	21,585	21,191	3,535	24,727
Grocery and Convenience Retailers	2.6%	21,273	31,861	-1,959	29,902
Warehouse Clubs, Supercenters, and Other General Merchandise Retailers	2.3%	18,525	25,775	-1,505	24,270
Services to Buildings and Dwellings	2.0%	16,055	20,279	148	20,427
Agencies, Brokerages, and Other Insurance Related Activities	1.9%	15,195	14,474	656	15,129
Employment Services	1.8%	14,465	16,783	791	17,573
Elementary and Secondary Schools	1.6%	12,781	16,521	549	17,070
Department Stores	1.5%	12,106	16,900	-1,038	15,862
General Medical and Surgical Hospitals	1.4%	11,036	12,995	-203	12,792
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	1.3%	10,948	10,343	-114	10,229
Computer Systems Design and Related Services	1.3%	10,822	10,480	1,596	12,076
Building Material and Supplies Dealers	1.3%	10,639	13,995	-633	13,362
Other Amusement and Recreation Industries	1.3%	10,328	18,575	3,661	22,236
Traveler Accommodation	1.2%	10,156	15,952	2,408	18,360
Activities Related to Real Estate	1.2%	9,929	9,695	162	9,856
Colleges, Universities, and Professional Schools	1.2%	9,858	10,322	-245	10,077
All Others	48.6%	395,180	444,819	11,741	456,559

Career Field Demographics

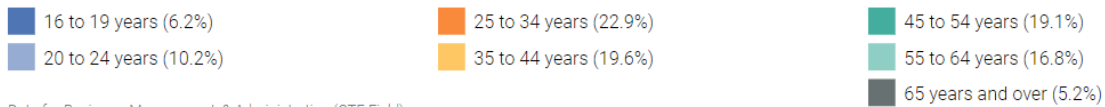
The Business, Management, and Administration field has a slightly higher concentration of female workers (54.6%) than male (up 0.6 percentage points from the prior year), and is 80.7% White. Diversity increased in this career field over the past year, with the share of talent that is BIPOC by race increasing by 1.3 percentage points from 2021Q1. Nearly 40% of workers in Business, Management, and Administration roles are under 35 years old.

Age :

Twin Cities 7-County Metro



Minnesota



Race :

Twin Cities 7-County Metro

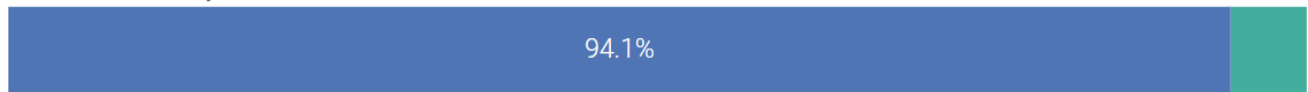


Minnesota

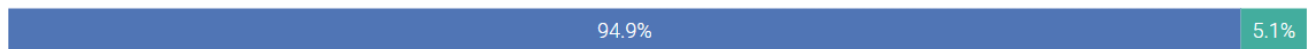


Ethnicity :

Twin Cities 7-County Metro



Minnesota



Gender :

Twin Cities 7-County Metro



Minnesota



Educational Attainment and Requirements

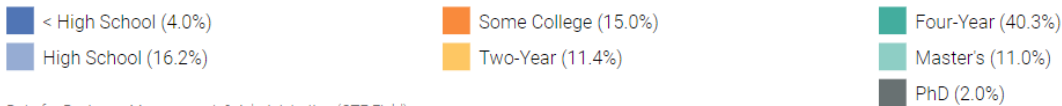
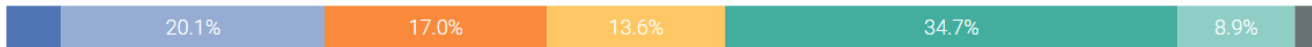
The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this occupation(s) in aggregate. In general, the MSP Metro Business, Management, and Administration workforce is overskilled for the typical credentials of entry-level positions. About half of all positions in this field (49.8%) 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, 40.3% of talent in this field holds a Bachelor’s degree and 13% hold a Master’s or PhD. There have been some shifts in the education requirements of positions in the region, with a greater share of roles now requiring a Bachelor’s degree as compared to one year prior, up by 0.6 percentage points from the prior years’ estimates.

Educational Attainment :

Twin Cities 7-County Metro



Minnesota

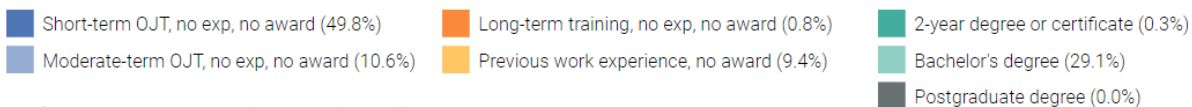


Education and Training Requirements :

Twin Cities 7-County Metro



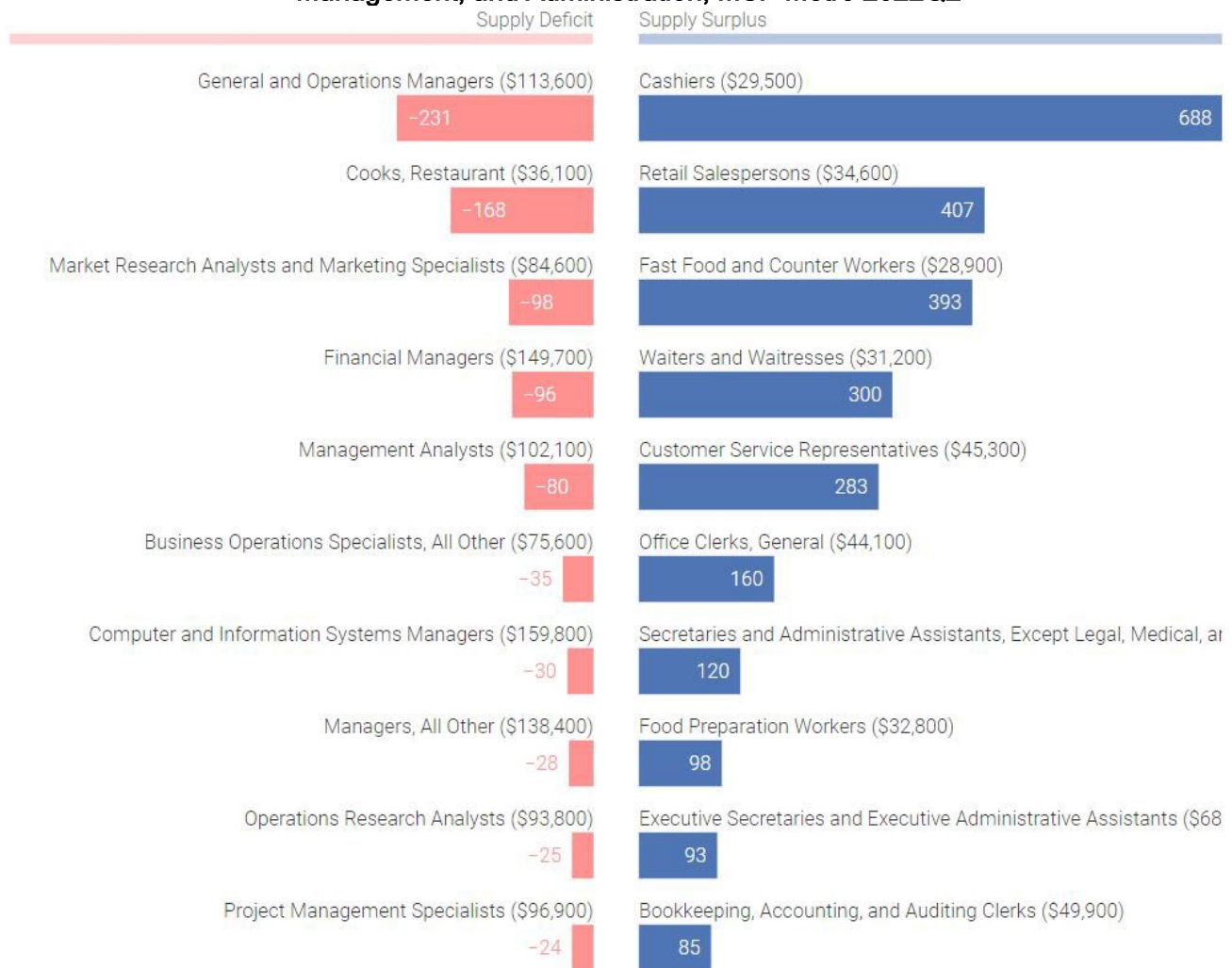
Minnesota



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 231 skilled workers needed annually (averaged over the next ten years, and increased from 175 estimated in 2021Q1) to meet employer demand. This critical talent shortage is primarily due to moderate growth and retirements which far outpace demand.

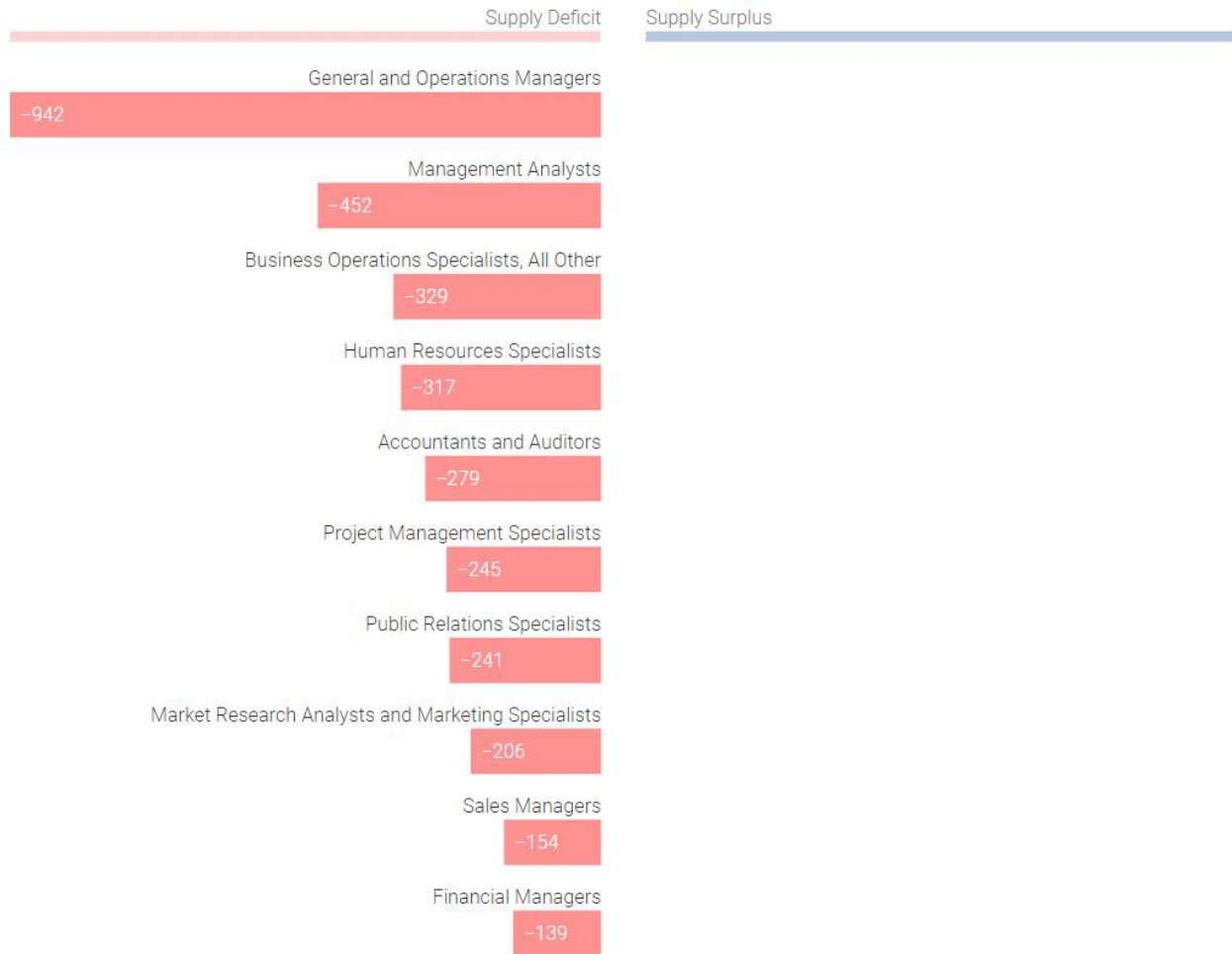
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Business, Management, and Administration, MSP Metro 2022Q2



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 942 graduates annually that are needed to fill General and Operations Manager positions open with employers based in the 7-county MSP Metro alone (slightly improved from 1,040 short estimated in 2021Q1). Second, there are about 452 fewer Management Analysts graduating locally annually than what employers currently need to support demand. As of 2022Q2, there are no Business, Management, and Administration cluster occupations that have award surpluses; meaning that programs are generally underproducing talent for these roles locally.

Award Gaps in Business, Management, and Administration, MSP Metro 2022Q2



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 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 four-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.

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 (\$64,300 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.

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$64,300 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.

Origin-to-Gateway-to-Target Occupations for Business, Management, and Administration, MSP Metro 2022Q2



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

High Location Quotient (LQ) Occupations for Business, Management, and Administration, MSP Metro 2022Q2

- 1) Gambling & Sports Book Writers & Runners (3.38)
- 2) Gambling Service Workers, All Other (3.02)
- 3) Brokerage Clerks (2.38)
- 4) Labor Relations Specialists (2.05)
- 5) New Accounts Clerks (1.94)

ENGINEERING, MANUFACTURING, AND TECHNOLOGY

Engineering, Manufacturing, and Technology is a wide career field with transportation, logistics, STEM, architecture, construction, manufacturing, and machining careers. As of 2022Q2, there are 417,324 employees working in roles specifically aligned to these career clusters. Over the next three years, under a pessimistic baseline forecast, this career field's employment is forecast to rise by about 0.4%, an improvement from 0.1% forecast in 2021Q1. Most of the growth is attributable to engineering, transportation, general maintenance, and trades careers in this field.

Baseline Worst-Case Scenario 3-Year Forecast for Engineering, Manufacturing, and Technology Careers, MSP Metro 2022Q2



Top Ten Engineering, Manufacturing, and Technology Occupations by Employment Volume in the MSP Metro, 2022Q2

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	31,081	\$40,700	0.93	496	4,405	0.7%
Heavy and Tractor-Trailer Truck Drivers	19,991	\$58,500	0.81	591	2,315	0.5%
Maintenance and Repair Workers, General	16,542	\$52,000	0.93	-663	1,702	0.7%
Team Assemblers	14,576	\$40,000	1.08	172	1,450	-1.3%
Light Truck Drivers	12,577	\$48,400	0.97	133	1,524	0.9%
Construction Laborers	12,023	\$53,700	0.77	493	1,303	0.8%
Carpenters	11,360	\$61,700	1.05	38	1,057	0.2%
Landscaping and Groundskeeping Workers	11,209	\$40,500	0.83	-22	1,593	0.9%
Industrial Engineers	8,209	\$101,900	2.35	474	600	0.9%
First-Line Supervisors of Production and Operating Workers	7,323	\$72,100	0.97	-146	724	0.1%
Remaining Component Occupations	272,428	\$64,100	0.90	-7,372	28,711	0.4%
Engineering, Manufacturing, & Technology (CTE Field)	417,324	\$60,200	0.94	-5,807	45,390	0.4%

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

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

Many different industries employ Engineering, Manufacturing, and Technology talent in the MSP Metro. Locally, the industries with the greatest share of this field's talent are Employment Services (5.3%), or staffing and temp agencies which play a critical role in filling the talent needs of MSP Metro direct employers. Second highest employment is with Building Equipment Contractors (4.5%). 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, 2022Q2, MSP Metro

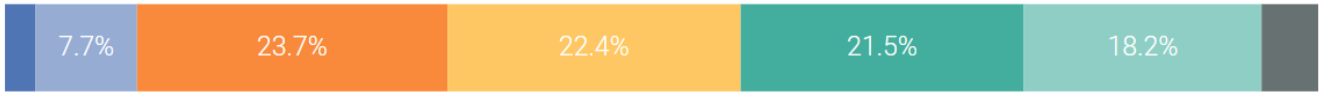
Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Employment Services	5.3%	22,229	27,234	2,158	29,392
Building Equipment Contractors	4.5%	18,714	18,835	763	19,598
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	3.2%	13,220	11,727	-236	11,491
Building Finishing Contractors	3.0%	12,646	11,547	547	12,095
Architectural, Engineering, and Related Services	3.0%	12,568	10,179	-124	10,055
Medical Equipment and Supplies Manufacturing	2.7%	11,184	11,477	-133	11,344
General Freight Trucking	2.3%	9,773	10,742	278	11,020
Couriers and Express Delivery Services	2.3%	9,559	11,749	1,306	13,054
Management of Companies and Enterprises	2.2%	9,159	8,226	50	8,276
Scheduled Air Transportation	2.0%	8,546	10,360	1,460	11,820
Services to Buildings and Dwellings	2.0%	8,518	10,635	414	11,048
Foundation, Structure, and Building Exterior Contractors	2.0%	8,231	7,982	324	8,306
Plastics Product Manufacturing	1.9%	8,020	8,023	-660	7,363
Residential Building Construction	1.9%	7,987	7,369	333	7,702
Other Specialty Trade Contractors	1.9%	7,979	8,105	363	8,468
Warehousing and Storage	1.9%	7,753	9,571	1,083	10,654
Automotive Repair and Maintenance	1.9%	7,725	8,384	456	8,840
Nonresidential Building Construction	1.6%	6,826	6,321	281	6,601
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1.6%	6,471	6,728	165	6,893
Executive, Legislative, and Other General Government Support	1.5%	6,053	6,175	260	6,434
All Others	51.3%	214,162	227,406	9,662	237,069

Career Field Demographics

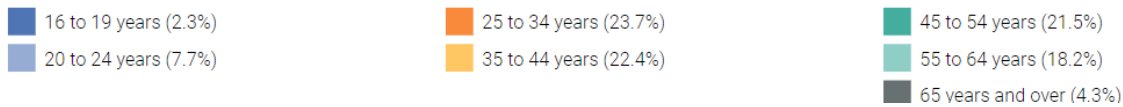
Engineering, Manufacturing, and Technology field is heavily male (81.7%) and White (79.7%), with the share of talent that is BIPOC by race increasing by about 0.9 percentage points. About 46.1% of workers in this field are between 25 and 44 years old, and 22.5% are over 55 years old (up by 0.3 percentage points)—signaling potential exacerbation of the talent shortage due to impending retirements.

Age :

Twin Cities 7-County Metro



Minnesota



Race :

Twin Cities 7-County Metro

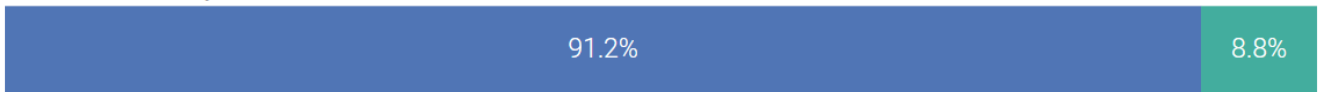


Minnesota

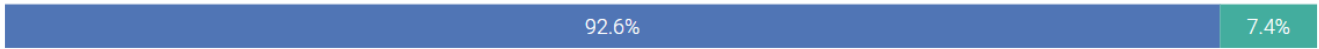


Ethnicity :

Twin Cities 7-County Metro



Minnesota



Gender :

Twin Cities 7-County Metro



Minnesota

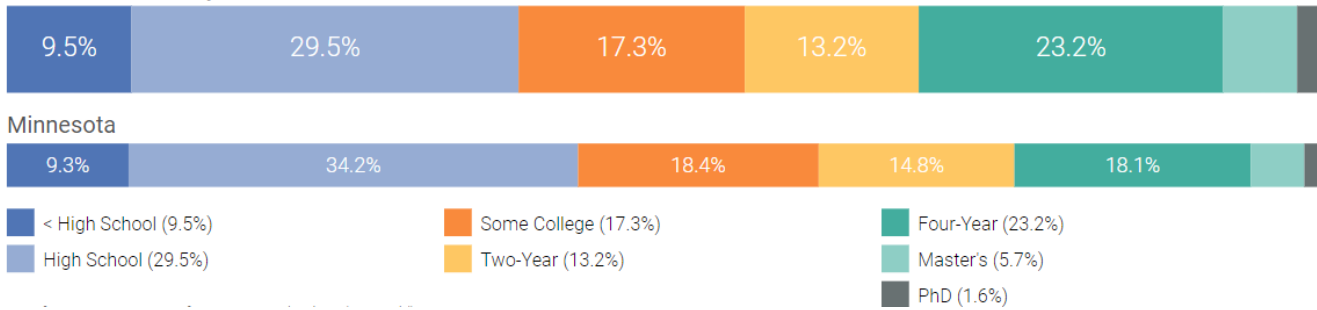


Educational Attainment and Requirements

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 (26.4%) require no degree, no experience, and only short-term on-the-job training. About half (49.4%) require experience or some on-the-job training, but still no degree. About 1 in 10 of the workforce in this field (9.5%) has no degree at all, and nearly 1 in 3 (29.5%) hold a high school diploma as their highest credential. In all, 56.3% of the Engineering, Manufacturing, and Technology workforce have not completed a postsecondary credential. Roles requiring no educational award or experience and needing only short-term on-the-job training increased by 0.9 percentage points from the prior year.

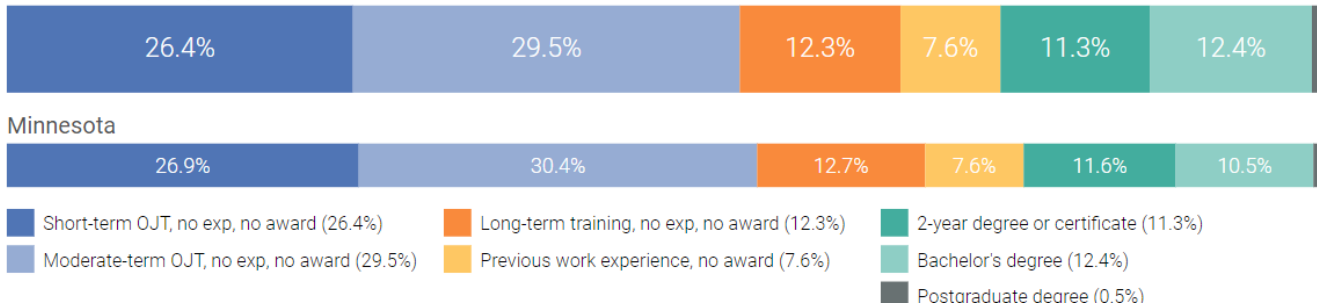
Educational Attainment :

Twin Cities 7-County Metro



Education and Training Requirements :

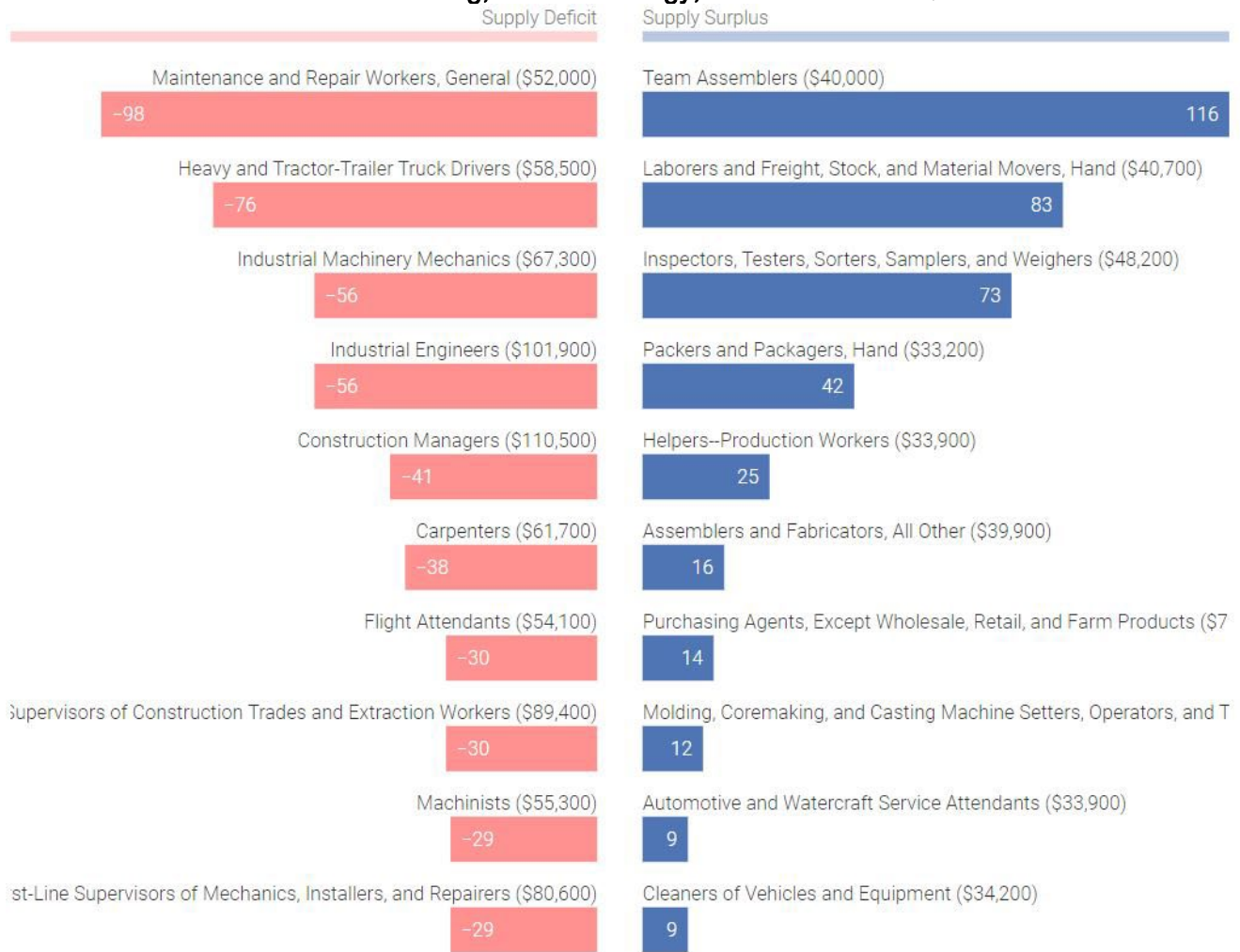
Twin Cities 7-County Metro



Occupation Gaps

The chart below shows the potential average annual gaps over 10 years. Forecasted shortages have either maintained in severity from the prior years' estimates or worsened notably. The Maintenance and Repair talent pool will likely fall short at least 98 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 and limited new talent to fill replacement openings.

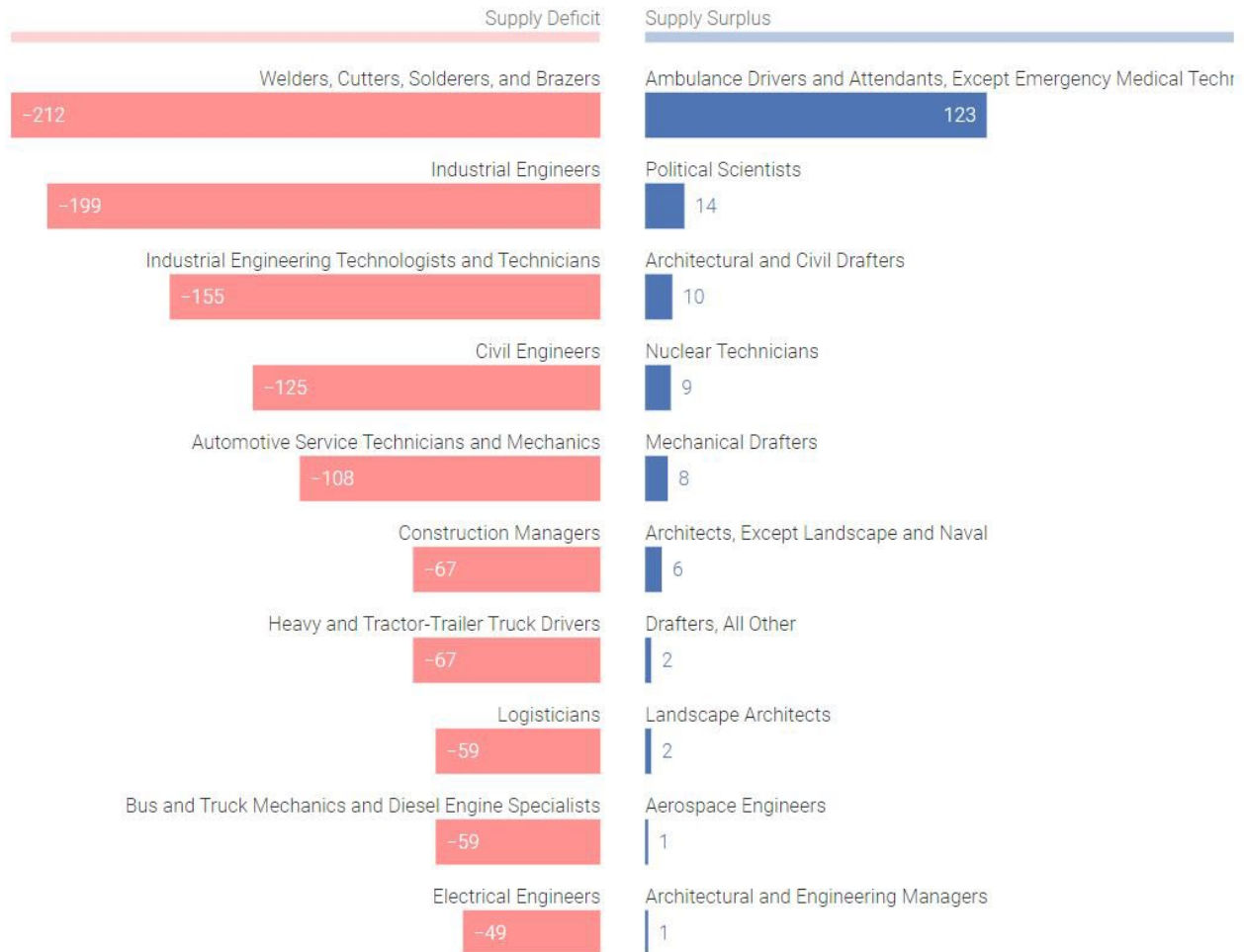
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Engineering, Manufacturing, and Technology, MSP Metro 2022Q2



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 212 graduates annually that are needed to fill Welder positions open with employers based in the 7-county MSP Metro alone—consistent with trends observed over the past two years. Second, there are about 199 fewer Industrial Engineers graduating locally annually than what employers currently need to support demand.

Award Gaps in Engineering, Manufacturing, and Technology, MSP Metro 2022Q2



Promising Pathways

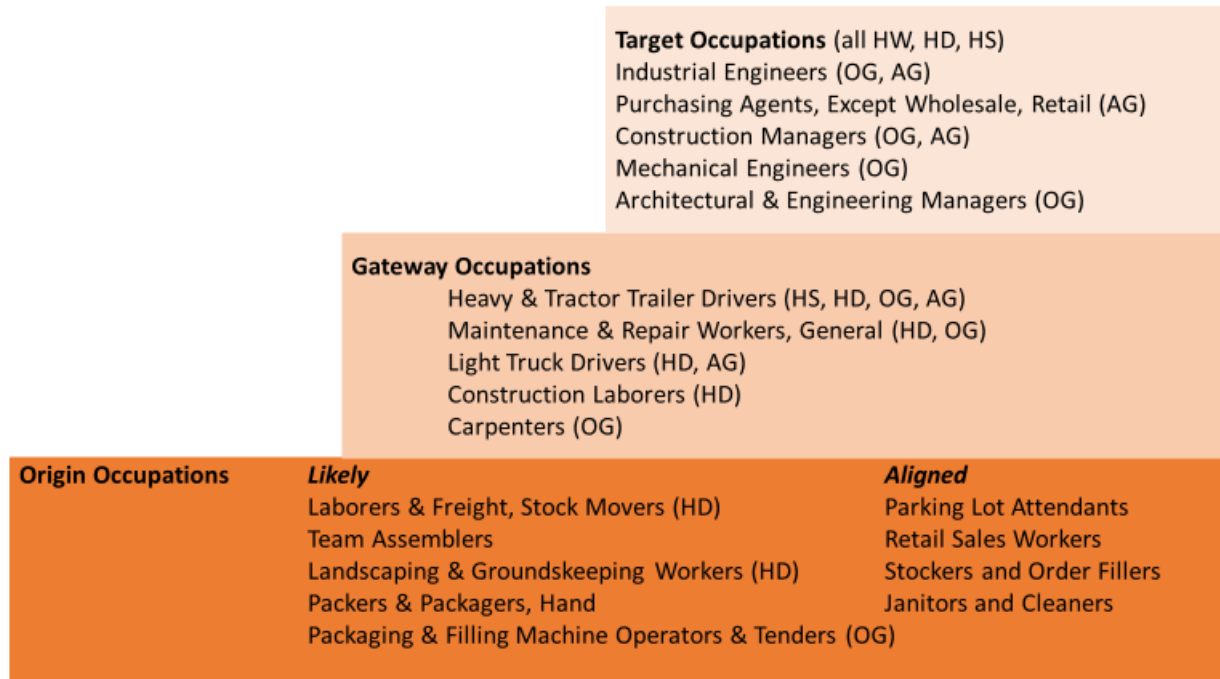
This section offers an origin-to-gateway-to-target model analysis for how to help move students from entrypoints into their field of interest into both likely and other aligned careers, taking into account automation, remote work, and the changing work environment.

Origin 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 four-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.

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 (\$64,300 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.

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$64,300 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.

Origin-to-Gateway-to-Target Occupations for Engineering, Manufacturing, and Technology, MSP Metro 2022Q2



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

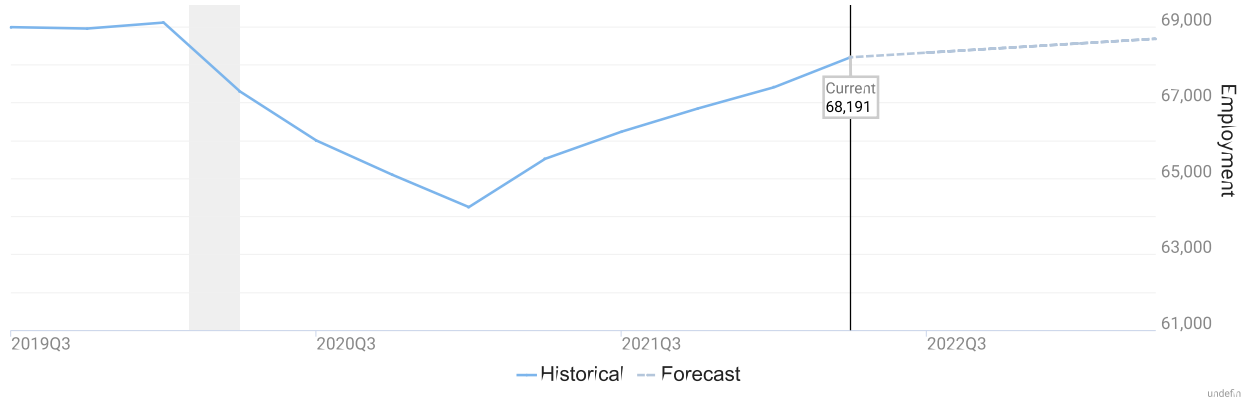
High Location Quotient (LQ) Occupations for Engineering, Manufacturing, and Technology, MSP Metro 2022Q2

- 1) Timing Device Assemblers & Adjusters (3.03)
- 2) Photographic Process Workers & Processing Machine Operators (2.97)
- 3) Industrial Engineering Technologists & Technicians (2.87)
- 4) Airline Pilots, Copilots, & Flight Engineers (2.80)
- 5) Hydrologists (2.73)

AGRICULTURE, FOOD, AND NATURAL RESOURCES

There are eight career pathways within Agriculture, Food, and Natural Resources: 1) Food Products and Processing Systems, 2) Plant Systems, 3) Animal Systems, 4) Natural Resources Systems, 5) Agribusiness Systems, 6) Environmental Services Systems, 7) Power, Structural and Technical Systems, and 8) Biotechnology Systems. These roles represent positions that are at least 50% or more concentrated in Agriculture, Food, and Natural Resources industries, and as such exclude some occupations that are critical to the industry but may have smaller in-industry employment numbers (such as Ag Loan Officers, Ag Financing, or some trades). Over the next three years this career field's employment is forecast to increase at a rate similar to what is expected across all occupations in the region (0.7%). There are currently about 68,191 people employed in focused Agriculture, Food, and Natural Resources occupations in the MSP Metro. 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 2022Q2



Top Ten Agriculture, Food, and Natural Resources Occupations by Employment Volume in the MSP Metro, 2022Q2

6-Digit Occupation	Empl	Avg Mean Wages	LQ	Historical 3-Year Empl Change	Annual Demand	Baseline Forecast Ann Growth
Landscaping and Groundskeeping Workers	11,209	\$40,500	0.83	-22	1,593	0.9%
Plumbers, Pipefitters, and Steamfitters	4,731	\$84,900	0.85	209	499	0.3%
Animal Caretakers	3,638	\$32,700	0.95	111	713	3.2%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3,104	\$67,400	0.67	344	305	0.3%
Bakers	1,985	\$37,500	0.82	-20	281	0.7%
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1,934	\$39,000	0.28	117	316	0.5%
Veterinary Technologists and Technicians	1,858	\$41,900	1.31	181	157	1.2%
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	1,790	\$56,300	0.77	36	199	0.6%
Food Batchmakers	1,746	\$36,700	0.91	80	223	0.5%
Farmers, Ranchers, and Other Agricultural Managers	1,662	\$85,200	0.18	-14	171	0.4%
Remaining Component Occupations	34,536	\$72,100	0.84	-1,783	3,805	0.4%
Agriculture, Food, and Natural Resources (CTE Field)	68,191	\$61,700	0.71	-763	8,268	0.7%

"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 (12.0%) and Building Equipment Contractors (10.0%). 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, 2022Q2, MSP Metro

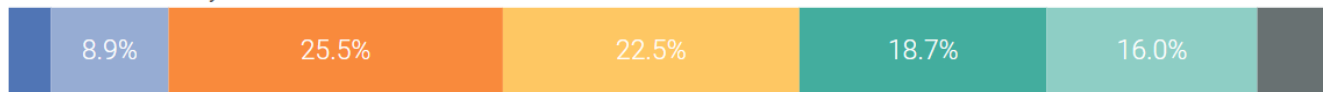
Industry Title	% of Career Field Empl	Career Field Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Services to Buildings and Dwellings	12.0%	8,153	10,473	441	10,914
Building Equipment Contractors	10.0%	6,817	6,906	261	7,168
Other Professional, Scientific, and Technical Services	5.6%	3,837	3,539	494	4,033
Other Personal Services	4.1%	2,785	4,566	1,155	5,721
Architectural, Engineering, and Related Services	4.0%	2,741	2,597	-69	2,528
Executive, Legislative, and Other General Government Support	3.3%	2,230	2,388	85	2,474
Colleges, Universities, and Professional Schools	3.2%	2,208	2,321	75	2,397
Other Amusement and Recreation Industries	2.7%	1,825	2,603	537	3,140
Grocery and Convenience Retailers	2.5%	1,721	1,971	-152	1,819
Greenhouse, Nursery, and Floriculture Production	2.4%	1,645	2,377	147	2,524
Management, Scientific, and Technical Consulting Services	2.1%	1,455	1,529	260	1,788
Management of Companies and Enterprises	2.1%	1,450	1,368	-14	1,354
Bakeries and Tortilla Manufacturing	2.1%	1,429	1,917	124	2,040
Electric Power Generation, Transmission and Distribution	2.0%	1,352	1,100	-262	839
Scientific Research and Development Services	1.9%	1,297	1,226	20	1,246
Employment Services	1.9%	1,273	1,563	132	1,695
Restaurants and Other Eating Places	1.7%	1,133	1,652	322	1,974
Justice, Public Order, and Safety Activities	1.5%	1,055	1,104	7	1,111
Wired and Wireless Telecommunications (except Satellite)	1.5%	1,005	1,059	-84	976
Administration of Human Resource Programs	1.2%	803	814	-31	783
All Others	32.2%	21,978	25,697	1,587	27,284

Career Field Demographics

The Agriculture, Food, and Natural Resources field is predominantly male (72.2%) and White (82.7%), but with variation by career pathway. The share of talent that is BIPOC increased by 0.8 percentage points, and the share that is Hispanic or Latinx increased by 0.4 percentage points. Female representation in the region's Agriculture, Food, and Natural Resources field increased by 1.6 percentage points. The largest age cohort is between the ages of 25 and 34 (25.5%), 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. Overall, the Agriculture, Food, and Natural Resources workforce got older from the prior years' estimates, now with 21.1% 55 years or older compared to 20.7% a year prior.

Age :

Twin Cities 7-County Metro



Minnesota



16 to 19 years (3.2%)

25 to 34 years (25.5%)

45 to 54 years (18.7%)

20 to 24 years (8.9%)

35 to 44 years (22.5%)

55 to 64 years (16.0%)

65 years and over (5.1%)

Race :

Twin Cities 7-County Metro



Minnesota



White (82.7%)

American Indian (0.6%)

Pacific Islander (0.0%)

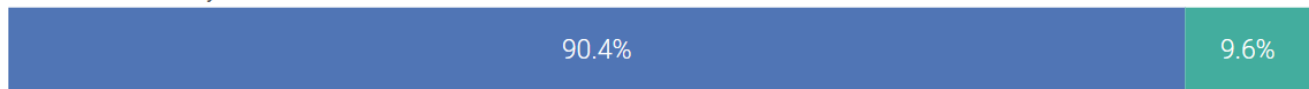
Black (6.8%)

Asian (6.6%)

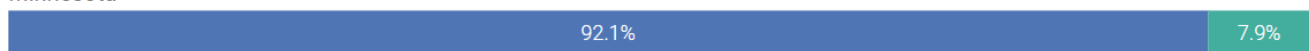
Two or More Races (3.3%)

Ethnicity :

Twin Cities 7-County Metro



Minnesota



Non-Hispanic/Latino (90.4%)

Hispanic or Latino (of any race) (9.6%)

Gender :

Twin Cities 7-County Metro



Minnesota



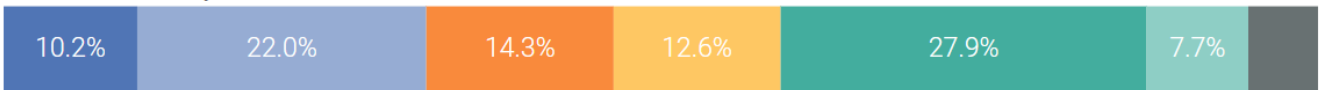
Male (72.2%) Female (27.8%)

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. Now, nearly one-third of all positions in this field (30.1%) require no degree, no experience, and only short-term on-the-job training. Slightly more than one-third (35.9%) 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 (10.2%), and just over 1 in 5 (22.0%) hold a high school diploma as their highest credential. In all, 46.5% of the Agriculture, Food, and Natural Resources workforce in the MSP Metro 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 :

Twin Cities 7-County Metro



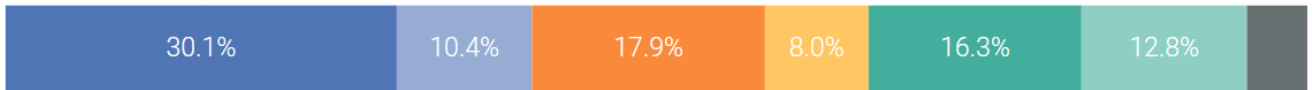
Minnesota



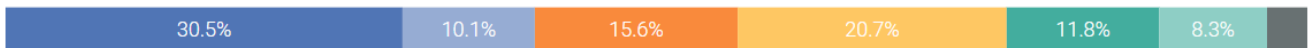
< High School (10.2%) High School (22.0%) Some College (14.3%) Two-Year (12.6%) Four-Year (27.9%) Master's (7.7%) PhD (5.3%)

Education and Training Requirements :

Twin Cities 7-County Metro



Minnesota

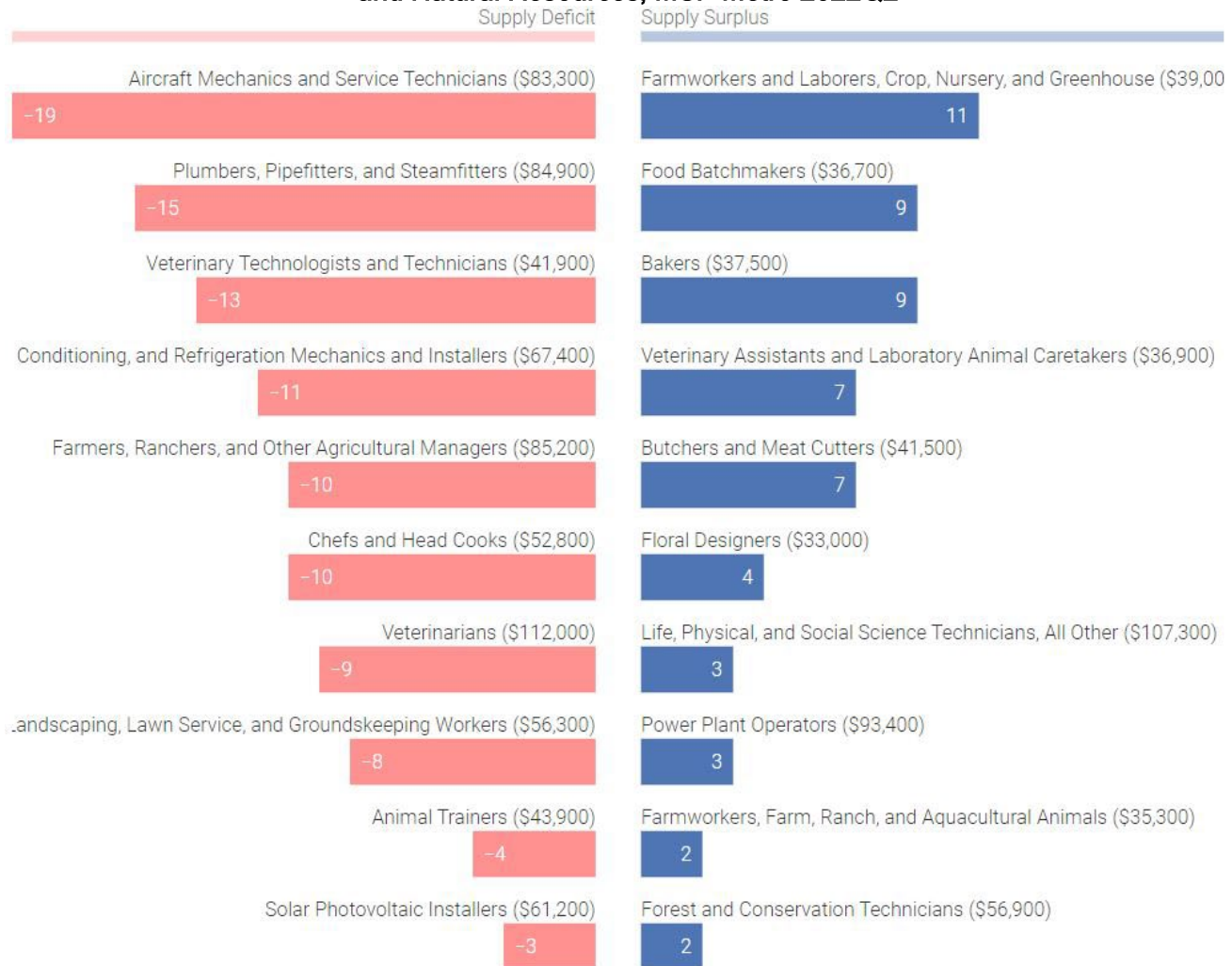


Short-term OJT, no exp, no award (30.1%) Moderate-term OJT, no exp, no award (10.4%) Long-term training, no exp, no award (17.9%) Previous work experience, no award (8.0%) 2-year degree or certificate (16.3%) Bachelor's degree (12.8%) Postgraduate degree (4.6%)

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 Aircraft Mechanics (which includes drone and flying equipment technicians), Plumbers, 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.

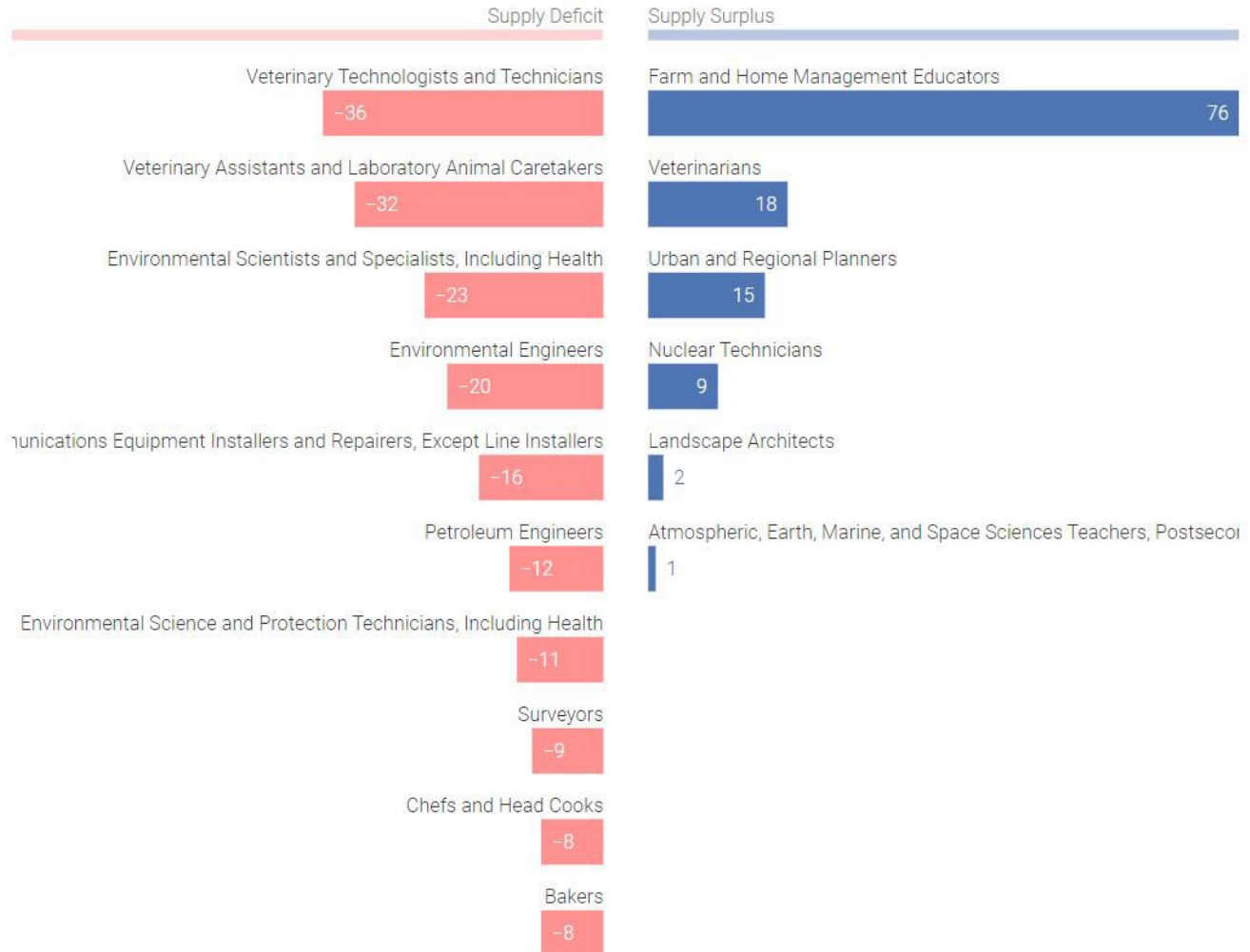
Annual Average Occupation Gaps (i.e. Talent Shortages) for the next 10 Years in Agriculture, Food, and Natural Resources, MSP Metro 2022Q2



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 36 graduates annually that are needed to fill Veterinary Technician positions and at least 32 graduates for Veterinary Assistant positions open with employers based in the 7-county MSP Metro alone. Shortages of Biological Technician and Aircraft Mechanic awards improved moderately from the prior year, dropping them out of the top ten award gaps. 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 2022Q2



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 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 four-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.

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 (\$64,300 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.

Target Occupations refer to high-wage occupations that pay at or above the region's average wage (\$64,300 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.

Origin-to-Gateway-to-Target Occupations for Agriculture, Food, and Natural Resources, MSP Metro 2022Q2

Target Occupations (all HW, HD, HS)
 Aircraft Mechanics & Service Technicians (OG, AG)
 Environmental Scientists & Specialists (OG, AG)
 Veterinarians (OG)
 Life, Physical, & Social Science Technicians (AG)
 Biological Science Teachers, Postsecondary (OG)

Gateway Occupations

Supervisors of Groundskeeping Workers (HD, OG)
 Telecommunications Equipment Installers & Repairers (HS, HD, AG)
 Chefs & Head Cooks (HD, OG, AG)
 Refuse and Recyclable Material Collectors (HD, AG)
 Chemical Technicians (HS, HD)

Origin Occupations

Likely

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

Aligned

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

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

High Location Quotient (LQ) Occupations for Agriculture, Food, and Natural Resources, Northeast Minnesota 2022Q2

- 1) Animal Scientists (3.20)
- 2) Hydrologists (2.73)
- 3) Food Scientists & Technologists (1.98)
- 4) Stationary Engineers & Boiler Operators (1.95)
- 5) Agricultural Sciences Teachers, Postsecondary (1.88)

Conclusion

Some noticeable shifts have occurred in the talent landscape, with employers continuing to recruit heavily over the past twelve months. Some new occupations of need have emerged, signaling some rebounding of the Hospitality and Tourism industry, and reflecting the tight labor market across all levels of experience and education requirements, and through each industry sector. What continues to be true is that the most in-demand occupations of the future typically require a two-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.

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

The MSP Metro region is poised to see changes in demand for talent over the next five years and beyond as the region continues to recover from the impacts of the pandemic, wrestle with deepening talent shortages, and face the possibility of recession as interest rates continue to rise. Unemployment has dropped while employer demand for talent remains high, particularly for roles that require advanced educational background, but also for a rising number of Gateway occupations. There is urgency to address these talent shortages now by leveraging new ways of working remotely and leveraging new technologies wherever possible.