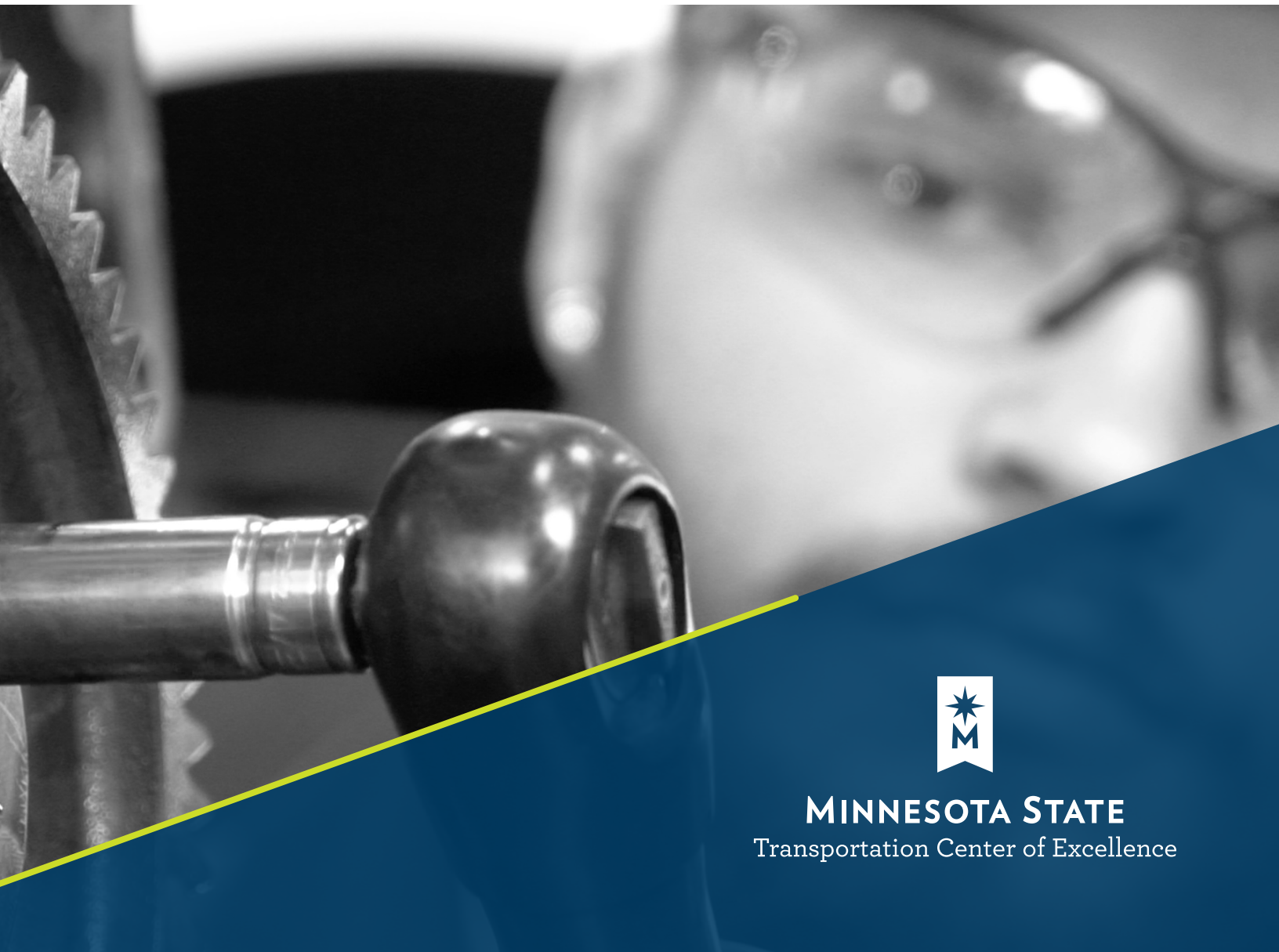


DIESEL EQUIPMENT & TRUCK

Supply & Demand Analysis
2022



MINNESOTA STATE
Transportation Center of Excellence

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Introduction and Sector Overview

This report highlights the importance of the Diesel, Equipment, and Truck career pathway for Minnesota’s Transportation Industry. Professionals in Diesel, Equipment, and Truck careers work as Truck Mechanics, Diesel Specialists, Crane Operators, and Farm Equipment Mechanics serving a variety of industries. In all, about 12,518 people work in Diesel Equipment and Truck roles in Minnesota as of the third quarter of 2022—down about 371 workers from a year prior.

Overall employment in Minnesota has grown by nearly 118,000 workers (4.0%) between the second quarter of 2021 and the third quarter of 2022, and the five-year forecast recovered to 45,970 expansion of employment over five years as of the most current baseline forecasts, or about 0.3% average annual growth. During this time frame, Diesel, Equipment, and Truck pathway employment is anticipated to grow moderately by about 192 jobs (0.3% annually). Total baseline demand for Diesel, Equipment, and Truck talent is anticipated to be around 6,135 professionals needed to fill positions due to job exits and transfers, such as retirements and job changes.

Transportation Pathways in Minnesota – Baseline Forecast, 2022Q3¹

Occupation	Current						5-Year History		5-Year Baseline Forecast				
	Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
Automotive Technology Pathway	21,227	\$66,900	1.02	387	1.8%	1,183	-819	-0.8%	8,677	3,181	5,821	-279	-0.4%
Aviation and Drone Technology Pathway	9,162	\$115,200	0.86	139	1.5%	313	-531	-1.1%	4,615	1,584	2,945	86	0.2%
Collision Repair Pathway	6,757	\$54,100	1.05	177	2.6%	359	-44	-0.1%	3,236	1,128	2,142	-34	-0.1%
Diesel Equipment and Truck Pathway	12,518	\$61,900	1.06	230	1.8%	593	-458	-0.7%	6,135	2,048	3,894	192	0.3%
Marine and Power Sports Pathway	4,799	\$46,200	0.95	205	4.2%	75	95	0.4%	3,046	1,062	1,946	38	0.2%
Truck Driving Pathway*	98,845	\$51,200	0.93	2,607	2.6%	6,446	5,748	1.2%	63,838	27,225	34,298	2,315	0.5%
Transportation Occupations	145,613	\$58,000	0.96	3,444	2.4%	8,585	1,899	0.3%	84,921	33,955	48,916	2,050	0.3%
Total - All Occupations	3,038,766	\$63,700	1.00	68,550	2.3%	170,185	-11,615	-0.1%	1,800,961	734,547	1,020,444	45,970	0.3%

*This pathway includes School Bus Driver careers as of 2022, which were not included in the 2020 or 2021 estimates of career pathway employment or demand.

Source: [JobsEQ®](#)

Data as of 2023Q3 unless noted otherwise

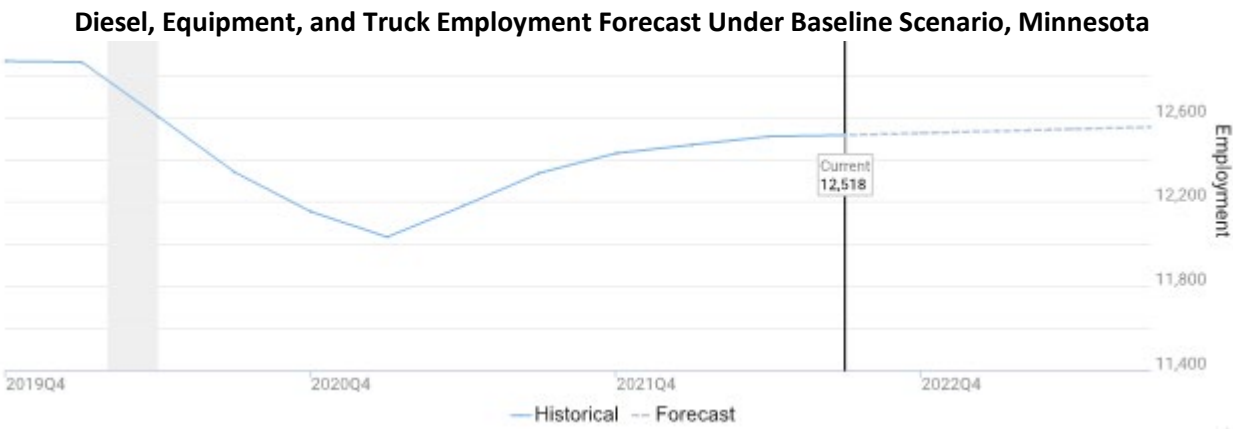
Note: Figures may not sum due to rounding.

1. Data based on a four-quarter moving average unless noted otherwise.

2. Wage data represent the average for all Covered Employment

3. Data represent found online ads active within the last thirty days in the selected region; data represents a sampling rather than the complete universe of postings. Ads lacking zip code information but designating a place (city, town, etc.) may be assigned to the zip code with greatest employment in that place for queries in this analytic. Due to alternative county-assignment algorithms, ad counts in this analytic may not match that shown in RTI (nor in the popup window ad list).

Minnesota saw a strong job market throughout 2022 and elevated recruitment among employers across most sectors. As the available talent pool was exhausted, unemployment rates dropped dramatically across critical roles and in many scenarios demand far outpaced talent supply. Forecasting future needs under current conditions with an eye to anticipated talent pipelines into Diesel, Equipment, and Truck careers suggest that there may be shortages of talent across a large share of occupations in this career pathway unless more talent decides to enter the field. The pathway forecast now shows a 0.3% growth in overall employment by the second quarter of 2027. This is up from last year's baseline estimates of 0.0%.



Source: RealTime Talent analysis of Chmura Economics JobsEQ®, <http://www.chmuraecon.com/jobseq/>. Job Posting Trends section uses data from Gartner TalentNeuron Plan, accessed 1/18/2022 at talentneuronplan.gartner.com

Industry/Occupation Mix

Diesel, Equipment, and Truck talent is primarily concentrated in the Machinery, Equipment, and Supplies Merchant Wholesalers Industry (16.9%), decreasing in concentration in 2021 by 1.5 percentage points. The next highest industry of employment concentration is General Freight Trucking (8.9%), followed by Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (5.1%). These top industries also account for the most total demand for this talent over the next ten years.

Top Industry Distribution for Diesel, Equipment, and Truck Pathway Occupations in Minnesota

NAICS Code	Industry Title	CURRENT			10-YEAR DEMAND			
		% of Occ Empl	Empl	Avg Ann Wages	Exits	Transfers	Empl Growth	Total Demand
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	16.9%	2,117	\$53,000	709	1,383	209	2,300
4841	General Freight Trucking	8.9%	1,116	\$57,900	360	639	-41	958
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	5.1%	636	\$60,600	222	390	78	689
8111	Automotive Repair and Maintenance	4.8%	603	\$54,500	199	351	5	556
4854	School and Employee Bus Transportation	4.5%	566	\$53,100	193	340	43	576
2389	Other Specialty Trade Contractors	4.5%	561	\$66,900	175	385	9	568
9211	Executive, Legislative, and Other General Government Support	3.5%	442	\$58,900	145	263	5	413
2122	Metal Ore Mining	3.5%	437	\$68,900	136	283	-11	408
2373	Highway, Street, and Bridge Construction	3.4%	432	\$63,100	140	285	18	443
4842	Specialized Freight Trucking	2.6%	322	\$57,900	105	187	-5	287
2123	Nonmetallic Mineral Mining and Quarrying	2.2%	277	\$58,600	86	193	-3	277
2371	Utility System Construction	2.2%	271	\$56,500	89	193	27	309
5621	Waste Collection	1.9%	241	\$57,700	81	144	12	236
4882	Support Activities for Rail Transportation	1.9%	241	\$63,800	75	147	-15	207
4851	Urban Transit Systems	1.8%	222	\$62,600	74	131	8	214
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	1.7%	217	\$56,800	70	131	-2	199
5321	Automotive Equipment Rental and Leasing	1.6%	200	\$54,600	67	119	11	197
6111	Elementary and Secondary Schools	1.5%	189	\$57,600	63	111	4	178
4821	Rail Transportation	1.5%	185	\$85,700	59	116	2	178
5511	Management of Companies and Enterprises	0.8%	104	\$61,600	34	62	1	97
n/a	All Others	25.1%	3,141	n/a	1,016	1,940	34	2,990

Source: JobsEQ®
 Data as of 2022Q3 except wages which are as of 2022. Note that occupation-by-industry wages represent adjusted national data and may not be consistent with regional, all-industry occupation wages shown elsewhere in JobsEQ.
 Note: Figures may not sum due to rounding.

Talent Demand Detail

Employment and Wage Overview

Of all occupations found in the Diesel, Equipment, and Truck pathway, Farm Equipment Mechanics are particularly concentrated in Minnesota, with nearly double the concentration locally than seen in the nation overall. On average, careers in this pathway pay about \$61,900—about \$1,800 below than the average wage statewide across all positions. Demand was high over the past year, seeing employment growth of 1.5% since the third quarter of 2021. Employment will likely continue to grow statewide by about 0.3% through the third quarter of 2023.

Diesel, Equipment, and Truck Pathway in Minnesota – Baseline Forecast, 2022Q3¹

		Current						1-Year History		1-Year Forecast		5-Year Baseline Forecast				
SOC	Occupation	Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Change	Ann % Change
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	6,739	\$61,500	1.19	142	2.1%	536	132	2.0%	12	0.2%	3,149	1,120	1,968	62	0.2%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	2,209	\$67,100	0.74	27	1.2%	3	50	2.3%	16	0.7%	1,162	365	718	80	0.7%
49-3041	Farm Equipment Mechanics and Service Technicians	1,718	\$53,600	1.98	22	1.3%	25	54	3.3%	8	0.5%	873	280	551	41	0.5%
47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining	695	\$65,700	0.95	5	0.8%	5	-54	-7.3%	1	0.1%	362	108	251	3	0.1%
49-3043	Rail Car Repairers	455	\$60,200	1.14	5	1.2%	12	-11	-2.3%	0	-0.1%	214	73	143	-1	-0.1%
53-7021	Crane and Tower Operators	381	\$75,900	0.43	13	3.2%	10	12	3.2%	1	0.2%	205	54	148	3	0.2%
47-5023	Earth Drillers, Except Oil and Gas	321	\$57,400	0.98	16	4.9%	2	-3	-1.0%	1	0.2%	169	50	116	3	0.2%
	Diesel Equipment and Truck Pathway	12,518	\$61,900	1.06	230	1.8%	593	180	1.5%	38	0.3%	6,135	2,048	3,894	192	0.3%
	Total - All Occupations	3,038,766	\$63,700	1.00	68,550	2.3%	170,185	91,312	3.1%	9,139	0.3%	1,800,961	734,547	1,020,444	45,970	0.3%

Source: [JobsEQ®](#)

Data as of 2021Q2 unless noted otherwise

Note: Figures may not sum due to rounding.

1. Data based on a four-quarter moving average unless noted otherwise.

2. Wage data are as of 2020 and represent the average for all Covered Employment

3. Data represent found online ads active within the last thirty days in the selected region; data represents a sampling rather than the complete universe of postings. Ads lacking zip code information but designating a place (city, town, etc.) may be assigned to the zip code with greatest employment in that place for queries in this analytic. Due to alternative county-assignment algorithms, ad counts in this analytic may not match that shown in RTI (nor in the popup window ad list).

Diesel, Equipment, and Truck careers saw some significant wage gains across the pathway, with average wages rising by about \$6,000 from prior estimates.¹ Entry-level wages in the pathways exceed the average entry-level wages observed across all occupations statewide, paying an average of \$46,400 annually for entry-level talent.

Occupation Wages, Average Annual in Minnesota, 2022Q3

SOC	Occupation	Mean	Entry Level	Experienced	Percentiles				
					10%	25%	50% (Median)	75%	90%
47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining	\$65,700	\$48,300	\$74,300	\$45,800	\$54,200	\$65,800	\$77,600	\$84,500
47-5023	Earth Drillers, Except Oil and Gas	\$57,400	\$40,800	\$65,700	\$38,800	\$45,800	\$57,500	\$65,300	\$72,000
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	\$61,500	\$46,600	\$68,900	\$45,200	\$50,500	\$59,900	\$71,400	\$82,000
49-3041	Farm Equipment Mechanics and Service Technicians	\$53,600	\$39,400	\$60,600	\$36,800	\$44,600	\$51,700	\$61,400	\$66,500
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	\$67,100	\$51,700	\$74,800	\$48,800	\$57,500	\$65,700	\$76,300	\$84,300
	Diesel Equipment and Truck Pathway	\$61,900	\$46,400	\$69,600	\$44,400	\$51,200	\$60,400	\$71,300	\$80,500
	Total - All Occupations	\$63,700	\$31,400	\$79,800	\$29,100	\$35,700	\$49,800	\$75,000	\$108,400

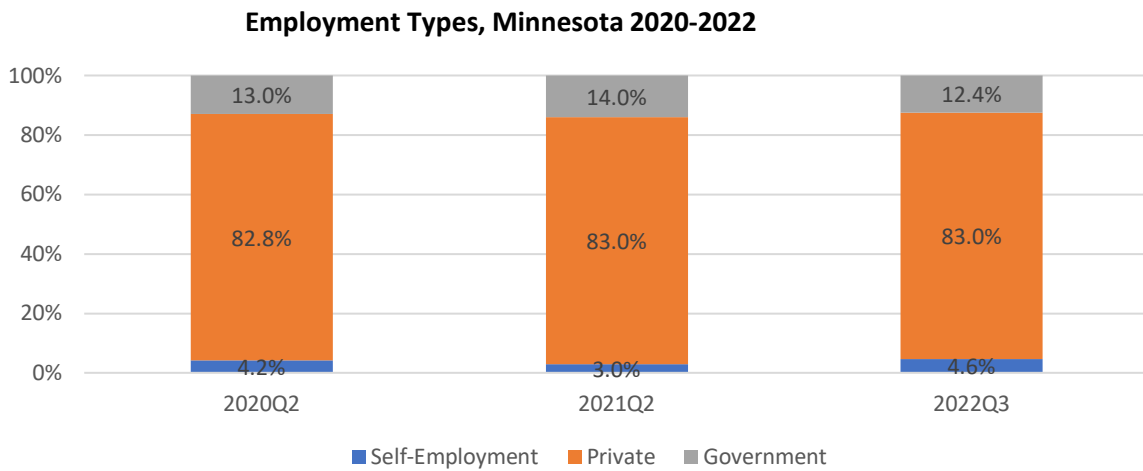
Source: [JobsEQ®](#)

Wage data represent the average for all Covered Employment

¹ Methodology for estimating wages changed between the 2021 and 2022 reports and are new as of the 2022Q3 dataset used here. They are estimated for the most current quarter of data available (2022Q3) using a combination of data from the Bureau of Labor Statistics and Chmura RTI wages, and no longer lag by a calendar year.

Employment Types

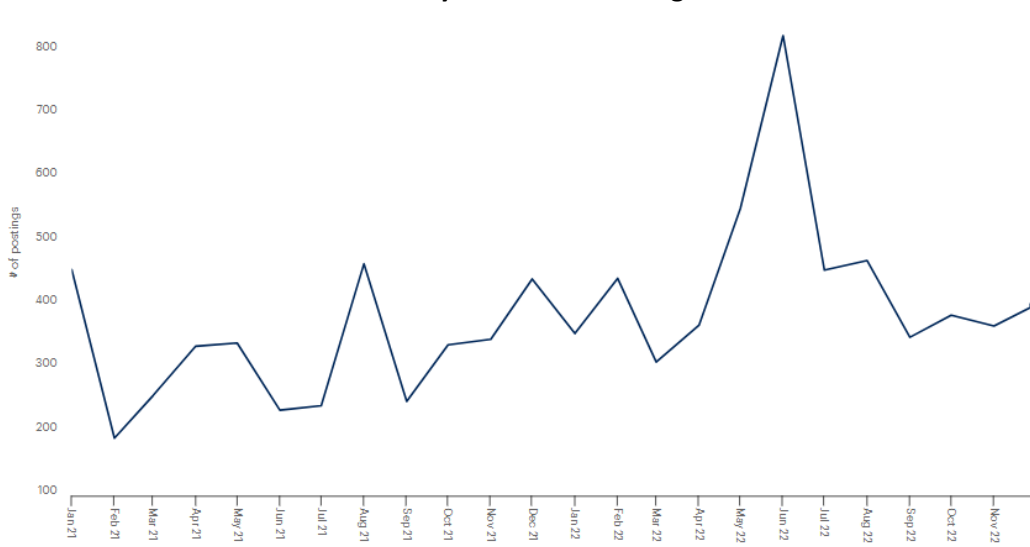
About 83% of people employed in Diesel, Equipment, and Truck careers in Minnesota work for private employers, while an estimated 4.6% are self-employed (a slight increase from 2021). The remaining 12.4% work for state, federal, or local government entities (a slight decrease from 2021).



Job Posting Trends

Data in this section focuses on jobs newly advertised between January 1 and December 31, 2022 in Diesel, Equipment, and Truck roles across Minnesota. Volume of total job postings, employer types (direct versus staffing), and top employers by unique job posting volumes comes from Gartner TalentNeuron; industry detail, skill and certification analysis, wage trends, and posting to hire analysis are from the Lightcast 2022Q4 dataset. Overall, there were 5,272 new jobs advertised in Diesel, Equipment, and Truck pathway careers during this time frame, an increase of 36% from the prior 12-month period (2021). The share of posted positions advertised by staffing and temp agencies in the Diesel, Equipment, and Truck pathway increased again to 18% up from 10% in 2021, implying dramatic increases in challenges finding talent in this career pathway and direct employers resorting to using new strategies to find talent. Posted wages increased to an average \$28.03 per hour as of 2022, and there was only three hires per every one unique job posting advertised based on Lightcast estimates.

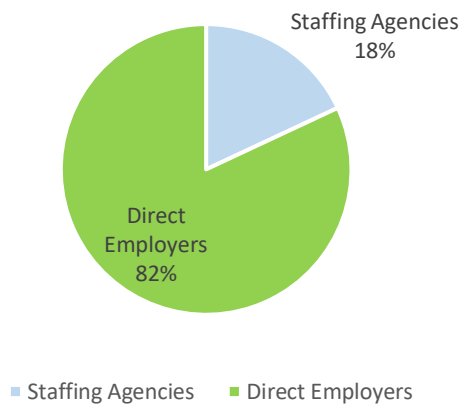
Volume of Career Pathway Online Job Postings in 2021 and 2022



Top Employers by Volume of New Job Postings, With Change from Prior Year

Rank	Employer	Percent Change between 2021 and 2022
1.	Labor Services	NA – New Entrant
2.	Sysco	27%
3.	XPO Logistics, Inc.	126%
4.	United Natural Foods, Inc.	NA – New Entrant
5.	Waste Connections	0%
6.	Waste Management	-40%
7.	GPAC	74%
8.	Ryder	149%
9.	Republic Services, Inc.	183%
10.	Carvana	NA – New Entrant

New Job Postings Advertised in Minnesota by Employer Type

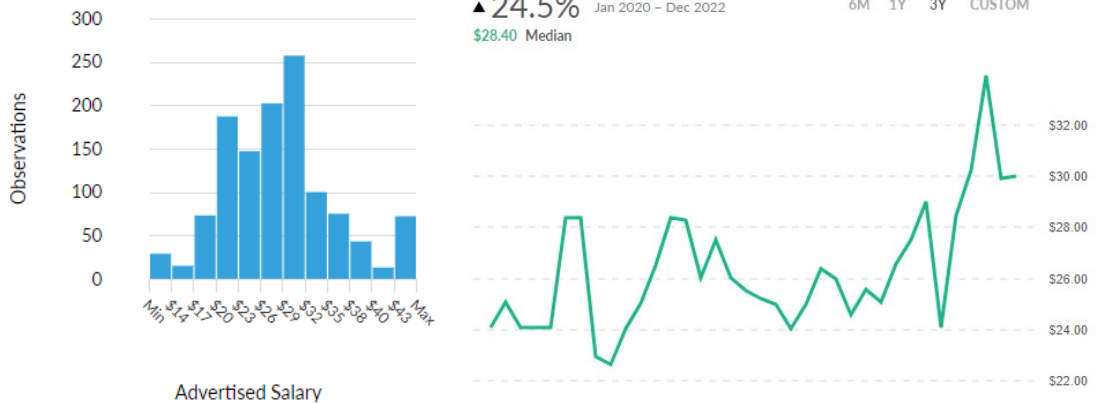


New Job Postings by Industry or Employer Type

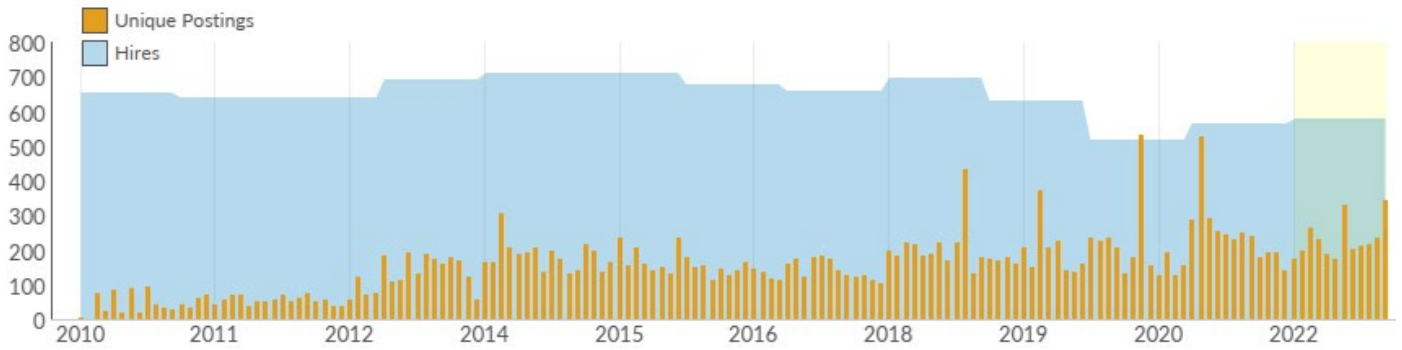
Industry	Total/Unique (Jan 2022 - Dec 2022)	Posting Intensity	Median Posting Duration
Administrative and Support and Waste Management and Remediation Services	917 / 442	2 : 1	31 days
Wholesale Trade	1,265 / 373	3 : 1	31 days
Transportation and Warehousing	1,753 / 343	5 : 1	20 days
Manufacturing	565 / 231	2 : 1	33 days
Construction	870 / 179	5 : 1	26 days
Real Estate and Rental and Leasing	395 / 132	3 : 1	23 days
Retail Trade	277 / 131	2 : 1	31 days
Other Services (except Public Administration)	201 / 121	2 : 1	31 days
Information	83 / 47	2 : 1	26 days
Professional, Scientific, and Technical Services	107 / 30	4 : 1	21 days

Pathway Advertised Salary Range

\$28.03/hr
Median Advertised Salary

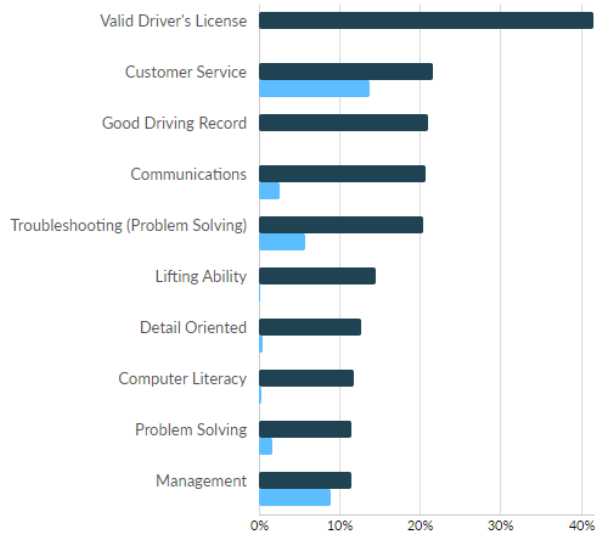


Monthly Ratio of Unique Job Postings to Estimated Hires



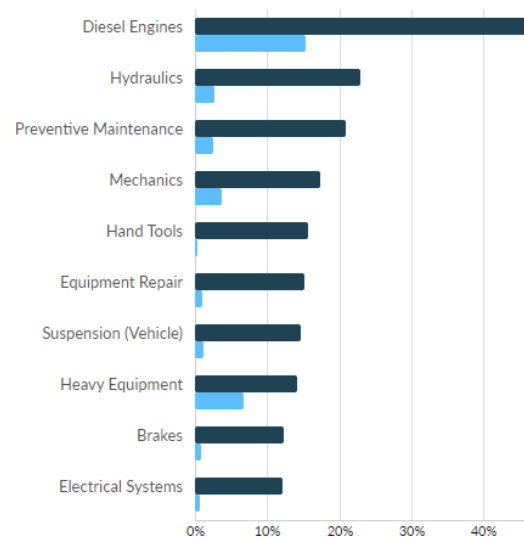
Top Common Skills

● Frequency in Job Postings ● Frequency in Profiles



Top Specialized Skills

● Frequency in Job Postings ● Frequency in Profiles



Top Certifications and Qualifications

Qualification	Postings with Qualification
Commercial Driver's License (CDL)	407
Automotive Service Excellence (ASE) Certification	267
CDL Class A License	151
CDL Class B License	79
HVAC Certification	56
DOT Certification	38
10-Hour OSHA General Industry Card	32
Forklift Certification	26
Tanker Endorsement	23
Product Certification	21

Talent Supply Detail

Talent Unemployment, Underemployment, and Educational Attainment

At an overall pathway unemployment rate of 1.8%, there are about 230 unemployed Diesel Equipment Truck professionals statewide. An additional 743 Diesel Equipment Truck professionals are underemployed—meaning they are working in roles for which they are overqualified by education or experience.

Diesel, Equipment, and Truck Pathway in Minnesota

SOC	Occupation	Empl (Place of Residence)								Overall Occupation ¹		
		< High School	High School	Some College	2-Year	4-Year	Master's	PhD	Total Empl	Underemployed	Unemployed	Unempl Rate
47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining	11.4%	53.0%	17.6%	10.8%	6.9%	0.2%	0.2%	685	46	5	0.8%
47-5023	Earth Drillers, Except Oil and Gas	11.4%	52.6%	17.7%	10.8%	7.1%	0.2%	0.2%	313	23	16	4.9%
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	7.3%	42.0%	19.4%	24.9%	5.6%	0.6%	0.2%	6,562	394	142	2.1%
49-3041	Farm Equipment Mechanics and Service Technicians	6.1%	43.8%	19.3%	25.2%	4.7%	0.7%	0.2%	1,702	75	22	1.3%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	6.3%	42.9%	19.9%	24.1%	5.6%	0.9%	0.3%	2,158	139	27	1.2%
49-3043	Rail Car Repairers	6.7%	42.5%	19.7%	23.5%	6.1%	1.0%	0.4%	447	34	5	1.2%
53-7021	Crane and Tower Operators	5.7%	54.2%	19.6%	12.3%	7.0%	1.1%	0.2%	384	32	13	3.2%
	Diesel Equipment and Truck Pathway	7.2%	43.7%	19.3%	23.2%	5.6%	0.7%	0.2%	12,251	743	230	1.8%
	Total - All Occupations	4.9%	21.1%	15.4%	14.1%	30.4%	10.3%	3.8%	2,944,602	511822	65850	2.3%

Source: JobsEQ®

Data as of 2022Q3 unless noted otherwise

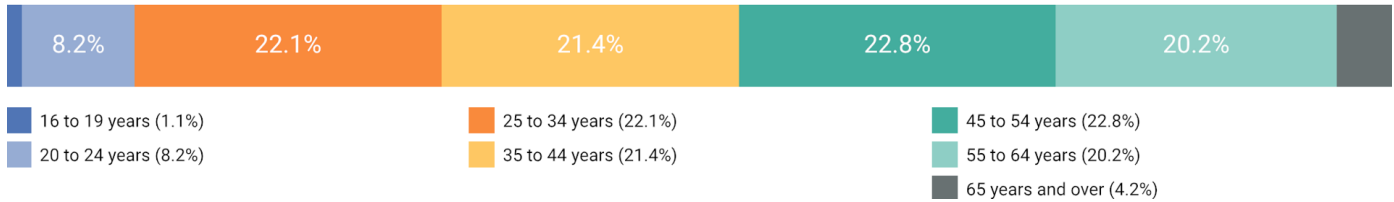
Note: Figures may not sum due to rounding.

1. "Overall occupation" characteristics refer to attributes across all individuals in those occupations, not just those limited to the demographic categories shown in this table.

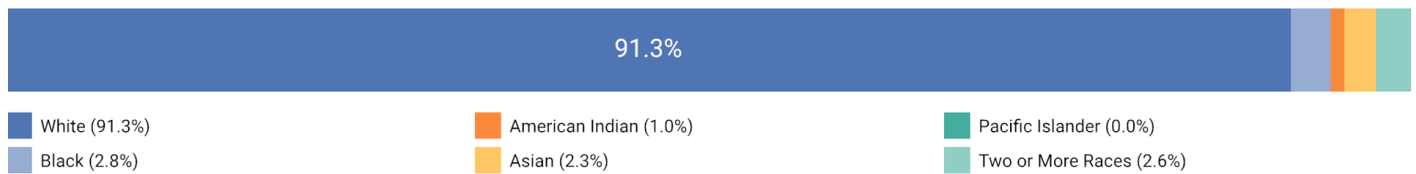
Workforce Demographics

About 9.3% of the Diesel Equipment Truck workforce is under the age of 25, and 4.2% are over 64 years old. The largest demographic group by race are White, representing 91.3% of the total pathway's workforce, with the next largest cohort Black talent representing 2.8% of the workforce. Nearly 5% of the pathway's workforce are Hispanic or Latinx, and less than 2% are female.

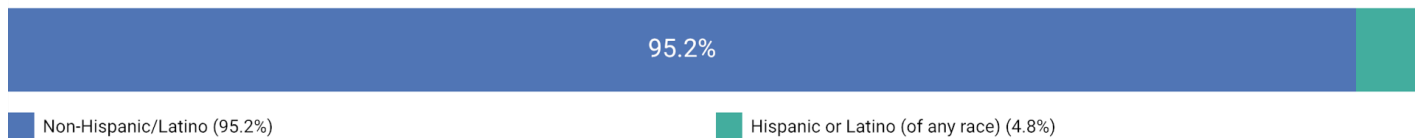
Diesel, Equipment, and Truck Workforce Age Demographics, 2022Q3



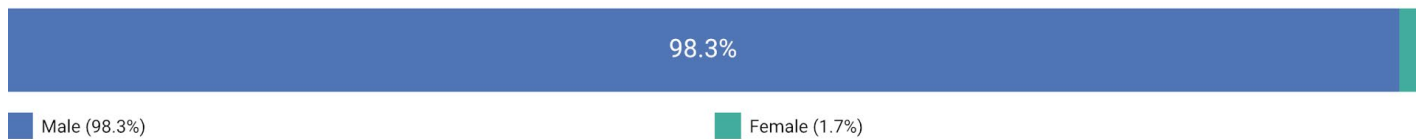
Diesel, Equipment, and Truck Workforce Race Demographics, 2022Q3



Diesel, Equipment, and Truck Workforce Ethnicity Demographics, 2022Q3



Diesel, Equipment, and Truck Workforce Gender Demographics, 2022Q3



Graduate Demographics

Postsecondary program diversity varies by program across the Diesel, Equipment, and Truck pathway. Medium/Heavy Vehicle and Truck Technology/Technician programs are the most diverse by race and ethnicity. However, all programs have an overrepresentation of male students.

Race and Gender of Graduates Receiving Postsecondary Awards in SY2021, Minnesota

CIP Code	Description	All 2021 Graduates	International Student*	Black or African American, non-Hispanic	American Indian or Alaska Native	Asian, Native Hawaiian or Other Pacific Islander	Hispanic or Latino	White, non-Hispanic	Multiple or unknown race/ethnicity	Gender - Males	Gender - Females
01.0201	Agricultural Mechanization, General	5	0	0	0	0	0	5	0	5	0
01.0204	Agricultural Power Machinery Operation	0	0	0	0	0	0	0	0	0	0
01.0205	Agricultural Mechanics and Equipment/Machine Technology/Technician	6	0	0	0	0	0	6	0	6	0
47.0302	Heavy Equipment Maintenance Technology/Technician	30	0	0	3	0	1	25	1	28	2
47.0399	Heavy/Industrial Equipment Maintenance Technologies/Technicians, Other	0	0	0	0	0	0	0	0	0	0
47.0605	Diesel Mechanics Technology/Technician	93	0	1	2	0	3	86	1	89	4
47.0613	Medium/Heavy Vehicle and Truck Technology/Technician	75	0	9	1	8	4	47	6	68	7
49.0202	Construction/Heavy Equipment/Earthmoving Equipment Operation	80	0	0	1	0	0	78	1	80	0
All Diesel, Equipment, and Truck Postsecondary Programs		289	0	10	7	8	8	247	9	276	13

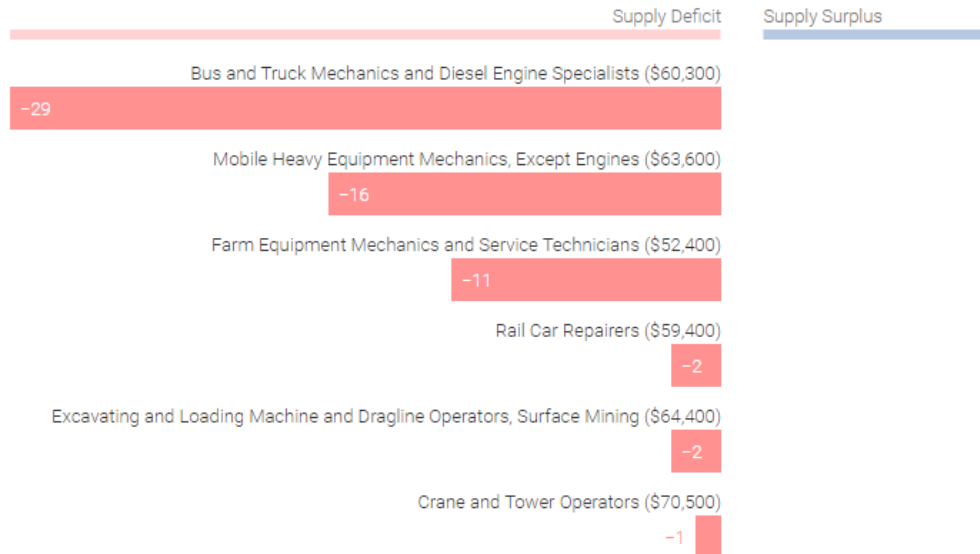
IPEDS SY2021 demographics by award conferred. Count of awards may double count individuals who obtained multiple credentials in the same calendar year. *[NCES IPEDS](#) refers to international students that do not have resident status in the United States as “nonresident aliens.” This title aligns to Federal tax definitions and according to NCES IPEDS refers to “a person who is not a citizen or national of the United States and who is in this country on a visa or temporary basis and does not have the right to remain indefinitely. Note: Nonresident aliens are reported separately, rather than in any of the racial/ethnic categories.” They are not included in calculations of BIPOC talent in this report as race and ethnicity information is not provided for these international students. The terminology of “international student” has been used in this report as it is more familiar to a common audience. <https://nces.ed.gov/ipeds/report-your-data/race-ethnicity-definitions>. For more information, view this article from Berkeley on tax filing status of international students. <https://internationaloffice.berkeley.edu/taxes/tax-filing-status>

Talent Gap Analysis

Occupation Gaps

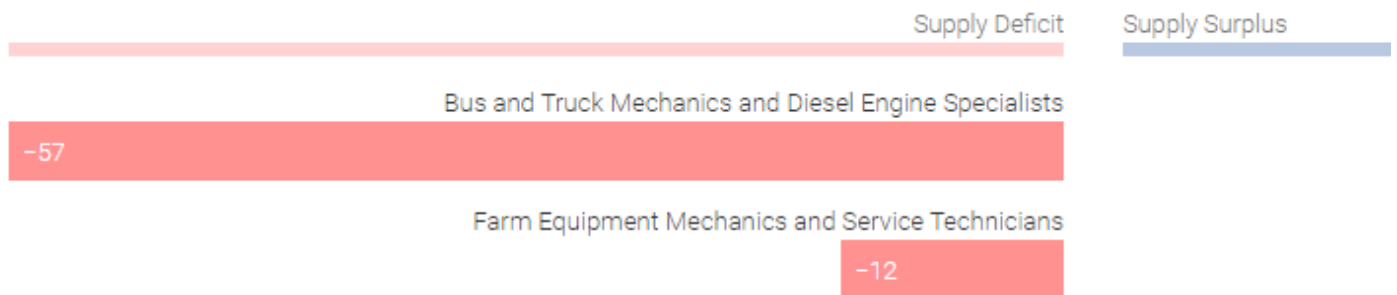
By 2027, it is likely that Minnesota will see a growing shortage of talent across all occupations in the Diesel, Equipment, and Truck pathway (shown in red below). The estimated annual shortage of Bus and Truck Mechanics in particular has worsened since 2021 estimates.

Estimated Occupation Gaps over Five Years in Minnesota



Award Gaps

Minnesota postsecondary institutions are underproducing credentials for Bus and Truck Mechanics and Diesel Engine Specialists and Farm Equipment Mechanics and Service Technicians when compared to national benchmarks for how many awards are typically conferred per local demand. This award gap coupled with the talent shortages highlighted above suggest that increasing the volume of Bus and Truck Mechanics, Diesel Engine Specialists, and Farm Equipment Mechanics out of existing programs, or building new two- and four-year programs aligned to these occupations may be warranted.

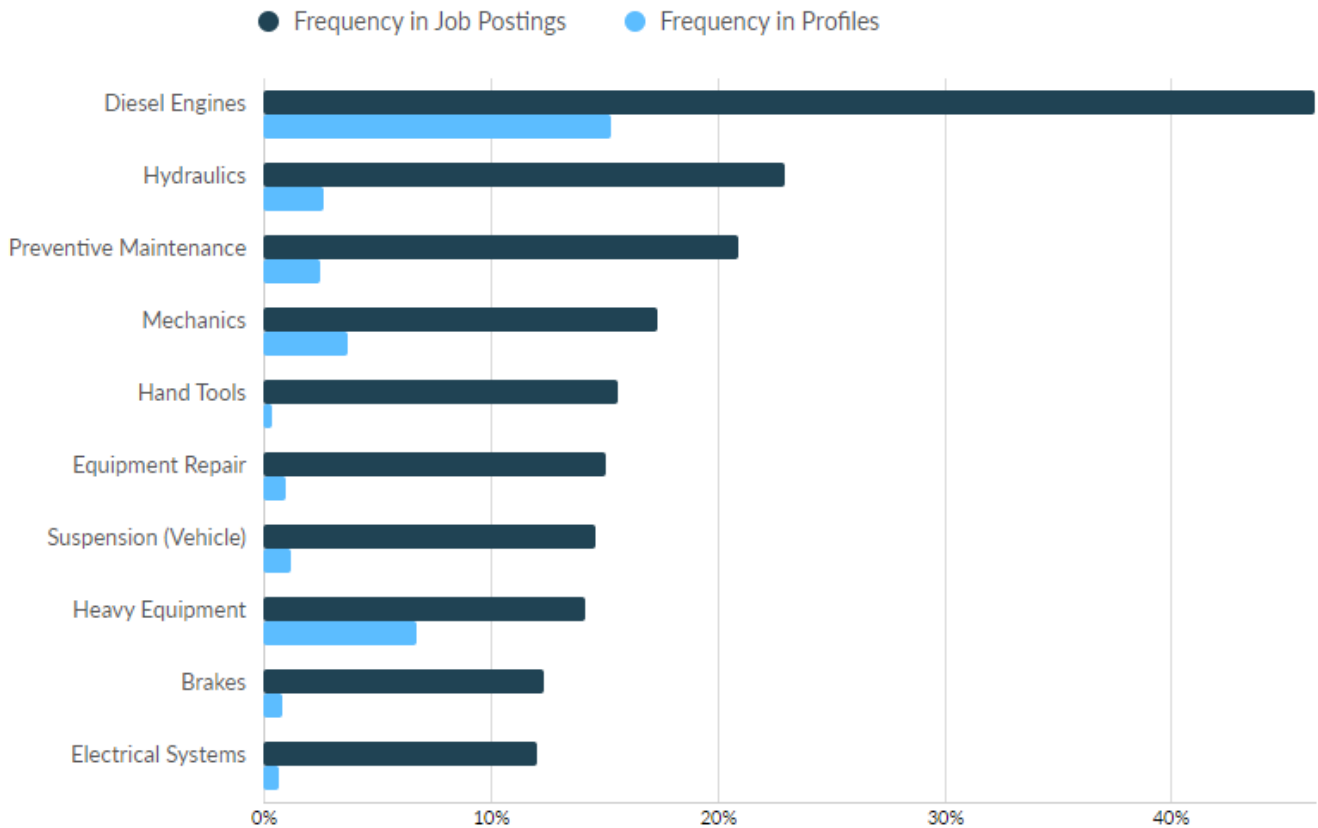


Skill Misalignments

All of these specialized skills are more frequent in job postings than in candidate profiles found online. Diesel Engines, Hydraulics, Preventative Maintenance, and Mechanics are all named more frequently in Diesel Equipment job postings than in the talent profiles of individuals currently employed or seeking work in these roles.

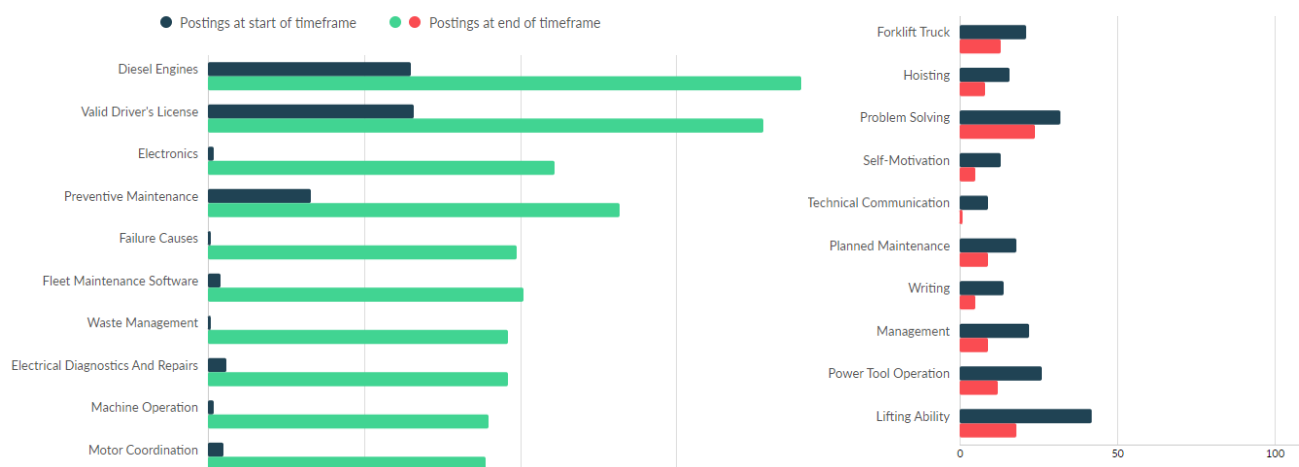
Source: RealTime Talent analysis of Chmura Economics JobsEQ®, <http://www.chmuraecon.com/jobseq/>. Job Posting Trends section uses data from Gartner TalentNeuron Plan, accessed 1/18/2022 at talentneuronplan.gartner.com

Percent of Pathway Job Postings and Online Talent Profiles Indicating Specialized Skills in Minnesota, 2022



Several baseline requirements, such as holding a valid driver’s license, experience with diesel engines, knowledge of performing preventative maintenance, and electronics have been trending up at the close of 2022. The chart below indicates skills that have increased in frequency in online job postings between January and December 2022 (shown in green) and those that have declined in frequency (shown in red).

Pathway Hot and Cold Skills in Demand in Minnesota, 2022



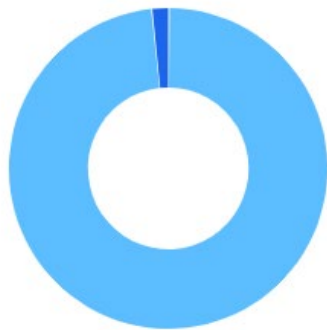
Source: RealTime Talent analysis of Chmura Economics JobsEQ®, <http://www.chmuraecon.com/jobseq/>. Job Posting Trends section uses data from Gartner TalentNeuron Plan, accessed 1/18/2022 at talentneuronplan.gartner.com

High Need, High Demand Pathways

There were about 289 awards conferred at 14 different Minnesota postsecondary institutions in programs aligned to Diesel Equipment Truck careers in SY2021. Among these, 117 were at the Associate level, and 41 were certificates that could be earned in less than two years. The average school had about 20 completions, but range from two to 101 completions. No programs were delivered remotely.

Diesel Equipment Postsecondary Program Awards by Level, SY2021

CIP Code	Title	Certificate < 1 Yr	Certificate 1+ but < 2 Yr	Associate's	Certificate 2+ but < 4 Yr	Bachelor's	Master's	Doctorate	Total Awards
47.0605	Diesel Mechanics Technology/Technician	3	33	43	14	0	0	0	93
49.0202	Construction/Heavy Equipment/Earthmoving Equipment Operation	0	0	0	80	0	0	0	80
47.0613	Medium/Heavy Vehicle and Truck Technology/Technician	0	4	51	20	0	0	0	75
47.0302	Heavy Equipment Maintenance Technology/Technician	0	0	22	8	0	0	0	30
01.0205	Agricultural Mechanics and Equipment/Machine Technology/Technician	0	1	1	4	0	0	0	6
01.0201	Agricultural Mechanization, General	0	0	0	0	5	0	0	5
01.0204	Agricultural Power Machinery Operation	0	0	0	0	0	0	0	0
	Total	3 (1.0%)	38 (13.1%)	117 (40.5%)	126 (43.6%)	5 (1.7%)	0 (0.0%)	0 (0.0%)	289



Institution Type	Completions (2021)	Market Share
Public, 2-year	284	98.3%
Public, 4-year or above	5	1.7%

All awards were conferred by public institutions, and all but five awards were conferred by public four-year institutions. Central Lake College-Brainerd had the largest number of completions in SY2021, comprising 34.9% of related awards conferred. Completions are up 3.6% from 2012.

Diesel Equipment Postsecondary Program Awards by Institution, SY2021

Institution	Completions (2021)	Growth % YOY (2021)	Market Share (2021)	IPEDS Tuition & Fees (2021)	Completions Trend (2017-2021)
Central Lakes College-Brainerd	101	124.4%	34.9%	\$5,954	
Dakota County Technical College	44	-6.4%	15.2%	\$6,208	
Alexandria Technical & Community College	33	-10.8%	11.4%	\$5,910	
Hennepin Technical College	27	58.8%	9.3%	\$5,741	
Minnesota West Community and Technical College	23	0.0%	8.0%	\$6,286	
St Cloud Technical and Community College	12	-33.3%	4.2%	\$5,874	
Riverland Community College	10	-16.7%	3.5%	\$6,060	
Hibbing Community College	10	-9.1%	3.5%	\$5,773	
Saint Paul College	9	50.0%	3.1%	\$6,041	
Minnesota State Community and Technical College	6	-57.1%	2.1%	\$5,862	

The clearest gap in program offerings is for Farm Equipment Mechanics, which are both an area of talent shortages and where Minnesota institutions fall short of national award benchmarks. There were only six Certificate or Associate-level Agricultural Mechanics and Equipment Machine Technician graduates in the most recent school year and only five Bachelor's-level Agricultural Mechanization, General graduates in the most recent school year. There were no Agricultural Power Machinery Operation competitions. All three of these programs (CIP 01.0205, 01.0201, and 01.0204) are prime for exploration of certificate or two-year program growth or development given local employer demand.

Promising Approaches to Addressing Possible Misalignments

A variety of strategies may improve the outlook for diesel equipment talent in need. In the Diesel, Equipment, and Truck pathway, most occupations have low talent diversity by race and gender. Many also have a higher than average share of their workforce that is over 45 years of age.

Postsecondary programs aligned to Farm Equipment Mechanics and Service Technicians and Bus and Truck Mechanics and Diesel Engine Specialists are underproducing graduates in comparison to national benchmarks. These two occupations are also experiencing talent shortages, a low share of female workers and graduates, and Farm Equipment Mechanics and Service Technicians have a low share of BIPOC graduates. Bus and Truck Mechanics and Diesel Engine Specialists have the highest volume of employment and the highest number related graduates; there were 79 diesel graduates specifically from Diesel Mechanics Technology/Technician programs in Minnesota during the 2021 school year, plus another 55 graduates of Medium/Heavy Vehicle and Truck Technology/Technician programs—both of which are counted in the table below.

Source: RealTime Talent analysis of Chmura Economics JobsEQ®, <http://www.chmuraecon.com/jobseq/>. Job Posting Trends section uses data from Gartner TalentNeuron Plan, accessed 1/18/2022 at talentneuronplan.gartner.com

Postsecondary Strategy Summary Table, Minnesota 2022

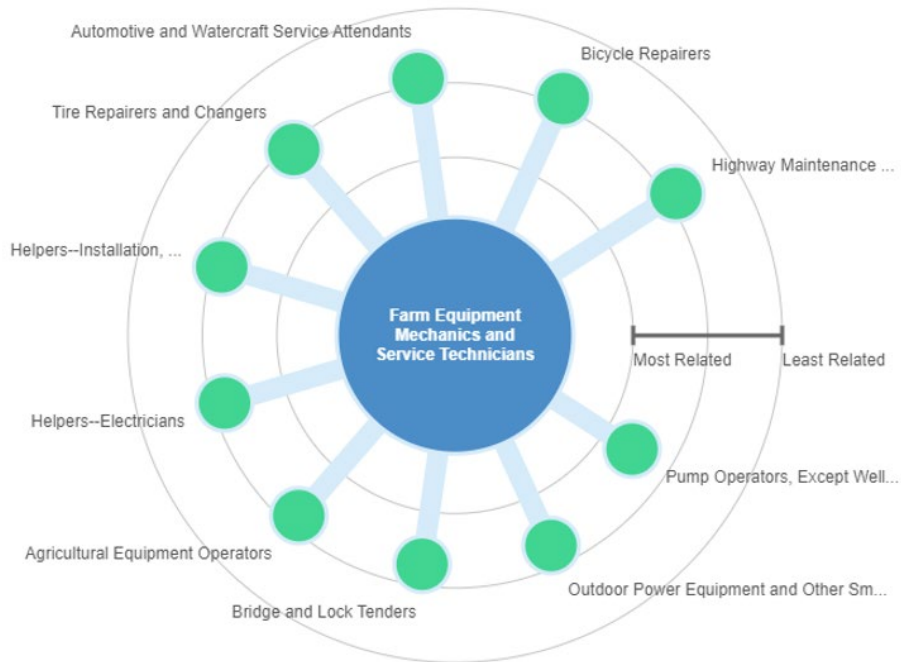
Occupation	Related Programs*	2022Q3 Empl	Talent Shortage	Workforce BIPOC by Race	Workforce Hispanic/Latinx	Workforce Female	Workforce Under 45	SY2021 Graduates (Certificate and AA/AS only)	Award Gap (All Award Levels)**	Graduates BIPOC by Race or Ethnicity (All Award Levels)	Graduates Female (All Award Levels)
Excavating and Loading Machine and Dragline Operators, Surface Mining	<ul style="list-style-type: none"> Construction/Heavy Equipment/Earthmoving Equipment Operation 	685	Y	7.7%	9.4%	5.0%	23.8%	80	N	2.5%	0%
Earth Drillers, Except Oil and Gas	<ul style="list-style-type: none"> Construction/Heavy Equipment/Earthmoving Equipment Operation 	313	Y	8.1%	9.5%	5.3%	53.3%	80	N	2.5%	0%
Bus and Truck Mechanics and Diesel Engine Specialists	<ul style="list-style-type: none"> Diesel Mechanics Technology/Technician Medium/Heavy Vehicle and Truck Technology/Technician 	6,562	Y	10.2%	4.6%	1.3%	52.9%	168	Y	44.8%	13.6%
Farm Equipment Mechanics and Service Technicians	<ul style="list-style-type: none"> Agricultural Mechanics and Equipment/Machine Technology/Technician Agricultural Mechanization, General Agricultural Power Machinery Operation 	1,702	Y	4.9%	4.5%	1.4%	57.3%	6	Y	0%	0%
Mobile Heavy Equipment Mechanics, Except Engines	<ul style="list-style-type: none"> Heavy Equipment Maintenance Technology/Technician Agricultural Mechanics and Equipment/Machine Technology/Technician 	2,158	Y	7.3%	3.9%	1.4%	58.5%	32	N	16.6%	6.6%
Rail Car Repairers	<ul style="list-style-type: none"> Heavy Equipment Maintenance Technology/Technician 	447	Y	10.2%	4.5%	1.5%	59.5%	30	N	16.6%	6.6%
Crane and Tower Operators	<ul style="list-style-type: none"> Construction/Heavy Equipment/Earthmoving Equipment Operation 	384	Y	7.7%	1.4%	1.4%	42.6%	80	N	2.5%	0%
Diesel Equipment and Truck Pathway	All nine aligned programs	12,251	Y	8.7%	4.8%	1.7%	52.8%	284	Y	14.5%	4.5%
All Occupations		2,944,602		15.0%	5.2%	48.3%	56.5%	29,484		37.3%	65.6%

NOTE: Red highlighting indicates lower than overall share of workforce or graduate pool, or existence of occupation or award gap. *Related programs may overlap among occupations within the pathway or across other Transportation career pathways. Only those programs most tightly aligned to the occupation in question are listed in this column. **Award gaps are estimated based on a wider alignment of programs than what is illustrated in this table.

Career Pathway Opportunities

When considering occupations that have significant skill and experience overlap with the occupations of highest need in this pathway, the majority have low employment numbers or are other careers in the Diesel, Equipment, and Truck sector that share high demand. The graphic below offers several careers related to the Farm Equipment Mechanic occupation in skill demands that have highly relevant skill and experience overlap that would be strong feeder occupations for talent. Agricultural Equipment Operators is the most logical source for career advancement into Farm Equipment Mechanic roles.

Feeder Occupations into Farm Equipment Mechanic Roles, 2023Q1



Occupation	Category	Relevance	Avg. Unique Monthly Postings from Jan 2022 - Dec 2022	Mean Salary Diff.
Pump Operators, Except Wellhead Pumpers	Lateral Transition	78%	3	+\$33
Outdoor Power Equipment and Other Small Engine Mechanics	Advancement	65%	4	-\$8,592
Bridge and Lock Tenders	Lateral Advancement	64%	1	-\$9,288
Agricultural Equipment Operators	Lateral Advancement	59%	12	-\$14,163

Source: RealTime Talent analysis of Chmura Economics JobsEQ®, <http://www.chmuraecon.com/jobseq/>. Job Posting Trends section uses data from Gartner TalentNeuron Plan, accessed 1/18/2022 at talentneuronplan.gartner.com

FAQ

What is a location quotient?

A location quotient (LQ) is a measurement of concentration in comparison to the nation. An LQ of 1.00 indicates a region has the same concentration of an industry (or occupation) as the nation. An LQ of 2.00 would mean the region has twice the expected employment compared to the nation and an LQ of 0.50 would mean the region has half the expected employment in comparison to the nation.

What is a cluster?

A cluster is a geographic concentration of interrelated industries or occupations. If a regional cluster has a location quotient of 1.25 or greater, the region is considered to possess a competitive advantage in that cluster.

What is separation demand?

Separation demand is the number of jobs required due to separations—labor force exits (including retirements) and turnover resulting from workers moving from one occupation into another. Note that separation demand does not include all turnover—it does not include when workers stay in the same occupation but switch employers. The total projected demand for an occupation is the sum of the separation demand and the growth demand (which is the increase or decrease of jobs in an occupation expected due to expansion or contraction of the overall number of jobs in that occupation).

What is the difference between industry wages and occupation wages?

Industry wages and occupation wages are estimated via separate data sets, often the time periods being reported do not align, and wages are defined slightly differently in the two systems (for example, certain bonuses are included in the industry wages but not the occupation wages). It is therefore common that estimates of the average industry wages and average occupation wages in a region do not match exactly.

What is NAICS?

The North American Industry Classification System (NAICS) is used to classify business establishments according to the type of economic activity. The NAICS Code comprises six levels, from the “all industry” level to the 6-digit level. The first two digits define the top level category, known as the “sector,” which is the level examined in this report.

What is SOC?

The Standard Occupational Classification system (SOC) is used to classify workers into occupational categories. All workers are classified into one of over 804 occupations according to their occupational definition. To facilitate classification, occupations are combined to form 22 major groups, 95 minor groups, and 452 occupation groups. Each occupation group includes detailed occupations requiring similar job duties, skills, education, or experience.

Who created this report?

This report was developed by RealTime Talent for the Transportation Center of Excellence. If you have questions about the data found in this report, or are interested in learning more, please contact the Senior Director of Strategic Research, Erin Olson at erin@realtimentalentmn.org or visit the RealTime Talent website at www.realtimentalent.org