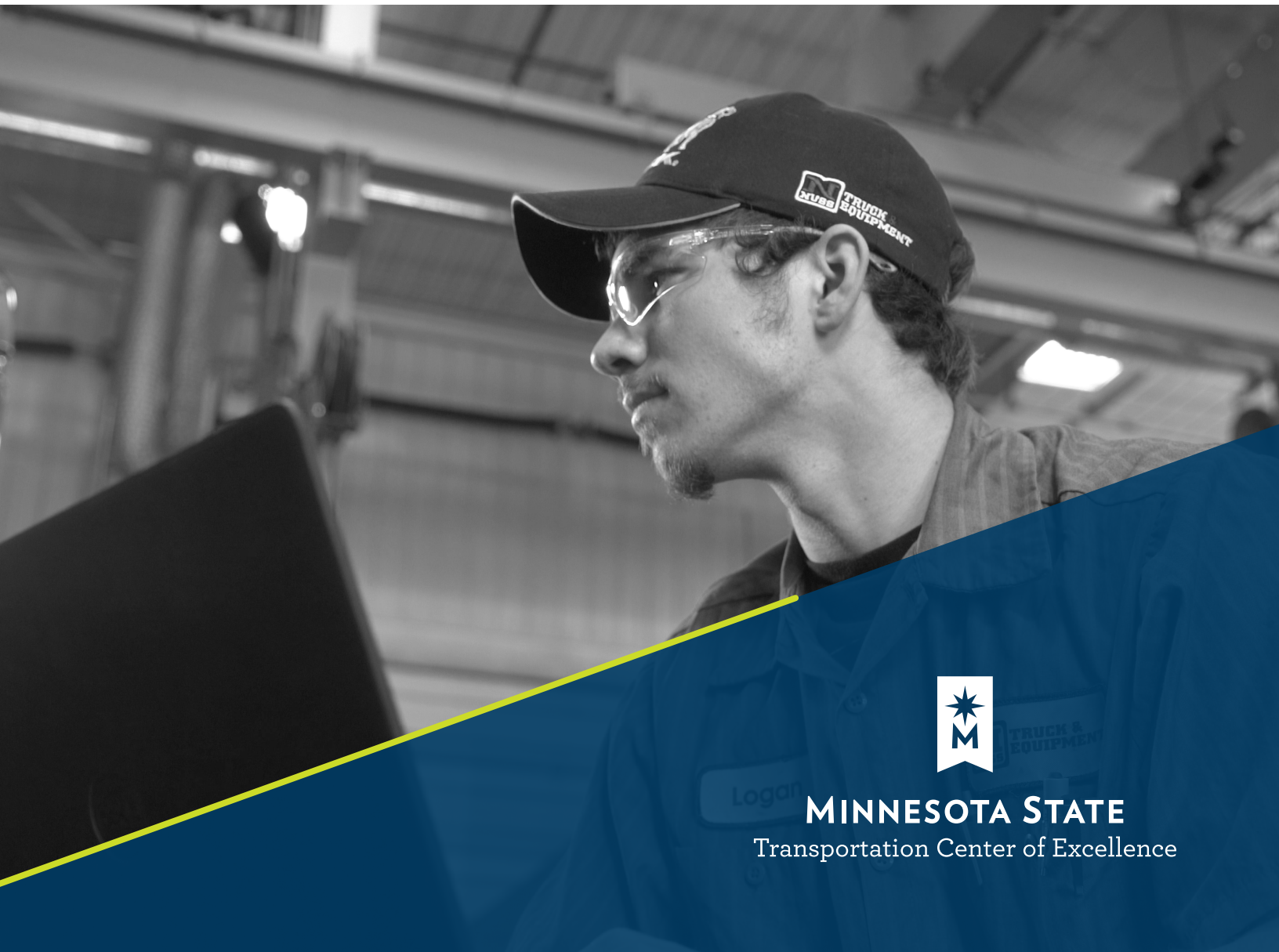


DIESEL EQUIPMENT & TRUCK

2023 Supply & Demand Analysis Overview

Published February 2024



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 12,161 people work in Diesel Equipment and Truck roles in Minnesota as of the second quarter of 2023—down about 357 workers from a year prior and continuing the trend of declining employment in the pathway.

Overall employment in Minnesota has grown by nearly 60,301 workers (2.0%) between the second quarter of 2022 and the second quarter of 2023, and the five-year forecast growth is flat at 0.0% and 1,756 expansion of employment as of the most current baseline forecasts. During this time frame, Diesel, Equipment, and Truck pathway employment is anticipated decline slightly by about 43 jobs (-0.1% on average annually). Total baseline demand for Diesel, Equipment, and Truck talent is anticipated to be around 5,635 professionals needed to fill positions due to job exits and transfers, such as retirements and job changes.

Occupation	Current					5-Year History		5-Year Baseline Forecast				
	Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Empl Change	Ann % Change	Total Demand	Exits	Transfers	Empl Change	Ann % Change
Automotive Technology Pathway	20,884	\$68,300	0.97	236	1.1%	-586	-0.6%	9,072	3,184	5,828	60	0.1%
Aviation and Drone Technology Pathway	9,370	\$125,500	0.87	135	1.5%	69	0.1%	4,559	1,602	2,976	-19	0.0%
Collision Repair Pathway	7,307	\$52,800	1.10	227	3.1%	188	0.5%	3,442	1,213	2,305	-77	-0.2%
Diesel Equipment and Truck Pathway	12,161	\$64,200	1.01	153	1.3%	152	0.3%	5,635	1,954	3,724	-43	-0.1%
Marine and Power Sports Pathway	4,284	\$48,700	0.84	159	3.7%	68	0.3%	2,574	926	1,673	-25	-0.1%
Truck Driving Pathway*	97,603	\$51,800	0.95	3,280	3.3%	2,561	0.5%	61,265	26,466	33,538	1,261	0.3%
Transportation Occupations	133,108	\$60,700	0.93	3,418	2.6%	3,212	0.5%	73,669	27,527	45,162	981	0.1%
Total - All Occupations	3,075,767	\$66,100	1.00	87,730	2.9%	11,603	0.1%	1,746,576	727,900	1,016,920	1,756	0.0%

*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 2023Q2 unless noted otherwise

Note: Figures may not sum due to rounding.

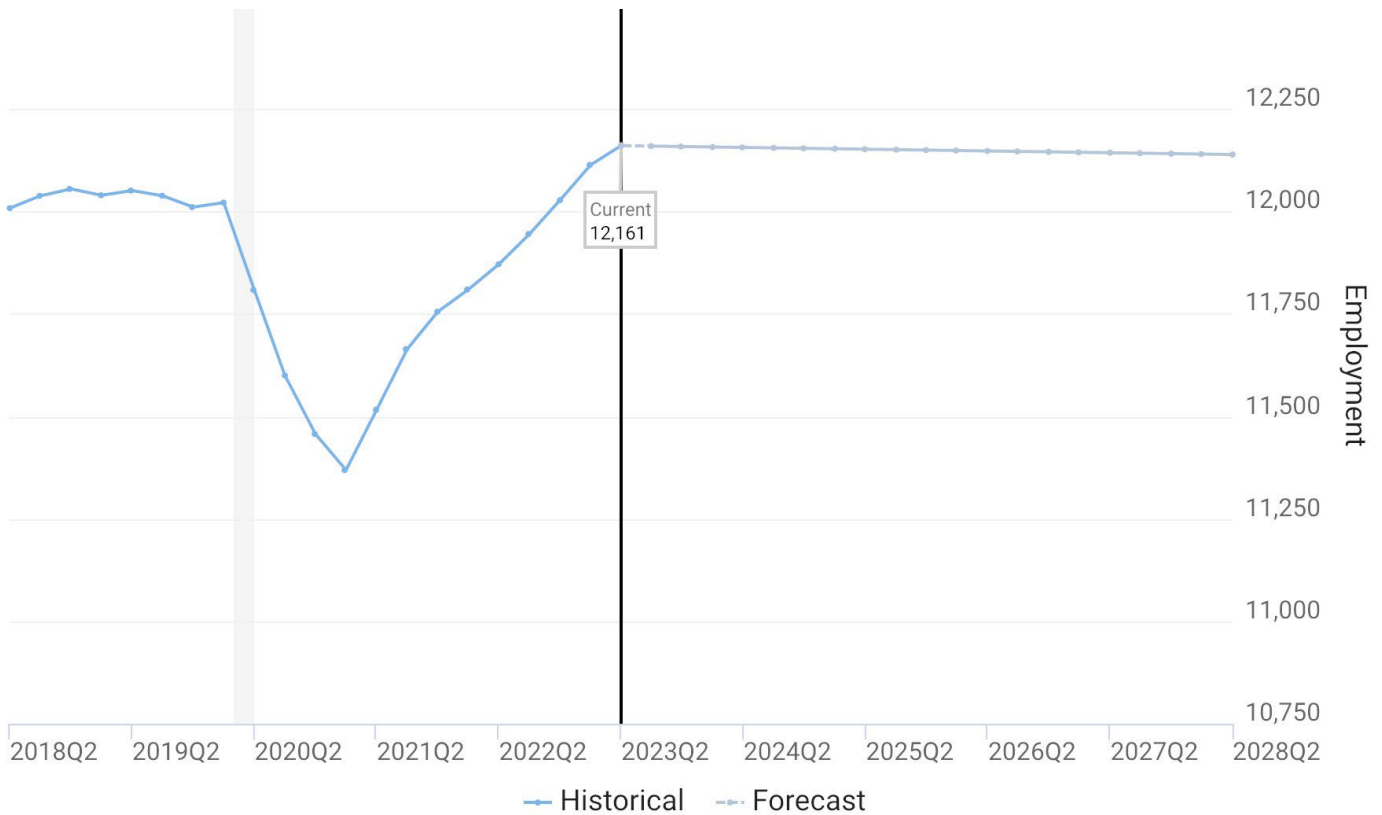
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Minnesota saw a strong job market throughout 2023 and elevated recruitment among employers across most sectors. As the available talent pool was exhausted, unemployment rates dropped dramatically across critical roles and in many scenarios demand far 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 sufficient talent across a large share of occupations in this career pathway. The pathway forecast now shows a -0.1% decline in overall employment by the second quarter of 2028. This is down from last year's baseline estimates of 0.3% growth.

Diesel, Equipment, and Truck Employment Forecast Under Baseline Scenario, Minnesota



Source: JobsEQ®, Data as of 2023Q2, The shaded areas of the graph represent national recessions.

Industry/Occupation Mix

Diesel, Equipment, and Truck talent is primarily concentrated in the Machinery, Equipment, and Supplies Merchant Wholesalers Industry (17.8%), increasing slightly in concentration in 2023 by 0.9 percentage points. The next highest industry of employment concentration is General Freight Trucking (7.6%), followed by Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (5.6%). 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				Total Demand
		% of Occ Empl	Empl	Avg Ann Wages	Exits	Transfers	Empl Growth	
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	17.8%	2,159	\$58,200	706	1,378	104	2,188
4841	General Freight Trucking	7.6%	918	\$63,900	296	526	-34	789
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	5.6%	678	\$65,800	228	401	30	659
8111	Automotive Repair and Maintenance	5.1%	621	\$62,000	204	359	-5	558
2389	Other Specialty Trade Contractors	5.0%	611	\$75,900	186	408	-23	571
4854	School and Employee Bus Transportation	4.3%	528	\$60,600	172	303	-11	463
9211	Executive, Legislative, and Other General Government Support	3.4%	416	\$64,100	135	244	-8	371
2373	Highway, Street, and Bridge Construction	3.3%	398	\$71,500	123	254	-17	360
2122	Metal Ore Mining	3.0%	363	\$78,600	112	233	-18	328
2123	Nonmetallic Mineral Mining and Quarrying	2.6%	313	\$67,500	96	217	-13	300
4842	Specialized Freight Trucking	2.3%	286	\$63,900	92	164	-11	245
4851	Urban Transit Systems	2.1%	252	\$66,100	82	144	-7	218
2371	Utility System Construction	2.0%	238	\$68,100	76	166	10	252
5621	Waste Collection	2.0%	238	\$63,100	80	143	15	238
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	1.8%	223	\$62,800	72	137	-1	208
4882	Support Activities for Rail Transportation	1.8%	220	\$58,100	70	137	-4	203
5321	Automotive Equipment Rental and Leasing	1.7%	206	\$60,200	66	116	-11	171
4821	Rail Transportation	1.5%	177	\$78,200	56	109	-6	158
6111	Elementary and Secondary Schools	1.4%	174	\$63,500	56	99	-8	147
9221	Justice, Public Order, and Safety Activities	0.8%	94	\$64,300	30	55	-2	83
-	All Others	25.1%	3,049	-	971	1,856	-65	2,762

Source: JobsEQ®
 Data as of 2023Q2. 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 double the concentration locally than seen in the nation overall. Other occupations highly concentrated in Minnesota include Excavating and Loading Machine Operators and Bus and Truck Mechanics. On average, careers in this pathway pay about \$64,200—about \$1,900 below the average wage statewide across all positions. However, average wages in the pathway increased by \$2,300 since 2022. Demand was high over the past year, seeing employment growth of 2.4% since the second quarter of 2022. Employment in the pathway is forecast to decline statewide by about -0.1% through the second quarter of 2028.

Diesel, Equipment, and Truck Pathway in Minnesota – Baseline Forecast, 2023Q2¹

SOC	Occupation	Current					5-Year Baseline Forecast				
		Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Total Demand	Exits	Transfers	Empl Change	Ann % Change
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	6,356	\$63,500	1.15	78	1.2%	2,791	1,036	1,821	-67	-0.2%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	2,176	\$69,200	0.67	28	1.3%	1,079	352	693	34	0.3%
49-3041	Farm Equipment Mechanics and Service Technicians	1,769	\$54,500	2.05	22	1.2%	845	283	557	5	0.1%
47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining	834	\$73,800	1.22	2	0.2%	410	127	296	-13	-0.3%
49-3043	Rail Car Repairers	417	\$58,200	1.05	5	1.2%	196	66	131	-2	-0.1%
53-7021	Crane and Tower Operators	320	\$78,000	0.35	11	3.2%	166	45	123	-1	-0.1%
47-5023	Earth Drillers, Except Oil and Gas	289	\$65,900	0.75	7	2.6%	148	45	103	0	0.0%
	Diesel Equipment and Truck Pathway	12,161	\$64,200	1.01	153	1.3%	5,635	1,954	3,724	-43	-0.1%
	Total - All Occupations	3,075,767	\$66,100	1.00	87,730	2.9%	1,746,576	727,900	1,016,920	1,756	0.0%

Source: [JobsEQ®](#)

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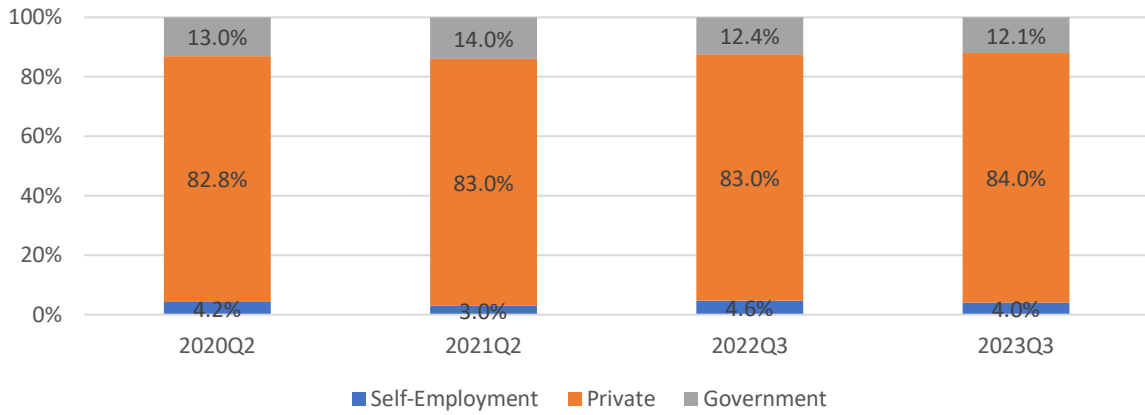
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Employment Types

About 84% of people employed in Diesel, Equipment, and Truck careers in Minnesota work for private employers, while an estimated 4% are self-employed (similar to 2022). The remaining 12% work for state, federal, or local government entities.

Employment Types, Minnesota 2020-2023



Wage Analysis

Diesel, Equipment, and Truck careers saw some wage gains across the pathway, with average wages rising by about \$2,300 from prior estimates.¹ Entry-level wages in the pathway exceed the average entry-level wages observed across all occupations statewide, paying an average of \$47,300 annually for entry-level talent.

Education and training requirements vary slightly across the different occupations in this pathway, with all occupations typically requiring only a High School equivalency and zero to five years of work experience. Typical on-the-job training is either moderate or long term for all occupations.

Diesel, Equipment, and Truck Pathway Wages and Experience Level Requirements, MN, 2023Q2

SOC	Occupation	Mean	Entry Level	Experienced	Percentiles					Education and Training		
					10%	25%	50% (Median)	75%	90%	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	\$63,500	\$47,000	\$71,800	\$44,200	\$52,900	\$62,400	\$74,400	\$85,800	HS/GED	None	Long-term OJT
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	\$78,000	\$52,200	\$90,800	\$48,900	\$59,700	\$72,800	\$103,500	\$119,300	HS/GED	None	Long-term OJT
49-3041	Farm Equipment Mechanics and Service Technicians	\$65,900	\$46,400	\$75,700	\$42,600	\$53,900	\$64,400	\$72,000	\$86,800	HS/GED	None	Long-term OJT
47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining	\$73,800	\$51,700	\$84,900	\$48,400	\$59,100	\$71,800	\$87,400	\$96,600	HS/GED	Less than 5 years	Mod-term OJT
49-3043	Rail Car Repairers	\$54,500	\$41,900	\$60,800	\$38,500	\$48,100	\$53,800	\$62,700	\$68,400	HS/GED	None	Long-term OJT
53-7021	Crane and Tower Operators	\$69,200	\$50,500	\$78,500	\$46,800	\$57,900	\$69,000	\$80,000	\$89,900	HS/GED	Less than 5 years	Mod-term OJT
47-5023	Earth Drillers, Except Oil and Gas	\$58,200	\$46,900	\$63,800	\$45,600	\$49,600	\$53,300	\$68,900	\$78,200	HS/GED	Less than 5 years	Long-term OJT
	Diesel Equipment and Truck Pathway	\$64,200	\$47,300	\$72,600	\$44,200	\$53,600	\$63,000	\$75,100	\$85,400			
	Total - All Occupations	\$66,100	\$32,800	\$82,700	\$30,300	\$37,500	\$51,700	\$77,900	\$113,000			

Source: [JobsEQ®](#) Wage data represent the average for all Covered Employment

Wages in the Diesel, Equipment, and Truck pathway vary across the three regions of Rural Greater Minnesota, Urban Greater Minnesota, and the 7-county MSP Metro. The MSP Metro region has the highest wages across experience levels and percentiles and contains 48% of the pathway's total statewide employment. Wages in the Urban Greater Minnesota region, while lower than those in the MSP Metro, are higher than for Rural Greater Minnesota across experience levels and percentiles.

Source: RealTime Talent analysis of Chmura Economics JobsEQ®, <http://www.chmuraecon.com/jobseq/>. Job Posting Trends section uses data from Gartner TalentNeuron Plan, accessed 1/11/2024 at talentneuronplan.gartner.com. Industry detail, skill and certification analysis, wage trends, and posting to hire analysis are from the Lightcast 2023Q4 dataset accessed at analyst.lightcast.io

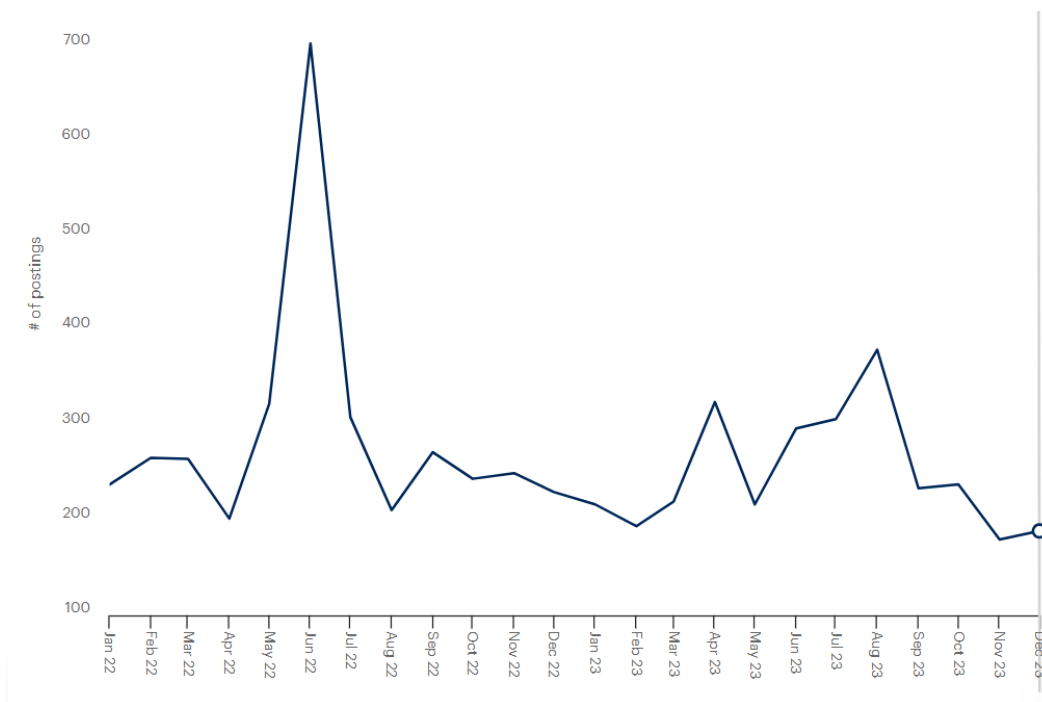
Diesel, Equipment, and Truck Pathway Wages, 2023Q2

Region	Empl Count	Mean	Entry Level	Experienced	Percentiles				
					10%	25%	50% (Median)	75%	90%
Rural Greater Minnesota	3,828	\$57,600	\$43,000	\$64,900	\$39,700	\$49,000	\$56,500	\$67,000	\$74,700
Urban Greater Minnesota	2,247	\$61,700	\$45,900	\$69,600	\$43,300	\$51,600	\$61,200	\$70,300	\$80,100
MSP Metro	5,698	\$69,500	\$53,300	\$77,500	\$50,500	\$59,100	\$67,800	\$81,400	\$89,400
Minnesota	12,161	\$64,200	\$47,300	\$72,600	\$44,200	\$53,600	\$63,000	\$75,100	\$85,400

Job Posting Trends

Data in this section focuses on jobs newly advertised between January 1 and December 31, 2023 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 2023Q4 dataset. Overall, there were 2,970 new jobs advertised in Diesel, Equipment, and Truck pathway careers during this time frame, a decrease of -16% from the prior 12-month period (2022). The share of positions advertised by staffing and temp agencies in the Diesel, Equipment, and Truck pathway decreased back to levels similar to 2021 (11%), implying an easing of the challenges seen in 2022 in finding talent in this career. Posted wages increased to an average \$31.38 per hour as of 2023, and there were only an average of three hires per every one unique job posting advertised based on Lightcast estimates.

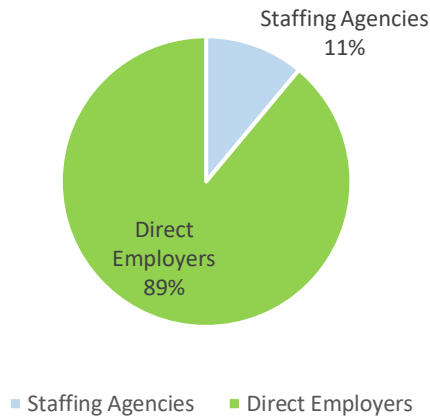
Volume of Career Pathway Online Job Postings in 2022 and 2023



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

Employer	Percent Change between 2022 and 2023
1. PENSKE	160%
2. Ryder	13%
3. Army	100%
4. Ruan Transportation	4200%
5. ZIEGLER	-11%
6. Waste Management	-44%
7. John Deere	22%
8. Ziegler Caterpillar	-21%
9. Sysco	20%
10. XPO Logistics, Inc	-50%

New Job Postings Advertised in Minnesota by Employer Type

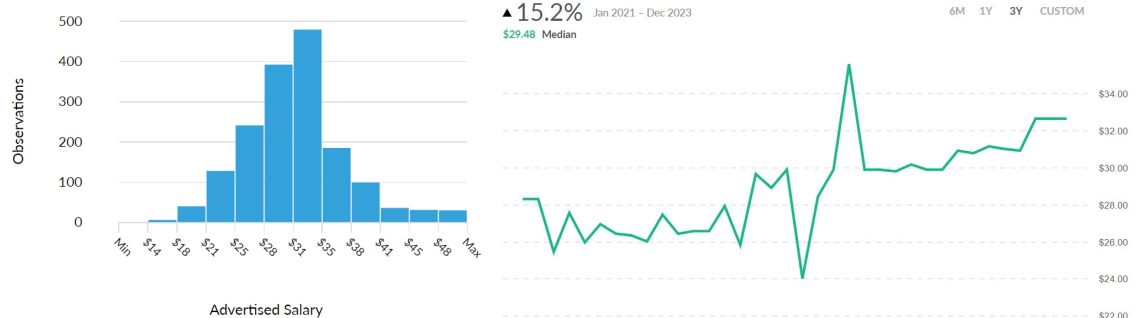


New Job Postings by Industry or Employer Type

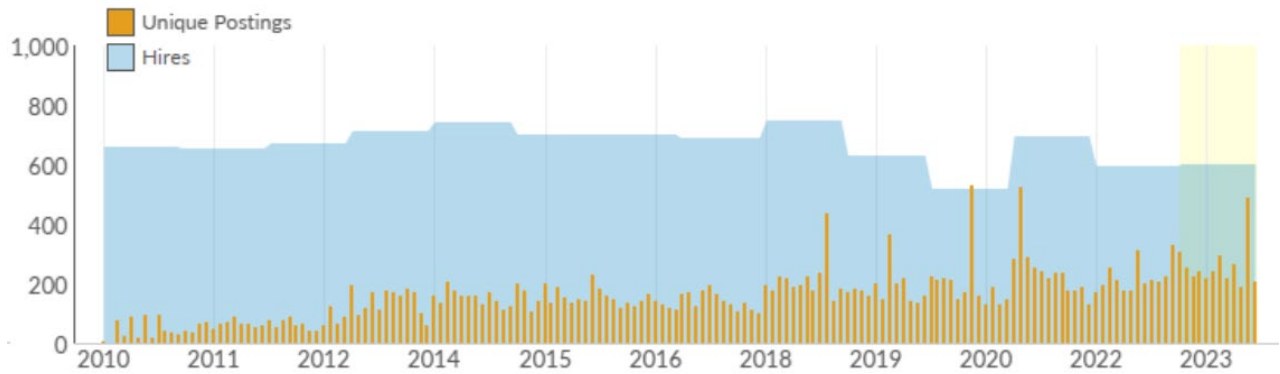
Industry	Total/Unique (Jan 2023 - Dec 2023)	Posting Intensity	Median Posting Duration
General Freight Trucking, Long-Distance, Truckload	3,637 / 263	14 : 1	25 days
Employment Placement Agencies	377 / 257	1 : 1	28 days
Solid Waste Collection	608 / 173	4 : 1	35 days
Process, Physical Distribution, and Logistics Consulting Services	5,040 / 163	31 : 1	41 days
Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing	282 / 108	3 : 1	23 days
General Automotive Repair	589 / 80	7 : 1	34 days
Other Grocery and Related Products Merchant Wholesalers	363 / 71	5 : 1	47 days
Hardware Retailers	250 / 69	4 : 1	36 days
New Car Dealers	739 / 67	11 : 1	20 days
Automobile and Other Motor Vehicle Merchant Wholesalers	235 / 55	4 : 1	31 days

Pathway Advertised Salary Range

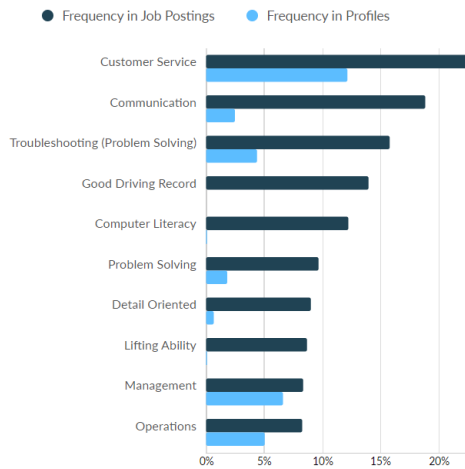
\$31.38/hr
Median Advertised Salary



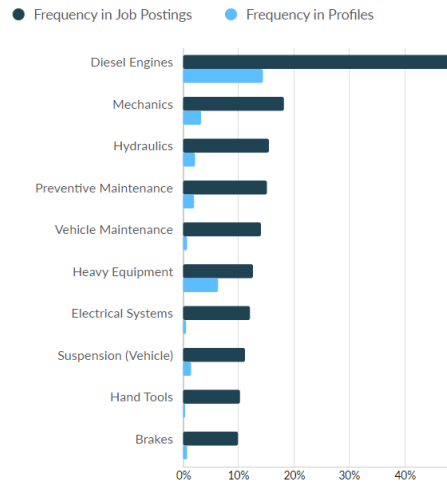
Monthly Ratio of Unique Job Postings to Estimated Hires



Top Common Skills



Top Specialized Skills



Top Certifications and Qualifications

Qualification	Postings with Qualification
Valid Driver's License	1,016
Commercial Driver's License (CDL)	462
Automotive Service Excellence (ASE) Certification	386
CDL Class A License	329
HVAC Certification	56
CDL Class B License	39
ASE Medium-Heavy Truck Certification	39
DOT Certification	37
Forklift Certification	19
EPA 608 Technician Certification	15

Talent Supply Detail

Talent Unemployment, Underemployment, and Educational Attainment

At an overall pathway unemployment rate of 1.3%, there are about 153 unemployed Diesel Equipment Truck professionals statewide. An additional 745 Diesel Equipment Truck professionals are underemployed—meaning they are working in roles for which they are overqualified by education or experience.²

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	11.3%	52.9%	17.4%	10.9%	7.2%	0.2%	0.2%	820	58	2	0.2%
47-5023	Earth Drillers, Except Oil and Gas	11.4%	52.6%	17.3%	10.9%	7.4%	0.2%	0.2%	280	22	7	2.6%
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	7.2%	41.9%	19.1%	25.2%	5.8%	0.7%	0.2%	6,172	386	78	1.2%
49-3041	Farm Equipment Mechanics and Service Technicians	6.0%	43.8%	19.0%	25.5%	4.8%	0.7%	0.2%	1,744	79	22	1.2%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	6.2%	42.7%	19.6%	24.4%	5.8%	0.9%	0.3%	2,114	142	28	1.3%
49-3043	Rail Car Repairers	6.6%	42.5%	19.5%	23.7%	6.3%	1.1%	0.4%	406	32	5	1.2%
53-7021	Crane and Tower Operators	5.5%	54.1%	19.4%	12.5%	7.1%	1.1%	0.2%	320	27	11	3.2%
	Diesel Equipment and Truck Pathway	7.2%	43.7%	19.0%	23.4%	5.8%	0.7%	0.2%	11,856	745	153	1.3%
	Total - All Occupations	4.8%	20.9%	15.2%	14.1%	30.7%	10.4%	3.9%	2,976,622	526,677	87,730	2.9%

Source: JobsEQ®

Data as of 2023Q2 unless noted otherwise

Note: Figures may not sum due to rounding.

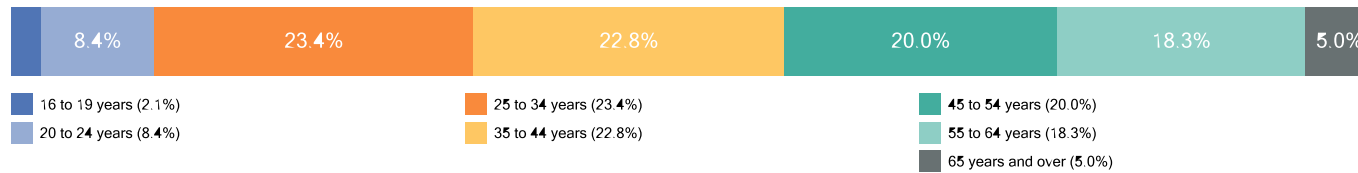
1. "Overall occupation" characteristics refer to attributes across all individuals in those occupations, not just those limited to the demographic categories shown in this table.

² Chmura adopts the New York Fed methodology of counting as underemployed only those who have acquired at least a Bachelor's degree and yet are working in an occupation that does not typically require a Bachelor's degree. In Occupation Diversity, the only occupations shown in the Underemployment table are "non-college jobs", as designated by the New York Fed. Per the New York Fed, "a job is classified as a college job if 50 percent or more of the people working in that job indicate that at least a bachelor's degree is necessary; otherwise, the job is classified as a non-college job."

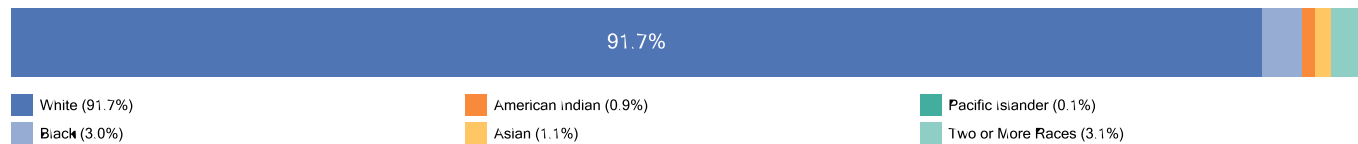
Workforce Demographics

About 10.5% of the Diesel Equipment Truck workforce is under the age of 25, and 5.0% are over 64 years old. More of the workforce in 2023 is between 25-44 years old (46.2%) than in 2022 (43.5%). Similar to 2022, the largest demographic group by race are White, representing 91.7% of the total pathway's workforce, with the next largest cohort being talent identifying as two or more races, representing 3.1% of the workforce. Just over 5% of the pathway's workforce are Hispanic or Latinx, and less than 2% are female.

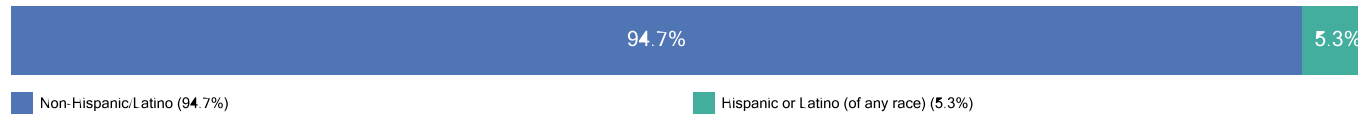
Diesel, Equipment, and Truck Workforce Age Demographics, 2023Q2



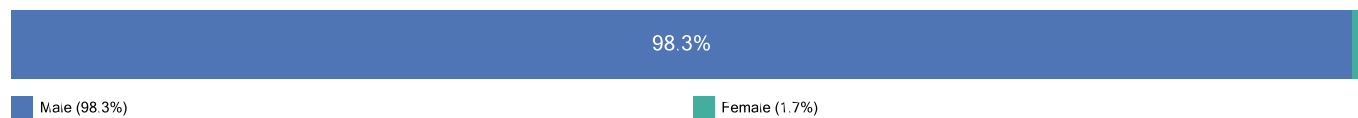
Diesel, Equipment, and Truck Workforce Race Demographics, 2023Q2



Diesel, Equipment, and Truck Workforce Ethnicity Demographics, 2023Q2



Diesel, Equipment, and Truck Workforce Gender Demographics, 2023Q2

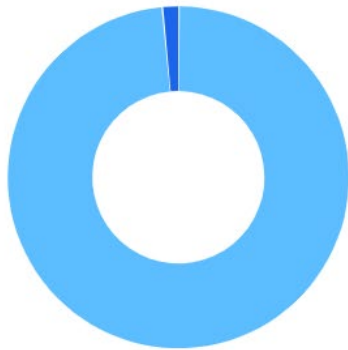


Aligned Postsecondary Programs

There were 256 awards conferred at 14 different Minnesota postsecondary institutions in programs aligned to Diesel, Equipment, and Truck careers in SY2022. Among these, 106 were certificates that could be earned in more than two but less than four years, while 97 were at the Associate level. The average school had about 18 completions, but schools range from two to 67 completions. No programs were delivered remotely.

Diesel, Equipment, and Truck Postsecondary Program Awards by Level, SY2022

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
01.0201	Agricultural Mechanization, General	0	0	0	0	4	0	0	4
01.0204	Agricultural Power Machinery Operation	0	1	0	0	0	0	0	1
01.0205	Agricultural Mechanics and Equipment/Machine Technology/Technician	0	0	5	7	0	0	0	12
47.0302	Heavy Equipment Maintenance Technology/Technician	2	0	19	10	0	0	0	31
47.0399	Heavy/Industrial Equipment Maintenance Technologies/Technicians, Other	0	0	0	0	0	0	0	0
47.0605	Diesel Mechanics Technology/Technician	0	33	35	22	0	0	0	90
47.0613	Medium/Heavy Vehicle and Truck Technology/Technician	4	9	38	21	0	0	0	72
49.0202	Construction/Heavy Equipment/Earthmoving Equipment Operation	0	0	0	46	0	0	0	46
	Total	6 (2.3%)	43 (16.8%)	97 (37.9%)	106 (41.4%)	4 (1.6%)	0 (0%)	0 (0%)	256



Institution Type	Completions (2022)	Market Share
Public, 2-year	252	98.4%
Public, 4-year or above	4	1.6%

Source: RealTime Talent analysis of Chmura Economics JobsEQ®, <http://www.chmuraecon.com/jobseq/>. Job Posting Trends section uses data from Gartner TalentNeuron Plan, accessed 1/11/2024 at [talentneuronplan.gartner.com](https://www.talentneuronplan.gartner.com). Industry detail, skill and certification analysis, wage trends, and posting to hire analysis are from the Lightcast 2023Q4 dataset accessed at analyst.lightcast.io

Nearly all (98.4%) SY2022 awards were conferred at public two-year institutions, with the largest number of completions in SY2022 at Central Lakes College-Brainerd, followed by the Dakota County Technical College (26.2% and 18.8% respectively of related awards conferred). Completions are down overall by 4% from 2018.

Diesel, Equipment, and Truck Postsecondary Program Awards by Institution, SY2022

Completions by Institution

Institution	Completions (2022)	Growth % YOY (2022)	Market Share (2022)	IPEDS Tuition & Fees (2022)	Completions Trend (2018-2022)
Central Lakes College-Brainerd	67	-33.7%	26.2%	\$6,140	
Dakota County Technical College	48	9.1%	18.8%	\$6,419	
Alexandria Technical & Community College	32	-3.0%	12.5%	\$6,107	
Hennepin Technical College	21	-22.2%	8.2%	\$5,881	
St Cloud Technical and Community College	18	50.0%	7.0%	\$6,075	
Minnesota West Community and Technical College	16	-30.4%	6.3%	\$6,484	
Minnesota State Community and Technical College	11	83.3%	4.3%	\$5,900	
Riverland Community College	10	0.0%	3.9%	\$6,249	
Minnesota North College	9	-10.0%	3.5%	\$5,970	
South Central College	9	125.0%	3.5%	\$6,146	

Source: RealTime Talent analysis of Chmura Economics JobsEQ®, <http://www.chmuraecon.com/jobseq/>. Job Posting Trends section uses data from Gartner TalentNeuron Plan, accessed 1/18/2024 at talentneuronplan.gartner.com

Graduate Demographics

Postsecondary program diversity varies by program across the Diesel, Equipment, and Truck pathway. Medium/Heavy Vehicle and Truck Technology/Technician programs remain the most diverse by race and ethnicity, similar to SY2021. However, all programs continue to have an overrepresentation of male students, with just 11 graduates statewide from all aligned programs this year being female.

Race and Gender of Graduates Receiving Postsecondary Awards in SY2022, Minnesota

CIP Code	Description	All 2022 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	4	0	0	0	0	0	4	0	4	0
01.0204	Agricultural Power Machinery Operation	1	0	0	0	0	0	1	0	1	0
01.0205	Agricultural Mechanics and Equipment/Machine Technology/Technician	12	0	0	0	0	0	12	0	11	1
47.0302	Heavy Equipment Maintenance Technology/Technician	31	0	1	1	0	0	25	4	29	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	90	1	0	3	0	5	76	5	87	3
47.0613	Medium/Heavy Vehicle and Truck Technology/Technician	72	1	7	0	2	3	51	8	69	3
49.0202	Construction/Heavy Equipment/Earthmoving Equipment Operation	46	0	0	0	0	0	43	3	44	2
All Diesel, Equipment, and Truck Postsecondary Programs		256	2	8	4	2	8	212	20	245	11

IPEDS SY2022 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>

Postsecondary programs aligned to Bus and Truck Mechanics and Diesel Engine Specialists and Farm Equipment Mechanics and Service Technicians are underproducing graduates in comparison to national benchmarks. These two occupations, along with Mobile Heavy Equipment Mechanics, are also experiencing moderate graduate shortages. The eight aligned programs for the Diesel, Equipment, and Truck pathway all have very low shares of BIPOC graduates and of female graduates. The share of BIPOC graduates in aligned programs increased by 2.7 percentage points from the 2021 school year. However, the share of graduates that are female was relatively steady, with a 0.2 percentage point decrease from the 2021 school year (down from 4.5%). The Bus and Truck Mechanics and Diesel Engine Specialist occupation has the highest volume of employment and the highest number related graduates; there were 90 graduates specifically from Diesel Mechanics Technology/Technician in Minnesota during the 2022 school year, plus another 72 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 1/18/2024 at talentneuronplan.gartner.com

Postsecondary Strategy Summary Table, Minnesota 2023

Occupation	Related Programs*	2023Q2 Empl	Workforce BIPOC by Race	Workforce Hispanic/Latinx	Workforce Female	Workforce Under 45	SY2022 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 	820	8.6%	10.4%	5.2%	56.8%	46	N	6.5%	4.3%
Earth Drillers, Except Oil and Gas	<ul style="list-style-type: none"> Construction/Heavy Equipment/Earthmoving Equipment Operation 	280	9.4%	10.7%	5.5%	57.5%	46	N	6.5%	4.3%
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 	6,172	10.7%	5.5%	1.3%	56.4%	162	Y	21.6%	3.7%
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 	1,744	3.7%	4.1%	1.4%	57.7%	13	Y	0%	5.9%
Mobile Heavy Equipment Mechanics, Except Engines	<ul style="list-style-type: none"> Heavy Equipment Maintenance Technology/Technician Agricultural Mechanics and Equipment/Machine Technology/Technician 	2,114	5.5%	3.7%	1.4%	59.1%	43	N	14%	0%
Rail Car Repairers	<ul style="list-style-type: none"> Heavy Equipment Maintenance Technology/Technician 	406	7.6%	4.3%	1.4%	60.7%	31	N	19.4%	6.5%
Crane and Tower Operators	<ul style="list-style-type: none"> Construction/Heavy Equipment/Earthmoving Equipment Operation 	320	3.2%	2.5%	0.9%	36.9%	46	N	6.5%	4.3%
Diesel Equipment and Truck Pathway	All nine aligned programs	11,856	8.3%	5.3%	1.7%	56.7%	252	Y	17.2%	4.3%
All Occupations		2,976,622	16.0%	5.4%	48.1%	56.7%	30,032		34.1%	66.0%

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

Conclusion

The Diesel, Equipment, and Truck pathway employment forecast declined slightly in 2023, now forecasting a slight decrease of -0.1% average annual employment over the next five years. Of the seven occupations included in the Diesel, Equipment, and Truck pathway, three (Farm Equipment Mechanics and Service Technicians; Excavating and Loading Machine and Dragline Operators, Surface Mining; Bus and Truck Mechanics and Diesel Engine Specialists) are uniquely concentrated in Minnesota to a higher degree than seen in the nation overall, with location quotients of 2.05, 1.22, and 1.15, respectively. The percentage of people employed by private employers in Diesel, Equipment, and Truck careers has increased slightly from prior years (84% compared to 83% in 2022). This comes from a slight decrease in both self-employment and government employment. Average wages increased significantly across the pathway statewide as occurred the past two years, rising by nearly \$2,300 from prior year estimates.

About 6.2% of workers employed in the Diesel, Equipment, and Truck pathway in Minnesota are underemployed (about 745 underemployed people). As in prior years, the institution with the largest number of completions was the Central Lakes College-Brainerd, with 67 completions in SY2022. The following programs are prime for exploration of certificate or two-year program growth or development given local employer demand and underproduction of graduates in the state: Diesel Mechanics Technology/Technician, Medium/Heavy Vehicle and Truck Technology/Technician, Agricultural Mechanics and Equipment/Machine Technology/Technician, General Agricultural Mechanization, and Agricultural Power Machinery Operation. Each of the eight programs aligned with the Diesel, Equipment, and Truck pathway have a low share of BIPOC graduates and a low share of female graduates, showcasing the opportunity to diversify student enrollment into these programs.

FAQ

How is employment forecast determined?

Forecast employment growth uses national projections from the Bureau of Labor Statistics, forecasts for 2022-2032, adapted for regional growth patterns by Chmura. Employment data are based on [occupation forecasts](#) and event-based forecasts if applicable. Forecasts are developed at the county level; therefore, for detailed (6-digit NAICS) ownership-specific industries, the forecast employment growth for a zip code or place (city, town, etc.) is taken from the forecast of the county to which it belongs.

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@realtimetalentmn.org or visit the RealTime Talent website at www.realtimetalent.org