

TRANSPORTATION PATHWAYS *SUPPLY & DEMAND ANALYSIS*

A Workshop with Education Professionals

February 7, 2023



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MINNESOTA STATE
Transportation Center of Excellence



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SUPPLY AND DEMAND ANALYSIS

Transportation Pathways
2022



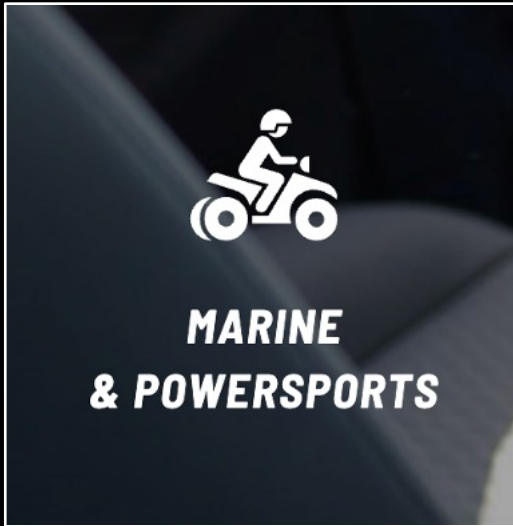
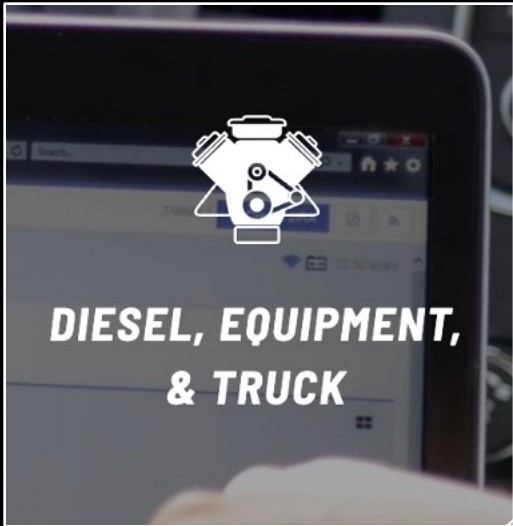
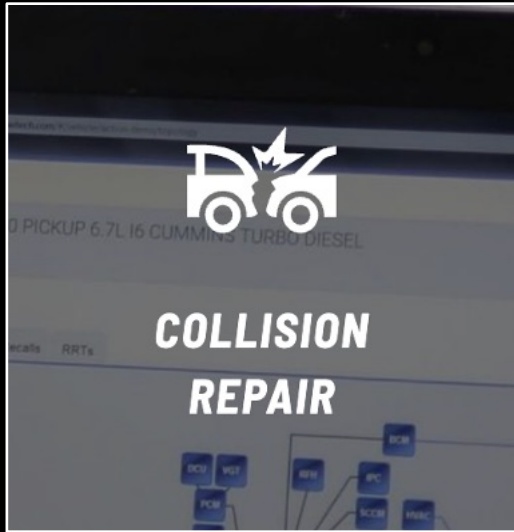
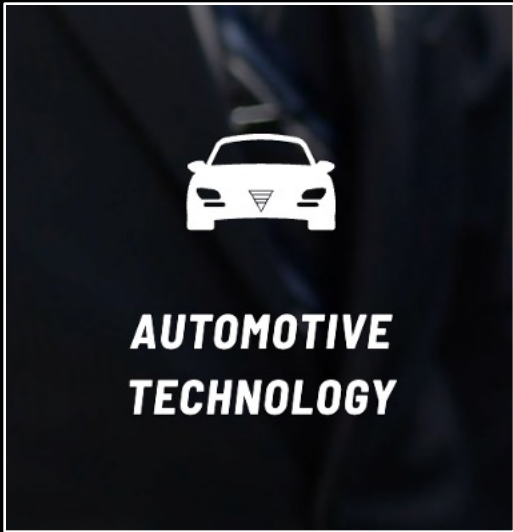
Deep-Dive into Six Pathways in Transportation

- Demand Analysis
 - Critical workforce trends and opportunities
 - Future sector growth
 - Foundational and trending skills
- Supply Analysis
 - Unemployment, Underemployment
 - Educational Attainment
 - Workforce & Graduate Demographics
- Talent Gap Analysis
- Workshopping Solutions

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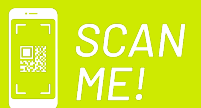


THE TRANSPORTATION SECTOR

Transportation Pathways in Minnesota – Baseline Forecast, 2022Q3¹

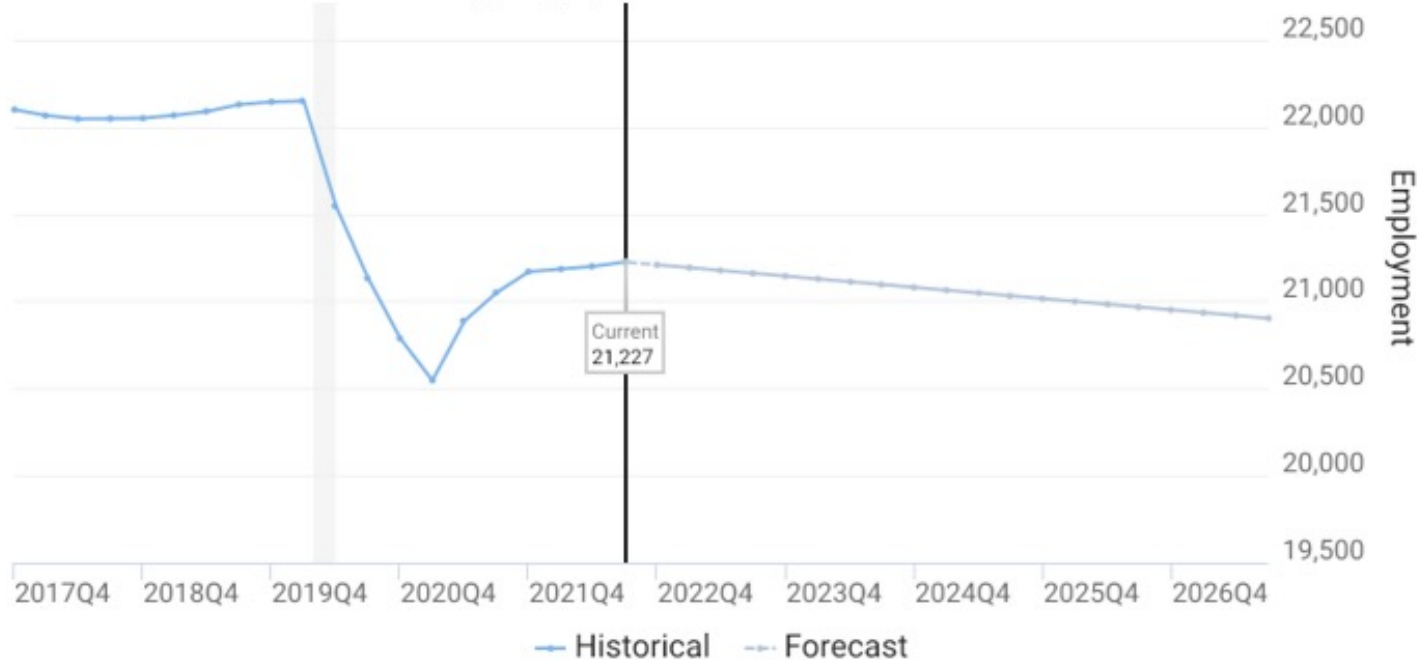
Occupation	Current						5-Year History		5-Year Baseline Forecast				
	Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
Automotive Technology Pathway	21,227	\$66,900	1.02	387	1.8%	1,183	-819	-0.8%	8,677	3,181	5,821	-279	-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.



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Automotive Technology Employment Forecast Under Baseline Scenario, Minnesota



Takeaways

- Low unemployment (1.8%, 387 people)
- Second highest total employment among transportation pathways
- About **41% of positions** held today will need to be filled by new talent in the next five years (improved)

Top Industries of Employment

- Automotive Repair and Maintenance (25.8%)
- Automobile Dealers (21.6%)
- Architectural, Engineering, and Related Services (5.5%)



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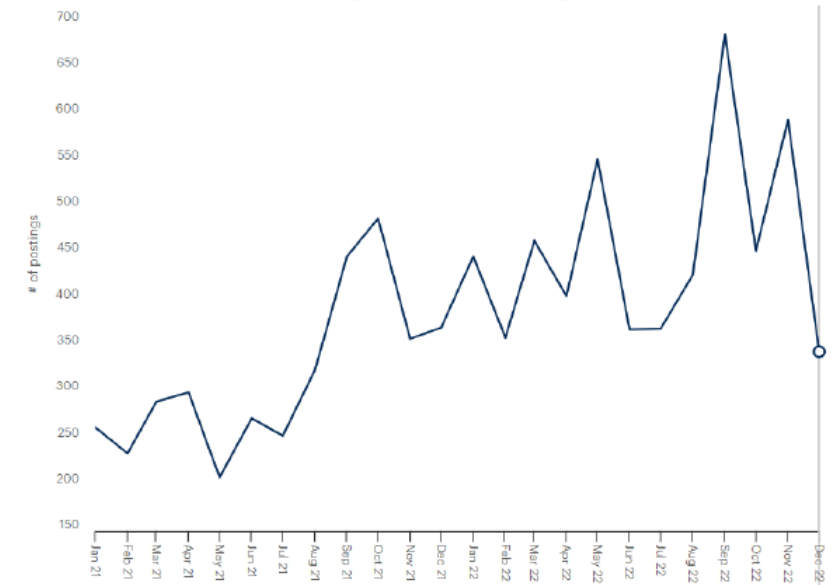
Occupations of Employment in Automotive Technology, 2022Q3

SOC	Occupation	Current						1-Year History		1-Year Forecast	
		Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Empl Change	Ann %
49-3023	Automotive Service Technicians and Mechanics	13,649	\$54,800	0.98	281	2.0%	707	-134	-1.0%	-56	-0.4%
17-2141	Mechanical Engineers	6,313	\$93,200	1.11	88	1.4%	409	298	5.0%	-3	0.0%
17-3027	Mechanical Engineering Technologists and Technicians	1,003	\$68,400	1.20	13	1.4%	19	27	2.7%	-1	-0.1%
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	216	\$53,800	1.23	4	1.8%	12	-14	-6.1%	-6	-2.8%
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	45	\$82,500	0.23	1	1.7%	36	-2	-3.8%	0	0.3%
	Automotive Technology Pathway	21,227	\$66,900	1.02	387	1.8%	1,183	175	0.8%	-66	-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%

Job Postings

- 5,469 unique job postings (+44%)
- 1 hire for every 4 unique job postings

Volume of Career Pathway Online Job Postings in 2021 and 2022

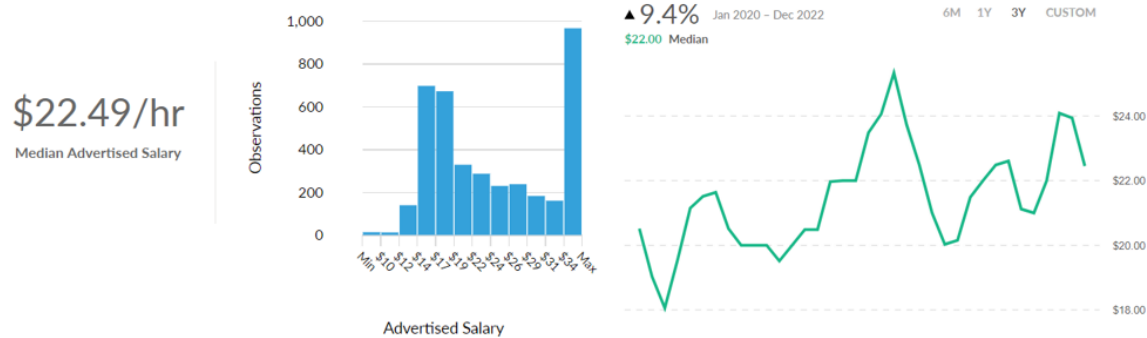


AUTOMOTIVE TECHNOLOGY

Occupation Wages, Average Annual in Minnesota, 2022Q3

SOC	Occupation	Mean	Entry Level	Experienced	Percentiles				
					10%	25%	50% (Median)	75%	90%
17-2141	Mechanical Engineers	\$93,200	\$66,000	\$106,800	\$61,200	\$75,200	\$87,200	\$104,200	\$127,700
17-3027	Mechanical Engineering Technologists and Technicians	\$68,400	\$48,100	\$78,600	\$46,900	\$52,200	\$64,200	\$79,900	\$94,800
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	\$82,500	\$59,500	\$94,000	\$52,600	\$72,000	\$84,600	\$95,900	\$105,000
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	\$53,800	\$37,500	\$62,000	\$36,700	\$40,200	\$48,400	\$61,900	\$77,300
49-3023	Automotive Service Technicians and Mechanics	\$54,800	\$34,300	\$65,000	\$31,400	\$39,700	\$50,500	\$62,300	\$75,800
	Automotive Technology Pathway	\$66,900	\$44,500	\$78,100	\$41,100	\$50,900	\$62,100	\$75,700	\$92,200
	Total - All Occupations	\$63,700	\$31,400	\$79,800	\$29,100	\$35,700	\$49,800	\$75,000	\$108,400

Pathway Advertised Salary Range



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Automotive Technology Pathway in Minnesota

SOC	Occupation	Empl (Place of Residence)							Total Empl	Overall Occupation ¹		
		< High School	High School	Some College	2-Year	4-Year	Master's	PhD		Underemployed	Unemployed	Unempl Rate
17-2141	Mechanical Engineers	0.2%	1.9%	3.2%	8.9%	60.2%	21.6%	3.9%	6,160	N/A	88	1.4%
17-3027	Mechanical Engineering Technologists and Technicians	1.8%	17.4%	20.8%	29.5%	25.5%	3.9%	1.1%	969	269	13	1.4%
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	3.9%	24.1%	23.3%	27.7%	19.7%	0.9%	0.3%	46	8	1	1.7%
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	4.0%	24.1%	23.1%	27.4%	20.1%	1.0%	0.3%	213	43	4	1.8%
49-3023	Automotive Service Technicians and Mechanics	9.2%	39.3%	19.9%	23.0%	7.5%	0.7%	0.4%	13,435	1,015	281	2.0%
	Automotive Technology Pathway	6.2%	27.0%	15.1%	19.2%	24.1%	7.0%	1.5%	20,823	1,336	387	1.8%
	Total - All Occupations	4.9%	21.1%	15.4%	14.1%	30.4%	10.3%	3.8%	2,944,602	511,822	68,550	2.3%

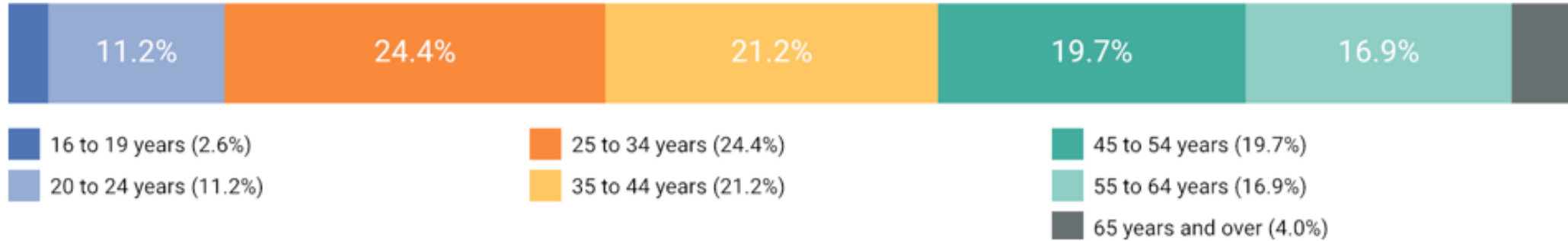
Talent Supply Detail

- 387 people unemployed (1.8%)
- 1,336 underemployed
- 1 in 4 Automotive Tech professionals hold a Bachelor's Degree; nearly 1 in 10 hold a Master's or PhD

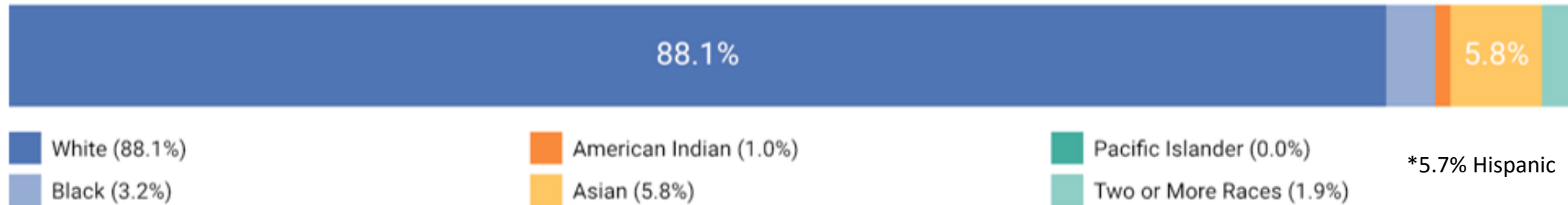


AUTOMOTIVE TECHNOLOGY

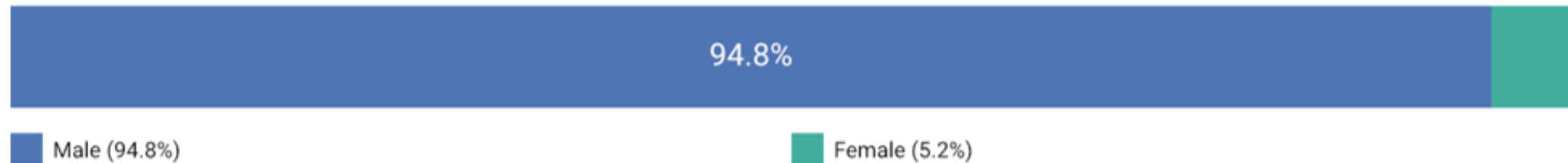
Automotive Technology Workforce Age Demographics, 2022Q3



Automotive Technology Workforce Race Demographics, 2022Q3



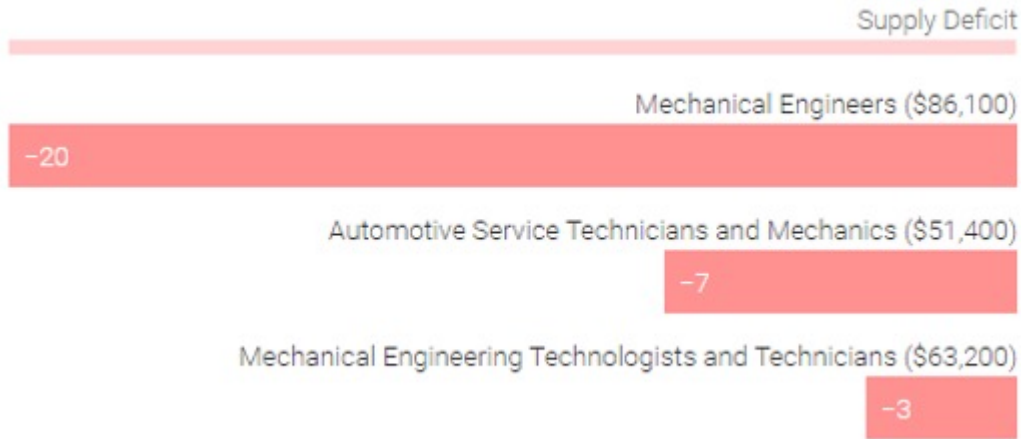
Automotive Technology Workforce Gender Demographics, 2022Q3



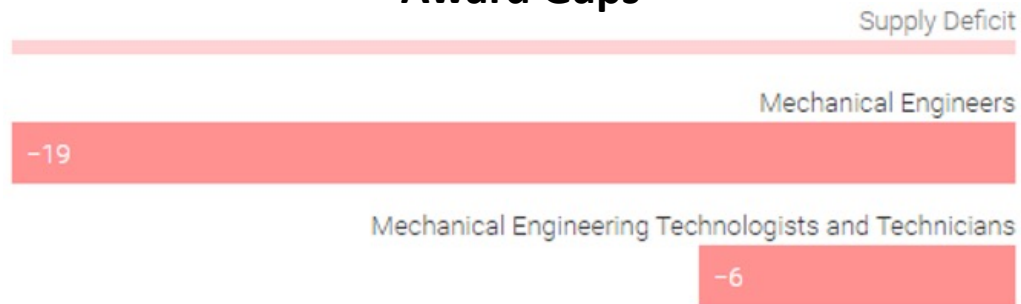
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Pathway Hot and Cold Skills in Demand in Minnesota, 2022

Occupation Gaps



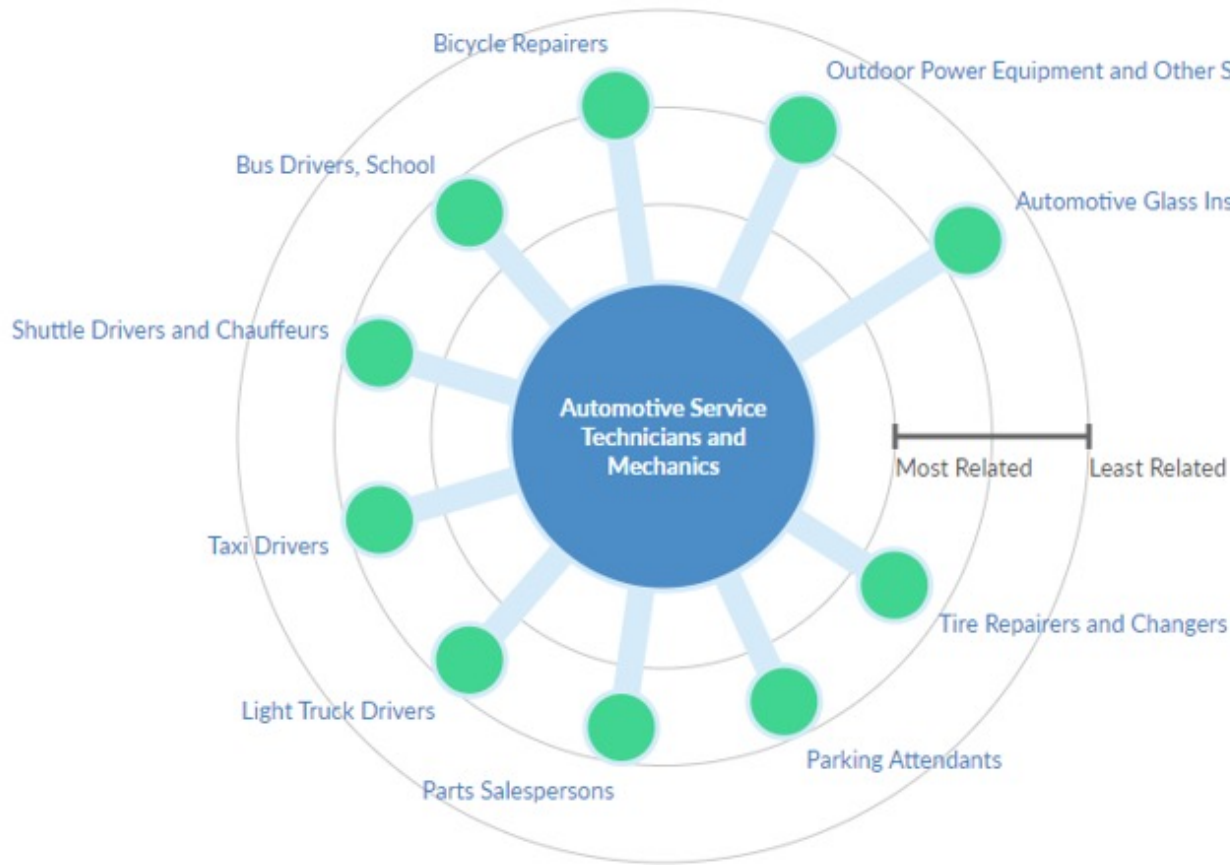
Award Gaps



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Feeder Occupations into Automotive Service Technician Roles, 2023Q1

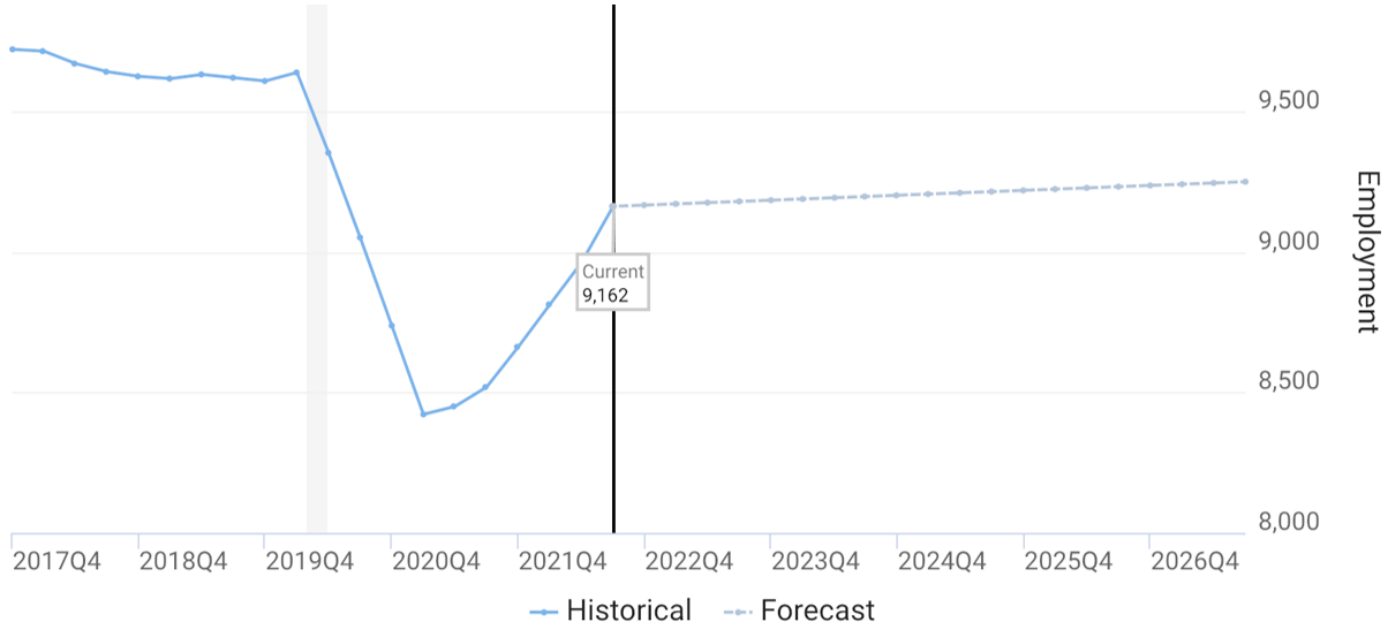


Occupation	Relevance	Avg. Unique Monthly Postings from Jan 2022 - Dec 2022	Mean Salary Diff.
Tire Repairers and Changers	78%	42	-\$15,837
Parking Attendants	69%	48	-\$18,555
Parts Salespersons	68%	85	-\$9,806
Light Truck Drivers	67%	356	-\$6,554
Taxi Drivers	67%	33	-\$10,893
Shuttle Drivers and Chauffeurs	67%	32	-\$10,893
Bus Drivers, School	67%	26	-\$10,893
Bicycle Repairers	47%	4	-\$5,183
Outdoor Power Equipment and Other Small Engine Mecha...	46%	4	-\$9,058
Automotive Glass Installers and Repairers	33%	7	-\$7,210



AVIATION & DRONE TECHNOLOGY

Aviation and Drone Technology Employment Forecast Under Baseline Scenario, Minnesota



Takeaways

- Unemployment fell to 1.5% from 2.5% one year prior
- Highest average annual wage among transportation pathways (\$115,200)
- 0.2% forecasted baseline average annual employment growth over the next five years
- About **50% of positions** held today will need to be filled by new talent in the next five years

Top Industries of Employment

- Scheduled Air Transportation (39.7%)
- Support Activities for Air Transportation (10.4%)
- Architectural, Engineering, and related Services (4.4%)



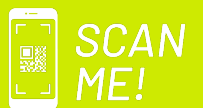
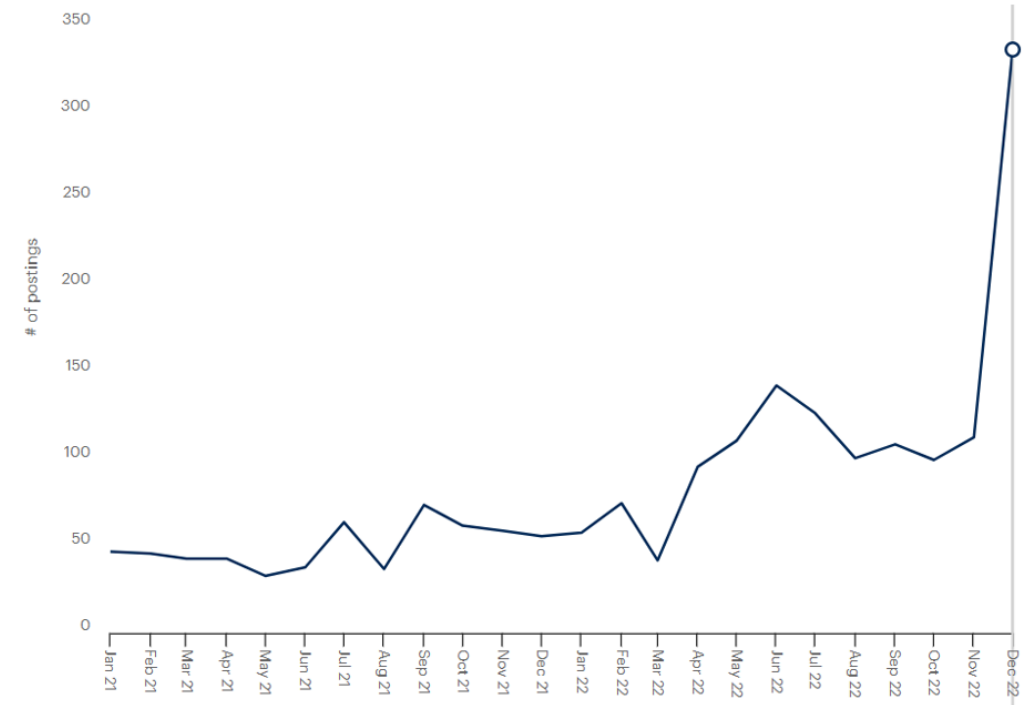
AVIATION & DRONE TECHNOLOGY

SOC	Occupation	Current						1-Year History		1-Year Forecast	
		Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Empl Change	Ann %
53-2011	Airline Pilots, Copilots, and Flight Engineers	2,970	\$139,700	1.74	36	1.2%	1	333	12.6%	9	0.3%
49-3011	Aircraft Mechanics and Service Technicians	2,041	\$85,300	0.75	24	1.2%	51	188	10.2%	10	0.5%
17-2199	Engineers, All Other	1,981	\$116,200	0.62	18	1.0%	80	9	0.5%	0	0.0%
53-2012	Commercial Pilots	636	\$133,800	0.68	7	1.2%	38	61	10.6%	3	0.4%
53-2021	Air Traffic Controllers	575	\$154,000	1.48	16	2.8%	6	-15	-2.6%	-1	-0.2%
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	290	\$61,800	0.42	21	7.1%	5	33	12.9%	-4	-1.3%
17-3024	Electro-Mechanical and Mechatronics Technologists and Technicians	288	\$64,400	1.22	4	1.4%	87	-3	-1.2%	-2	-0.7%
53-2022	Airfield Operations Specialists	182	\$65,000	0.69	5	2.7%	7	17	10.4%	1	0.5%
53-1041	Aircraft Cargo Handling Supervisors	126	\$69,200	0.64	1	0.9%	1	12	11.0%	0	0.4%
49-2091	Avionics Technicians	73	\$76,200	0.19	5	5.9%	37	7	10.3%	0	0.5%
	Aviation and Drone Technology Pathway	9,162	\$115,200	0.86	139	1.5%	313	642	7.5%	17	0.2%
	Total - All Occupations	3,038,766	\$63,700	1.00	68,550	2.3%	170,185	91,312	3.1%	9,139	0.3%

Job Postings

- 51,412 unique job postings (+135%)
- 1 hire for every 3 unique job postings

Volume of Career Pathway Online Job Postings in 2021 and 2022



AVIATION & DRONE TECHNOLOGY

Occupation Wages, Average Annual in Minnesota, 2022Q3

SOC	Occupation	Mean	Entry Level	Experienced	Percentiles				
					10%	25%	50% (Median)	75%	90%
17-2199	Engineers, All Other	\$116,200	\$79,000	\$134,800	\$71,900	\$93,000	\$112,000	\$132,700	\$163,500
17-3024	Electro-Mechanical and Mechatronics Technologists and Technicians	\$64,400	\$48,600	\$72,400	\$47,400	\$52,500	\$63,100	\$76,000	\$83,200
49-2091	Avionics Technicians	\$76,200	\$54,000	\$87,200	\$48,700	\$63,000	\$69,100	\$81,700	\$96,800
49-3011	Aircraft Mechanics and Service Technicians	\$85,300	\$51,400	\$102,200	\$45,400	\$62,500	\$78,600	\$118,700	\$128,800
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	\$61,800	\$37,800	\$73,800	\$35,100	\$43,500	\$54,000	\$78,000	\$89,000
53-1041	Aircraft Cargo Handling Supervisors	\$69,200	\$50,500	\$78,600	\$48,900	\$52,800	\$52,900	\$81,100	\$102,000
53-2011	Airline Pilots, Copilots, and Flight Engineers	\$139,700	\$108,400	\$155,300	\$108,400	\$108,500	\$109,200	\$137,300	\$173,500
53-2012	Commercial Pilots	\$133,800	\$68,700	\$166,300	\$59,800	\$86,500	\$122,600	\$160,100	\$218,700
53-2021	Air Traffic Controllers	\$154,000	\$107,900	\$177,100	\$86,300	\$142,600	\$164,500	\$181,400	\$195,900
53-2022	Airfield Operations Specialists	\$65,000	\$38,700	\$78,100	\$35,600	\$44,900	\$57,800	\$75,800	\$91,300
	Aviation and Drone Technology Pathway	\$115,200	\$79,800	\$132,800	\$74,700	\$89,300	\$102,100	\$130,300	\$157,200
	Total - All Occupations	\$63,700	\$31,400	\$79,800	\$29,100	\$35,700	\$49,800	\$75,000	\$108,400

Salary Range



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AVIATION & DRONE TECHNOLOGY

Aviation and Drone Technology Pathway in Minnesota

SOC	Occupation	Empl (Place of Residence)								Overall Occupation ¹		
		< High School	High School	Some College	Two-Year	Four-Year	Master's	PhD	Total Empl	Underemployed	Unemployed	Unempl Rate
17-2199	Engineers, All Other	0.2%	1.3%	3.2%	6.1%	54.8%	26.1%	8.4%	1,861	0	18	1.0%
17-3024	Electro-Mechanical and Mechatronics Technologists and Technicians	1.8%	17.4%	20.7%	29.3%	25.8%	3.9%	1.2%	275	78	4	1.4%
49-2091	Avionics Technicians	0.8%	16.3%	29.4%	33.6%	17.3%	2.6%	0.0%	73	14	5	5.9%
49-3011	Aircraft Mechanics and Service Technicians	1.6%	18.4%	26.4%	32.6%	17.4%	2.5%	0.9%	1,977	0	24	1.2%
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	9.6%	42.7%	21.2%	13.9%	10.9%	1.3%	0.4%	281	33	21	7.1%
53-1041	Aircraft Cargo Handling Supervisors	3.6%	27.5%	22.1%	16.8%	24.2%	4.8%	0.9%	124	39	1	0.9%
53-2011	Airline Pilots, Copilots, and Flight Engineers	0.2%	1.7%	5.3%	5.6%	67.2%	16.4%	3.5%	2,902	0	36	1.2%
53-2012	Commercial Pilots	0.2%	2.1%	6.1%	6.8%	66.2%	15.4%	3.2%	596	0	7	1.2%
53-2021	Air Traffic Controllers	0.1%	6.9%	17.5%	16.0%	49.8%	8.7%	0.9%	562	313	26	2.8%
53-2022	Airfield Operations Specialists	0.1%	7.0%	17.6%	16.7%	49.3%	8.5%	0.8%	189	98	5	2.7%
	Aviation and Drone Technology Pathway	0.9%	8.1%	12.1%	14.1%	47.8%	13.5%	3.5%	8,840	986	139	1.5%
	Total - All Occupations	4.9%	21.1%	15.4%	14.1%	30.4%	10.3%	3.8%	2,944,602	511,822	68,550	2.3%

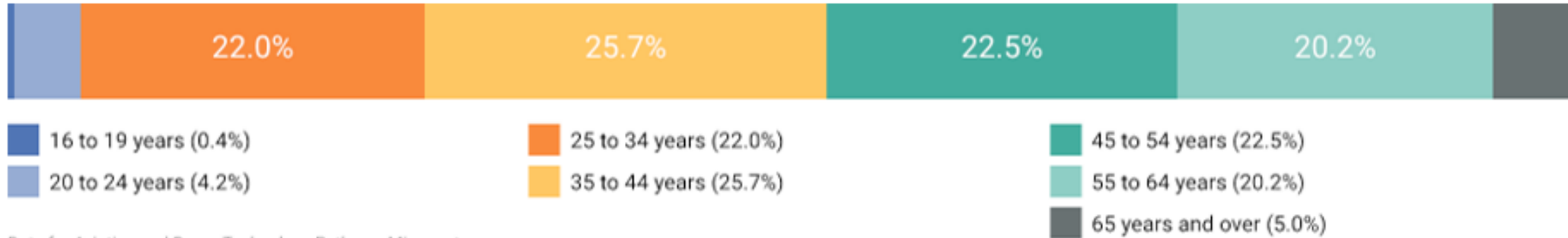
Talent Supply Detail

- 139 people unemployed (1.5%)
- 986 underemployed
- Half of Aviation and Drone professionals hold a Bachelor's Degree; 17% hold a Master's or PhD

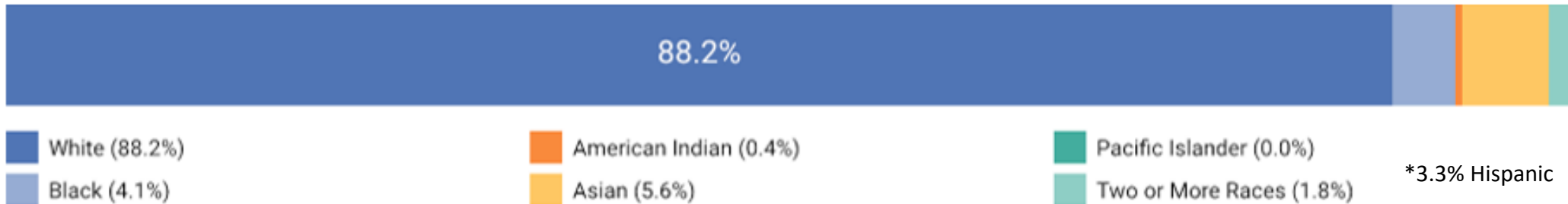


AVIATION & DRONE TECHNOLOGY

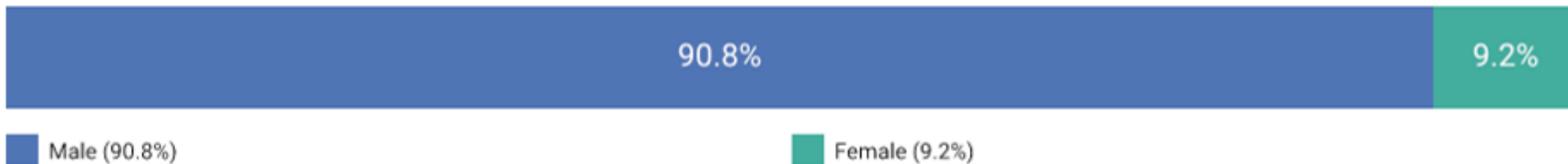
Aviation and Drone Technology Workforce Age Demographics, 2022Q3



Aviation and Drone Technology Workforce Race Demographics, 2022Q3



Aviation and Drone Technology Workforce Gender Demographics, 2022Q3



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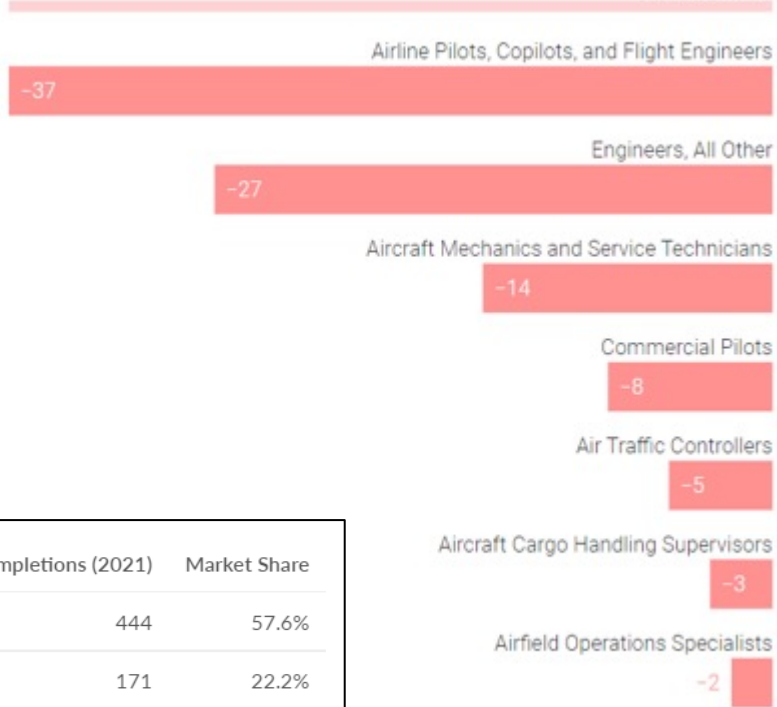
Occupation Gaps

Supply Deficit



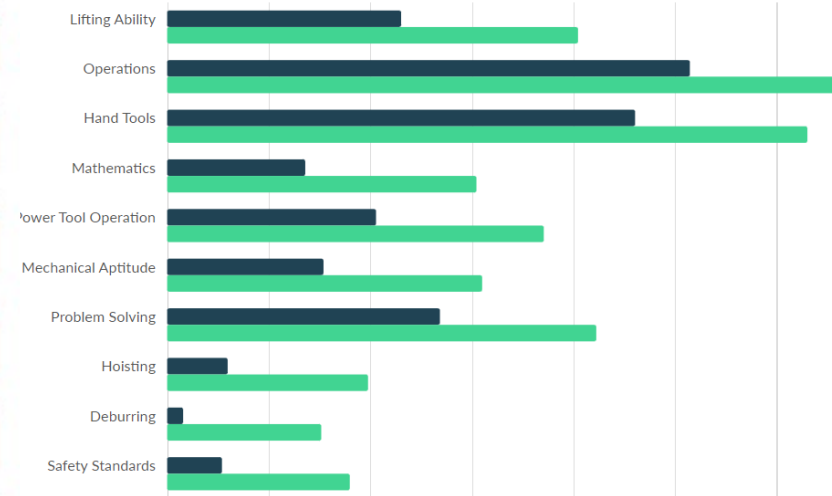
Award Gaps

Supply Deficit



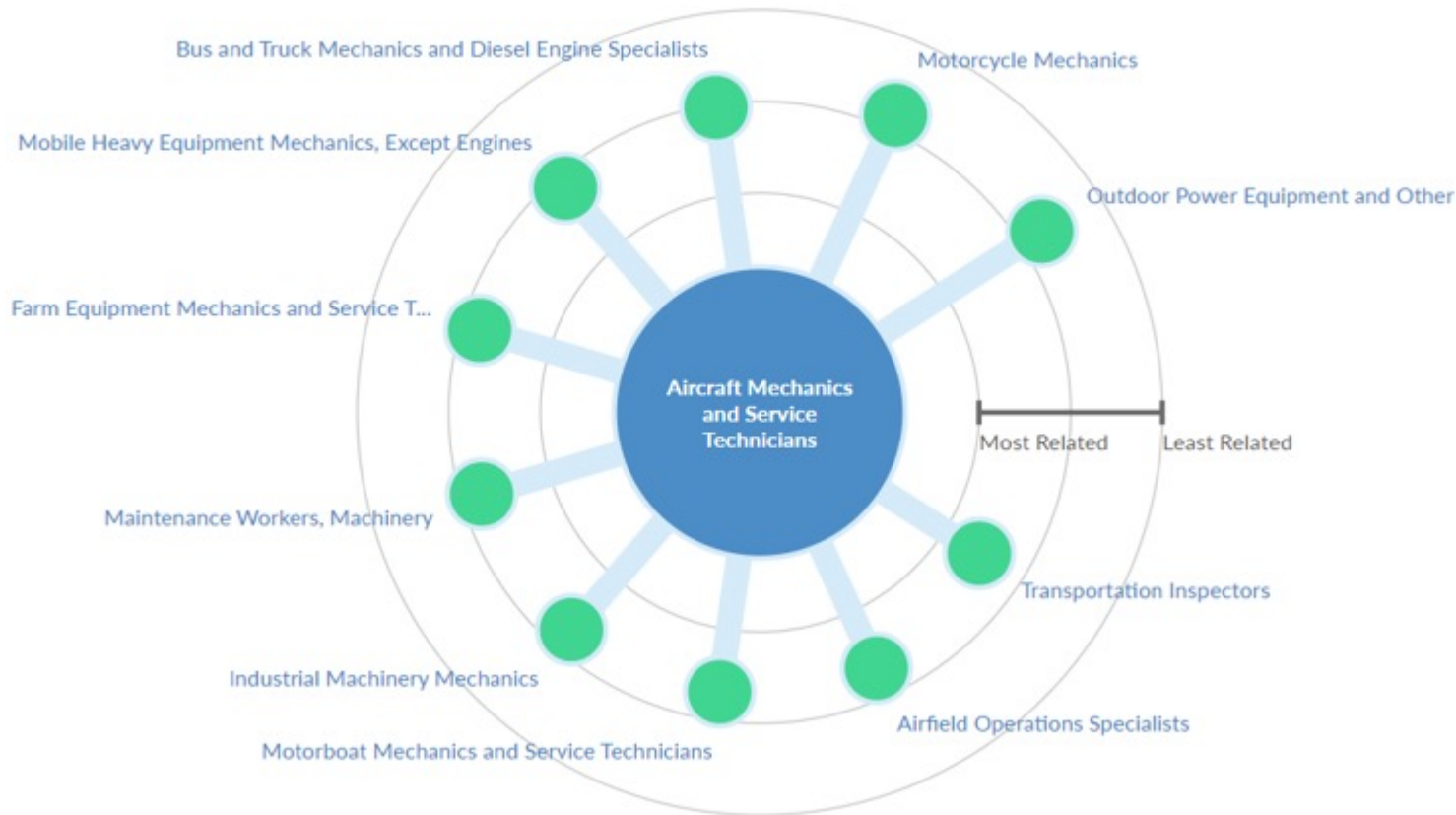
Trending Skills

● Postings at start of timeframe ● Postings at end of timeframe

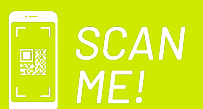


AVIATION & DRONE TECHNOLOGY

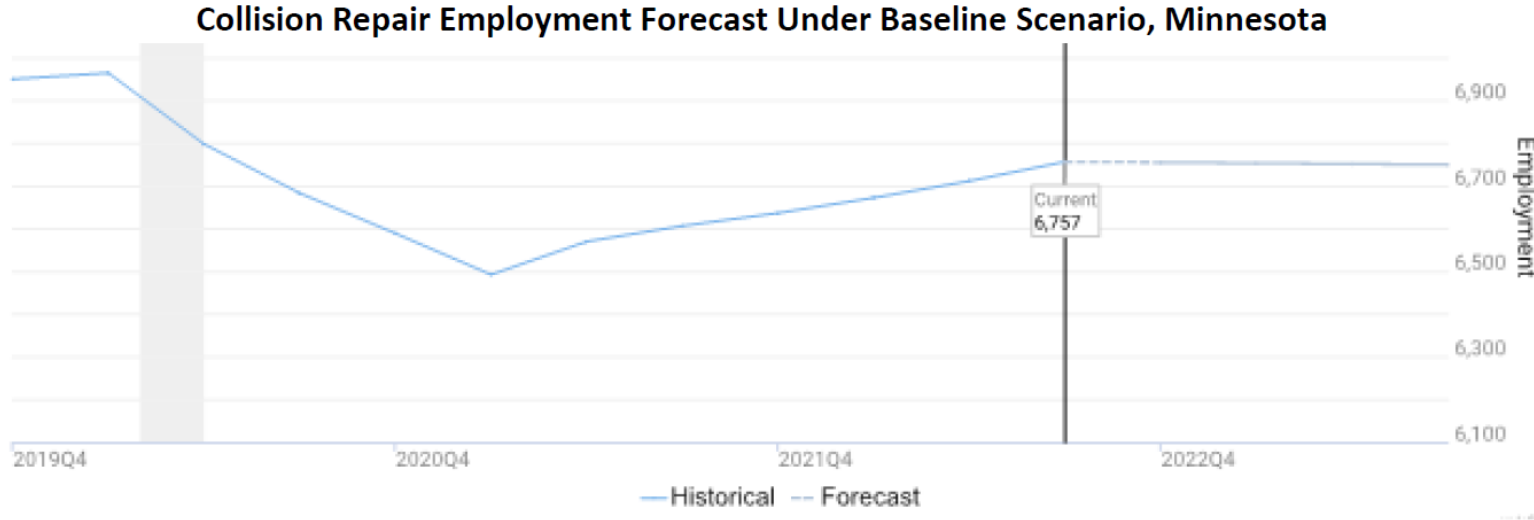
Feeder Occupations into Aircraft Mechanic and Service Technician Roles, 2023Q1



Occupation	Category	Relevance	Avg. Unique Monthly Postings from Jan 2022 - Dec 2022	Mea Salary Dif
Transportation Inspectors	Lateral Advancement	77%	6	-\$7,96
Airfield Operations Specialists	Lateral Advancement	66%	2	-\$8,40
Motorboat Mechanics and Service Technicians	Advancement	66%	1	-\$11,88
Industrial Machinery Mechanics	Lateral Advancement	63%	108	-\$10,44
Maintenance Workers, Machinery	Lateral Advancement	62%	3	-\$10,78
Farm Equipment Mechanics and Service Technicians	Advancement	60%	7	-\$16,84
Mobile Heavy Equipment Mechanics, Except Engines	Advancement	58%	33	-\$6,95
Bus and Truck Mechanics and Diesel Engine Specialists	Advancement	52%	173	-\$8,61
Motorcycle Mechanics	Advancement	41%	1	-\$15,47
Outdoor Power Equipment and Other Small Engine Mechanics	Advancement	37%	4	-\$25,43



COLLISION REPAIR



Top Industries of Employment

- Automotive Repair and Maintenance (45.2%)
- Automobile Dealers (7.5%)
- Coating, Engraving, Heat Treating, and Allied Activities (6.3%)

Takeaways

- Second highest Location Quotient, or concentration of roles among transportation pathways (1.05 LQ)
- Unemployment rate of 2.6% (177 people)
- Talent shortage may be affecting this industry most; declining employment deepened; 5-year average annual forecast dropped from 0.0% to -0.1%
- About **48% of positions** held today will need to be filled by new talent in the next five years



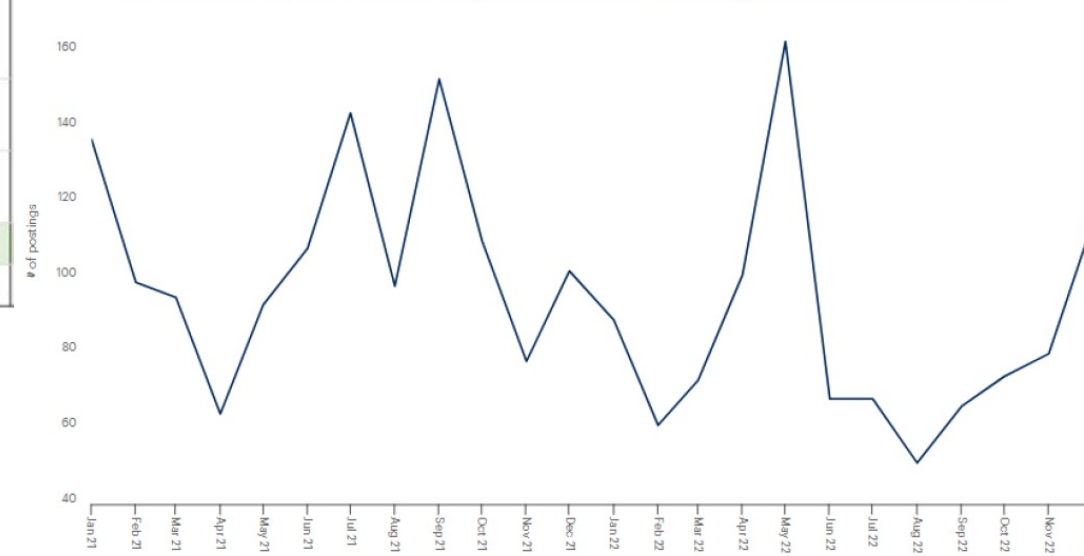
COLLISION REPAIR

Job Postings

- 1,008 unique job postings (-21%)
- 1 hire for every 2 unique job postings

SOC	Occupation	Current					1-Year History		1-Year Forecast		
		Empl	Avg Ann Wages ²	LQ	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Empl Change	Ann %	
51-9124	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	3,535	\$51,200	1.17	96	2.7%	197	122	3.6%	-4	0.1%
49-3021	Automotive Body and Related Repairers	2,863	\$58,300	0.93	74	2.5%	132	25	0.9%	-4	-0.1%
49-3022	Automotive Glass Installers and Repairers	359	\$48,800	1.00	7	1.9%	38	2	0.6%	0	0.1%
	Collision Repair Pathway	6,757	\$54,100	1.05	177	2.6%	367	150	2.3%	-7	-0.1%
	Total - All Occupations	3,038,766	\$63,700	1.00	68,550	2.3%	169,085	91,312	3.1%	9,139	0.3%

Volume of Career Pathway Online Job Postings in 2021 and 2022

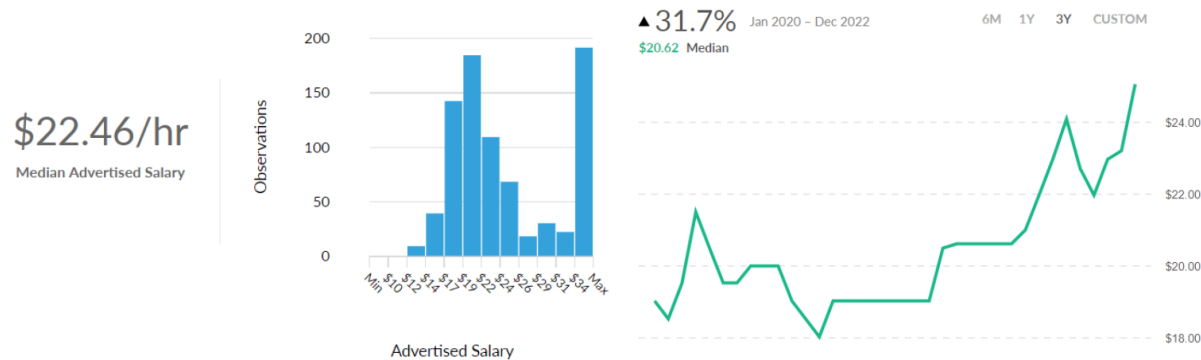


COLLISION REPAIR

Occupation Wages, Average Annual in Minnesota, 2022Q3

SOC	Occupation	Mean	Entry Level	Experienced	Percentiles				
					10%	25%	50% (Median)	75%	90%
49-3021	Automotive Body and Related Repairers	\$58,300	\$40,300	\$67,300	\$37,700	\$45,400	\$52,500	\$63,300	\$79,100
49-3022	Automotive Glass Installers and Repairers	\$48,800	\$38,600	\$53,900	\$37,300	\$41,800	\$48,000	\$53,600	\$60,900
51-9124	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	\$51,200	\$35,800	\$58,900	\$33,900	\$40,000	\$48,400	\$59,000	\$67,800
	Collision Repair Pathway	\$54,100	\$37,900	\$62,200	\$35,700	\$42,400	\$50,100	\$60,600	\$72,300
	Total - All Occupations	\$63,700	\$31,400	\$79,800	\$29,100	\$35,700	\$49,800	\$75,000	\$108,400

Pathway Advertised Salary Range



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COLLISION REPAIR

Collision Repair 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
49-3021	Automotive Body and Related Repairers	13.6%	46.4%	17.0%	16.9%	5.2%	0.7%	0.2%	2,836	279	96	2.5%
49-3022	Automotive Glass Installers and Repairers	10.3%	52.3%	25.2%	6.9%	4.6%	0.2%	0.6%	355	165	74	1.9%
51-9124	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	12.3%	47.4%	18.2%	13.1%	7.4%	1.4%	0.2%	3,484	19	7	2.7%
	Collision Repair Pathway	12.7%	47.2%	18.1%	14.4%	6.3%	1.0%	0.2%	6,674	463	177	2.6%
	Total - All Occupations	4.9%	21.1%	15.4%	14.1%	30.4%	10.3%	3.8%	2,944,602	511,822	68550	2.3%

Talent Supply Detail

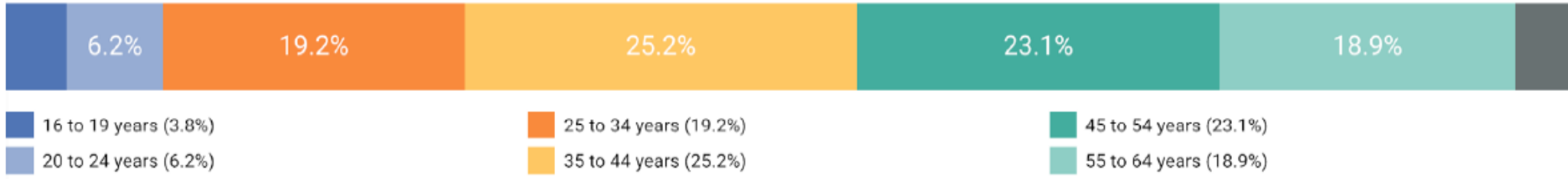
- 177 people unemployed (2.6%)
- 463 underemployed
- More than 2 in 5 professionals hold a High School diploma as their highest degree



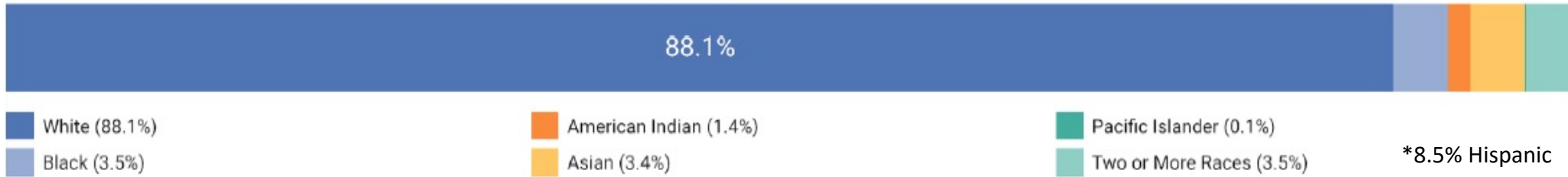
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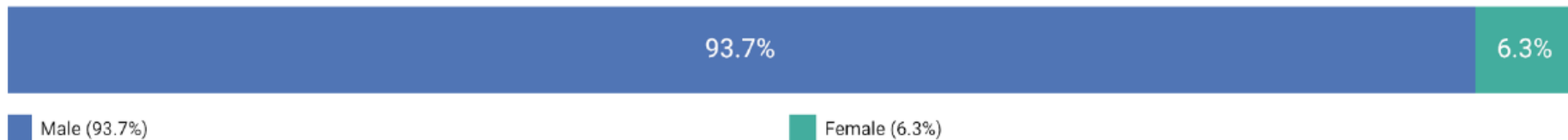
Collision Repair Workforce Age Demographics, 2022Q3



Collision Repair Workforce Race Demographics, 2022Q3

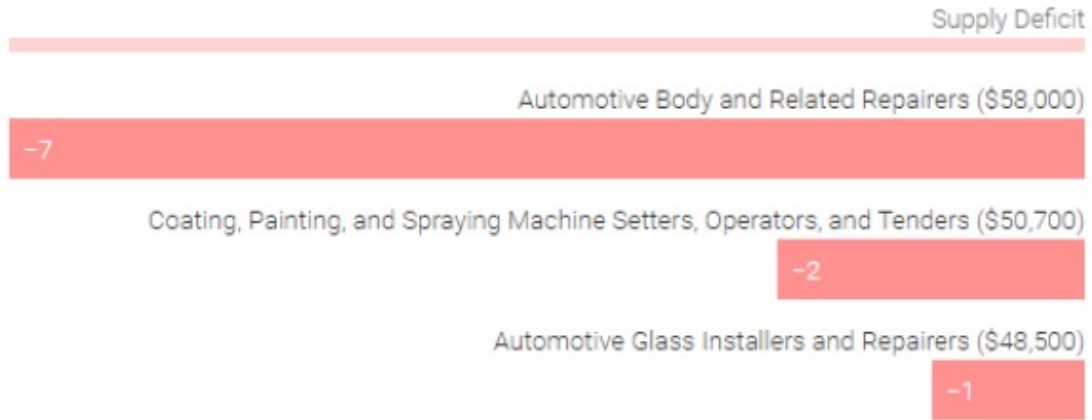


Collision Repair Workforce Gender Demographics, 2022Q3



COLLISION REPAIR

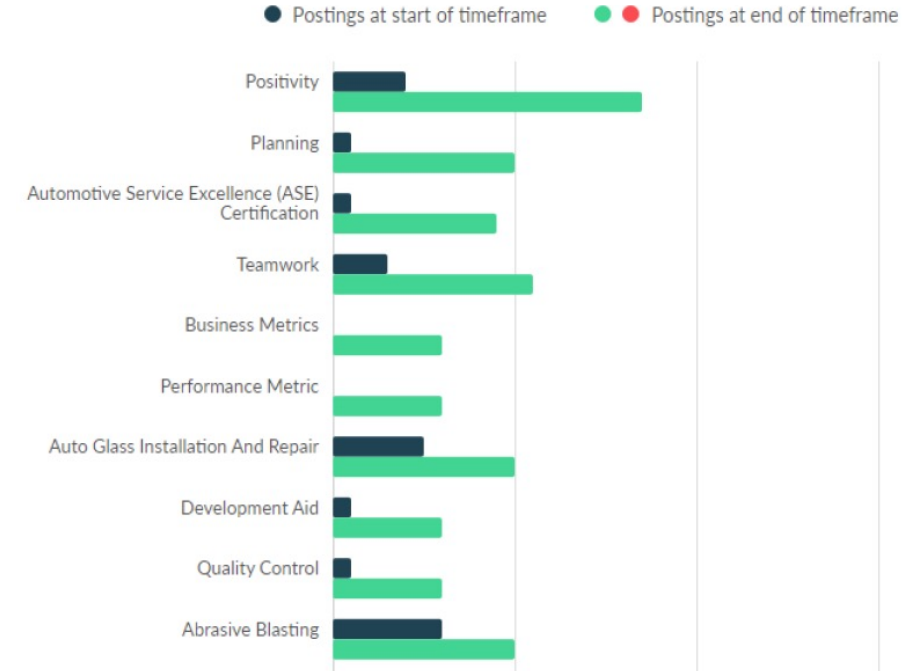
Occupation Gaps



Award Gaps

There are no award gaps associated with the Collision Repair pathway

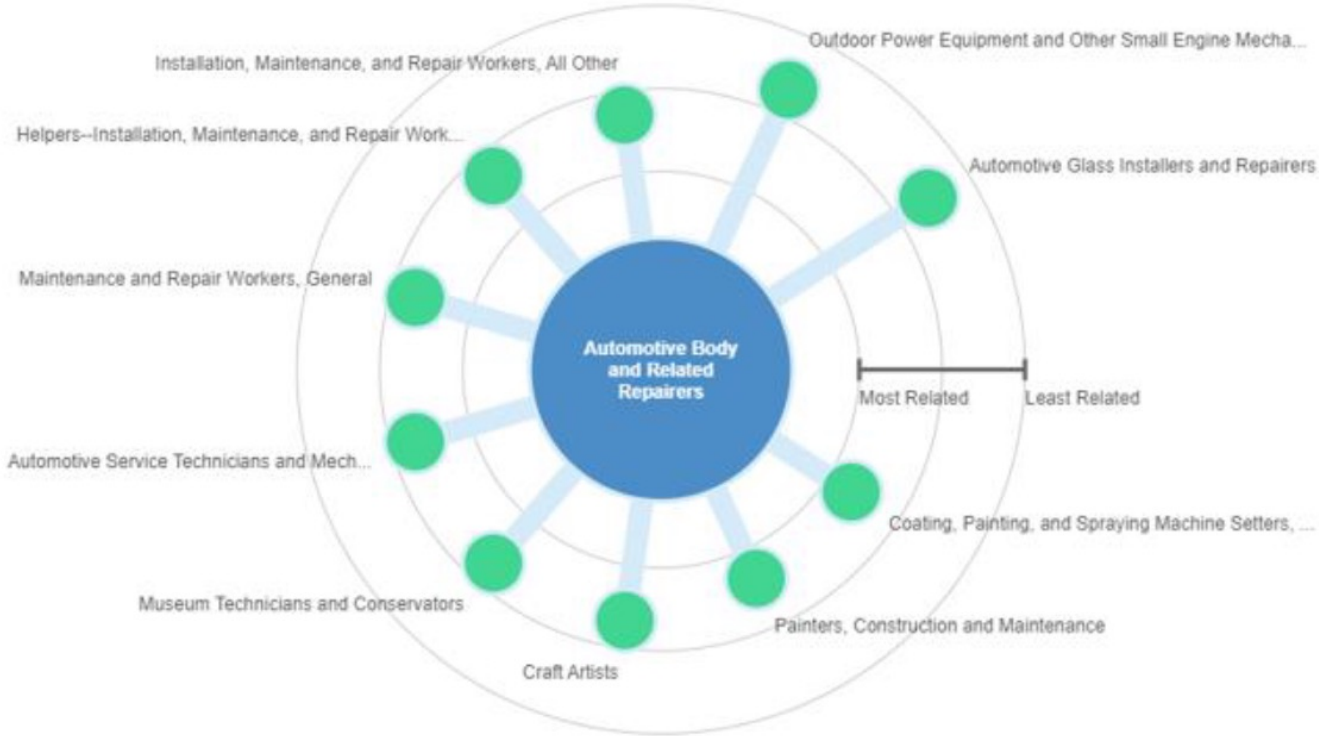
Trending Skills



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COLLISION REPAIR

Feeder Occupations into Automotive Body and Related Repairer Roles, 2023Q1

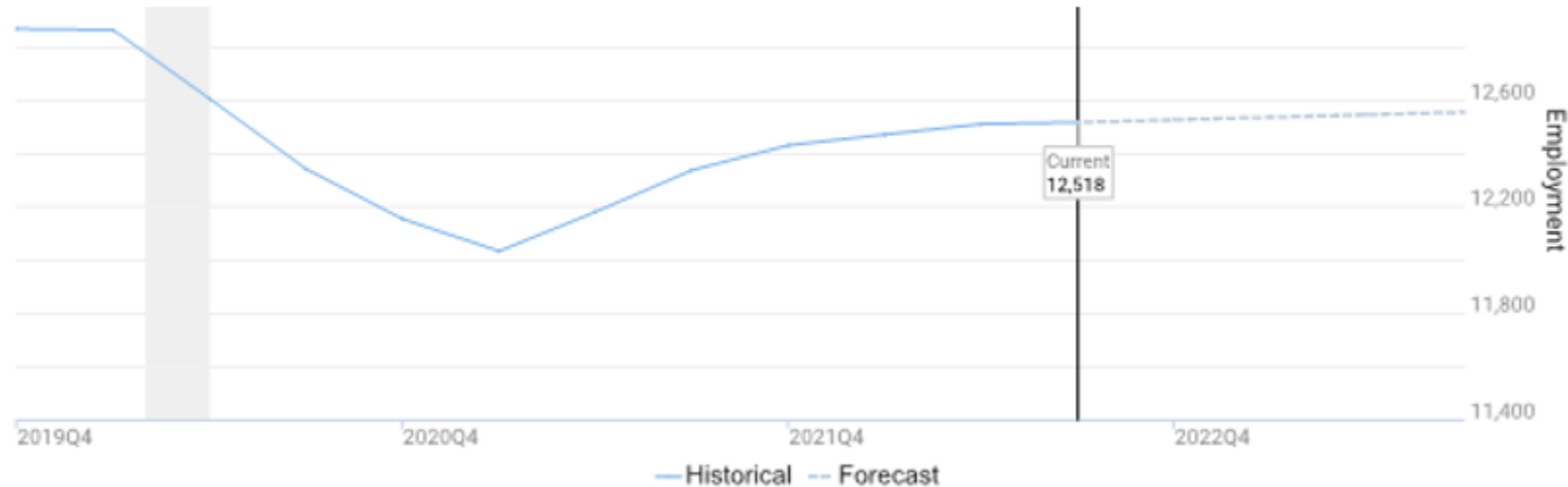


Occupation	Category	Relevance	Avg. Unique Monthly Postings from Jan 2022 - Dec 2022	Mean Salary Diff.
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	Lateral Advancement	83%	38	-\$13,683
Painters, Construction and Maintenance	Lateral Advancement	81%	87	-\$11,701
Craft Artists	Lateral Advancement	67%	2	-\$6,668
Museum Technicians and Conservators	Lateral Advancement	65%	3	-\$7,771
Automotive Service Technicians and Mechanics	Advancement	65%	560	-\$5,774
Maintenance and Repair Workers, General	Lateral Advancement	65%	1,210	-\$10,354
Helpers--Installation, Maintenance, and Repair Workers	Lateral Advancement	65%	63	-\$18,161
Installation, Maintenance, and Repair Workers, All Other	Lateral Advancement	64%	41	-\$8,416
Outdoor Power Equipment and Other Small Engine Mechanics	Advancement	34%	4	-\$14,832
Automotive Glass Installers and Repairers	Advancement	28%	7	-\$12,984



DIESEL EQUIPMENT & TRUCK

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



Top Industries of Employment

- Machinery, Equipment, and Supplies Merchant Wholesalers (16.9%)
- General Freight Trucking (8.9%)
- Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (5.1%)

Takeaways

- Highest Location Quotient, or concentration of roles in Minnesota among transportation pathways (1.06 LQ, but dropped)
- Unemployment rate of 1.8% (230 people)
- About **49% of positions** held today will need to be filled by new talent in the next five years



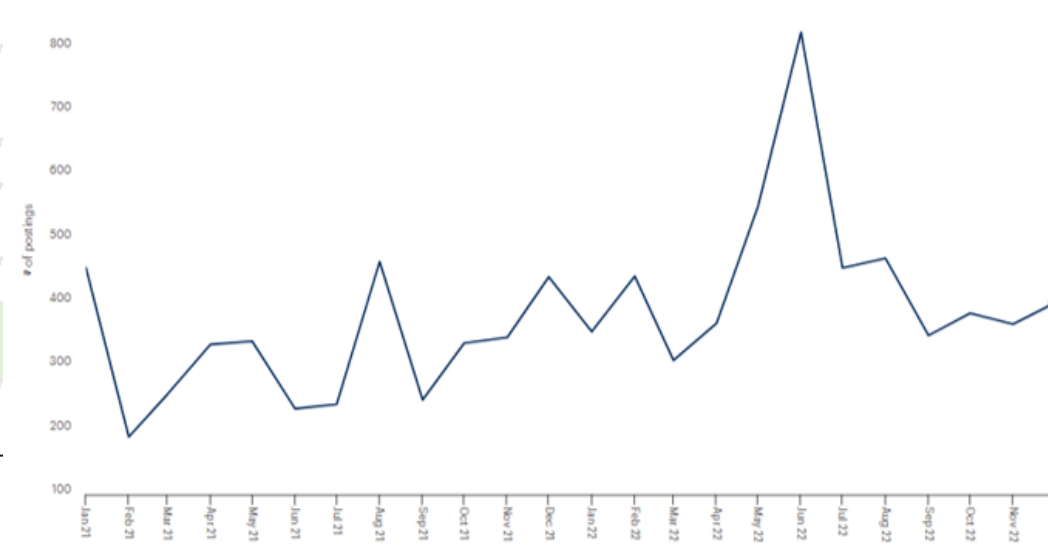
DIESEL EQUIPMENT & TRUCK

SOC	Occupation	Current						1-Year History		1-Year Forecast	
		Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Empl Change	Ann %
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%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	2,209	\$67,100	0.74	27	1.2%	3	50	2.3%	16	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%
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%
49-3043	Rail Car Repairers	455	\$60,200	1.14	5	1.2%	12	-11	-2.3%	0	-0.1%
53-7021	Crane and Tower Operators	381	\$75,900	0.43	13	3.2%	10	12	3.2%	1	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%
	Diesel Equipment and Truck Pathway	12,518	\$61,900	1.06	230	1.8%	593	180	1.5%	38	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%

Job Postings

- 5,272 unique job postings (+36%)
- 3 hires for every 1 unique job posting

Volume of Career Pathway Online Job Postings in 2021 and 2022



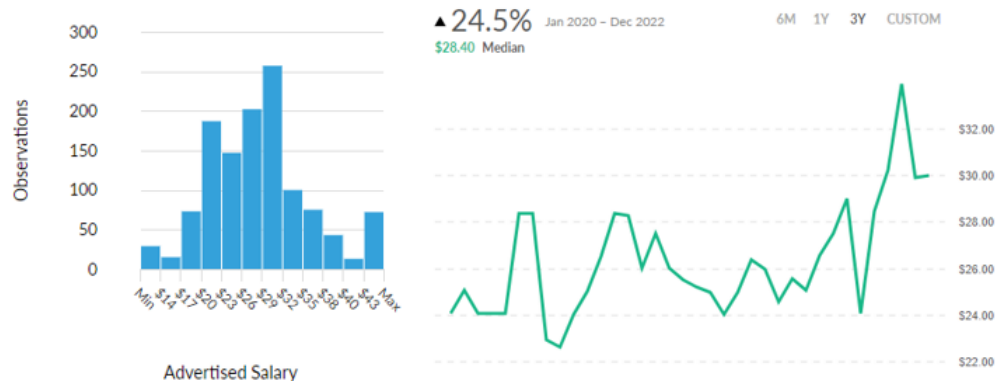
DIESEL EQUIPMENT & TRUCK

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

Pathway Advertised Salary Range

\$28.03/hr
Median Advertised Salary



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DIESEL EQUIPMENT & TRUCK

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%

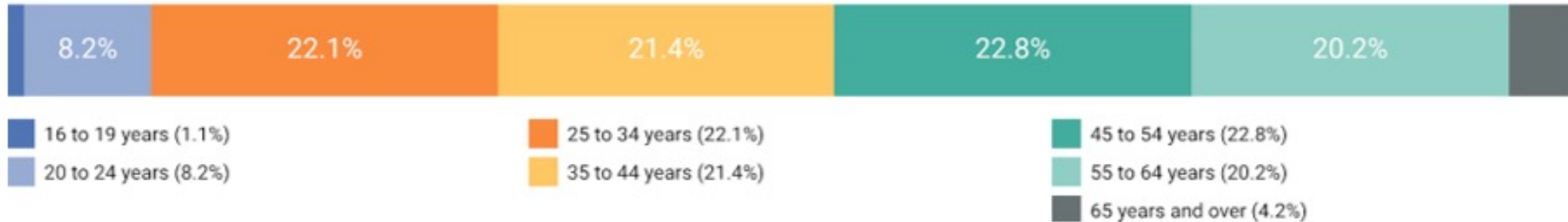
Talent Supply Detail

- 230 people unemployed (1.8%)
- 743 underemployed
- More than 2 in 5 professionals hold a High School diploma as their highest degree

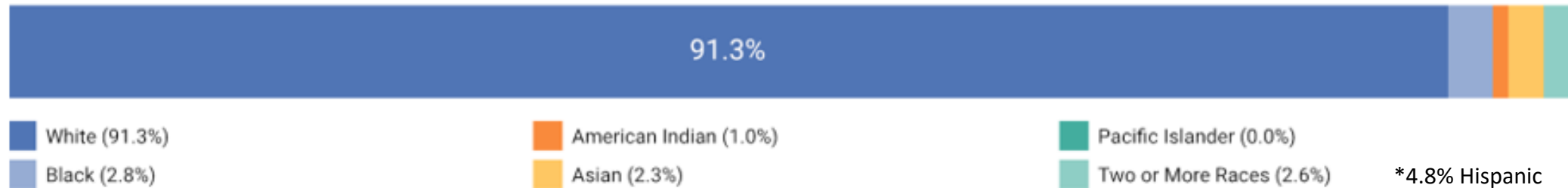


DIESEL EQUIPMENT & TRUCK

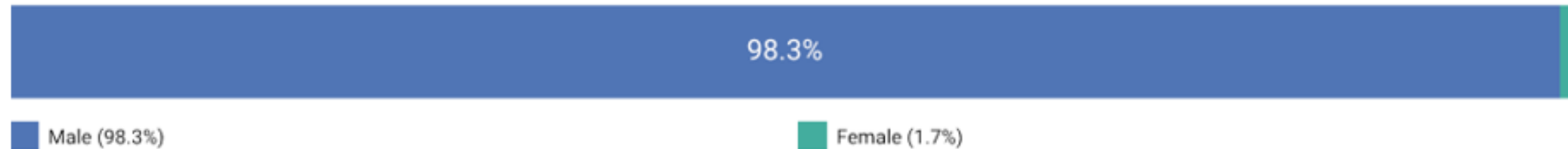
Diesel, Equipment, and Truck Workforce Age Demographics, 2022Q3



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



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

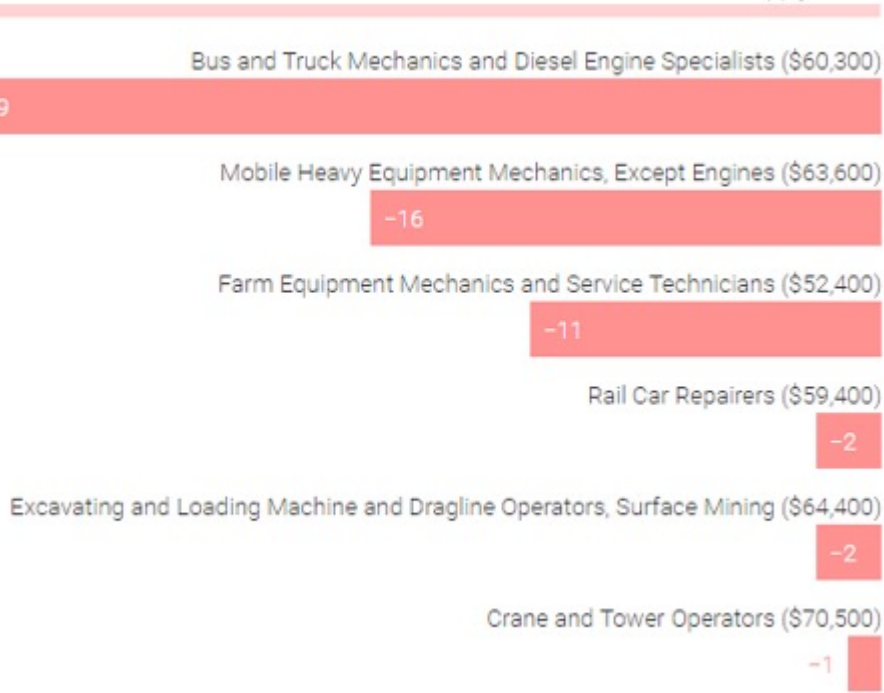


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DIESEL EQUIPMENT & TRUCK

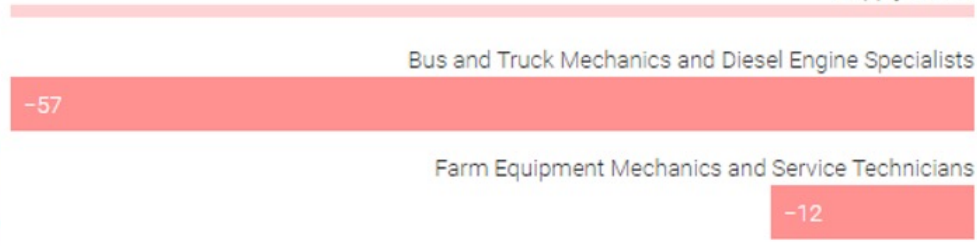
Occupation Gaps

Supply Deficit

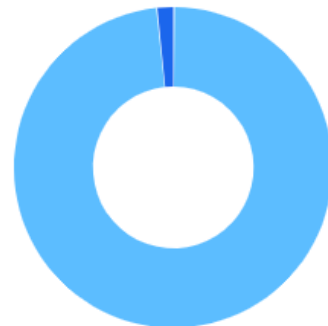
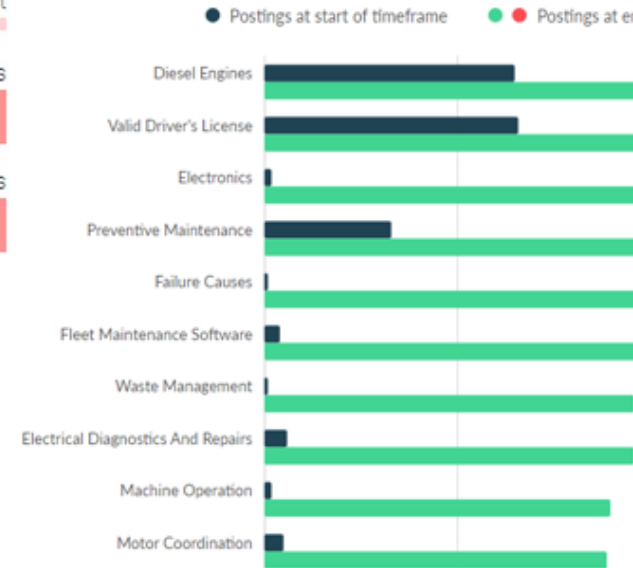


Award Gaps

Supply Deficit



Trending Skills

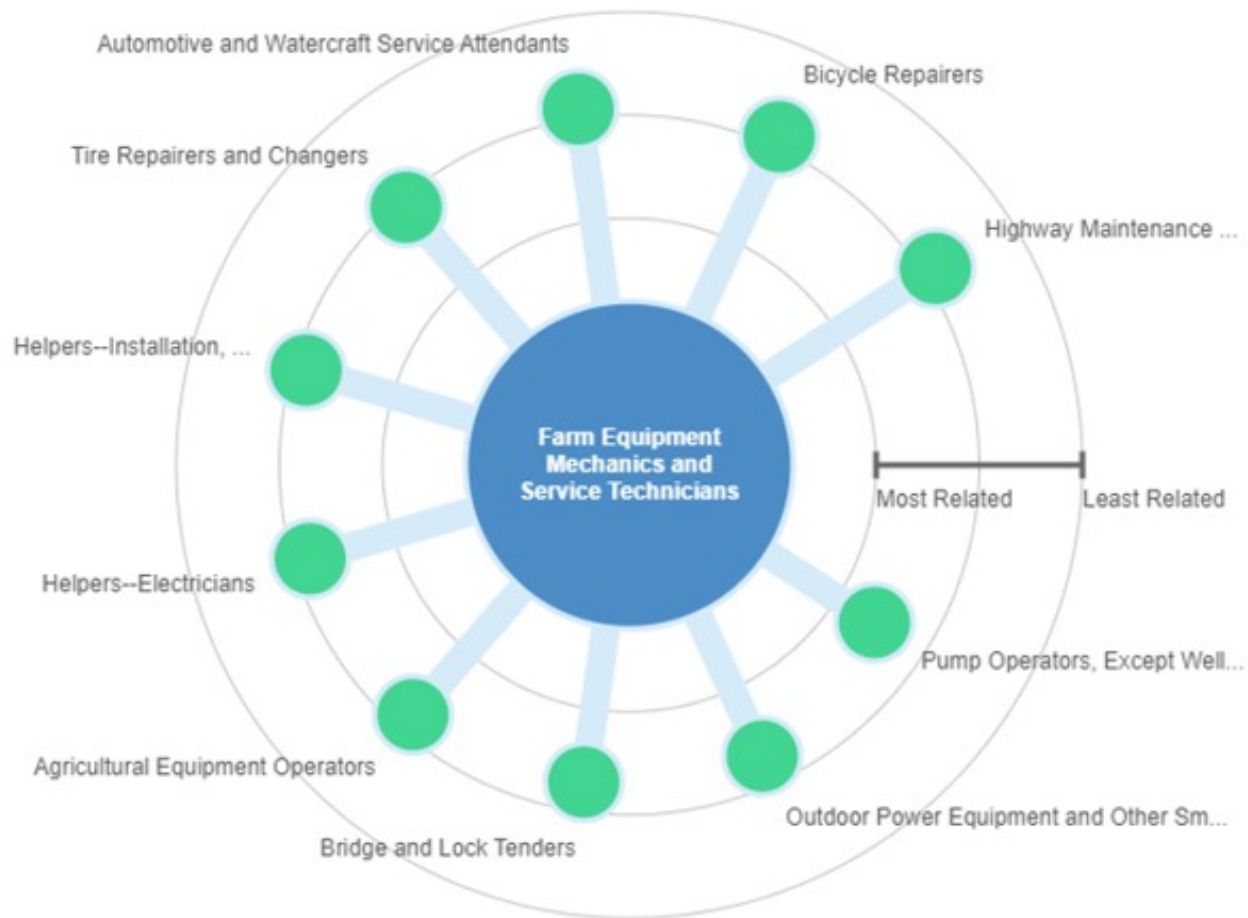


Institution Type	Completions (2021)	Market Share
Public, 2-year	284	98.3%
Public, 4-year or above	5	1.7%



DIESEL EQUIPMENT & TRUCK

Feeder Occupations into Farm Equipment Mechanic Roles, 2023Q1

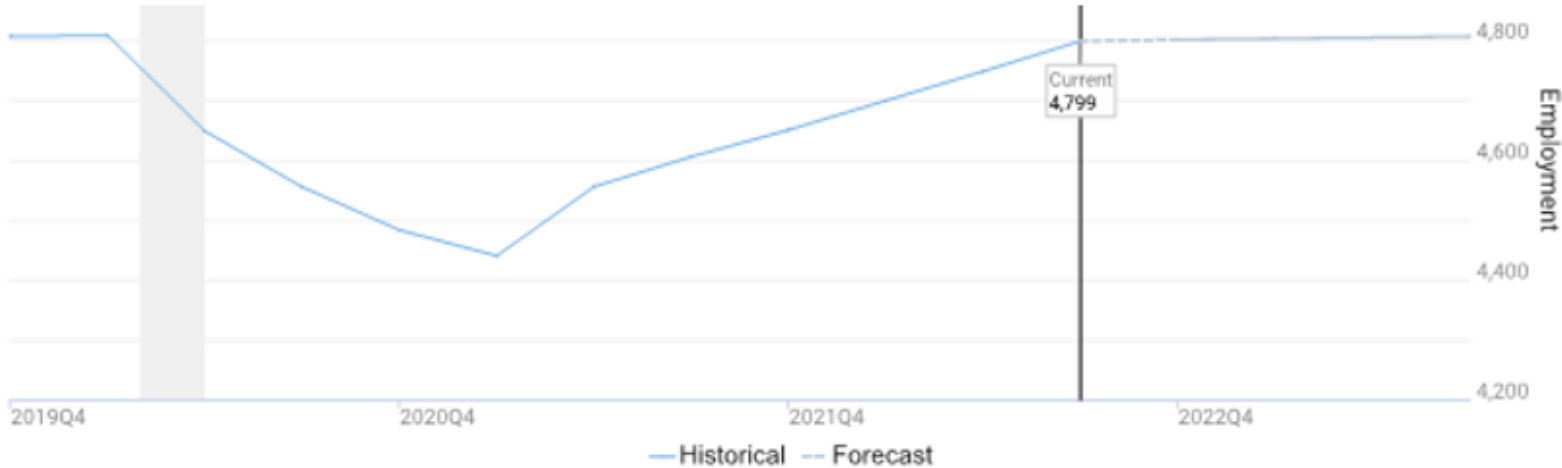


Occupation	Category	Relevance	Avg. Unique Monthly Postings from Jan 2022 - Dec 2022	Mean Salary Diff.
Pump Operators, Except Wellhead Pumpers	Lateral Transition	78%	3	+\$33
Outdoor Power Equipment and Other Small Engine Mechanics	Advancement	65%	4	-\$8,592
Bridge and Lock Tenders	Lateral Advancement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



MARINE & POWERSPORTS

Marine and Power Sport Employment Forecast Under Baseline Scenario, Minnesota



Takeaways

- Smallest total employment of all transportation pathways
- Hardest hit by COVID-19 Pandemic; Most volatile; still 4.2% unemployment (205 people in 2022Q3, compared to 47 in 2020Q2)
- About **63.5% of positions** held today will need to be filled by new talent in the next five years

Top Industries of Employment

- Other Motor Vehicle Dealers (16.4%)
- Gasoline Stations (10.3%)
- Automotive Repair and Maintenance (9.7%)



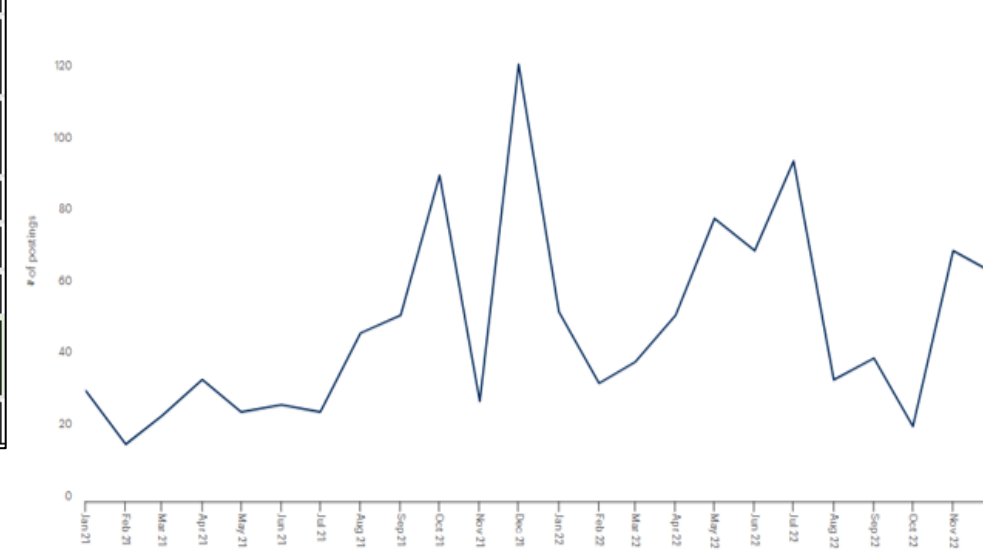
MARINE & POWERSPORTS

SOC	Occupation	Current						1-Year History		1-Year Forecast	
		Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Empl Change	Ann %
53-6031	Automotive and Watercraft Service Attendants	1,906	\$34,500	0.85	71	3.7%	7	82	4.5%	-1	-0.1%
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	880	\$75,000	0.90	23	2.7%	29	-19	-2.1%	-1	-0.1%
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	724	\$44,200	1.02	44	5.9%	20	29	4.1%	2	0.3%
49-3051	Motorboat Mechanics and Service Technicians	568	\$47,900	1.16	35	6.0%	15	45	8.5%	4	0.8%
49-3052	Motorcycle Mechanics	480	\$43,700	1.55	31	6.1%	1	22	4.9%	1	0.3%
53-6032	Aircraft Service Attendants	205	\$37,600	0.76	1	0.5%	3	32	18.5%	2	0.9%
53-5022	Motorboat Operators	36	\$51,100	0.52	0	n/a	n/a	2	6.9%	0	0.6%
16420	Marine and Power Sports Pathway	4,799	\$46,200	0.95	205	4.2%	75	193	4.2%	7	0.2%
Total - All Occupations		3,038,766	\$63,700	1.00	68,550	2.3%	170,185	91,312	3.1%	9,139	0.3%

Job Postings

- 650 unique job postings (+25%)
- 6 hires for every 1 unique job posting

Volume of Career Pathway Online Job Postings in 2021 and 2022



MARINE & POWERSPORTS

Occupation Wages, Average Annual in Minnesota, 2022Q3

SOC	Occupation	Mean	Entry Level	Experienced	Percentiles				
					10%	25%	50% (Median)	75%	90%
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	\$75,000	\$57,000	\$84,000	\$53,700	\$64,000	\$74,700	\$83,300	\$96,000
49-3051	Motorboat Mechanics and Service Technicians	\$47,900	\$35,000	\$54,400	\$32,500	\$39,700	\$47,200	\$52,200	\$62,100
49-3052	Motorcycle Mechanics	\$43,700	\$30,600	\$50,300	\$29,800	\$32,900	\$40,200	\$49,700	\$60,800
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	\$44,200	\$32,400	\$50,100	\$30,400	\$36,300	\$43,500	\$49,700	\$56,000
53-5022	Motorboat Operators	\$51,100	\$33,600	\$59,800	\$32,100	\$37,200	\$44,600	\$57,000	\$72,400
53-6031	Automotive and Watercraft Service Attendants	\$34,500	\$27,300	\$38,100	\$25,700	\$29,800	\$32,600	\$38,000	\$44,600
53-6032	Aircraft Service Attendants	\$37,600	\$29,300	\$41,700	\$26,100	\$33,800	\$37,500	\$40,500	\$40,500
16420	Marine and Power Sports Pathway	\$46,200	\$34,900	\$51,800	\$32,800	\$38,800	\$44,700	\$51,100	\$59,500
00-0000	Total - All Occupations	\$63,700	\$31,400	\$79,800	\$29,100	\$35,700	\$49,800	\$75,000	\$108,400

Pathway Advertised Salary Range

\$20.00/hr
Median Advertised Salary



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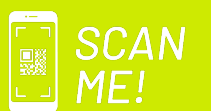
MARINE & POWERSPORTS

Marine and Power Sports Pathway in Minnesota

SOC	Occupation	Empl (Place of Residence)							Total Empl	Overall Occupation ¹		
		< High School	High School	Some College	2-Year	4-Year	Master's	PhD		Underemployed	Unemployed	Unempl Rate
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	4.0%	23.9%	23.0%	27.0%	20.8%	1.0%	0.3%	849	188	23	2.7%
49-3051	Motorboat Mechanics and Service Technicians	7.5%	41.7%	23.3%	18.3%	6.7%	0.9%	1.6%	557	45	35	6.0%
49-3052	Motorcycle Mechanics	7.3%	42.2%	23.3%	18.4%	6.4%	0.9%	1.5%	474	34	31	6.1%
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	7.7%	41.5%	23.1%	18.1%	6.9%	1.0%	1.7%	704	64	44	5.9%
53-5022	Motorboat Operators	5.2%	26.9%	22.5%	10.5%	26.2%	6.9%	1.8%	34	11	0	1.5%
53-6031	Automotive and Watercraft Service Attendants	8.1%	44.1%	21.6%	16.1%	8.6%	1.5%	0.0%	1,865	157	71	3.7%
53-6032	Aircraft Service Attendants	8.9%	41.8%	21.6%	15.4%	10.4%	1.9%	0.0%	199	25	1	0.5%
	Marine and Power Sports Pathway	7.2%	39.4%	22.4%	18.8%	10.3%	1.2%	0.7%	4,681	524	205	4.2%
	Total - All Occupations	4.9%	21.1%	15.4%	14.1%	30.4%	10.3%	3.8%	2,944,602	511,822	68,550	2.3%

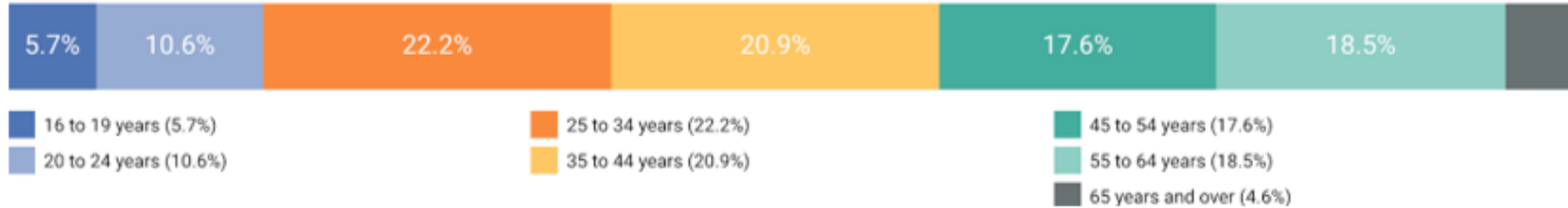
Talent Supply Detail

- 205 people unemployed (4.2%)
- 524 underemployed
- 2 in 5 professionals hold a High School diploma as their highest degree; 7% don't have a High School diploma

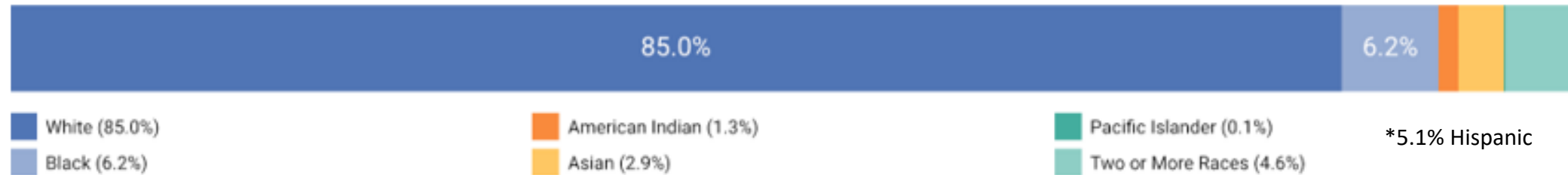


MARINE & POWERSPORTS

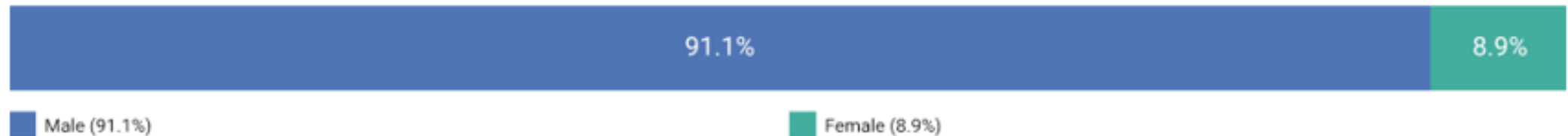
Marine and Power Sports Workforce Age Demographics, 2022Q3



Marine and Power Sports Workforce Race Demographics, 2022Q3



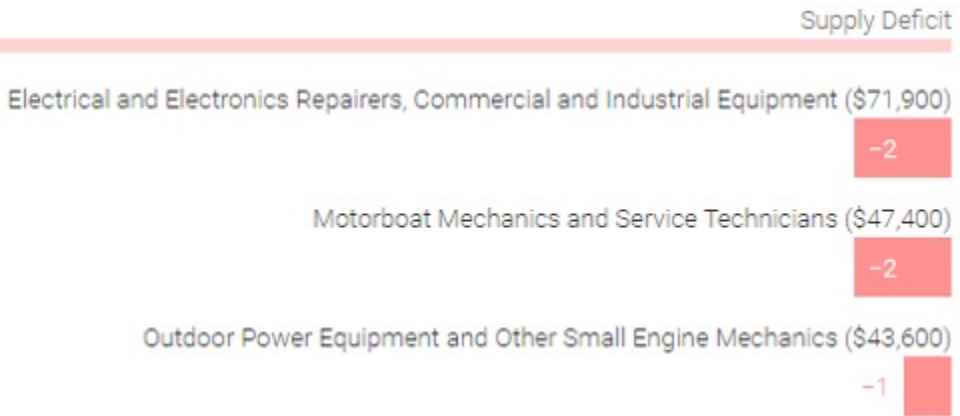
Marine and Power Sports Workforce Gender Demographics, 2022Q3



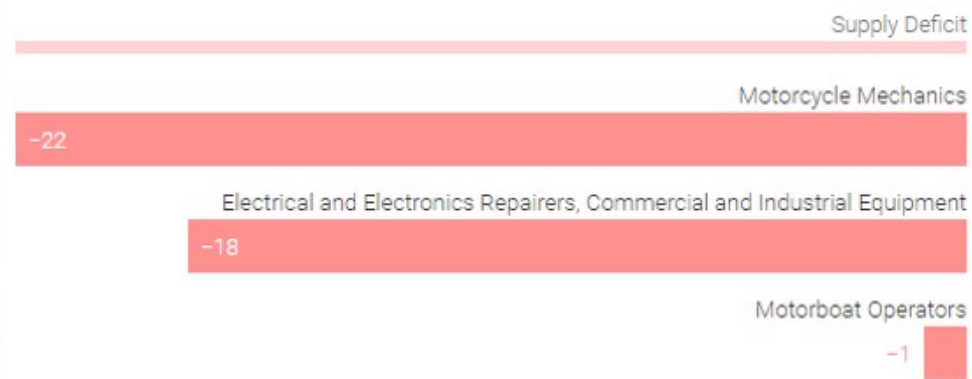
SCAN ME!

MARINE & POWERSPORTS

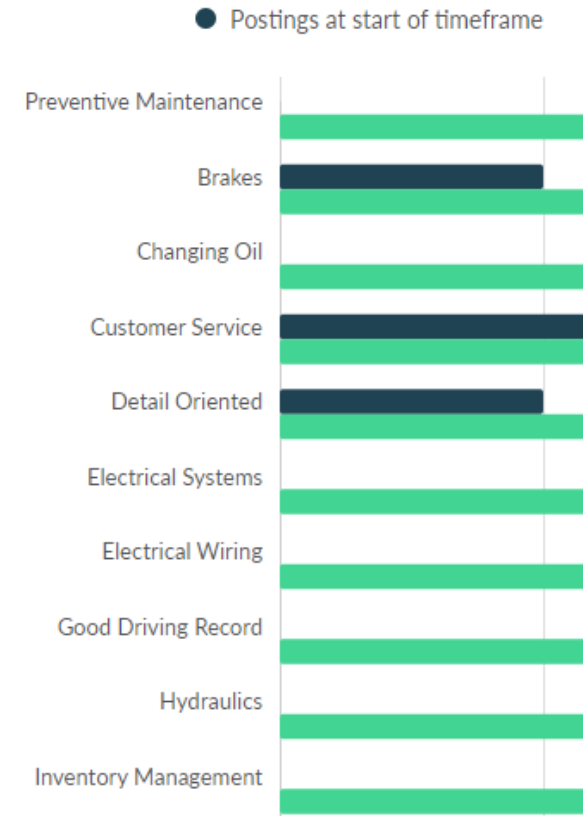
Occupation Gaps



Award Gaps

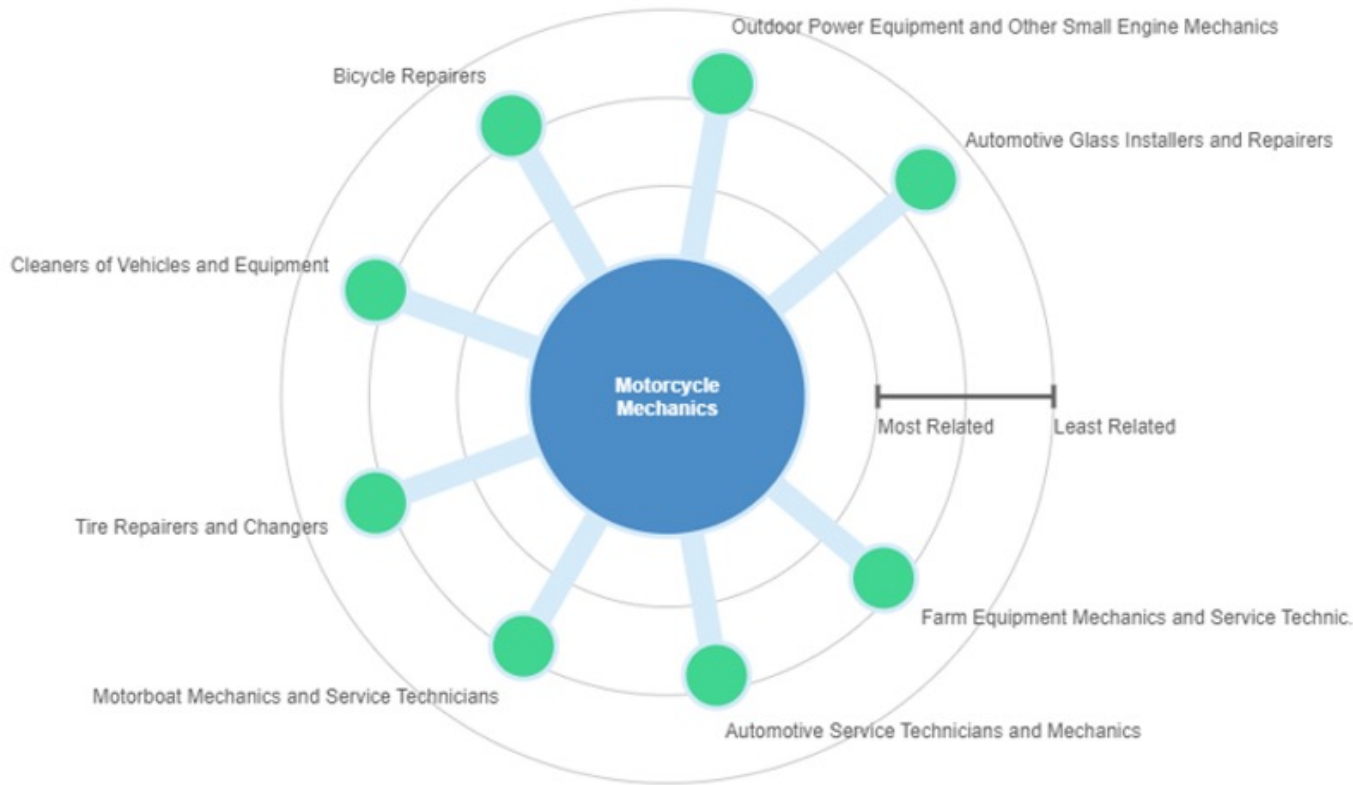


Trending Skills



MARINE & POWERSPORTS

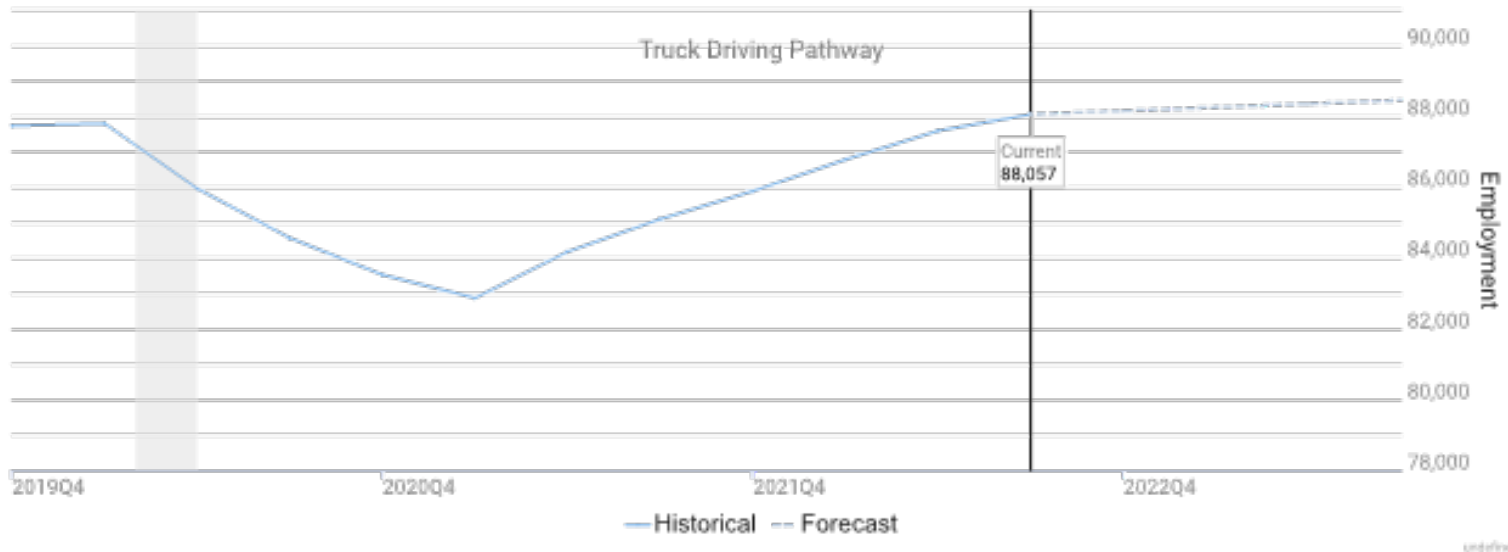
Feeder Occupations into Motorcycle Mechanic Roles, 2023Q1



Occupation	Relevance	Avg. Unique Monthly Postings from Jan 2022 - Dec 2022	Mean Salary Diff.
Farm Equipment Mechanics and Service Technicians	59%	7	-\$1,369
Automotive Service Technicians and Mechanics	59%	560	-\$902
Motorboat Mechanics and Service Technicians	56%	1	+\$3,594
Tire Repairers and Changers	43%	42	-\$16,739
Cleaners of Vehicles and Equipment	43%	101	-\$18,530
Bicycle Repairers	42%	4	-\$6,085
Outdoor Power Equipment and Other Small Engine Mechanics	39%	4	-\$9,960
Automotive Glass Installers and Repairers	28%	7	-\$8,111



TRUCK DRIVING

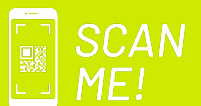


Top Industries of Employment

- General Freight Trucking (15.1%)
- School and Employee Bus Transportation (7.7%)
- Couriers and Express Delivery Services (6.5%)

Takeaways

- Highest total employment of all transportation pathways by a factor of five (98,845 employed)
- Highest baseline average annual growth forecast (0.5%)
- Most vulnerable set of entry-level occupations to technology innovation in transportation
- About **64% of positions** held today will need to be filled by new talent in the next five years

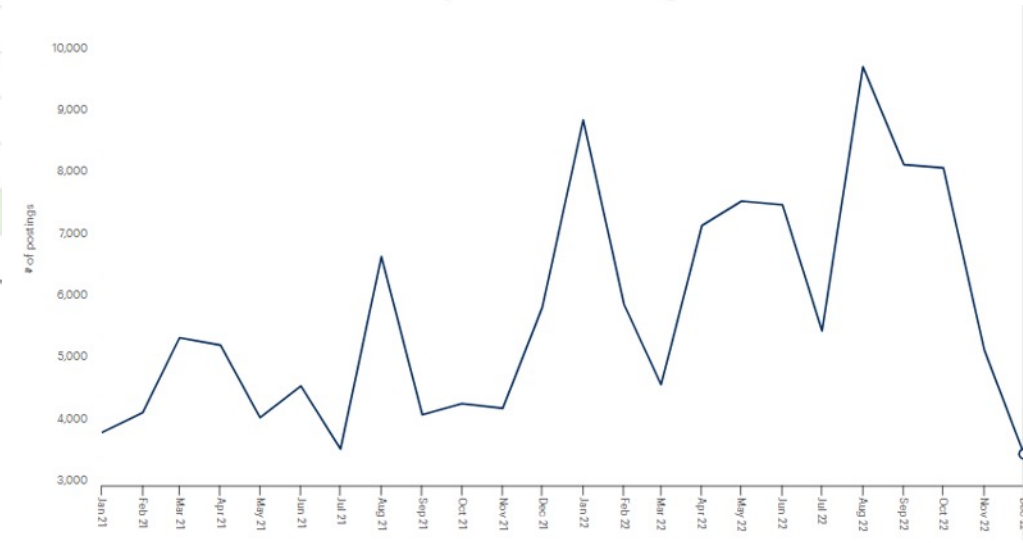


TRUCK DRIVING

Job Postings

- 83,114 unique job postings (+46%)
- 2 hires for every 1 unique job posting

Volume of Career Pathway Online Job Postings in 2021 and 2022



SOC	Occupation	Current					1-Year History		1-Year Forecast		
		Empl	Avg Ann Wages ²	LQ	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Empl Change	Ann %	
53-3032	Heavy and Tractor-Trailer Truck Drivers	39,919	\$59,400	0.97	781	2.0%	3,144	962	2.5%	57	0.1%
53-3033	Light Truck Drivers	19,832	\$50,000	0.92	383	2.0%	860	149	0.8%	124	0.6%
53-3051	Bus Drivers, School	10,788	\$45,000	1.25	566	5.1%	102	1,057	10.9%	64	0.6%
53-7051	Industrial Truck and Tractor Operators	9,821	\$51,600	0.61	313	3.2%	242	674	7.4%	48	0.5%
53-3031	Driver/Sales Workers	9,758	\$34,500	0.93	194	2.0%	1,851	498	5.4%	103	1.1%
53-3053	Shuttle Drivers and Chauffeurs	4,900	\$36,000	1.08	262	5.2%	212	674	15.9%	43	0.9%
53-3052	Bus Drivers, Transit and Intercity	3,636	\$49,200	1.17	106	2.9%	29	-6	-0.2%	18	0.5%
53-7121	Tank Car, Truck, and Ship Loaders	191	\$58,500	0.79	3	1.5%	5	5	2.8%	0	-0.2%
Truck Driving Pathway		98,845	\$51,200	0.93	2,607	2.6%	6,446	4,014	4.2%	457	0.5%
Total - All Occupations		3,038,766	\$63,700	1.00	68,550	2.3%	170,185	91,312	3.1%	9,139	0.5%



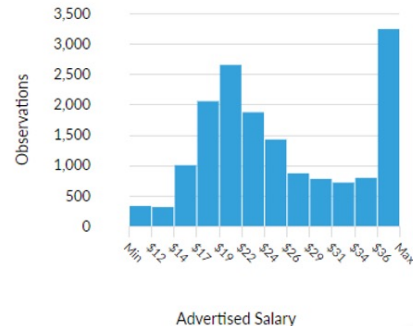
TRUCK DRIVING

Occupation Wages, Average Annual in Minnesota, 2022Q3

SOC	Occupation	Mean	Entry Level	Experienced	Percentiles				
					10%	25%	50% (Median)	75%	90%
53-3031	Driver/Sales Workers	\$34,500	\$24,700	\$39,400	\$23,900	\$26,100	\$30,900	\$39,300	\$50,900
53-3032	Heavy and Tractor-Trailer Truck Drivers	\$59,400	\$43,200	\$67,500	\$40,300	\$49,000	\$57,400	\$66,600	\$79,000
53-3033	Light Truck Drivers	\$50,000	\$32,200	\$58,800	\$28,700	\$37,800	\$48,700	\$59,100	\$77,500
53-3051	Bus Drivers, School	\$45,000	\$32,900	\$51,000	\$30,400	\$37,400	\$42,800	\$50,300	\$56,700
53-3052	Bus Drivers, Transit and Intercity	\$49,200	\$33,500	\$57,100	\$29,600	\$39,600	\$47,000	\$60,600	\$68,000
53-3053	Shuttle Drivers and Chauffeurs	\$36,000	\$27,400	\$40,400	\$25,600	\$30,200	\$35,700	\$40,500	\$44,300
53-7051	Industrial Truck and Tractor Operators	\$51,600	\$38,600	\$58,000	\$37,900	\$41,100	\$48,500	\$56,100	\$68,800
53-7121	Tank Car, Truck, and Ship Loaders	\$58,500	\$39,900	\$67,800	\$38,900	\$42,800	\$50,600	\$73,300	\$89,900
Truck Driving Pathway		\$51,200	\$36,400	\$58,500	\$33,900	\$41,200	\$49,100	\$58,100	\$70,400
Total - All Occupations		\$63,700	\$31,400	\$79,800	\$29,100	\$35,700	\$49,800	\$75,000	\$108,400

Pathway Advertised Salary Range

\$23.85/hr
Median Advertised Salary



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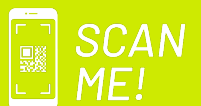
TRUCK DRIVING

Truck Driving 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
53-3031	Driver/Sales Workers	9.2%	43.8%	20.4%	12.3%	12.1%	1.8%	0.4%	9,507	1,249	194	2.0%
53-3032	Heavy and Tractor-Trailer Truck Drivers	9.0%	44.0%	20.4%	12.6%	11.9%	1.7%	0.4%	38,843	4,583	781	2.0%
53-3033	Light Truck Drivers	9.2%	43.0%	20.4%	12.3%	12.7%	1.9%	0.4%	19,128	2,659	383	2.0%
53-3051	Bus Drivers, School	4.1%	37.4%	23.9%	16.3%	14.3%	3.2%	0.9%	10,548	1,665	566	5.1%
53-3052	Bus Drivers, Transit and Intercity	4.7%	36.2%	23.3%	15.7%	16.5%	3.0%	0.6%	3,516	621	106	2.9%
53-3053	Shuttle Drivers and Chauffeurs	6.2%	29.8%	19.4%	12.8%	24.0%	5.8%	2.0%	4,768	1,314	262	5.2%
53-7051	Industrial Truck and Tractor Operators	12.3%	49.6%	19.2%	10.9%	6.7%	0.8%	0.4%	9,437	778	313	3.2%
53-7121	Tank Car, Truck, and Ship Loaders	11.6%	47.4%	17.1%	12.2%	10.2%	1.3%	0.2%	191	19	191	1.5%
	Truck Driving Pathway (2023 Update)	8.6%	42.6%	20.7%	12.9%	12.6%	2.1%	0.5%	95,937	12,888	2,607	2.6%
	Total - All Occupations	4.9%	21.1%	15.4%	14.1%	30.4%	10.3%	3.8%	2,944,602	511,822	68,550	2.3%

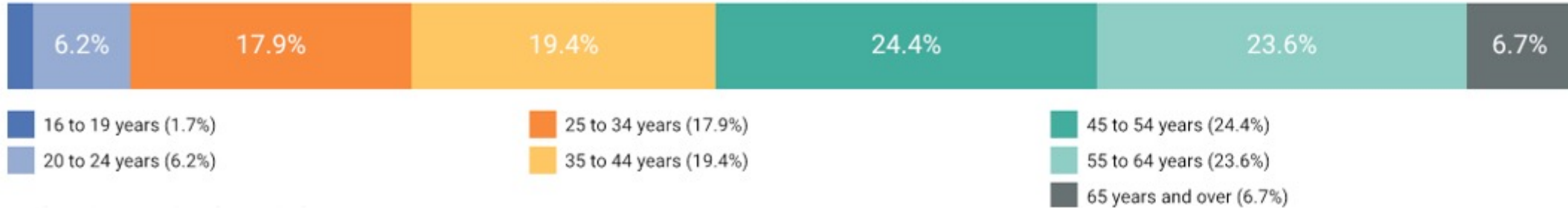
Talent Supply Detail

- 2,607 people unemployed (2.6%)
- 12,888 underemployed
- More than 2 in 5 professionals hold a High School diploma as their highest degree, 8.6% don't have a High School Diploma

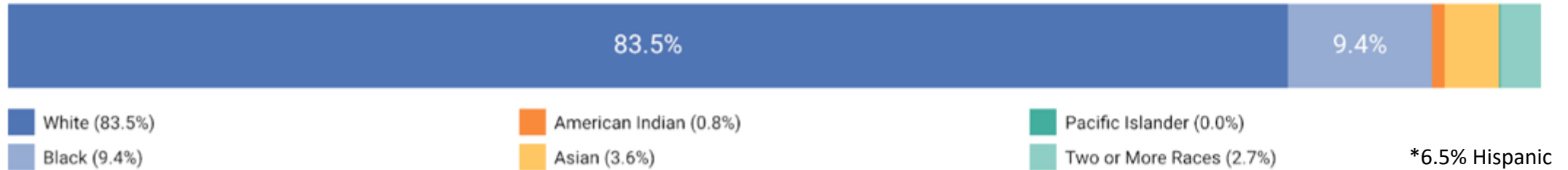


TRUCK DRIVING

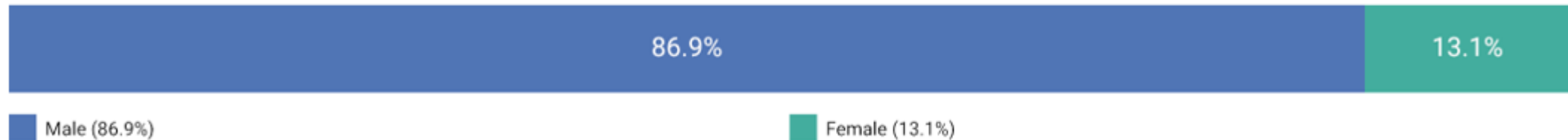
Truck Driving Workforce Age Demographics, 2022Q3



Truck Driving Workforce Race Demographics, 2022Q3



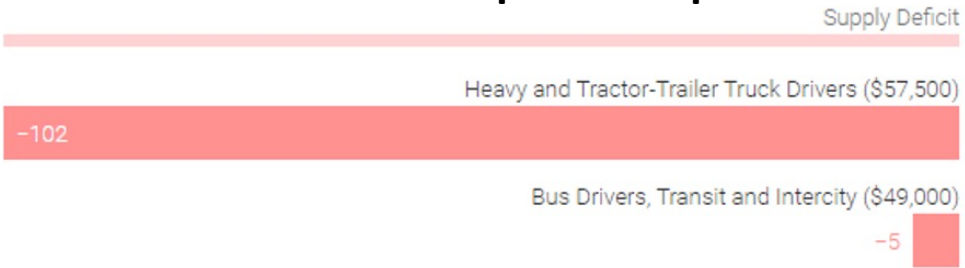
Truck Driving Workforce Gender Demographics, 2022Q3



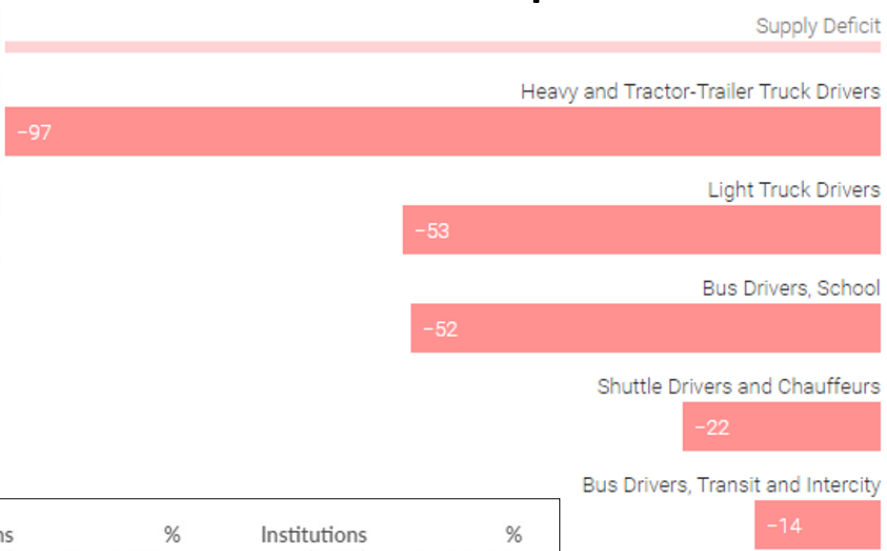
SCAN ME!

TRUCK DRIVING

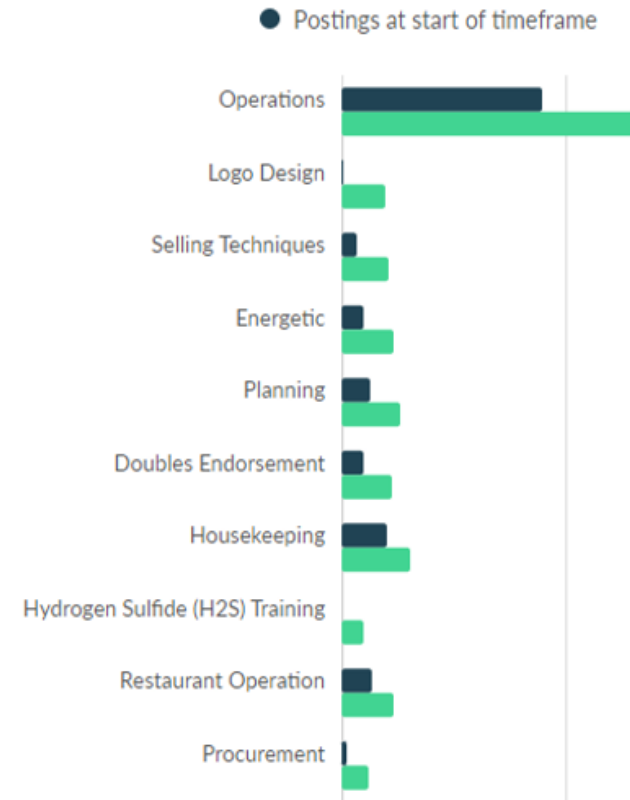
Occupation Gaps



Award Gaps



Trending Skills

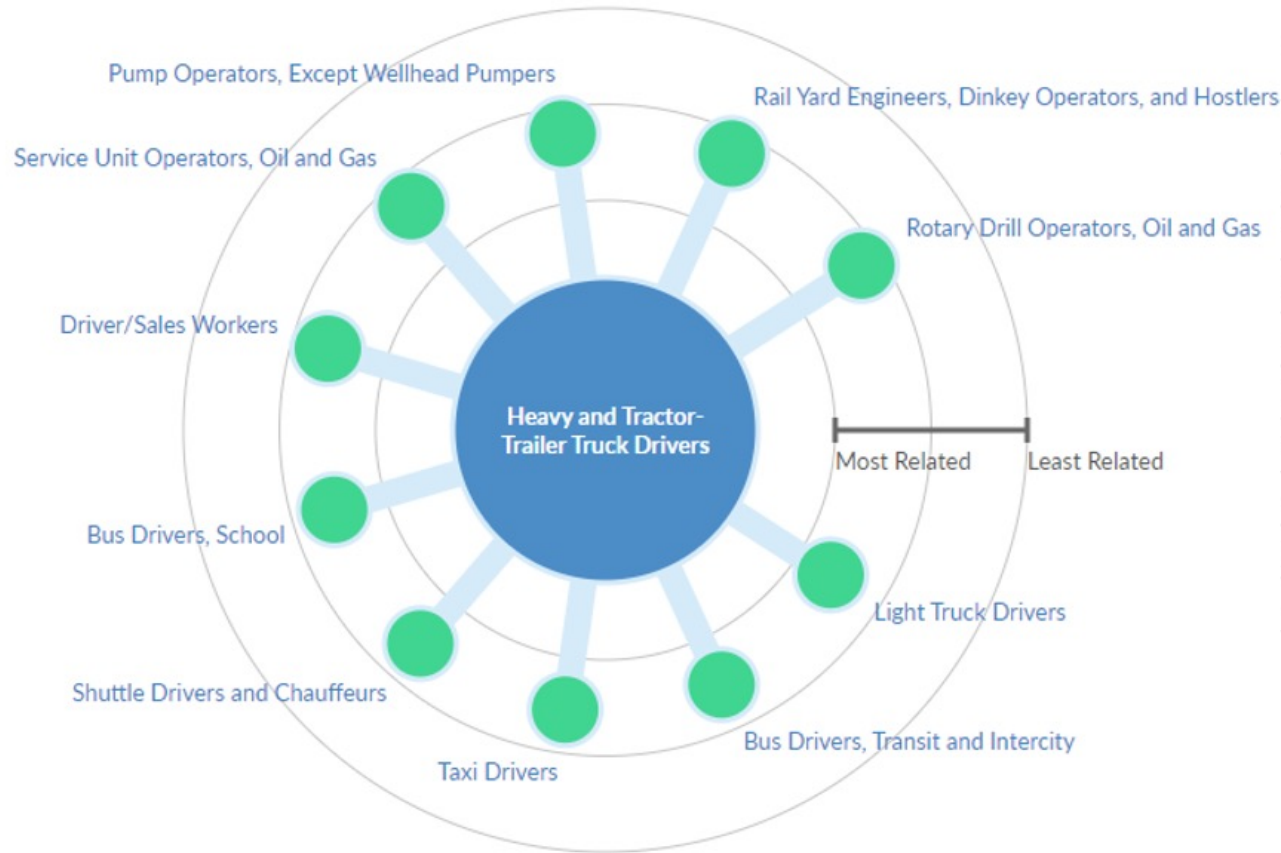


	Completions (2021)	% Completions	Institutions (2021)	% Institutions
All Programs	84	100%	3	100%
Distance Offered Programs	0	0%	0	0%
Non-Distance Offered Programs	84	100%	3	100%



TRUCK DRIVING

Feeder Occupations into Heavy and Tractor-Trailer Truck Driver Roles, 2023Q1



Occupation	Category	Relevance	Avg. Unique Monthly Postings from Jan 2022 - Dec 2022	Mean Salary Diff.
Light Truck Drivers	Advancement	80%	356	-\$27,639
Bus Drivers, Transit and Intercity	Advancement	74%	34	-\$28,942
Taxi Drivers	Advancement	73%	33	-\$31,978
Shuttle Drivers and Chauffeurs	Advancement	73%	32	-\$31,978
Bus Drivers, School	Advancement	73%	26	-\$31,978
Driver/Sales Workers	Advancement	69%	510	-\$31,542
Service Unit Operators, Oil and Gas	Lateral Advancement	65%	0	-\$17,927
Pump Operators, Except Wellhead Pumpers	Lateral Advancement	64%	3	-\$21,519
Rail Yard Engineers, Dinkey Operators, and Hostlers	Lateral Advancement	61%	0	-\$23,596
Rotary Drill Operators, Oil and Gas	Lateral Advancement	61%	3	-\$12,533



We welcome your questions and comments!

View the Reports here:

<https://www.minntran.org/demand-analysis/>



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MINNESOTA STATE
Transportation Center of Excellence



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BREAKOUT GROUPS

Click the link to the Jamboard in the Chat now. We will now split into breakout rooms for a workshop on the topic of Transportation talent shortages and strategies.



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Thank You



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Appendix



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AUTOMOTIVE TECHNOLOGY

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)
Automotive Service Technicians and Mechanics	<ul style="list-style-type: none"> Automobile/Automotive Mechanics Technology/Technician Hydraulics and Fluid Power Technology/Technician Diesel Mechanics Technology/Technician Medium/Heavy Vehicle and Truck Technology/Technician 	13,649	Y	10.4%	7.6%	2.4%	59.9%	622	N	24.2%	4.4%
Mechanical Engineers	<ul style="list-style-type: none"> Mechanical Engineering 	6,313	Y	15.3%	2.2%	8.6%	61.1%	0	Y	24.4%	14.8%
Mechanical Engineering Technologists and Technicians	<ul style="list-style-type: none"> Mechanical Engineering Technology/Technician Automotive Engineering Technology/Technician Automation Engineer Technology/Technician 	1,003	Y	11.7%	3.1%	21.7%	48.5%	189	Y	25.2%	10.7%
Electronic Equipment Installers and Repairers, Motor Vehicles	<ul style="list-style-type: none"> Alternative Fuel Vehicle Technology/Technician 	216	N	10.6%	5.1%	4.6%	41.3%	0	N	N/A	N/A
Electrical and Electronics Installers and Repairers, Transportation Equipment	N/A	45	N	10.4%	4.9%	4.5%	0.0%	N/A	N	N/A	N/A
Automotive Technology Pathway	All nine aligned programs	21,227	Y	11.9%	5.7%	5.2%	59.4%	801	Y	25.5%	9.4%
All Occupations		3,038,766		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.



AUTOMOTIVE TECHNOLOGY

Automotive Technology 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
14.1901	Mechanical Engineering	0	0	0	0	477	80	25	582
47.0604	Automobile/Automotive Mechanics Technology/Technician	41	69	109	121	0	0	0	340
15.0406	Automation Engineer Technology/Technician	25	35	111	17	0	0	0	188
15.1103	Hydraulics and Fluid Power Technology/Technician	8	16	40	40	0	0	0	104
47.0605	Diesel Mechanics Technology/Technician	3	33	43	14	0	0	0	93
47.0613	Medium/Heavy Vehicle and Truck Technology/Technician	0	4	51	20	0	0	0	75
15.0803	Automotive Engineering Technology/Technician	0	0	0	0	25	0	0	25
15.0805	Mechanical/Mechanical Engineering Technology/Technician	0	0	1	0	0	0	0	1
47.0614	Alternative Fuel Vehicle Technology/Technician	0	0	0	0	0	0	0	0
	Total	77 (5.5%)	157 (11.2%)	355 (25.2%)	212 (15.1%)	502 (35.7%)	80 (5.7%)	25 (1.8%)	1,408



AVIATION & DRONE TECHNOLOGY

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)
Airline Pilots, Copilots, and Flight Engineers	• Airline/Commercial/Professional Pilot and Flight Crew	2,970	Y	6.7%	2.0%	4.7%	45.4%	8	Y	14.3%	14.3%
Aircraft Mechanics and Service Technicians	• Agricultural Mechanics and Equipment/Machine Technology/Technician • Airframe Mechanics and Aircraft Maintenance Technology/Technician	2,041	Y	9.7%	4.4%	3.2%	56.6%	51	Y	23.5%	7.8%
Engineers, All Other	• Engineering, General • Engineering Physics/Applied Physics • Engineering Science • Systems Engineering • Manufacturing Engineering • Geological/Geophysical Engineering • Mechatronics, Robotics, and Automation Engineering • Engineering, Other	1,981	Y	20.0%	2.5%	14.1%	54.9%	0	Y	21.3%	27.5%
Commercial Pilots*	• Airline/Commercial/Professional Pilot and Flight Crew	636	Y	4.2%	1.5%	4.5%	42.2%	8	Y	14.3%	14.3%
Air Traffic Controllers	• Aviation/Airway Management and Operations	575	N	19.1%	7.1%	19.5%	60.4%	3	Y	66.7%	33.3%
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	• Aircraft Powerplant Technology/Technician	290	N	19.5%	6.3%	30.3%	80.0%	55	N	16.4%	5.5%
Electro-Mechanical and Mechatronics Technologists and Technicians	• Engineering Technologies/Technicians, General • Electrical, Electronic, and Communications Engineering Technology/Technician • Electromechanical/Electromechanical Engineering Technology/Technician • Instrumentation Technology/Technician • Robotics Technology/Technician • Automation Engineer Technology/Technician • Mechanical/Mechanical Engineering Technology/Technician • Engineering Design • Nanotechnology • Engineering/Engineering-Related Technicians, Other	288	N	12.4%	3.1%	21.9%	48.7%	365	N	28.3%	12.6%
Airfield Operations Specialists*	• Aviation/Airway Management and Operations	182	N	17.9%	6.8%	19.6%	60.3%	3	Y	66.7%	33.3%
Aircraft Cargo Handling Supervisors	• Logistics, Materials, and Supply Chain Management	126	N	20.1%	6.4%	25.8%	61.7%	8	Y	50.0%	30.4%
Avionics Technicians	• Avionics Maintenance Technology/Technician	73	N	13.6%	5.7%	4.4%	43.1%	3	N	0.0%	0.0%
Aviation and Drone Technology Pathway	All 26 aligned programs	9,162	Y	11.8%	3.3%	9.2%	52.4%	771	Y	29.2%	16.3%
All Occupations		3,038,766		15.0%	5.2%	48.3%	56.5%	29,484		37.3%	65.6%



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AVIATION & DRONE TECHNOLOGY

Aviation and Drone Technology 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	Post Bacc.	Masters	Total Awards
15.0406	Automation Engineer Technology/Technician	25	35	111	17	0	0	0	188
15.0303	Electrical, Electronic, and Communications Engineering Technology/Technician	21	6	58	8	9	0	0	102
47.0608	Aircraft Powerplant Technology/Technician	39	0	16	0	0	0	0	55
14.3601	Manufacturing Engineering	0	0	0	0	27	16	10	53
14.0101	Engineering, General	0	0	0	0	48	1	2	51
52.0203	Logistics, Materials, and Supply Chain Management	0	0	8	0	38	0	0	46
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician	2	0	23	20	0	0	0	45
15.0404	Instrumentation Technology/Technician	0	0	35	2	0	0	0	37
15.0405	Robotics Technology/Technician	1	0	31	0	0	0	1	33
15.0000	Engineering Technologies/Technicians, General	0	0	5	0	25	0	0	30
14.9999	Engineering, Other	0	0	0	0	0	9	21	30
14.2701	Systems Engineering	0	0	0	0	0	0	19	19
49.0102	Airline/Commercial/Professional Pilot and Flight Crew	0	0	8	0	6	0	0	14
15.1502	Engineering Design	0	0	0	0	0	0	13	13
14.1201	Engineering Physics/Applied Physics	0	0	0	0	11	0	0	11
15.0499	Electromechanical Technologies/Technicians, Other	9	0	0	0	0	0	0	9
15.9999	Engineering/Engineering-Related Technologies/Technicians, Other	0	0	0	0	0	0	8	8



COLLISION REPAIR

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)
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	• Autobody/Collision and Repair Technology/Technician	3,535	Y	9.3%	8.2%	2.9%	52.7%	161	N	42.2%	13.7%
Automotive Body and Related Repairers	• Autobody/Collision and Repair Technology/Technician	2,863	Y	12.3%	5.5%	5.3%	55.2%	161	N	42.2%	13.7%
Automotive Glass Installers and Repairers	• Autobody/Collision and Repair Technology/Technician	359	Y	14.0%	9.0%	9.1%	55.7%	161	N	42.2%	13.7%
Collision Repair Pathway	All aligned programs	6,757	Y	11.9%	8.5%	6.3%	54.4%	161	N	42.2%	13.7%
Total - All Occupations		3,038,766		15.0%	5.2%	48.3%	56.5%	29,484		37.3%	65.6%



COLLISION REPAIR

Collision Repair 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
47.0603	Autobody/Collision and Repair Technology/Technician	76	37	27	21	0	0	0	161
	Total	76 (47.2%)	37 (23.0%)	27 (16.8%)	21 (13.0%)	0	0	0	161



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DIESEL EQUIPMENT & TRUCK

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%



DIESEL EQUIPMENT & TRUCK

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



MARINE & POWERSPORTS

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)
Automotive and Watercraft Service Attendants	<ul style="list-style-type: none"> Personal Watercraft/Boating Education (not offered in Minnesota) 	1,906	N	19.4%	4.9%	12.5%	61.7%	N/A	N	N/A	N/A
Electrical and Electronics Repairers, Commercial and Industrial Equipment	<ul style="list-style-type: none"> Electrical, Electronic, and Communications Engineering Technology/Technician Computer Installation and Repair Technology/Technician Communications Systems Installation and Repair Technology/Technician 	880	Y	11.0%	5.2%	4.6%	53.1%	96	Y	72.5%	7.8%
Outdoor Power Equipment and Other Small Engine Mechanics	<ul style="list-style-type: none"> Small Engine Mechanics and Repair Technology/Technician 	724	Y	11.8%	5.4%	5.1%	60.9%	15	N	6.7%	6.7%
Motorboat Mechanics and Service Technicians	<ul style="list-style-type: none"> Diesel Mechanics Technology/Technician Marine Maintenance/Fitter and Ship Repair Technology/Technician Small Engine Mechanics and Repair Technology/Technician 	568	Y	10.3%	5.1%	5.1%	60.5%	172	N	20.5%	21.9%
Motorcycle Mechanics	<ul style="list-style-type: none"> Small Engine Mechanics and Repair Technology/Technician Motorcycle Maintenance and Repair Technology/Technician 	480	Y	9.2%	4.4%	5.0%	59.8%	21	Y	23.4%	6.7%
Aircraft Service Attendants	N/A	205	N	27.2%	8.0%	24.5%	58.1%	N/A	N	N/A	N/A
Motorboat Operators	<ul style="list-style-type: none"> Personal Watercraft/Boating Education (not offered in Minnesota) 	36	N	20.0%	7.9%	23.1%	43.0%	N/A	Y	N/A	N/A
Marine and Power Sports Pathway	All seven aligned programs	4,799	Y	15.0%	5.1%	8.9%	59.4%	236	Y	25.5%	9.4%
Total - All Occupations		3,038,766		15.0%	5.2%	48.3%	56.5%	29,484		37.3%	65.6%



MARINE & POWERSPORTS

Marine and Power Sports 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
15.0303	Electrical, Electronic, and Communications Engineering Technology/Technician	21	6	58	8	9	0	0	102
47.0605	Diesel Mechanics Technology/Technician	3	33	43	14	0	0	0	93
47.0616	Marine Maintenance/Fitter and Ship Repair Technology/Technician	6	24	9	25	0	0	0	64
47.0606	Small Engine Mechanics and Repair Technology/Technician	0	12	0	3	0	0	0	15
47.0611	Motorcycle Maintenance and Repair Technology/Technician	0	6	0	0	0	0	0	6
47.0104	Computer Installation and Repair Technology/Technician	2	1	0	0	0	0	0	3
47.0103	Communications Systems Installation and Repair Technology/Technician	0	0	0	0	0	0	0	0
	Total	32 (11.3%)	82 (28.9%)	110 (38.9%)	50 (17.7%)	9 (3.2%)	0 (0%)	0 (0%)	283



TRUCK DRIVING

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)
Heavy and Tractor-Trailer Truck Drivers		39,919	Y	13.9%	6.2%	8.1%	45.2%	84	Y	22.6%	13.1%
Light Truck Drivers		19,832	N	16.6%	6.6%	8.1%	46.4%	84	Y	22.6%	13.1%
Bus Drivers, School		10,788	N	17.4%	4.9%	30.1%	39.9%	84	Y	22.6%	13.1%
Industrial Truck and Tractor Operators		9,821	N	19.2%	10.4%	10.0%	57.5%	84	N	22.6%	13.1%
Drivers/Sales Workers		9,758	N	16.8%	6.5%	8.5%	46.2%	N/A	N	N/A	N/A
Shuttle Drivers and Chauffeurs		4,900	N	23.2%	5.5%	30.2%	41.9%	84	Y	22.6%	13.1%
Bus Drivers, Transit and Intercity		3,636	Y	24.4%	3.8%	42.0%	23.4%	84	Y	22.6%	13.1%
Tank Car, Truck, and Ship Loaders		191	N	14.6%	7.4%	21.2%	53.3%	NA	N	N/A	N/A
Truck Driving Pathway	Truck and Bus Driver/Commercial Vehicle Operator and Instructor	21,227	Y	16.5%	6.5%	13.1%	45.2%	84	Y	22.6%	13.1%
All Occupations		3,038,766		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. *There is only one program associated with occupations in this career pathway. For this reason, the Graduate and Demographics columns have identical information.



TRUCK DRIVING

Truck Driving 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
49.0205	Truck and Bus Driver/Commercial Vehicle Operator and Instructor	84	0	0	0	0	0	0	84
	Total	84 (100%)	0	0	0	0	0	0	84



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