Labor Market Analysis for:
0947.00 Diesel Technology

Inland Empire/Desert Center of Excellence, May 2024
Prepared by: Chris Cruzcosa, ccruzcosa@iegocollaborative.org

Summary

Program LMI Endorsement	All LMI Criteria Met	Some LMI Criteria Met (Proceed with Caution)	LMI Criteria NOT Met
	✓	☐	☐

Program LMI Endorsement Criteria		
Supply Gap	Yes ✓	No ☐
	Comments: There is *projected* to be 726 **annual job openings** throughout the Inland Empire/Desert region, which is more than the **127 annual average awards conferred by educational institutions over the last 3 years.** Supply data includes both community college awards (42) and non-community college awards (85).	
Living Wage	Yes ✓	No ☐
	Comments: **The majority (100%) of annual job openings** for these two occupations **have entry-level hourly wages above the IE/D living wage of 13.74.**[1]	
Education	Yes ✓	No ☐
	Comments: **Most job postings for target occupations require a high school or equivalent education (93%).** See exhibits 8 and 9 for more details.	

The Inland Empire/ Desert (IE/D) Center of Excellence for Labor Market Research (IE/D COE) reviewed the following occupations to prepare this report:

- Middle-Skill (typically require training/education above a HS diploma but less than a bachelor's degree)
  - Mobile Heavy Equipment Mechanics, Except Engines (49-3042)
  - Bus and Truck Mechanics and Diesel Engine Specialists (49-3031)

Summary of findings

Demand
- The number of jobs related to the middle-skill occupations – mobile heavy equipment mechanics, except engines & bus and truck mechanics and diesel engine specialists - is projected to increase 12% through 2027, with 726 annual job openings (new and replacement jobs).
- Hourly entry-level wages for all occupations are above living wage at the 25th percentile hourly wage ranging from $21.32 to $26.60 in IE/D.
- There were 1,087 online job postings from 314 employers over the past 12-months with the highest postings for diesel mechanics and diesel technicians.
- Most job postings for target occupations require high school or equivalent (93%) followed by an associate degree (4%), and bachelor's degree (3%).

Supply
- On average, there were 127 annual awards conferred by educational institutions over the last 3 years in related fields: 42 from community colleges and 85 from other institutions (e.g., 4-year universities, private schools).
- IE/D community college students that exited these programs in the 2021-22 academic year earned a median annual wage of $43,772 ($21.04 per hour).
- 83% of students that exited their program in 2021-22 reported that they are working in a job closely related to their field of study.
- Community college programs play an important role diversifying the talent pipeline in these occupations. Most IE/D professionals in Diesel Technology occupations are Hispanic or Latino (49%), mid career (35 - 54) (45%), and Male (98%). Most community college students in related programs are Hispanic or Latino (79%), pre-career/college (49%), and Male (100%).

---

[1] *While the* UW self-sufficiency standard *is currently used by the CO and other COEs, the self-sufficiency standard was last updated by UW in 2021, does not account for significant increases in the cost of living in the Inland Empire the last three years, and is below the State of California minimum wage of $16.00. For these reasons, the COE will provide an alternative living wage calculation from MIT in the analysis below as an additional reference point. MIT estimates, the living wage for an adult with no kids living in 2024 is $26.30 in Riverside County and $25.17 in San Bernadino County.*

Introduction

California Community College Diesel Technology (TOP 0947.00) programs prepare students for employment to repair and maintenance of diesel engines in vehicles, ships, locomotives, and construction equipment, as well as stationary diesel engines in electrical generators and related equipment. (Taxonomy of Programs, 2023). The knowledge, skills, and abilities trained by diesel technology programs lead to employment in occupations related to engine and generator technology.

Job Demand

In 2022, there were 6,543 jobs in occupations related to engine and generator technology in the IE/D region. Regional employment for this occupation group is projected to increase by 12% through 2027 with 726 job openings projected annually. Exhibit 1 displays the job count, five-year projected job growth, and job openings in the region.

Exhibit 1. Five-year projections for occupations related to engine and generator technology IE/D Region 2022-2027

Occupation	SOC	2022 Jobs	2027 Jobs	2022 - 2027 % Change	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)
Bus and Truck Mechanics and Diesel Engine Specialists	49-3031	4,282	4,828	13%	2,411.42	482
Mobile Heavy Equipment Mechanics, Except Engines	49-3042	2,261	2,505	11%	1,219.68	244
Total		6,543	7,333	12%	3,631.10	726

SOURCE: LIGHTCAST 2023.4

Job Postings

The following analysis for occupations related to engine and generator technology using online job posting data.

Important note: The data produced in this section were generated by leveraging online job posting data sourced from Lightcast, which is the labor market analytics software tool COEs use to produce these briefs. The job posting data is collected from scraping online job boards such as LinkedIn, Indeed, Glassdoor and many others. The process Lightcast uses to assemble this data does have some limitations due to methods that recruitment professionals sometimes use (e.g., posting one job to fill multiple positions). For example, the number of jobs posted is not necessarily the same as the number of job vacancies.[2] While not perfect, Lightcast leverages machine learning and other AI technologies to enrich, deduplicate and aggregate this information to make it a meaningful dataset.

Exhibit 2 displays the number of job ads posted for occupations related to engine and generator technology over the last 12 months and the median posting duration. Over the previous 12 months, there were 1,087 unique job postings for occupations related to engine and generator technology in the region from 314 employers.

Exhibit 2. Job ads and posting duration, IE/D Region, May 2023 – April 2024

| Job Title	Job Ads	Median Posting Duration (days)
Bus and Truck Mechanics and Diesel Engine Specialists	828	29 days
Mobile Heavy Equipment Mechanics, Except Engines	259	30 days
Total	1,087	

SOURCE: LIGHTCAST 2023.4

---

[2] *"Job Posting Analytics (JPA) Methodology." Lightcast Knowledge Base, https://kb.lightcast.io/en/articles/6957446-job-posting-analytics-jpa-methodology*

Earnings

Exhibit 3 displays the hourly earnings for occupations related to engine and generator technology and includes comparison of hourly earnings as compared to the MIT IE/D living wage of $25.73.[3]

Exhibit 3. Hourly earnings by percentile for occupations related to engine and generator technology, IE/D Region, 2022
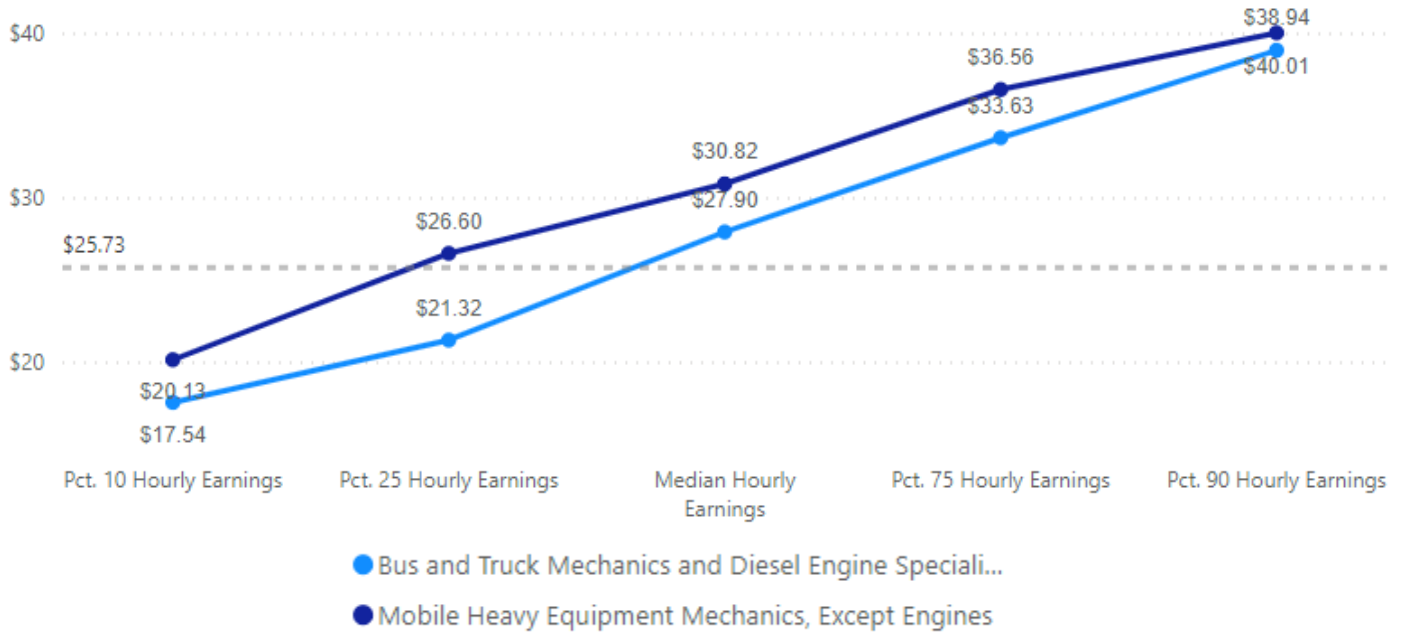
SOURCE: LIGHTCAST 2023.4

All entry-level earnings (that is, the earnings of the lowest paid 10% of employees in the IE/D) were above the UW Self-Sufficiency Standard for the IE/D[4]. However, none of the occupations were above the MIT living wage for an adult with no children ($25.73).

---

[3] *While the* UW self-sufficiency standard *is currently used by the CO and other COEs, the self-sufficiency standard was last updated by UW in 2021, does not account for significant increases in the cost of living in the Inland Empire the last three years, and is below the State of California minimum wage of $16.00. While the COE uses this standard for the LMI Wage criteria, For these reasons, the provides an alternative living wage calculation from MIT in the analysis as an additional reference point. MIT estimates, the living wage for an adult with no kids living in 2024 is $26.30 in Riverside County and $25.17 in San Bernadino County.*

[4] *ibid*

Advertised Salary from Online Job Ads

Exhibit 4 displays the regional online advertised salaries for the occupations related to engine and generator technology over the last 12 months. Online job ad salary information data suggests most employers (51%) advertise an annual salary greater than $70,000.

Exhibit 4. Online advertised salaries for occupations related to engine and generator technology, IE/D Region, May '23 to April '24
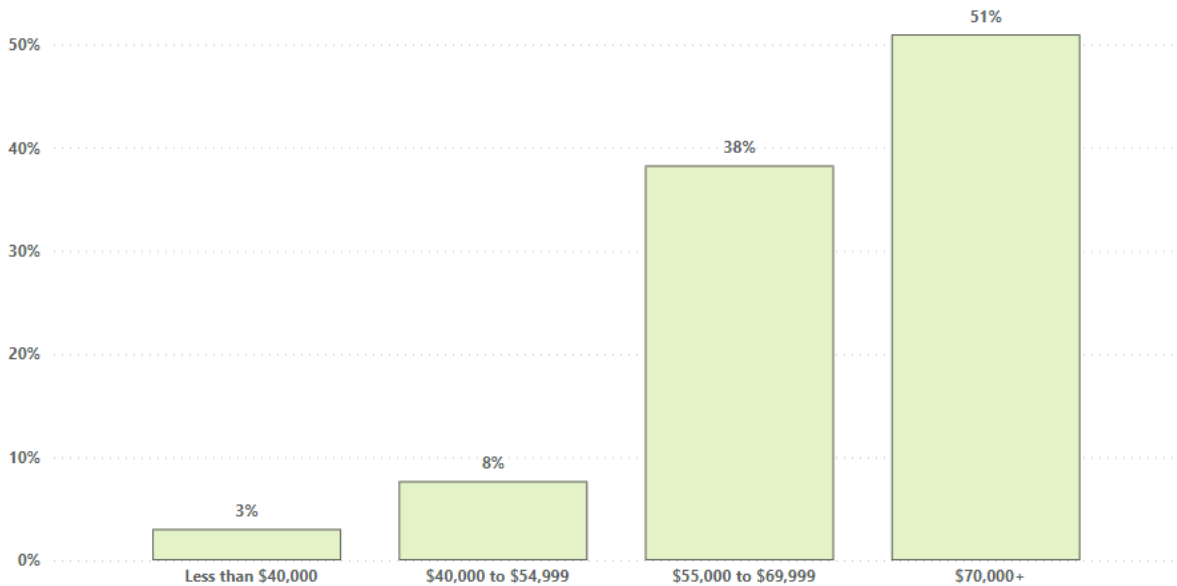
SOURCE: LIGHTCAST 2023.4

Online Job Advertisements: top job titles, skills, education & work experience.

Exhibit 5 displays the job titles most frequently used in job postings for the occupations related to engine and generator technology over the last 12 months. Assessing the top advertised job titles may provide insight into the types of positions sought by employers.

Exhibit 5. Job titles most frequently used in job ads, IE/D May '23 to April '24

Job Title	Unique Postings	Total Postings
Diesel Mechanics	145	789
Diesel Technicians	114	599
Trailer Technicians	59	281
Heavy Equipment Mechanics	42	192
Diesel Mechanic Technicians	39	164
Fleet Mechanics	31	89
Diesel Technicians/Mechanics	28	237
Trailer Mechanics	26	84
Fleet Technicians	24	85
Mobile Diesel Mechanics	24	71
Diesel Fleet Mechanic Technicians	23	136

SOURCE: LIGHTCAST 2023.4

Exhibit 6 displays the employers posting the most job ads for this occupational group during the last 12 months. Showing employer names can provide insight into where students may find employment after completing a program and may inform job development and other employer engagement targets for faculty and staff involved in related programs. Amerit Fleet Solutions and Penske Automotive Group had the highest unique job posts for this occupational group in the last 12 months. Posting intensity is the ratio of total job posts to unique job posts which are deduplicated. A higher posting intensity can represent the level of effort and activity the organization is putting into hiring for that position. The following report comes directly from Lightcast's Job Posting Analytics dashboard.

Exhibit 6. Employers posting the most job ads, IE/D May '23 to April '24

Company	Total/Unique (May 2023 - Apr 2024)	Posting Intensity	Median Posting Duration
Amerit Fleet Solutions	385 / 83	5 : 1	29 days
Penske Automotive Group	296 / 29	10 : 1	32 days
Velocity Vehicle Group	71 / 21	3 : 1	26 days
Estes Express Lines	37 / 17	2 : 1	31 days
United Road	62 / 17	4 : 1	23 days
FedEx	26 / 16	2 : 1	37 days
Power Plus	43 / 15	3 : 1	47 days
Love's	46 / 15	3 : 1	5 days
Rush Enterprises	49 / 14	4 : 1	17 days
Westrux International	151 / 13	12 : 1	8 days

SOURCE: LIGHTCAST 2023.4

Exhibit 7 displays the top common, specialized and computer skills that were included in the job postings over the last 12 months. Today's demand is an important indicator of which skills employers are looking for in the current market. Analyzing skills from a historical perspective as well as projecting the future needs of employers may provide insight into how the job posting skills demand compares to the market as a whole. Rapidly growing skills are those that are increasing in demand at a faster rate than the market as a whole. [5]

Exhibit 7. Top 10 in-demand skills from employer job ads, IE/D May '23 to April '24

Common skills	Total Postings	Skill Growth Relative to Market	Specialized skills	Total Postings	Skill Growth Relative to Market
Troubleshooting (Problem Solving)	336	Growing	Diesel Engines	455	Rapidly Growing
Communication	289	Lagging	Heavy Equipment	195	Growing
Computer Literacy	252	Lagging	Preventive Maintenance	191	Growing
Customer Service	182	Stable	Mechanics	175	Growing
Lifting Ability	171	Growing	Brakes	165	Stable
Management	149	Stable	HVAC	152	Stable
Operations	136	Stable	Vehicle Maintenance	145	Growing
Verbal Communication Skills	124	Lagging	Hydraulics	136	Growing
Good Driving Record	109	Growing	Electrical Systems	135	Growing
Problem Solving	99	Growing	Suspension (Vehicle)	122	Stable

---

[5] *"What are Lightcast Skill Projects", Lightcast Knowledge base, https://kb.lightcast.io/en/articles/8496296-what-are-lightcast-skill-projections*

Computer Skills	Total Postings	Skill Growth Relative to Market
Inventory Control Systems	34	Growing
Microsoft Office	33	Growing
Microsoft Excel	32	Growing
Disassembler	18	Growing
Microsoft Outlook	18	Rapidly Growing
Microsoft Word	14	Stable
SAP Applications	13	Rapidly Growing
Apple IOS	11	Growing
Fleet Maintenance Software	10	Growing
Software Systems	9	Growing

SOURCE: LIGHTCAST 2023.4

Exhibit 8 includes the minimum educational requirements from job postings for this occupational group with high school diploma or equivalent (93%) significantly more than associate degree (4%) or bachelor's degree (3%).
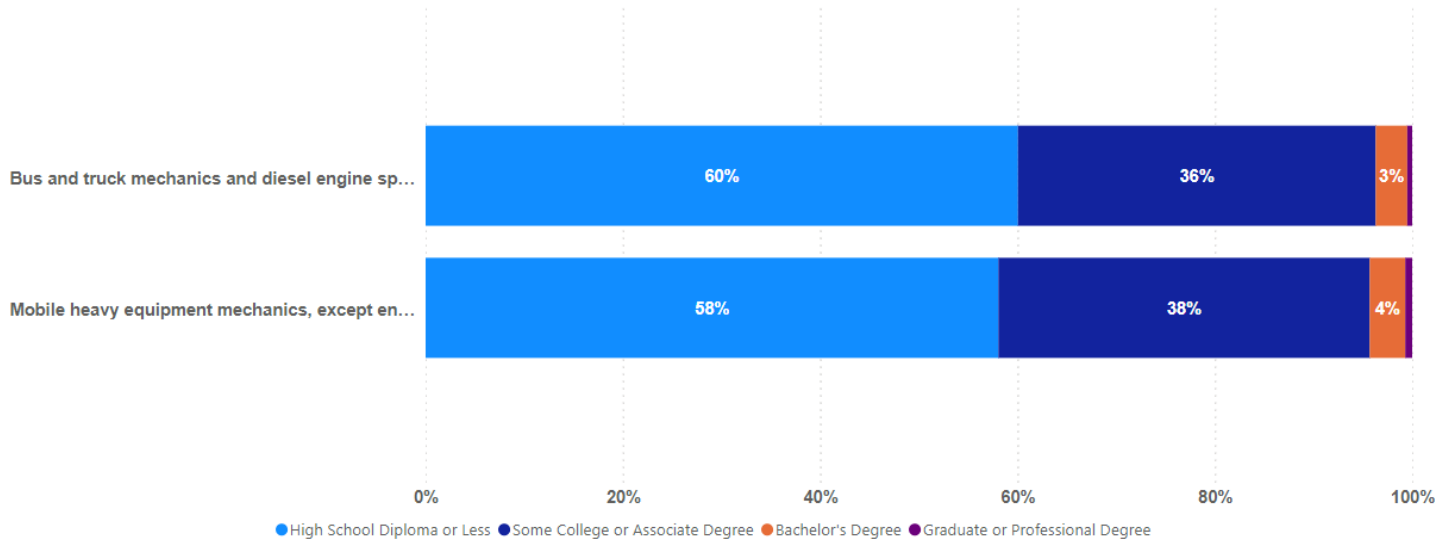
Exhibit 8 Minimum educational requirements in job postings for this occupational group, 2022
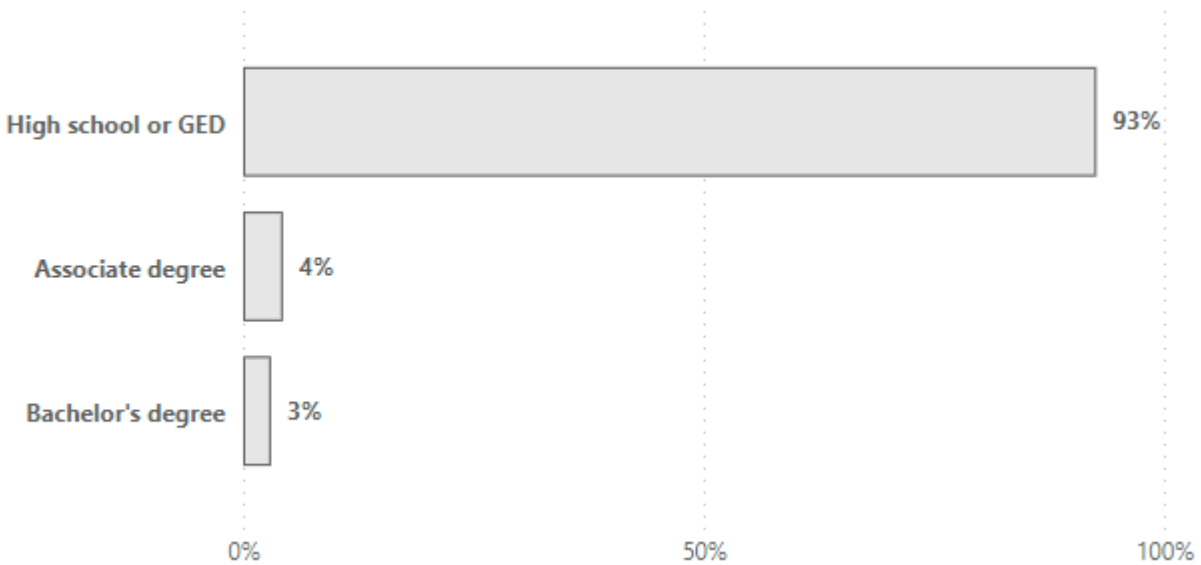
SOURCE: LIGHTCAST 2023.4

For the middle-skill occupations, the Bureau of Labor Statistics (BLS) education attainment data in Exhibit 9 for current professionals in the occupations of interest indicates that between 36% and 38% of workers have completed some college or an associate degree as their highest level of education.

Exhibit 9 National-level Education Attainment for Occupations

Bus and truck mechanics and diesel engine sp...: 60% | 36% | 3%

Mobile heavy equipment mechanics, except en...: 58% | 38% | 4%

● High School Diploma or Less ● Some College or Associate Degree ● Bachelor's Degree ● Graduate or Professional Degree

SOURCE: BLS 2021

Exhibit 10 displays the work experience typically required from employer job ads for this occupational group. The plurality (44%) of employers listing minimum experience requirements sought candidates with 2 – 3 years of previous work experience.

Exhibit 10 Work experience requirements, IE/D May '23 to April '24

0 - 1 Years: 24%
2 - 3 Years: 44%
4 - 6 Years: 33%
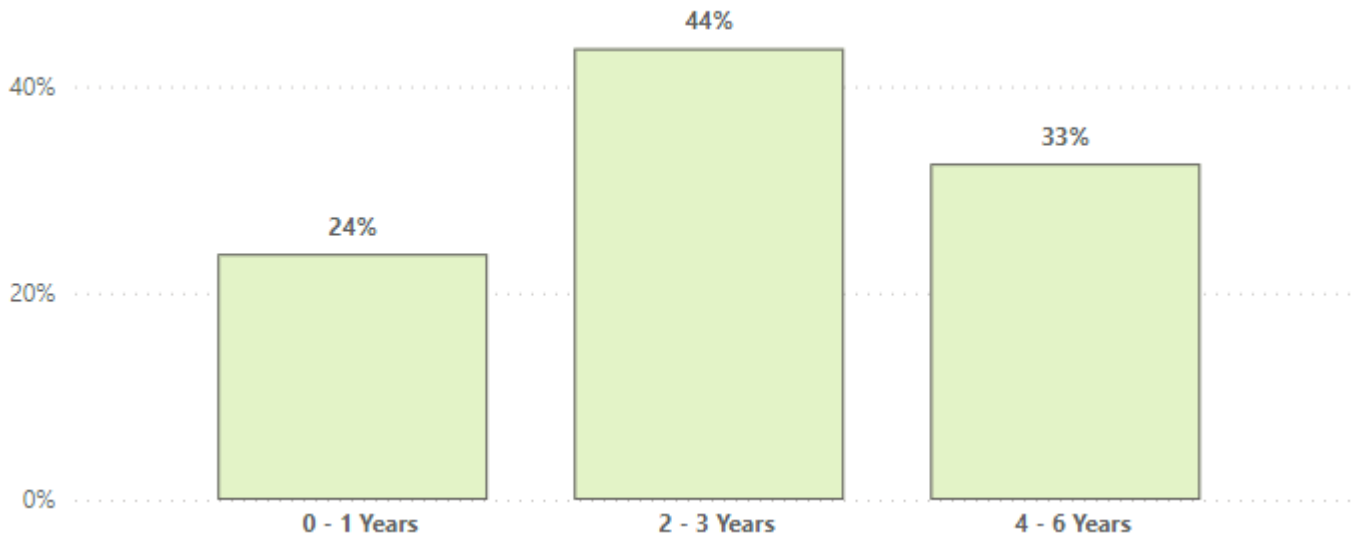
SOURCE: LIGHTCAST 2023.4

Student Completions and Program Outcomes

Exhibit 11 displays student completions for the Diesel Technology (TOP 0947.00) programs over the last three academic years (2019-2022). In the previous three academic years, three regional community colleges issued an average of 42 awards in relevant programs.

Exhibit 11 Annual average community college awards for Diesel Technology (TOP 0947.00)

Top Code	Program	College	2020-2021 Awards	2022-2023 Awards	2021-2022 Awards	3-Year Award Average
0947.00	Diesel Technology	Barstow	8	8	7	8
0947.00	Diesel Technology	San Bernardino	8	12	39	20
0947.50	Truck and Bus Driving	Victor Valley	0	44	0	15
Total			**16**	**64**	**46**	**42**

SOURCE: MIS DATA MART

Non-Community College Supply

Award completion data is available for Diesel Mechanics Technology/Technician (47.0605) in the IE/D for non-community college programs.

In the previous three academic years, one regional non-community colleges institution issued an average of 85 awards in relevant programs.

CIP	CIP with Title	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
47.0605	47.0605 - Diesel Mechanics Technology/Technician	Universal Technical Institute of California Inc	77	85	94	85
Total			**77**	**85**	**94**	**85**

SOURCE: IPEDS

California program outcome data may provide useful insight into the likelihood of success for the proposed program. Community college student outcome information based on the selected TOP code and region is provided in Exhibit 12.

Exhibit 12 Diesel Technology strong workforce program outcomes, IE/D, most recent academic year

Program metric title	Inland Empire/Desert	Statewide
Attained a living wage (completers and skills-builders)	70%	73%
Completed 9+ career education units in one year	45%	52%
Job closely related to the field of study	83%	79%
Median annual earnings (all exiters)	$43,772	$46,428
Median change in earnings (all exiters)	0%	0%
Students who attained a noncredit workforce milestone in a year		0%
Students who earned a degree, certificate, or attained apprenticeship	16	104
Unduplicated count of enrolled students	99	1,050

SOURCE: LAUNCHBOARD

Building an Inclusive Economy

This section examines demographic data for IE/D community college students in Diesel Technology programs compared to the IE/D population. We also include demographics for related occupation data for the two occupations related to engine and generator technology. This analysis can be used to:

- Understand the community college system's current or potential role supporting a diverse talent pipeline into the occupations of interest.
- Inform students (and the faculty and staff working with them) the extent to which individuals from similar demographic groups are over or underrepresented in the professions related to their field of study.
- Inform employers of the diverse talent pipeline coming from the community college system for the occupations analyzed.

Notably, 79% of students enrolled in Diesel Technology programs are Hispanic or Latino, which is significantly higher than Hispanic or Latino workers in occupations related to engine and generator technology in the IE/D region (49%). Additionally, 41% of the IE/D population that are employed in occupations related to engine and generator technology are White, which is significantly higher than both IE/D community college students (21%) and IE/D population (28%).

Exhibit 13 Program and County Demographics by Ethnicity
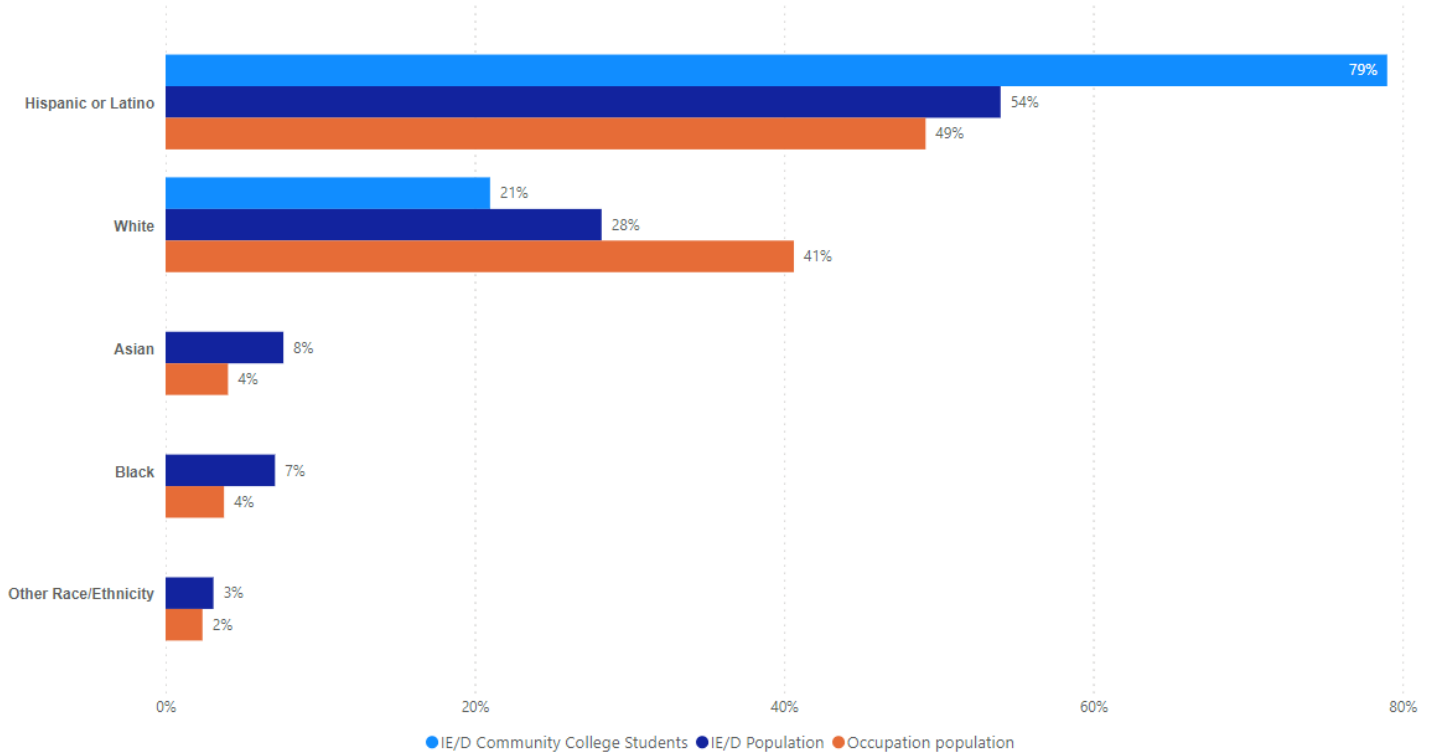
SOURCE: LIGHTCAST 2023.4 AND LAUNCHBOARD

Most IE/D professionals in engine and generator technology occupations are Hispanic or Latino (49%), mid career (35 - 54) (45%), and Male (98%). Most community college students in related programs are Hispanic or Latino (79%), pre-career/college (49%), and Male (100%). Major takeaways:

- Community colleges are an important talent source for employers committed to greater racial/ethnic diversity, especially Hispanic/Latino professionals.
- College programs may want to consider strategies to engage more women into these programs.

Exhibit 14 compares the age of IE/D community college students enrolled in Diesel Technology programs compared to the IE/D population.

Most students enrolled in Diesel Technology programs are either in the pre-career/college category (49%) or early career category (40%) as compared to IE/D population and workforce in these two occupations related to engine and generator technology. These programs are an important entry point for young engine and generator technology professionals.

Exhibit 14 Program and County Demographics by Age
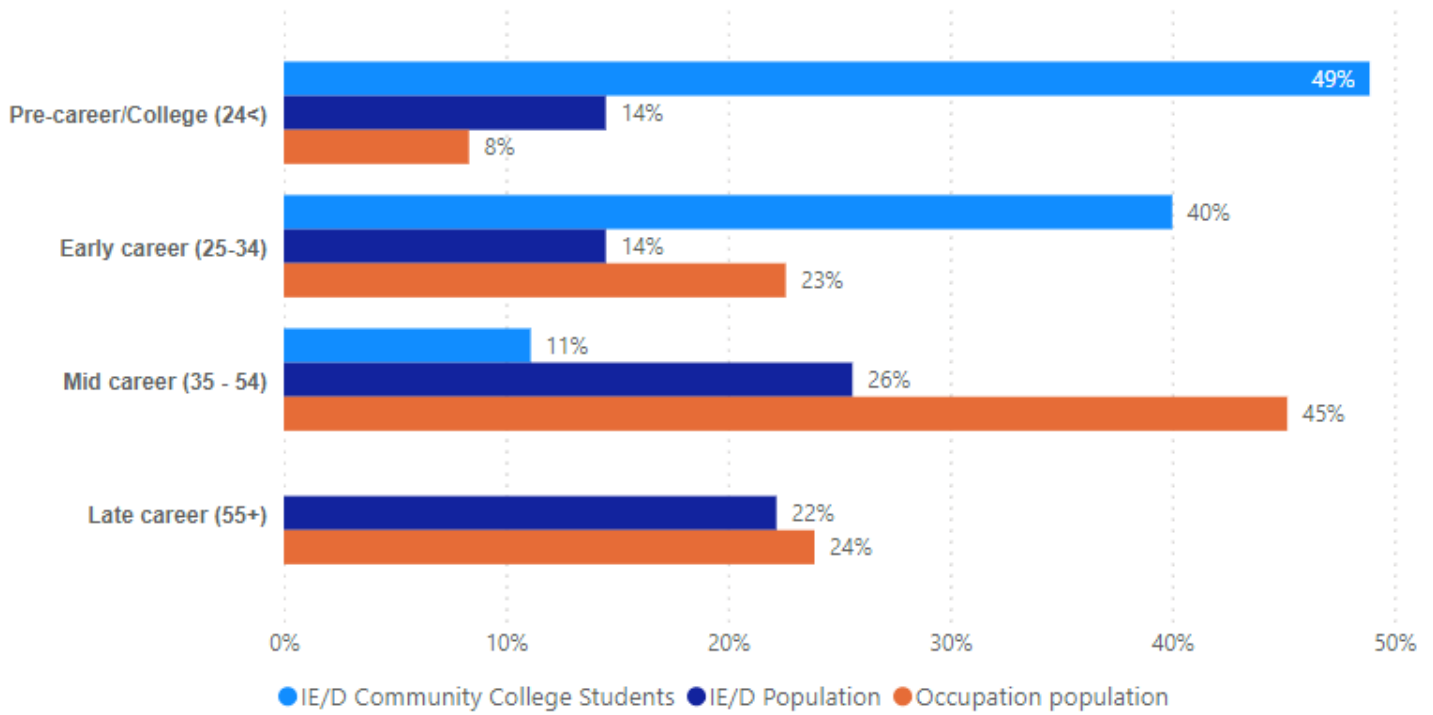
Exhibit 15 compares the gender of IE/D County community college students enrolled in Diesel Technology programs compared to the IE/D population. We also include demographics for related occupation data for the two occupations related to engine and generator technology to identify potential diversity and equity issues addressable by community college programs.

Exhibit 15 Program and County Demographics by Gender
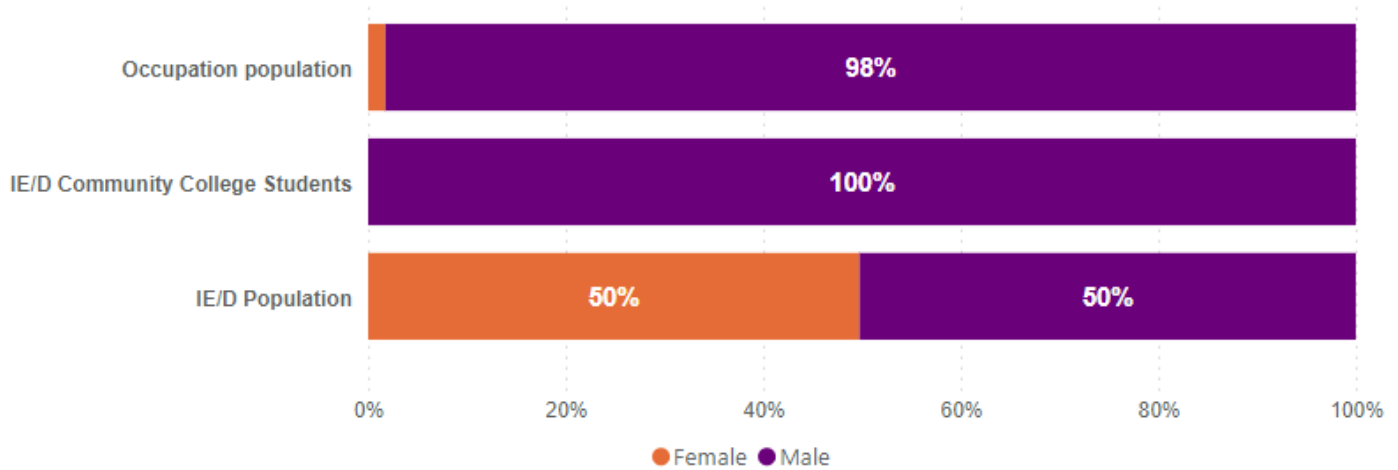
Appendix: Methodology

Exhibit 11 displays the average annual California Community College (CCC) awards conferred during the three academic years between 2020 and 2023 from the California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart. Awards are the combined total during the timeframe, divided by three in this case to calculate an annual average. This is done to minimize the effect of atypical variations that might be present in a single year.

Community college student outcome information is from LaunchBoard and based on the selected TOP code and region. These metrics are based on records submitted to the California Community Colleges Chancellor's Office Management Information Systems (MIS) by community colleges, which come from self-reported student information from CCC Apply and the National Student Clearinghouse. Employment and earnings metrics are sourced from California's Employment Development Department's Unemployment Insurance database. When available, outcomes for completers are reported to demonstrate the impact that earning a degree or certificate can have on employment and earnings. For more information on the types of students included for each metric, please see the web link for LaunchBoard's Strong Workforce Program Metrics Data Element Dictionary in the References section (LaunchBoard, 2023a). Finally, employment in a job closely related to the field of study comes from self-reported student responses on the CTE Employment Outcomes Survey (CTEOS) administered by Santa Rosa Junior College (LaunchBoard, 2023a).

Appendix: References

Type of Data	Source
Occupational Projections, Wages, and Job Postings	Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment. https://lightcast.io/
Living Wage	The living wage is derived from MITs Living Wage Calculator, which measures the income necessary for an individual of family to afford basic expenses. The data assesses the cost of housing, food, childcare, health care, transportation, and taxes. For more information, see: https://livingwage.mit.edu/pages/methodology The living wage for one adult in San Bernardino County is $25.17 per hour ($52,353.60 annually). The living wage for one adult in Riverside County is $26.30 per hour ($54,704 annually). The average living wage to represent Inland Empire/Desert is $25.74 per hour (53,539.20 annually)
Typical Education and Training Requirements, and Educational Attainment	The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. BLS uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data. For more information, see https://www.bls.gov/emp/documentation/education/tech.htm
Educational Supply	The CCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: https://datamart.cccco.edu The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions
Student Metrics and Demographics	LaunchBoard, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: https://www.calpassplus.org/LaunchBoard/Home.aspx