



# Alternative Fuels and Advanced Transportation Technology

## *Advanced Transportation*

June 2018

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### Research Summary

The Los Angeles/Orange County Center of Excellence (COE) compiled this report to provide regional labor market supply and demand data related to **alternative fuels and advanced transportation technology**.

The following summarizes key findings from this brief:

- The number of jobs for alternative fuels and advanced transportation technology-related occupations are expected to **increase by 3%** through 2022, resulting in nearly 2,700 annual job openings.
- One of the occupations studied in this report has entry-level hourly wages **below** the MIT Living Wage<sup>1</sup> estimate for the county – \$ 13.54 per hour for a single adult.
- In 2017, there were **2,523 employer job ads** for occupations identified as the most relevant.
- Of the job postings that posted a minimum education requirement, 97% listed high school or vocational training. However, between 33% and 35% of the current workforce has some postsecondary coursework and/or training.
- Between 2014 and 2017, community colleges in the county conferred an average of 815 awards (associate degrees and certificates) in a related training program.

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<sup>1</sup> MIT Living Wage Calculator. <http://livingwage.mit.edu/>

## Occupation Codes and Descriptions

Currently, there is one existing occupation in the standard occupational classification (SOC) system, and two emerging occupations in the O\*NET database of occupational information directly related to alternative fuels and advanced transportation technology. The occupation titles and descriptions, as well as reported job titles are included in Exhibit 1.<sup>2</sup>

**Exhibit 1 – Occupations, descriptions and sample job titles**

| SOC Code   | Title   | Description  | Sample of Reported Job Titles   |
|------------|---|--|---|
| 49-3023.01 | Automotive Master Mechanics                           | Plan, direct, or coordinate activities of an organization or department that serves food and beverages. Repair automobiles, trucks, buses, and other vehicles. Master mechanics repair virtually any part on the vehicle or specialize in the transmission system. | Auto Technician, Automobile Technician, Automotive Service Technician, Automotive Technician, Certified Automotive Service Excellence Master Automotive Technician, Master Automotive Technician, Master Technician, Mechanic, Shop Foreman, Truck Technician |
| 49-3023.02 | Automotive Specialty Technicians                      | Repair only one system or component on a vehicle, such as brakes, suspension, or radiator.   | Air Conditioning Technician, Automobile Mechanic, Automobile Technician, Automotive Technician, Drivability Technician, Heavy Line Technician, Lube Technician, Oil Bay Technician, Quick Service Technician, Service Technician                              |
| 49-3031    | Bus and Truck Mechanics and Diesel Engine Specialists | Diagnose, adjust, repair, or overhaul buses and trucks, or maintain and repair any type of diesel engines. Includes mechanics working primarily with automobile or marine diesel engines.  | Bus Mechanic, Diesel Mechanic, Diesel Technician, Fleet Mechanic, General Repair Mechanic, Mechanic, Service Technician, Trailer Mechanic, Transit Mechanic, Truck Mechanic   |

Source: O\*NET Online

<sup>2</sup> New and emerging occupations (N&E) are incorporated into the O\*NET-SOC classification system based on the evolving nature of workforce requirements stemming from changes in technology, society, law, and business practices. Incorporating N&E occupations into the O\*NET system makes O\*NET information more beneficial and responsive. <https://www.onetcenter.org/reports/NewEmerging.html>

## Current and Future Employment

In Los Angeles County, the number of jobs for occupations related alternative fuels and advanced transportation technology is expected to increase by 3% over the next five years. Nearly 2,700 job opportunities will be available annually for this group of occupations through 2022 due to new job growth and replacement need (e.g., retirements). Exhibit 2 contains detailed employment projections data for these occupations.

**Exhibit 2 – Five-year projections for alternative fuels and advanced transportation technology-related occupations**

| SOC     | Occupation  | 2017 Jobs     | 2022 Jobs     | 2017 - 2022 Change | 2017 - 2022 % Change | Annual Openings |
|---------|---|---------------|---------------|--------------------|----------------------|-----------------|
| 49-3023 | Automotive Service Technicians and Mechanics          | 22,013        | 22,252        | 239                | 1%                   | 2,084           |
| 49-3031 | Bus and Truck Mechanics and Diesel Engine Specialists | 5,638         | 6,094         | 456                | 8%                   | 605             |
|         | <b>Total</b>  | <b>27,651</b> | <b>28,346</b> | <b>695</b>         | <b>3%</b>            | <b>2,689</b>    |

Source: Economic Modeling Specialists International (EMSI)

## Earnings

In Los Angeles County, the average entry-level wage for the occupations in this report are between \$10.74 and \$14.13 per hour. The entry-level wage for both occupations are below the MIT Living Wage estimate of \$13.54 per hour for a single adult. The average annual earnings for this occupation group in the region is between \$38,268 and \$52,185 per year, assuming full-time employment.

Exhibit 3 contains hourly wages and annual average earnings for these occupations. Entry-level hourly earnings is represented by the 10<sup>th</sup> percentile of wages, median hourly earnings is represented by the 50<sup>th</sup> percentile of wages, and experienced hourly earnings is represented by the 90<sup>th</sup> percentile of wages, demonstrating various levels of employment.

**Exhibit 3 – Earnings for alternative fuels and advanced transportation technology-related occupations**

| SOC     | Occupation  | Entry-Level Hourly Earnings | Median Hourly Earnings | Experienced Hourly Earnings | Average Annual Earnings |
|---------|---|-----------------------------|------------------------|-----------------------------|-------------------------|
| 49-3031 | Bus and Truck Mechanics and Diesel Engine Specialists | \$14.13                     | \$25.92                | \$35.65                     | \$52,185                |
| 49-3023 | Automotive Service Technicians and Mechanics          | \$10.74                     | \$16.18                | \$29.71                     | \$38,268                |

Source: Economic Modeling Specialists International (EMSI)

## Employer Job Postings

In this research brief, real-time labor market information is used to provide a more nuanced view of the current job market, as it captures job advertisements for occupations relevant to the field of study. Employer job postings are consulted to understand who is employing workers in the field of alternative fuels and advanced transportation technology, and what they are looking for in potential candidates. To identify job postings related to alternative fuels and advanced transportation technology, the occupation codes listed in Exhibit 1 were used.

### Top Titles

The most common job titles for occupations identified as relevant are listed in Exhibit 4. Auto technician is mentioned as the top job title, and is present in 22% of all relevant job postings (548 out of 2,523 postings).

**Exhibit 4 –Job titles (n=2,523)**

| <b>Title</b>       | <b>Job Postings,<br/>Full Year 2017</b> |
|--------------------|---|
| Auto Technician    | 548                                     |
| Mechanic           | 246                                     |
| Diesel Mechanic    | 193                                     |
| Service Technician | 107                                     |
| Truck Mechanic     | 105                                     |
| Technician         | 103                                     |
| Auto Mechanic      | 91                                      |
| Diesel Technician  | 89                                      |
| Fleet Mechanic     | 55                                      |
| Lube Technician    | 53                                      |

Source: Labor Insight/Jobs (Burning Glass)

### Top Employers

Exhibit 5 lists the major employers hiring professionals in the field of interest. Top employers postings job ads included Pep Boys, AutoNation, and Goodyear. The top worksite cities in the region for these occupations were Los Angeles, Torrance, Long Beach, Santa Clarita, and Palmdale.

**Exhibit 5 – Top employers (n=1,914)**

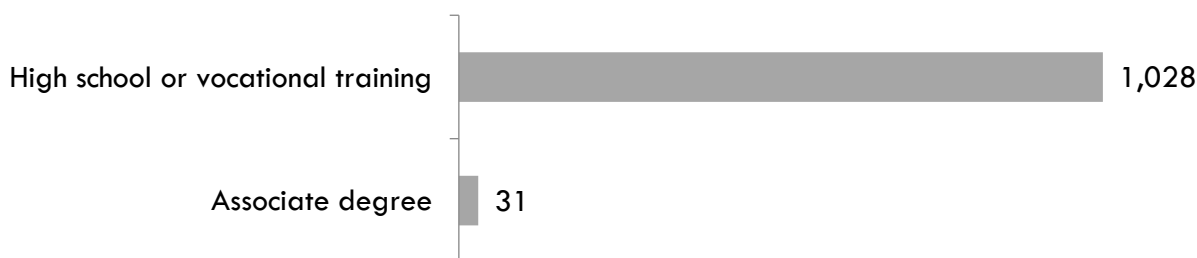
| Employer              | Job Postings, Full Year 2017 |
|-----------------------|------------------------------|
| Pep Boys              | 171                          |
| AutoNation            | 139                          |
| Goodyear              | 111                          |
| Bridgestone/Firestone | 98                           |
| Sonic Automotive      | 36                           |
| Penske                | 35                           |
| Chrysler              | 34                           |

Source: Labor Insight/Jobs (Burning Glass)

### Advertised Education Levels

Exhibit 6 displays the education level requested by employers in online job ads. The majority of employers were looking for a candidate with a high school or vocational training level of education. Approximately 58% of job postings did not specify a level of education.

**Exhibit 6 – Advertised education requirements for transportation occupations (n=1,059)**



Source: Labor Insight/Jobs (Burning Glass)

## Education and Training

Exhibit 7 shows the typical entry-level education requirement for the occupations of interest, along with the typical on-the-job training, and percentage of workers in the field who hold a community college award or have completed some postsecondary courses. Between 33% and 35% of the workforce in alternative fuels and advanced technology occupations have completed some community college education as their highest level of education.

**Exhibit 7 – Education and training requirements**

| SOC     | Occupation  | Typical entry-level education | Typical on-the-job training | % of Community College Award Holders or Some Postsecondary Coursework |
|---------|---|-------------------------------|-----------------------------|---|
| 49-3023 | Automotive Service Technicians and Mechanics          | Postsecondary nondegree award | Short-term                  | 33%   |
| 49-3031 | Bus and Truck Mechanics and Diesel Engine Specialists | HS diploma/equivalent         | Long-term                   | 35%   |

Source: Economic Modeling Specialists International, Bureau of Labor Statistics Employment Projections (Educational Attainment)

In Los Angeles County, 10 community college have conferred awards in programs that have historically trained students for the occupations of interest. Between 2014 and 2017, there was an average of 815 community college awards conferred annually across the three programs listed below. It is important to note that an award is not equivalent to a single person in search of a job opening, since a student may earn more than one award (e.g. an associate degree and a certificate).

**Exhibit 8 – CCC Student Awards (by TOP and College)**

| TOP Code | Program               | College    | 2014-15 Awards | 2015-16 Awards | 2016-17 Awards | Total Average CC Awards |
|----------|-----------------------|------------|----------------|----------------|----------------|-------------------------|
| 0947.00  | Diesel Technology     | Citrus     | 8              | 3              | 1              | 4                       |
|          |                       | LA Trade   | 49             | 44             | 61             | 51                      |
|          |                       | Long Beach | 2              | 3              | N/A            | 3                       |
| 0948.00  | Automotive Technology | Cerritos   | 35             | 37             | 52             | 41                      |
|          |                       | Citrus     | 120            | 69             | 81             | 90                      |
|          |                       | Compton    | 3              | 26             | 25             | 18                      |
|          |                       | East LA    | 29             | 70             | 53             | 51                      |
|          |                       | El Camino  | 26             | 45             | 60             | 44                      |
|          |                       | LA Pierce  | 115            | 138            | 96             | 116                     |
|          |                       | LA Trade   | 261            | 220            | 235            | 239                     |

|         |  |              |            |            |            |            |
|---------|--|--------------|------------|------------|------------|------------|
|         |  | Long Beach   | 5          | 3          | N/A        | 4          |
|         |  | Pasadena     | 85         | 24         | 46         | 52         |
|         |  | Rio Hondo    | 31         | 151        | 38         | 73         |
| 0948.40 | Alternative Fuels and Advanced Transportation Technology | Cerritos     | N/A        | N/A        | 1          | 1          |
|         |  | LA Trade     | 15         | 9          | 11         | 12         |
|         |  | Long Beach   | 12         | 21         | N/A        | 17         |
|         |  | Rio Hondo    | 6          | 6          | 14         | 9          |
|         |  | <b>Total</b> | <b>802</b> | <b>869</b> | <b>774</b> | <b>815</b> |

Source: California Community Colleges Chancellor's Office MIS Data Mart

### Student Outcomes

The CTE LaunchBoard provides student outcome data on the effectiveness of CTE programs. The following student outcome information was collected from exiters of the Diesel Technology Taxonomy of Program (TOP) code (0947.00) in Los Angeles County.

- The median earnings in the second fiscal quarter after program completion is \$7,649
- 50% of students are earning a living wage
- 70% of students are employed within six months after completing a program

#### Automotive Technology Taxonomy of Program (TOP) code (0948.00)

- The median annual wage after program completion is \$22,550
- 37% of students are earning a living wage
- 69% of students are employed within six months after completing a program

#### Alternative Fuels and Advanced Technology Taxonomy of Program (TOP) code (0948.40)

- Median earnings in the second fiscal quarter after exit: \$10,352
- 29% of students are earning a living wage
- 53% of students are employed within six months after completing a program

Source: CTE LaunchBoard

## Sources

O\*Net Online, Labor Insight/Jobs (Burning Glass), Economic Modeling Specialists International (EMSI), MIT Living Wage Calculator, Bureau of Labor Statistics (BLS) Education Attainment, California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart, CTE LaunchBoard, and Statewide CTE Outcomes Survey.

## Notes

Data included in this analysis represents the labor market demand for positions most closely related to alternative fuels and advanced transportation technology. Standard occupational classification (SOC) codes were chosen based on the national education level required for employment (associate degree and postsecondary certificate) as well as the proportion of current workers who hold a community college award or have had some community college training. This selection process narrows the labor market analysis to the most relevant employment opportunities for students with community college education and/or training.

Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study and should not be used to establish current job openings, because the numbers may include duplicate job postings or postings intended to gather a pool of applicants. Real-time labor market information can signal demand and show what employers are looking for in potential employees, but is not a perfect measure of the quantity of open positions.