

# SECTOR PROFILE

## Advanced Transportation Pathways & Occupations



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San Francisco Bay Center of Excellence for Labor Market Research



## Introduction

To support the planning and development of career education (CE) programs and to inform information about different sector pathways within the Bay Area, the San Francisco Bay Center of Excellence (COE) for Labor Market Research developed a series of sector profiles highlighting trends in the labor market and postsecondary education and training programs that fall within each sector. These profiles highlight jobs that fall below, within, and above middle skill jobs. Middle skill jobs are those that typically require training beyond a high school diploma, but less than a bachelor's degree. These occupations are a critical component of the labor workforce and support the economic vitality of the Bay Area.

The Advanced Transportation profile summarizes key findings on current and projected workforce demand, hourly wages for occupations within the sector by career pathway, and program information from community colleges in the region that offer training programs in Advanced Transportation.

### What Pathways Make Up the Advanced Transportation Sector?

This profile provides a snapshot of the labor market for Advanced Transportation and focuses on one career pathway within the sector. The labor market data presented in this profile includes in-demand occupations by this pathway that have related education and training programs offered at community colleges across the Bay Area.

There is one Advanced Transportation career pathway below that offers a range of opportunities for employment and advancement across skill levels.

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#### ADVANCED TRANSPORTATION CAREER PATHWAYS

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- 1 Transportation Equipment and Repair
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## Quick Facts About Advanced Transportation in the Bay Area

Quick facts related to the Advanced Transportation Sector below feature labor market projections between 2021-2026 in the Bay Area, and community college program information for program years 2018-19 to 2020-21.

The Advanced Transportation sector accounted for over 40,000 jobs in the Bay Region in 2021. Between 2021 and 2026, these jobs are projected to grow by 7% with 4,505 projected annual job openings.

Advanced Transportation programs are offered at 16 community colleges in the Bay Area. Nearly 4,000 students enrolled in Advanced Transportation programs each year at a Bay Region community college during program years 2018-19 to 2020-21, and 826 students completed a degree or certificate, on average. As for demographics, approximately 32% of students who enrolled between program years 2018-19 to 2020-21 were 20 to 24 years old. Males were predominantly represented among students who enrolled in Advanced Transportation programs (89%), as well as students who identify as Hispanic (45%) or White (21%).

### Bay Area Quick Facts



**40,470**

Number of Jobs  
in 2021



**7%**

5-year  
Projected Job Growth



**4,505**

5-year  
Projected Annual Openings



**16**

Community Colleges (CC)  
Offering Advanced Transportation  
Programs



**3,965**

Students Enrolled in  
CC Advanced Transportation  
Programs  
(2018-19 to 2020-21)



**826**

CC Degrees/Certificates Awarded on  
Average in Advanced Transportation  
(2018-19 to 2020-21)

### Local Employers



- Bridgestone Corporation
- Tesla
- Lucid Motors
- CarMax
- UPS
- Caliber Collision
- Penske Automotive Group
- Transdev
- Carvana
- Amerit Fleet Solutions

# Projected Employment for the Advanced Transportation Sector

## Industry Employment Demand for Advanced Transportation

The Advanced Transportation sector includes sub-sectors and industries grouped under North American Industry Classification System (NAICS) codes 42, 48, 49, 54, and 81, which is used to organize and categorize industries in the job market for the sector. A single two-digit NAICS code, for example, may represent several sub-sector and industry groups within the sector.

Overall, employment demand in the Advanced Transportation sector is projected to grow in the Bay Region over the next several years (2021-2026) by 10% (Table 1). Approximately 172,431 workers in the Bay Region were employed in Advanced Transportation industries in 2021, and this number is projected to increase to 189,997 workers by 2026.

**Table 1: Projected Industry Demand for Advanced Transportation**

2021 JOBS	2026 JOBS	JOB CHANGE	% CHANGE
172,431	189,997	17,566	10%

Source: Lightcast, Projected Demand for Advanced Transportation, 2021-2026 [2023.1].

## Occupational Demand for Advanced Transportation by Career Pathway

Examining demand for Advanced Transportation by career pathway, Table 2 summarizes the number of workers employed in the pathway in 2021 and the total number of openings projected between 2021-2026. The Transportation Equipment and Repair career pathway employed 40,470 workers in 2021, and is projected to have 22,513 job openings between 2021-2026.

**Table 2: Number of Jobs and Total Openings for Advanced Transportation by Career Pathway (2021-2026)**

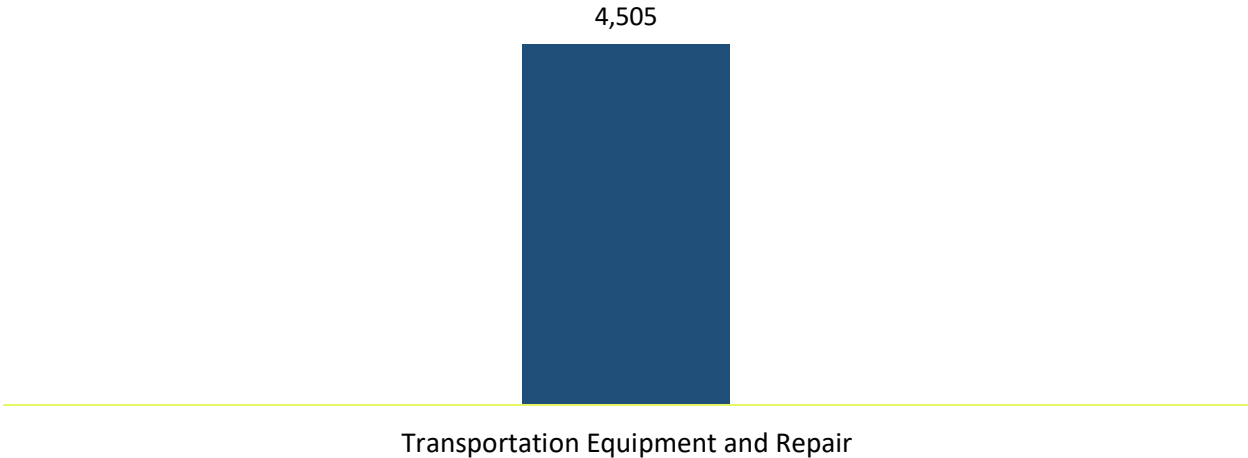
PATHWAY	2021 JOBS	2021 - 2026 OPENINGS*
Transportation Equipment and Repair	40,470	22,513

Source: Lightcast, Projected Number of Jobs and Total Openings for Advanced Transportation, 2021-2026 [2023.1].

\*2021-2026 Openings are new job openings and replacement job openings. Replacement openings are created as workers switch jobs, retire or leave for other reasons.

In terms of annual openings, Figure 1 presents projected average annual openings for the career pathway in Advanced Transportation. More than 4,505 annual openings are projected for occupations in the Transportation Equipment and Repair pathway between 2021 and 2026.

**Figure 1: Annual Job Openings for Advanced Transportation by Career Pathway (2021-2026)**



Source: Lightcast, Projected Demand for Advanced Transportation, 2021-2026 [2023.1].



## Advanced Transportation Occupations and Skill Level by Career Pathway

When examining specific occupations in the Advanced Transportation sector, Table 3 below presents data on employment and projected demand by occupation by career pathway and skill level. The Transportation Equipment and Repair pathway is made up of 10 occupations. Please note that the figures in Table 3 are calculated across regional data and totals may be subject to rounding error.

### SKILL LEVEL LEGEND

• = Below Middle Skill   • • = Middle Skill   • • • = Above Middle Skill

**Table 3: Projected Demand for Advanced Transportation Occupations by Career Pathway (2021-2026)**

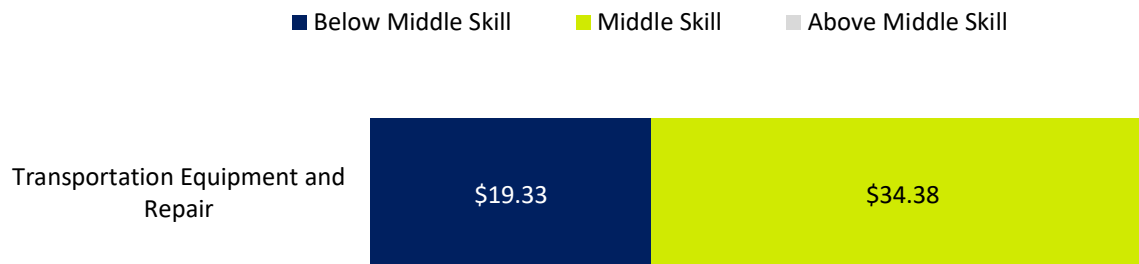
Skill Level	Occupation	Annual Openings	2021 Jobs	5-Yr Change	5-Yr % Change	5-Yr Replacement Jobs	Replacements as % of Openings
<b>TRANSPORTATION EQUIPMENT AND REPAIR PATHWAY</b>							
•	Tire Repairers and Changers	225	1,967	-55	-4%	1,082	96%
•	Bicycle Repairers	95	768	29	4%	437	91%
•	Automotive Glass Installers and Repairers	9	54	13	25%	29	62%
• •	Automotive Service Technicians and Mechanics	1,563	14,399	452	4%	7,198	92%
• •	First-Line Supervisors of Mechanics, Installers, and Repairers	1,200	10,546	868	9%	5,116	84%
• •	Bus and Truck Mechanics and Diesel Engine Specialists	406	3,587	311	9%	1,711	84%
• •	Automotive Body and Related Repairers	321	2,699	184	7%	1,343	83%
• •	Mobile Heavy Equipment Mechanics, Except Engines	319	2,773	221	9%	1,372	86%
• •	Aircraft Mechanics and Service Technicians	294	3,066	89	5%	1,228	84%
• •	Transportation Inspectors	73	611	14	5%	339	91%
<b>ADVANCED TRANSPORTATION TOTAL</b>		<b>4,505</b>	<b>40,470</b>	<b>2,126</b>	<b>7%</b>	<b>19,855</b>	<b>85%</b>

Source: Lightcast, Projected Demand for Advanced Transportation Occupations, 2021-2026 [2023.1].

## Advanced Transportation Occupational Wages by Career Pathway

In terms of wages, Figure 2 below presents the median averages for below middle skill, middle skill, and above middle skill jobs by career pathway. Table 4 summarizes wages by the 25<sup>th</sup> percentile, median and 75<sup>th</sup> percentile hourly earnings for each occupation in the Bay Region. The 25<sup>th</sup> percentile wage is used here as a proxy for entry-level earnings, while the 75<sup>th</sup> percentile represents estimated earnings for a more experienced worker in the occupation.

**Figure 2: Average Median Hourly Earnings for Career Pathways (2021-2026)**



Source: Lightcast, Projected Demand for Advanced Transportation, 2021-2026 [2023.1].

**Table 4: Hourly Earnings for Advanced Transportation Occupations by Career Pathway (2021-2026)**

SKILL LEVEL LEGEND					
•	= Below Middle Skill	• •	= Middle Skill	• • •	= Above Middle Skill
Skill Level	Occupation	25 <sup>th</sup> Pct. Hourly Earnings	Median Hourly Earnings	75 <sup>th</sup> Pct. Hourly Earnings	
<b>TRANSPORTATION EQUIPMENT AND REPAIR PATHWAY</b>					
•	Tire Repairers and Changers	\$17.32	\$19.93	\$21.58	
•	Bicycle Repairers	\$16.78	\$18.62	\$21.62	
•	Automotive Glass Installers and Repairers	\$15.95	\$19.46	\$24.57	
• •	Aircraft Mechanics and Service Technicians	\$34.20	\$39.24	\$45.01	
• •	First-Line Supervisors of Mechanics, Installers, and Repairers	\$32.01	\$41.61	\$53.63	
• •	Mobile Heavy Equipment Mechanics, Except Engines	\$27.26	\$33.67	\$40.09	
• •	Bus and Truck Mechanics and Diesel Engine Specialists	\$26.76	\$33.20	\$39.78	
• •	Transportation Inspectors	\$26.04	\$34.76	\$45.21	
• •	Automotive Body and Related Repairers	\$23.91	\$30.20	\$34.48	
• •	Automotive Service Technicians and Mechanics	\$21.39	\$28.00	\$33.84	
<b>ADVANCED TRANSPORTATION TOTAL</b>		<b>\$24.16</b>	<b>\$29.87</b>	<b>\$35.98</b>	

Source: Lightcast, 25<sup>th</sup> pct., Median, and 75<sup>th</sup> pct. Hourly Earnings for Advanced Transportation Occupations, 2021-2026 [2023.1].

## Emerging Trends in the Advanced Transportation Sector

This report outlines various emerging trends in the Advanced Transportation sector for electric vehicles (EV) and drones or unmanned aerial vehicles (UAVs).

### Electric Vehicles (EV)

The trillion-dollar global market for electric vehicles has grown exponentially over the past decade. From 2011-2022, approximately 3.3 million EVs have been sold in the United States. The California market represents approximately 42% of the total U.S. EV market. EV market share in California is just below 20% of the total CA vehicle market with over 119 light duty EV models now available to consumers (February 2023). Medium and heavy-duty vehicle models are also increasing on the road, driven by regulatory pressures to have diesel fleets electrified by 2035. These new EVs are loaded with advanced technologies and electrical systems requiring more advanced skills sets for their maintenance and repair. New career pathways are emerging to include specialists in the following areas: ADAS (advanced driver assistance systems), Infotainment, High Voltage Diagnostics, and Electrical and Body Controls. At this time, it is unclear how many of these skill sets will remain under the automotive technician umbrella and how many will become specialist positions that require more advanced degrees. However, a separate pathway for Electrical Diagnosticians is beginning to emerge at several employers, including at the heavy-duty employers, and this new pathway offers higher compensation levels.

### Drones

Drones or unmanned aerial vehicles (UAVs) are emerging to replace some manual data collection processes. Drone services include aerial imagery, inspections, surveying and mapping, volumetrics, and construction progress reporting. Drones are being used in a variety of industries, e.g., agriculture, architecture and engineering, construction, emergency and disaster services, energy and solar, real estate, and marketing. There are a number of employment positions including drone pilots/operators, drone technical support and operations, drone software engineers, software architects, drone data analysts, videographers, video editors, and marketing specialists. Employment can be within a company, part of an outside drone contractor offering drone services or as an independent drone service provider.



## Emerging Occupations in the Advanced Transportation Sector

Table 5 summarizes the unique job postings for eight emerging occupations for the 12-month period of July 2022 to June 2023. Unique job postings reflect the number of job postings that may be posted multiple times by the same company in the same region, but have been deduplicated and only counted once. An education level of Bachelor’s degree and below were used as a filter in the job postings search. Job titles are listed in rank order of most postings within the Electric Vehicles category, and then in rank order of most postings within the Drones category.

**Table 5: Job Titles and Unique Job Postings**

Job Title	Unique Job Postings
<i>Electric Vehicles</i>	
EV Infotainment Specialist	364
EV High Voltage Diagnostician and Charging Specialist	88
EV Advanced Driver Assist Systems (ADAS) Specialist	44
EV Electrical and Body Controls Specialist	24
<i>Drones</i>	
Drone Videographers/Editors	61
Drone Software Engineers/Data Analysts	29
Drone Operator/Pilot	29
Drone Technical Support and Operations	25

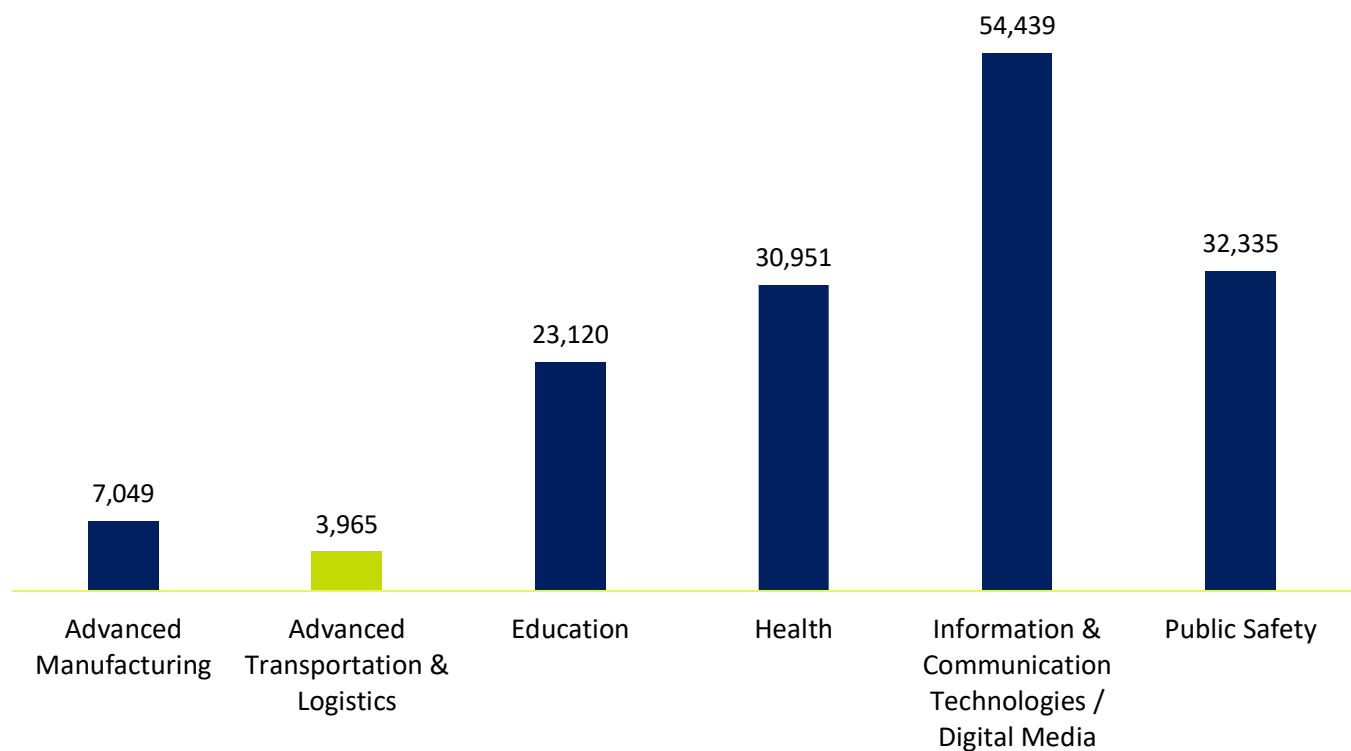
Source: Lightcast, Job Posting Analytics, 2022-2023 [2023.2].

## Advanced Transportation Community College Programs

California community colleges offer a variety of programs in Advanced Transportation, training students for career pathways in Transportation Equipment and Repair. Colleges combine classroom instruction on campus, online, and/or as external work experiences. Of the 28 community colleges in the Bay region, at least 16 colleges offer a program related to the Advanced Transportation sector.

Figure 3 shows community college pipeline students by each of the Bay region's six priority sectors. During program years (PY) 2018-19 to 2020-21, nearly 4,000 students enrolled in Advanced Transportation courses each year, on average. These numbers represent an unduplicated count of students who took any single credit course or had positive attendance hours in any noncredit course in a TOP code related to Advanced Transportation (Table 6).

**Figure 3: Community College Pipeline Students\* by Sector (3-YR Average, PY 2018-19 to PY 2020-21)**



Source: Cal-PASS Plus LaunchBoard. Program Years 2018-19 to 2020-21, Bay Area Community Colleges.

\*Community College Pipeline Students: Unduplicated count of "All students who took at least .5 units in any single credit course or who had at least 12 positive attendance hours in any noncredit course(s) on the selected TOP code in the selected year.

Nineteen (19) Taxonomy of Program (TOP) codes related to Advanced Transportation are presented in Table 6, along with the number of colleges in the region that awarded degrees and certificates in program years 2018-19 to 2020-21. Note that only data on programs are presented below, and may not include the number of students in courses offered that could be related to Advanced Transportation.

**Table 6: Advanced Transportation Programs at Community Colleges in the Bay Area (PY 2018-19 to 2020-21)**

TOP6	TOP6 Program Title	# Colleges w/Programs
094800	Automotive Technology	14
094900	Automotive Collision Repair	6
095010	Aviation Airframe Mechanics	4
095020	Aviation Powerplant Mechanics	4
094700	Diesel Technology	3
094840	Alternative Fuels and Advanced Transportation Technology	2
094750	Truck and Bus Driving	1
094830	Motorcycle, Outboard and Small Engine Repair	1
051000	Logistics and Materials Transportation	0
094720	Heavy Equipment Maintenance	0
094730	Heavy Equipment Operation	0
094740	Railroad and Light Rail Operations	0
094850	Recreational Vehicle Service	0
094910	Upholstery Repair - Automotive	0
095900	Marine Technology	0
302000	Aviation and Airport Management and Services	0
302010	Aviation and Airport Management	0
302020	Piloting	0
302030	Air Traffic Control	0

Source: CCCCO Datamart. Program Years 2018-19 to 2020-21 by TOP6 Code, Bay Area Community Colleges.

Table 7 and 8 summarize educational supply by analyzing the number of degrees awarded in related TOP and Classification of Instructional Programs (CIP) codes. According to TOP data, 826 degrees or certificates were awarded, on average, in a Bay Area community college between program years 2018-19 to 2020-21. The average number of degrees and certificates awarded in programs may include students who earned multiple degrees or certificates. According to CIP data (Table 8), non-community college institutions supply the Bay Area with 77 awards, on average, each year. Total awards for a TOP or CIP Program Title, which is the sum of all award types, may be subject to rounding error.

**Table 7: Awards for Community College Programs in the Bay Area (PY 2018-19 to 2020-21)**

TOP6	TOP6 Title	Associate Degree/ Associate for Transfer	Certificate	Credit Award	Noncredit Award	Total Awards
094700	Diesel Technology	3	30	0	0	33
094750	Truck and Bus Driving	0	17	0	0	17
094800	Automotive Technology	111	419	41	3	574
094830	Motorcycle, Outboard and Small Engine Repair	1	7	0	0	8
094840	Alternative Fuels and Advanced Transportation Technology	0	27	0	0	27
094900	Automotive Collision Repair	3	16	2	0	21
095010	Aviation Airframe Mechanics	11	54	0	1	66
095020	Aviation Powerplant Mechanics	14	66	0	0	80
<b>Total Awards</b>		<b>143</b>	<b>636</b>	<b>43</b>	<b>4</b>	<b>826</b>

Source: CCCCO Datamart. Program Years 2018-19 to 2020-21 Annual Awards, by TOP6 Code, Bay Area Community Colleges.

**Table 8: Awards for Non-Community College Programs in the Bay Area (PY 2017-18 to 2019-20)**

CIP - CIP Program Title	Associate Degree	Bachelor's Degree	Award <1 Year	Total Awards
15.0806 - Marine Engineering Technology/Technician	0	19	0	19
47.0603 - Autobody/Collision and Repair Technology/Technician	4	0	0	4
47.0604 - Automobile/Automotive Mechanics Technology/Technician	0	0	15	15
49.0205 - Truck and Bus Driver/Commercial Vehicle Operator and Instructor	0	0	38	38
52.0203 - Logistics, Materials, and Supply Chain Management	0	0	1	1
<b>Total Awards</b>	<b>4</b>	<b>19</b>	<b>54</b>	<b>77</b>

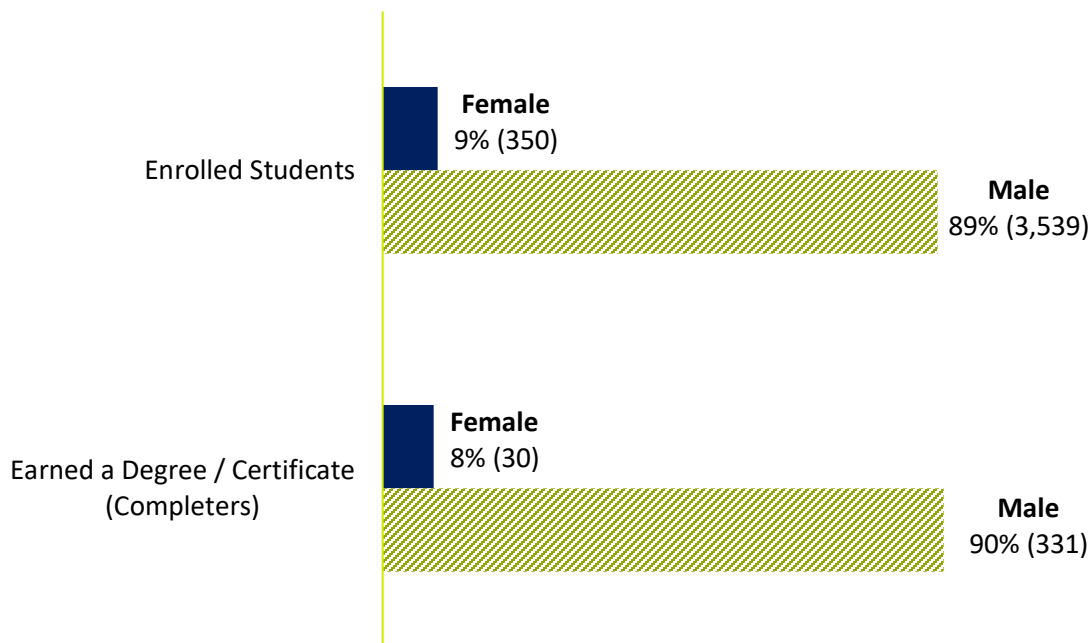
Source: Integrated Postsecondary Education Data System (IPEDS). Program Years 2017-18 to 2019-20 Annual Awards, by CIP Code, Bay Area Institutions.

## Demographic Profile of Students in Advanced Transportation Programs

This sector profile also summarizes the demographics of students who enroll and complete a degree or certificate in Advanced Transportation programs. Figures 4 through 6 below present data on students by gender, race and ethnicity, and age.

On average, more male students enroll (89%) and earn awards (90%) in Advanced Transportation programs, compared to female students (9% and 8% respectively). Students who identify as Hispanic (45%) and White (21%) comprise the two largest groups by race and ethnicity among enrolled students, while students 20 to 24 years old are the most represented age group among those who enroll and complete a program. The figures below provide greater detail on the demographic profiles of students who enrolled and earned degrees or certificates in Advanced Transportation programs in the Bay Area.

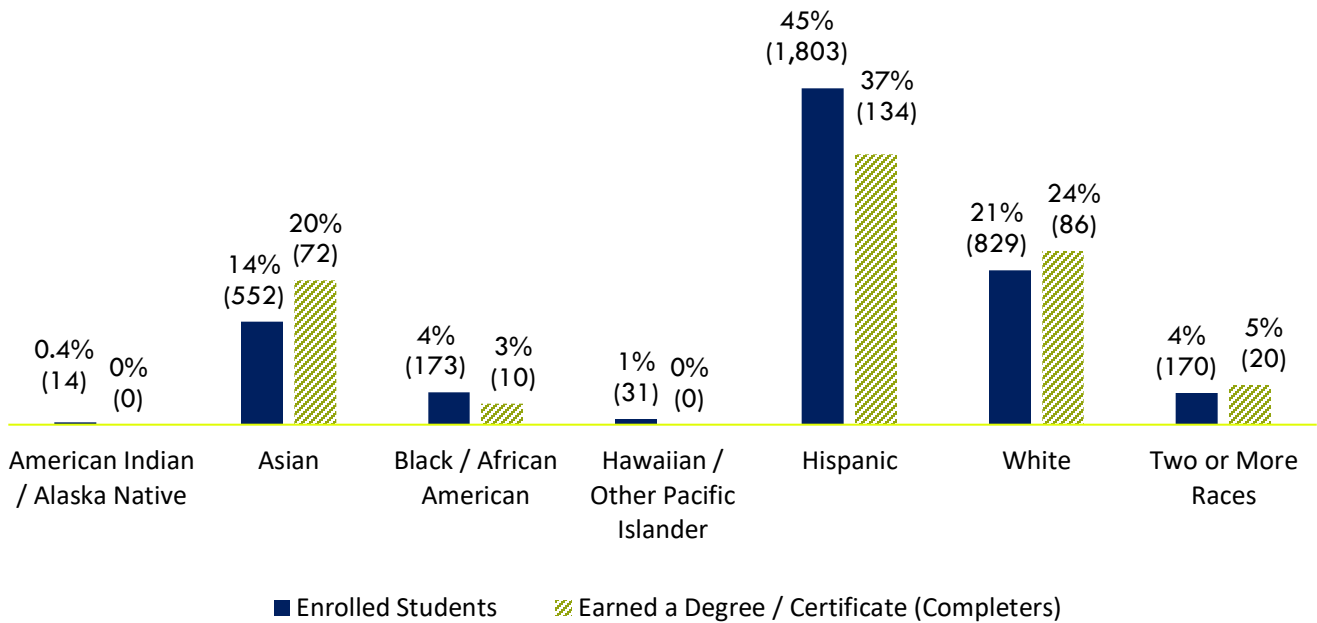
**Figure 4: Gender of Students in Advanced Transportation Programs in the Bay Area (PY 2018-19 to 2020-21)**



Note: May not total 100 percent due to non-respondent/non-binary.

Source: Cal-PASS Plus LaunchBoard. Program Years 2018-19 to 2020-21 Programs, Bay Area Community Colleges

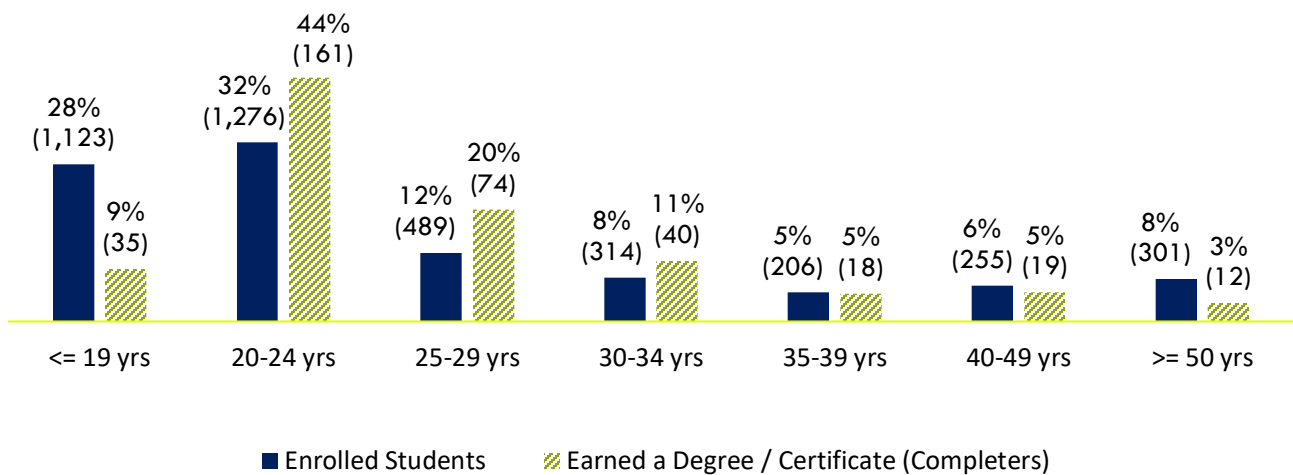
**Figure 5: Race/Ethnicity of Students in Advanced Transportation Programs in the Bay Area (PY 2018-19 to 2020-21)**



Note: May not total 100 percent due to non-respondent/unknown.

Source: Cal-PASS Plus LaunchBoard. Program Years 2018-19 to 2020-21 Programs, Bay Area Community Colleges

**Figure 6: Ages of Students in Advanced Transportation Programs in the Bay Area (PY 2018-19 to 2020-21)**



Note: May not total 100 percent due to non-respondent/unknown.

Source: Cal-PASS Plus LaunchBoard. Program Years 2018-19 to 2020-21 Programs, Bay Area Community Colleges

## Methodology

Occupations for this report were identified by use of job descriptions and skills listed in O\*Net. Labor demand data is sourced from Lightcast occupation and job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CCCCO Data Mart and CTE LaunchBoard.

## Sources

O\*Net Online

Lightcast

CTE LaunchBoard [www.calpassplus.org](http://www.calpassplus.org)

LaunchBoard

Statewide CTE Outcomes Survey

Employment Development Department Unemployment Insurance Dataset

Living Insight Center for Community Economic Development

Chancellor's Office MIS system

## Contacts

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