CENTER FOR A COMPETITIVE WORKFORCE

Opportunities in Global Commerce:
Middle-Skill Jobs at LA Basin Air and Sea Ports

C·O·E   LAEDC

Table of Contents

View this report online at CompetitiveWorkforce.LA/ports

About CCW
Center for a Competitive Workforce

CCW

The Center for a Competitive Workforce (CCW) was established in 2017 as a Strong Workforce Program regional project of the 19 community colleges in the Los Angeles region, in collaboration with the L.A./O.C. Center of Excellence for Labor Market Research (COE), hosted at Mt. San Antonio College, the Los Angeles County Economic Development Corporation (LAEDC) and its Institute for Applied Economics.

CCW is focused on institutionalizing the regular engagement of and partnerships between our 19 community colleges in the L.A. region and employers from high-growth industry sectors (i.e., those with productive advantages, deep labor concentrations and projected growth of middle skill jobs). It is through the development, institutionalization and activation of these productive partnerships and realtime feedback loops that colleges can adaptively attune their programs, courses and curricula to the workforce needs in a way that is truly responsive, demand-driven and future-forward, while also providing students with the very important real-world experiences that come from work-based learning opportunities such as internships.

CCW has published 17 regional labor market and occupational reports for L.A. and Orange County. These reports analyze labor supply and demand data for middle-skill occupations in high-growth industries to inform and influence the expansion of new or modified career education, and workforce development programs and curricula. CCW hosts regional program advisory meetings for faculty at multiple colleges with regional employers to get feedback on curriculum and training programs, and get their insights on workplace trends, new technology and the in-demand skills that will make students even more competitive for employment and work-based learning opportunities. CCW supports quarterly convenings for faculty, workforce, nonprofit, government and industry leaders in three of the L.A. region's most highly concentrated and fastest growing industry sectors—advanced transportation, bioscience and digital media/entertainment—with the co-equal goals to strengthen industry engagement with faculty, and connect students to meaningful work-based learning opportunities and employment.

This is one of the best ways to constructively prepare them for the 21st century jobs and careers, in the fast emerging and rapidly-changing knowledge-intensive industries that drive our regional economy. In partnership with the regional directors for employer engagement, CCW has hosted seven regional program advisory committee meetings to further strengthen regional alignment of, and ongoing connections between, faculty and industry. CCW has developed two online platforms: a Biosciences Industry Portal, and a regional Workforce and Education Partner Portal to increase the speed and richness of industry-college connections. The goal is to seamlessly access and deploy the economic intelligence gleaned through industry engagement, and to rapidly expand and scale the number of work-based learning and employment opportunities for career education students and graduates.

Acknowledgements

CCW Advisory Council

Salvatrice Cummo
Executive Director,
Economic and Workforce
Development
Pasadena City College

Lyla Eddington
K-14 Pathways Coordinator
Rio Hondo College

Margaret Fernandez
Strong Workforce
Coordinator
Rio Hondo College

Jennifer Galbraith
Dean, Business Division
Mt. San Antonio College

Kendra Madrid
Dean, Continuing
Education and Workforce
Development
East Los Angeles College

Freddy Saucedo
Dean (Interim)
Career Education and
Workforce Development
*Glendale Community
College*

Patricia Ramos, Ed.D.
Dean, Academic Affairs
Santa Monica College

Dr. Lucia Robles J.D., M.A.
Dean, CTE, Strong
Workforce and Workforce
Development
*Los Angeles Community
College District*

Virginia Rapp
Dean, Business Division
El Camino College

Michael Wangler
Dean of Career, Technical &
Continuing Education
Citrus College

Lynell R. Wiggins
Director of Adult
Education and Workforce
Development
Compton College

Mercy Yanez
Dean of Student Services
Los Angeles Harbor College

Richard Verches
Executive Director,
*Center for a Competitive
Workforce*

College Partners

Gene Carbonaro
Dean, Career and
Technical Education
Long Beach City College

Carmen Dones
Dean of Health Science
West L.A. College

Laurie Nalepa
Dean, Career and
Technical Education
Los Angeles Valley College

Nick Real, Ed.D.
Instructional Dean,
Technology Division
Cerritos College

**Dr. Armando Figueroa-
Rivera**
Dean of CTE and
Workforce Development
Los Angeles City College

Marla Uliana
Dean of Academic Affairs,
CTE and Workforce
Development
Los Angeles Mission College

Dr. Paul Flor
Dean of Student Learning
Compton College

Marcia Wilson
Dean, Pathway Innovation
and Institutional
Effectiveness
*Los Angeles Trade Technical
College*

Mike Slavich
Dean, Career and
Technical Education
Rio Hondo College

Mon Khat
Dean, Career Technical
Education
Los Angeles Pierce College

Rick Hodge
Dean, CTE and Workforce
Development
*Los Angeles Southwest
College*

College Leadership

Dr. Seher Awan
President
Los Angeles Southwest College

Keith Curry, Ed.D.
CEO
Compton College

Dr. Luis Dorado
Interim President
Los Angeles Harbor College

Erika Endrijonas, Ph.D.
Superintendent-President
Pasadena City College

Dr. Jose Fierro
President/Superintendent
Cerritos College

Dr. Mary Gallagher
President
Los Angeles City College

Dr. Barry Gribbons
President
Los Angeles Valley College

Dr. Kathryn E. Jeffery
Superintendent/President
Santa Monica College

Dr. Katrina VanderWoude
President
Los Angeles Trade-Technical College

James M. Limbaugh, Ph.D.
President
West Los Angeles College

Dena P. Maloney, Ed.D.
Superintendent/President
El Camino College

Alexis S. Montevirgen, Ed.D.
President
Los Angeles Pierce College

Monte E. Perez, PhD
President
Los Angeles Mission College

Geraldine M. Perri, Ph.D.
Superintendent/President
Citrus College

Teresa Dreyfus
Interim President
Rio Hondo College

Lou Anne Bynum
Superintendent-President
Long Beach City College

Dr. Alberto J. Román
President
East Los Angeles College

**Dr. William (Bill)
T. Scroggins**
President & CEO
Mt. San Antonio College

David Viar
Superintendent/President
Glendale Community College

Dr. Francisco Rodriguez
Chancellor
Los Angeles Community College District

California Community Colleges

CCW Project Leadership

Dr. Patricia Ramos *(Santa Monica College)* and **Jennifer Galbraith** *(Mt. San Antonio College)*

SANTA MONICA COLLEGE

MT. SAC
Mt. San Antonio College

Regional Directors for Employer Engagement

Ruth Amanuel
Regional Director for Employer Engagement
Global Trade - Los Angeles Region
Hosted at Long Beach City College
C:310-990-6028|O:562-938-3240
ramanuel@lbcc.edu
https://globaltradeworkforce.com/

Katie Mishler
Regional Director for Employer Engagement
Advanced Transportation & Logistics
Los Angeles County
Hosted at Cerritos College
11111 New Falcon Way
Cerritos, CA, 90703
kmishler@cerritos.edu

In this report, the Center for a Competitive Workforce:

- Analyzes the major trends occurring in LA's seaport/airport industries
- Projects regional employment in target occupations
- Identifies the jobs that have the brightest future for community college students in the region

The Los Angeles Basin's competitive and rapidly changing economic landscape has given rise to a job market in which highly specialized knowledge and skills often mean the difference between success and failure. To help meet this challenge, the Center for a Competitive Workforce (CCW) set out to study occupations within port-related transportation industries of the Los Angeles Basin, with the intention of calibrating the region's talent development system. This report is the latest in a series of reports by the Center for a Competitive Workforce, the LA/OC Center of Excellence for Labor Market Research and the Los Angeles County Economic Development Corporation.

Why Focus on Port-Related Occupations?

As a hub for international trade and tourism, the Los Angeles Basin places extreme importance on its transportation, warehousing and logistics sectors as economic drivers. The San Pedro Bay Ports, which include the Port of Los Angeles and the Port of Long Beach, contributed close to $370 billion alone in cargo value in the year of 2019. With the growth of electronic commerce and expedited shipping, transportation and logistics is only growing in importance. However, there are changes on the horizon which have the potential to transform the nature of the port-related workforce. Automation and new technologies are expected to change how ports operate and create potential pathways towards greater efficiency, safety and sustainability. Meanwhile, the aging and retiring workforce will create a high number of job openings for new entrants to the workforce. Port-related transportation industries are in a period of transition and modernization, and it is essential for the community college system to be able to provide students with the proper tools and skills to succeed in this new environment.

SUPPLY VS. DEMAND

The Center also assesses whether community college supply is meeting workforce demand. Based on regional community college completions, **a looming workforce shortage appears to exist.** There are 30,540 annual openings projected for the 11 entry-level and pathway target occupations studied for this report. However, annual community college completions in relevant programs have averaged well below this figure in recent years, leaving opportunities for new workers to fill this shortage.

OCCUPATION PROFILES

This report identifies 11 occupations, which include three entry-level occupations vulnerable to displacement in the long-term and eight middle-skill and pathway occupations for workers to target.

Vulnerable Entry-Level Port-Related Occupations

These lower-skill opportunities typically have little to no requirements for educational attainment and pay lower wages. These have the highest risk of being displaced by modernization, and workers in these occupations are recommended to consider upskilling and retraining to attain more secure jobs.

1. **Shipping, Receiving and Traffic Clerks**
2. **Crane and Tower Operators**
3. **Laborers and Freight, Stock and Material Movers, Hand**

Middle-Skill and Pathway Occupations

The Center for a Competitive Workforce also identified six middle-skill and two pathway occupations that will be attractive opportunities for community college graduates and current lower-skilled port workers to target. These occupations generally require higher than a high school education and pay above the living wage.

1. **Electricians**
2. **Industrial Machinery Mechanics**
3. **Avionics Technicians**
4. **Aircraft Mechanics and Service Technicians**
5. **Cargo and Freight Agents**
6. **Transportation Inspectors**
7. **Transportation, Storage, and Distribution Managers**
8. **Logisticians**

ADDITIONAL TRENDS

There are many developing trends in these essential occupations that will assist workers as they perform their jobs in the port-related industries. The greatest focus will again remain on technology and how it changes the scope of work for occupations in these sectors.

While many believe that automation should be used to augment human labor at the ports rather than replace it, to improve the working environment for port-related occupations and increase safety and efficiency, there are many labor-intensive operations that are expected to eventually be taken over by machines entirely, which has the potential to disrupt the workforce. As market investments into technology increase and the costs continue to decrease, robots could be seen as a more cost-effective way to perform certain operations more productively.

But this could also open up many new opportunities for the skilled workforce of the Los Angeles Basin. Technology could become a competitive advantage on the port scene, where data-minded and optimized operations are able to process more efficiently and with less error. In ports across the world, route optimization, automated terminals and cranes, energy management and capacity sensing technology are rapidly becoming the norm, and advanced data analytics is critical for streamlining the usage of resources. Accordingly, there is a potential shift from blue-collar work at the ports towards white-collar, more digitally minded occupations that can oversee automated activities rather than perform the labor themselves.

Sustainability will be essential in the transportation sector of the future. The International Maritime Organization has introduced regulation aimed at reducing carbon emissions from international shipping by at least 40% by the end of the decade, with a long-term goal of 70% in 2050. Major airlines are also adopting initiatives to operate net-zero carbon flights that can offset their jet fuel emissions, as well as reducing or eliminating single-use plastic. Many major corporations will adapt to demands for sustainability through the development and implementation of green technology as environmental demands become more pressing.
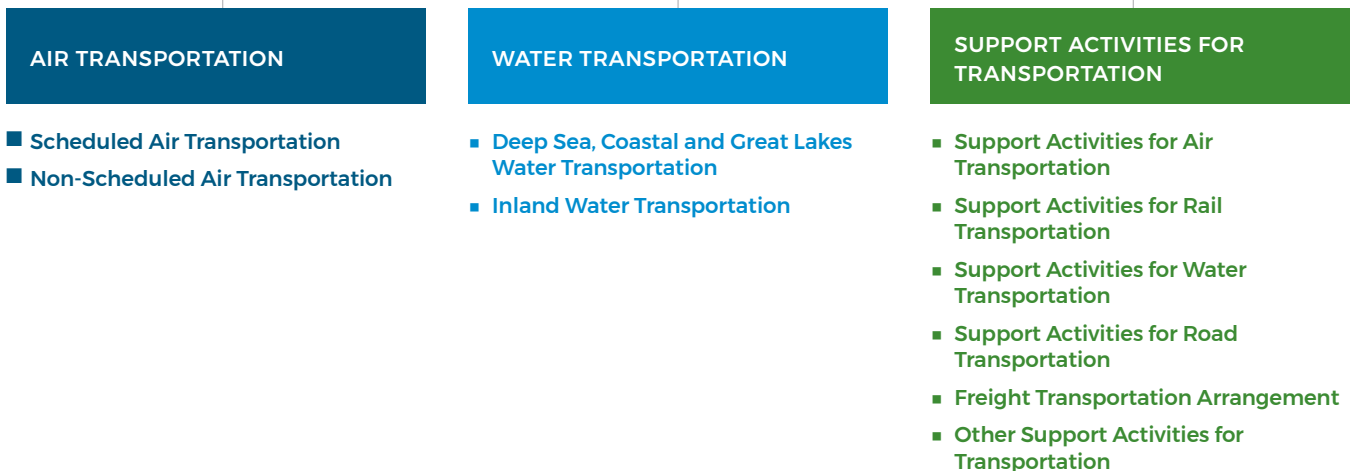
RECOMMENDATIONS

There are many ways in which policymakers, community colleges and labor associations can positively impact the future of our ports and the related family-supporting jobs that benefit our communities.

A key recommendation is to engage with industry associations and labor unions as much as possible in the coming months and years to ensure that modernization is implemented at the San Pedro Bay Ports in a manner that is beneficial for workers and employers and enhances long-term job security and market competitiveness. With a collaborative approach, these bodies can work towards establishing a sustainable adoption of automation and technology into the port environment. Strengthening the synergy between industry associations, labor unions, and community colleges can create benefits for all sides—a steady supply of workers trained in the latest trends at the ports, a globally competitive operation with the ability to process cargoes and goods efficiently and effectively, and a clean and green port complex supporting well-paying and stable jobs for the region.

As a degree of displacement is likely even in the best-case scenarios, retraining and upskilling will be key for community college programs. The introduction of technology has the potential to require and create a diversity of skills and daily task requirements among workers in the port-related industries, and the ability to oversee and interact with technology will become essential for success. Training community college students for the ports of the future, which are expected to become more digital, modern, efficient and environmentally conscious than ever before, will ensure that there is a steady supply of qualified graduates to fill positions that are increasingly demanding higher levels of proficiency.

Port-Related Industries

AIR TRANSPORTATION	WATER TRANSPORTATION	SUPPORT ACTIVITIES FOR TRANSPORTATION
■ Scheduled Air Transportation ■ Non-Scheduled Air Transportation	■ Deep Sea, Coastal and Great Lakes Water Transportation ■ Inland Water Transportation	■ Support Activities for Air Transportation ■ Support Activities for Rail Transportation ■ Support Activities for Water Transportation ■ Support Activities for Road Transportation ■ Freight Transportation Arrangement ■ Other Support Activities for Transportation

A Changing Landscape

In this report, the Center for a Competitive Workforce and the LAEDC's Institute for Applied Economics, in partnership with the region's network of community colleges and the L.A./O.C. Center of Excellence for Labor Market Research, focus on port-related transportation industries in the Los Angeles Basin.

As a hub of global trade, the Los Angeles Basin relies on its airports and seaports to ensure the efficient and timely import and export of goods across the world. Prior to the pandemic, the Los Angeles International Airport, commonly referred to as LAX, was the second busiest airport in the United States and ranked third globally for overall passenger traffic. Both the Port of Los Angeles and the Port of Long Beach ranked in the top 20 ports worldwide by volume of containers in 2019; their combined volume would have ranked tenth in the world. This places a unique regional importance on the air and seaports in the region, as well as the essential workforce that ensures their operations run smoothly.

However, the transportation and warehousing industry as a whole is evolving rapidly, and port-related industries will be among those most affected by the introduction of new technology and trends. While some occupations in the port workforce will become more obsolete, there are also certain opportunities that will become much more attractive for those with the proper qualifications. This report dives into our airports and the San Pedro Bay port complex and their labor market, to develop a greater understanding of the workforce challenges these industries will face and how the Center and regional community colleges can meet this demand by supplying technically-trained talent for this critical, high-growth industry sector, particularly in middle-skill occupations (those jobs requiring more education than a high school diploma, but less than a bachelor's degree) as the region recovers from the COVID-19 pandemic.

Enrolling more than 350,000 career education students per year, the 19 community colleges in Los Angeles County, and the additional 10 in Orange County, have adapted to this changing economic landscape by offering a wide range of short-term, industry-recognized training programs aimed at reskilling recently displaced workers to find employment and succeed in this rapidly evolving industry sector.

The Sector Defined

The port-related transportation industries identified for this report include air transportation, water transportation, and support activities for transportation.

The air transportation subsector provides air transportation of passengers and/or cargo using aircraft, such as airplanes and helicopters. Scheduled air carriers fly regular routes on regular schedules and operate even if flights are only partially loaded. Nonscheduled carriers often operate during nonpeak time slots at busy airports and provide chartered air transportation of passengers, cargo, or specialty flying services.

The water transportation subsector moves passengers and cargo using watercraft, such as ships, barges, and boats.

Both air and water transportation are supported by various activities and services which may be provided to transportation carrier establishments or to the general public. This subsector includes a wide array of establishments, including air traffic control services, marine cargo handling, navigational services, and freight transportation arrangement, also known as logistics.

The Port-Related Workforce

The total estimated economic impact of the San Pedro Bay Port Complex is 193,000 total jobs (direct, indirect, and induced) in Los Angeles and Long Beach, and just under 1 million jobs in the five-county region of Southern California — over 10% of all jobs in this region. The Port of Los Angeles alone accounted for $276 billion in cargo value during the 2019 calendar year, with top trading partners in China, Japan, and South Korea; the Port of Long Beach contributed $93 billion.

To support this system, there is a need for a diverse and skilled workforce in the Los Angeles Basin's port-related industries. But there are several workforce challenges on the horizon for the sector.

One challenge/opportunity will be the aging workforce. Over half of workers in port-related industries are over the age of 45, and 26.8% are over the age of 55, indicating that the rate of retirements from this sector is likely to rapidly rise over the next decade, creating openings for new workers. But there are many barriers to entry for potential new workers, most importantly the time necessary to earn the required certificates for employment. In the air transportation industry, maintenance technicians need over a year and a half of practical work experience to obtain certification for working on aircraft, with hundreds of hours of coursework related to airframe or powerplant technology. A growing market for commercial and jet aircraft operations has contributed to growing demand for mechanics and on-the-ground operators, but the potential supply of trained workers in this area is limited.

Similarly, airlines are struggling to find replacements for the rising number of retiring airline pilots. Finding entry-level pilots for regional markets has grown in difficulty in the past few years as experienced regional pilots leave to fill openings in the larger national airlines. With the costs of flight training often reaching over $150,000 and 1,500 flight hours required to earn an air transport pilot license, attracting and training new pilots has become increasingly difficult.

There are also questions of diversity to be addressed in these industries, particularly in the maritime subsector which has been traditionally male dominated. Although there have been higher numbers of women training in ocean and maritime programs over the past decades, their promotion to leadership roles in maritime activities has been modest. Across the three industries highlighted in this report (air transportation, water transportation, and support activities for transportation), over 63% of workers reported as male, demonstrating a clear gender imbalance.

But the central theme for this sector and its workforce will be how technology leads to changing workforce needs over the next few decades. There are many ways in which the introduction of technology is helping businesses in the transportation and warehousing industry reduce costs, and stay competitive and cutting-edge. As shipping companies are expected to deliver packages faster than ever, with greater transparency and consumer engagement, while keeping costs low, innovation has driven new technology. For example, removing the need for paper documentation when handling air cargo shipments and using electronic bills has streamlined interactions and allowed for more efficient processing by airlines before delivery.

Technology also has many roles in augmenting the routines of workers and allowing them to optimize their time. On aircraft and cargo ships, artificial intelligence and enhanced communication through the Internet of Things has radically improved predictive maintenance, allowing mechanics and operators to monitor for issues before they happen and reduce both labor costs and the amount of time wasted on repairs. With these advancements, performance and safety during shipping will be able to reach new heights. Even the nature of training will change; pilot training has been moving towards virtual reality often without the need for expensive flight simulator equipment.

Overall, advanced automation technology is expected to make job requirements more diverse and result in the need for a more diverse talent pool with more varied levels of skill. But there are also undertones of concern that come with the introduction of technology in the workplace at higher and higher levels. Many believe that automation should be used to augment human control and not replace it, to improve the working environment for port-related occupations and lead to better safety and job security and reduced working time and fatigue. However, there are many labor-intensive operations that are expected to eventually be taken over by machines entirely, which has the potential to displace workers. As market investments into technology increase and costs continue to decrease, robots could be seen as a more cost-effective way to perform certain operations more productively.

In the long term, this may lead to greater emphasis on digitization, automation, and cyber security. This could open up many new opportunities for the skilled workforce of the Los Angeles Basin. Technology could become a competitive advantage on the port scene, where data-minded and optimized operations are able to process more efficiently and with fewer errors. In ports across the world, route optimization, automated terminals and cranes, energy management, and capacity sensing technology are rapidly becoming the norm, and advanced data analytics is critical for streamlining the usage of resources. Thus, there will be a likely shift from blue-collar work at the ports toward white-collar, more digitally minded occupations that can oversee automated activities rather than perform the labor themselves.
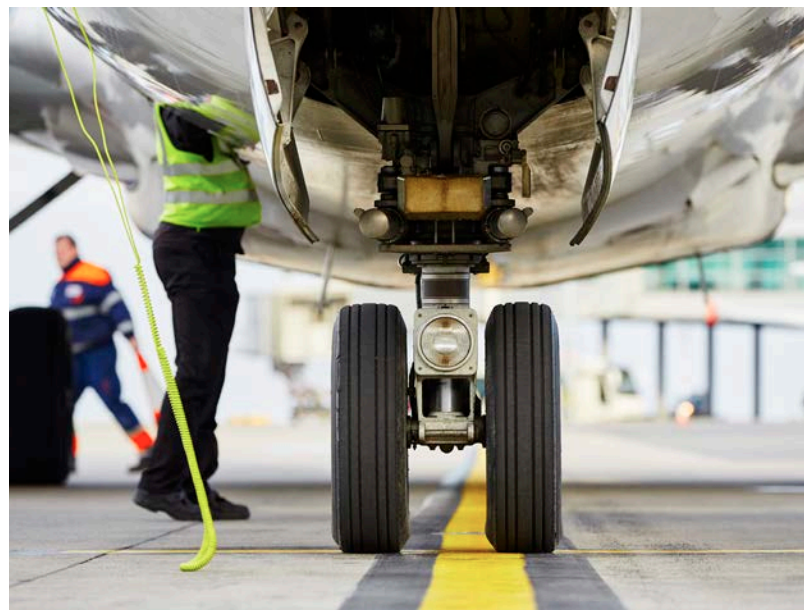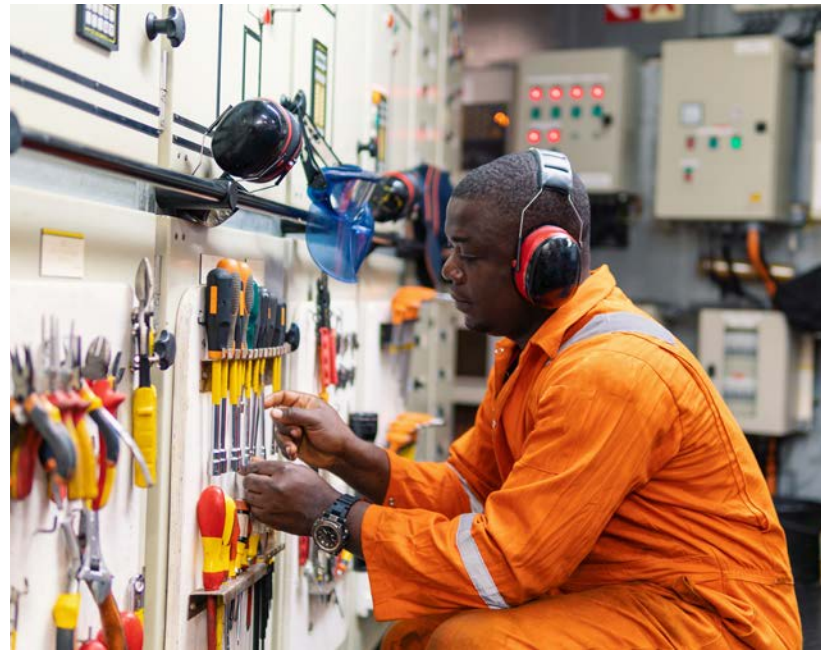
When considering where the transportation industry is headed in the future, sustainability is a key word for every major corporation. This is especially apparent in the maritime sector, where ship emissions and related onshore diesel equipment have impacted regional air quality, spurring a global transition toward a cleaner and more environmentally mindful industry. In 2020, the International Maritime Organization introduced regulation aimed at reducing carbon emissions from international shipping by at least 40% by the end of the decade, with a long-term goal of 70% in 2050. As such, carriers will adapt to demands for sustainability through the development and implementation of green technology.

The airline industry is no different, as the International Air Transport Association estimates that aviation contributes 2% of the entire world's carbon emissions, a figure that will likely rise as demand for airline travel grows. Major airlines are adopting initiatives to operate net-zero carbon flights that can offset their jet fuel emissions, as well as reducing or eliminating single-use plastic. As the aviation industry is estimated to carry between 3 billion and 4 billion passengers per year and deliver a third of global trade, finding new strategies to perform these services in a more sustainable manner is imperative.

The impact of the COVID-19 pandemic on port-related transportation industries also has been massive, as trade volumes and supply chains were directly disrupted and port workforce health protocols decreased throughput. Recovery will take time, and a focus on basic economic growth could be prioritized over the demands for sustainable development in the short term. Trends of protectionism, which were already growing before the pandemic, have shortened supply chains and in time could lead to an altered system of global trade where US companies demand more raw materials and reshore or nearshore manufacturing instead of importing finished products and component assemblies. Meanwhile, the ongoing search for low-cost production will have an impact on trade routes in the recovery as well.

The transportation and warehousing industry as a whole is growing, and the Los Angeles Basin will continue to have an important role to play as a hub for international trade. While technology will be at the forefront of advancement, the workforce in port-related transportation industries will adapt and in many cases be able to improve productivity with the assistance of machines. There is potential for job displacement, but high expectations for the future of trade growth makes opportunities in these sectors appear promising for potential new workers.

Sizing Things Up

The port-related industries employed 106,535 public and private payroll workers in the Los Angeles Basin in 2019, accounting for 1.7% of total regional employment.

The Industry Defined

Analysis of port-related industry trends provides insights into the challenges and opportunities facing the sector's workers and employers. Understanding where the jobs are now, and in the future, is critical to tailor training and career education programs, as well as regional policies to prepare for these changes and to fill the jobs of the future with a workforce that is competitive in a fast-changing global economy.

In this section, job counts and changes in payroll employment and wages are discussed for Los Angeles County and Orange County, which together comprise the Los Angeles Basin.

Industry Employment

With 106,535 workers in 2019, port-related industry employment in the Los Angeles Basin represents 57.4% of this sector's workforce in the state of California and 7.6% nationwide. This also comprises 1.7% of the Los Angeles Basin's employment base.

Exhibit 2-1 displays the distribution of employment across port-related transportation industry subsectors in the Los Angeles Basin. Scheduled air transportation employs the most workers at nearly 33,000, while freight transportation arrangement (i.e., logistics directly serving the ports) also has over 20,000 workers. Support activities for transportation, which includes marine cargo handling, employs over 60% of the workforce, air transportation another third, and water transportation (which includes primarily ship crews) just 4%.

EXHIBIT 2-1:
EMPLOYMENT DISTRIBUTION IN THE LA BASIN ACROSS THE PORT-RELATED INDUSTRIES, 2019

Industry	Employment
Scheduled Air Transportation	32,750
Freight Transportation Arrangement	20,220
Support Activities for Air Transportation	15,270
Support Activities for Water Transportation	14,460
Support Activities for Road Transportation	5,900
Other Support Activities for Transportation	4,700
Deep Sea, Coastal and Great Lakes Water Transportation	3,480
Non-Scheduled Air Transportation	3,220
Support Activities for Rail Transportation	1,770
Inland Water Transportation	170

EXHIBIT 2-2:
PORT-RELATED EMPLOYMENT DISTRIBUTION
BETWEEN COUNTIES

Los Angeles County
94.7%

Orange County
5.3%
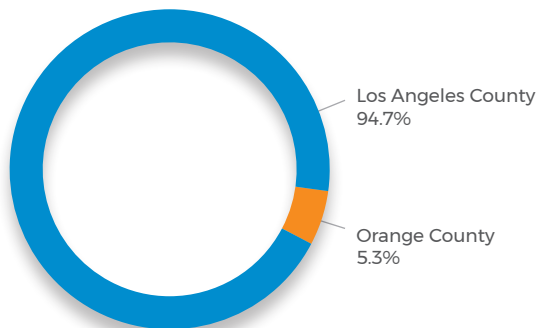
EXHIBIT 2-3:
CHANGE IN PAYROLL EMPLOYMENT, 2009-2019

91%
50%
37%
18%
16%

- Air Transportation
- Port-Related Average
- Support Activities for Transportation
- Water Transportation
- Total, Across All Industries
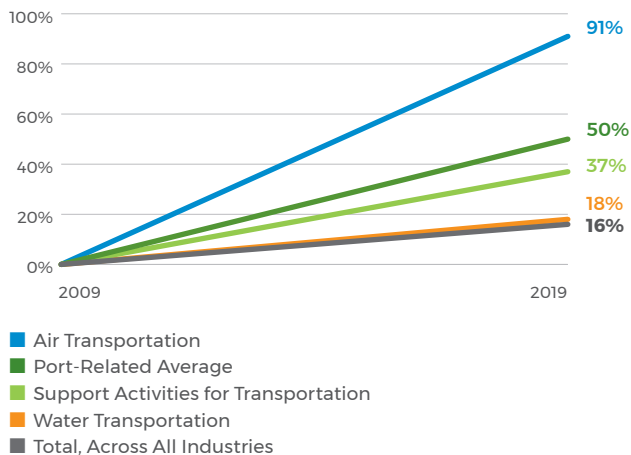
employment

The split of the workforce across the two counties in the Los Angeles Basin is extremely large, as Los Angeles County accounts for nearly 95% of port-related transportation industry employment (Exhibit 2-2). This is due to important trade and transportation hubs such as the San Pedro Bay Ports and Los Angeles International Airport being located within county borders. Of the roughly 5,750 employees in Orange County, nearly 4,300 are in support activities for transportation. In Los Angeles County, over 35,000 work in the air transportation subsector and 65,000 work in support activities.

Total employment in port-related transportation has grown throughout the past decade, with an overall gain of over 37,000 jobs between 2009 and 2019 (Exhibit 2-3). **The 53% growth rate of payroll employment has vastly outpaced that of the all-industries average in the Los Angeles Basin,** in which the workforce grew by just 16%.

Of these three component industries, **air transportation has seen the largest employment growth by percentage, with a 91% employment gain over the decade** — adding close to 18,000 new jobs. Water transportation has shown the most modest growth in employment at 18%, but this still outpaces the average across all industries.

Industry Wages

Employees in port-related transportation industries typically earn higher than average wages compared to the regional economy. **In 2019 the average wage across the highlighted industries was $84,575, well above the average wage** of $66,063 in the Los Angeles Basin (Exhibit 2-4). Real wages in the port-related industries have grown at a rate of 23% in the 10 years leading up to 2019, well above the average growth rate of real wages in the Los Angeles Basin.

Air transportation wages have been at the forefront of this growth, as real wages increased in this industry by 52% between 2009 and 2019; the average worker in air transportation now earns over $100,000 each year. Real wage growth in water transportation and support activities for transportation has been much slower, falling right around the average pace of growth across all industries.

EXHIBIT 2-4:
CHANGE IN REAL WAGES, 2009-2019

- ■ Air Transportation | Average Wage 2019: $107,303
- ■ Port-Related Average | Average Wage 2019: $84,575
- ■ Total, Across All Industries | Average Wage 2019: $66,063
- ■ Water Transportation | Average Wage 2019: $72,045
- ■ Support Activities for Transportation | Average Wage 2019: $73,170
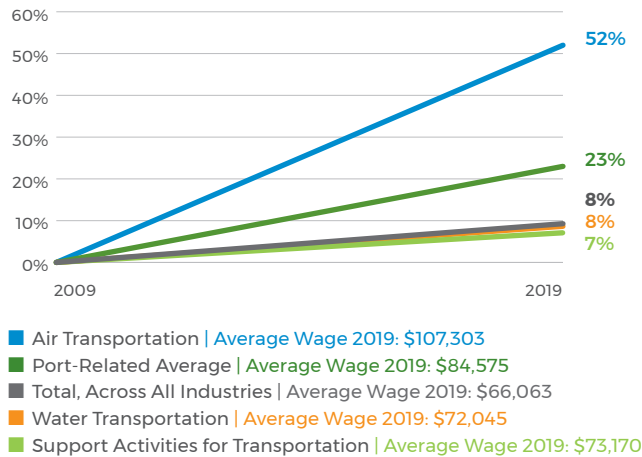
EXHIBIT 2-5:
LOCATION QUOTIENTS BY INDUSTRY, 2009-2019

■ 2009 ■ 2019
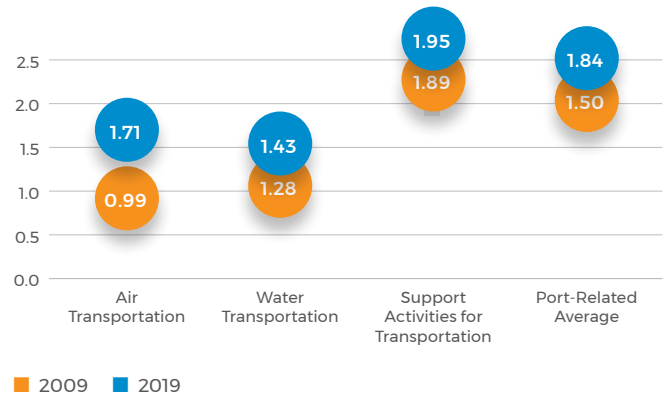
Competitiveness and Regional Advantage

A region's competitiveness in an industry is a function of many factors, including: the attractiveness and value of the product(s)/service(s) produced and delivered; the costs of inputs such as labor, land, and energy; the productivity of individual firms; and the geographic concentration of the industry. Industries that are highly concentrated in a region are likely to be more competitive. As a traded industry that is wealth-generating and selling goods and services in markets beyond the region, the port-related transportation industries are more likely to be concentrated in regions that provide the most competitive benefits to industry participants.

Location quotients are used to measure industry competitiveness. A value of 1.0 signifies that the regional concentration of an industry matches the national concentration, and there is no advantage to being located in this particular region; values higher than 1.0 demonstrate higher levels of concentration.

The location quotient for port-related transportation industries is 1.84, demonstrating there is a greater concentration in the Los Angeles Basin than in the nation as a whole and showing that there is a competitive advantage in the region (Exhibit 2-5).

Changes in competitiveness over time show whether an industry is gaining or losing strength in a region. The concentration of the port-related industries in the Los Angeles Basin increased from 1.50 to 1.84 between 2009 and 2019. While the location quotients of water transportation and support activities for transportation increased minimally, the competitiveness of air transportation in the Los Angeles Basin showed remarkable growth, increasing from 0.99 in 2009 to 1.71 in 2019.

Industry Outlook and Future Workforce Needs

To determine where port-related transportation industries are headed, job growth was forecasted over the next five years and used to extrapolate future workforce needs. It is important to note that the complications of the COVID-19 pandemic and its effects on occupational and industry employment make forecasting more difficult, as it is unclear how the economic situation of the Los Angeles Basin will unfold throughout the recovery process. This report outlines the research team's best estimation of the future but changing circumstances could have a dramatic impact on the trajectory of these industries at some point in the near future.

Between 2019 and 2024, **employment in port-related transportation industries is projected to grow by 12,010 jobs, a growth rate of 11.3% over five years.** Compared to the average growth over the last decade discussed in the previous section, this represents a step back in employment growth. Much of this can be attributed to the economic effects of the pandemic, which constrained business operations and growth for much of 2020 and into 2021. In addition, protectionist tariffs and trade wars during the past several years have reduced trade. It will take time for a full economic recovery, and as such previous expectations of employment growth have been tempered in the near term. Exhibit 3-1 displays the breakdown by industry of net employment growth between 2019 and 2024 in the sector.

The number of projected new jobs can be combined with job openings from attrition (retirements) and job churn, referred to as replacements, to provide an overall estimate of employer hiring needs.

Overall, **64,230 job openings will be available in port-related transportation industries in the Los Angeles Basin from 2019 to 2024,** of which an estimated 52,220 will be replacement workers. Net new jobs added will only account for 10.1%, as there are large numbers of workers in lower-skill occupations with high rates of exits and employee churn in this sector, which contributes heavily to the degree of total openings that will be present. As shown in Exhibit 3-2, there will be roughly the same number of replacement jobs over the five-year span.

EXHIBIT 3-1:
INDUSTRY OUTLOOK

EXHIBIT 3-2:
EMPLOYMENT OUTLOOK
FOR THE PORT-RELATED INDUSTRIES

Replacement Jobs
52,220
44.0%

Net Job Growth
12,010
10.1%

Static Jobs
54,320
45.8%
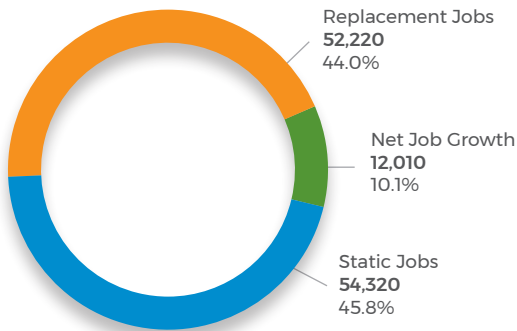
EXHIBIT 3-3:
SKILLS CLASSIFICATION FOR THE LA BASIN'S
PORT-RELATED INDUSTRIES

Above Middle-Skill
29.1%

Below Middle-Skill
12.0%
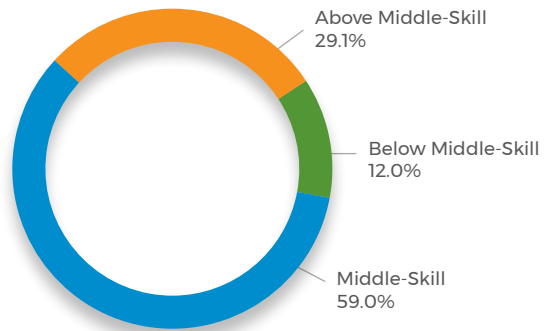
Middle-Skill
59.0%

Analysis of the skill classifications for total job openings over the next five years reveals that **well over half (59%) of projected openings will be for middle-skill occupations** (Exhibit 3-3), which reinforces the selection of port-related transportation industries as a valid target for community college programs.

There is a wide array of middle-skill occupations in the port-related transportation industries, ranging from flight attendants to cargo and freight agents, and tractor-trailer truck drivers. Job duties and core job competencies vary along with wages. Some occupations provide full-time employment, while others do not. Port-related transportation industries have a number of middle-skill occupations that have significant employment churn and relatively higher numbers of replacement jobs annually.

It is important to note that net change in jobs can be negative while the number of total job openings remains high in an occupation with a lot of churn. Retirements also represent additional job opportunities not related to growth. In the event that the predicted net change in jobs in this particular occupation were to slow and dip negative, the large number of openings from individuals changing jobs and retiring would still represent opportunities for job seekers.

Examples of middle-skill occupations in port-related transportation industries with high replacement rates include passenger and flight attendants, customer service representatives, sales and related workers, and ship engineers (Exhibit 3-4).

EXHIBIT 3-4:
MIDDLE-SKILL OCCUPATIONS WITH
HIGH REPLACEMENT RATES (ANNUAL)

10.9%	11.3%	11.5%	11.9%	12.6%
Flight Attendants	Ship Engineers	Sales and Related Workers, All Other	Customer Service Reps	Passenger Attendants
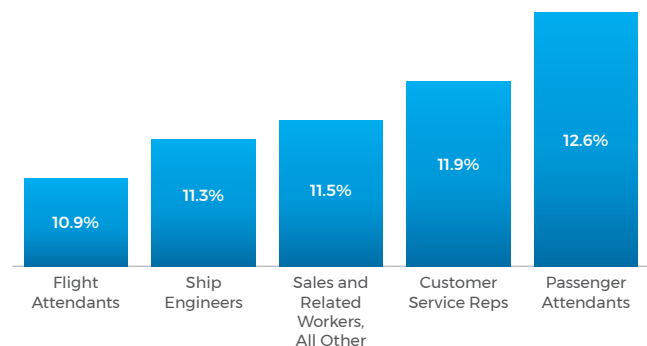
Sources of Occupational Movement

There are several occupations in port-related transportation industries that are fueling growth by adding net new jobs through 2024. These are shown in Exhibit 3-5. The majority of these occupations are middle-skill occupations that show promising opportunities for the Los Angeles Basin's community college graduates.

Flight attendants are projected to add nearly 2,000 new jobs, and airline pilots, copilots, and flight engineers will add 1,200 new jobs by 2024, in conjunction with the continued growth projected for air travel. Cargo and freight agents are also expected to add 1,400 jobs, signifying the importance of port-related industries in the Los Angeles Basin. Two low-skill jobs that are contributing to net job growth are laborers and freight, stock, and material movers; and sailors and marine oilers.

On the other hand, there are occupations creating job openings due to their high rate of turnover resulting from exits and transfers. These occupations are shown in Exhibit 3-6; the low-skill, highly manual-labor-focused occupation of laborers and freight, stock, and material movers is unsurprisingly at the top of the list with close to 6,500 replacement openings between 2019 and 2024.

Flight attendants, heavy and tractor-trailer truck drivers, reservation and transportation ticket agents and travel clerks, and cargo and freight agents are all middle-skill occupations with high levels of replacement openings that present career pathway opportunities for community college graduates.

occupation

EXHIBIT 3-5:
NET PORT-RELATED JOBS ADDED BY OCCUPATION, 2019-2024
Middle-Skill Occupations in Orange

Occupation	Value
Flight Attendants	1,909
Cargo and Freight Agents	1,378
Airline Pilots, Copilots, and Flight Engineers	1,218
Reservation/Transportation Ticket Agents & Travel Clerks	1,003
Aircraft Mechanics and Service Technicians	941
Heavy and Tractor-Trailer Truck Drivers	921
Laborers & Freight/Stock/Material Movers	519
Captains, Mates, and Pilots of Water Vessels	347
Sailors and Marine Oilers	323
Passenger Attendants	233

EXHIBIT 3-6:
PORT-RELATED REPLACEMENTS BY OCCUPATION, 2019-2024
Middle-Skill Occupations in Orange

Occupation	Value
Laborers & Freight/Stock/Material Movers	6,465
Flight Attendants	4,816
Heavy and Tractor-Trailer Truck Drivers	3,300
Reservation/Transportation Ticket Agents & Travel Clerks	3,071
Cargo and Freight Agents	2,796
Airline Pilots, Copilots, and Flight Engineers	2,623
Customer Service Representatives	2,019
Aircraft Mechanics and Service Technicians	1,883
Sales Representatives of Services	1,028
First-Line Supervisors of Office/Admin Workers	1,014

Through the analysis of job openings in port-related transportation industries, trends that are transforming the workforce can be identified. The strong projected growth in occupations used for transporting goods (e.g., heavy and tractor-trailer truck drivers; laborers and freight, stock, and material movers; and cargo and freight agents) indicates that the Los Angeles Basin should continue to grow as a regional hub for international trade. More jobs are being added to accommodate the increased volume of goods flowing through the San Pedro Bay port complex and other facets of the trade and logistics industry in the region.

The forecasted growth of airline occupations indicates a strong outlook for the industry, with more pilots and flight attendants hired as passenger demand increases. While travel and tourism has declined significantly due to the COVID-19 pandemic, over time these sectors are expected to re-emerge and drive further regional economic growth. This demand also will fuel occupational growth in supporting roles such as customer service representatives, and transportation ticket agents and travel clerks.

Characteristics of Workers

Exhibits 3-7 through 3-10 show the characteristics of employees working in the port-related transportation industries, broken down by age, sex, educational attainment, and race and ethnicity.

The average age of workers in the port-related industries tends to skew higher than in the Los Angeles Basin overall, with nearly 51% of the workforce above the age of 45. This could lead to greater numbers of occupational openings over time as retirements drive new demand from employers. Only a quarter of the workforce is under the age of 34.

There are jobs at every level of education in the port-related transportation industries with the distribution of educational attainment fairly similar to the Los Angeles Basin's as a whole. Over 30% of all workers have completed some college or an associate degree, indicating the important role that community college education plays in preparing potential entrants to the sector. With 24% of workers holding a bachelor's degree or higher, there are many higher-skill employment opportunities available as well.

In terms of race and ethnicity, the port-related industries have slightly lower than average proportions of Hispanic and white workers than seen normally in the county (36.8% and 28.2%, respectively), but a much higher proportion of Black workers, who comprise 12.3% of the total workforce. Exhibit 3-10 demonstrates how the sector is skewed heavily toward male workers, a challenge that industry leaders are looking to address in the coming years.

EXHIBIT 3-7:
AGE OF WORKERS, 2019

Port-Related Industries

24 or less	25 to 34	35 to 44	45 to 54	55 and older
5.8%	21.1%	22.2%	24.0%	26.8%

Total, All Industries

| 10.2% | 23.0% | 22.0% | 21.0% | 23.9% |

- 24 or less
- 25 to 34
- 35 to 44
- 45 to 54
- 55 and older
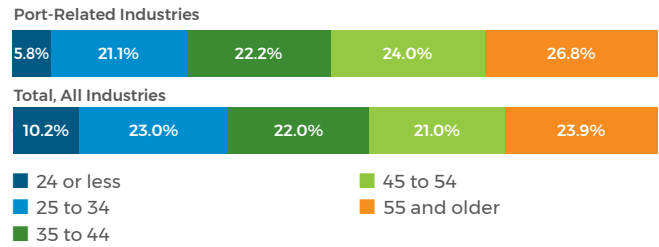
EXHIBIT 3-8:
EDUCATIONAL ATTAINMENT OF WORKERS, 2019

Port-Related Industries

| 5.8% | 17.0% | 22.3% | 30.7% | 24.1% |

Total, All Industries

| 10.2% | 18.1% | 19.0% | 26.4% | 26.4% |

- N/A (less than 24 years of age)
- Less than High School
- High School
- Some College/Associate
- Bachelor's or higher
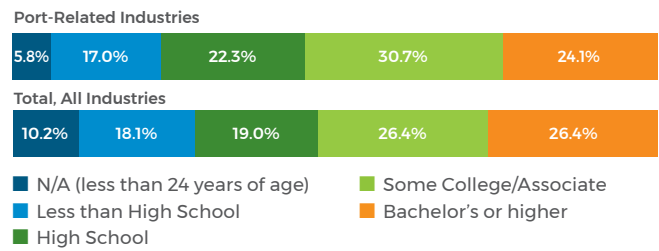
EXHIBIT 3-9:
RACE OF WORKERS, 2019

Port-Related Industries

| 36.8% | 28.2% | 12.3% | 16.8% | 1.3% | 1.5% | 3.1% |

Total, All Industries

| 39.4% | 31.1% | 8.1% | 16.5% | 1.4% | 0.5% | 3.0% |

- Hispanic/Latino
- White
- Black/African American
- American Indian/Alaska Native
- Asian
- Hawaiian/Pacific Islander
- Two or More Races
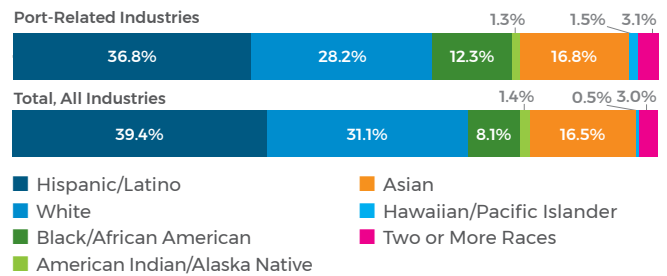
EXHIBIT 3-10:
GENDER OF WORKERS, 2019

Port-Related Industries

| 63.2% | 36.8% |

Total, All Industries

| 51.1% | 48.9% |

- Male
- Female
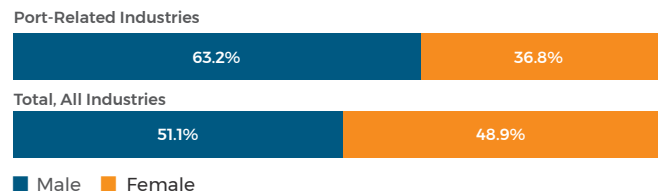
EXHIBIT 3-11:
TOP EMPLOYERS BY JOB POSTINGS, 2019

Employer	Job Postings
AAA	1,277
Yusen Logistics	303
Princess Cruise Lines	217
APL	159
Maersk	150
American Airlines	143
Forward Air	97
Carnival Cruise Lines	83
Kuehne Nagel	75
Bcd Travel	74

Source: Burning Glass

EXHIBIT 3-12:
TOP LOCATIONS OF JOB POSTINGS, 2019

City	Job Postings
Los Angeles, CA	2,450
Costa Mesa, CA	679
Long Beach, CA	464
Santa Clarita, CA	362
Irvine, CA	241
Burbank, CA	200
Torrance, CA	183
Santa Ana, CA	164
El Segundo, CA	158
Carson, CA	145

Source: Burning Glass

Employer Demand

There are a wide variety of employers in the port-related transportation industries looking to fill openings created by either replacements or the creation of new jobs every year. Using data from Burning Glass, the analysis identified the top 10 employers in port-related industries with the most job postings in 2019 (Exhibit 3-11).

The American Automobile Association (AAA) posted nearly 1,300 jobs in 2019, seeking primarily insurance sales agents, insurance claims clerks, customer service representatives, and software developers. Yusen Logistics followed, with high demand for copy writers, wholesale and manufacturing sales representatives, and laborers and material movers. Transportation and logistics corporations, such as Maersk and Kuehne + Nagel, major airlines like American Airlines, and cruise companies, such as Princess Cruise Lines and Carnival Cruise Lines, posted a high number of job ads.

Exhibit 3-12 displays the top locations of job postings by employers in the port-related industries in 2019. The City of Los Angeles ranked first, followed by the cities of Costa Mesa and Long Beach. It is likely that the San Pedro Bay Ports influenced the locations of a large number of the job postings in Los Angeles and Long Beach, which are home to many major employers in the sector.

Target Occupations

Important target occupations predicted to have significant job prospects over the next five years and that stand to benefit from investments in the development or expansion of postsecondary non-degree and career education programs include cargo and freight agents, aircraft mechanics and service technicians, and avionics technicians. The highlighted occupations are shown in Exhibit 3-13, along with total job openings broken out by net new jobs and replacement jobs in the Los Angeles Basin.

Through ongoing research conducted at the LAEDC involving waterborne trade, a number of occupations have been identified as vulnerable to automation in the longer-term. These occupations are identified below as Vulnerable Entry-Level Port-Related Occupations. Individuals within these roles should consider upskilling or retraining for other occupations that have lower risk of displacement. These occupations include the middle-skill target occupations outlined in the table below. While these vulnerable entry-level port-related occupations are displaying some growth between 2019 and 2024, this growth is only in the near-term; as operations at sea ports modernize these occupations will increasingly be at risk.

EXHIBIT 3-13:
TARGET PORT-RELATED TRANSPORTATION OCCUPATIONS
IN THE LA BASIN, 2019-2024

SOC	Occupation	2019 Employment	2019-2024 CHANGE IN JOBS		Total Openings	2019 Entry-Level Hourly Wage
			New Jobs	Replacements		
VULNERABLE ENTRY-LEVEL PORT-RELATED OCCUPATIONS						
43-5071	Shipping, Receiving and Traffic Clerks	38,690	470	17,210	**17,680**	$13.38
53-7021	Crane and Tower Operators	1,560	160	760	**920**	$25.25
53-7062	Laborers & Freight, Stock, Material Movers, Hand	154,510	7,500	93,480	**100,980**	$12.38
MIDDLE-SKILL OPPORTUNITIES FOR UPSKILLING						
47-2111	Electricians	22,760	1,780	11,270	**13,050**	$23.59
49-9041	Industrial Machinery Mechanics	8,730	-50	3,490	**3,440**	$20.84
MIDDLE-SKILL AIRPORT TRANSPORTATION OCCUPATIONS						
49-2091	Avionics Technicians	530	80	180	**260**	$29.87
49-3011	Aircraft Mechanics and Service Technicians	5,430	1,020	2,040	**3,060**	$25.89
MIDDLE-SKILL OCCUPATIONS ACROSS BOTH MODES OF TRANSPORTATION						
43-5011	Cargo and Freight Agents	8,520	1,810	3,660	**5,470**	$17.07
53-6051	Transportation Inspectors	1,000	200	470	**670**	$14.58
PATHWAY OCCUPATIONS ACROSS BOTH MODES OF TRANSPORTATION						
11-3071	Transportation, Storage, and Distribution Managers	7,650	710	2,570	**3,280**	$34.25
13-1081	Logisticians	8,510	340	3,540	**3,880**	$31.26

Community College Supply-Side Analysis

Although a substantial proportion of economic activity in the Los Angeles Basin will remain disrupted until COVID-19 vaccines are widely distributed, certain sectors of the economy are projected to be a significant source of well-paying, middle-skill jobs through 2024, particularly jobs involved in the global supply chain at the Los Angeles Basin's air and sea ports. By completing a year or two of postsecondary education, specialized training, or a transfer program, area residents can enter occupations that are in demand, pay at least a living wage, and do not require a significant investment of time or money.

As part of this study's analysis, 11 target middle-skill occupations were selected based on their involvement in port-related transportation and support activities, high number of annual job openings, and entry-level wages (25th percentile) that are close to or above $15.04/hour, the living wage threshold for a single adult in Los Angeles County. While two of the entry-level port-related occupations are slightly below the living wage threshold, they offer ample job openings and can be career steppingstones leading to opportunities for advancement through upskilling. (A detailed profile of each occupation with demographic, job postings, and labor market data is included at the end of this report.)

Community colleges in the region offer noncredit awards, certificates, and associate degrees in many areas that provide the necessary training for the 11 target occupations in port-related transportation industries. In the Los Angeles Basin, community colleges offer 15 unique certificate and degree programs related to these occupations. Exhibit 4-1 shows the five community college programs providing pathways into these occupations with the greatest average number of

awards over the last three academic years. International business and trade programs have conferred on average 371 awards in the Los Angeles Basin each year, followed by logistics and materials transportation programs.

Exhibit 4-2 displays a comparison of projected employment demand for the 11 occupations and the community college programs that are preparing students to enter these occupations. Please note one program may train for more than one occupation, and for the purpose of this study, the 11 occupations have been divided into five groups which are discussed in detail in this section:

1. **Vulnerable entry-level port-related occupations**
2. **Middle-skill occupations that present an opportunity for upskilling**
3. **Middle-skill airport transportation occupations**
4. **Middle-skill occupations across both modes of transportation**
5. **Pathway occupations across both modes of transportation**

In Exhibit 4-2, a program and its average annual awards are sometimes included in more than one grouping. For example, logistics and materials moving programs train for jobs in the entry-level port-related occupations group and the pathway occupations across both modes of transportation group. As a result, a direct comparison of supply and demand cannot be made.

In total, the 11 occupations are projected to offer 30,540 annual job openings. Of those, laborers and freight, stock, and material movers comprise the largest share of annual job openings, a total of 20,200. Community colleges in the Los Angeles Basin have conferred on average each year 1,331 awards through programs related to the 11 occupations. Given the strong projected employment demand for these occupations, there appears to be an opportunity for community colleges to expand existing programs or create new programs to meet anticipated workforce needs.

Please note that college data in this section are derived from two primary sources. The first is the Chancellor's Office Management Information Systems Data Mart. This database contains state, district, and college-level information about community college students and programs. The second is Cal-PASS Plus LaunchBoard, a statewide data system that provides information on progress, employment, and earnings outcomes of community college students. These two data systems contain similar metrics, but due to different intended uses and how each metric is calculated, values can vary between systems. Completion data for non-community-college programs, such as for-profit proprietary schools, is sourced from the Integrated Postsecondary Education System (IPEDS).

EXHIBIT 4-1:

PORT-RELATED COMMUNITY COLLEGE PROGRAMS AND STUDENT AWARDS, ACADEMIC YEARS 2017-20	
Community College Program	3-Year Average Awards
International Business and Trade	371
Logistics and Materials Transportation	208
Electrical	207
Industrial Systems Technology and Maintenance	119
Aviation Airframe Mechanics	106

Given the uncertainty in the labor market caused by the COVID-19 pandemic, it is more important than ever to direct community college students toward stable employment that pays at least a living wage. Employment opportunities in many industry sectors have been hindered by the pandemic, but the port-related transportation sector shows potential for ongoing growth.

The 11 occupations highlighted in this report are poised for growth based on their involvement in the supply chain, while credential attainment from related programs remains relatively low. Community college students can obtain training for the majority of these occupations in approximately one year and in most cases, they can expect to earn entry-level wages above $15.04/hour.

EXHIBIT 4-2:
COMPARISON OF WORKFORCE DEMAND FOR THE 11 TARGET OCCUPATIONS AND COMMUNITY COLLEGE SUPPLY, ACADEMIC YEARS 2017-20

Occupation	Annual Job Openings	Community College Program	3-Year Average Awards
VULNERABLE ENTRY-LEVEL PORT-RELATED OCCUPATIONS			
Shipping, Receiving, and Traffic Clerks	3,540	Logistics and Materials Transportation	208
Crane and Tower Operators	180	Heavy Equipment Operation	28
Laborers and Freight, Stock, and Material Movers, Hand	20,200	-	-
MIDDLE-SKILL OPPORTUNITIES FOR UPSKILLING			
Industrial Machinery Mechanics	690	Industrial Systems Technology and Maintenance	119
		Manufacturing and Industrial Technology	84
Electricians	2,610	Electrical	207
MIDDLE-SKILL AIRPORT TRANSPORTATION OCCUPATIONS			
Avionics Technicians	50	Aeronautical and Aviation Technology	54
		Aircraft Electronics (Avionics)	-
		Aircraft Fabrication	-
Aircraft Mechanics and Service Technicians	610	Aeronautical and Aviation Technology	54
		Aviation Airframe Mechanics	106
		Aviation Powerplant Mechanics	97
		Aircraft Fabrication	-
MIDDLE-SKILL OCCUPATIONS ACROSS BOTH MODES OF TRANSPORTATION			
Cargo and Freight Agents	1,090	Logistics and Materials Transportation	208
		International Business and Trade	371
Transportation Inspectors	130	Aviation and Airport Management and Services	13
PATHWAY OCCUPATIONS ACROSS BOTH MODES OF TRANSPORTATION			
Transportation, Storage, and Distribution Managers	660	Logistics and Materials Transportation	208
		Aviation and Airport Management and Services	13
		Aviation and Airport Management	44
Logisticians	780	Logistics and Materials Transportation	208

Vulnerable Entry-Level Port-Related Occupations

In 2019, the region employed 197,100 workers in three occupations that make up this grouping:

- **Shipping, receiving, and traffic clerks**
- **Crane and tower operators**
- **Laborers and freight, stock, and material movers**

These three occupations are projected to gain 8,130 new jobs over the next five years. Workers in these occupations earn entry-level hourly wages (25th percentile) that range from $12.38 to $25.25, translating to between $25,750 and $52,520 per year. Projections show there will be 22,290 combined annual job openings for shipping, receiving, and traffic clerks; crane and tower operators; and laborers and freight, stock, and material movers due to replacements (transfers and exits). These occupations present an entry-point to port-related transportation employment, but do not have a bright long-term outlook. Modernization at the ports may decrease future demand for these entry-level port-related occupations. As such, these lower-skilled jobs are weak points for long-term growth and are highlighted due to their vulnerability to displacement over time. The occupations covered in the next section (i.e., industrial machinery mechanics and electricians) are expected to be less impacted by automation.

On average, 236 awards in related programs were conferred annually by community colleges over the most recent three academic years. According to the most recent data in LaunchBoard, the statewide data system for tracking progress, success, employment, and earnings outcomes for community college students, 223 awards were issued to 144 completers in related programs, and 18 transferred.

In sum, there are 23,920 annual openings for the three entry-level port-related occupations, when including new and replacement jobs. With 236 annual average awards reported by community colleges and an annual average of 140 awards across two non-community college programs, there is a potential supply gap of 23,540 workers, meaning that **there are currently far more job opportunities projected than skilled workers trained in these areas.**

A total of 1,152 community college students enrolled in related courses in the Los Angeles Basin in 2018-19. Demographic information and employment outcomes for students in these programs appear below.

STUDENT GENDER 2019

Logistics and Materials Transportation

Female	Male
46%	53%

Heavy Equipment Operation

~0.0%	95%	2%

■ Female ■ Male ■ Masked

STUDENT RACE & ETHNICITY 2019

Logistics and Materials Transportation

10%	10%	54%	1% 1%	4%	7%	12%

Heavy Equipment Operation

30%	2%	5%	54%

■ American Indian/Alaska Native
■ Asian
■ Black or African American
■ Filipino
■ Hispanic
■ Masked Values

■ Multiple Values Reported
■ Native Hawaiian or Other Pacific Islander
■ Two or More Races
■ Unknown/Non-Respondent
■ White

STUDENT AGE DISTRIBUTION 2019

Logistics and Materials Transportation

18%	27%	21%	11%	8%	12%	3%

Heavy Equipment Operation

18%	27%	20%	14%	18%	2%

■ 19 or less
■ 20 to 24
■ 25 to 29
■ 30 to 34

■ 35 to 39
■ 40 to 54
■ 55 and older
■ Masked Values

EXHIBIT 4-3: STUDENT OUTCOMES IN PROGRAMS RELATED TO ENTRY-LEVEL PORT-RELATED OCCUPATIONS

	Obtained Job Closely Related to Field of Study	Median Annual Earnings	Median Change in Earnings	Attained a Living Wage
Logistics and Materials Transportation	73%	$40,880	48%	67%
Heavy Equipment Operation	83%	$85,764	124%	91%

Middle-Skill Opportunities for Upskilling

In 2019, the region employed 31,490 workers in two occupations comprising this grouping:

- **Industrial machinery mechanics**
- **Electricians**

These occupations are projected to gain 1,730 new jobs over the next five years. Workers in these occupations earn entry-level hourly wages (25th percentile) that range from $20.84 to $23.59, translating to between $43,350 and $49,070 per year. Projections show there will be 2,950 openings for these occupations due to replacements (transfers and exits). Electricians in particular are projected to grow at a faster rate than other occupations at the San Pedro Bay Ports due to modernization and electrification and the ongoing effort to reduce carbon emissions from international shipping by 70% in 2050. Training for these occupations does not limit students to a career at regional seaports. Incumbent workers in these occupations work across a variety of industries such as construction, renewable energy and manufacturing.

On average, 410 awards in related programs were conferred annually by community colleges over the most recent three academic years. According to LaunchBoard, 362 awards were issued to 300 completers in related programs, and 49 transferred.

In terms of comparing educational supply to occupational demand, there are 3,300 projected annual openings for industrial machinery mechanics and electricians, when including new and replacement jobs. On the supply side, an annual average of 410 community college awards and 543 awards across five non-community college programs were conferred. In sum, there is a potential supply gap of 2,350 workers meaning that **there are currently more job opportunities projected than skilled workers trained in these areas.**
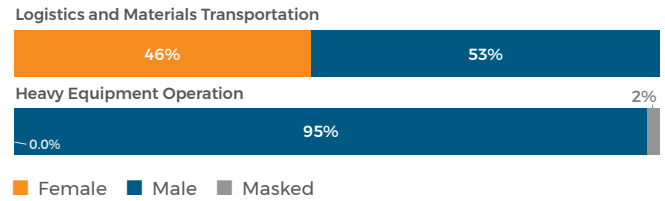
A total of 5,539 community college students enrolled in related courses in the Los Angeles Basin in 2018-19. Demographic information and employment outcomes for students in these programs appear below.
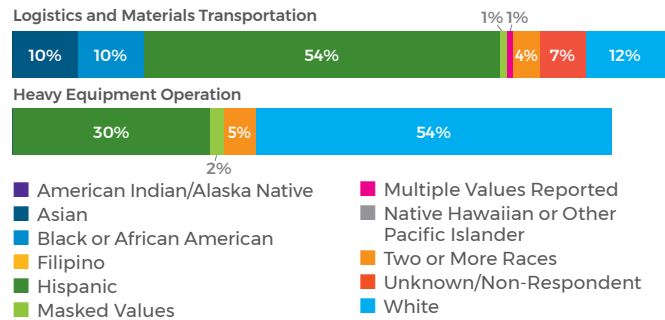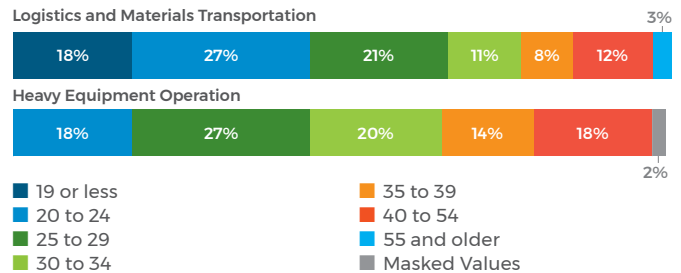
REGIONAL COLLEGES ISSUING AWARDS

LA Colleges:
Cerritos
Compton
El Camino
Glendale
LA Harbor
LA Southwest
LA Trade-Tech
LA Valley
Long Beach
Mt San Antonio
West LA

OC Colleges:
Fullerton
Irvine
North Orange Adult
Orange Coast
Saddleback
Santa Ana
Santiago Canyon

STUDENT GENDER 2019

Electrical
Female	Male	Masked
4%	96%	

Industrial Systems Technology and Maintenance
Female	Male	Masked
21%	77%	1%

Manufacturing and Industrial Technology
Female	Male	Masked
10%	89%	1%

■ Female ■ Male ■ Masked

STUDENT RACE & ETHNICITY 2019

Electrical: 4%, 7%, 66%, 2%, 5%, 16%

Industrial Systems Technology and Maintenance: 18%, 55%, 2%, 17%

Manufacturing and Industrial Technology: 13%, 3%, 1%, 51%, 1%, 1%, 26%

■ American Indian/Alaska Native
■ Asian
■ Black or African American
■ Filipino
■ Hispanic
■ Masked Values
■ Multiple Values Reported
■ Native Hawaiian or Other Pacific Islander
■ Two or More Races
■ Unknown/Non-Respondent
■ White

STUDENT AGE DISTRIBUTION 2019

Electrical: 10%, 25%, 23%, 16%, 10%, 13%, 3%

Industrial Systems Technology and Maintenance: 8%, 21%, 17%, 12%, 31%, 6%

Manufacturing and Industrial Technology: 11%, 25%, 23%, 15%, 8%, 12%, 6%

■ 19 or less
■ 20 to 24
■ 25 to 29
■ 30 to 34
■ 35 to 39
■ 40 to 54
■ 55 and older
■ Masked Values

EXHIBIT 4-4: STUDENT OUTCOMES IN PROGRAMS RELATED TO UPSKILLING INTO MIDDLE-SKILL, PORT-RELATED OCCUPATIONS

	Obtained Job Closely Related to Field of Study	Median Annual Earnings	Median Change in Earnings	Attained a Living Wage
Electrical	82%	$47,144	46%	72%
Industrial Systems Technology and Maintenance	88%	$75,618	60%	80%
Manufacturing and Industrial Technology	77%	$40,200	21%	58%

Middle-Skill Airport Transportation Occupations

In 2019, the region employed 5,960 workers in two occupations comprising this grouping:

- **Avionics technicians**
- **Aircraft mechanics and service technicians**

These occupations are projected to gain 1,100 new jobs over the next five years. Workers earn entry-level hourly wages (25th percentile) that range from $25.89 to $29.87, translating to between $53,850 and $62,130 per year. Projections show there will be 440 annual openings for these two occupations due to replacements (transfers and exits). While not solely employed by the ports in the Los Angeles Basin, these occupations pay well above the living wage standard and provide relevant work experience for higher-level occupations such as aerospace engineers, and aerospace engineering and operations technologists and technicians.

On average, 257 awards in related programs were conferred annually by community colleges over the most recent three academic years. According to LaunchBoard, 295 awards were issued to 287 completers in related programs, and none transferred.

Altogether, there are 660 annual openings for these occupations, when including new and replacement role. An annual average of 257 community college awards and 241 awards by two non-community college programs were conferred. This yields a potential supply gap of 162, indicating that **these programs lead to jobs that are in high demand and not oversaturated with trained workers.**

A total of 707 community college students enrolled in related courses in the Los Angeles Basin in 2018-19. Demographic information and employment outcomes for students in these programs appear below.
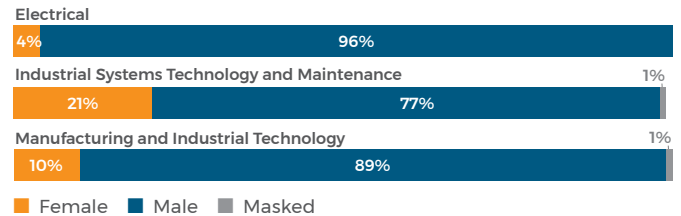
STUDENT GENDER 2019

Aeronautical and Aviation Technology
50%

Aviation Airframe Mechanics
96% | 1%

Aviation Powerplant Mechanics
6% | 93%

■ Female ■ Male ■ Masked

STUDENT RACE & ETHNICITY 2019

Aeronautical and Aviation Technology
22% | 6% | 40% | 2% | 23%

Aviation Airframe Mechanics
23% | 38% | 3% | 24%

Aviation Powerplant Mechanics
14% | 9% | 42% | 2% | 5% | 20%

■ American Indian/Alaska Native
■ Asian
■ Black or African American
■ Filipino
■ Hispanic
■ Masked Values

■ Multiple Values Reported
■ Native Hawaiian or Other Pacific Islander
■ Two or More Races
■ Unknown/Non-Respondent
■ White

STUDENT AGE DISTRIBUTION 2019

Aeronautical and Aviation Technology
11% | 36% | 24% | 11% | 9% | 4%

Aviation Airframe Mechanics
11% | 26% | 28% | 14% | 10% | 5%

Aviation Powerplant Mechanics
6% | 31% | 28% | 17% | 8% | 7% | 4%

■ 19 or less
■ 20 to 24
■ 25 to 29
■ 30 to 34

■ 35 to 39
■ 40 to 54
■ 55 and older
■ Masked Values

EXHIBIT 4-5: STUDENT OUTCOMES IN PROGRAMS RELATED TO MIDDLE-SKILL AIRPORT TRANSPORTATION OCCUPATIONS

	Obtained Job Closely Related to Field of Study	Median Annual Earnings	Median Change in Earnings	Attained a Living Wage
Aeronautical and Aviation Technology	100%	$40,738	29%	54%
Aviation Airframe Mechanics	55%	$38,554	11%	50%
Aviation Powerplant Mechanics	71%	$49,114	43%	70%

Middle-Skill Occupations Across Both Modes of Transportation

In 2019, the region employed 9,520 workers in two occupations in this grouping:

- **Cargo and freight agents**
- **Transportation Inspectors**

These occupations are projected to gain 2,010 new jobs over the next five years. Workers in these occupations earn entry-level hourly wages (25th percentile) ranging from $14.58 to $17.07, translating roughly to between $30,330 and $35,500 per year. Projections show there will be 830 annual openings for the two occupations due to replacements (transfers and exits). Experience in these occupations, along with additional training, can lead to jobs in the subsequent "pathway occupations" section and occur in both modes of transportation.

On average, 592 awards in related programs were conferred annually by community colleges over the most recent three academic years. According to LaunchBoard, 271 awards were issued to 164 completers in related programs, and 28 transferred.
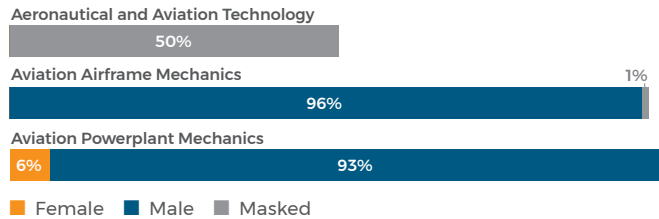
There are 1,230 annual openings for these occupations, when including new and replacement jobs. On the supply side, on average, 592 community college awards were conferred and 255 awards were conferred across two non-community college programs. **This yields a shortage of 383 workers, providing community colleges with a strong rationale to train students to enter this growing field,** which is likely to remain undersupplied for the foreseeable future due to increasing employer demand and a low rate of credential attainment.

A total of 2,648 community college students enrolled in related courses in the Los Angeles Basin in 2018-19. Demographic information and employment outcomes for students in these programs appear below.
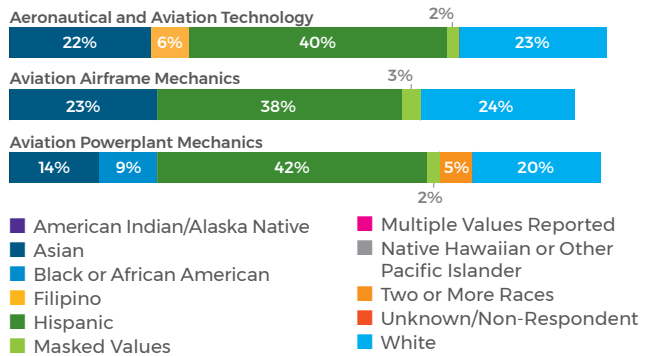
REGIONAL COLLEGES ISSUING AWARDS

LA Colleges:
Cerritos
East LA
Glendale
LA Harbor
LA Pierce
Long Beach
Mt San Antonio
Pasadena
Rio Hondo
Santa Monica

OC Colleges:
Coastline
Fullerton
Orange Coast
Saddleback
Santa Ana

STUDENT GENDER 2019

Logistics and Materials Transportation
| 46% | 53% |

International Business and Trade
| 52% | 47% | 1% |

Aviation and Airport Management and Services
| 36% | 64% |

■ Female ■ Male ■ Masked

STUDENT RACE & ETHNICITY 2019

Logistics and Materials Transportation
10% | 10% | 54% | 1% 1% 4% | 7% | 12%

International Business and Trade
6% | 10% | 6% | 49% | 1% 3% 3% | 7% | 16%

Aviation and Airport Management and Services
12% | 36% | 3% | 37%

■ American Indian/Alaska Native
■ Asian
■ Black or African American
■ Filipino
■ Hispanic
■ Masked Values
■ Multiple Values Reported
■ Native Hawaiian or Other Pacific Islander
■ Two or More Races
■ Unknown/Non-Respondent
■ White

STUDENT AGE DISTRIBUTION 2019

Logistics and Materials Transportation
18% | 27% | 21% | 11% | 8% | 12% | 3%

International Business and Trade
10% | 33% | 19% | 12% | 8% | 14% | 4%

Aviation and Airport Management and Services
22% | 42% | 16% | 5%

■ 19 or less
■ 20 to 24
■ 25 to 29
■ 30 to 34
■ 35 to 39
■ 40 to 54
■ 55 and older
■ Masked Values

EXHIBIT 4-6: STUDENT OUTCOMES IN PROGRAMS RELATED TO MIDDLE-SKILL OCCUPATIONS IN BOTH MODES

	Obtained Job Closely Related to Field of Study	Median Annual Earnings	Median Change in Earnings	Attained a Living Wage
Aviation and Airport Management and Services	-	$33,988	81%	-
Logistics and Materials Transportation	73%	$40,880	48%	67%
International Business and Trade	57%	$32,732	49%	50%

Pathway Occupations Across Both Modes of Transportation

In 2019, the region employed 16,160 workers in this grouping which contains two occupations:

- **Transportation, storage, and distribution managers**
- **Logisticians**

These occupations are classified as pathway occupations because employment as a logistician typically requires a bachelor's degree while five years or more of work experience is typically required for transportation, storage, and distribution managers. Combined, these occupations are projected to gain 1,050 new jobs over the next five years. Workers in these occupations earn entry-level hourly wages (25th percentile) ranging from $31.26 to $34.25, translating roughly to between $65,020 and $71,240 per year. Projections show there will be 1,220 annual openings for these occupations due to replacements (transfers and exits). Experience in these occupations can open the door for career advancement opportunities across the greater supply chain, as the employment demand from online retailers and order fulfillment centers continues to rise.

On average, 265 awards in related programs were conferred annually by community colleges over the most recent three academic years. According to LaunchBoard, 271 awards were issued to 164 completers in related programs, and 28 transferred.

There are 1,432 annual openings for these occupations, when including new and replacement jobs. An average annual total of 265 community college awards were conferred and 140 awards by two non-community college programs. **This yields a potential shortage of 1,027 workers, providing a strong rationale for training programs that address a growing field** that is likely to remain undersupplied with talent for the foreseeable future due to increasing employer demand and a much lower rate of credential attainment.

A total of 1,260 community college students enrolled in related courses in the Los Angeles Basin in 2018-19. Demographic information and employment outcomes for students in these programs appear below.
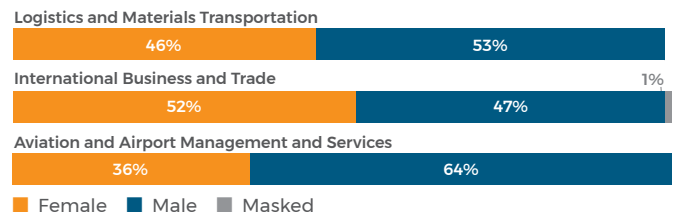
REGIONAL COLLEGES ISSUING AWARDS

LA Colleges:
East LA
Glendale
LA Harbor
Rio Hondo
Santa Monica

OC Colleges:
Coastline
Cypress
Orange Coast

STUDENT GENDER 2019

Aviation and Airport Management and Services
| 36% | 64% |

Aviation and Airport Management
| 64% | 35% |

Logistics and Materials Transportation
| 46% | 53% |

■ Female ■ Male ■ Masked

STUDENT RACE & ETHNICITY 2019

Aviation and Airport Management and Services
12% | 36% | 3% | 37%

Aviation and Airport Management
18% | 6% | 49% | 3% | 5% | 14%

Logistics and Materials Transportation
10% | 10% | 54% | 1% 1% 4% | 7% | 12%

■ American Indian/Alaska Native
■ Asian
■ Black or African American
■ Filipino
■ Hispanic
■ Masked Values
■ Multiple Values Reported
■ Native Hawaiian or Other Pacific Islander
■ Two or More Races
■ Unknown/Non-Respondent
■ White

STUDENT AGE DISTRIBUTION 2019

Aviation and Airport Management and Services
22% | 42% | 16% | 5%

Aviation and Airport Management
15% | 44% | 20% | 9% | 7% | 3%

Logistics and Materials Transportation
18% | 27% | 21% | 11% | 8% | 12% | 3%

■ 19 or less
■ 20 to 24
■ 25 to 29
■ 30 to 34
■ 35 to 39
■ 40 to 54
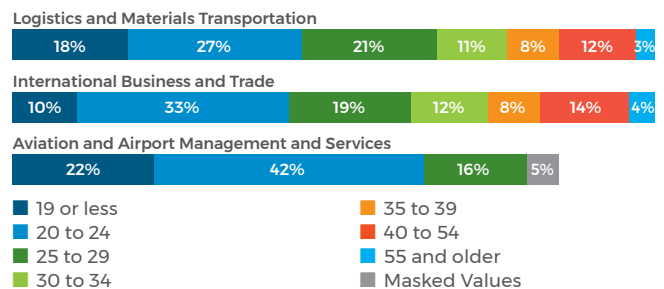■ 55 and older
■ Masked Values

EXHIBIT 4-7: STUDENT OUTCOMES IN PROGRAMS RELATED TO PATHWAY OCCUPATIONS IN BOTH MODES

	Obtained Job Closely Related to Field of Study	Median Annual Earnings	Median Change in Earnings	Attained a Living Wage
Aviation and Airport Management and Services	-	$33,988	81%	-
Aviation and Airport Management	-	$36,952	45%	-
Logistics and Materials Transportation	73%	$40,880	48%	67%

Additional Training Programs Related to LA Basin Airports

There are other key community college programs in the region that provide training for middle-skill occupations related to the air transportation industry. Supply data for these programs is summarized in Exhibit 4-8. Completion data comes from the most recent three-year average of community college awards in Data Mart (2017-18, 2018-19 & 2019-20), enrollments are from 2018-19, and student employment outcomes are from the most recent year available.

This collection of programs provides training for flight attendants; reservation and transportation ticket agents and travel clerks; air traffic controllers; and airline pilots, copilots, and flight engineers as well as commercial pilots.

REGIONAL COLLEGES ISSUING AWARDS

LA Colleges:
Glendale
Mt San Antonio
West LA

OC Colleges:
Cypress
Orange Coast
Saddleback

EXHIBIT 4-8:
STUDENT OUTCOMES IN ADDITIONAL
PROGRAMS RELATED TO LA BASIN AIRPORTS

	COMMUNITY COLLEGE PROGRAMS			
	Travel Services and Tourism	Piloting	Air Traffic Control	Flight Attendant
Students Enrolled	148	1,026	289	508
Community College Awards	26	136	30	60
Obtained Job Closely Related to Field of Study	71%	40%	57%	64%
Median Annual Earnings	$24,524	$34,930	$30,540	$26,400
Median Change in Earnings	13%	28%	34%	26%
Attained a Living Wage	54%	52%	46%	27%

To better understand where the three industry subsectors (air transportation, water transportation, and support activities for transportation) are headed, growth was forecasted over the next five years. This forecast is used to extrapolate future workforce needs and the demand for workers.

Air Transportation

SIZING THINGS UP

Air transportation employed 35,790 payroll workers in the Los Angeles Basin in 2019, accounting for 0.6% of total regional employment across all industries and 33.8% of employment in port-related industries in the region.

The jobs are concentrated heavily in scheduled air transportation, which accounts for over 32,000 jobs while non-scheduled air transportation employs just 3,280 workers.

INDUSTRY OUTLOOK

Between 2019 and 2024, there is a projected net job change of 5,230 in the Los Angeles Basin, **a 14.5% increase** in employment.

FUTURE WORKFORCE NEEDS

Overall, **22,790 total job openings will be created in air transportation over the next five years,** of which an estimated 5,230 will be net new jobs and 17,560 will be replacement workers.

Analysis of the skills classifications for total job openings over the next five years reveals that **64.6% of projected openings are for middle-skill occupations.**

EXHIBIT 5-1:

MIDDLE-SKILL OCCUPATIONS:

SIGNIFICANT JOB PROSPECTS THROUGH 2024

Occupational Group	Annual Openings
Flight Attendants	1,330
Reservation & Transportation Ticket Agents & Travel Clerks	640
Aircraft Mechanics & Service Technicians	250
Customer Service Representatives	140
Commercial Pilots	130

TOP MIDDLE-SKILL OCCUPATIONS

Middle-skill occupations projected to have significant job prospects over the next five years in air transportation include flight attendants, reservation and transportation ticket agents and travel clerks, and aircraft mechanics and service technicians.

air

EXHIBIT 5-2:
SKILLS CLASSIFICATION FOR THE LA BASIN'S AIR TRANSPORTATION INDUSTRY OPENINGS, 2019-2024

Above Middle-Skill 13.3%

Below Middle-Skill 22.1%

Middle-Skill 64.6%
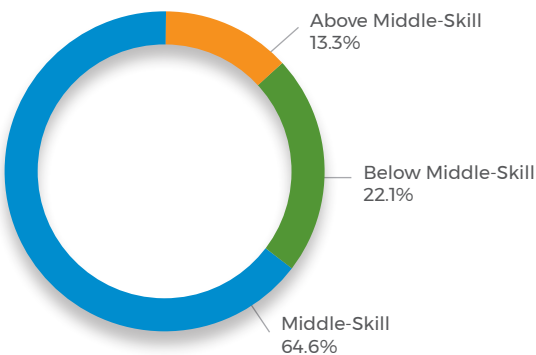
EXHIBIT 5-3:
INDUSTRY OUTLOOK

PAYROLL JOB INCREASE

45,000

30,000

15,000

0

41,200

35,970

5,230 Net Job Change (14.5%)

Air Transportation
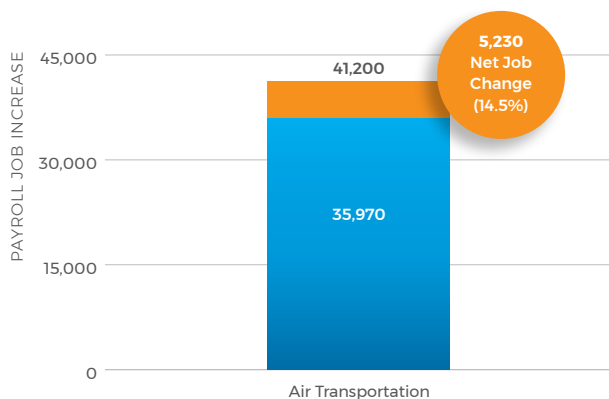
Industry Profile

EXHIBIT 5-4:
AGE OF WORKERS, 2019

Air Transportation

| 3.5% | 21.6% | 19.2% | 24.3% | 31.4% |

Total, All Industries

| 10.2% | 23.0% | 22.0% | 21.0% | 23.9% |

- 24 or less
- 25 to 34
- 35 to 44
- 45 to 54
- 55 and older
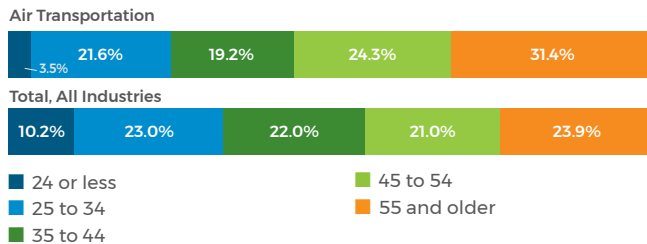
EXHIBIT 5-5:
EDUCATIONAL ATTAINMENT OF WORKERS, 2019

Air Transportation

| 3.5% | 12.9% | 22.5% | 33.1% | 28.1% |

Total, All Industries

| 10.2% | 18.1% | 19.0% | 26.4% | 26.4% |

- N/A (less than 24 years of age)
- Less than High School
- High School
- Some College/Associate's
- Bachelor's or higher
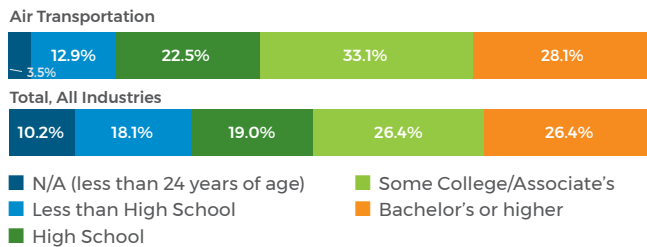
EXHIBIT 5-6:
RACE OF WORKERS, 2019

Air Transportation

| 22.8% | 45.1% | 12.4% | 13.7% | 0.8% | 1.7% | 3.4% |

Total, All Industries

| 39.4% | 31.1% | 8.1% | 16.5% | 1.4% | 0.5% | 3.0% |

- Hispanic/Latino
- White
- Black/African American
- American Indian/Alaska Native
- Asian
- Hawaiian/Pacific Islander
- Two or More Races
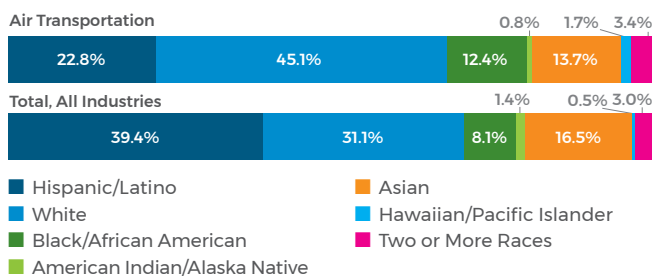
EXHIBIT 5-7:
GENDER OF WORKERS, 2019

Air Transportation

| 58.0% | 42.0% |

Total, All Industries

| 51.1% | 48.9% |

- Male
- Female

EXHIBIT 5-8:
TOP EMPLOYERS BY JOB POSTINGS, 2019

Employer	Job Postings
American Airlines	143
Forward Air	97
Bcd Travel	74
Delta Air Lines	65
Southwest Airlines Company	63
Panalpina	52
Frontier Airlines	45
Amr	44
Alaska Airlines	41
Gat Airline Support	36

Source: Burning Glass

EXHIBIT 5-9:
TOP LOCATIONS OF JOB POSTINGS, 2019

City	Job Postings
Los Angeles, CA	1,054
Burbank, CA	110
Irvine, CA	65
Santa Ana, CA	63
Carson, CA	56
Long Beach, CA	46
Torrance, CA	40
El Segundo, CA	39
Anaheim, CA	38
Lake Forest, CA	25

Source: Burning Glass

Water Transportation

SIZING THINGS UP

Water transportation employed 4,040 payroll workers in the Los Angeles Basin in 2019, accounting for 0.1% of total regional employment across all industries and 3.8% of employment in port-related industries in the region.

The majority of jobs are in deep sea and, coastal water transportation with 3,480 jobs, while the remaining are in inland water transportation.

INDUSTRY OUTLOOK

Between 2019 and 2024, there are projected to be 570 net new jobs added to the water transportation industry in the Los Angeles Basin. This equates to 14.1% job growth over the five-year span.

FUTURE WORKFORCE NEEDS

Overall, **2,540 total job openings will be created in water transportation over the next five years,** of which an estimated 570 will be net new jobs and 1,970 will be replacement workers.

Analysis of the skills classifications for total job openings over the next five years reveals that **50.7% of projected openings are for middle-skill occupations.**

TOP MIDDLE-SKILL OCCUPATIONS

Middle-skill occupations projected to have significant job prospects over the next five years in water transportation include captains, mates and pilots of water vessels; ship engineers; and customer service representatives.

MIDDLE-SKILL OCCUPATIONS:

SIGNIFICANT JOB PROSPECTS THROUGH 2024

Occupational Group	Annual Openings
Captains, Mates and Pilots of Water Vessels	120
Ship Engineers	40
Customer Service Representatives	10
Cargo and Freight Agents	10
First Line Supervisors of Transportation and Material Movers	10

water

EXHIBIT 5-11:
SKILLS CLASSIFICATION FOR THE LA BASIN'S WATER TRANSPORTATION INDUSTRY OPENINGS, 2019-2024

Above Middle-Skill 42.4%

Below Middle-Skill 6.9%

Middle-Skill 50.7%
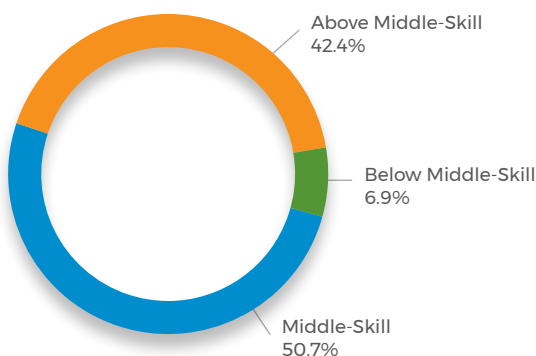
EXHIBIT 5-12:
INDUSTRY OUTLOOK

570 Net Job Change (14.1%)

4,610

4,040

Deep Sea, Coastal and Great Lakes Water Transportation
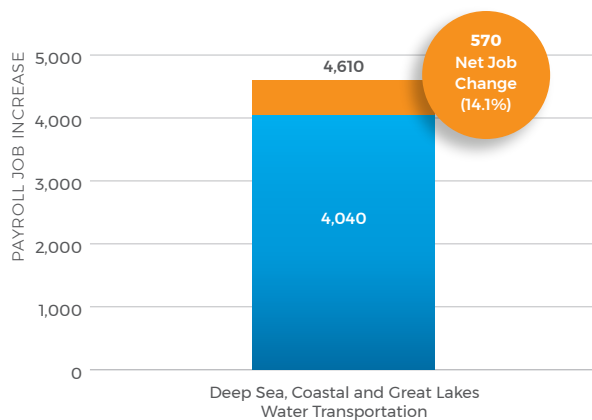
Industry Profile

EXHIBIT 5-13:
AGE OF WORKERS, 2019

Water Transportation

| 5.4% | 18.8% | 22.4% | 25.2% | 28.3% |

Total, All Industries

| 10.2% | 23.0% | 22.0% | 21.0% | 23.9% |

- ■ 24 or less
- ■ 25 to 34
- ■ 35 to 44
- ■ 45 to 54
- ■ 55 and older
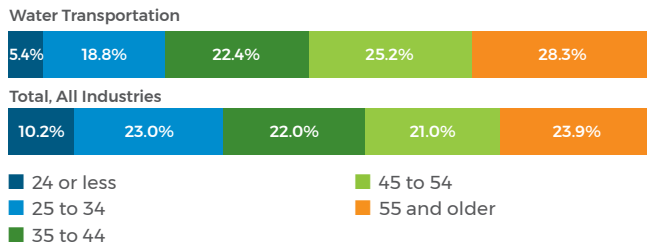
EXHIBIT 5-14:
EDUCATIONAL ATTAINMENT OF WORKERS, 2019

Water Transportation

| | 12.9% | 20.4% | 32.2% | 29.1% |
5.4%

Total, All Industries

| 10.2% | 18.1% | 19.0% | 26.4% | 26.4% |

- ■ N/A (less than 24 years of age)
- ■ Less than High School
- ■ High School
- ■ Some College/Associate's
- ■ Bachelor's or higher
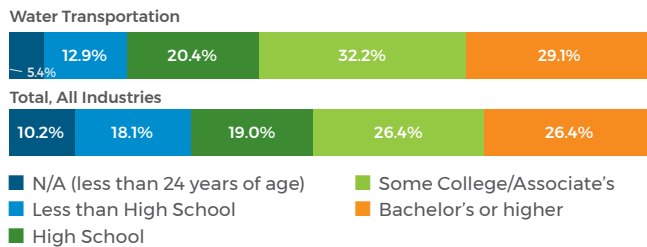
EXHIBIT 5-15:
RACE OF WORKERS, 2019

Water Transportation

3.0%

| 27.9% | 43.6% | 7.9% | 16.0% | |

Total, All Industries

1.4%   0.5% 3.0%

| 39.4% | 31.1% | 8.1% | 16.5% | |

- ■ Hispanic/Latino
- ■ White
- ■ Black/African American
- ■ American Indian/Alaska Native
- ■ Asian
- ■ Hawaiian/Pacific Islander
- ■ Two or More Races
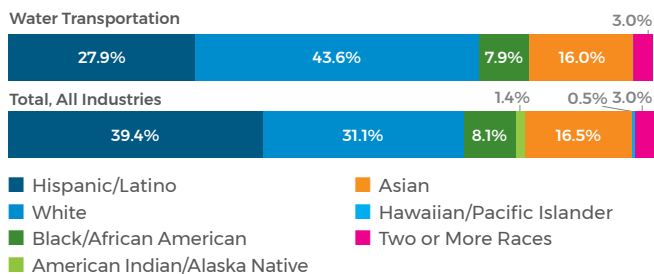
EXHIBIT 5-16:
GENDER OF WORKERS, 2019

Water Transportation

| 49.4% | 50.6% |

Total, All Industries

| 51.1% | 48.9% |

- ■ Male
- ■ Female

EXHIBIT 5-17:
TOP EMPLOYERS BY JOB POSTINGS, 2019

Employer	Job Postings
Princess Cruise Lines	217
APL	159
Maersk	150
Carnival Cruise Lines	83
Norwegian Cruise Line	29
Viking Cruises	27
Harley Marine Services Incorporated	11
Cruise America Incorporated	11
Gm Cruise Llc	6
Metro Cruise Services	4

Source: Burning Glass

EXHIBIT 5-18:
TOP LOCATIONS OF JOB POSTINGS, 2019

City	Job Postings
Santa Clarita, CA	300
Los Angeles, CA	164
Carson, CA	59
South Gate, CA	55
Newport Beach, CA	48
City Of Industry, CA	32
Long Beach, CA	31
Santa Fe Springs, CA	13
Walnut, CA	11
El Segundo, CA	8

Source: Burning Glass

Support Activities for Transportation

SIZING THINGS UP

Support activities for transportation employed 66,520 payroll workers in the Los Angeles Basin in 2019, accounting for 1.1% of total regional employment across all industries and 62.4% of employment in port-related industries in the region.

There are many smaller component industries, with freight transportation arrangement employing over 20,000 workers, and the industries supporting air and water transportation employing about 15,000 workers each.

INDUSTRY OUTLOOK

Between 2019 and 2024, employment is projected to grow by 9.4%, which will create about 6,220 new jobs in Los Angeles Basin over this period.

FUTURE WORKFORCE NEEDS

Overall, **38,900 total job openings will be created in support activities for transportation over the next five years,** of which an estimated 6,220 will be net new jobs and 32,690 will be replacement workers.

Analysis of the skills classifications for total job openings over the next five years reveals that **56.2% of projected openings are for middle-skill occupations.**

TOP MIDDLE-SKILL OCCUPATIONS

Middle-skill occupations projected to have significant job prospects over the next five years in air transportation include heavy and tractor-trailer truck drivers, cargo and freight agents, and aircraft mechanics and service technicians.

EXHIBIT 5-19:

MIDDLE-SKILL OCCUPATIONS:

SIGNIFICANT JOB PROSPECTS THROUGH 2024

Occupational Group	Annual Openings
Heavy and Tractor-Trailer Truck Drivers	840
Cargo and Freight Agents	740
Aircraft Mechanics and Service Technicians	320
Customer Service Representatives	270
Sales Representatives of Services	190

support

EXHIBIT 5-20:
SKILLS CLASSIFICATION FOR THE LA BASIN'S SUPPORT ACTIVITIES FOR TRANSPORTATION INDUSTRY OPENINGS, 2019-2024
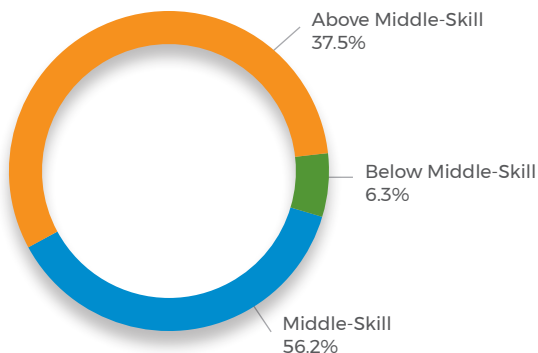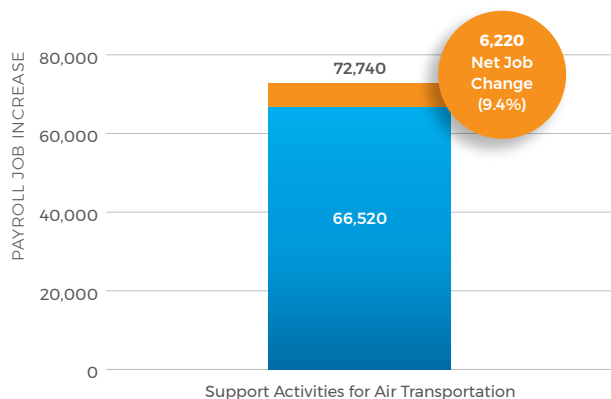

Above Middle-Skill 37.5%
Below Middle-Skill 6.3%
Middle-Skill 56.2%

EXHIBIT 5-21:
INDUSTRY OUTLOOK

PAYROLL JOB INCREASE

72,740
66,520
6,220 Net Job Change (9.4%)

Support Activities for Air Transportation

Industry Profile

EXHIBIT 5-22:
AGE OF WORKERS, 2019

Support Activities for Transportation

7.0%	21.0%	23.6%	23.9%	24.5%

Total, All Industries

10.2%	23.0%	22.0%	21.0%	23.9%

- ■ 24 or less
- ■ 25 to 34
- ■ 35 to 44
- ■ 45 to 54
- ■ 55 and older
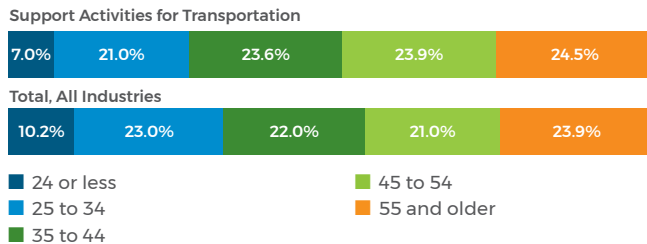
EXHIBIT 5-23:
EDUCATIONAL ATTAINMENT OF WORKERS, 2019

Support Activities for Transportation

7.0%	19.2%	22.3%	29.6%	22.0%

Total, All Industries

10.2%	18.1%	19.0%	26.4%	26.4%

- ■ N/A (less than 24 years of age)
- ■ Less than High School
- ■ High School
- ■ Some College/Associate's
- ■ Bachelor's or higher
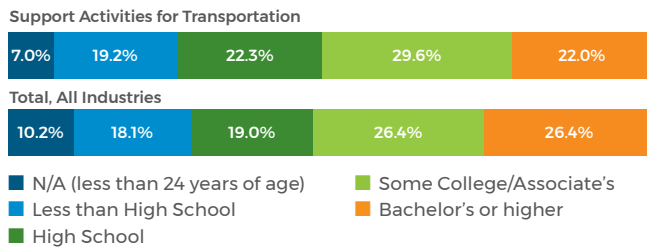
EXHIBIT 5-24:
RACE OF WORKERS, 2019

Support Activities for Transportation

43.7%	19.6%	12.6%	18.2%	1.6%	1.5%	2.9%

Total, All Industries

39.4%	31.1%	8.1%	16.5%	1.4%	0.5%	3.0%

- ■ Hispanic/Latino
- ■ White
- ■ Black/African American
- ■ American Indian/Alaska Native
- ■ Asian
- ■ Hawaiian/Pacific Islander
- ■ Two or More Races
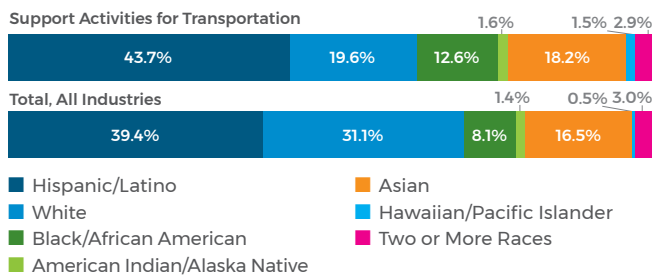
EXHIBIT 5-25:
GENDER OF WORKERS, 2019

Support Activities for Transportation

66.4%	33.6%

Total, All Industries

51.1%	48.9%

- ■ Male
- ■ Female
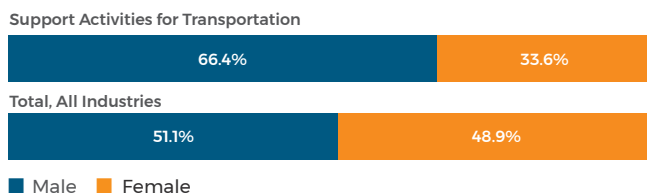
EXHIBIT 5-26:
TOP EMPLOYERS BY JOB POSTINGS, 2019

Employer	Job Postings
AAA	1,277
Yusen Logistics	303
Kuehne Nagel	75
Resource Logistics Incorporated	53
Airport Terminal Services	47
Db Schenker	42
Signature Flight Support	32
Pcc Logistics Incorporated	28
Total Airport Services Incorporated	27
Laz Parking	27

Source: Burning Glass

EXHIBIT 5-27:
TOP LOCATIONS OF JOB POSTINGS, 2019

City	Job Postings
Los Angeles, CA	1,232
Costa Mesa, CA	667
Long Beach, CA	387
Irvine, CA	175
Torrance, CA	143
El Segundo, CA	111
Santa Ana, CA	94
Burbank, CA	90
Santa Clarita, CA	55
Anaheim, CA	40

Source: Burning Glass

Challenges, Recommendations & Next Steps

In this report, we focused on targeted employment opportunities in port-related transportation industries. These are jobs that are projected to gain importance as the technological and workforce landscape of the sector evolves over the next decade.

Technology will be one of the greatest driving forces of evolution in transportation and warehousing, as it provides the ability to operate at higher levels of efficiency and speed with better safety. Oftentimes this will augment the capabilities of workers and allow them to perform their jobs better; however, we must also be careful to steer community college graduates and potential workforce entrants towards middle-skill and higher-skill occupations (jobs requiring more than a high school education) that will be less susceptible to displacement. Some low-skill jobs in the industry could eventually give way to robotic and full-scale automation, forcing workers to upskill or find employment in new sectors.

Another challenge present in these industries is the **high replacement rate that has become common for lower-skilled, blue collar occupations.** At the ports, workers employed in jobs such as freight, stock and material movers or stockers and order fillers often do not last long before transferring out of the occupation and searching for new opportunities, leading to a constant demand for labor in these positions. With a shortfall of qualified entrants into the labor market, filling vacancies has often been difficult for employers. In time, automation may be utilized by employers to solve for the high turnover issue, but in the short-term understaffed crews can lead to delays and inefficiency at a time when transportation and warehousing is expanding.

As such, a key recommendation is to **engage with industry associations, such as the Pacific Maritime Association (PMA) and labor unions, such as the International Longshore and Warehouse Union or the International Brotherhood of Electrical Workers (and others), represented at the ports** as much as possible in the coming months and years to ensure that modernization is implemented at the San Pedro Bay Ports in a manner that is beneficial for workers and employers, and enhances long-term job security and market competitiveness. Through a collaborative approach, these bodies can work toward a sustainable adoption of automation and technology in the port environment. Strengthening the synergy between industry associations, labor unions, and community

colleges can create benefits for all sides, namely a steady supply of workers with the cutting-edge skills needed by the ports, a globally competitive operation with the ability to process cargoes and goods efficiently and effectively, and a clean and green port complex supporting good paying and stable jobs for the region.

Furthermore, as a global hub for international business and trade, the Ports of Los Angeles, Long Beach and LAX will continue to play a dominant role in the global economy. As the nation's top-ranking customs district with over $428 billion in total two-way trade with the world and the top California destination for foreign direct investment (FDI) with over 5,113 foreign-owned establishments, Los Angeles will need more workers trained in international business and trade in the coming years. As more international companies continue to explore nearshoring options, community colleges need to **equip students with the technical skills to work with international firms.**

With the coming modernization, a number of below middle-skill occupations will be at risk, including the ones identified as vulnerable in this report. As a degree of displacement is likely even in the best-case scenarios, **retraining and upskilling will be key for community college programs.** The introduction of technology has the potential to require and create a diversity of skills and daily task requirements among workers in port-related industries, and the ability to oversee and interact with technology will become essential for success. **Training community college students for the ports of the future,** which are expected to become more digital, modern, efficient and environmentally conscious than ever before, will ensure there is a steady supply of qualified graduates to fill positions that are increasingly demanding higher levels of proficiency. Existing community college programs can increase their emphasis on these skills, or create new, short-term certificate programs to upskill the existing workforce, and workers displaced by the pandemic.

Providing awareness about employment opportunities is also a critical operation as shortfalls in labor supply currently exist for all four cohorts of the highlighted target occupations. It is clear that jobs are available and ready to be filled. A concerted effort in marketing the opportunities available in the growing port sector, along with the necessary certification programs or degree paths that provide qualification for these opportunities, could increase the number of entrants into applicable programs in the Los Angeles Basin. Workers who lost their jobs in industries hit hardest by the pandemic could benefit from this information, which could mobilize them to pursue promising career paths that offer stability and a living wage.

Employment Numbers & Worker Characteristics

Detailed information has been compiled for key occupations in port-related transportation industries. Data from 2019 was used to determine wages and worker characteristics for the charts included with the profiles.

The information on top industries employing workers in these occupations, current and projected employment, wages, and worker demographics can be used by community colleges to tailor existing programs and guide outreach to potential students. The occupational analyses that follow may even inspire new program development or new approaches in attracting students to promising career paths.

HIGHLIGHTED OCCUPATIONS

Shipping, Receiving and Traffic Clerks
(SOC 43-5071)

Crane and Tower Operators
(SOC 53-7021)

Laborers and Freight, Stock and Material Movers
(SOC 53-7062)

Industrial Machinery Mechanics
(SOC 49-9041)

Electricians
(SOC 47-2111)

Avionics Technicians
(SOC 49-2091)

Aircraft Mechanics and Service Technicians
(SOC 49-3011)

Transportation, Storage and Distribution Managers
(SOC 11-3071)

Logisticians
(SOC 13-1081)

Cargo and Freight Agents
(SOC 43-5011)

Transportation Inspectors
(SOC 53-6051)

profiles

Each occupational profile contains:
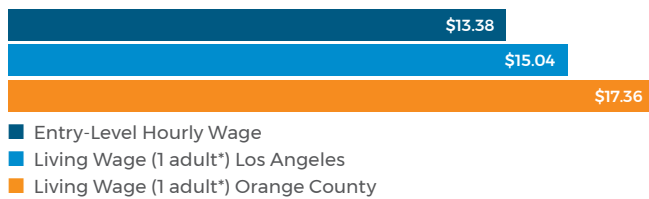
■ Hourly wages paid in 2019 for workers in Los Angeles and Orange counties compared to the living wage.

■ The distribution of workers across industry sectors in the Los Angeles Basin.

■ Metrics for each occupation, including the number of current jobs and projected openings.

■ Worker demographics, such as educational attainment, age distribution, race and ethnicity, and gender.

Shipping, Receiving and Traffic Clerks

(SOC 43-5071)

Verify and maintain records on incoming and outgoing shipments involving inventory. Duties include verifying and recording incoming merchandise or material and arranging for the transportation of products. May prepare items for shipment.

5-YEAR PROJECTIONS THROUGH 2024

520 Port-Related Openings
10 Net Job Change
510 Replacements

17,680 Projected Openings Across All Industries
470 Net Job Change
17,210 Replacements

8,520 Total Jobs in LA Basin

2019 HOURLY WAGES IN LA BASIN

$13.38	Entry-Level Hourly Wage
$15.04	Living Wage (1 adult*) Los Angeles
$17.36	Living Wage (1 adult*) Orange County

*MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

1,140

Shipping, receiving and traffic clerks employed in port-related industries in the LA Basin

3%

Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries

Industry subsectors with the most workers in this occupation:

1. Merchant Wholesalers, Durable Goods
2. Merchant Wholesalers, Nondurable Goods
3. Administrative and Support Services

Top specialized skills in job postings:

1. Shipping
2. Shipping and Receiving
3. Receiving
4. Forklift Operation
5. Lifting Ability

GENDER 2019

Target Occupation

Male	Female
66.4%	33.6%

Total, All Industries

Male	Female
49.3%	50.7%

- Male
- Female

EDUCATIONAL ATTAINMENT 2019

Target Occupation

Less than High School	High School	Associate/Some College	Bachelor's	Master's & Higher
19.0%	36.9%	32.1%	11.4%	0.7%

Total, All Industries

Less than High School	High School	Associate/Some College	Bachelor's	Master's & Higher
17.2%	17.7%	28.4%	24.0%	12.7%

- Less than High School
- High School
- Associate/Some College
- Bachelor's
- Master's & Higher

AGE DISTRIBUTION 2019

Target Occupation

< 24	25 to 39	40 to 54	55+
13.9%	39.9%	31.1%	15.1%

Total, All Industries

< 24	25 to 39	40 to 54	55+
30.6%	22.8%	19.9%	26.7%

- < 24
- 25 to 39
- 40 to 54
- 55+

RACE & ETHNICITY 2019

Target Occupation

Hispanic	White	Asian	Black	Other
72.7%	11.4%	9.2%	5.4%	1.4%

Total, All Industries

Hispanic	White	Asian	Black	Other
45.1%	29.2%	16.1%	6.3%	3.3%

- Hispanic
- White
- Asian
- Black
- Other

Crane and Tower Operators

(SOC 53-7021)

Operate mechanical boom and cable or tower and cable equipment to lift and move materials, machines, or products in many directions.

5-YEAR PROJECTIONS THROUGH 2024

230 Port-Related Openings
40 Net Job Change
190 Replacements

920 Projected Openings Across All Industries
160 Net Job Change
760 Replacements

1,560 Total Jobs in LA Basin

2019 HOURLY WAGES IN LA BASIN

$25.25
$15.04
$17.36

- Entry-Level Hourly Wage
- Living Wage (1 adult*) Los Angeles
- Living Wage (1 adult*) Orange County

*MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

390

Crane and tower operators employed in port-related industries in the LA Basin

25%

Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries

Industry subsectors with the most workers in this occupation:

1. Specialty Trade Contractors
2. Merchant Wholesalers, Durable Goods
3. Support Activities for Transportation

Top specialized skills in job postings:

1. Forklift Operation
2. Occupational Health and Safety
3. Repair
4. Telecommunications
5. Antenna Installation
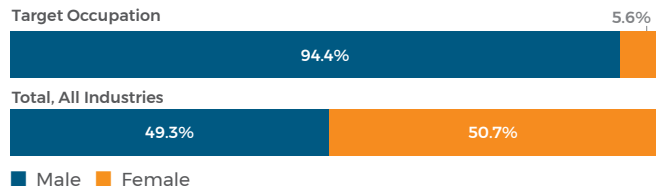
GENDER 2019

Target Occupation
94.4% | 5.6%

Total, All Industries
49.3% | 50.7%

- Male
- Female

EDUCATIONAL ATTAINMENT 2019

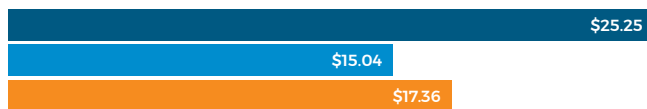Target Occupation
13.3% | 39.3% | 47.4% | 0.0% 0.0%

Total, All Industries
17.2% | 17.7% | 28.4% | 24.0% | 12.7%

- Less than High School
- High School
- Associate/Some College
- Bachelor's
- Master's & Higher

AGE DISTRIBUTION 2019

Target Occupation
0.0% | 22.7% | 40.0% | 37.3%

Total, All Industries
30.6% | 22.8% | 19.9% | 26.7%

- < 24
- 25 to 39
- 40 to 54
- 55+

RACE & ETHNICITY 2019

Target Occupation
56.2% | 23.1% | 12.9% | 0.0% | 7.8%

Total, All Industries
45.1% | 29.2% | 16.1% | 6.3% 3.3%

- Hispanic
- White
- Asian
- Black
- Other
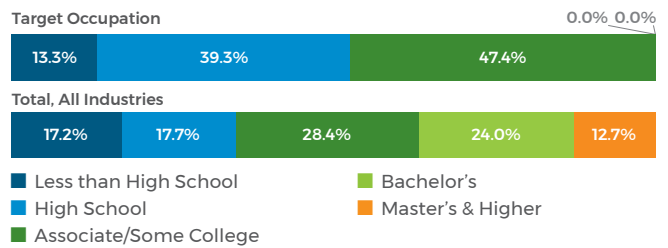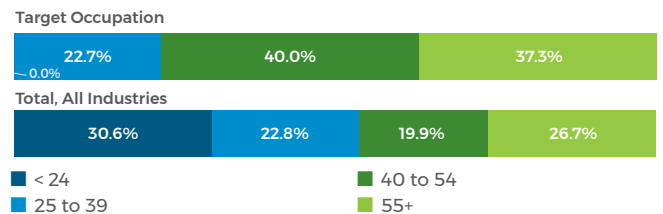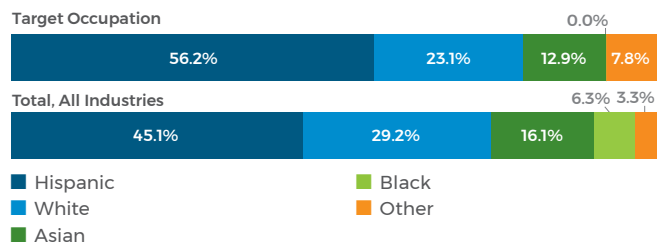
Laborers & Freight, Stock & Material Movers, Hand

(SOC 53-7062)

Manually move freight, stock, luggage, or other materials, or perform other general labor. Includes all manual laborers not elsewhere classified.

5-YEAR PROJECTIONS THROUGH 2024

6,980 **Port-Related Openings**
520 Net Job Change
6,460 Replacements

100,980 **Projected Openings Across All Industries**
7,500 Net Job Change
93,480 Replacements

154,510 **Total Jobs in LA Basin**

2019 HOURLY WAGES IN LA BASIN

$12.38	
$15.04	
$17.36	

- Entry-Level Hourly Wage
- Living Wage (1 adult*) Los Angeles
- Living Wage (1 adult*) Orange County

*MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

10,670

Laborers and freight, stock & material movers, (hand) employed in port-related industries in the LA Basin

7%

Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries

Industry subsectors with the most workers in this occupation:

1. **Administrative and Support Services**
2. **Merchant Wholesalers, Nondurable Goods**
3. **Support Activities for Transportation**

Top specialized skills in job postings:

1. **Forklift Operation**
2. **Lifting Ability**
3. **Customer Service**
4. **Packaging**
5. **Cleaning**
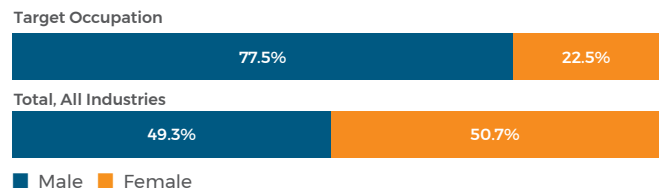
GENDER 2019

Target Occupation

77.5%	22.5%

Total, All Industries

49.3%	50.7%

- Male
- Female

EDUCATIONAL ATTAINMENT 2019

Target Occupation

19.5%	39.5%	32.1%	7.2%	1.6%

Total, All Industries

17.2%	17.7%	28.4%	24.0%	12.7%

- Less than High School
- High School
- Associate/Some College
- Bachelor's
- Master's & Higher

AGE DISTRIBUTION 2019

Target Occupation

22.2%	34.5%	26.3%	17.0%

Total, All Industries

30.6%	22.8%	19.9%	26.7%

- < 24
- 25 to 39
- 40 to 54
- 55+

RACE & ETHNICITY 2019

Target Occupation

67.4%	15.8%	6.3%	7.9%	2.5%

Total, All Industries

45.1%	29.2%	16.1%	6.3%	3.3%

- Hispanic
- White
- Asian
- Black
- Other
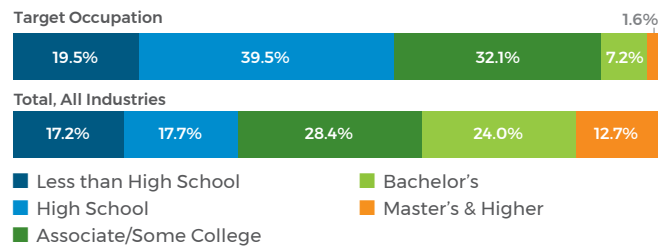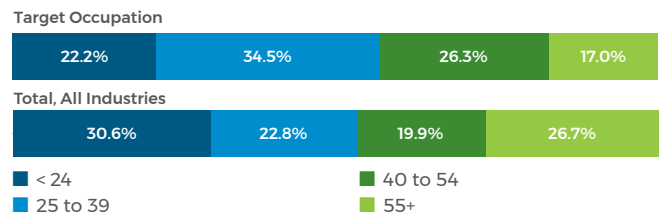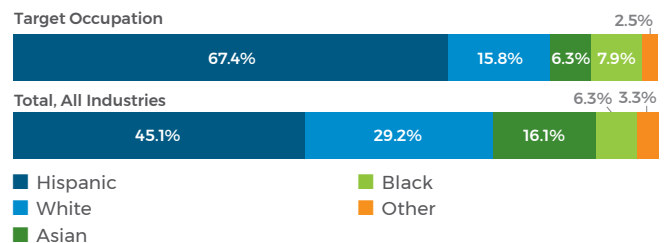
Industrial Machinery Mechanics
(SOC 49-9041)

Repair, install, adjust, or maintain industrial production and processing machinery or refinery and pipeline distribution systems. May also install, dismantle, or move machinery and heavy equipment according to plans.

5-YEAR PROJECTIONS THROUGH 2024

30 Port-Related Openings
0 Net Job Change
30 Replacements

3,440 Projected Openings Across All Industries
-50 Net Job Change
3,490 Replacements

8,730 Total Jobs in LA Basin

2019 HOURLY WAGES IN LA BASIN

- $20.84
- $15.04
- $17.36

■ Entry-Level Hourly Wage
■ Living Wage (1 adult*) Los Angeles
■ Living Wage (1 adult*) Orange County

*MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

70
Industrial machinery mechanics employed in port-related industries in the LA Basin

1%
Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries
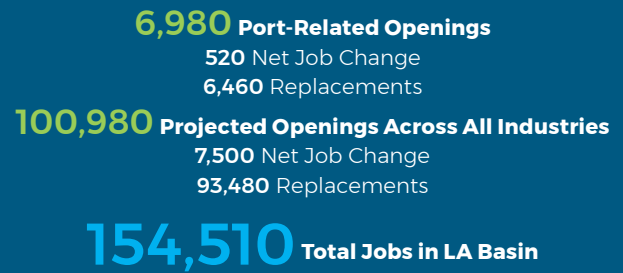
Industry subsectors with the most workers in this occupation:

1. **Merchant Wholesalers, Durable Goods**
2. **Repair and Maintenance**
3. **Aerospace Product and Parts Manufacturing**

Top specialized skills in job postings:

1. **Repair**
2. **Machinery**
3. **Predictive/Preventative Maintenance**
4. **Welding**
5. **Hand Tools**
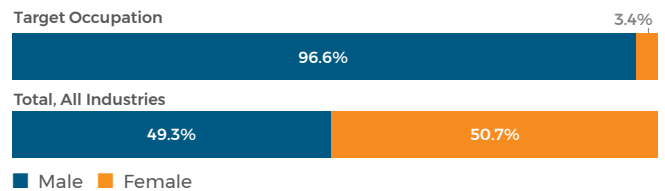
GENDER 2019

Target Occupation
96.6% | 3.4%

Total, All Industries
49.3% | 50.7%

■ Male ■ Female

EDUCATIONAL ATTAINMENT 2019

Target Occupation
9.4% | 23.8% | 46.4% | 16.2% | 4.2%

Total, All Industries
17.2% | 17.7% | 28.4% | 24.0% | 12.7%

■ Less than High School ■ Bachelor's
■ High School ■ Master's & Higher
■ Associate/Some College

AGE DISTRIBUTION 2019

Target Occupation
4.1% | 27.2% | 39.3% | 29.5%

Total, All Industries
30.6% | 22.8% | 19.9% | 26.7%

■ < 24 ■ 40 to 54
■ 25 to 39 ■ 55+

RACE & ETHNICITY 2019

Target Occupation
57.2% | 25.9% | 11.4% | 4.5% | 1.0%

Total, All Industries
45.1% | 29.2% | 16.1% | 6.3% | 3.3%

■ Hispanic ■ Black
■ White ■ Other
■ Asian
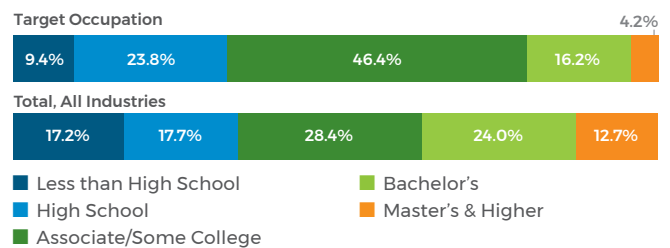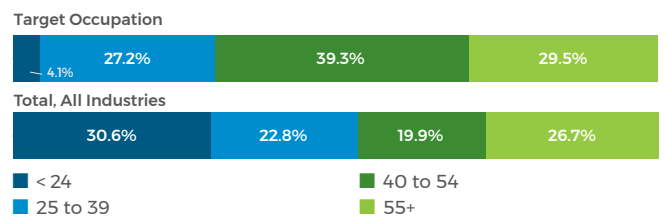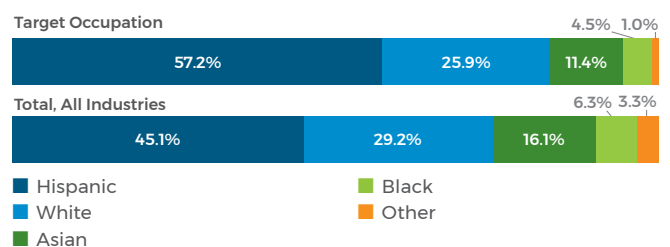
Electricians

(SOC 47-2111)

Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service streetlights, intercom systems, or electrical control systems.

5-YEAR PROJECTIONS THROUGH 2024

40 Port-Related Openings
10 Net Job Change
30 Replacements

13,050 Projected Openings Across All Industries
1,780 Net Job Change
11,270 Replacements

22,760 Total Jobs in LA Basin

2019 HOURLY WAGES IN LA BASIN

$23.59	Entry-Level Hourly Wage
$15.04	Living Wage (1 adult*) Los Angeles
$17.36	Living Wage (1 adult*) Orange County

*MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

65

Electricians employed in port-related industries in the LA Basin

0.3%

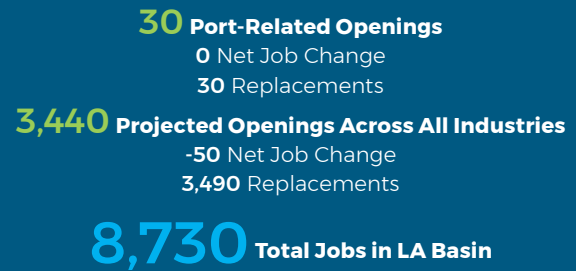Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries

Industry subsectors with the most workers in this occupation:

1. Specialty Trade Contractors
2. Motion Picture and Sound Recording
3. Construction of Buildings

Top specialized skills in job postings:

1. Electrical Work
2. Repair
3. Electrical Systems
4. Wiring
5. Hand Tools

GENDER 2019

Target Occupation

Male	Female
99.3%	0.7%

Total, All Industries

Male	Female
49.3%	50.7%

- Male
- Female

EDUCATIONAL ATTAINMENT 2019

Target Occupation

Less than High School	High School	Associate/Some College	Bachelor's	Master's & Higher
9.9%	32.4%	45.8%	9.8%	2.1%

Total, All Industries

Less than High School	High School	Associate/Some College	Bachelor's	Master's & Higher
17.2%	17.7%	28.4%	24.0%	12.7%

- Less than High School
- High School
- Associate/Some College
- Bachelor's
- Master's & Higher

AGE DISTRIBUTION 2019

Target Occupation

< 24	25 to 39	40 to 54	55+
6.6%	39.4%	32.6%	21.4%

Total, All Industries

< 24	25 to 39	40 to 54	55+
30.6%	22.8%	19.9%	26.7%

- < 24
- 25 to 39
- 40 to 54
- 55+

RACE & ETHNICITY 2019

Target Occupation

Hispanic	White	Asian	Black	Other
62.7%	26.7%	7.3%	2.0%	1.3%

Total, All Industries

Hispanic	White	Asian	Black	Other
45.1%	29.2%	16.1%	6.3%	3.3%

- Hispanic
- White
- Asian
- Black
- Other

Avionics Technicians

(SOC 49-2091)

Install, inspect, test, adjust, or repair avionics equipment, such as radar, radio, navigation, and missile control systems in aircraft or space vehicles.

2019 HOURLY WAGES IN LA BASIN

$29.87
$15.04
$17.36

■ Entry-Level Hourly Wage
■ Living Wage (1 adult*) Los Angeles
■ Living Wage (1 adult*) Orange County

*MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

500

Avionics technicians employed in port-related industries in the LA Basin

85%

Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries
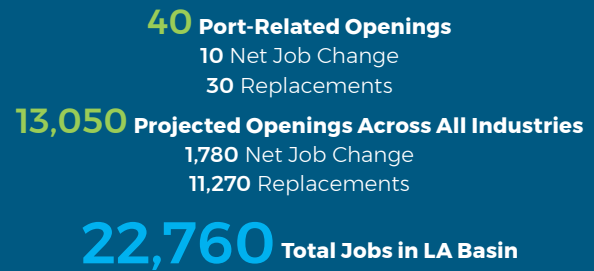
Industry subsectors with the most workers in this occupation:

1. **Support Activities for Transportation**
2. **Aerospace Product and Parts Manufacturing**
3. **Navigational, Measuring, Electromedical and Control Instruments Manufacturing**

Top specialized skills in job postings:

1. **Avionics**
2. **Repair**
3. **Schematic Diagrams**
4. **Test Equipment**
5. **Hand Tools**
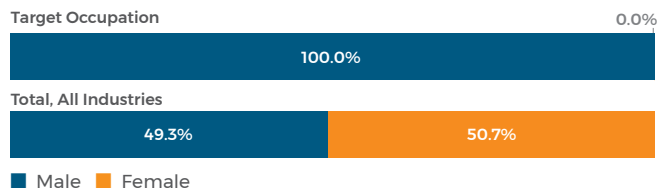
GENDER 2019

Target Occupation
100.0% | 0.0%

Total, All Industries
49.3% | 50.7%

■ Male ■ Female

EDUCATIONAL ATTAINMENT 2019

Target Occupation
0.0% | 40.7% | 39.7% | 6.5% | 13.1%

Total, All Industries
17.2% | 17.7% | 28.4% | 24.0% | 12.7%

■ Less than High School
■ High School
■ Associate/Some College
■ Bachelor's
■ Master's & Higher

AGE DISTRIBUTION 2019

Target Occupation
0.0% | 34.2% | 30.6% | 35.2%

Total, All Industries
30.6% | 22.8% | 19.9% | 26.7%

■ < 24
■ 25 to 39
■ 40 to 54
■ 55+

RACE & ETHNICITY 2019

Target Occupation
5.5% | 46.6% | 0.0% | 30.6% | 17.2%

Total, All Industries
45.1% | 29.2% | 16.1% | 6.3% | 3.3%

■ Hispanic
■ White
■ Asian
■ Black
■ Other
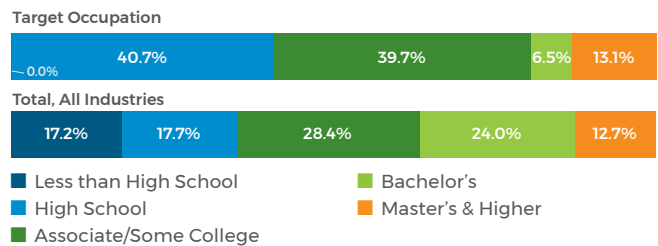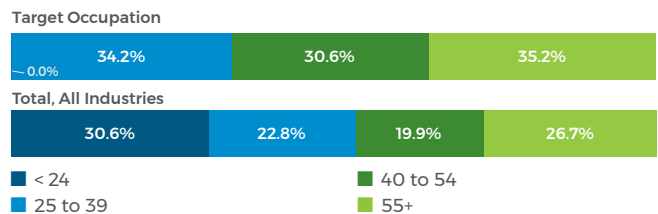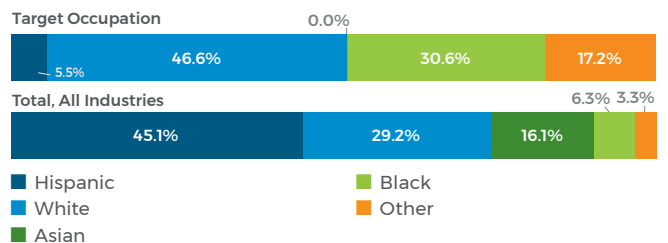
Aircraft Mechanics & Service Technicians

(SOC 49-3011)

Diagnose, adjust, repair, or overhaul aircraft engines and assemblies, such as hydraulic and pneumatic systems.
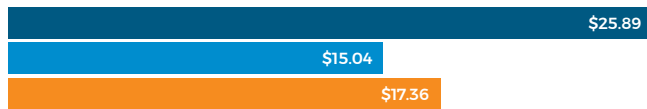
5-YEAR PROJECTIONS THROUGH 2024

2,820 Port-Related Openings
940 Net Job Change
1,880 Replacements

3,060 Projected Openings Across All Industries
1,020 Net Job Change
2,040 Replacements

5,430 Total Jobs in LA Basin

2019 HOURLY WAGES IN LA BASIN

$25.89
$15.04
$17.36

- Entry-Level Hourly Wage
- Living Wage (1 adult*) Los Angeles
- Living Wage (1 adult*) Orange County

*MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

5,020

Aircraft mechanics and service technicians employed in port-related industries in the LA Basin

92%

Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries
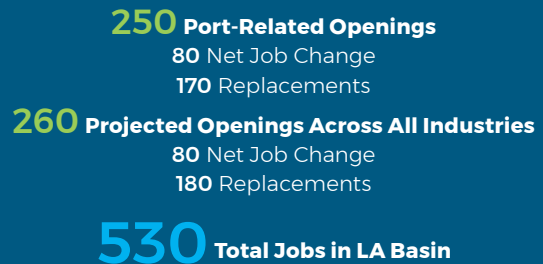
Industry subsectors with the most workers in this occupation:

1. Support Activities for Transportation
2. Air Transportation
3. Aerospace Product and Parts Manufacturing

Top specialized skills in job postings:

1. Repair
2. Cardiopulmonary Resuscitation
3. Aircraft Maintenance
4. Quality Assurance and Control
5. Hand Tools
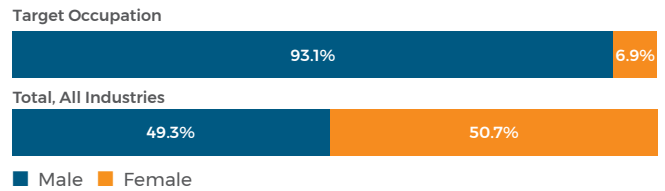
GENDER 2019

Target Occupation

| 93.1% | 6.9% |

Total, All Industries

| 49.3% | 50.7% |

- Male
- Female

EDUCATIONAL ATTAINMENT

Target Occupation

0.6%

| 10.9% | 19.0% | 63.5% | 6.0% |

Total, All Industries

| 17.2% | 17.7% | 28.4% | 24.0% | 12.7% |

- Less than High School
- High School
- Associate/Some College
- Bachelor's
- Master's & Higher

AGE DISTRIBUTION 2019

Target Occupation

2.5%

| 26.9% | 27.0% | 43.6% |

Total, All Industries

| 30.6% | 22.8% | 19.9% | 26.7% |

- < 24
- 25 to 39
- 40 to 54
- 55+

RACE & ETHNICITY 2019

Target Occupation

| 41.2% | 24.9% | 18.0% | 9.5% | 6.4% |

Total, All Industries

6.3% 3.3%

| 45.1% | 29.2% | 16.1% | | |

- Hispanic
- White
- Asian
- Black
- Other
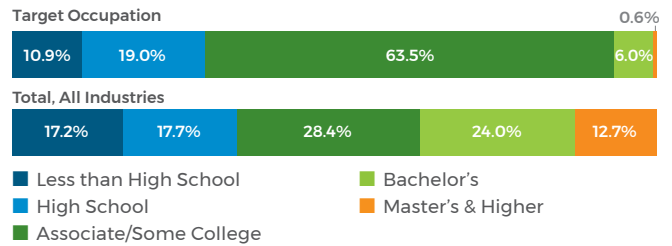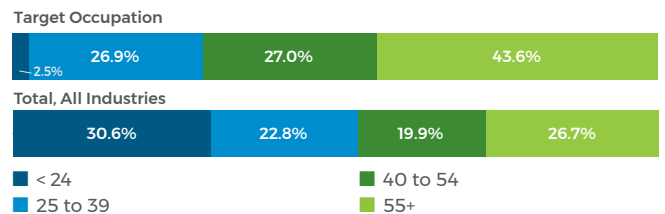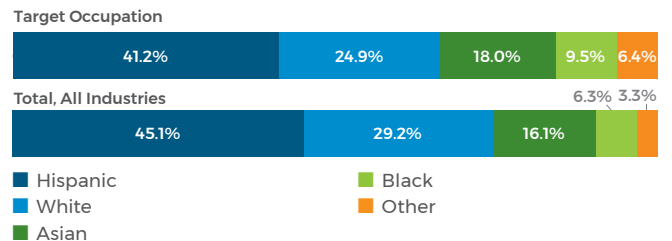
Transportation, Storage, & Distribution Managers

(SOC 11-3071)

Plan, direct, or coordinate transportation, storage, or distribution activities in accordance with organizational policies and applicable government laws or regulations. Includes logistics managers.

5-YEAR PROJECTIONS THROUGH 2024

390 **Port-Related Openings**
90 Net Job Change
300 Replacements

3,280 **Projected Openings Across All Industries**
710 Net Job Change
2,570 Replacements

7,650 **Total Jobs in LA Basin**

2019 HOURLY WAGES IN LA BASIN

Entry-Level Hourly Wage	$34.25
Living Wage (1 adult*) Los Angeles	$15.04
Living Wage (1 adult*) Orange County	$17.36

- ■ Entry-Level Hourly Wage
- ■ Living Wage (1 adult*) Los Angeles
- ■ Living Wage (1 adult*) Orange County

*MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

900

Transportation, storage, and distribution managers employed in port-related industries in the LA Basin

12%

Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries

Industry subsectors with the most workers in this occupation:

1. **Warehousing and Storage**
2. **Truck Transportation**
3. **Management of Companies and Enterprises**

Top specialized skills in job postings:

1. **Logistics**
2. **Scheduling**
3. **Warehouse Management**
4. **Budgeting**
5. **Inventory Management**

GENDER 2019

Target Occupation

Male	Female
80.2%	19.8%

Total, All Industries

Male	Female
49.3%	50.7%

- ■ Male
- ■ Female

EDUCATIONAL ATTAINMENT 2019

Target Occupation

Less than High School	High School	Associate/Some College	Bachelor's	Master's & Higher
8.5%	25.7%	31.2%	31.5%	3.2%

Total, All Industries

Less than High School	High School	Associate/Some College	Bachelor's	Master's & Higher
17.2%	17.7%	28.4%	24.0%	12.7%

- ■ Less than High School
- ■ High School
- ■ Associate/Some College
- ■ Bachelor's
- ■ Master's & Higher

AGE DISTRIBUTION 2019

Target Occupation

< 24	25 to 39	40 to 54	55+
1.2%	35.1%	39.1%	24.5%

Total, All Industries

< 24	25 to 39	40 to 54	55+
30.6%	22.8%	19.9%	26.7%

- ■ < 24
- ■ 25 to 39
- ■ 40 to 54
- ■ 55+

RACE & ETHNICITY 2019

Target Occupation

Hispanic	White	Asian	Black	Other
43.4%	26.0%	18.3%	8.0%	4.4%

Total, All Industries

Hispanic	White	Asian	Black	Other
45.1%	29.2%	16.1%	6.3%	3.3%

- ■ Hispanic
- ■ White
- ■ Asian
- ■ Black
- ■ Other

Logisticians

(SOC 13-1081)

Analyze and coordinate the ongoing logistical functions of a firm or organization. Responsible for the entire life cycle of a product, including acquisition, distribution, internal allocation, delivery, and final disposal of resources.

5-YEAR PROJECTIONS THROUGH 2024

310 Port-Related Openings
30 Net Job Change
280 Replacements

3,880 Projected Openings Across All Industries
340 Net Job Change
3,540 Replacements

8,510 Total Jobs in LA Basin

2019 HOURLY WAGES IN LA BASIN

$31.26
$15.04
$17.36

- Entry-Level Hourly Wage
- Living Wage (1 adult*) Los Angeles
- Living Wage (1 adult*) Orange County

MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

690

Logisticians employed in port-related industries in the LA Basin

8%

Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries

Industry subsectors with the most workers in this occupation:

1. **Aerospace Product and Parts Manufacturing**
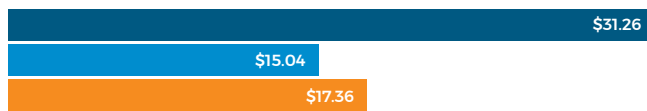2. **Management of Companies and Enterprises**
3. **Utilities**

Top specialized skills in job postings:

1. **Supply Chain Knowledge**
2. **Logistics**
3. **Scheduling**
4. **Supply Chain Management**
5. **Enterprise Resource Planning**
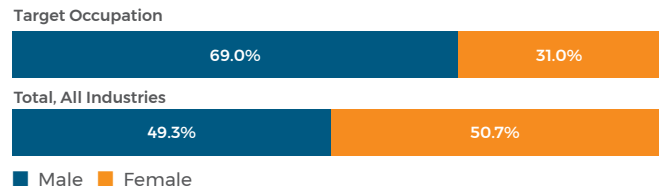
GENDER 2019

Target Occupation

69.0%	31.0%

Total, All Industries

49.3%	50.7%

- Male
- Female

EDUCATIONAL ATTAINMENT 2019

Target Occupation

15.7%	0.6%	25.3%	48.6%	9.8%

Total, All Industries

17.2%	17.7%	28.4%	24.0%	12.7%

- Less than High School
- High School
- Associate/Some College
- Bachelor's
- Master's & Higher

AGE DISTRIBUTION 2019

Target Occupation

6.4%	42.6%	38.0%	13.0%

Total, All Industries

30.6%	22.8%	19.9%	26.7%

- < 24
- 25 to 39
- 40 to 54
- 55+

RACE & ETHNICITY 2019

Target Occupation

28.0%	32.9%	28.1%	4.0%	7.0%

Total, All Industries

45.1%	29.2%	16.1%	6.3%	3.3%

- Hispanic
- White
- Asian
- Black
- Other
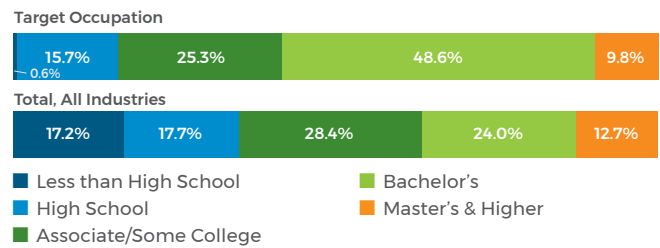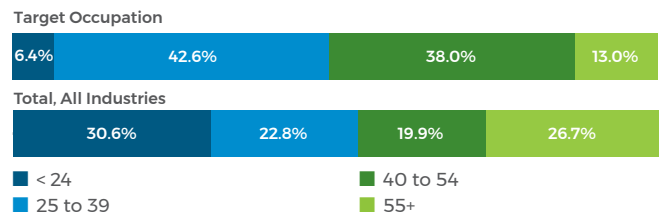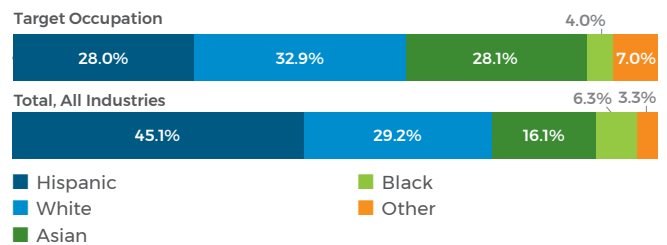
Cargo and Freight Agents

(SOC 43-5011)

Expedite and route movement of incoming and outgoing cargo and freight shipments in airline, train, and trucking terminals and shipping docks. Take orders from customers and arrange pickup of freight and cargo for delivery to loading platform. Prepare and examine bills of lading to determine shipping charges and tariffs.

5-YEAR PROJECTIONS THROUGH 2024

4,180 **Port-Related Openings**
1,380 Net Job Change
2,800 Replacements

5,470 **Projected Openings Across All Industries**
1,810 Net Job Change
3,660 Replacements

8,520 **Total Jobs in LA Basin**

2019 HOURLY WAGES IN LA BASIN

- $17.07
- $15.04
- $17.36

■ Entry-Level Hourly Wage
■ Living Wage (1 adult*) Los Angeles
■ Living Wage (1 adult*) Orange County

*MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

6,500
Cargo and freight agents employed in port-related industries in the LA Basin

76%
Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries

Industry subsectors with the most workers in this occupation:

1. **Support Activities for Transportation**
2. **Air Transportation**
3. **Couriers and Messengers**

Top specialized skills in job postings:

1. **Customer Service**
2. **Customer Contact**
3. **Forklift Operation**
4. **Freight Brokerage**
5. **Materials Transport**

GENDER 2019

Target Occupation

61.5%	38.5%

Total, All Industries

49.3%	50.7%

■ Male ■ Female

EDUCATIONAL ATTAINMENT 2019

Target Occupation

~0.0%	23.2%	63.8%	10.3%	2.6%

Total, All Industries

17.2%	17.7%	28.4%	24.0%	12.7%

■ Less than High School ■ Bachelor's
■ High School ■ Master's & Higher
■ Associate/Some College

AGE DISTRIBUTION 2019

Target Occupation

3.9%	49.6%	9.5%	37.0%

Total, All Industries

30.6%	22.8%	19.9%	26.7%

■ < 24 ■ 40 to 54
■ 25 to 39 ■ 55+

RACE & ETHNICITY 2019

Target Occupation

35.0%	8.3%	26.9%	22.2%	7.6%

Total, All Industries

45.1%	29.2%	16.1%	6.3%	3.3%

■ Hispanic ■ Black
■ White ■ Other
■ Asian

Transportation Inspectors

(SOC 53-6051)

Inspect equipment or goods in connection with the safe transport of cargo or people. Includes rail transportation inspectors, such as freight inspectors, rail inspectors, and other inspectors of transportation vehicles not elsewhere classified.

5-YEAR PROJECTIONS THROUGH 2024

330 Port-Related Openings
100 Net Job Change
230 Replacements

670 Projected Openings Across All Industries
200 Net Job Change
470 Replacements

1,000 Total Jobs in LA Basin

2019 HOURLY WAGES IN LA BASIN

- $14.58
- $15.04
- $17.36

- ■ Entry-Level Hourly Wage
- ■ Living Wage (1 adult*) Los Angeles
- ■ Living Wage (1 adult*) Orange County

*MIT Living Wage Calculator

2019 INDUSTRY DISTRIBUTION

490
Transportation inspectors employed in port-related industries in the LA Basin

49%
Percentage of workers in this occupation in the LA Basin employed in Port-Related Industries

Industry subsectors with the most workers in this occupation:

1. Public Administration
2. Support Activities for Transportation
3. Air Transportation

Top specialized skills in job postings:

1. Customer Service
2. Customer Contact
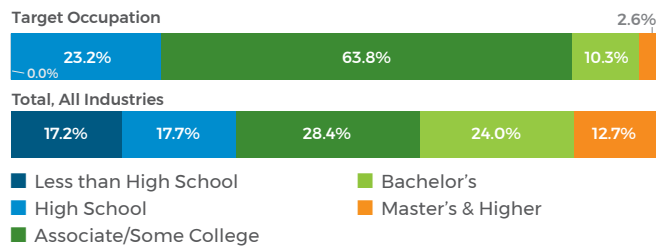3. Forklift Operation
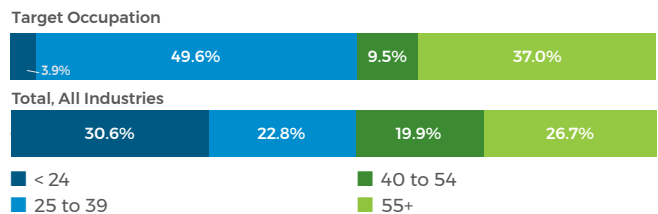4. Freight Brokerage
5. Materials Transport

GENDER 2019

Target Occupation

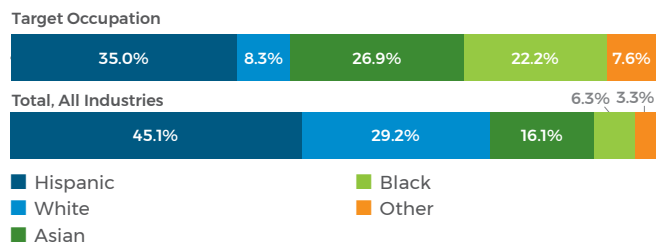| 86.1% | 13.9% |

Total, All Industries

| 49.3% | 50.7% |

- ■ Male   ■ Female

EDUCATIONAL ATTAINMENT 2019

Target Occupation

| 3.8% | 21.7% | 44.7% | 20.7% | 9.1% |

Total, All Industries

| 17.2% | 17.7% | 28.4% | 24.0% | 12.7% |

- ■ Less than High School
- ■ High School
- ■ Associate/Some College
- ■ Bachelor's
- ■ Master's & Higher

AGE DISTRIBUTION 2019

Target Occupation

| 2.4% | 33.5% | 22.6% | 41.4% |

Total, All Industries

| 30.6% | 22.8% | 19.9% | 26.7% |

- ■ < 24
- ■ 25 to 39
- ■ 40 to 54
- ■ 55+

RACE & ETHNICITY 2019

Target Occupation

| 45.7% | 19.9% | 18.3% | 13.2% | 2.9% |

Total, All Industries

| 45.1% | 29.2% | 16.1% | 6.3% | 3.3% |

- ■ Hispanic
- ■ White
- ■ Asian
- ■ Black
- ■ Other

Appendix

Three-year average number of awards issued by regional community colleges (academic years 2017-18, 2018-19, and 2019-20)

Program – TOP/College	3-Yr Average (2017-2020)
International Business and Trade - 050800	**371**
Cerritos	18
East LA	6
Fullerton	1
Glendale	2
LA Pierce	1
Long Beach	8
Mt San Antonio	27
Orange Coast	5
Pasadena	4
Rio Hondo	1
Saddleback	5
Santa Ana	290
Santa Monica	2
Industrial Systems Technology and Maintenance - 094500	**119**
Fullerton	1
LA Harbor	1
LA Southwest	3
LA Trade	82
Long Beach	0
Santiago Canyon	15
West LA	18
Heavy Equipment Operation - 094730	**28**
Santiago Canyon	28
Aeronautical and Aviation Technology - 095000	**54**
Long Beach	1
Mt San Antonio	8
Orange Coast	38
West LA	7
Aviation Airframe Mechanics - 095010	**106**
Mt San Antonio	22
Orange Coast	31
West LA	53
Aviation Powerplant Mechanics - 095020	**97**
Mt San Antonio	23
Orange Coast	30
West LA	45

Logistics and Materials Transportation - 051000	**208**
Coastline	114
East LA	72
LA Harbor	1
Rio Hondo	12
Santa Monica	9
Electrical - 095220	**207**
Irvine Valley	10
LA Trade	148
North Orange Adult	18
Orange Coast	3
Santiago Canyon	28
Manufacturing and Industrial Technology - 095600	**84**
Cerritos	3
Compton	1
El Camino	2
Fullerton	19
Glendale	1
Irvine Valley	1
LA Trade	5
LA Valley	5
Mt San Antonio	12
Saddleback	9
Santa Ana	1
Santiago Canyon	**26**
Travel Services and Tourism - 300900	26
Cypress	13
Orange Coast	4
Saddleback	8
West LA	1
Aviation and Airport Management and Services - 302000	**13**
Orange Coast	13
Aviation and Airport Management - 302010	**44**
Cypress	38
Glendale	6
Piloting - 302020	**136**
Cypress	50
Glendale	7
Mt San Antonio	55
Orange Coast	23
Air Traffic Control - 302030	**30**
Mt San Antonio	30
Flight Attendant - 302040	**60**
Cypress	45
Glendale	7
Orange Coast	8

www.CompetitiveWorkforce.LA

CENTER FOR A COMPETITIVE WORKFORCE

FOR MORE INFORMATION

www.CompetitiveWorkforce.LA

LAEDC

LOS ANGELES COUNTY
ECONOMIC DEVELOPMENT CORPORATION
Collaboratively Advancing Growth and Prosperity for All

C·O·E

CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH