

Labor Market Analysis for Program Exploration:
 0510.00/Logistics and Materials Transportation
 (Global Supply Chain Management)
 Orange County Center of Excellence, April 2024



Summary

Program LMI Endorsement	Endorsed: All LMI Criteria Met <input checked="" type="checkbox"/>	Endorsed: Some LMI Criteria Met <input type="checkbox"/>	Not LMI Endorsed <input type="checkbox"/>
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Program LMI Endorsement Criteria

	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Supply Gap:	<i>Comments:</i> There are projected to be 1,940 middle-skill annual job openings throughout Los Angeles and Orange counties for supply chain occupations, which is less than the 24,791 awards conferred by educational institutions . However, these educational programs also prepare students for 31 other related occupations, which account for 59,030 additional annual job openings . Because these programs train for a variety of occupations with high demand, there is an undersupply of labor for these supply chain occupations.	
Living Wage: (Entry-Level, 25 th)	<i>Comments:</i> All annual job openings for these supply chain occupations have entry-level hourly wages above the OC living wage of \$20.63.	
Education:	<i>Comments:</i> Though a slight majority (51%) of these supply chain occupations typically requires a high school diploma or equivalent, more than one-third of workers in the field have completed some college or an associate degree as their highest level of education.	

Emerging Occupation(s)		
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
<i>Comments:</i> N/A		

The Orange County Center of Excellence for Labor Market Research (OC COE) prepared this report to determine whether there is a supply gap in the Los Angeles/Orange County regional labor market related to two middle-skill occupations:

- *Transportation, Storage, and Distribution Managers (11-3071)*
- *Logisticians (13-1081)*

Based on the available data, there appears to be a supply gap for these supply chain occupations. Though the number of awards for these occupations exceeds demand, supply is overstated because the related educational programs train for an additional 31 occupations. When considering the high demand for these occupations, there is an undersupply of labor for the two supply chain occupations. In addition, typical education requirements for these occupations align with a community college education and typical entry-level wages are above the living wage. **Therefore, due to all the regional labor market criteria being met, the COE endorses this proposed program.**

Exhibit 1 lists the occupational demand, supply, typical entry-level education, and educational attainment for the occupations included in this report.

Exhibit 1: Labor Market Endorsement Summary

Occupation (SOC)	Demand (Annual Openings)	Supply (CC and Non-CC)	Entry-Level Hourly Earnings (25 th Percentile)	Typical Entry-Level Education	Community College Educational Attainment
Transportation, Storage, and Distribution Managers (11-3071)	LA: 748	LA: 16,412		High school diploma or equivalent	36%
	OC: 245	OC: 8,048	OC: \$35.45		
	TTL: 993	TTL: 24,460			
Logisticians (13-1081)	LA: 682	LA: 144		Bachelor's degree	37%
	OC: 268	OC: 187	OC: \$30.33		
	TTL: 950	TTL: 331			
Total	1,943	24,791	N/A	N/A	N/A

Demand:

- The number of jobs related to these supply chain occupations is projected to increase 6% through 2027, equating to 1,943 annual job openings.
- Hourly entry-level wages for these supply chain occupations range from \$30.33 to \$35.45 in Orange County; all annual job openings have entry-level wages above the living wage.
- There were 5,829 online job postings for these supply chain occupations over the past 12 months. The highest number of postings were for warehouse supervisors, warehouse managers, and supply chain managers.
- The typical entry-level education for these supply chain occupations ranges from a high school diploma or equivalent to a bachelor's degree.
- Between 36% and 37% of workers in the field have completed some college or an associate degree as their highest level of educational attainment.

Supply:

- There was an average of 9,712 awards conferred by 29 community colleges in Los Angeles and Orange Counties from 2019 to 2022.
- Non-community college institutions conferred an average of 15,079 awards from 2019 to 2021.
- Due to a low number of students, there was insufficient data to determine the following metrics:
 - Orange County community college students that exited logistics and materials transportation programs in the 2020-21 academic year and the percentage of students who attained the regional living wage.
 - The percentage of Orange County community college logistics and materials transportation students that exited their program in 2019-20 who reported that they are working in a job closely related to their field of study.

Demand

Occupational Projections:

Exhibit 2 shows the annual percent change in jobs for these supply chain occupations from 2017 through 2027. Though there was a 7% decline across all occupations in Los Angeles and Orange counties from 2019 to 2020 due to the COVID-19 pandemic, employment in these supply chain occupations only decreased 2% during the same period and experienced significant increases through 2022.

In the three years preceding the pandemic, employment increased for these occupations. In addition, employment for these supply chain occupations is projected to increase at a similar rate relative to all occupations through 2027.

In the three years preceding the pandemic, employment for these occupations had variable levels of increases and growth had been slowing. After increase in employment in 2021 and 2022, employment for these supply chain occupations is projected to increase at a similar rate relative to all occupations through 2027.

Exhibit 2: Annual Percent Change in Jobs for Supply Chain Occupations, 2017-2027

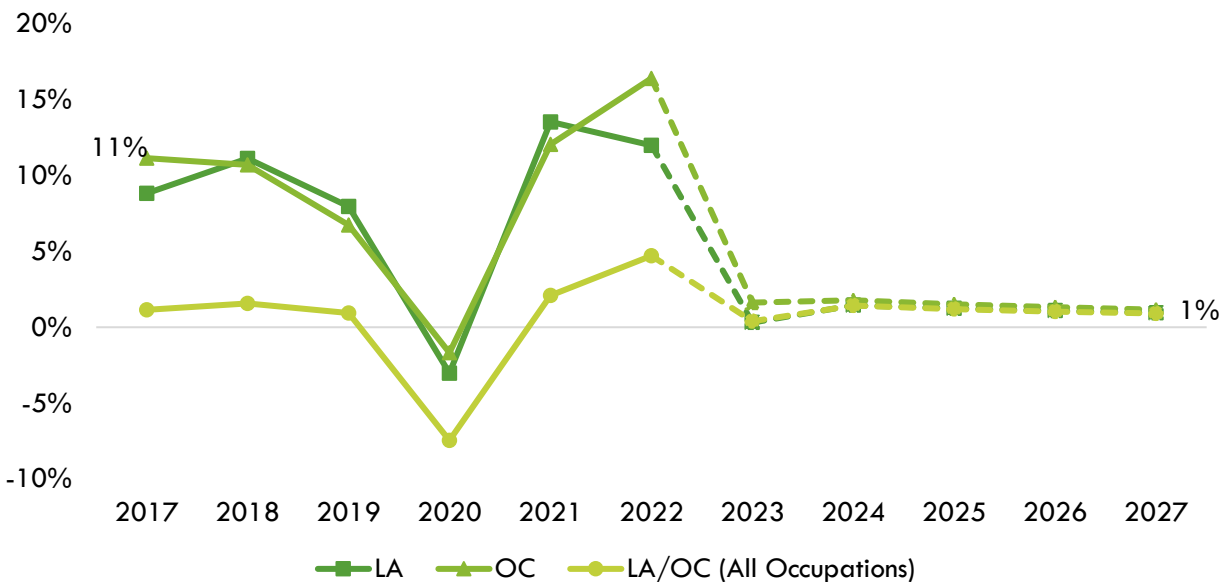


Exhibit 3 shows the five-year occupational demand projections for these supply chain occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 6% through 2027. There is projected to be 1,943 jobs available annually.

Exhibit 3: Occupational Demand in Los Angeles and Orange Counties¹

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	15,730	16,535	805	5%	1,430
Orange	5,330	5,736	406	8%	513
Total	21,060	22,271	1,211	6%	1,943

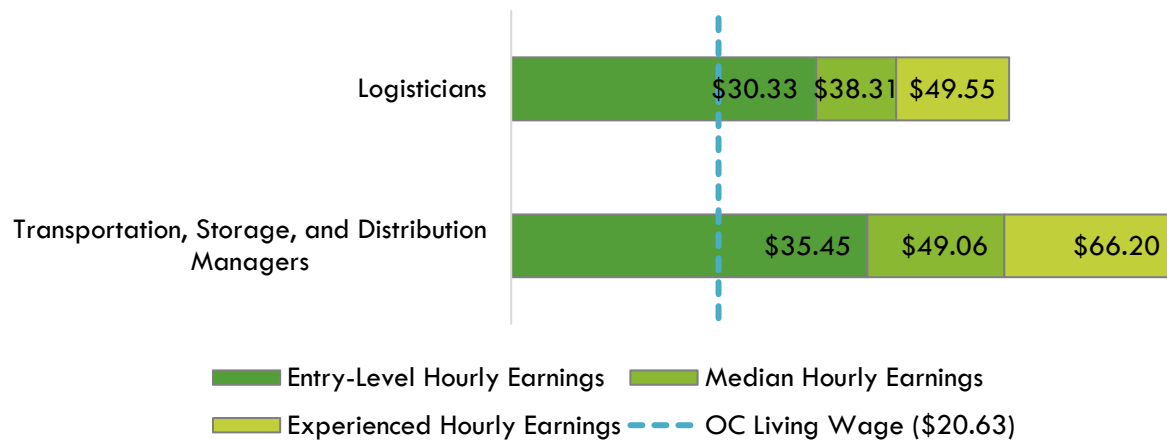
¹ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Wages:

The labor market endorsement in this report considers the entry-level hourly wages for these supply chain occupations in Orange County as they relate to the county's living wage. Los Angeles County wages are included below to provide a complete analysis of the LA/OC region.

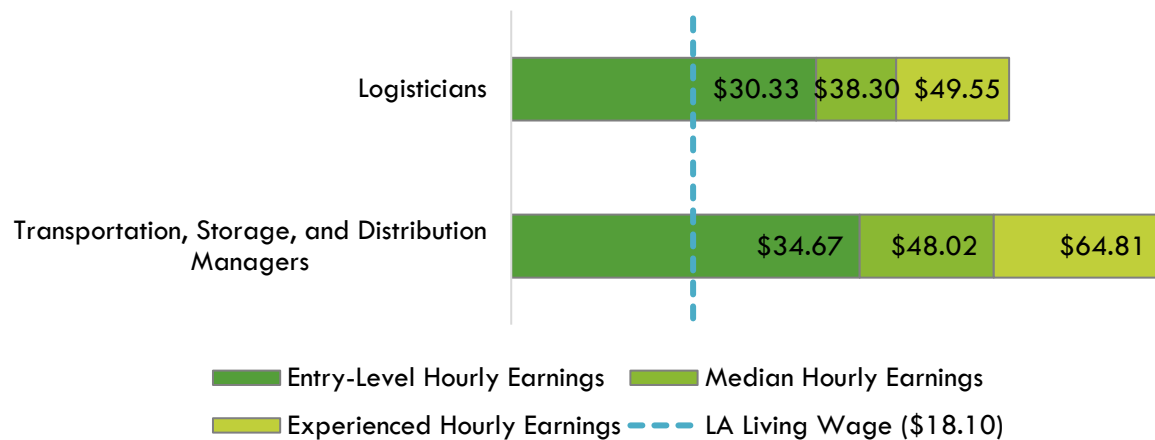
All annual openings for these supply chain occupations have entry-level wages above the living wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages range between \$30.33 and \$35.45. Orange County's average wages of \$47.44 are below the average statewide wage of \$48.43 for these occupations. Exhibit 4 shows the wage range for each of these supply chain occupations in Orange County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

Exhibit 4: Wages by Occupation in Orange County



All annual openings for these supply chain occupations have entry-level wages above the living wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$33.03 and \$34.67. Los Angeles County's average wages of \$47.53 are below the average statewide wage of \$48.43 for these occupations. Exhibit 5 shows the wage range for each of these supply chain occupations in Los Angeles County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

Exhibit 5: Wages by Occupation in Los Angeles County



Job Postings:

Important Online Job Postings Data Note: Online job postings data is sourced from Lightcast, a labor market analytics firm that scrapes, collects, and organizes data from online job boards such as LinkedIn, Indeed, Glassdoor, Monster, GovernmentJobs.com, and thousands more. Lightcast uses natural language processing (NLP) to determine the related company, industry, occupation, and other information for each job posting. However, NLP has limitations that include understanding contextual words of phrases; determining differences in words that can be used as nouns, verbs, and/or adjectives; and misspellings or grammatical errors.² For these reasons, job postings could be assigned to the wrong employer, industry, or occupation within Lightcast’s database.

Additionally, there are several limitations when analyzing job postings. A single job posting may not represent a single job opening, as employers may be creating a pool of candidates for future openings or hiring for multiple positions with a single posting. Additionally, not all jobs are posted online, and jobs may be filled through other methods such as internal promotion, word-of-mouth advertising, physical job boards, or a variety of other channels.

There were 5,829 online job postings related to these supply chain occupations listed in the past 12 months. Exhibit 6 shows the number of job postings by occupation. Nearly 59% of job postings were for transportation, storage, and distribution managers and approximately 41% were for logisticians.

Exhibit 6: Number of Job Postings by Occupation (n=5,829)

Occupation	Job Postings	Percentage of Job Postings
Transportation, Storage, and Distribution Managers	3,463	59%
Logisticians	2,366	41%
Total Postings	5,829	100%

The top employers in the region, by number of job postings, are shown in Exhibit 7.

Exhibit 7: Top Employers by Number of Job Postings (n=5,829)

Employer	Job Postings	Percentage of Job Postings
Northrop Grumman	188	3%
Geopaq Logic	107	2%
The Judge Group	70	1%
SpaceX	65	1%
Cma Cgm	58	1%
Niagara Bottling	48	1%
Boeing	44	1%
Randstad	34	1%
Lockheed Martin	31	1%
Southern California Edison	31	1%

² K. R. Chowdhary, Fundamentals of Artificial Intelligence (Basingstoke: Springer Nature, 2020), <https://link.springer.com/book/10.1007/978-81-322-3972-7>.

The top specialized, soft, and computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 8.

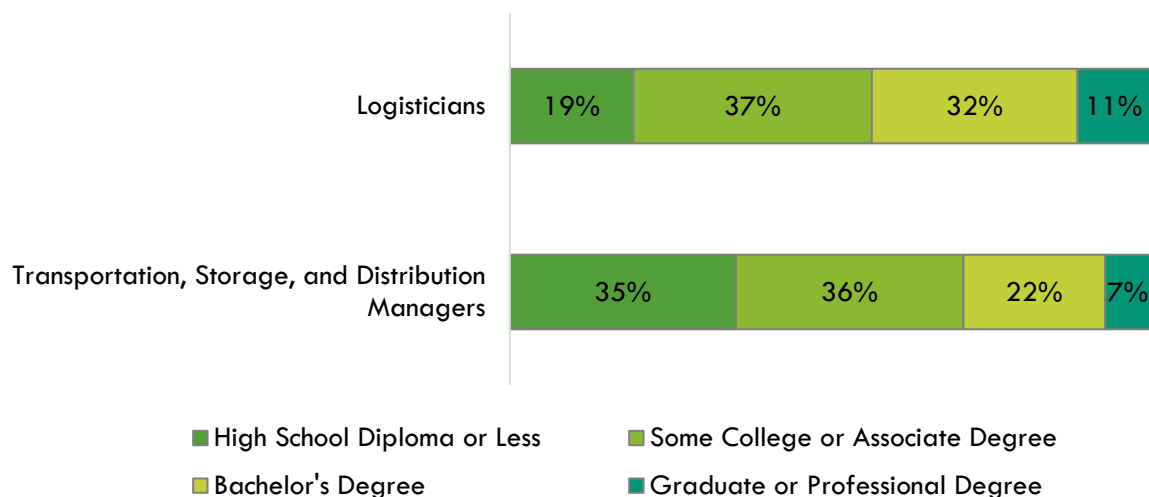
Exhibit 8: Top Skills by Number of Job Postings (n=5,829)

Top Specialized Skills	Top Soft Skills	Top Computer Skills
Supply Chain (2,259)	Management (2,331)	Microsoft Excel (1,258)
Warehousing (1,746)	Operations (2,309)	Microsoft Office (917)
Purchasing (1,097)	Communication (2,249)	Microsoft PowerPoint (607)
Supply Chain Management (1,048)	Planning (1,880)	SAP Applications (607)
Procurement (1,039)	Leadership (1,536)	Warehouse Management Systems (417)
Inventory Management (989)	Customer Service (1,284)	Microsoft Outlook (364)
Logistics (823)	Microsoft Excel (1,258)	Microsoft Word (197)
Project Management (704)	Problem Solving (1,203)	Inventory Management System (194)
Key Performance Indicators (KPIs) (684)	Sales (1,004)	SQL (Programming Language) (177)
Inventory Control (652)	Detail Oriented (925)	Power BI (156)

Educational Attainment:

The Bureau of Labor Statistics (BLS) lists a high school diploma or equivalent as the typical entry-level education for *transportation, storage, and distribution managers* and a bachelor's degree for *logisticians*. However, the national-level educational attainment data indicates between 36% and 37% of workers in the field have completed some college or an associate degree as their highest level of education. Exhibit 9 shows the educational attainment for each occupation, sorted by highest community college educational attainment to lowest.

Exhibit 9: National-level Educational Attainment for Occupations



Of the 73% of the cumulative job postings for these supply chain occupations that listed a minimum education requirement in Los Angeles/Orange County, 31% (1,302) requested a high school diploma or an associate degree and 68% (2,888) requested a bachelor's degree.

Educational Supply

Community College Supply:

Exhibit 10 shows the three-year average number of awards conferred by community colleges in the related TOP codes:

- Business and Commerce, General (0501.00)
- Logistics and Materials Transportation (0510.00)
- Business Administration (0505.00)
- Aviation and Airport Management and Services (3020.00)
- Business Management (0506.00)
- Aviation and Airport Management (3020.10)
- Management Development and Supervision (0506.30)

The colleges with the most completions in the region are Pasadena, Coastline, and Cerritos. Over the past 12 months, there were three other related program recommendation requests from regional community colleges.

Exhibit 10: Regional Community College Awards (Certificates and Degrees), 2019-2022

TOP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
0501.00	Business and Commerce, General	Cerritos	5	4	1	3
		Glendale	46	61	73	60
		LA City	116	50	60	75
		LA Harbor	10	12	12	11
		LA Mission	0	0	1	0
		LA Pierce	17	13	24	18
		LA Southwest	29	29	24	27
		Long Beach	237	189	195	207
		Mt San Antonio	117	117	136	123
		Santa Monica	5	12	14	10
		West LA	44	67	83	65
		LA Subtotal	626	554	623	601
		Coastline	6	5	4	5
		Saddleback	19	39	73	44
		OC Subtotal	25	44	77	49
Supply Subtotal/Average			651	598	700	650
0505.00	Business Administration	Cerritos	250	222	299	257
		Citrus	399	416	386	400
		Compton	29	31	22	27
		East LA	247	391	309	316
		El Camino	306	342	325	324
		Glendale	241	217	221	226

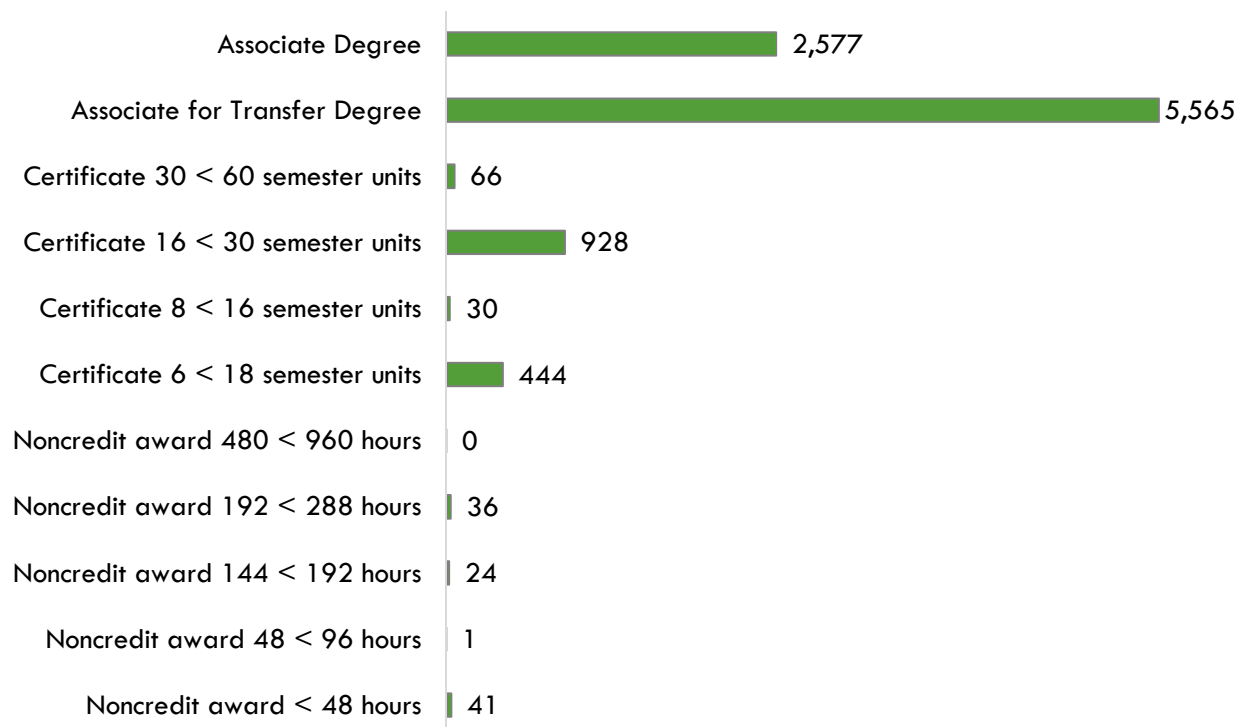
TOP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
		LA City	91	151	112	118
		LA Harbor	83	87	68	79
		LA Mission	88	89	89	89
		LA Pierce	208	255	266	243
		LA Southwest	56	45	38	46
		LA Trade	7	28	32	22
		LA Valley	147	172	197	172
		Long Beach	293	319	296	303
		Mt San Antonio	269	337	281	296
		Pasadena	1,191	1,240	859	1,097
		Rio Hondo	276	246	254	259
		Santa Monica	334	337	370	347
		West LA	156	134	127	139
		LA Subtotal	4,671	5,059	4,551	4,760
		Coastline	592	432	410	478
		Cypress	244	232	206	227
		Fullerton	373	319	367	353
		Golden West	166	194	186	182
		Irvine	349	299	383	344
		Orange Coast	443	368	412	408
		Saddleback	382	315	327	341
		Santa Ana	220	198	187	202
		Santiago Canyon	157	153	143	151
		OC Subtotal	2,926	2,510	2,621	2,686
		Supply Subtotal/Average	7,597	7,569	7,172	7,446
0506.00	Business Management	Cerritos	516	387	276	393
		East LA	18	17	18	18
		El Camino	33	49	22	35
		Glendale	13	15	28	19
		LA City	39	18	16	24
		LA Mission	1	4	6	4
		LA Pierce	2	7	14	8
		LA Valley	36	30	39	35
		Long Beach	29	44	28	34
		Mt San Antonio	145	150	188	161
		LA Subtotal	832	721	635	729
		Coastline	72	307	33	137

TOP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
		Cypress	3	7	1	4
		Fullerton	12	11	19	14
		Golden West	8	11	13	11
		Irvine	14	5	23	14
		North Orange Adult	36	19	32	29
		Orange Coast	16	19	16	17
		Santa Ana	71	40	39	50
		Santiago Canyon	24	55	25	35
		OC Subtotal	256	474	201	310
		Supply Subtotal/Average	1,088	1,195	836	1,040
0506.30	Management Development and Supervision	Cerritos	32	50	59	47
		LA Pierce	4	5	11	7
		LA Southwest	9	15	21	15
		LA Trade	4	8	12	8
		LA Valley	20	18	17	18
		Pasadena	3	10	6	6
		Rio Hondo	25	18	16	20
		Santa Monica	19	19	30	23
		LA Subtotal	116	143	172	144
		Coastline	247	7	142	132
		Cypress	0	1	11	4
		Irvine	0	3	0	1
		Saddleback	27	53	38	39
		Santa Ana	11	9	9	10
		Santiago Canyon	2	1	1	1
		OC Subtotal	287	74	201	187
		Supply Subtotal/Average	403	217	373	331
0510.00	Logistics and Materials Transportation	East LA	46	60	57	54
		LA Harbor	3	0	0	1
		Mt San Antonio	0	12	16	9
		Rio Hondo	1	5	7	4
		Santa Monica	6	6	11	8
		LA Subtotal	56	83	91	77
		Coastline	116	150	75	114
		OC Subtotal	116	150	75	114
		Supply Subtotal/Average	172	233	166	190

TOP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
3020.00	Aviation and Airport Management and Services	-	-	-	-	-
		LA Subtotal	-	-	-	-
		Cypress	0	7	7	5
		Orange Coast	10	9	24	14
		OC Subtotal	10	16	31	19
Supply Subtotal/Average			10	16	31	19
3020.10	Aviation and Airport Management	Glendale	6	13	11	10
		LA Subtotal	6	13	11	10
		Cypress	33	30	16	26
		OC Subtotal	33	30	16	26
Supply Subtotal/Average			39	43	27	36
Supply Total/Average			9,960	9,871	9,305	9,712

Exhibit 11 shows the annual average community college awards by type from 2019-20 to 2021-22. The plurality of the awards are for associate for transfer degrees, followed by associate degrees and certificates between 16 and less than 30 semester units.

Exhibit 11: Annual Average Community College Awards by Type, 2019-2022



Community College Student Outcomes:

Exhibit 12 shows the Strong Workforce Program (SWP) metrics for logistics and materials transportation programs in Rancho Santiago Community College District (RSCCD), the Orange County Region, and California. According to Chancellor’s Office Curriculum Inventory (COCI) data, there are five active logistics and materials transportation programs in Orange County. Of the five programs, two were approved in January 2010, two others were approved in February 2022, and the final was approved in December 2023. None of these programs are hosted at an RSCCD community college. Therefore, no metrics are available at the district level and due to a low number of students, many metrics are unavailable at the county level.

Exhibit 12: Logistics and Materials Transportation (0510.00) Strong Workforce Program Metrics, 2020-21³

SWP Metric	RSCCD	OC Region	California
SWP Students	N/A	Insufficient Data	1,263
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	N/A	Insufficient Data	41%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	N/A	Insufficient Data	Insufficient Data
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	N/A	109	177
SWP Students Who Transferred to a Four-Year Postsecondary Institution (2019-20)	N/A	Insufficient Data	69
SWP Students with a Job Closely Related to Their Field of Study (2019-20)	N/A	Insufficient Data	78%
Median Annual Earnings for SWP Exiting Students	N/A	Insufficient Data	\$50,044 (\$24.06)
Median Change in Earnings for SWP Exiting Students	N/A	Insufficient Data	23%
SWP Exiting Students Who Attained the Living Wage	N/A	Insufficient Data	65%

Non-Community College Supply:

To comprehensively analyze the regional supply, it is crucial to include data from other institutions offering logistics and materials transportation training programs. Exhibit 13 displays the annual and two-year average awards granted by these institutions under the related Classification of Instructional Programs (CIP) Codes:

- Business/Commerce, General (52.0101)
- Business Administration and Management, General (52.0201)

No metrics were available for the following CIP Codes:

- Aviation/Airway Management and Operations (49.0104)
- Operations Management and Supervision (52.0205)

³ All SWP metrics are for 2020-21 unless otherwise noted.

The available data covers 2019 to 2021. During this period, non-community college institutions in the region conferred an average of 15,079 awards annually in related programs.

Exhibit 13: Regional Non-Community College Awards, 2019-2021

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2-Year Award Average
52.0101	Business / Commerce, General	Azusa Pacific University	86	70	78
		Biola University	18	26	22
		Loyola Marymount University	55	38	47
		Marymount California University	10	33	22
		Mount Saint Mary's University	0	0	0
		Pacific States University	0	0	0
		University of Southern California	1	1	1
Supply Subtotal/Average			170	168	169
51.0201	Business Administration and Management, General	Abraham Lincoln University	1	1	1
		America Evangelical University	1	8	5
		American Jewish University	12	5	9
		Angeles College	6	10	8
		Azusa Pacific University	147	142	145
		Bethesda University	47	57	52
		Biola University	137	122	130
		California Institute of Advanced Management	19	32	26
		California Intercontinental University	19	19	19
		California State Polytechnic University-Pomona	1,452	1,690	1,571

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2-Year Award Average
		California State University-Dominguez Hills	629	662	646
		California State University-Fullerton	2,500	2,588	2,544
		California State University-Long Beach	1,550	1,684	1,617
		California State University-Los Angeles	1,207	957	1,082
		California State University-Northridge	780	871	826
		Chapman University	544	554	549
		Claremont Graduate University	84	92	88
		Concordia University-Irvine	126	122	124
		Fremont College	24	15	20
		Hope International University	72	56	64
		InterCoast Colleges-Santa Ana	18	0	9
		InterCoast Colleges-West Covina	0	1	1
		Learnet Academy Inc	3	10	7
		Life Pacific University	15	17	16
		Los Angeles Pacific College	7	3	5
		Los Angeles Pacific University	0	16	8
		Loyola Marymount University	34	71	53
		Marymount California University	59	42	51
		Mount Saint Mary's University	53	33	43

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2-Year Award Average
		Pacific College	0	0	0
		Pacific Oaks College	19	16	18
		Pacific States University	4	6	5
		Pathways College	0	2	1
		Pepperdine University	641	598	620
		Platt College-Anaheim	14	9	12
		Platt College-Los Angeles	11	4	8
		Presbyterian Theological Seminary in America	0	0	0
		Saybrook University	0	1	1
		The Chicago School of Professional Psychology at Anaheim	0	4	2
		The Chicago School of Professional Psychology at Los Angeles	18	24	21
		The Master's University and Seminary	64	53	59
		Touro University Worldwide	0	0	0
		University of Antelope Valley	38	32	35
		University of California-Irvine	497	560	529
		University of California-Los Angeles	148	38	93
		University of La Verne	545	559	552
		University of Massachusetts Global	352	433	393

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2-Year Award Average
		University of Southern California	1,441	1,490	1,466
		University of the People	564	815	690
		University of the West	12	21	17
		Vanguard University of Southern California	51	66	59
		West Coast University-Orange County	0	0	0
		Westcliff University	407	574	491
		Whittier College	64	64	64
		Woodbury University	66	69	68
		Supply Subtotal/Average	14,502	15,318	14,910
		Supply Total/Average	14,672	15,486	15,079

Regional Demographics

This section examines demographic data for Orange County community college students in logistics and materials transportation programs compared to OC population, along with occupational data, to identify potential diversity and equity issues addressable by community college programs.

As noted in the student outcomes section, five community colleges in Orange County offer logistics and materials transportation courses. However, due to a low number of students, student demographic data is unavailable. Therefore, this section compares the Orange County population to the supply chain occupations.

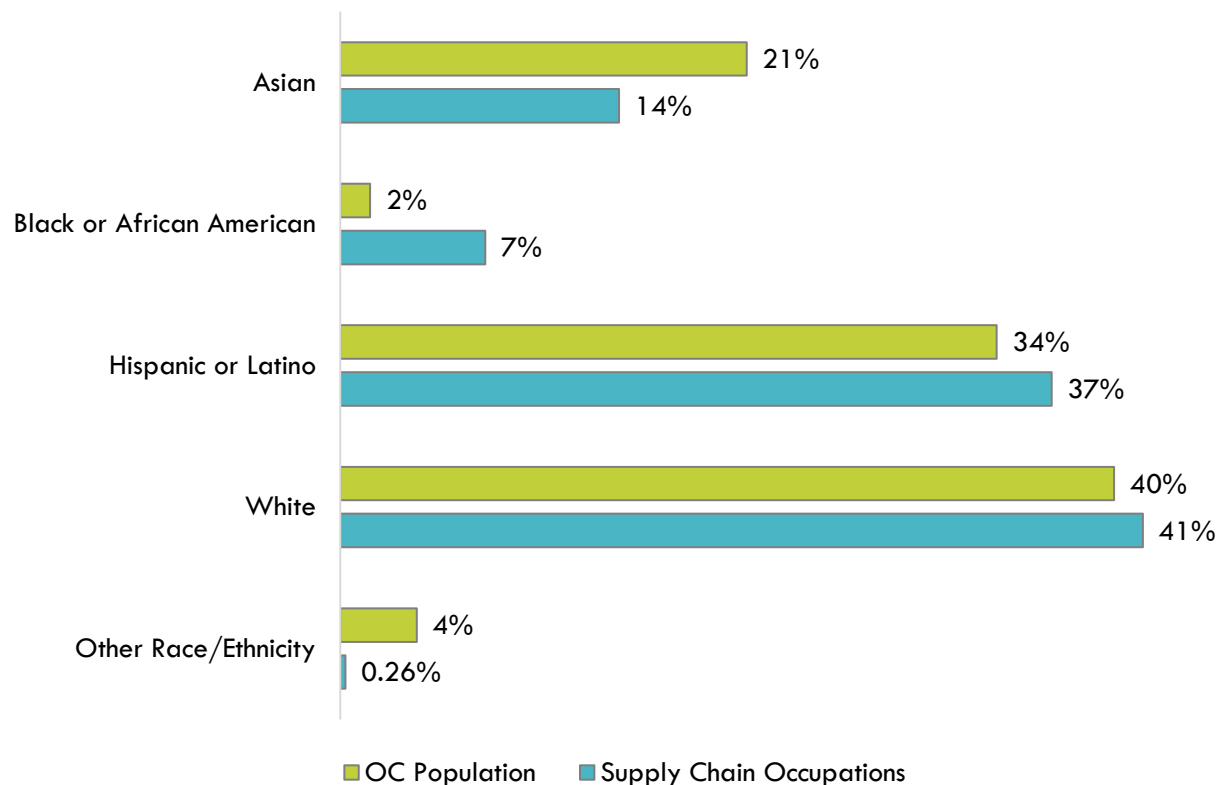
Ethnicity:

Exhibit 14 compares the ethnicity of the overall Orange County population to occupation-specific data for the two supply chain occupations included in this report. Representation of Hispanic or Latino and white workers aligns with their respective shares of the county population.

However, 21% of the county population is Asian, which is significantly higher than these supply chain occupations (14%). Similarly, 4% of the county population is another race or ethnicity, which is higher than workers in the field (0.26%). Conversely, 7% of workers in the field are Black or African American, higher than their representation in the county population (2%).

Examining disaggregated data for each occupation (not shown), the occupation with the highest percentages of Asian (19%), Black or African American (13%), and white (44%) workers respectively is *logisticians*, which has the lowest entry-level wages and highest typical entry-level education of the two supply chain occupations. The occupation with the highest percentage of Hispanic or Latino workers is *transportation, storage, and distribution managers*. This occupation has the highest entry-level wages and lowest typical entry-level education of the two supply chain occupations.

Exhibit 14: Program and County Demographics by Ethnicity



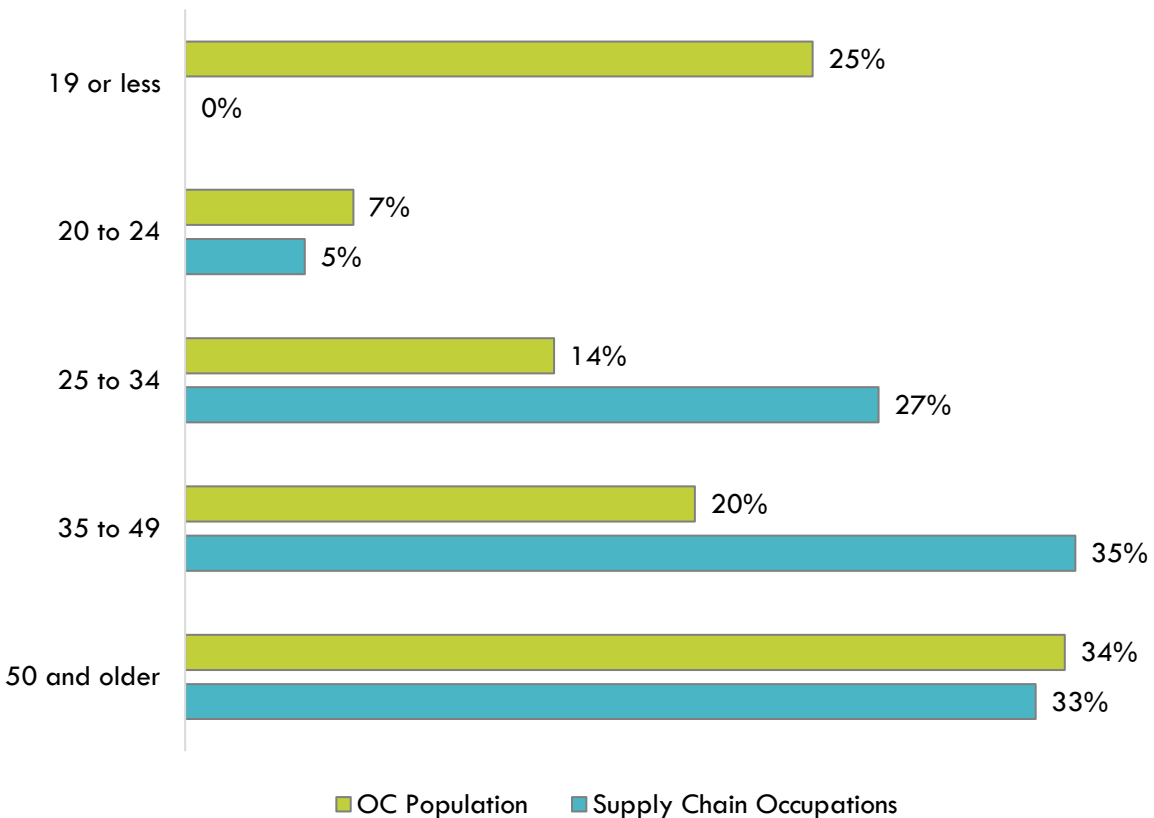
Age:

Exhibit 15 compares the age of the overall Orange County population to occupation-specific data for the two supply chain occupations included in this report.

Nearly 68% of workers in these supply chain occupations are age 35 and older, which is higher than the population (54%). The gap between these figures largely stems from the fact individuals 35 to 49 represent the plurality of workers in the field (35%) but account for only 20% of the county population. Similarly, despite accounting for more than one-in-four workers in the field, persons 25 to 34 comprise only 14% of the county population.

Examining disaggregated data for each occupation (not shown), the age group with the highest representation among *transportation, storage, and distribution managers* is 50 and older (36%). This occupation has the highest entry-level wages and lowest typical entry-level education of the two supply chain occupations. The age group with the highest representation among *logisticians* is 35 and 49 (45%). This occupation has the lowest entry-level wages and highest typical entry-level education of the two supply chain occupations.

Exhibit 15: Program and County Demographics by Age

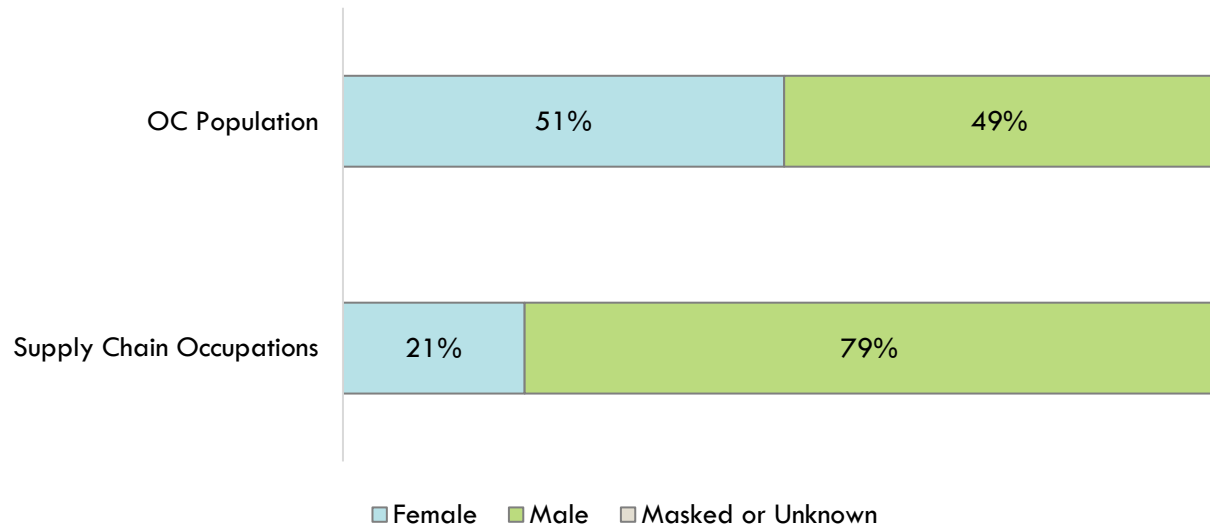


Sex:

Exhibit 16 compares the sex of the overall Orange County population to occupation-specific data for the two supply chain occupations.

Though the population is largely split evenly amongst women and men, only 21% of workers in the field are women. Examining disaggregated data for each occupation (not shown), 36% of *logisticians* are women. Though this occupation has higher typical entry-level education requirements, it has lower entry-level wages compared to *transportation, storage, and distribution managers*. Conversely, 85% of *transportation, storage, and distribution managers* (85%) are men, which has the highest entry-level wages but the lowest typical entry-level education of the two supply chain occupations.

Exhibit 16: Program and County Demographics by Sex



Appendix A: Methodology

The OC COE prepared this report by analyzing data from occupations and education programs. Occupational data is derived from Lightcast, a labor market analytics firm that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS) and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

Using a TOP-SOC crosswalk, the OC COE identified middle-skill jobs for which programs within these TOP codes train. Middle-skill jobs include:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

The OC COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a “supply table” with this information, which is the source of the program supply data for this report. TOP code data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP code data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS. TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education in the United States and Canada. Institutions outside of the California Community College system do not use TOP codes in their reporting systems.

Data included in this analysis represent the labor market demand for relevant positions most closely related to the proposed program as expressed by the requesting college in consultation with the OC COE. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study which can signal demand and show what employers are looking for in potential employees, but is not a perfect measure of the quantity of open positions.

All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

Appendix B: Data Sources

Data Type	Source
Occupational Projections, Wages, and Job Postings	<p>Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics and the American Community Survey. For more information, see https://lightcast.io/</p>
Living Wage	<p>The living wage is derived from the Insight Center’s California Family Needs Calculator, which measures the income necessary for an individual of family to afford basic expenses. The data assesses the cost of housing, food, child care, health care, transportation, and taxes. For more information, see: https://insightccd.org/family-needs-calculator/</p> <p>The living wage for one adult in Orange County is \$20.63 per hour (\$42,910.40 annually). This figure is used by the CCCCCO to calculate the percentage of students that attained the regional living wage.</p>
Typical Education and Training Requirements, and Educational Attainment	<p>The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. BLS uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data. For more information, see https://www.bls.gov/emp/documentation/education/tech.htm</p>
Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences	<p>The O*NET database includes information on skills, abilities, knowledges, work activities, and interests associated with occupations. For more information, see https://www.onetonline.org/help/online/</p>
Educational Supply	<p>The CCCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: https://datamart.cccco.edu</p> <p>The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions</p>
Student Metrics and Demographics	<p>LaunchBoard, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: https://www.calpassplus.org/LaunchBoard/Home.aspx</p>

Data Type	Source
Population and Occupation Demographics	<p>The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. For more information, see: https://www.census.gov/programs-surveys/acs</p> <p>Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: https://usa.ipums.org/usa/about.shtml</p>

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