Southern California Association of Governments
May 1, 2025

To: Regional Council (RC)

From: Lucy Dunn, Ex-Officio Member; Business Representative

Subject: Addendum to Business Report – May 1, 2025

On April 22, 2025, Southern California Leadership Coalition (SCLC) and the Los Angeles Economic Development Corporation (LAEDC) released their research report, ***"Goods on the Move: Trade and Logistics in Southern California."*** SCLC commissioned the report, which was carried out by LAEDC's Institute for Applied Economics.

The primary findings of the report, presented by Stephen Cheung, President and CEO of LAEDC, showed that Southern California's trade and logistics sector:

- Contributes nearly $497.6 billion annually in total economic output.
- Accounts for 13.1% of Southern California's regional GDP.
- Employs over 2 million workers, including over 900,000 direct workers, whose average annual wage is 26% higher than the region's average annual wage.
- Generates a total of $93.3 billion in tax revenues.
- **The report states that proposed tariffs threaten $500 billion in revenue for the So Cal region and put 2 million local workers at risk.**

The report was completed before the current round of bi-lateral tariff increases was initiated; however, it did identify a global trade war as a primary threat to the economic vitality of this sector, and the potential direct impacts of a significant reduction of trade with China, the ports' #1 trading partner. SCLC and LAEDC will continue to monitor the impacts of this trade war, including job losses.

The study is attached, along with the press release used for the event, and a Key Highlights summary.

Here are examples of strong media coverage of this important research:

- Trump's tariffs threaten Southern California's $300-billion trade industry, report says
- https://www.cbsnews.com/losangeles/video/president-trumps-tariffs-threatening-500-billion-in-revenue-for-southern-california/
- https://www.bloomberg.com/news/articles/2025-04-22/trump-china-tariffs-to-hit-california-hub-serving-amazon-fedex
- https://www.msn.com/en-us/money/other/trump-china-tariffs-to-hit-california-hub-serving-amazon-fedex/ar-AA1DpEtq?ocid=FW79805
- LA County ports expect roughly 40% drop in traffic as Trump's tariffs continue

GOODS ON THE MOVE: Trade and Logistics *in Southern California*

INSTITUTE FOR APPLIED ECONOMICS
Los Angeles County Economic Development Corporation

March 2025

GOODS ON THE MOVE: TRADE AND LOGISTICS

IN SOUTHERN CALIFORNIA

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March 2025

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SOUTHERN CALIFORNIA LEADERSHIP COUNCIL

This research was commissioned by the Southern California Leadership Council (SCLC).

The LAEDC Institute for Applied Economics provides objective economic and policy research for public agencies and private firms. The group focuses on economic impact studies, regional industry analyses, economic forecasts, and issue studies, particularly in workforce development, transportation, infrastructure, and environmental policy.

Cover Photo Credit: Port of Los Angeles

Preface

April 15, 2025

The events of recent weeks have highlighted the importance of international trade to Southern California and the centrality of the region's Trade and Logistics industry cluster:

On April 2, dubbed "Liberation Day" by the Trump Administration, the White House announced a massive expansion in its tariff policy to go into effect that week. This policy included a 10 percent baseline tariff on imported goods and additional "reciprocal" tariffs ranging from 10 percent to 50 percent on dozens of countries. The resulting turmoil in the stock and bond markets was severe, causing the Trump administration paused most of its reciprocal tariffs for 90 days.

However, what still remains in effect as of today is substantial. In addition to the baseline tariffs, there now exists a staggering 145 percent tariff on Chinese goods; 25 percent tariffs on goods from Canada and Mexico falling outside of the United States–Mexico–Canada Agreement; and 25 percent tariffs on aluminum, steel, autos and auto parts.

China represents Southern California's largest trading partner, with about $130 billion of Chinese imports flowing through the Ports of Los Angeles and Long Beach in 2024. A 145 percent tariff on Chinese goods—coupled with a retaliatory 125 percent Chinese tariff on U.S. goods—can be expected to dramatically curtail the region's trade with China.

The implications for the Southern California economy are significant. The Port of Los Angeles already expects cargo volumes to drop by at least 10 percent as early as May and extend throughout the rest of this year.[1] This translates into less work across the region's supply chains, affecting port operators, haulers, wholesalers and other workers. It also leaves thousands of Southern California importers facing inputs that potentially are two-and-a-half times more expensive, and these cost increases would get passed down to consumers across the region. Moreover, the uncertainty created over the changeable U.S. tariff policies affects the many foreign owned enterprises in Southern California whose investments could seek other destinations.

It is difficult to foresee what the country's long-term tariff policies will look like. There are outstanding questions on whether the tariff on Chinese goods might get reduced, whether the reciprocal tariffs get reinstated, and whether additional proposed tariffs on lumber, pharmaceuticals, and other goods come about. As we get greater policy clarity over the coming weeks, the impacts to the Southern California Trade and Logistics industry cluster will become clearer as well.

[1] Sami, I. (2025, April 11.) "Port of L.A. officials anticipate lower cargo volume as tariffs on China take effect." *L.A. Business First.*

Executive Summary

The Trade and Logistics industry cluster is a pillar of economic strength for Southern California and the entire state of California, facilitating the movement of goods across the nation and beyond. As the largest trade gateway in North America, Southern California's world-class infrastructure—including the San Pedro Bay Ports (Los Angeles and Long Beach), extensive highway and rail networks, major air cargo hubs, and a vast warehousing and distribution system—ensures the efficient flow of goods for businesses and consumers.

In 2022, the Trade and Logistics industry cluster directly employed nearly 902,400 workers (including payroll workers and self-employed individuals) in Southern California, supporting a total of nearly 2 million jobs across the region, including 565,460 indirect jobs and 493,600 induced jobs created through spending linked to the sector. The industry cluster contributed nearly $497.6 billion in total economic output, including $289.6 billion in direct output, and generated $157 billion in labor income, making it one of the most significant economic drivers in the region. Additionally, economic activities directly and indirectly tied to the Trade and Logistics industry cluster generated a total of $93.3 billion in tax revenues in 2022. Of this total, 25 percent was directed to local governments, 31 percent to state governments, and 44 percent to the federal government, highlighting the industry cluster's substantial fiscal impact at all levels of government.

Key Industry Cluster Strengths and Economic Impact

Southern California's Trade and Logistics industry cluster has been, and remains today, a leader in global trade. This prominence is due to its:

- **Unmatched Trade Volume:** The San Pedro Bay Ports handled over 19 million TEUs (twenty-foot container equivalent units) in 2022—nearly 35 percent of all U.S. waterborne containerized trade—with total cargo value surpassing $469 billion.
- **Multimodal Connectivity:** The region's intermodal transportation network moves 598.3 million tons of freight valued at $1.7 trillion annually, ensuring seamless domestic and international trade flows.
- **Job Creation and Economic Impact:** The industry cluster directly employs 902,370 workers, contributes 13.1 percent of the regional GDP, and sustains nearly 2 million total jobs across Southern California.
- **Competitive Wages and Workforce Opportunities:** In 2022, the average annual wage in the Trade and Logistics industry cluster in Southern California was $90,600. This was over 26 percent higher than the average annual wage of $71,617 reported across all industries in the five-county region.
- **Investment and Growth Potential:** With $6 billion in planned port and logistics infrastructure investments, the industry cluster is poised for continued expansion, efficiency improvements, and sustainability initiatives.

Competitive Landscape and Geographic Comparison

Photo Credit: Port of Los Angeles

Southern California's continued leadership position in global trade has been hard fought. The region's Trade and Logistics industry cluster competes with other major North American trade gateways, such as New York/New Jersey, Savannah, Houston, and Seattle-Tacoma.

These competitor seaports generally are large, covering over one thousand acres, and their size enables room for multiple terminals, transloading and transmodal facilities, and storage facilities. Most of these seaports have 4 or more container terminals and a draft depth of at least 50 feet, allowing for the accomodation of the largest containerships.

Southern California faces increasing competition from Gulf and East Coast ports, in particular. These ports spend hundreds of millions of dollars annually to modernize infrastructure and expand their capabilities, enabling them to take advantage of changing global trade routes resulting from shifting consumer demand and geopolitical crises. Additionally, improvements at the Panama Canal that have made access to Gulf and East Coast ports easier.

Challenges and Opportunities

Maintaining the prominence and continued growth of Southern California's Trade and Logistics industry cluster presents both challenges and opportunities for the region:

- **Tariffs and Global Trade Uncertainty:** Southern California's position as an international trade gateway leaves it exposed to fallout from high tariffs and protectionist measures taken by the United States and its traditional trading partners. Higher costs—as well as the uncertainty that results from shifting global trade policies—can disrupt existing supply chains for businesses reliant on international commerce, reduce trade volumes and the associated economic activity, and inhibit foreign direct investment in the region.
- **Congestion and Infrastructure Strain:** Increasing freight volumes contribute to traffic congestion, wear on transportation infrastructure, and delays for both goods and people. Ongoing investments to improve freight corridors, modernize intermodal facilities, and incorporate automation are needed to ensure that the industry cluster can continue to operate and grow to meet the increasing needs of the region, state and nation.
- **Environmental and Regulatory Pressures:** With freight activity contributing significantly to emissions, the industry must adapt to low-emission technologies, clean energy solutions, and regulatory changes aimed at reducing its environmental impacts. These regulations, which sometimes rely on yet-to-be-developed technologies, can place significant financial burdens on individual companies and entire segments of the industry cluster.

- **Workforce Development Needs:** Nearly 335,300 job openings are projected in the next five years, primarily due to retirements and workforce replacements. While these high-paying jobs should benefit the region, the industry cluster could face an insufficient supply of skilled labor in the absence of efforts to expand education and training opportunities.

Addressing Challenges: Policy Support Needed for Sustainable Growth

While Southern California remains the nation's premier trade gateway, the region's continued economic leadership is at risk. As has been mentioned, multiple challenges threaten the future growth of Southern California's Trade and Logistics industry cluster, ranging from increasing competition from Gulf and East Coast ports, to shifting global supply chains, to burdensome regulations and ambitious environmental mandates.

Smart policy decisions and strategic investments are essential to maintain the region's economic strength. These are needed in the following areas:

- **Infrastructure Modernization:** Accelerate investment in the region's ports, highways, intermodal hubs, and freight corridors to reduce congestion while at the same time enhancing efficiencies to increase trade volumes.
- **Workforce Development:** Expand trade and logistics related training programs and apprenticeship initiatives to prepare workers for automation, digital logistics, and supply chain management roles.
- **Balanced Regulatory Framework:** Encourage the adoption of environmental and labor regulations and initiatives (e.g., zero-emission trucks, clean port technologies, and energy-efficient warehouses) that properly balance state and local environmental goals with cost, competitiveness, and efficiency considerations.
- **Global Competitiveness Initiatives:** Increase FDI in the region to build on the more than 2,000 FOEs here that employ nearly 67,000 workers and generate $5.8 billion in wages. Additionally, strengthen trade partnerships and supply chain innovation to better adapt to shifting trade routes, supply chain vulnerabilities, and evolving economic landscapes.

By prioritizing smart investments, strategic policies, and industry collaboration, Southern California's Trade and Logistics industry cluster will drive sustained economic growth, job creation, and supply chain resilience. Strengthening infrastructure, expanding workforce training, embracing sustainable logistics solutions, and encouraging additional foreign direct investment will help ensure the region retains its competitive edge and global leadership position while supporting long-term prosperity for businesses and workers alike.

Table of Contents

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1 Introduction and Industry Cluster Overview

Trade and Logistics in Southern California

Photo Credit: ACTA

Trade and logistics are inextricably linked to the Southern California economy. With a population of more than 18 million, the Southern California region represents one of the largest consumer markets in the United States; trade and logistics are how consumers obtain the goods they depend on every day. The region, across all of its industries, generated nearly $2.6 trillion in economic output in 2022, and trade and logistics related industries, accounting for 11.2 percent (or $0.29 billion) of the total output, are how these businesses obtained their needed parts and materials and delivered their final goods to market. And the region employs over 7 million workers across all industries; trade and logistics are how hundreds of thousands of people—whether working in wholesale trade, transportation, or warehousing and distribution—receive a paycheck to provide for their families.

Put simply, the many trade and logistics related industries (hereafter referred to as the Trade and Logistics industry cluster) are critical segment of the Southern California economy and are what enable the region to function, grow, and thrive.

But it is not just Southern California that depends on the region's Trade and Logistics industry cluster. Southern California serves as a gateway for goods and commodities to reach the rest of the nation. In 2023, 115.3 million tons of imported goods and commodities worth more than $405 billion passed through Southern California ports for destinations across the United States. This represented 10.0 percent by tonnage and 13.7 percent by value of all imports into the United States that year.

What does it take for Southern California's Trade and Logistics industry cluster to move this massive amount of goods quickly and reliably? The region relies on extensive infrastructure including the busiest port complex in North America, a network of interconnected railroad infrastructure and intermodal facilities, and a multitude of interstate highways. It has tens of thousands of businesses spanning import and export activity, transportation services, freight arrangement, warehousing and distribution, and repackaging and redistribution to retailers. Additionally, it employs tens of thousands of dedicated workers, both skilled and unskilled, to

operate this critical system including truck drivers, air traffic control personnel, longshoremen, and supply chain professionals.

Southern California's Trade and Logistics industry cluster is growing as well. In the twenty years between 2002 and 2022, the number of trade and logistics workers in the region grew by nearly 37 percent. The number of trade and logistics establishments grew even faster, by over 61 percent. This is not just due to expanding international trade volumes; it also reflects an expanding domestic economy in the region, one that requires access to more goods more quickly and at a lower cost.

While the growing Trade and Logistics industry cluster generates clear and substantial benefits for Southern California, it also creates challenges. As all modes of freight transportation (i.e., air, rail, water and road) carry more and more goods each year, traffic congestion increases for passengers and commerce alike, resulting in reduced reliability of the transportation system and costly delays. Increases in greenhouse gas emissions and co-pollutants also occur, adversely impacting the health of nearby communities and drawing the scrutiny (and action) of public officials. And greater stress is placed upon public and private infrastructure including roads, bridges, and container terminals, requiring continued funding to cover repairs and maintenance and to invest in upgrades and new technologies.

Of course, this also provides opportunities for the region's Trade and Logistics industry cluster. Southern California is not the only region in the country confronting congestion, pollution and ageing infrastructure from trade and logistics activities. But if Southern California can get ahead of the curve in addressing these various issues, it will position itself well in the future to compete against other regions and continue to serve as the gateway United States.

About This Report

This report is an in-depth examination of the state and performance of the Trade and Logistics industry cluster in Southern California. Industry *clusters* are distinct from more commonly-recognized industry *sectors* as they are formed by firms that are in related industries, that sell related products, employ similar types of labor and have a common geographic concentration of activity. This clustering of activity is believed to indicate regional specialization and competitiveness and offers the best opportunity for encouraging and sustaining economic development.

As important as they are in driving economic activity, industry clusters are even more significant when they represent export industries. By selling goods and services to the global audience, such clusters bring new dollars into the region, which then recirculate through their supply chains to local firms and employees, supporting resident households and businesses and allowing them, in turn, to prosper and grow. Because such industry clusters are not overly dependent on the local market for their business, these are the very industries that are most able to locate where they find conditions most hospitable—in terms of access to capital and land, cost-effective raw materials, and a qualified and available labor pool.

It is the distinction between traded clusters and local clusters that drives our analysis in this report. By examining the current and historic trends of our leading competitive industry clusters, we can understand the challenges and opportunities, and tailor our economic development programs and policies to strengthen these existing specialties and help them flourish. We can ensure that we have a workforce ready and able to fill the jobs of the future in our strongest industry clusters, and remain competitive in an ever-changing global economy. We can focus our public policy and programmatic efforts on those industries which are most likely to provide the highest wages which, in turn, produce the largest impacts on the local economy and the best return on investment, and those that are at risk of moving elsewhere.

Our discussion proceeds as follows:

First, we provide an overview of the Trade and Logistics industry cluster in terms of its productive activity at the regional level. We focus on the Southern California region defined by the five counties of Los Angeles, Orange, Riverside, San Bernardino and Ventura. We discuss the industry cluster only in relation to the movement of goods; we do not focus on the types of goods moved.

Second, we map the landscape of the Trade and Logistics industry cluster in Southern California. This consists of an accounting of major goods movement infrastructure as well as businesses operating in the industry cluster. We use this mapping to help identify spatial clusters of trade and logistics businesses in Southern California and to analyze the characteristics of these businesses.

Third, we provide a comparative analysis between Southern California and other key U.S. port regions, examining industry concentration, specializations, growth patterns, and emerging trends that shape the trade and logistics landscape. We analyze historical trade flows at Southern California's airports and seaports. And we describe major investments and initiatives that competitor ports across North America are undertaking.

Fourth, we describe the scale of the economic contribution the Trade and Logistics industry cluster makes to the larger Southern California economy. This section uses input-output models to estimate the direct economic activity generated by the Trade and Logistics industry cluster and its spillover effects. It also estimates the tax revenues generated by this economic activity.

Fifth, we examine the supply of workers into the Trade and Logistics industry cluster. It employs a full spectrum of workers, from new job entrants to highly-specialized and experienced labor. We explore the occupational makeup of the industry cluster and outline regional workforce development programs. We also provide an occupational forecast that outlines future workforce needs.

Sixth, we conduct an analysis of foreign direct investment in Southern California's Trade and Logistics industry cluster. Given that Southern California is the international gateway to the United States, it is not surprising that a number of foreign-owned businesses operate in the industry cluster, even beyond terminal operators at the Ports of Los Angeles and Long Beach. We examine the types of foreign-owned enterprises operating and provide insight into their activities.

Photo Credit: ACTA

Finally, we undertake a threat analysis of Southern California's Trade and Logistics industry cluster. The intent is to identify major domestic and global trends and issues that could adversely impact the growth of the cluster over the next ten years.

This comprehensive picture of Southern California's Trade and Logistics industry cluster is meant to inform regional stakeholders and policymakers as we together develop strategies to ensure the continued growth and vitality of this important economic resource.

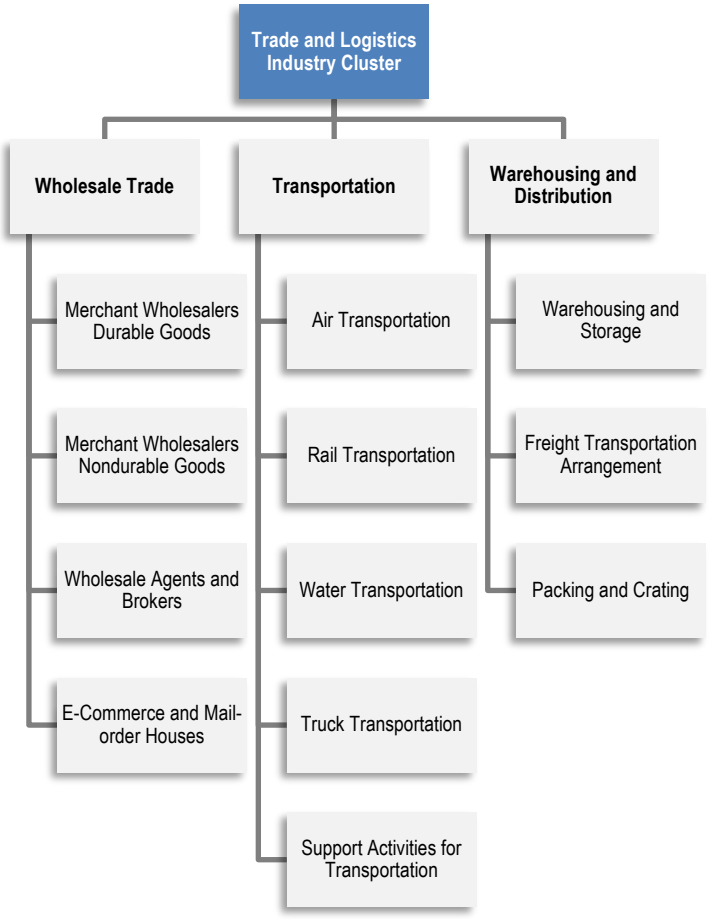
The Trade and Logistics Industry Cluster

Thousands of companies comprise the Trade and Logistics industry cluster in Southern California. In this section, we examine these companies to better understand the scale and scope of the cluster. We quantify the industry based on current and historical establishments, payroll employment, wages, and value added at the regional level for the five counties in Southern California that comprise the Los Angeles-Long Beach Combined Statistical Area (i.e., Los Angeles, Orange, Riverside, San Bernardino, and Ventura). We also compare current employment to other regions to illustrate regional specialization.

Definition

Taking a systematic approach to measuring the Trade and Logistics industry cluster, both geographically and over time, requires a consistent and comprehensive definition of what constitutes trade and logistics. In this report, we base our definition with a few exceptions on that produced by the Cluster Mapping Project (CMP) developed by the Harvard Business School (see the Appendix for details). This widely accepted taxonomy distinguishes between traded clusters (those that produce goods and services that are likely to be traded with markets outside the local economic region) and local clusters that produce goods and services primarily for the local population. The distinction matters from an economic development perspective given that traded clusters—like the Trade and Logistics industry cluster—are most likely to be the source of new money flowing into the regional economy, rather than simply responsible for recirculating existing funds.[2]

Figure 1.1
Definition of Trade and Logistics Industry Cluster



The Trade and Logistics industry cluster includes Wholesale Trade (NAICS 42), Transportation (NAICS 48) and Warehousing and Distribution (NAICS 493). These are described briefly below:

Wholesale Trade comprises four broad components: merchant wholesalers of durable goods (those goods with a normal life expectancy of three or more years); merchant wholesalers of nondurable goods (those goods with a normal life expectancy of less than three years); wholesale agents and brokers (including electronic markets); and electronic shopping and mail-order houses (operating on the retail side).

The Transportation industry provides transportation services through several different modes, including air, rail, water and truck. The transportation industry also

[2] Note that this definition and the corresponding data refer only to private sector economic activity, which undercounts to some extent the true size of the ecosystem.

includes support activities related to these services. We exclude from this industry definition local-serving transportation services such as transit and ground passenger transportation. We also exclude scenic and sightseeing transportation as well as pipeline transportation, which is not considered a trade and logistics related industry as such, but instead a delivery mechanism for specific commodities.

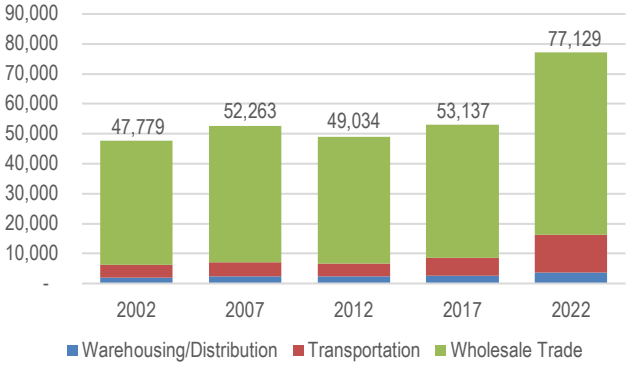
The Warehousing and Distribution industry includes firms operating warehousing and storage facilities. These firms may also provide services that are often called logistics services, such as labeling, repackaging, price marking and ticketing, order entry and fulfilment and transportation arrangements.

Detailed descriptions of the component industries of the Trade and Logistics industry cluster are provided in the Appendix.

Establishments

Using this definition, the size of the Trade and Logistics industry cluster in the five-county Southern California region is significant. More than 77,000 employer firms were directly involved in the industry cluster in 2022. That is about 52.4 percent of all trade and logistics establishments in the state of California and approximately 9.2 percent of all employer firms in Southern California. This total is up from 2002 when there were fewer than 48,000 firms, although it represents a slightly smaller share of all firms than the 9.7 percent from that year. Over the twenty years since 2002, the number of employer firms has grown by 61.4 percent, or an annual average growth of 3.1 percent. Much of the overall growth occurred since 2017, however.

Figure 1.2
Trade and Logistics Establishments in Southern California

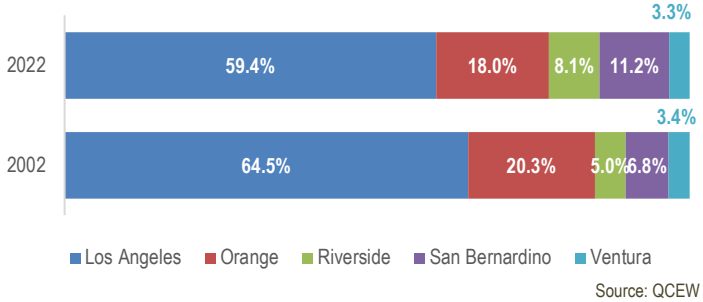


Source: QCEW

The vast majority of trade and logistics firms in the region have involved Wholesale Trade. In 2022, 79.0 percent of firms operated in the wholesale trade space compared to 87.0 percent in 2002. Transportation firms represented the next largest segment, nearly doubling in share from 8.7 percent of trade and logistics firms in 2002 to 16.3 percent in 2022. Warehousing and Distribution firms made up the remainder at 4.3 percent of firms in 2002 and 4.8 percent in 2022.

In 2022, nearly 80 percent employer establishments in the Trade and Logistics industry cluster were located in just two counties, Los Angeles County (59.4 percent) and Orange (18.0 percent). San Bernardino (11.2 percent) came next, followed by Riverside (8.1 percent) and Ventura (3.3 percent). This distribution is slightly less concentrated than twenty years prior, when 84.8 percent of establishments were located in Los Angeles and Orange Counties.

Figure 1.3
Distribution of Trade and Logistics Establishments in Southern California
By County

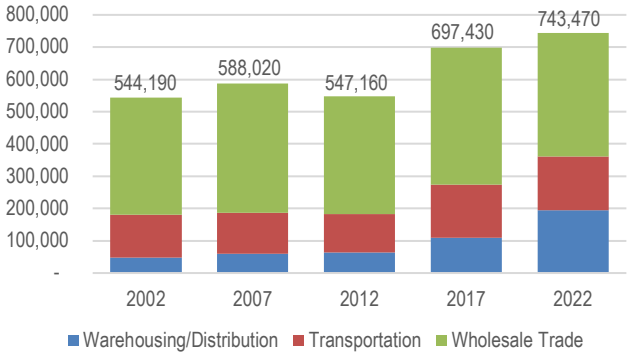


Source: QCEW

Employment

While the share of establishments in Southern California's Trade and Logistics industry has declined slightly since 2002, the share of employees instead has increased. The cluster employed a total of 743,470 payroll workers (which excludes self-employed individuals) in 2022. Total payroll employment increased to its present level from 544,190 workers in 2002, reflecting 36.6 percent growth over the 20 years, or average annual growth of 1.8 percent. As a share of all payroll employment in Southern California, the Trade and Logistics industry cluster in 2022 was responsible for 10.5 percent of all private employment. This is up from 9.3 percent in 2002.

Figure 1.4
Trade and Logistics Employment in Southern California

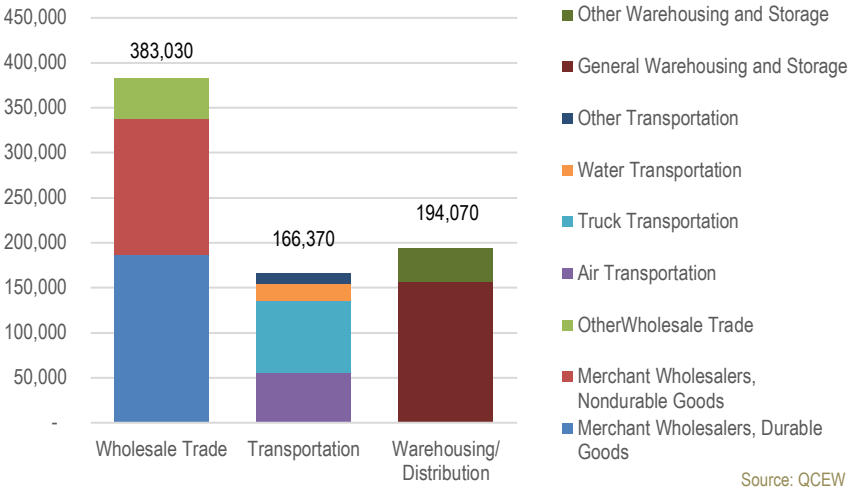


Source: QCEW

The growth in payroll workers in the industry cluster has not been smooth. The number of workers dropped in the aftermath of the Great Recession but rebounded afterwards. Today the number of workers exceeds pre Covid-19 pandemic levels.

Wholesale Trade accounted for over half of all payroll employment in the cluster, or 383,030 jobs (51.5 percent). Warehousing and Distribution at 194,070 jobs (26.1 percent) and Transportation at 166,370 jobs (22.4 percent) roughly split the remainder. In fact, a total of 494,000 workers (66.4 percent) operated in just three individual industries: Merchant Wholesalers, Durable Goods (186,230 workers); Merchant Wholesalers, Nondurable Goods (151,420 workers); and General Warehousing and Storage (156,350 workers). Additionally, Air Transportation accounted for 54,570 workers while Truck Transportation and Water Transportation accounted for 81,480 and 18,380 workers, respectively.

Figure 1.5
Trade and Logistics Employment by Industry in Southern California
2022

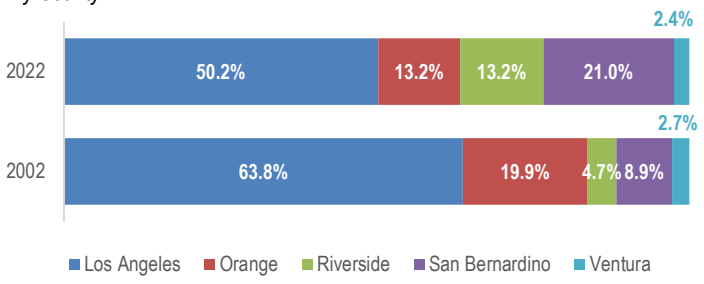


Source: QCEW

Geographically, about half of all payroll workers in the Trade and Logistics industry cluster were located in Los Angeles County in 2022 (50.2 percent). This was followed by San Bernardino (21.0 percent), Riverside (13.2 percent), Orange (13.2 percent), and Ventura (2.4 percent). This distribution looks markedly different than twenty years earlier, when Los Angeles County was responsible for about 64 percent of employment and when Riverside and San Bernardino Counties combined accounted for only 13.6

percent of employment. Much of this change can be attributed to the growth in Warehousing and Distribution in the Inland Empire. In 2002, Riverside and San Bernardino Counties employed 1,960 and 5,380 workers, respectively, in Warehousing and Distribution. By 2022, these had grown to 58,330 and 80,150 workers, respectively.

Figure 1.6
Distribution of Trade and Logistics Employment in Southern California
By County



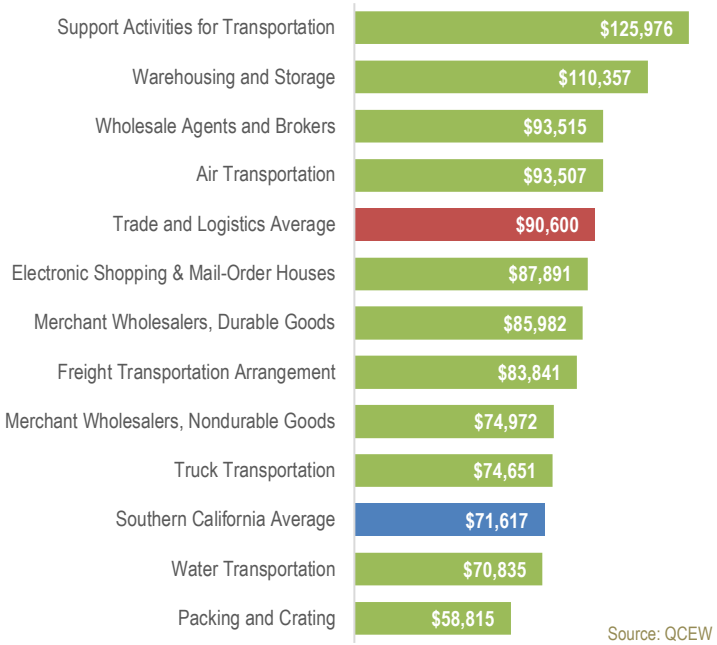
Source: QCEW

Wages

In 2022, the average annual wage in the Trade and Logistics industry cluster in Southern California was $90,600. This was over 26 percent higher than the average annual wage of $71,617 reported across all industries in the five-county region.

That said, there was wide variation in the wages earned across the Trade and Logistics industry cluster. Some of the highest wages were seen in Support Activities for Transportation, which together averaged $125,976 a year. By contrast, some of the lowest wages were seen in Water Transportation and Packing and Crating, which had annual average wages of $70,835 and $58,815, respectively. Given that almost two-thirds of workers operated as Merchant Wholesalers, Durable Goods ($85,982), Merchant Wholesalers, Nondurable Goods ($74,972), or in Warehousing and Distribution ($110,357), these three industries heavily influenced the overall average wage for the industry cluster.

Figure 1.7
Average Annual Earnings by Trade and Logistics Industry
2022



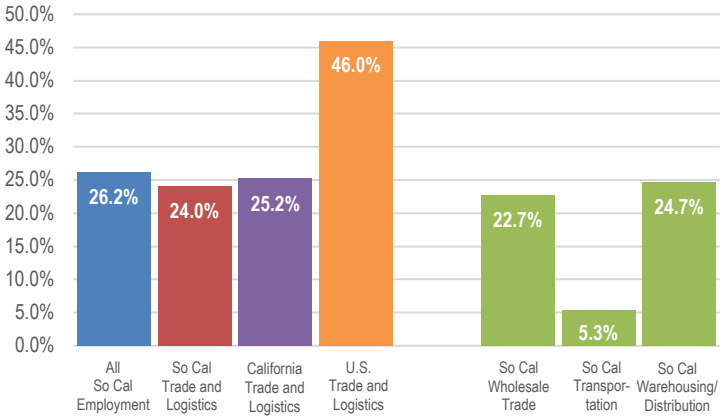
Source: QCEW

Over the twenty years from 2002 to 2022, average wages in the Trade and Logistics industry cluster grew by 24.0 percent in inflation-adjusted dollars, reflecting an average annual growth rate of 1.2 percent. This was slightly slower growth than for all industries in Southern California (twenty-year growth of 26.2 percent; average annual growth of 1.3 percent). It also was slightly slower than for all trade and logistics related industries in California as a whole (twenty-year growth of 25.2 percent; average annual growth of 1.3 percent) and significantly slower than those same industries across the United States (twenty-year growth of 46.0 percent; average annual growth of 2.3 percent). It should be noted that the average annual wage in the trade and logistics related industries nationally in 2022 was $144,200.

In Southern California, wage growth has been fastest in the Warehousing and Distribution subsector, which experienced an increase of 24.7 percent between 2002 and 2022. Wholesale Trade saw similar but slightly

lower growth of 22.7 percent. The Transportation subsector, encompassing all modes, fared the worst over the twenty years. Its relatively anemic 5.3 percent growth reflects the fact that average annual wages for the Transportation subsector dipped significantly below their 2002 levels and only rebounded in the mid-2010s. While industries in the Warehousing and Distribution and Wholesale Trade subsectors also saw declines in wages, particularly around the Great Recession, their declines were not as severe.

Figure 1.8
Trade and Logistics Industry Cluster Real Wage Growth
2002-2022



Source: QCEW

Competitiveness and Regional Advantage

Industries that are highly concentrated in a region—meaning there is a geographical clustering of firms and workers in these industries—suggest that they are more competitive relative to other locations. This is because the tight geographical proximity allows for a number of beneficial effects to emerge, such as increased specialization, efficiencies and innovation.

One can measure the level of competitiveness and regional advantage in an industry through location quotients. A location quotient (LQ) for an industry in Southern California shows the employment concentration for that industry by comparing the industry's share of total employment locally to its share of total employment nationally.

For example, if 6.0 percent of regional employment is in the motion picture industry compared to 2.0 percent nationally, the location quotient for the motion picture industry in Southern California is 3.0, indicating that Southern California is relatively more specialized in motion pictures production. Similarly, a location quotient equal to one indicates that the employment concentration in Southern California is equal to that elsewhere, meaning the region is not highly-specialized in that industry. It is commonly assumed that a location quotient of at least 1.2 (120.0 percent of the concentration for the United States) demonstrates regional specialization and competitiveness.

Using this threshold, the Trade and Logistics industry cluster in Southern California stands at the cusp of having a regional advantage. In 2022, the industry cluster in the 5-county region had an LQ of 1.2. While this LQ is fractionally smaller than that in 2017, it reflects the fact that the importance of the industry cluster has increased gradually over the last 20 years, starting at a level of 0.9 in 2002.

The increase in the relative importance of the Trade and Logistics industry cluster over the past two decades can be attributed to growth in Riverside and San Bernardino Counties. Specifically, the LQ for Riverside County grew from 0.6 in 2002 to 1.6 in 2022 while the LQ for San Bernardino grew from 1.0 in 2002 to 2.5 in 2022. Over the same time period, the growth in the relative importance of the industry cluster for the other three counties was flat: Between 2002 and 2022, the LQ for Los Angeles County went from 1.0 to 1.1, the LQ for Orange County actually decreased from 0.8 to 0.7, and the LQ for Ventura County went from 0.6 to 0.7.

Regionally, there are very high concentrations in a few industries. Specifically, Marine Cargo Handling had an LQ of 4.0 for the region and 7.1 for Los Angeles County. Also, All Other Support Activities for Transportation saw an LQ of 4.0 for the region and 5.8 for both Los Angeles and San Bernardino Counties.

Additionally, Riverside and San Bernardino Counties had very high LQs in Warehousing and Distribution industries. General Warehousing and Storage in particular had an LQ of 5.9 for Riverside County and 7.7 for San Bernardino County. Also, Refrigerated Warehousing and Storage saw an LQ of 3.0 for Riverside County and 2.9 for San Bernardino County.

Figure 1.9
Location Quotients of Southern California Trade and Logistics Industries

Industry	2022 Location Quotient	Change Since 2002
Wholesale Trade:		
Merchant Wholesalers, Durable Goods	1.0	↑
Merchant Wholesalers, Nondurable Goods	1.3	↑
Wholesale Agents and Brokers	0.7	↓
Electronic Shopping & Mail-Order Houses	1.0	↑
Subcluster	**1.1**	↑
Transportation:		
Air Transportation	1.2	↑
Support Activities for Air Transportation	1.3	↓
Rail Transportation	0.5	↓
Support Activities for Rail Transportation	1.1	↑
Water Transportation	0.7	↑
Support Activities for Water Transportation	2.8	↑
Truck Transportation	0.9	↑
Support Activities for Truck Transportation	1.0	↓
Subcluster	**1.1**	↑
Warehousing and Distribution:		
Warehousing and Storage	1.6	↑
Freight Transportation Arrangement	1.8	—
Packing and Crating	1.0	↓
Subcluster	**1.6**	↑
Total	**1.2**	↑

Source: QCEW

Individually, San Bernardino County also demonstrated very high concentrations in industries related to Truck Transportation. General Freight Trucking, Local had an LQ of 4.7 in 2022 while General Freight Trucking, Long-Distance, Less Than Truckload had an LQ of 3.9 and Specialized Freight (Except Used Goods) Trucking, Long-Distance had an LQ of 3.3. Other Support Activities for Road Transportation saw an LQ of 3.0.

It should be emphasized that by measuring relative employment levels locally and nationally, the location quotient simply reflects the use of labor across the industry cluster. It does not reflect the value of products produced or sold. Moreover, a declining location quotient is consistent both with a decrease in a region's competitive advantage and with an increase in capital-intensive production processes in the region resulting from innovation. Consequently, care must be taken when interpreting changes in location quotients over time.

2 Industry Cluster Landscape and Mapping

Section Summary

Southern California's Trade and Logistics industry cluster is highly dependent on multimodal connectivity, with businesses clustering around seaports, airports, major highways, and intermodal facilities. The spatial analysis provides insights into economic activity, workforce concentration, and infrastructure accessibility, helping inform policy decisions, economic planning, and infrastructure investments to sustain the region's role as a global logistics hub.

Key Infrastructure Components

- **Seaports**
  - The San Pedro Bay Ports are the busiest container complex in the country and handle 35 percent of all waterborne containerized trade in the U.S.
  - Supported by on-dock rail and near-dock rail, enabling efficient inland distribution to key national markets beyond California, such as Chicago and Dallas.
  - Support a range of intermodal activities, with approximately 35 percent of containers at the Port of Los Angeles and 28 percent at the Port of Long Beach moved by rail.
- **Airports**
  - Los Angeles International Airport (LAX), Ontario International Airport (ONT), and Southern California Logistics Airport (SCLA) play central roles in international and domestic air cargo movement.
  - LAX ranks among the busiest air cargo airports in the country, while ONT and SCLA have become important alternatives, offering ample capacity for freight operations and reducing congestion at LAX.
  - Increasing cargo operations at San Bernardino International Airport (SBD) and March Air Reserve Base (ARB) due to rising e-commerce demand, offering connectivity to global markets.
- **Rail Network:**
  - Essential for moving goods across the region and onto key national markets.
  - Burlington Northern Santa Fe (BNSF) and Union Pacific (UP), two of North America's largest rail operators, manage extensive rail infrastructure, including intermodal facilities that connect with the San Pedro Bay Ports.
  - The Alameda Corridor links the ports to main rail lines via a dedicated freight expressway.
  - Recent developments continue to shift intermodal activities inland, addressing rising demand and port congestion.
- **Highway Freight Network**
  - I-5, I-10, I-15, I-40, I-710, and State Routes 60, 91, 210 form the backbone of truck freight movement, handling 80 percent of regional freight tonnage.
  - This network forms essential connections between seaports, intermodal yards, distribution centers, and urban and rural markets.
- **Intermodal Yards and Classification Yards**
  - Facilitate efficient rail-to-truck transfers and optimize goods distribution in an efficient manner.

Key Business Sectors

- **Wholesale Trade**
  - Clusters near Ontario International Airport, major highways, and John Wayne Airport reflect strategic placement for efficient supply chain access.
- **Transportation**
  - Dense near the San Pedro Bay Ports, major highways, and intermodal yards, ensuring seamless goods movement.
- **Warehousing and Distribution**
  - Concentrated near major seaports and airports, and along CA-60, leveraging key freight corridors for large-scale distribution.

Identifying Spatial Clusters

- Heat Maps reveal high-density areas in major logistics and distribution hubs. Specifically, clusters emerged around critical infrastructure such as the San Pedro Bay Ports s, LAX, ONT, and along major highways like I-5, I-10, I-710, and CA-60.
- Point Density Analysis, when unweighted, identified major business clusters in Central LA, Inland Empire, and key ports/airports.
  - Employee-Weighted: Shows labor-intensive hubs near ONT, LAX, and major intermodal areas.
  - Sales-Weighted: Highlights high-revenue hubs in Central LA, Ontario, and the San Pedro Bay Ports.

Strategic Applications of Cluster Identification

- **Infrastructure Planning:** Supports investments in transportation, public transit, and logistics hubs.
- **Workforce Development:** Aligns workforce training with labor-intensive business clusters.
- **Economic Development:** Targets high-revenue clusters for business retention and expansion.
- **Land Use and Zoning Adjustments:** Ensures logistics businesses align with transportation infrastructure to maximize efficiency.

This section provides a comprehensive mapping of Southern California's trade and logistics infrastructure using ESRI's ArcGIS software. Our goal is to visualize and analyze the location and spatial distribution of key infrastructure and businesses across the trade and logistics landscape in Southern California.

Focusing on a five-county region, including Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties, this mapping analysis seeks to bring a geographical dimension to the Trade and Logistics industry cluster. By leveraging ArcGIS, we map vital components of the goods movement infrastructure and key industry players, delivering insights into their spatial patterns and connectivity.

This mapping effort identifies and analyzes spatial clusters within the Trade and Logistics industry cluster, specifically focusing on infrastructure assets and businesses. It allows us to understand the distribution of businesses and pinpoint critical nodes in the region's goods movement network, supporting informed planning and decision-making.

Source: U.S. Department of Transportation, California Department of Transportation, California Freight Mobility Plan, Cal Trans Office of Strategic Freight Planning

Mapping the Goods Movement Infrastructure

Key Infrastructure Components:

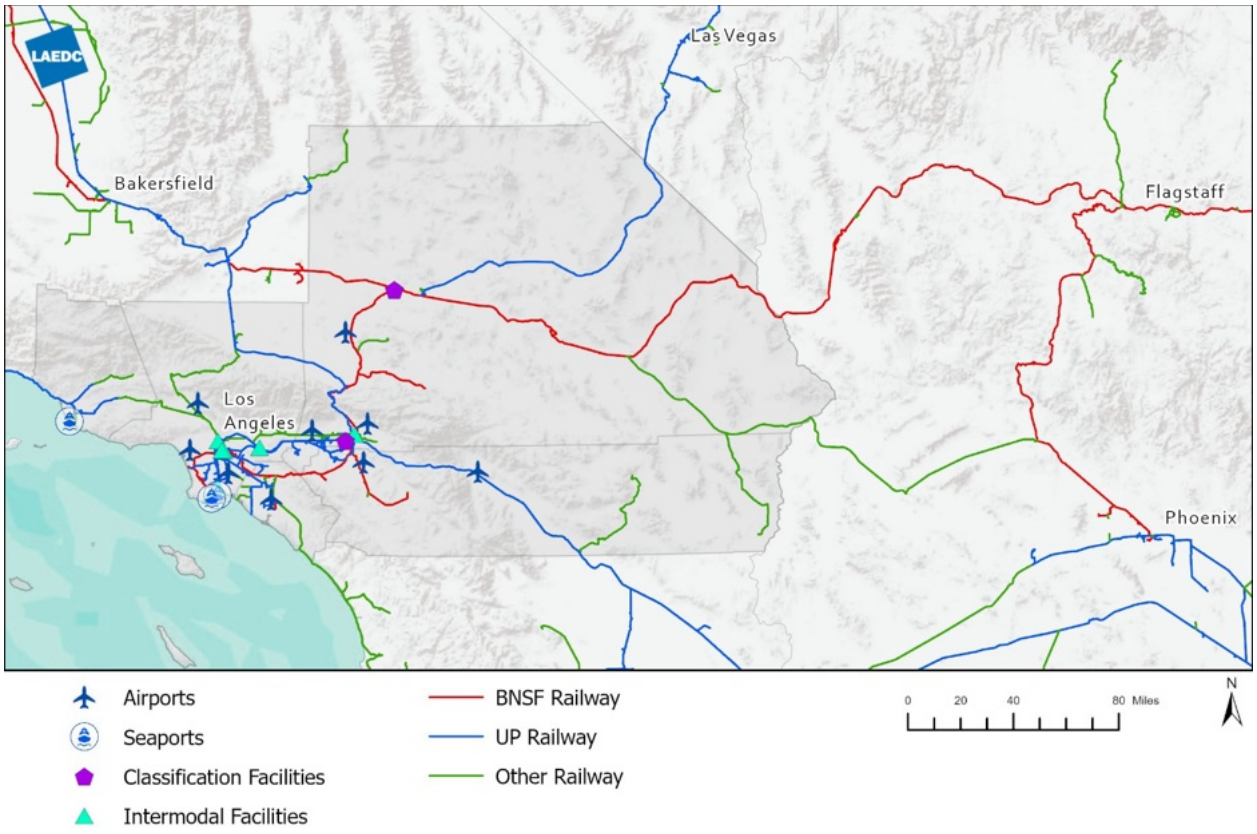
- **Seaports**: Southern California's seaports, particularly the San Pedro Bay Ports of Los Angeles and Long Beach, play an outsized role in national and global trade. Handling around 35 percent of all waterborne containers entering and exiting the U.S., these ports are the busiest container complex in the country and the ninth-largest worldwide[3]. The San Pedro Bay Ports collectively span approximately 11,000 acres and are supported by on-dock and near-dock rail facilities, which enable efficient inland distribution to key national markets, including Chicago and Dallas. An essential component of the goods movement ecosystem, these ports support a range of intermodal activities, with approximately 35 percent of containers at the Port of Los Angeles and 28 percent at the Port of Long Beach moved by rail[1]. Additionally, Port Hueneme, located in Ventura County, complements the San Pedro Bay Ports by specializing in handling automobiles, produce, and project cargo. Port Hueneme's role in moving high-value and perishable goods further strengthens the region's capabilities in diverse cargo handling[4].

- **Airports**: Airports are integral to Southern California's air cargo infrastructure, with major hubs such as Los Angeles International Airport (LAX), Ontario International Airport (ONT), and Southern California Logistics Airport (VCV) in Victorville playing critical roles in facilitating international and domestic freight movement. LAX ranks among the busiest air cargo airports in the U.S., handling millions of tons of cargo annually[2] ONT and SCLA have become important alternatives to LAX, offering ample capacity for freight operations and reducing congestion at the main airport and the highways immediately servicing it. In recent years, San Bernardino International Airport (SBD) and March Air Reserve Base (ARB) in Riverside have increasingly focused on cargo operations, reflecting the growing demand for air freight capacity in the region. These facilities support fast-growing e-commerce demand and offer connectivity to global markets. This diversified network of airports helps ensure that Southern California remains resilient to fluctuations in air cargo demand and maintains a strong position in international logistics[2,1].

[3] Southern California Association of Governments. (2023). *Connect SoCal 2024: Goods Movement Technical Report, Draft*.
[4] Southern California Association of Governments. (2020). *Connect SoCal: Aviation and Airport Ground Access Technical Report*. Retrieved from https://connectsocal.org

- **Rail Lines**: The rail network in Southern California is essential for moving goods across the region and into key national markets. Burlington Northern Santa Fe (BNSF) and Union Pacific (UP), two of North America's largest rail operators, manage extensive rail infrastructure in the region, including intermodal facilities that connect with the San Pedro Bay Ports. Key components of this network, such as the Alameda Corridor, a dedicated freight expressway linking the ports to main rail lines in Los Angeles, and the Cajon Pass, which provides a critical route through the San Bernardino Mountains, enhance the efficiency and capacity of rail transport in the region. These elements help facilitate the rapid and uninterrupted movement of goods from ports to inland areas and national markets.

  Recent developments, including the BNSF Barstow International Gateway (BIG) and UP's Inland Empire Intermodal Terminal (IEIT), address rising demand and port congestion by shifting intermodal operations further inland. Positioned in the Inland Empire, a primary industrial hub, these terminals allow for the seamless transfer of goods from ports to distribution centers across the region. Southern California's extensive rail infrastructure is essential for the efficiency of goods movement, connecting both regional and national distribution networks and providing an effective alternative to highway transport for bulk goods.

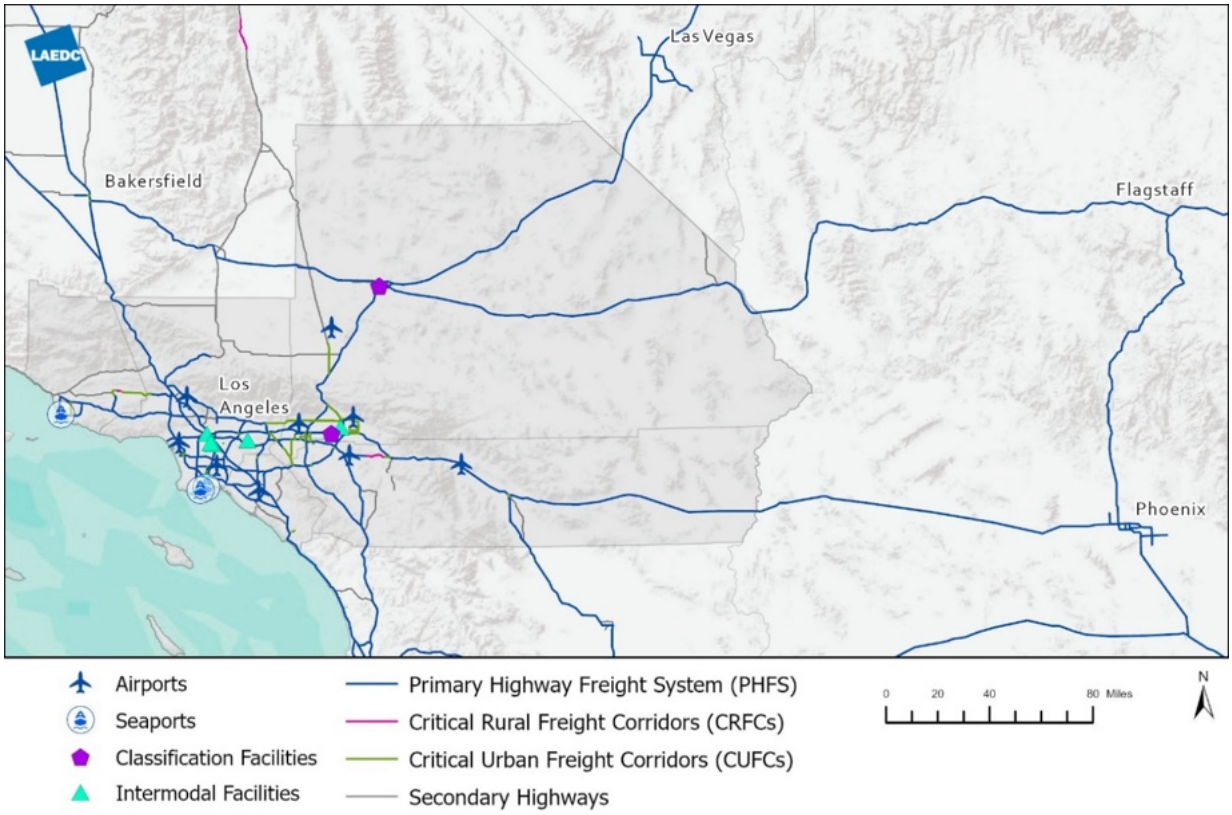


- **Highway Freight Network and Critical Freight Connectors**:
  The Highway Freight Network, a key part of the Primary Highway Freight System (PHFS) in Southern California, serves as the backbone of goods movement by truck, handling approximately 80 percent of regional freight tonnage[3]. Major freight corridors, including I-5, I-10, I-15, I-40, and I-710, form essential connections between seaports, intermodal yards, distribution centers, and urban and rural markets. For example, the I-710 directly connects the San Pedro Bay Ports to distribution hubs across the region, supporting significant cargo flows. Additional routes, such as

State Routes 60, 91, and 210, offer alternative pathways that reduce congestion and enhance flexibility in freight movement.

Critical Urban Freight Connectors (CUFCs) and Critical Rural Freight Connectors (CRFCs) enhance this network by linking key freight-generating areas to the broader PHFS. CUFCs are concentrated in densely populated urban areas, connecting crucial infrastructures, such as ports, rail yards, and industrial zones, to major highways. This urban network reduces congestion and improves last-mile delivery within high-traffic urban centers by ensuring smoother access to primary freight corridors.

CRFCs support rural regions by linking freight-generating areas, such as agricultural and manufacturing zones, to the main freight corridors. This access ensures that goods produced in rural areas can efficiently reach regional and national markets, supporting local industries and promoting economic resilience across Southern California. Together, the CUFCs and CRFCs enhance connectivity within the highway freight network, facilitating goods movement from production sites to distribution centers and final destinations, and supporting balanced regional growth[3].



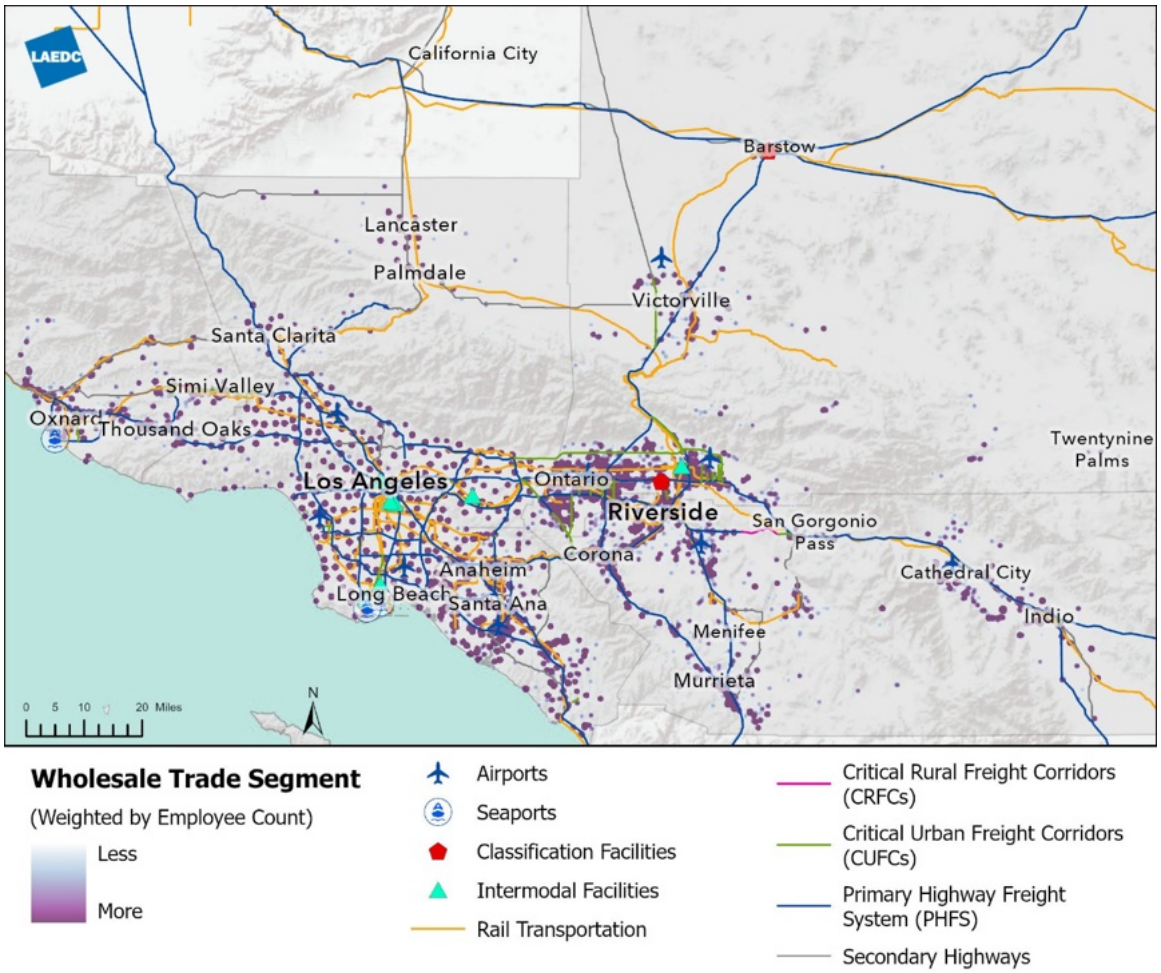
- **Intermodal Yards**: Intermodal yards serve as critical transfer points where goods are moved between rail and truck, optimizing distribution across Southern California. These facilities play a vital role in reducing transit times and enhancing the efficiency of goods movement within the region.

- **Classification Yards**: Classification yards are specialized facilities within the rail network where freight trains are assembled, disassembled, and reconfigured to ensure that cargo reaches its intended destinations efficiently. By organizing freight cars based on their destination and shipping requirements, classification yards contribute to the streamlined movement of goods across Southern California and beyond, enhancing the logistical capabilities of the region's transportation network.

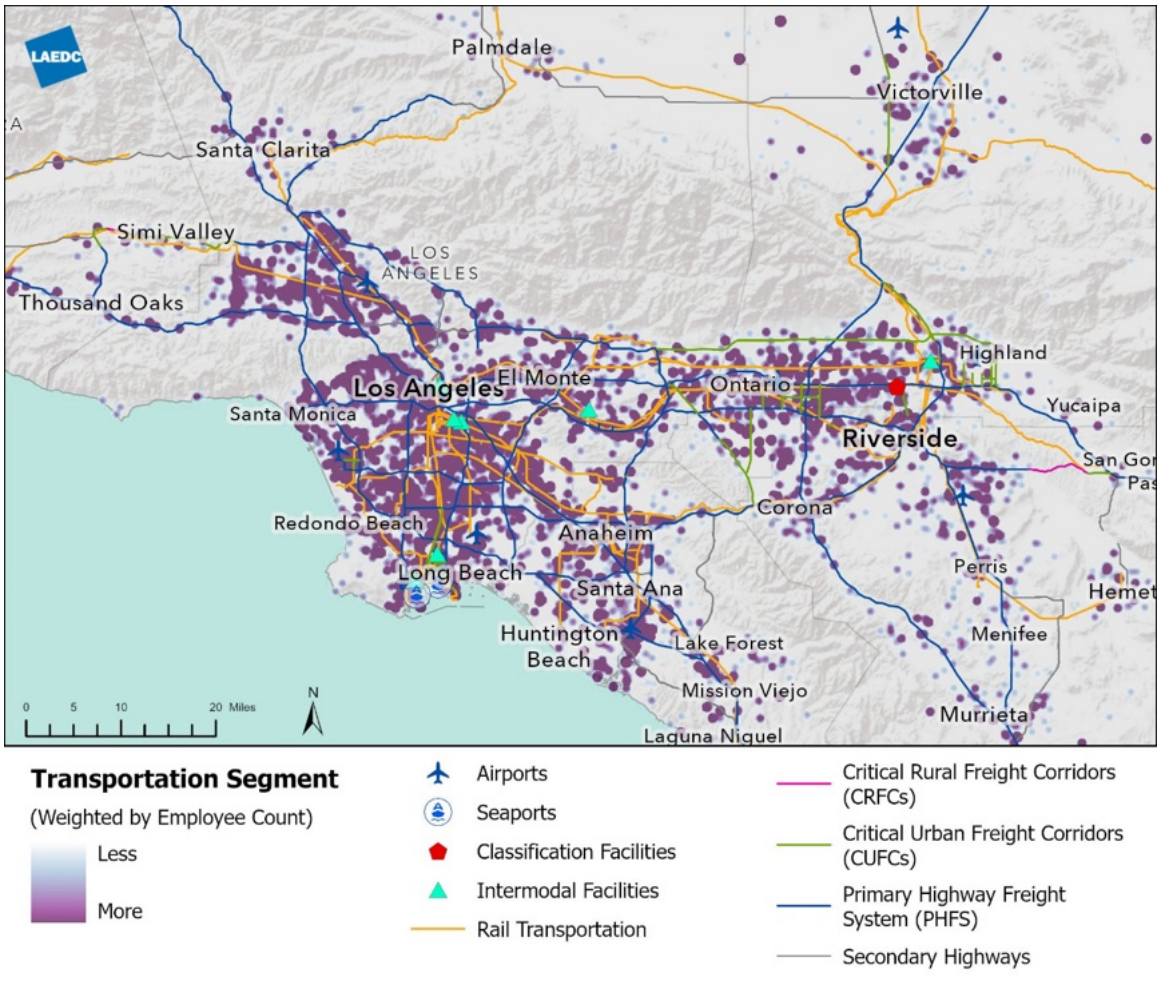
Mapping Trade and Logistics Businesses

Key Business Segments in the Trade and Logistics Industry Cluster:

- **Wholesale Trade**: Wholesale establishments serve as essential intermediaries, distributing goods to various market channels across the Southern California region. According to the heat map analysis, these businesses are mostly evenly distributed across populated areas, indicating a widespread demand for wholesale services to support local and regional economies. However, notable clustering occurs in specific areas, reflecting strategic placements to optimize supply chain efficiency. For instance, there is significant clustering around Ontario International Airport and major freeway intersections in the Inland Empire. This area is a key logistics hub, leveraging proximity to the airport and highway connections to expedite goods movement across the region and beyond. Additionally, clustering near John Wayne Airport in Orange County highlights the importance of air freight access for the wholesale trade sector, allowing businesses in this area to service nearby counties with minimal transit time. These clusters suggest that wholesale businesses prioritize locations with optimal transportation connectivity—near airports, major highways, and intermodal facilities—to reduce costs and improve supply chain agility. This strategic placement enables wholesale trade establishments to quickly and efficiently distribute products across multiple counties, supporting Southern California's role as a major distribution and logistics center.



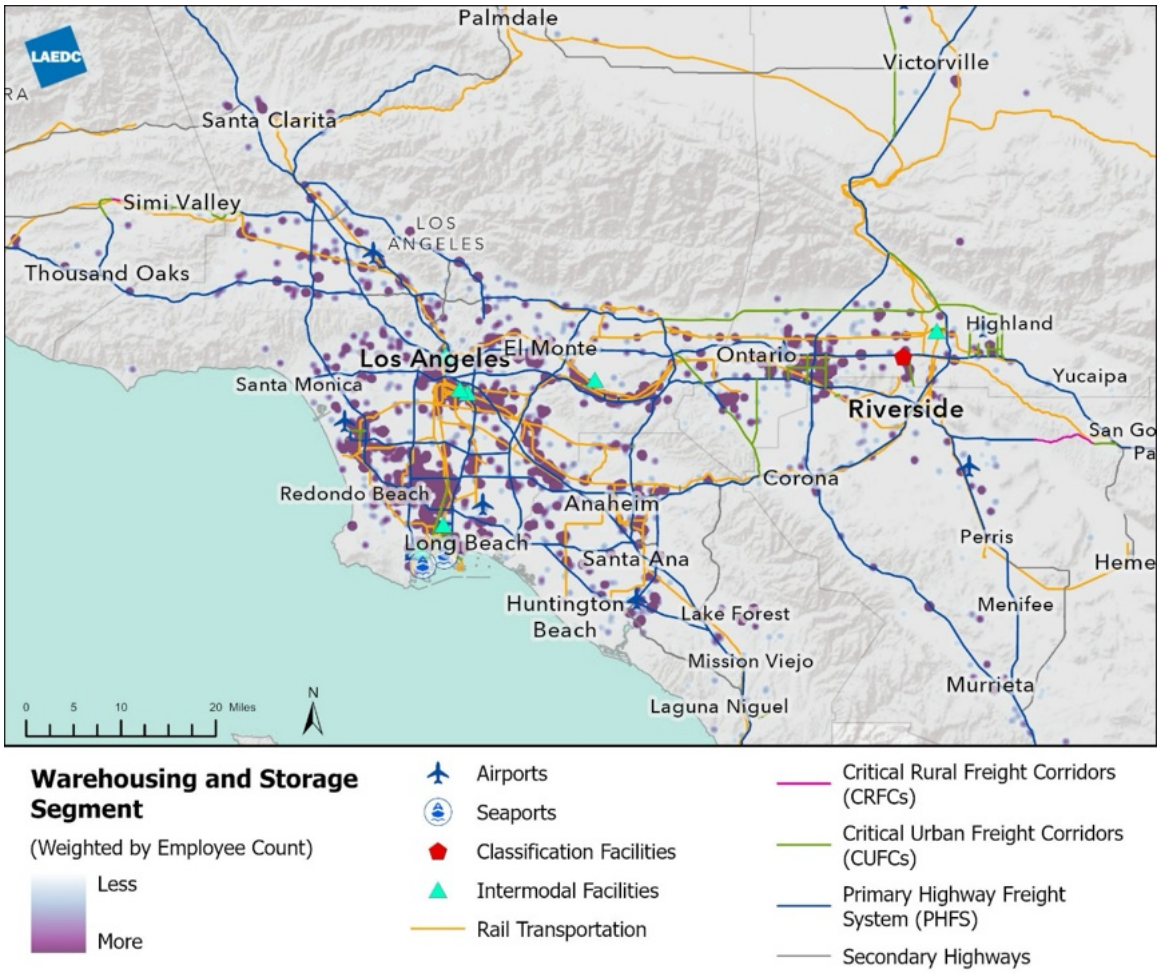
- **Transportation**: Trucking companies and other transportation providers are fundamental to local and regional goods distribution, ensuring the seamless flow of goods from ports and warehouses to final destinations. The heat map reveals a high density of transportation sector employment across the Southern California region, particularly in Los Angeles County and extending into the Inland Empire. This distribution indicates that transportation businesses are heavily concentrated near major transportation infrastructure, including the Primary Highway Freight System, intermodal yards, and critical freight corridors. Significant clustering occurs around key logistics nodes, such as the San Pedro Bay Ports and along major freeways. These clusters suggest that trucking companies prioritize locations with easy access to highways and intermodal facilities to maximize distribution efficiency and reduce transit times. Proximity to airports, particularly Ontario International Airport and Los Angeles International Airport, also contributes to clustering in areas where goods need to be rapidly distributed both regionally and nationally. The transportation sector's strategic placement near infrastructure hubs enables efficient movement along critical routes, such as I-5, I-10, I-15, and I-710, and ensures these businesses can respond to demand across Southern California's vast and diverse market. This extensive network supports first- and last-mile deliveries, highlighting the region's role as a crucial distribution center not only for Southern California but also for neighboring regions[5].



[5] Southern California Association of Governments. (2023). *Connect SoCal 2024: Goods Movement Technical Report, Draft*.

- **Warehousing and Distribution**: Warehouses function as essential storage and distribution hubs in Southern California's supply chain, facilitating the flow of goods before they reach consumers. Managed by logistics companies, these facilities coordinate movement, storage, and handling, playing a crucial role in enhancing the efficiency of goods distribution.

  The heat map indicates significant clustering of warehousing and storage facilities around major logistics and transportation hubs, including the San Pedro Bay Ports, Los Angeles International Airport, and Ontario International Airport. This distribution reflects the importance of proximity to key entry points for international goods, enabling rapid processing and distribution. Additionally, smaller clusters are evident near other regional airports, indicating that air freight access is a priority for warehousing businesses to meet quick distribution demands across the region. A notable concentration of warehousing and distribution facilities is visible in Central Los Angeles and along the CA-60 corridor, which runs parallel to a major rail line. This corridor is strategically positioned for efficient transfer between rail and road transportation, optimizing access to both regional and interstate markets. The clustering along CA-60 and adjacent rail lines highlights how warehousing businesses prioritize locations that offer seamless connections to both rail and highway networks, which are critical for large-scale goods distribution. Overall, the spatial pattern of warehousing and distribution facilities underscores the sector's need to operate near major infrastructure to streamline supply chains. By positioning near airports, seaports, and key freight corridors, these facilities can effectively handle large volumes and ensure timely delivery, supporting Southern California's role as a primary logistics hub.



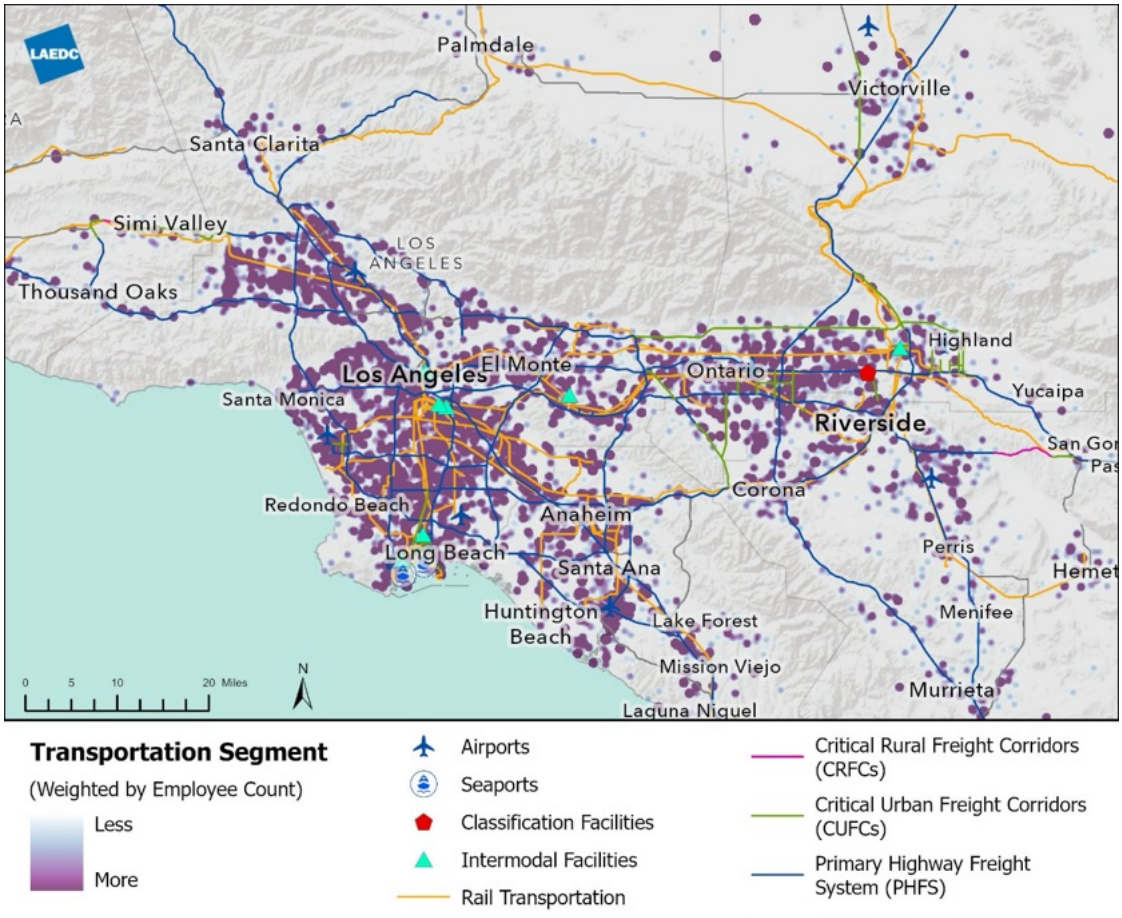
Identifying Spatial Clusters of Trade and Logistics Businesses

Cluster Identification Process:

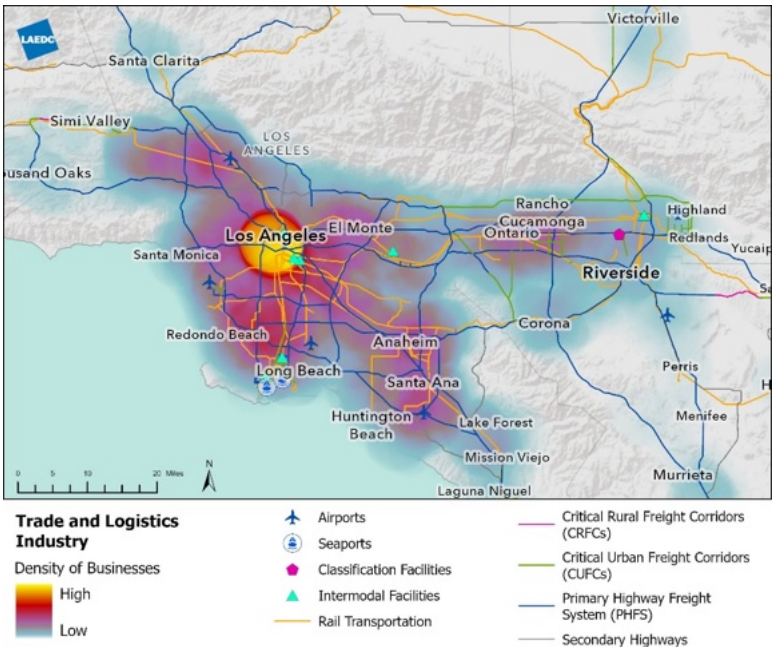
- The identification of clusters within the Trade and Logistics industry cluster is essential for understanding the distribution of businesses and their relationship with key infrastructure in Southern California. Using GIS spatial analysis tools, we performed a series of analyses to detect and analyze clustering patterns, with an initial focus on creating a Heat Map. This map allowed us to visualize the intensity of trade and logistics business locations weighted by the number of employees, giving us an initial indication of high-density areas and potential clusters.

- **Heat Map Analysis**: The first analysis involved generating a Heat Map using GIS software to visualize the distribution of all trade and logistics businesses across the region, weighted by employee count. By weighting each business location by its number of employees, the Heat Map highlighted areas where large workforces were concentrated, indicating significant hubs of economic activity within the industry.

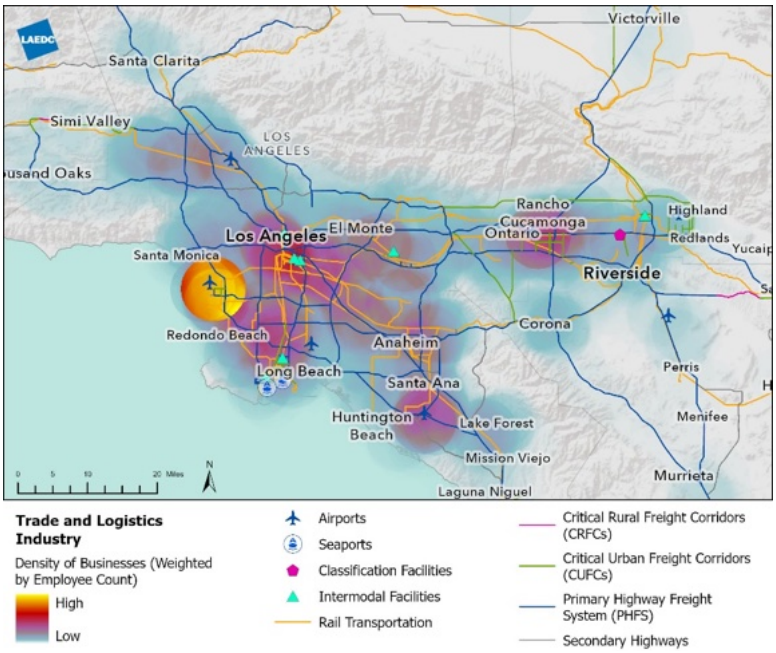
- **Insights from the Heat Map**: The Heat Map revealed high-density areas in major logistics and distribution hubs. Specifically, clusters emerged around critical infrastructure such as the San Pedro Bay Ports, Los Angeles International Airport, Ontario International Airport, and along major highways like I-5, I-10, I-710, and CA-60. This concentration indicated that businesses with larger workforces were strategically located in areas with easy access to major transportation nodes, supporting efficient goods movement and distribution.



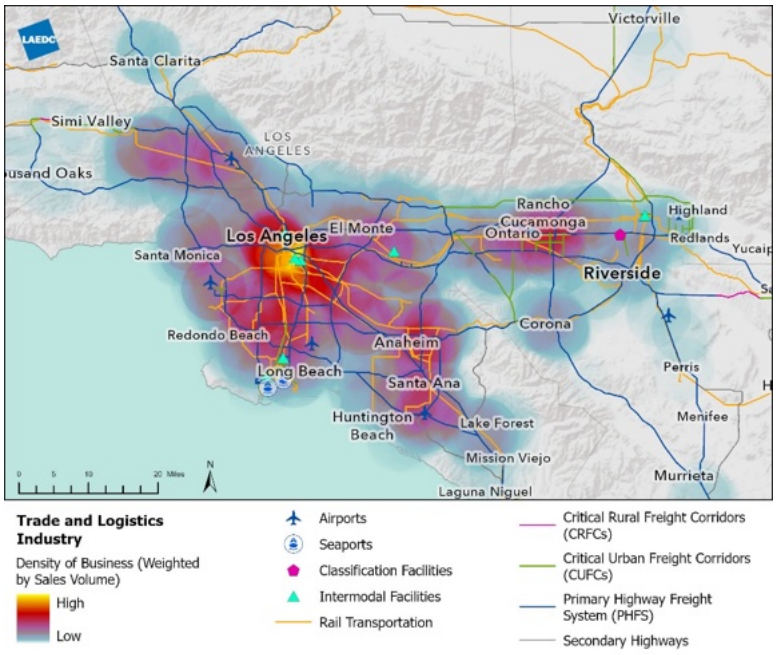
- **Point Density Analysis**: Point density analysis measures the concentration of point features within a specified area, revealing spatial distribution patterns. The initial analysis, conducted without any weighting, revealed the natural concentration of trade and logistics businesses across Southern California, offering insight into the industry's spatial distribution. The highest density appeared in Central Los Angeles, underscoring its role as a core logistics hub and a critical area for trade-related activities. Other significant clusters were identified around the San Pedro Bay Ports, Los Angeles International Airport, Ontario International Airport, John Wayne Airport, and in the San Gabriel and San Fernando Valleys, each of which benefits from proximity to major transportation infrastructure. These clusters align with key logistical assets, highlighting the sector's dependence on accessibility to ports, airports, and highways. By establishing a baseline for business density patterns, this unweighted analysis pinpointed high-activity zones and served as a foundation for further analysis weighted by workforce size and economic output, which would provide additional layers of insight into the industry's structure and labor needs across the region.



- **Point Density Weighted by Employee Count**: The second run of the Point Density analysis incorporated employee count as a weight, allowing us to highlight areas with a concentration of businesses that employ larger workforces. This approach provided a refined understanding of labor-intensive clusters within the Trade and Logistics industry cluster, showing where the most significant employment hubs are located. The highest density was observed around Los Angeles International Airport, followed by the San Pedro Bay Ports, Ontario International Airport, and John Wayne Airport, reflecting the critical role of these transportation hubs in supporting large-scale employment and facilitating goods movement. Additional high-density areas included Central Los Angeles, as well as the San Gabriel and San Fernando Valleys, which both displayed substantial employee concentrations, aligning with their established logistical infrastructure. This weighted analysis underscored workforce accessibility as a key factor in cluster formation, indicating that businesses with significant labor needs are strategically positioned near these major transportation and infrastructure nodes to maximize efficiency and operational reach within the region.



- **Point Density Weighted by Sales Volume**: In the third run, we applied sales volume as a weight in the Point Density analysis, which revealed clusters where high-revenue businesses were concentrated, highlighting areas with substantial economic impact within the Trade and Logistics industry cluster. The highest density was observed near the intermodal facilities in Central Los Angeles, indicating this area as a key hub for high-revenue logistics operations. Following closely were the San Pedro Bay Ports, which serve as critical entry points for goods and contribute significantly to revenue generation within the region. Ontario International Airport, John Wayne Airport, and Anaheim also showed high sales density, reflecting the economic importance of these locations in facilitating accessible and efficient distribution. Additionally, Los Angeles International Airport and Hollywood Burbank Airport had notable density levels, underscoring their roles in supporting high-revenue businesses strategically positioned to maximize market reach. This sales-weighted analysis offered insights into the areas where high economic output clusters align with transportation and logistical infrastructure, emphasizing the importance of proximity to key distribution channels for revenue-generating businesses.



Criteria for Cluster Formation

- **Proximity to Key Infrastructure**: The Point Density analyses, particularly when weighted by employee count and sales volume, underscored the importance of proximity to critical infrastructure. High-density clusters consistently emerged near seaports, airports, and primary freight corridors, affirming that businesses in the Trade and Logistics industry cluster prioritize locations that optimize access to transportation infrastructure.

- **Business Density, Employee Concentration, and Sales Volume**: The weighted Point Density analyses provided additional criteria for cluster identification, incorporating both workforce size and economic output. By examining clusters based on employee count and sales volume, we were able to distinguish areas of high economic activity from purely high-density business locations, allowing for a deeper understanding of the factors influencing cluster formation.

Visualizing and Interpreting Cluster Results

- **Cluster Maps and Point Density Visualization**: The Point Density maps, combined with the initial Heat Map, allowed for a multi-dimensional view of clustering across the region. The unweighted Point Density map provided a baseline for business distribution, while the weighted maps refined our understanding by highlighting areas with high labor demands and significant sales activity. These visualizations helped to pinpoint high-impact clusters that are central to the economic and logistical functions of Southern California.

- **Comparing Employee-Weighted and Sales-Weighted Clusters**: By comparing the employee-weighted and sales-weighted density maps, we were able to identify patterns where clusters were driven primarily by workforce demands versus economic output. For instance, certain areas near Ontario International Airport showed high density both by employee count and sales volume, indicating strong economic hubs with labor-intensive operations. Other areas, such as Central Los Angeles, demonstrated high sales volume density but moderate employee-weighted density, suggesting a concentration of high-revenue businesses with potentially smaller workforces.

Applications of Cluster Identification in Strategic Planning

- **Infrastructure and Labor Market Alignment**: The insights from the Point Density analyses highlighted regions where infrastructure investments and workforce development could support growing business clusters. Areas with high employee-weighted density, for example, may benefit from improved transportation and public transit options to support labor accessibility.

- **Economic Development Focus Areas**: The sales-weighted density clusters revealed areas of significant economic impact, suggesting potential zones for business retention and expansion efforts. By focusing economic development initiatives in high-sales regions, planners can bolster key hubs within the Trade and Logistics industry cluster.

- **Customized Land Use and Zoning Adjustments**: The distinction between clusters based on employee density and sales volume supports more targeted land use planning. High employee-density zones may be prioritized for workforce housing and transportation accessibility, while high sales-volume areas may benefit from incentives for business expansion and logistics infrastructure.

This cluster identification process, incorporating both Heat Map and Point Density analyses, offered a comprehensive understanding of the spatial organization of the Trade and Logistics industry cluster in Southern California. The multi-weighted approach allowed for an in-depth examination of clusters driven by workforce concentration and economic output, supporting strategic decision-making for regional economic and infrastructure planning.

Analyzing Business Characteristics and Location Factors

Average Distance to Key Infrastructure for Trade and Logistics Businesses

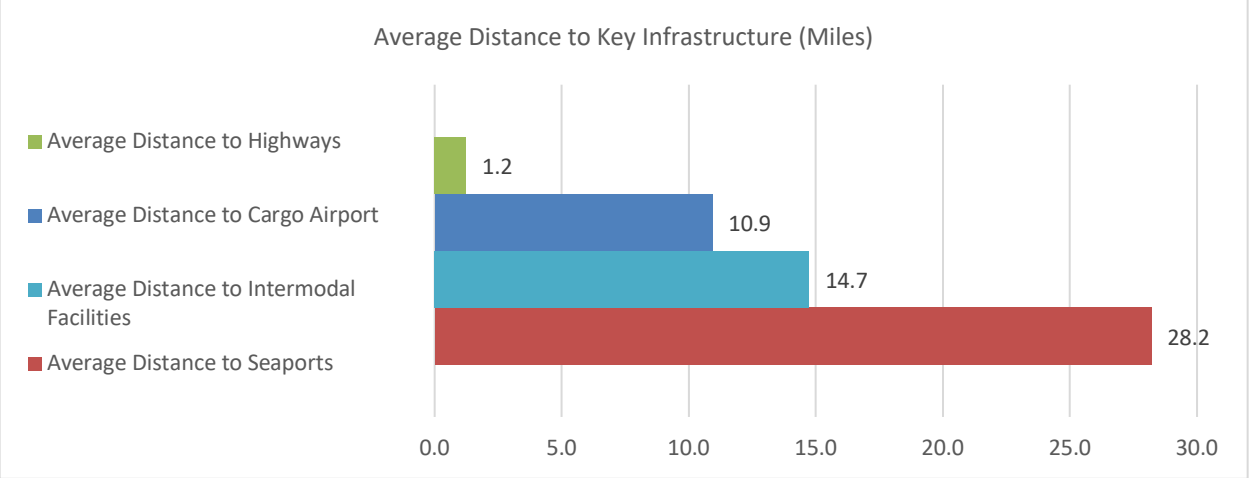
The analysis of average distances from trade and logistics businesses to critical infrastructure offers valuable insights into the spatial organization and operational efficiency of the sector in Southern California. With a total of 39,802 businesses analyzed, the results illustrate how trade and logistics establishments strategically position themselves in relation to key transportation nodes, enhancing accessibility and efficiency. The average proximity to various infrastructure types is as follows:

- **Cargo Airports**: Businesses are, on average, located 10.9 miles from the nearest cargo airport. This moderate distance indicates a balanced positioning, allowing businesses to efficiently access air freight services while also considering proximity to other transport modes and industrial hubs. Airports play a crucial role in time-sensitive logistics, especially for high-value and perishable goods, making this level of accessibility beneficial for businesses relying on air cargo.

- **Seaports**: With an average distance of 28.2 miles to the nearest seaport, businesses are positioned within a reasonable range to support maritime logistics, albeit farther compared to other types of infrastructure. This longer distance reflects both the spatial constraints and limited number of seaports compared to other infrastructure types in the region. Businesses relying on seaport access balance this need with closer access to complementary transport nodes, such as highways and rail lines.

- **Highways**: The analysis shows that trade and logistics businesses maintain very close proximity to highway access points, with an average distance of only 1.2 miles. This underscores the essential role of highways in facilitating efficient goods movement across the region, supporting both first- and last-mile delivery. Such close highway access allows businesses to streamline operations and reduce transportation costs, emphasizing the highway network as a backbone of the regional logistics infrastructure.

- **Intermodal Facilities**: The average distance to intermodal facilities is 14.7 miles, indicating that businesses are positioned within reasonable range to access points where goods can transfer between rail and truck modes. While farther than highways or rail lines, intermodal facilities provide critical connectivity for businesses moving goods across long distances and integrating different transportation methods. This access allows businesses to enhance distribution efficiency and reach broader markets.



These proximity averages reveal the strategic distribution of trade and logistics businesses in Southern California, emphasizing the importance of close access to highways and rail networks while balancing other logistical needs. Businesses prioritize proximity to infrastructure that supports rapid and flexible goods movement, with a strong emphasis on multimodal transport access. This spatial distribution supports Southern California's role as a vital logistics hub, where well-positioned infrastructure enables efficient local, regional, and national distribution.

3 Geographic Comparison

Section Summary

Southern California, anchored by the San Pedro Bay port complex (Ports of Los Angeles and Long Beach), remains the largest trade gateway in the United States, supporting a vast trade and logistics ecosystem across Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. This section provides a comparative analysis between Southern California and other key U.S. port regions, examining industry concentration, infrastructure connectivity, trade flow trends, and competitive positioning.

Competitive Position Among U.S. Ports

- Southern California's ports handle the highest container volumes in North America, benefiting from advanced intermodal infrastructure, including the Alameda Corridor rail link.
- However, competition from East Coast and Gulf ports, such as New York/New Jersey, Savannah, Houston, and Norfolk, is intensifying due to infrastructure investments, changing trade routes, and labor advantages.

Industry Concentration and Workforce Growth

- Southern California's trade network is supported by a robust transportation infrastructure, including:
    - **Highway Network**: Major trucking corridors (I-5, I-10, I-15, I-40) facilitate rapid freight movement.
    - **Rail System**: Union Pacific and BNSF rail lines, coupled with the Alameda Corridor, enhance inland connectivity.
    - **Air Cargo Hubs**: LAX and ONT play critical roles in handling high-value, time-sensitive goods.

Trade Flow Trends and Challenges

- Between 2018 and 2023, total trade flows in Southern California declined by 5.0 percent (tonnage) and 7.7 percent (value) due to global supply chain disruptions, pandemic-related slowdowns, and labor challenges at West Coast ports.
- In contrast, Savannah experienced significant growth (+22.3 percent in tonnage), while New York/New Jersey and Houston performed better than Southern California.

Investment at Competing Seaports

- Major competing ports are making multi-billion-dollar investments to capture more market share:
    - New York/New Jersey: Expanded rail capacity and warehousing.
    - Savannah: Nearly $5 billion planned for terminal expansions.
    - Houston: Strengthening container terminals and cargo handling.
    - Charleston and Norfolk: Focused on deep-water expansion and intermodal efficiency.

Strategic Considerations for Southern California

- To maintain its competitive edge, Southern California must prioritize:
    - **Port and Infrastructure Modernization:** Investing in automation and efficiency improvements.
    - **Workforce Development:** Addressing labor shortages and training for specialized logistics roles.

- **Multimodal Connectivity:** Enhancing truck, rail, and air freight networks to ensure supply chain resilience.
- **Policy and Trade Strategies:** Navigating shifts in global shipping routes and port competitiveness.

The Southern California region, anchored by the San Pedro Bay Ports—comprising the Ports of Los Angeles and Long Beach—serves as the largest gateway for trade in the United States. This critical infrastructure supports a vast trade and logistics ecosystem that spans the five-county area of Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. This section provides a comparative analysis between Southern California and other key U.S. port regions, examining industry concentration, specializations, growth patterns, and emerging trends that shape the trade and logistics landscape.

Regional and National Comparisons

Port Competitiveness

Southern California's seaports are the largest in terms of container volumes handled in North America (see the Investment at Competing Seaports section for more detail), bolstered by extensive intermodal infrastructure like the Alameda Corridor, which provides a direct, high-capacity rail link between port facilities and inland distribution hubs. Some of Southern California's greatest competitors include:

- **Port of New York and New Jersey**: Serving the East Coast, this port complex ranks second in container volumes, with strong growth in goods from Europe and Asia. Its proximity to major urban centers and connectivity to the Northeast corridor enhance its role in the eastern U.S. market. Additionally, Northeast ports serve a population twice as large as that of the San Pedro Bay Ports, further reinforcing their significance in national and regional trade dynamics.

- **Port of Savannah (Georgia)**: The Port of Savannah has seen rapid growth due to expansion projects and an efficient intermodal rail system. Georgia's low-cost land and labor draw distribution and logistics operations to the region, making it one of the fastest-growing ports in the country. However, the port faces challenges due to an insufficient amount and quality of labor, which may impact its ability to sustain long-term growth and meet increasing demand.

- **Port of Houston (Texas)**: Dominated by the energy sector, the Port of Houston benefits from its proximity to oil refineries and petrochemical industries. Its diversified cargo portfolio includes container, breakbulk, and liquid bulk, and recent investments in terminal expansions support a growing industrial base in the Gulf region. The city's projected population growth further underscores Houston's expanding role in national trade and logistics.

- **Port of Seattle-Tacoma (Northwest Seaport Alliance)**: This alliance strengthens the ports' position for Pacific Northwest trade. Though smaller in volume than Southern California, Seattle-Tacoma's strategic investments position it as a key alternative for trans-Pacific routes, benefiting from its accessibility to Canada.

- **Port of Norfolk (Virginia)**: The Port of Virginia is strategically located with deep-water access, handling ultra-large container vessels post-Panama Canal expansion. Its proximity to the I-95 corridor and on-dock rail service makes it a critical East Coast gateway for intermodal transport to the Midwest and Eastern U.S.

- **Port of Charleston (South Carolina)**: The Port of Charleston has experienced rapid growth, fueled by terminal expansions and strong rail connectivity. Charleston's proximity to South Carolina's booming manufacturing sector, especially automotive and aerospace, supports a steady export flow.

- **Port of Oakland**: The Port of Oakland is a key hub for U.S. agricultural exports, particularly to Asia-Pacific markets. Its proximity to California's agricultural centers supports its specialization in perishable goods, with expansions in cold storage and warehousing enhancing its service to exporters.

Industry Concentration

What facilitates the large trade volumes through Southern California's ports is the assortment of specialty industries that make up the Trade and Logistics industry cluster. And as noted earlier, the Southern California region has a number of trade and logistics industries that are highly-concentrated relative to the United States. For example, in 2022 Marine Cargo Handling had a location quotient (LQ) of 4.0 for the region and 7.1 for Los Angeles County. Also for the same year, All Other Support Activities for Transportation saw an LQ of 4.0 for the region and 5.8 for both Los Angeles and San Bernardino Counties. These high levels of concentration indicate a geographical clustering of firms and workers, and suggest that these industries offer a particular competitive advantage to the region. This is because increased concentration helps to foster increased specialization, efficiencies and innovation.

We identified the individual trade and logistics industries that demonstrated high levels of concentration in 2022 (i.e., they had LQs of 1.2 or greater) and that experienced the greatest percentage growth in their LQs from 2017 to 2022. These are considered ascendant critical industries.

Eight industries emerged from this analysis: Other Nonscheduled Air Transportation; Scheduled Passenger Air Transportation; All Other Support Activities for Transportation; General Freight Trucking, Local; Nonscheduled Chartered Freight Air Transportation; General Warehousing and Storage; and Marine Cargo Handling. These industries cover air transportation, ground transportation, water transportation, as well as warehousing and storage. These industries collectively added over 93,000 workers in Southern California's Trade and Logistics industry cluster between 2017 and 2022. Most of these pertain to Warehousing and Distribution.

Figure 3.1
Southern California Trade and Logistics Industries with High LQ Concentration and High LQ Growth
2017 to 2022

NAICS	Industry	Employment 2017	Employment 2022	2017-22 Change	LQ 2017	LQ 2022	2017-22 % Change
481219	Other Nonscheduled Air Transportation	333	581	248	1.0	1.6	61%
481111	Scheduled Passenger Air Transportation	24,542	29,509	4,967	1.0	1.2	20%
488999	All Other Support Activities for Transportation	2,830	3,867	1,037	3.4	4.0	17%
484110	General Freight Trucking, Local	19,953	26,762	6,809	1.4	1.6	14%
481212	Nonscheduled Chartered Freight Air Transportation	1,103	1,484	381	2.3	2.5	8%
493110	General Warehousing and Storage	77,280	156,350	79,070	1.5	1.6	4%
488320	Marine Cargo Handling	13,514	14,481	967	4.0	4.0	0%
	Total	**139,555**	**233,034**	**93,479**	---	---	---

Source: QCEW

It should be underscored, however, that location quotients only measure relative employment levels locally and nationally. In other words, they simply reflect the use of labor across the industry cluster. They do not reflect the value of products produced or sold. Additionally, an increasing location quotient is consistent both with an increase in a region's competitive advantage and with insufficient capital investment into production processes, causing the industries to become more labor intensive. Consequently, care must be taken when interpreting changes in location quotients over time.

Transportation Infrastructure and Connectivity

One important aspect of Southern California's transportation infrastructure that gives it a particular advantage is its extensive network of hot shot trucking routes and rail corridors.[6] These trucking routes and rail corridors are key to connecting the region's port facilities to the broader U.S. market.

Hot Shot Trucking Routes

The hot shot trucking routes in Southern California include major highways that enable efficient, direct transportation of goods from the Los Angeles area to other parts of the country. Key highways include:

- **Interstate 5 (I-5)**: Connecting Los Angeles north to Sacramento, Portland, and Seattle, I-5 serves as the primary north-south trucking route along the West Coast. Southward, it connects to San Diego and ultimately links with Mexican trade routes, making it critical for domestic and cross-border trade.

- **Interstate 10 (I-10)**: Running east from Los Angeles through Arizona, New Mexico, and Texas, I-10 is a main route to the southern U.S. and Gulf Coast, directly linking Southern California with major distribution centers in Phoenix, Tucson, El Paso, and Houston. Its connection to Texas is particularly valuable for trade with the Port of Houston.

- **Interstate 15 (I-15)**: I-15 moves goods north from Los Angeles through Las Vegas, Salt Lake City, and ultimately toward the Canadian border. This route is essential for connecting Southern California with the Intermountain West and Western Canada.

- **Interstate 40 (I-40)**: Eastbound from Southern California, I-40 crosses Arizona, New Mexico, Texas, and other states, connecting Los Angeles to the Midwest and East Coast markets. Its direct route to major logistics hubs, like Memphis and Nashville, facilitates efficient long-haul shipping.

[6] Hot shot trucking involves hauling small, time-sensitive loads that are less than a full truckload to a single customer or location.

Rail Lines and the Alameda Corridor

The **Alameda Corridor** is a critical 20-mile rail expressway connecting the Ports of Los Angeles and Long Beach to rail yards near downtown Los Angeles, effectively reducing surface traffic congestion and expediting cargo movement inland. This corridor provides streamlined access to the national rail network, where key rail lines include:

- **Union Pacific (UP) and Burlington Northern Santa Fe (BNSF) Railways**: These two rail companies dominate the region, with dedicated intermodal routes extending from Los Angeles to destinations across the U.S. UP's Sunset Route and BNSF's Transcon Route facilitate rapid eastward movement of containers, connecting Southern California to major logistics hubs in Chicago, Dallas, and Kansas City.

- **Pacific Surfliner Corridor**: Though primarily a passenger route, this line also supports limited freight traffic along the California coast, connecting Southern California with regional hubs to the north.

In comparison, ports like Savannah and Houston also have robust rail connectivity; Savannah's Mason Mega Rail Terminal, for instance, connects the port to major distribution hubs across the Southeast and Midwest. Seattle-Tacoma relies heavily on rail to move goods to the inland Northwest and Canadian markets, where rail access is essential given the mountainous terrain and limited highway infrastructure.

Together, these rail and trucking networks support hot shot routes that facilitate timely delivery of cargo from Los Angeles to the rest of the U.S., complementing Southern California's role as a central trade and logistics hub.

Role of Airports in Trade

Southern California's airport network also plays a vital role in trade flows, complementing the capacity of the region's seaports. Los Angeles International Airport (LAX) and Ontario International Airport (ONT) are significant cargo hubs that enable high-value, time-sensitive goods—such as electronics, pharmaceuticals, and e-commerce products—to reach global and domestic markets efficiently.

- **Los Angeles International Airport (LAX)**: LAX is among the busiest U.S. airports for air cargo volume, handling substantial international freight, especially between Asia-Pacific markets and the United States. With dedicated cargo terminals and advanced handling facilities, LAX is equipped to manage high volumes of goods that require expedited shipping. Air cargo flowing through LAX is an essential part of Southern California's supply chain, especially for industries dependent on high-speed logistics.

- **Ontario International Airport (ONT)**: Located in the Inland Empire, ONT is strategically positioned close to the region's vast number of warehousing and distribution centers. This airport supports overnight express shipments and has become a vital part of Southern California's e-commerce and last-mile delivery infrastructure. ONT has seen rapid growth in cargo volume in recent years, with expansions aimed at supporting increasing demand from e-commerce and time-sensitive industries.

In addition to these major airports, John Wayne Airport in Orange County, San Bernardino International Airport, and March Air Reserve Base in Riverside County provide supplementary air cargo capacity, contributing to the regional movement of goods. San Bernardino, in particular, has been expanding its air cargo facilities to capture more of the market for expedited shipping and last-mile logistics.

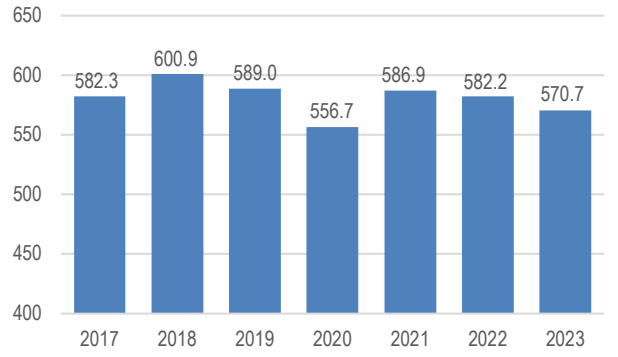
Trade Flow Changes at Southern California's Airports and Seaports

The U.S. Bureau of Transportation Statistics compiles freight flow data for regions across the country, incuding the five-county Southern California region, in its Freight Analysis Framework database. This data is broken out by a number of characteristics, including freight tonnage, freight value, origin and destination, and mode of transportation. Freight flows include movement out of the region as well as movement within the region itself, unless otherwise noted.

Total Trade Flows

In 2023, nearly 571 million tons of goods flowed through Southern California. These are goods that solely circulated throughout the Southern California region; entered the region as foreign imports for distribution locally or nationally; or originated in the region for export from the region or elsewhere. These goods were valued at $1.6 trillion dollars (or almost $1.3 trillion as measured in 2017 dollars).

Figure 3.2
Total Trade Flows in Southern California by Tonnage
Million Tons

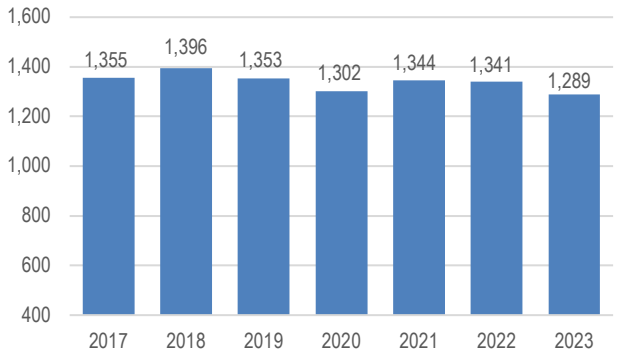


Source: Freight Analysis Framework

Since 2017, the growth in total trade flows of goods in Southern California has not been steady. In 2017, 582 million tons of goods flowed through the region, increasing to a high of almost 601 million tons the following year. After 2018, however, the amount of freight tonnage has steadily declined, with the notable exception of 2020 where total trade flows experienced a sizeable drop and bounce back resulting from the COVID-19 pandemic. Over the five years between 2018 and 2023, the trade flows in the region as measured by tonnage decreased by a total of 5.0 percent, or an annual average decline of 1.0 percent.

A similar pattern emerges when looking at the value of trade flows in Southern California. Trade flows increased in value in real terms between 2017 and 2018 from 1.36 trillion to nearly $1.4 trillion, where they peaked. They then experienced a decline to 2023, with a pronouced drop in 2020 and a return to trend in 2021. Between 2018 and 2024, the value of trade flows decreased by 7.7 percent in real terms. This translates to an average decline of 1.5 percent per year.

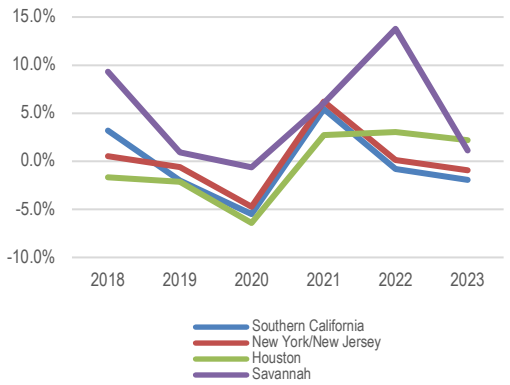
Figure 3.3
Total Trade Flows in Southern California by Value
Billion 2017 Dollars



Source: Freight Analysis Framework

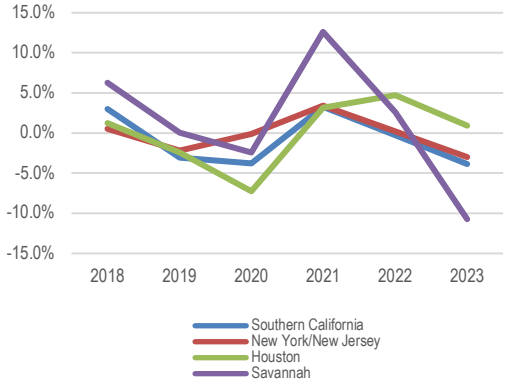
The causes behind the recent decline in total trade flows in Southern California are not readily apparent. Trade flows can be influenced by global or national economic conditions that affect the overall level of trade, such as recessions, and by global conflicts that affect access to particular shipping lanes or that decrease the desirability of certain ports relative to others. They can also be shaped by local conditions, since a region's unique industry composition has different commodity requirements than another's, and since labor actions like strikes or work stoppages tend to be localized.

Figure 3.4
Percentage Change in Trade Flow Tonnage
By Selected Region



Source: Freight Analysis Framework

Figure 3.5
Percentage Change in Trade Flow Value
By Selected Region



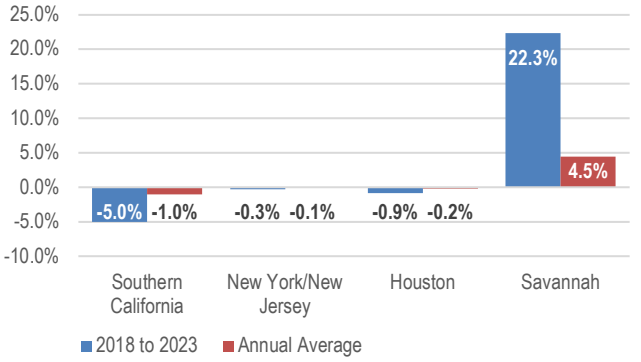
Source: Freight Analysis Framework

Similar trends in total trade flows experienced by Southern California can be seen elsewhere, whether measuring trade flows by tonnage or by value. For example, New York/New Jersey, Houston, and Savannah—three regions with major seaports all located at different points along the coastal United States—had similar saw-tooth patterns. This suggests that they were all affected similarly by global and national factors, including COVID-19 in 2020 and the spike in inflation in 2022.

However, local factors are also clearly at play. Savannah, for instance, saw more pronounced swings in growth rates of total trade flows than the other three regions shown. Additionally, when looking at the percentage change in tonnage, Savannah experienced only one year of negative growth (2020), and that decrease was only 0.6 percent. That compares to -4.7 percent for New York/New Jersey, -5.5 percent for Southern California, and -6.4 percent for Houston for the same year.

When considering the five-year period from 2018 to 2023 as a whole, the effect of local factors appears more prominently. As mentioned, the trade flows in Southern California as measured by tonnage decreased by a total of 5.0 percent, or an annual average decline of 1.0 percent. This was the worst performance of the four regions listed. By comparison, trade flows by tonnage decreased by only 0.3 percent for New York/New Jersey and by 0.9 percent for Houston, resulting in average annual declines of 0.1 percent and 0.2 percent, respectively. Savannah actually saw large gains of 22.3 percent over the period, or an average annual increase of 4.5 percent. It should be noted, though, that total trade flows in Savannah are significantly smaller in absolute terms relative to the other regions. In 2023, for example, Savannah handled 75.3 million tons of goods compared to 570.7 million for Southern California, 485.0 million for New York/New Jersey, and 680.6 million for Houston.

Figure 3.6
Total Percentage Change in Trade Flow Tonnage by Selected Region
2018 to 2023



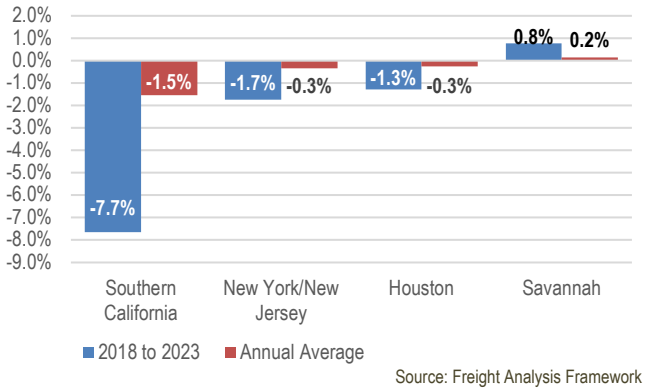
Source: Freight Analysis Framework

Several factors contributed to the decline in trade flows for Southern California, including disruptions during the pandemic. Concerns about goods arriving from the Far East as potential health risks may have impacted trade patterns during this period, along with broader global supply chain disruptions. Additionally, labor challenges at West Coast ports exacerbated delays and congestion, further straining trade operations. These compounding issues likely played a role in Southern California's underperformance relative to other major U.S. trade regions.

Additionally, local factors influence not just the amount of freight flowing through a region but the types of freight as well. The Port of Houston has more extensive bulk cargo facilities than the Ports of Los Angeles and Long Beach, for example, and thus has a different composition of freight. This composition also affects the value of the goods and commodities that move through a region.

The differences in the values of trade flows become evident when looking at the four regions from 2018 to 2023. Compared to Southern California's 7.7 percent drop and 1.5 percent average annual decline over the five years, the other three regions fared better. Trade flows by value decreased by 1.7 percent for New York/New Jersey and by 1.3 percent for Houston, resulting in average annual declines of 0.3 percent for each. Savannah experienced a much smaller gain of 0.8 percent relative to its 22.3 percent growth in tonnage, which resulted in an average annual increase of only 0.2 percent.

Figure 3.7
Total Percentage Change in Trade Flow Value by Selected Region
2018 to 2023



Source: Freight Analysis Framework

Types of Trade Flows in Southern California

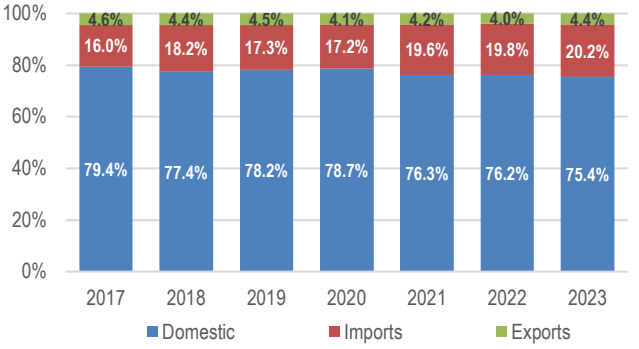
The vast majority of goods transported across the Southern California region are classified by the Freight Analysis Framework as domestic goods, meaning these trips originated in the region and had destinations that were either local or elsewhere in the United States. This transportation typically occurs by truck. In 2023, 75.4 percent of goods by tonnage and 69.2 percent of goods by value were domestic goods. Imports made up 20.2 percent of goods by tonnage and 25.0 percent of goods by value, whereas exports made up just 4.4 percent of goods by tonnage and 5.8 percent by value.

Between 2017 and 2023, the percentage of domestic goods in Southern California decreased slightly with respect to tonnage, going from 79.4 percent to 75.4 percent. The value of these domestic goods remained relatively flat over the period, however.

By contrast, the percentage of imports in Southern California increased in terms of tonnage, going from 16.0 percent to 20.2 percent. The relative value of these imports decreased slightly, declining from 26.7 percent to 25.0 percent.

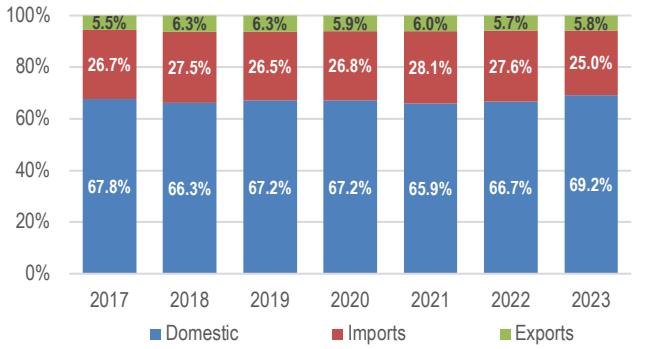
Exports in Southern California remained relatively flat both with respect to tonnage and value. Exports represented 4.6 percent of tonnage in 2017 compared to 4.4 percent in 2023, and 5.5 percent of value in 2017 compared to 5.8 percent in 2023.

Figure 3.8
Trade Flow Tonnage in Southern California by Trade Type



Source: Freight Analysis Framework

Figure 3.9
Trade Flow Value in Southern California by Trade Type



Source: Freight Analysis Framework

Domestic Trade Flows

Most of the domestic goods that originate in Southern California are transported for delivery somewhere else in Southern California. In 2023, nearly 328 million tons of freight, or about 76 percent of the region's total domestic trade flows, was delivered within the region. Other California locations, including San Francisco, San Diego, and Sacramento, appeared in Southern California's top ten list of destinations, together accounting for another 12.4 percent of Southern California's domestic trade flows. Other destinations included Phoenix (1.6 percent), Las Vegas (1.3 percent), Salt Lake City (0.6 percent), and Houston (0.4 percent).

In terms of the value of freight, 422.2 billion (in 2017 dollars) of Southern California's domestic trade flows stayed within the region, representing only 47.3 percent against the 76 percent of tonnage. Another significant portion remained in California, with San Diego (4.2 percent) coming in second in the top ten and San Francisco (3.2 percent) coming in third. The remainder included many new locations, such as Columbus (2.5 percent), Dallas-Fort Worth (1.7 percent) and Chicago (1.3) percent.

Import Trade Flows

The Freight Analysis Framework segments the foreign origin of imports into eight geographic regions. Some of these regions are countries (i.e., Canada, Mexico), some are continents (i.e., Europe, Africa), and the rest are subcontinents or mega-regions.

Figure 3.10
Top Ten Destinations of Southern California Freight
By Tonnage

Rank	Destination	2023 Tonnage (Million Tons)	Percent
1	Southern California	327.9	76.2%
2	San Francisco, CA	17.1	4.0%
3	San Diego, CA	15.7	3.6%
4	Rest of CA	14.0	3.3%
5	Phoenix, AZ	6.9	1.6%
6	Las Vegas, NV	5.6	1.3%
7	Sacramento, CA	4.3	1.0%
8	Salt Lake City, UT	2.4	0.6%
9	Fresno, CA	2.2	0.5%
10	Houston, TX	1.9	0.4%
	Total	430.5	100.0%

Source: Freight Analysis Framework

Figure 3.11
Top Ten Destinations of Southern California Freight
By Value

Rank	Destination	2023 Value (Billion 2017 $)	Percent
1	Southern California	422.2	47.3%
2	San Diego, CA	37.3	4.2%
3	San Francisco, CA	28.5	3.2%
4	Rest of CA	26.1	2.9%
5	Columbus, OH	22.1	2.5%
6	Phoenix, AZ	19.5	2.2%
7	Las Vegas, NV	17.1	1.9%
8	Dallas-Fort Worth, TX	15.5	1.7%
9	Seattle, WA	12.3	1.4%
10	Chicago, IL	12.0	1.3%
	Total	892.5	100.0%

Source: Freight Analysis Framework

Figure 3.12
Top Originations of Southern California Imports
By Tonnage

Rank	Destination	2023 Tonnage (Million Tons)	Percent
1	Eastern Asia	54.1	47.0%
2	Rest of Americas	21.4	18.6%
3	SE Asia & Oceania	15.9	13.8%
4	SW & Central Asia	12.6	10.9%
5	Europe	5.5	4.7%
6	Mexico	2.9	2.5%
7	Canada	1.9	1.7%
8	Africa	0.9	0.8%
	Total	115.3	100.0%

Source: Freight Analysis Framework

Figure 3.13
Top Originations of Southern California Imports
By Value

Rank	Destination	2023 Value (Billion 2017 $)	Percent
1	Eastern Asia	197.5	61.4%
2	SE Asia & Oceania	71.3	22.1%
3	Europe	23.4	7.3%
4	SW & Central Asia	12.3	3.8%
5	Rest of Americas	10.6	3.3%
6	Mexico	3.4	1.1%
7	Canada	2.0	0.6%
8	Africa	1.4	0.4%
	Total	322.0	100.0%

Source: Freight Analysis Framework

In 2023, 47.0 percent of imports by tonnage and 61.4 percent of imports by value into Southern California came from Eastern Asia. Eastern Asia includes China, Hong Kong, Japan, Macao, Mongolia, North Korea, South Korea, and Taiwan. Three additional regions, the Rest of Americas, Southeast Asia and Oceania, and Southwest and Central Asia, together account for 43.3 percent of tonnage, which consitutes the bulk of the remainder. With respect to value, Southeast Asia and Oceania (22.1 percent) and Europe (7.3) percent make up most of the remainder.

Export Trade Flows

As described earlier, export trade flows from Southern California are relatively small with respect to both value and tonnage. In 2023, only 24.9 million tons of freight and $74.4 billion (2017 dollars) in value were exported from Southern California. These exports were more uniformly distributed across the eight regions by both tonnage and value. Eastern Asia received 28.7 percent of Southern California exports by tonnage and 28.1 percent by value. Mexico received 25.4 percent of exports by tonnage and 20.3 percent by value, while Europe received 11.0 percent of exports by tonnage and 19.6 percent by value.

Figure 3.14
Top Destinations of Southern California Exports
By Tonnage

Rank	Destination	2023 Tonnage (Million Tons)	Percent
1	Eastern Asia	7.1	28.7%
2	Mexico	6.3	25.4%
3	Europe	2.7	11.0%
4	Canada	2.5	9.9%
5	SE Asia & Oceania	2.4	9.7%
6	Rest of Americas	1.9	7.5%
7	SW & Central Asia	1.8	7.2%
8	Africa	0.1	0.5%
	Total	24.9	100.0%

Source: Freight Analysis Framework

Figure 3.15
Top Destinations of Southern California Exports
By Value

Rank	Destination	2023 Value (Billion 2017 $)	Percent
1	Eastern Asia	20.9	28.1%
2	Mexico	15.1	20.3%
3	Europe	14.6	19.6%
4	SE Asia & Oceania	7.5	10.0%
5	Canada	7.1	9.6%
6	SW & Central Asia	4.8	6.5%
7	Rest of Americas	4.0	5.4%
8	Africa	0.4	0.6%
	Total	74.4	100.0%

Source: Freight Analysis Framework

Investment at Competing Seaports

Nine of the ten largest North American seaports, as defined by the number of twenty-foot equivalent unit (TEU) containers handled, are located in the United States. Four of the nine are found on the West Coast (i.e., the Ports of Long Beach, Los Angeles, Oakland, and Seattle/Tacoma), four of the nine are located on the East Coast (i.e., the Ports of Charleston, New York/New Jersey, Savannah, and Virginia), and one is situated on the Gulf of Mexico (i.e., the Port of Houston). The largest North American seaport outside the United States is the Port of Vancouver in British Columbia, Canada.

In 2023, the Port of Los Angeles ranked as the largest North American seaport with 7.9 million TEUs (from January through November), down from 9.9 million TEUs the previous year. The Port of Long Beach came in second with 7.3 million TEUs followed by the Port of New York/New Jersey with 7.2 million TEUs, having swapped positions from the prior year.

Compared to these three ports, the remainder of the top ten have a significant drop-off in the number of TEUs handled. The Port of Savannah held the fourth spot with 4.5 million TEUs, followed by the Port of Houston (3.5 million), the Port of Seattle-Tacoma (2.7 million), the Port of Charleston (2.3 million), the Port of Oakland (1.9 million), the Port of Vancouver (1.6 million) and the Port of Virginia (1.1 million).

The ten largest North American seaports generally are large, covering over one thousand acres. The size enables room for multiple terminals, transloading and transmodal facilities, and storage facilities. Most of these seaports have 4 or more container terminals and a draft depth of at least 50 feet, allowing for the accomodation of the largest containerships.

Figure 3.16
Ten Largest North American Seaports by Containers

Rank	Port	State	2023 (Jan-Nov) TEUs	2022 (Full Year) TEUs	Draft Depth	Size (Acres)	Container Terminals
1	Port of Los Angeles	CA	7,887,162	9,911,159	>52 feet (16 m)	7,500	7
2	Port of Long Beach	CA	7,308,848	9,133,657	>50 feet (15 m)	3,200	6
3	Port of New York/New Jersey	NY/NJ	7,176,126	9,493,664	50 feet (15 m)	N/A	6
4	Port of Savannah (Georgia Ports)	GA	4,506,367	5,892,131	47 feet (14 m)	1,345	2
5	Port of Houston	TX	3,499,580	3,974,901	45 feet (14 m)	N/A	2
6	Port of Seattle-Tacoma (NWSA)	WA	2,711,245	3,384,018	50 feet (15 m)	2,500	4
7	Port of Charleston	SC	2,274,586	2,792,313	52 feet (16 m)	>931	6
8	Port of Oakland	CA	1,889,697	2,337,125	50 feet (15 m)	1,300	3
9	Port of Vancouver	BC-CA	1,554,905	3,557,294	N/A	2,000	4
10	Port of Virginia	VA	1,131,450	3,703,230	50 feet (15 m)	1,864	6

Sources: American Journal of Transportation and individual port websites

While the Ports of Los Angeles and Long Beach consistently appear as two of the three largest North American seaports, the rankings of the remaining seaports have fluctuated over the past few years. There have been a number of reasons behind these fluctuations, beyond simple changes in consumer demand. Some factors led to increased trade volumes in East Coast and Gulf ports, including the West Coast waterfront labor disruptions in 2015; an expanded Panama Canal; increased Southeast Asian and Indian Subcontinent trade volumes moving through the Suez Canal following the Covid-19 pandemic; and capital investments in these ports allowing greater volumes to be handled more efficiently. Other, more recent factors have favored West Coast ports instead. These include low water levels and prolonged drought around the Panama Canal; Houthis attacks in the Red Sea that have impacted ship traffic through the Suez Canal and forced containership operators to divert to much longer alternative routes; and the possibility of waterfront labor disruptions on the East Coast in late 2024 and into 2025.[7]

We undertook a cursory review of the top North American seaports' websites, annual reports, and budgets to understand some of their current and recently completed investments and initiatives. The goal was to gain insight into how these ports are directly positioning themselves to compete for market share of container traffic into the near future. We summarize these perspectives below and list their major initiatives and investments in the Appendix:

Port of New York/New Jersey

The Port of New York and New Jersey describes itself the largest port on the U.S. East Coast and the second largest in the nation, having moved 7.8 million TEUs of cargo in 2023 with the capacity and efficiency measures to handle more. It also describes itself as a critical gateway and multimodal transportation nexus that is strategically located in the largest consumer marketplace in North America, with world class speed to market access. For shippers seeking a direct gateway to one of the world's largest and most vital economic regions, the port offers several unique benefits, including:

- A truck fleet of 9,000 frequent callers with direct access to 46.3 million consumers within only 4 hours;
- Six modern, state-of-the-art container terminals that can handle nine 14,000 TEU vessels at the same time;
- One billion square feet of warehousing and distribution space within 50 miles of the port;
- An ExpressRail network with 1.5 million annual lift capacity, meaning it can handle up to 1.5 million container transfers between ships and railcars per year, facilitating seamless access to major population centers in over 50 locations throughout New England, the Midwest, and eastern Canada; and
- Services provided to all of the world's major ocean carriers and global alliances. [8]

[7] Lauriat, G. (2024, January 22). *Top 20 North American ports*. American Journal of Transportation. Issue 761, p. 10. https://www.ajot.com/premium/ajot-top-20-north-american-ports
[8] https://www.panynj.gov/port/en/shipping/containers.html

Port of Savannah

The Port of Savannah describes itself as being the home of the largest single-terminal container facility of its kind in North America, encompassing 1,345 acres. It states that moving millions of tons of containerized cargo annually, Savannah is also the third-busiest container gateway in the U.S., providing greater scheduling flexibility and market reach with direct links to I-95 and I-16, on-terminal rail, and 37 weekly container ship calls. The Port of Savannah is the most westerly port on the Atlantic seaboard, providing shorter transit times and greater efficiency for cargo destined for major inland markets. A hundred miles closer to Atlanta than any other port, Savannah offers superior connections to multiple markets by road and rail. Planning for the future continues with another $4.5 billion in additional investment for new port and inland infrastructure in the next ten years. It also states that its advantages make Savannah ideal for container cargo and fast distribution to consumers and manufacturers:

- 36 Container Cranes with 42 cranes expected to be in place by 2028;
- 158 Rubber-Tired Gantry Cranes; and
- Nearly two miles of uninterrupted berthing space.[9]

Port of Houston

Port Houston owns and operates the eight public facilities along the 52-mile Houston Ship Channel, including the area's largest breakbulk facility and two of the most efficient container terminals in the nation. The Port describes itself as a strategic leader for this vital waterway that ensures the free flow of commerce throughout the region and bolsters national and international trade. It notes that the Houston Ship Channel complex and its more than 200 public and private facilities is the nation's largest port for waterborne tonnage, and an essential economic engine for the Houston region, the state of Texas, and the United States.[10] Containerized cargo is handled by the Authority at Barbours Cut and Bayport Container Terminals. Today, these terminals have a combined fleet of 29 wharf (STS) cranes, 123 Rubber Tired Gantry (RTG) cranes, 15 empty handlers, and additional heavy duty and other cargo handling equipment.[11]

Port of Seattle-Tacoma (NWSA)

The Northwest Seaport Alliance (NWSA) was formed when the ports of Seattle and Tacoma joined forces in August 2015 to unify management of marine cargo facilities and business to strengthen the Puget Sound gateway and attract more marine cargo and jobs to the region. Located in the Pacific Northwest in Washington state, the NWSA offers short transit times between the US and Asia, and the terminal and landside infrastructure necessary to quickly move cargo to the U.S. Midwest. NWSA strengths and advantages include:

[9] https://gaports.com/cargo/container/
[10] Port of Houston Authority. (2024.) *Annual Comprehensive Financial Report for the Years Ended December 31, 2023 and 2022.*
[11] https://porthouston.com/

- One gateway, two harbors and multiple terminal facilities offering more choices for shippers using the gateway;
- Naturally deep-water harbors and marine terminals with big-ship handling capabilities;
- Vessel service from the three international container shipping alliances and all major international container carriers;
- Dual service from the two West Coast transcontinental railroads (UP, BNSF) with competitive transit times to Chicago and other major Midwest markets; and
- Close proximity to the second largest concentration of warehousing on the West Coast.[12]

Port of Charleston

South Carolina Ports describes itself as providing reliable, highly productive port service at the Port of Charleston and two rail-served inland ports. As the 8th largest U.S. container port, SC Ports proactively invests in infrastructure and capacity to ensure customers' supply chains run smoothly. It notes that South Carolina Ports has invested more than $2 billion into port infrastructure in recent years to support the state's booming business sector. Combined with port funding and state funding, South Carolina Ports plans to spend an additional $2.5 billion over the next decade.[13]

Port of Oakland

The Oakland Seaport is comprised of approximately 1,300 acres of maritime-related facilities, including approximately 780 acres of marine terminals. The seaport is one of the 10 busiest container ports in the United States, and one of four major gateways for containerized shipments on the West Coast. It serves as the principal ocean gateway for international containerized cargo shipments to and from Northern California, California's agricultural Central Valley, and western Nevada. The seaport is also a key gateway for the Intermountain States, including western Colorado and Utah. In CY 2023, approximately 2.07 million twenty-foot equivalent units (TEUs) moved through the seaport. Approximately 92 percent of this activity was associated with international trade, while the remaining eight percent represented domestic trade within the U.S.[14]

Port of Vancouver

Located on the southwest coast of British Columbia, the Port of Vancouver extends from Roberts Bank and the Fraser River up to and including Burrard Inlet. Its jurisdiction includes more than 39,500 acres of water, more than 3,700 acres of land and hundreds of miles of shoreline, bordering 16 municipalities and intersecting the traditional territories and treaty lands of more than 35 Coast Salish First Nations. The Port of Vancouver is home to 29 major marine terminals, three Class 1 railroads, a regional short line railroad, and a full range of facilities and services that handle cargo and

[12] The Northwest Seaport Alliance. (2024.) *The Northwest Seaport Alliance 2025 Budget*.
[13] https://scspa.com/about-the-port/
[14] https://www.oaklandseaport.com/resources/about-the-oakland-seaport/

passengers across five different business sectors: automobile; breakbulk and project cargo; bulk; container; and cruise. Cargo terminals are operated and managed by independent third-party operators. The Canada Place cruise terminal at the Port of Vancouver is owned by the port authority, and we engage SSA Marine to manage terminal operations during the cruise season. These terminals, along with the railways, trucking companies, and other shipping and logistics companies that service the port, help move approximately $300 billion in goods to and from Canada each year.[15]

Port of Virginia

The Port of Virginia moves cargo through world-class facilities and transports to and from markets around the globe, carrying the goods and supplies that manufacturers, corporations, and individual consumers use in their everyday lives. This cargo is moved by way of: 6 Terminals; 1,864 acres; 19,885 L.F. of berth; up to 50' deep berths; and 30 miles of on-dock rail. The deep water harbor–the deepest on the US East Coast–shelters the world's largest naval base; a robust shipbuilding and repair industry; a thriving export coal trade and the sixth largest containerized cargo complex in the United States. The port offers 50-foot channels, inbound and outbound, and is moving forward with the Norfolk Harbor Dredging Project to attain 55 feet depths – retaining the deepest channel on the East Coast. In an era when container ships are carrying tens of thousands of twenty-foot equivalent units per voyage, deep water and the absence of overhead restrictions is a significant competitive advantage. The Port of Virginia is a hub port; an important distinction for the shipping public. Nearly 30 international shipping lines offer direct, dedicated service to and from Virginia, with connections to 200+ countries around the world. In an average week, more than 40 international container, breakbulk and roll-on / roll-off vessels are serviced at our marine terminals.[16]

[15] https://www.portvancouver.com/about
[16] https://www.virginia.gov/agencies/virginia-port-authority-/

4 Economic Contribution of the Trade and Logistics Industry Cluster

Section Summary

This section provides an assessment of the economic contribution of the Trade and Logistics industry cluster in Southern California to the regional economy, as well as its spillover effects on the rest of the state. The analysis examines both the direct and indirect impacts of the industry cluster, with a focus on its interconnectedness with other industries. Additionally, the induced spending effects of employees directly and indirectly linked to the industry cluster are analyzed. A customized input-output model was developed to quantify these contributions in terms of jobs, labor income, gross output, and fiscal revenues.

Direct Economic Activity

- The Trade and Logistics industry cluster directly employed 902,370 individuals in Southern California in 2022.
- The industry cluster generated $289.6 billion in direct output, representing 11.3 percent of the Southern California region's total gross output in 2022.

Total Economic Contribution

- In 2022, the Trade and Logistics industry cluster supported nearly 2 million jobs in Southern California. This included 902,370 direct jobs, 565,460 indirect jobs, and 493,600 jobs created through induced effects driven by household spending from employees directly or indirectly linked to the industry.
- The industry cluster generated nearly $290 billion in direct economic output in 2022. Additionally, it contributed another $116 billion in indirect output and $92 billion in induced output to the regional economy.
- The total labor income generated by the industry cluster in Southern California reached $157 billion, with $84 billion attributed to direct jobs within the industry cluster.
- Spillover effects to the rest of California resulted in nearly $8 billion in economic output and 26,560 jobs, along with $2.6 billion in associated labor income.

Tax Revenues Generated

- Economic activities directly and indirectly tied to the Trade and Logistics industry cluster in Southern California generated a total of $93.3 billion in tax revenues in 2022.
- Approximately 25 percent of these revenues were directed to local governments, while state governments received 31 percent. The federal government received the largest portion, accounting for 44 percent of the total.

Overall, the Trade and Logistics industry cluster is a vital driver of economic growth in Southern California. This industry cluster supports millions of jobs, generates substantial economic output, and contributes significantly to tax revenues at all levels of government. Its extensive interconnections with suppliers, service providers, and consumer markets in the region highlight its importance as a cornerstone of the region's economic system. Continued investment in the Trade and Logistics industry cluster will be important to ensure its long-term contributions to the growth of the regional economy.

Overview of Methodology

A contribution analysis is more comprehensive than economic impact analysis in that it measures the impact of entire industries and not just single companies or events within a given industry. Contribution analysis measures the value of the industry in terms of its backward linkages - its purchases of goods and services in its supply chain, its payment of labor income to regional workers, and the tax revenues generated on its operations and multiplier impacts. The concept of economic contribution help answer questions such as "What contribution does this industry make?" and "what would happen if industry did not exist in terms of those whose economic activity depends on supplying the industry?"

Economic contribution analyses measure not only the direct activity but also indirect and induced activity. This contribution is dependent on the payments made to suppliers of intermediate goods and services in the study region. This injection of funds circulates from the initial recipients to the owners and employees of establishments that help supply the goods and services that the industry purchases.

An industry also spends millions of dollars every year for the wages and benefits of its employees and contract workers. These workers, as well as the employees of all the industry's suppliers, spend a portion of their incomes on groceries, rent, vehicle expenses, healthcare, entertainment, and so on. The recirculation of the original expenditures multiplies the initial spending through these indirect and induced effects.

In this part of the study, a customized input-output model was developed for the five-county Southern California region and the state to estimate the economic contribution of the Trade and Logistics industry cluster in the region and California. The models measure economic benefits through jobs, labor income, economic output, Gross Regional Product (or Gross State Product), and fiscal revenues paid to state and local governments. Additional details on the methodology used in this report can be found in the Appendix.

Direct Economic Activity of the Trade and Logistics Industry Cluster

The economic activity in the Trade and Logistics industry cluster generates employment through two primary channels. Firstly, it creates jobs directly by employing individuals in businesses within the Trade and Logistics industry cluster. This includes roles in transportation, warehousing, distribution, and logistics services. Secondly, it indirectly supports employment in other sectors through the purchasing decisions made by trade and logistics businesses. The production and operation activities of these businesses require various goods and services from regional suppliers, such as equipment, materials and supplies, maintenance, technology, professional services, and utility, thus fostering job creation in those industries.

In 2022, the Trade and Logistics industry cluster's contributions to Southern California's economy were significant. In terms of industry sales (or output) generated by the industry cluster, it amounted to nearly $290 billion in 2022, accounting for 11.3 percent of the total gross output generated in the Southern California Region (Exhibit 4-1). These sales figures represent economic activity that would be lost without the presence of trade and logistics businesses in Southern California. This loss would not only affect direct employment but also the broader regional economy, which relies on the interconnections between the Trade and Logistics industry cluster and other sectors.

Exhibit 4-1.
Trade and Logistics Industry Cluster's Share of Regional Economic Output

Economic Contribution of Trade and Logistics Industry Cluster

The total economic contribution of the Trade and Logistics industry cluster includes indirect and induced activity in addition to the direct activity presented above. Direct activity includes the goods and services produced and the employees hired by the businesses in the Trade and Logistics industry cluster itself. Indirect effects are those which stem from the employment and business revenues motivated by the purchases made by the Trade and Logistics industry cluster and any of its suppliers. Induced effects are those generated by the spending of employees whose wages are sustained by both direct and indirect spending. These direct, indirect, and induced effects combined result in a considerable contribution to the Southern California economy, which is presented in Exhibit 4-2 for Year 2022.

Exhibit 4-2
Economic and Fiscal Contribution of Southern California's Trade and Logistics Industry Cluster in 2022

	SoCal Region	Rest of CA	State Total
Total Economic Contribution:			
Output ($ millions)	**$497,887.1**	**$7,999.5**	**$505,886.6**
Direct	*$289,635.1*	*$0.0*	*$289,635.1*
Indirect	*$115,888.2*	*$5,626.4*	*$121,514.6*
Induced	*$92,363.8*	*$2,373.1*	*$94,736.9*
Employment (jobs)	**1,961,420**	**26,560**	**1,987,980**
Direct	*902,370*	*0*	*902,370*
Indirect	*565,460*	*15,590*	*581,050*
Induced	*493,600*	*10,970*	*504,570*
Labor income ($ millions)	**$156,513.0**	**$2,644.0**	**$159,156.9**
Direct	*$83,591.9*	*$0.0*	*$83,591.9*
Indirect	*$40,952.7*	*$1,826.3*	*$42,779.1*
Induced	*$31,968.3*	*$817.6*	*$32,786.0*
Value added ($ millions)	**$284,668.3**	**$4,606.4**	**$289,274.8**
Direct	$162,488.7	$0.0	$162,488.7
Indirect	$64,960.0	$3,092.3	$68,052.3
Induced	$57,219.6	$1,514.1	$58,733.8
Total Fiscal Contribution ($ millions)**:**			
Federal tax revenues	$40,797.1	$650.6	$41,447.7
State and local tax revenues	$51,430.7	$467.8	$51,898.5

Sources: IMPLAN; estimates by LAEDC

The total economic contribution of the Trade and Logistics industry cluster extends beyond the activities generated by the industry itself within the region. As shown in Exhibit 4-3, in total, the Trade and Logistics industry cluster in Southern California directly and indirectly supported nearly 2 million jobs across the state in 2022. This included 902,370 direct jobs created by the trade and logistics companies in the region. Additionally, 581,050 indirect jobs, including 565,460 within Southern California and 15,590 in the rest of the state, were attributable to the purchases and spending activities of the trade and logistics firms in the 5-county region. These indirect jobs were held by employees of companies that supply goods and services to trade and logistics businesses both within and outside the region. Moreover, workers in various industries across the state, indirectly supported by economic activities in the Trade and Logistics industry cluster, earn wages, pay taxes, and spend their income on consumer goods and services. This consumer spending, in turn, stimulates further sales and job creation, a process known as induced spending effects. In 2022, these effects were associated with an additional 504,570 jobs, including 493,600 jobs in the Southern California region and 10,970 jobs elsewhere in the state.

Exhibit 4-3
Employment Contribution of Trade and Logistics Industry Cluster

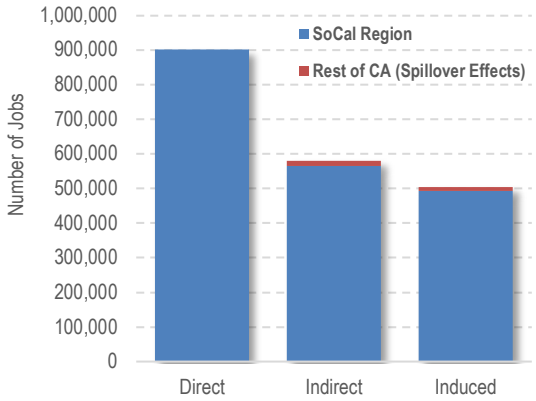


Exhibit 4-2 also presents other indicators (gross output, labor income, and value added) that measure the economic contributions of the Trade and Logistics industry cluster in Southern California. Total direct output (or sale revenues) generated by the Trade and Logistics industry cluster in the region amounted to $289.6 billion. The region also benefited from an indirect output of $112.0 billion, which highlights effects from inter-industry linkages throughout the region. The rest of California experienced an indirect output of $5.6 billion, reflecting further economic effects extending beyond the region to the rest of the state. The induced output, $92.4 billion in Southern California and $2.4 billion in the rest of the state, represented the additional economic activities resulting from the spending of income earned directly or indirectly through the economic activities associated with the Trade and Logistics industry cluster in the region.

The total labor income (including wages and benefits) generated in California that was directly and indirectly associated with the economic activities of the Trade and Logistics industry cluster in Southern California amounted to $159.2 billion in 2022. Of this, $156.5 billion was generated within Southern California, with approximately 53 percent coming from direct labor income produced by trade and logistics companies. The remaining portion was generated through indirect and induced effects within the region. Additionally, $2.6 billion in labor income was created through spillover effects in the rest of the state.

Moreover, economic activities in the Trade and Logistics industry cluster in Southern California contributed $289.3 billion to the state's gross product (measured as value-added in Exhibit 4-2). Of this total, $284.7 billion was generated in Southern California, comprising $162.5 billion from direct contributions of the Trade and Logistics industry cluster and $122.2 billion from indirect and induced effects. An additional $4.6 billion was generated in the rest of California.

The overall economic contributions in terms of output generated, jobs supported, and labor income created by the Trade and Logistics industry cluster were widely distributed across many sectors of the economy through indirect and induced effects, including administrative and waste services, retail trade, health and social services, real estate and rental and leasing, and others. (Please see the Appendix for complete and detailed contribution by industry sector.)

Tax Revenues Generated

The Trade and Logistics industry cluster in Southern California also plays a significant role in contributing tax revenues to local, state, and federal governments, as shown in Exhibit 4-4. These revenues provide important financial resources for government programs, infrastructure development, and essential public services. In 2022, the total fiscal impact of economic activity attributable to the Trade and Logistics industry cluster, including direct, indirect, and induced activity, reached $92.2 billion. Approximately 25 percent of these tax revenues went to local governments, 31 percent to the state government, and 44 percent to the federal government. Regarding different types of taxes, the fiscal contributions included over $25 billion in personal income taxes, $21 billion in sales taxes on consumer purchases, $18 billion in social insurance taxes, $16.5 billion in property taxes, $7.4 billion in corporate profits tax, and $4.9 billion of other fees and taxes.

Exhibit 4-4

Detailed Fiscal Contribution of Southern California's Trade and Logistics Industry Cluster in 2022

	SoCal Region	Rest of CA	State Total
By Type of Tax ($ millions):			
Personal income taxes	$25,174.3	$413.5	$25,587.8
Social insurance	17,676.3	276.6	17,952.9
Sales and excise taxes	20,900.7	131.0	21,031.7
Property taxes	16,378.4	114.1	16,492.5
Corporate profits taxes	7,222.5	140.6	7,363.1
Other fees and taxes	4,875.6	42.6	4,918.2
Total	**$92,227.8**	**$1,118.4**	**$93,346.2**
By Type of Government ($ millions):			
Federal	$40,797.1	$650.6	$41,447.7
State	28,397.5	312.3	28,709.9
County	7,020.2	38.3	7,058.5
Cities	16,012.9	117.2	16,130.1
Total	**$92,227.8**	**$1,118.4**	**$93,346.2**

Sources: IMPLAN; estimates by LAEDC

5 Workforce Capacity Analysis

Section Summary

The Trade and Logistics industry cluster in Southern California is a critical economic driver, supporting both domestic and international supply chains while employing a diverse workforce across transportation, warehousing, distribution, administrative, and sales roles. However, workforce shortages, an aging labor force, and training gaps present challenges to sustaining the industry cluster's growth. Targeted investments in education, training, and recruitment will be essential to ensuring a skilled workforce that maintains Southern California's competitive edge in global trade and logistics.

Workforce Composition & Employment Trends

- The industry cluster employs more than 900,000 workers, with transportation and material moving occupations being the largest group (282,450 workers).
- Warehousing and Distribution employment grew 345 percent from 2002 to 2023, with over 41,000 projected positions.
- Truck driving roles have expanded by 79 percent, reaching 46,000 jobs in 2023.
- Job distribution by county highlights Los Angeles as the primary hub, while San Bernardino and Riverside counties serve as key inland logistics centers.

Future Workforce Needs & Job Openings

- Nearly 335,300 job openings are projected over the next five years, with 93 percent driven by retirements and workforce replacements.
- Key occupational groups with the most openings:
    - Transportation & Material Moving: More than 202,400 openings (including more than 23,700 new jobs).
    - Office & Administrative Support: Nearly 48,800 openings.
    - Installation, Maintenance & Repair: More than 12,000 openings.

Skills & Educational Attainment

- Only 37 percent of job openings require a high school diploma and another 29 percent do not require any diploma.
- Only 10 percent of roles require a bachelor's degree, making the industry an accessible career path.
- Educational institutions and training programs are not currently producing enough graduates to meet workforce demand, especially in logistics, supply chain management, and truck driving.

Training & Career Pathways

- Specialized training programs are available for key industry roles:
    - Aviation: FAA-certified flight schools train cargo and commercial pilots.
    - Maritime: U.S. Coast Guard certifications prepare seamen and marine engineers.
    - Truck Driving: CDL programs provide training for commercial freight and hazardous materials transport.
    - Warehouse & Logistics: Forklift certification and supply chain programs equip workers with necessary skills.
- Higher education programs in logistics and supply chain management are available at CSULB, UCLA Extension, and Brandman University, though enrollment numbers remain insufficient.

Emerging Workforce Trends

- Technological Integration: Automation, AI, and data analytics are becoming essential in warehousing and logistics.
- Sustainability & Green Logistics: Increasing demand for environmentally responsible supply chain management.
- Diversity & Inclusion: Efforts to increase representation in traditionally male-dominated roles.
- Upskilling & Lifelong Learning: Expanding certification programs to meet evolving industry needs.

Strategic Considerations

- Expand workforce training programs to address high turnover in trucking and warehousing.
- Strengthen partnerships between industry and educational institutions to align curricula with real-world logistics demands.
- Promote recruitment efforts and retention strategies to mitigate the impact of an aging workforce.
- Increase access to certifications and apprenticeship programs to build a sustainable talent pipeline.

Jobs are commonly classified using the Standard Occupational Classification (SOC) system, developed by the Bureau of Labor Statistics. This system groups workers into specific occupations based on similar job duties, required skills, and levels of education and training. In Southern California, the workforce encompasses nearly 800 detailed occupations that are not necessarily tied to a single industry but are prevalent across multiple sectors.

This analysis provides a comprehensive view of the industry cluster's employment, educational attainment, skill levels, and future workforce needs across Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. It compares workforce demands to the regional labor supply, including program completions from two- and four-year colleges, and highlights key occupations essential for sustaining the industry cluster's growth.

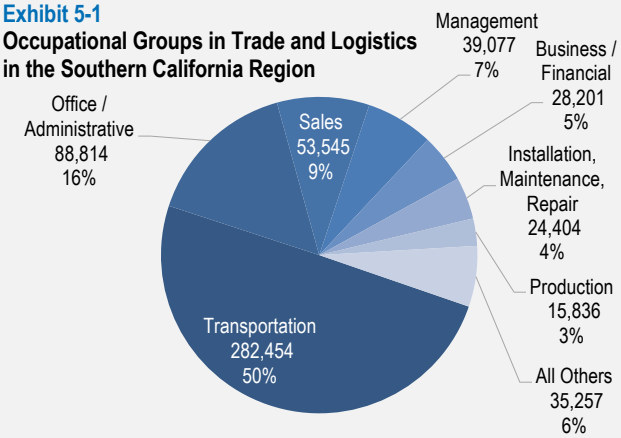
Employment Trends and Industry Composition

The Trade and Logistics industry cluster includes a wide range of occupations across the skills spectrum, with a significant concentration of workers in transportation, material handling, and order fulfillment roles. While some of these roles require specialized skills, many rely on on-the-job training and do not demand advanced educational qualifications.

Transportation and material moving occupations form the largest group within the Trade and Logistics industry cluster, with over 282,450 workers. This category includes a diverse array of detailed roles such as heavy and tractor-trailer truck drivers, air traffic controllers, and water vessel captains and crew members, reflecting the variety of tasks performed in this sector.

Additionally, there are more than 88,810 workers employed in office and administrative support roles, such as shipping and receiving clerks, order fillers, and customer service representatives. Sales and related

Exhibit 5-1
Occupational Groups in Trade and Logistics in the Southern California Region



Sources: Lightcast, BLS, Estimates by LAEDC

occupations, which include roles like sales representatives, retail salespersons, and first-line supervisors of non-retail sales workers, contribute nearly 53,550 workers to the cluster.

Exhibit A4 in the Appendix lists the top 50 detailed occupations in the industry cluster by current employment.

Key Employment Data

Regional Employment Growth

- **Warehousing**: Employment in warehousing has experienced rapid growth, with occupations like laborers and freight movers increasing by over 345 percent from 2002 to 2022, reaching more than 41,000 projected positions in 2023.
- **Transportation**: Truck driving roles, crucial for goods movement throughout Southern California and across the U.S., have increased by 79 percent, with approximately 46,000 jobs in 2023.
- **Wholesale Trade**: This segment has also seen growth, particularly in sales-related positions, as wholesale trade companies expand their operations to meet rising consumer demand.

Job Distribution by County

- **Los Angeles County:** As home to the Ports of Los Angeles and Long Beach, Los Angeles County plays a central role in international trade and goods movement. It leads in transportation employment and supports extensive warehousing, particularly near the ports and major freight corridors.
- **San Bernardino County:** With a vast network of distribution centers, San Bernardino County serves as a major inland hub for warehousing and logistics. While not directly adjacent to the ports, its strategic location along key transportation routes, including rail and highways, makes it essential for regional and national supply chains.
- **Riverside and Orange Counties:** These counties have expanded their warehousing and wholesale trade capacities to support distribution and logistics needs for Southern California and neighboring states.
- **Ventura County:** While smaller in overall trade and logistics employment, Ventura County supports the industry through agricultural exports, manufacturing, and a growing network of distribution centers. Its position along key transportation corridors and proximity to the Port of Hueneme enables it to play a supporting role in regional goods movement.

Future Workforce Needs

Exhibit 5-2 illustrates the anticipated workforce demands by major occupational group over the next five years. With the Trade and Logistics industry cluster projected to grow moderately, the demand for specific skills and occupations will stem from both job creation and replacement needs.

Exhibit 5-2
5 Year Trade and Logistics Occupational Needs in Southern California by Major Occupational Group

SOC	Occupational Group	New Jobs	Replacement Jobs	Total Job Openings
11-0000	Management	211	14,624	14,844
13-0000	Business and Financial Operations	421	11,556	11,976
15-0000	Computer and Mathematical	(110)	3,219	3,110
17-0000	Architecture and Engineering	(101)	996	895
19-0000	Life, Physical, and Social Science	143	1,207	1,351
27-0000	Arts, Design, Entertainment, Sports, and Media	(38)	3,363	3,334
29-0000	Healthcare Practitioners and Technical	(146)	448	317
33-0000	Protective Service	187	2,032	2,220
37-0000	Building and Grounds Cleaning and Maintenance	260	1,938	2,198
41-0000	Sales and Related	(2,174)	25,433	23,259
43-0000	Office and Administrative Support	45	48,741	48,779
49-0000	Installation, Maintenance, and Repair	1,416	10,683	12,099
51-0000	Production	(191)	8,631	8,459
53-0000	Transportation and Material Moving	23,704	178,738	202,442
	All Others	-	-	-
		23,629	**311,610**	**335,284**

Sources: Lightcast, BLS; Estimates by LAEDC

Much of the anticipated job demand will arise from workforce replacement due to retirements and other transitions. Replacement needs account for 93 percent of total openings, driven by the aging workforce. Specific roles like warehouse workers, drivers, and administrative staff are projected to have the highest turnover and new openings. Replacement needs, as estimated by the Bureau of Labor Statistics, depend on factors such as the age profile of the workforce and career advancement facilitated by on-the-job training.

It is projected that the industry will create nearly 23,630 new job openings in Southern California over the next five years. Additionally, almost 311,600 replacement workers will be needed to fill vacancies left by retirements and other workforce transitions.

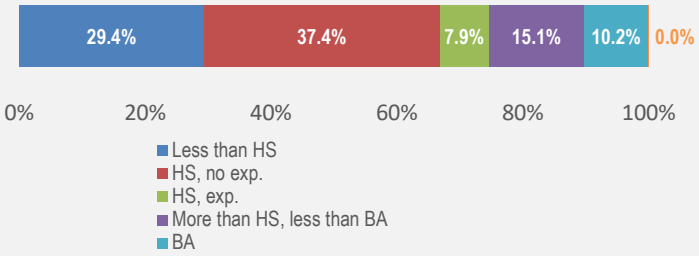
Transportation and material moving occupations, including drivers and warehouse workers, are expected to have the largest number of openings. Over the next five years, these roles will account for approximately 23,700 new jobs and almost 178,740 replacement jobs. Office and administrative occupations will generate the second-highest number of openings, with just 45 new jobs projected but an additional 48,740 replacement workers needed over the same period. The higher demand for replacement workers compared to new job creation reflects the aging of the current workforce and its approaching retirement.

A complete list of the top 100 projected occupational openings is provided in Exhibit A5 in the Appendix.

Educational Attainment and Skill Supply

Approximately 37 percent of projected openings will require a high school diploma, while over 29 percent will be accessible to individuals without a high school diploma. Another 8 percent will require a high school diploma coupled with some work experience. Slightly more than 15 percent will require post-secondary education, and just over 10 percent will necessitate a bachelor's degree. Data from regional colleges indicates that the number of graduates in fields like logistics, supply chain management, and transportation is growing but remains insufficient to meet current industry demands.

Exhibit 5-3
Education Requirement for Entry Level Positions in Southern California
By County



Source: Lightcast, BLS, Estimates by LAEDC

Preparing the Workforce

As the Trade and Logistics industry cluster grows, its demand for a skilled and adaptable workforce continues to intensify. Many occupations will be filled by local residents transitioning from other jobs or occupations or re-entering the workforce from unemployment. While some candidates may require industry-specific training or skills upgrades, the sector remains a significant source of accessible employment opportunities across a wide skills spectrum.

Entry-level and lower-skilled jobs traditionally associated with the trade and logistics industries often require primarily on-the-job training. For these positions, educational attainment plays a less prominent role in job preparedness. Most entry-level roles require a high school diploma or equivalent, and many workers in warehousing and transportation have qualifications at or below this level. Employers tend to prioritize transferable skills, experience, and a willingness to learn over formal education credentials for these positions.

In recent years, partnerships between trade schools, technical institutions, and community colleges have developed targeted programs to reduce on-the-job training time and create an occupation-ready workforce. These programs integrate industry-specific curricula designed to equip participants with the knowledge and skills required for success in various roles within the Trade and Logistics industry cluster.

Key Industry Training and Career Pathways

Aviation-Related

Pilots are required to meet Federal Aviation Administration (FAA) certification standards outlined in FAR's 14 CFR Parts 141 and 61. Certifications range from student pilot licenses to Airline Transport Pilot (ATP) ratings, with ATP certification requiring 1,500 logged flight hours and often a bachelor's degree. FAA-certified institutions in the region, including 23 training centers across Southern California airports, offer high-quality training to prepare candidates for careers in passenger and cargo aviation.

Exhibit 5-4

FAA Certified Flight Schools in the Region

County	City	Institution
Los Angeles	El Monte	Universal Aviators Academy Inc
	La Verne	Rotors and Wings Aviation Inc
	Long Beach	Anthelion Helicopters
	Long Beach	Candace A Larned Enterprises Inc
	Long Beach	Sky Creation Inc
	Torrance	Sling Flying Club, LLC
	Van Nuys	Corsair Aviation LLC
	Van Nuys	Mach 1 Aviation Inc
Orange	Costa Mesa	Helistream Inc
	Costa Mesa	Orange Coast College
	Santa Ana	Orange County Flight Center Inc
	Santa Ana	Sunrise Aviation Company Inc
Riverside	Murrieta	Executive Flight Institute
	Riverside	California Aviation Services
	Riverside	California Baptist University
	Riverside	Nextgen Flight Academy Inc
	Riverside	Riverside Flight Academy
San Bernardino	Chino	M I Air Corporation
	Redlands	Aero Tech Academy Inc
	Redlands	Learn to Fly LLC
	San Bernardino	World Wide Wings LLC
Ventura	Camarillo	Channel Islands Aviation Inc
	Oxnard	Sanbarcollbuscom Inc

Source: FAA

Maritime-Related

The maritime sector offers opportunities for apprenticeships and on-the-job training, with career progression based on experience rather than formal education. Roles such as Able-Bodied (AB) Seaman and Qualified Member of the Engineering Department (QMED) require experience and certification from the U.S. Coast Guard (USCG). Regional USCG offices in Long Beach, Marina Del Rey, and Newport Beach facilitate testing and certification for these roles.

Rail-Related

Railroad careers include entry-level positions such as switchperson and brakeman, which require no prior experience. Companies like Union Pacific provide apprenticeships combining classroom instruction and field training, enabling employees to advance to conductor or locomotive engineer roles. Regional hubs, including Long Beach and Commerce, serve as training centers for the industry.

Commercial Drivers

Commercial drivers are essential to goods movement in Southern California. Applicants must obtain a Commercial Driver's License (CDL) through the Department of Motor Vehicles (DMV), supplemented by specialized endorsements for roles involving hazardous materials or school buses. Private and union-based training programs, such as those offered by the Teamsters Union and Dolphin Trucking School, provide accessible pathways into the industry.

Exhibit 5-5

Certifications & Endorsements for Commercial Drivers

Abbreviations	Certification
AMB	Ambulance
F/L	Farm Labor
GPPV	General Public Paratransit Vehicle
HAM	Hazardous Agriculture Materials
RM	Radioactive Materials
SCH	School Bus
SPAB	School Pupils Activity Bus
VDDP	Vehicle for Developmentally Disabled Persons
YOB	Youth Bus
TTD	Tow Truck Driver Certificate

Code	Endorsements
T	Double/Triple Trailers
H	Hazardous Materials
N	Tank Vehicle
P	Passenger Transportation
X	Combination of Tank Vehicle and Hazardous Materials

Source: California Department of Motor Vehicles

Exhibit 5-6

Commercial Driver Training in Southern CA

County	City	Institution
Los Angeles	Arcadia	Dootson Truck Driving School
	Baldwin Park	El Monte Truck Driving School
	Bellflower	Toro School of Truck Driving
	Chatsworth	Alliance School of Trucking
	City of Industry	Camino Real Truck and Bus Driving
	Commerce	Dolphin Trucking School
	El Monte	Edison Truck and Bus Driving School
	Huntington Park	Professional Trucking School
	Lake Balboa	Exclusive Trucking School
	Lancaster	Hi-Desert Trucking School
		GSF Truck Training
		Universal Truck Driving School
	Los Angeles	Toro School of Truck Driving
	Montebello	TGA Truck Driving School
	Pomona	Dynasty Trucking & Bus School
	Sylmar	GSF Truck & Bus Driving School
Orange	Anaheim	California Career School
	Buena Park	Dootson School of Truck Driving
	Fullerton	Toro School of Truck Driving
	Santa Ana	America Truck Driving Academy
		California Truck Driving Academy
		United Truck Driving School
Riverside	Corona	America Truck Driving School
		CRST Training School
	Riverside	United Truck Driving School
	Temecula	United Truck Driving School
San Bernardino	Fontana	Roadmaster Drivers School of Fontana
	Ontario	Las Americas Truck Driving School
	San Bernardino	Las Americas Truck Driving School
	Upland	Universal Truck Driving School
		Advanced School of Driving
		CR England Premier Truck Driving School
		Pilot Trucking School
Ventura	N/A	N/A

Source: Various, compiled by LAEDC

Warehouse Workers

Warehouse workers, including forklift operators and logistics coordinators, often receive on-site training, with certifications tailored to meet Occupational Safety and Health Administration (OSHA) standards. External training programs provided by unions and private organizations enhance workforce competency while supporting site-specific needs.

Freight Brokers and Agents

Freight brokers coordinate logistics for global supply chains, requiring registration with the Federal Motor Carrier Safety Administration (FMCSA). Training programs focus on compliance, customer base development, and operational skills, preparing candidates for roles in large logistics firms or as independent agents.

Exhibit 5-7

Forklift Driver Training Programs in Southern CA

County	City	Institution
Los Angeles	Canoga Park	Southern California Material Handling
	Canyon Country	Sensible Safety Inc
	Chatsworth	Forklift Academy Inc
	Claremont	IVES Training Group
	Commerce	Hyundai Forklift of Southern California
	Long Beach	Komatsu Forklift
		Crown Lift Trucks
	Los Angeles	Environmental Outsource, Inc
		Boman Forklift
		M&M Industrial Equipment Pallet Jack & Forklift Repair
		All Valley Safety
	Montebello	Forklift University, Inc. of Southern California
		USA Forklift
	Pomona	USA Forklift
	San Fernando Valley	All Valley Safety
	Santa Fe Springs	BFC Forklift
		Coast to Coast Forklift Training
		Forklift Nation
	Sylmar	Industrial Compliance Services
	Torrance	Creation World Safety
	Van Nuys	USA Forklift
	Vernon	LA Lift Services
	Whittier	United Forklift
Orange	Anaheim	A-1 Forklift Certification Training Center
		Prosafe Forklift Training Center
		Southwest Material Handling Inc
	Fullerton	USA Forklift License
Riverside	Corona	R&J Material Handling Inc
	Riverside	AAA Forklift
		Riverside Forklifts
San Bernardino	Fontana	Iron Horse Certification
	Ontario	Superior Forklift Training
	Rancho Cucamonga	IVES Training Group
	San Bernardino	Atlas Forklift License
		USA Forklift License
	Upland	All Purpose Safety Training Solutions, LLC
	Victorville	Hi Desert Forklift Services
Ventura	Oxnard	Power Machinery Center

Source: Various, compiled by LAEDC

Supply Chain, Logistics, and Purchasing Managers

Supply chain managers oversee the coordination of goods and services, emphasizing cost efficiency, safety, and customer satisfaction. Logistics managers analyze data and resolve transportation challenges, while purchasing managers negotiate contracts, oversee procurement, and manage vendor relationships.

- **Educational Requirements**:
    - **Supply Chain and Logistics Managers**: Most hold bachelor's degrees, with advanced roles requiring master's degrees in supply chain management or business administration.
    - **Purchasing Managers**: Typically require an associate or bachelor's degree, with some pursuing certifications like the Certified Purchasing Professional (CPP) or Certified Professional in Supply Management (CPSM).

Regional Training Programs in Supply Chain Management:

Local colleges and universities in Southern California play a critical role in preparing students for careers in the Trade and Logistics industry cluster, offering specialized programs that develop the skills needed to excel in this growing sector. These programs cater to various educational levels, from certificates to advanced degrees, and are tailored to address the dynamic challenges of global supply chains.

At the **University of Southern California** (USC), the Marshall School of Business offers a Master of Science in Global Supply Chain Management that blends academic rigor with practical application. This program combines online and on-campus learning with international travel and hands-on projects, equipping students with advanced knowledge in sourcing, logistics strategy, and data-driven supply chain analysis.

At **California State University, Long Beach** (CSULB), the College of Continuing and Professional Education provides a Master of Science in Supply Chain Management. This cohort-based, ten-course program is designed to equip students with quantitative, technical, operational, strategic, and behavioral skills. Students are trained to identify, analyze, and resolve complex supply chain challenges encountered by global businesses. The curriculum includes advanced coursework in logistics analytics, operations strategy, and supplier relations, ensuring graduates are well-prepared for leadership roles in the industry.

California State University, Dominguez Hills (CSUDH) offers a Bachelor of Science in Business Administration with a concentration in Global Logistics and Supply Chain Management. Located near the Ports of Los Angeles and Long Beach, the program emphasizes real-world application in procurement, distribution, and international trade.

California State Polytechnic University, Pomona (Cal Poly Pomona) provides a Bachelor of Science in Technology and Operations Management with coursework focused on supply chain systems, analytics, and logistics operations. Students develop strong problem-solving skills applicable to modern supply chain environments.

Brandman University, located in Orange County, offers a Bachelor of Business Administration with a specialization in Supply Chain Management/Logistics. This undergraduate program combines a strong foundation in business principles, including accounting, economics, marketing, and business law, with specialized coursework in logistics. Students learn critical skills in inventory management, ethical sourcing,

quality control, and product development, preparing them for various mid-level roles in supply chain operations and logistics coordination.

At **Long Beach City College**, students pursuing an International Business concentration can focus on logistics or global trade. The coursework emphasizes supply chain management, distribution, and the movement of goods, equipping students with the knowledge needed to succeed in roles supporting international trade operations. The program is tailored to meet the growing demand for skilled professionals in global logistics and supply chain management.

The **University of California, Los Angeles** (UCLA) partners with key industry organizations such as the Institute for Supply Management (ISM-LA) and the California Association of Public Purchasing Officers (CAPPO) to offer an eight-course certificate program in supply chain management. Available online, on-campus, or at the workplace, these courses are designed for working professionals seeking to enhance their expertise or prepare for ISM certification exams. The program focuses on practical and theoretical aspects of supply chain management, covering topics such as procurement strategies, inventory optimization, and logistics technology.

These regional training programs provide critical pipelines for talent into the Trade and Logistics industry cluster, addressing the sector's demand for highly skilled professionals in supply chain, logistics, and operations management. By partnering with industry associations and tailoring curricula to meet industry needs, these institutions play a vital role in sustaining the competitiveness of Southern California's industry cluster.

Current and Emerging Trends in Workforce Preparation

- **Technological Integration**
  The increasing use of automation and logistics technology in warehousing and transportation demands a workforce skilled in robotics, software systems, and data analysis.

- **Sustainability and Green Logistics**
  Emerging roles in green logistics require training in environmental compliance, energy-efficient operations, and sustainable supply chain practices.

- **Workforce Diversity and Inclusion**
  Efforts to diversify the workforce, particularly in traditionally male-dominated roles such as trucking and maritime occupations, are essential for meeting labor demands and fostering equity.

- **Upskilling and Lifelong Learning**
  Programs emphasizing upskilling, such as those offered by the Teamsters Union and private training providers, play a pivotal role in equipping the workforce for evolving industry needs.

6 Foreign Direct Investment Analysis

Section Summary

Foreign-Owned Enterprises (FOEs) play a vital role in Southern California's Trade and Logistics industry cluster, particularly in Wholesale Trade, Transportation, and Warehousing and Distribution. With strategic port access, multimodal connectivity, and a robust logistics infrastructure, Southern California has become a prime destination for FOEs, attracting foreign investment that drives economic expansion, job creation, and supply chain innovation. This analysis examines FOE establishments, employment, wages, and industry concentration, highlighting their strategic contributions to the region's economy.

FOE Presence in Southern California:

- More than 2,000 FOE establishments in the Trade and Logistics industry cluster exist in the five-county Southern California region, employing nearly 67,000 workers.
- Los Angeles County leads with over 1,200 FOEs operating in trade and logistics and more than 37,600 employees, followed by Orange County (approximately 440 FOEs and14,900 workers).
- Riverside, San Bernardino, and Ventura counties collectively have nearly 670 FOEs operating in trade and logistics with more than 14,300 employees, focusing on warehousing and distribution.

FOE Wages & Economic Impact:

- Total FOE wages in the Trade and Logistics industry cluster exceed $5.8 billion, with Los Angeles County alone contributing $3.2 billion.
- Orange County has the highest FOE average wage ($101,112) in the industry cluster, particularly in air transportation and freight services.
- San Bernardino and Riverside counties offer lower wages ($71,825 and $81,348, respectively) due to dominance in warehousing and support services.

FOE Industry Cluster Segments:

- Wholesale Trade represents the largest FOE segment, employing more than 52,000 workers across 1,570 establishments.
- The Transportation segment includes air, sea, and freight services, with nearly 7,300 employees in more than 220 FOEs.
- Concentrated in Riverside and San Bernardino counties, Warehousing and Distribution employs more than 9,600 workers.

Strategic FOE Clusters in Trade and Logistics:

- Wholesale Trade FOEs cluster near the San Pedro Bay Ports, San Fernando Valley, Long Beach Airport, and the I-5 corridor.
- Warehousing and Distribution FOEs concentrate near the San Pedro Bay Ports, LAX, Ontario Airport, and intermodal hubs.
- Transportation FOEs are found near Santa Clarita Valley and LAX, leveraging air cargo infrastructure.

Economic & Strategic Implications

- FOEs enhance global connectivity, integrating Southern California into international supply chains.
- Their strategic location choices align with key logistical assets, ensuring efficient goods movement.
- Continued foreign investment in trade and logistics infrastructure will be critical for regional economic growth.

This section examines Foreign-Owned Enterprises (FOEs) within the Trade and Logistics industry cluster in Southern California, focusing on key metrics such as the number of FOE establishments, employment, average wages, and total wages. The industry breakdown reveals that FOE establishments are particularly significant in the three segments of the Trade and Logistics industry cluster: Wholesale Trade, Transportation, and Warehousing and Distribution. The Wholesale Trade segment outpaced the other two by a wide margin in number of FOE establishments and employees.

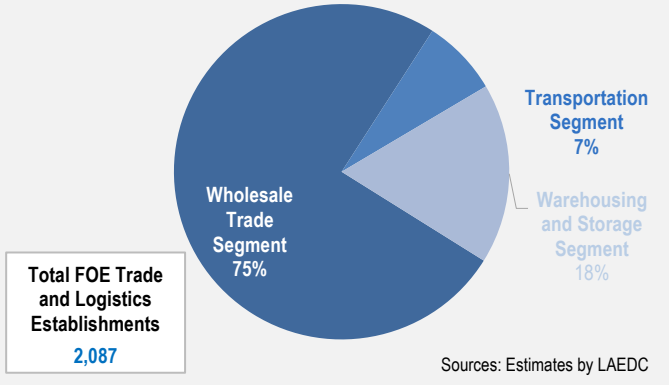
FOE Establishment and Employment Levels

Across California, trade and logistics related industries comprise 3,727 FOE establishments, employing over 109,000 workers. Within the 5-county Southern California region (Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties), the Trade and Logistics industry cluster accounts for 2,087 FOE establishments and 66,948 jobs.

- **Los Angeles County** leads with 1,217 FOE establishments employing 37,614 people, reflecting the county's dominant position as a hub for trade and logistics operations.
- **Orange County** follows, with 443 FOE establishments supporting 14,898 workers.
- **Riverside, San Bernardino, and Ventura counties** collectively represent 667 FOE establishments and 14,334 employees, with Riverside County contributing significantly to the workforce in warehousing and freight transportation.

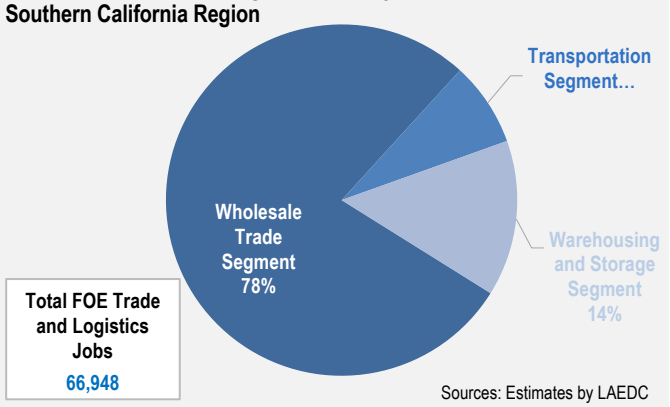
These employment figures highlight the concentration of foreign-owned businesses in major population and transportation hubs like Los Angeles and Orange counties, while the inland counties like Riverside and San Bernardino play a crucial role in warehousing and goods distribution.

Exhibit 6-1
FOE Establishments in Trade and Logistics Industry Cluster, Southern California Region



Sources: Estimates by LAEDC

Exhibit 6-2
FOE Jobs in Trade and Logistics Industry Cluster, Southern California Region



Sources: Estimates by LAEDC

FOE Average Wages and Total Wages

FOE wages within the Trade and Logistics industry cluster vary significantly across the Southern California region. Orange County stands out with the highest average wage of $101,112, indicating the presence of higher-paying jobs, particularly in specialized segments such as air transportation and freight arrangement services.

In comparison:

- **Los Angeles County** has an average wage of $85,326, driven by its large workforce and diversity in trade and logistics related industries.
- **Ventura County** also presents a strong wage profile, with an average wage of $96,854.
- **San Bernardino and Riverside counties** feature lower average wages of $71,825 and $81,348, respectively, reflecting their concentration in warehousing, trucking, and support services.

In terms of total wages, Southern California's Trade and Logistics industry cluster generates over $5.8 billion in total wages. Los Angeles County alone accounts for $3.2 billion, with significant contributions from Orange and San Bernardino counties.

FOE Segment-Specific Insights

Wholesale Trade Segment:

- Wholesale Trade is the largest segment within the Trade and Logistics industry cluster, consisting of 1,570 FOE establishments in Southern California, employing over 52,000 people.
- The Merchant Wholesalers, Durable Goods industry is particularly prominent, with over 35,000 employees in Southern California and $3.2 billion in total wages.
- Los Angeles County alone has 846 wholesale FOE establishments employing nearly 28,000 workers, reflecting the concentration of FOEs in trade and logistics, likely due to the region's proximity to the ports of Los Angeles and Long Beach.

Transportation Segment:

- The Transportation segment, which includes air, sea, and ground freight, is another major contributor to Southern California's economy, with 7,290 employees across 222 FOE establishments in California.
- Air transportation (both passenger and freight) is especially significant in Los Angeles and Orange counties, driven by major airports such as Los Angeles International (LAX) and Ontario Airport.
- Notably, the Deep Sea Freight Transportation industry contributes substantially in Riverside County, with 34 employees generating over $5.9 million in total wages.

Warehousing and Distribution Segment:

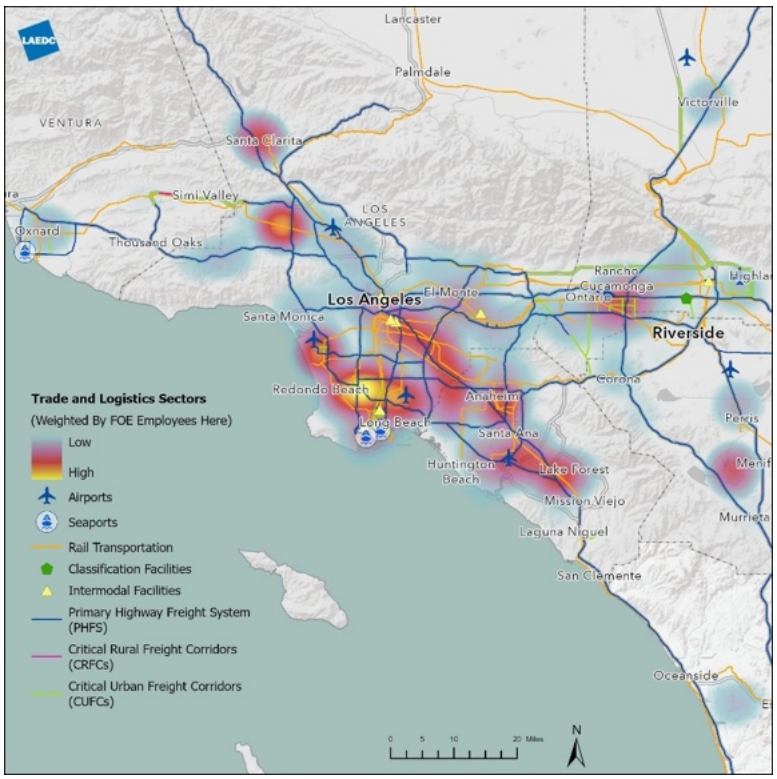
- The Warehousing and Distribution segment plays a critical role in Southern California's trade and logistics landscape, particularly in the Inland Empire (Riverside and San Bernardino counties), which serves as a key distribution center for goods moving through the ports.
- The sector employs over 12,000 workers in California, with 9,609 of those jobs located in Southern California. Riverside and San Bernardino counties have become major hubs for warehousing and logistics operations due to their large industrial spaces and connectivity to highways and railroads.

Freight Transportation Arrangement:

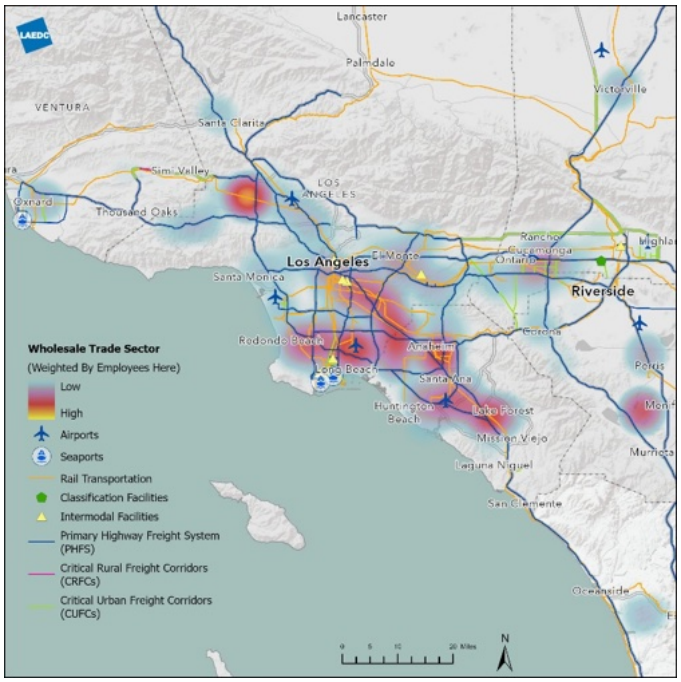
- Freight Transportation Arrangement services are a critical aspect of logistics operations, ensuring the smooth movement of goods through various modes of transportation.
- This industry includes freight forwarders, customs brokers, and other third-party logistics services, which employ over 9,000 people in California, with 7,392 workers in Southern California alone.
- Los Angeles County leads this industry, with over 5,000 workers earning an average wage of $88,343, generating $457 million in total wages.

Industry Cluster Concentration of FOEs

The presence of Foreign-Owned Enterprises (FOEs) within Southern California's Trade and Logistics industry cluster highlights the strategic importance of this region for international business operations. FOEs are often concentrated in high-value, logistics-heavy segments such as Wholesale Trade, Warehousing and Distribution, and Transportation. These businesses leverage Southern California's extensive infrastructure network, including seaports, airports, highways, and rail lines—to facilitate efficient goods movement between Asia, North America, and beyond. Analyzing the geographic concentration of FOEs using GIS-generated heat maps provides insights into how foreign investment aligns with regional infrastructure advantages and specific industry demands.



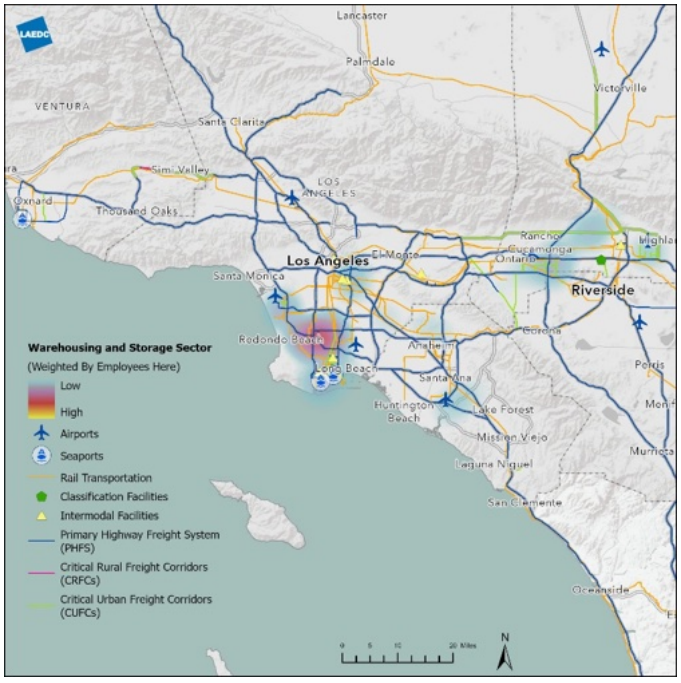
Wholesale Trade



The heat map for the Wholesale Trade segment, weighted by employee count, reveals notable FOE concentration around several key transportation corridors. Clustering is occurring in the San Fernando Valley, near the San Pedro Bay Ports, Long Beach Airport, John Wayne Airport, and along the I-5 corridor. These areas reflect the importance of accessibility to transportation nodes for FOEs in wholesale trade, facilitating efficient movement of goods within the region.

The significant clustering near the San Pedro Bay Ports underscores the critical role of port access for FOEs engaged in wholesale distribution, as these locations support direct import and export activities. Additionally, the concentration near the I-15 and I-215 interchange south of Riverside highlights the Inland Empire as an essential hub, benefiting FOEs through industrial land availability and comparatively lower operational costs. This region provides easy access to major highways and is strategically positioned to serve both regional and national markets, making it an attractive location for wholesale trade operations.

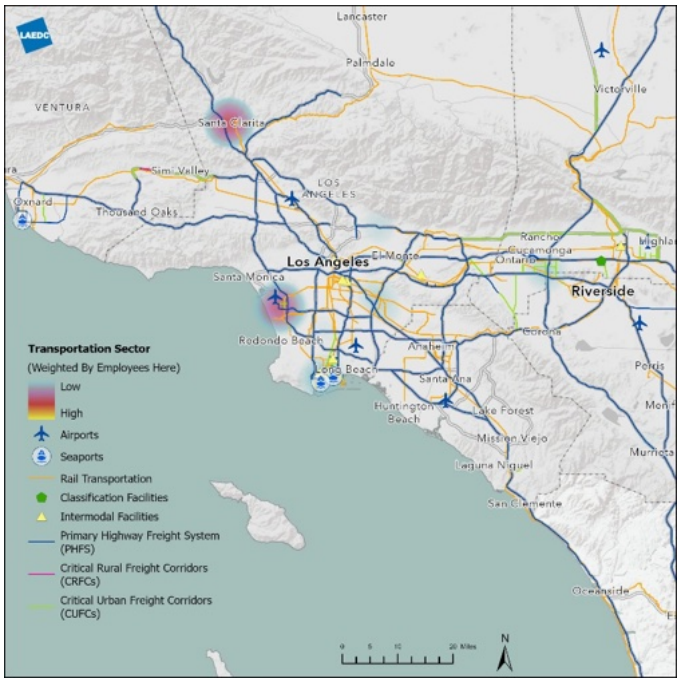
Warehousing and Distribution



The heat map for the Warehousing and Distribution segment reveals that FOEs show significant clustering near the San Pedro Bay Ports, emphasizing the priority of port access for warehousing operations that rely on the import and redistribution of goods. This clustering near the Port of Los Angeles and Port of Long Beach reflects the strategic need for proximity to maritime logistics hubs, enabling FOEs to efficiently handle incoming goods and distribute them regionally and nationally.

Additionally, there is minor clustering near Los Angeles International Airport, John Wayne Airport, Ontario International Airport, and intermodal facilities in Central Los Angeles. These secondary clusters indicate that FOEs in warehousing also value access to air cargo facilities and intermodal transfer points, which support rapid and flexible distribution options. The presence of FOEs near these airports and intermodal hubs suggests a strategic approach to diversifying transport options and reducing dependency on any single logistics channel.

Transportation



In the Transportation segment, FOEs are primarily concentrated near major logistics nodes, as indicated in the heat map. Clustering is most prominent in the Santa Clarita Valley and around Los Angeles International Airport, highlighting these areas as essential hubs for transportation-related FOEs. The concentration around Los Angeles International Airport reflects the need for proximity to a major air cargo hub, enabling FOEs to efficiently coordinate multimodal transportation and streamline the movement of goods.

The Santa Clarita Valley cluster suggests that FOEs are leveraging alternative transportation corridors and facilities, potentially to avoid the congestion of central urban areas while still maintaining strong logistical connectivity. These strategic locations allow FOEs in the transportation sector to optimize both regional and long-distance distribution, benefiting from infrastructure that supports efficient goods movement across Southern California and beyond.

Summary of FOE Cluster Advantages

Mapping FOEs in these industry cluster segments illustrates how foreign investments align with regional logistical assets, showing a strategic pattern of location choices driven by infrastructure accessibility, land availability, and operational cost efficiency. The concentration of FOEs near the San Pedro Bay Ports, major airports, and key inland hubs like Riverside and San Bernardino underscores the appeal of Southern California's trade and logistics infrastructure. Moreover, the distribution patterns reveal that specific regions attract higher levels of foreign investment due to advantages like proximity to high-demand urban centers, lower land costs in inland areas, and direct access to multimodal transportation routes. This analysis suggests that Southern California's infrastructure network plays a crucial role in supporting the growth and operational efficiency of FOEs within the Trade and Logistics industry cluster, solidifying the region's role as a strategic hub for international commerce.

Global Connectivity Beyond Freight Flows

Beyond freight flows, FOEs in Southern California's Trade and Logistics industry cluster enhance the region's global connectivity. By facilitating the import and export of goods, these enterprises integrate Southern California more deeply into global supply chains. Moreover, they contribute to the region's economy by attracting foreign capital, creating jobs, and fostering innovation through partnerships with local firms. As the world economy becomes increasingly interconnected, Southern California's role as a global trade and logistics hub will likely grow, supported by continued foreign investment.

7 Threat Analysis

Section Summary

The many different pieces of the Trade and Logistics industry cluster in Southern California operate in concert to transport and deliver goods across the region quickly, accurately, and cost-effectively. As a result, issues that threaten the functioning of any individual piece of the industry cluster potentially can impact the performance of the entire system. These can range anywhere from domestic regulations that restrict growth to labor disputes to international crises. Based on our assessments, we identify and describe the ten major near- and medium-term threats faced by the industry cluster to help inform policymakers and stakeholders of particularly important topics.

Threats to Southern California's Trade and Logistics Industry Cluster

- Land use regulations-warehouse restrictions
- Environmental regulations-air pollution
- Environmental regulations-climate change
- Competition from other regions
- Land use regulations-rezoning of industrial land
- Global trade wars
- Global conflicts
- New technology-port automation
- New technology-autonomous vehicles
- Global pandemics.

It should be noted that some of these threats are already actively occurring today while others have only a chance of happening. Land use regulations restricting the development of warehouses and environmental regulations addressing air pollution and climate change are here today and could drastically curtail the current performance and future growth of the industry cluster. Competition from other regions is ongoing and significant, especially as they continue to invest in modernizing their facilities and developing new capabilities such as deeper ports. And land use regulations pertaining to the rezoning of industrial land are having impacts today, although the effects are piecemeal and compound over time.

The remaining threats are less immediate but still important. It should be reiterated that these ten threats pertain to the near- and medium-term. Others could be expected to emerge when looking beyond ten years.

Near- and Medium-Term Threats

Forecasting threats to Southern California's Trade and Logistics industry cluster and their potential impacts on the region is difficult. To some extent, this is because of the variety of economic and government entities—here in California, nationally and abroad—whose actions can affect the region's industry cluster. The different combinations of actors that could be involved in a particular threat, for example a global trade war, can impact greatly the scope, scale and speed of that threat. But it is also difficult because the industry cluster itself is not static. The cluster's component businesses are constantly adapting to changing economic and political environments, like the shifting of a manufacturing base from one country to another. This evolution over time can increase or decrease the vulnerability of the industry cluster to individual threats.

Consequently, we confine our analysis to high-level threats to Southern California's Trade and Logistics industry cluster over the near- and medium-term. This timeframe spans roughly the next ten years. This means that we avoid addressing potentially serious issues with more distant impacts, such as sea-level rise brought about by climate change and decreases in regional demand brought about by a declining population. However, it also means that the issues we do examine can discussed with greater confidence.

Below, we identify ten high-level threats to Southern California's Trade and Logistics industry cluster:

1. Land use regulations—warehouse restrictions
2. Environmental regulations—air pollution
3. Environmental regulations—climate change
4. Competition from other regions
5. Land use regulations—rezoning of industrial land
6. Tariffs and global trade wars
7. Global conflicts
8. Labor issues—port automation
9. New technology—autonomous vehicles
10. Global pandemics.

Land Use Regulations—Warehouse Restrictions

Warehousing and Distribution is a significant and growing segment of Southern California's Trade and Logistics industry cluster. Warehousing and Distribution is now responsible for more than 26 percent of employment in the region, with much of it concentrated in Riverside and San Bernardino Counties.

The growth in warehousing in the Inland Empire over the past few years, as well as the increased truck traffic that has accompanied it, has drawn increased scrutiny from residents and state and local politicians. As a result, there have been legislative efforts to effectively ban new warehouses in the region by imposing

onerous conditions though land use regulations on their approval. De facto bans of new warehouses, if successful, could severely hamper the continued growth of the entire industry cluster, affecting not only warehouse employment but employment in the transportation and wholesaling segments that depend on them.

Recently, the industry cluster dodged two significant bills from the California Legislature. Assembly Bill (AB 2840) in 2022, which died in committee, would have served as a de facto ban on new warehouses specifically in the Counties of Riverside and San Bernardino by preventing most industrial development within 1,000 feet of "sensitive receptors" like schools and residences.[17] AB 1000, which died in 2024, would have prohibited in the Inland Empire new warehouse projects over 100,000 square feet within 1,000 feet of a sensitive receptor.[18]

However, AB 98 emerged at the end of the California Legislature's 2023-24 session and was enacted into law. AB 98 prescribes various statewide standards for any new or expanded warehouse that includes standards for building design and location, parking, truck loading bays, landscaping buffers, entry gates, and signage.[19] AB 98 targets warehouse and distribution facilities that utilize heavy-duty diesel trucks for goods movement, and it places additional development standards and limitations on logistics projects that are located within 900 feet of a sensitive receptor as well as larger-scale projects of 250,000 square feet or more.[20]

AB 98 applies to new warehouses or proposed expansions, and so it will blunt the growth of Southern California's Trade and Logistics industry cluster. The extent of the impact to the industry cluster from AB 98's burdens will become clearer over the long term, but in the near- to-medium term one could expect significant impacts on the industry cluster.

Environmental Regulations—Air Pollution

For decades, industries such as Southern California's Trade and Logistics industry cluster have been subject to stringent air pollution regulations. The Federal Clean Air Act as well as California legislation require attainment of ambient air quality standards for criteria air pollutants, which are pollutants that cause human health impacts due to their release from numerous sources. Criteria pollutants include ozone, particulate matter (PM10), carbon monoxide, lead, nitrogen dioxide, and sulfur dioxide. Multiple agencies including the California Air Resource Board (ARB), the South Coast Air Quality Management District (SCAQMD), and the Southern California Association of Governments (SCAG), are responsible for developing state implementation plans for reaching attainment, developing control regulations, and issuing permits for polluting equipment to operate.

The Trade and Logistics industry cluster is regularly scrutinized because of air pollutants that emanate from stationary sources like the Ports of Los Angeles and Long Beach and mobile sources like freight locomotives and trucks that impact surrounding neighborhoods. While all parties agree that reducing negative impacts

[17] https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB2840
[18] https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240AB1000
[19] https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240AB98
[20] Hodges, W. & L. Chang. (2024). A Deep Dive into AB 98's Restrictions on the Logistics Industry: What the Bill Does and Does Not Do. *Sheppard Mullin*. https://www.realestatelanduseandenvironmentallaw.com/wp-content/uploads/sites/48/2024/10/AB-98s-Restrictions-on-the-Logistics-Industry-Article-1024.pdf

to nearby communities is desirable, how this is done has ramifications for the health and functioning of the industry cluster. For example, despite the landmark Clean Air Action Plan (CAAP) launched by the San Pedro Bay Ports in 2006—a comprehensive strategy for reducing port-related air pollution and related health risks while allowing port development, job creation and economic activity to continue—SCAQMD recently has been developing the Ports Indirect Source (ISR) Rule No. 2304, which is intended to establish requirements to reduce emissions from mobile sources related to marine port operations.[21] A number of shipping, transportation and business interests have argued that this ISR would cause irreparable harm to the regional supply chain and the state and local economies because the underlying infrastructure needed to address these emissions is not yet available, so cargo traffic would get diverted to other ports and local jobs would be lost.[22] They recommended that an infrastructure plan combined with a streamlined permitting program instead would better help everyone reach their desired goals.

Reducing pollution around those impacted by trade and logistics activities is desirable. The complexity of the industry cluster, however, suggests that complex solutions are required. Simple regulatory actions rather than holistic approaches are likely to cause harms to the performance and growth of the industry cluster that outweigh the benefits gained from emissions reductions.

Environmental Regulations—Climate Change

Since the passage of the Global Warming Solutions Act of 2006, otherwise known as AB 32, the State of California and its localities have embarked on regulatory and other efforts to markedly reduce greenhouse gas emissions. Of particular relevance to Southern California's Trade and Logistics industry cluster are the California Air Resource Board's Advanced Clean Trucks regulation, which is a zero-emissions vehicle (ZEV) sales requirement for manufacturers and a one-time reporting requirement for large entities and fleets,[23] and the Mobile Cargo Handling Equipment regulation, which was adopted in 2005 to reduce toxic and criteria emissions and is now being assessed for an additional ZEV requirement.[24] Additionally, the Cities of Los Angeles and Long Beach have agreed to update their CAAP to further reduce greenhouse gases at their respective ports by transitioning to zero emission yard equipment by 2030 and by transitioning to a zero emission drayage fleet by 2035.[25]

Reducing greenhouse gas emissions and their associated co-pollutants is beneficial to communities around the ports, warehouses, and anywhere trade and logistics activities occur. However, the scale of reductions being attempted necessarily has an impact on the cost and reliability of Southern California's supply chains. Higher costs arise from the need to replace existing trucks and equipment, some of which are still within their economic useful lives, with more expensive zero emissions models. Lower reliability, which also affects cost, arises from the incorporation of unproven technologies into daily operations as well as friction from the transition. As an example, the move to electric-powered equipment at the Port of Los Angeles has resulted in at least a dozen power outages at various port

[21] https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-2304
[22]https://static1.squarespace.com/static/652d5fed9f7caa08fcf7670c/t/66ea2df1abc0490ef89d1878/1726623353996/ISR+Coalition+Letter+to+LA+LB+Mayors+-+Sep+2024+FINAL.pdf
[23] https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks
[24] https://ww2.arb.ca.gov/our-work/programs/cargo-handling-equipment
[25] https://lacity.gov/highlights/ports-los-angeles-and-long-beach-unveil-bold-strategies-reduce-greenhouse-gases

facilities this year that have scrambled unloading schedules and created backups of trucks on nearby freeways.[26]

Many of the higher costs and much of the lower reliability generated from environmental regulations are tied to the transition to new technologies. Over the long run, these cost and reliability issues will dissipate. In the near- and medium term, however, they will be felt more substantially throughout the industry cluster.

Competition from other Regions

Southern California's Trade and Logistics industry cluster competes with other regions in North America for the ability to receive, transport and distribute/export goods in the region and beyond. This is typically discussed in the context of the Ports of Los Angeles and Long Beach competing with others, such as the Ports of New York/New Jersey and the Port of Savannah, for more container ships and higher trade flows. But the reality is broader than this. The region's many trade and logistics businesses—transportation, warehousing and wholesaling—all work in combination to provide an effective supply chain for shipping customers. What makes one region's supply chain more compelling than another's comes down to efficiency, quality and cost.

Improvements in efficiency, quality and cost require ongoing investment to maintain and improve infrastructure as well as to incorporate new technologies into business operations. Major initiatives that competing seaports are undertaking, for example the Port of Virginia's development of its 55-foot-deep commercial channel that will be the deepest on the East Coast, are documented elsewhere in this report (see the Geographic Comparison section). For Southern California's Trade and Logistics industry cluster to remain competitive with other regions, similar investments and initiatives would be needed across its seaports, but also across the other segments as well.

Over the short- and mid-term, the failure to make timely investments would lead to a slow erosion of market share. More significant impacts would be seen over the long-term as international shippers migrate to different ports and, importantly, as domestic businesses move to other regions in the country that provide more reliable supply chains.

Land Use Regulations—Rezoning of Industrial Land

For decades, California has not built enough residential housing to keep up with demand. This has contributed to an insufficient supply and increasingly unaffordable housing prices. To address this severe housing shortage, the State of California recently has prioritized the regulatory enforcement of cities and counties' housing elements to ensure they are compliant with state law. Housing elements specify how each

[26] Lee, D. (2024, August 16). Power outages disrupt operations at Port of Los Angeles. *Los Angeles Times*. https://www.latimes.com/business/story/2024-08-16/power-outages-a-growing-concern-for-port-of-los-angeles-now-and-down-the-road

city and county will build housing to meet its mandated Regional Housing Needs Assessment allocation, and failure to submit a compliant housing element could lead to a variety of penalties, ranging from a loss of state and local funding to ministerial approval of new housing development.[27]

To accommodate new housing in light of this heightened enforcement, cities and counties in some cases will rezone existing commercial or industrial land to residential or mixed use. As an example, the Cemex Hollywood Concrete Plant, which had been operating in West Hollywood for more than a century, closed in October 2024 to be replaced by a 514-unit apartment complex that will rise 34 stories and include first-floor retail space for shops and restaurants.[28]

Once industrial land has been rezoned, especially for housing, it is effectively gone. That is, it is highly unlikely that it would ever be rezoned back and used for another industrial purpose. This means the future growth of Southern California's Trade and Logistics industry cluster, as well as the growth of other industries, is constrained by a declining resource. The economic impact from this stunted growth will be felt acutely over the long term, less so over the near- and medium-term as industrial parcels disappear on a piecemeal basis.

Tariffs and Global Trade Wars

Separate from the notion of global armed conflicts, there are also global economic conflicts. These take the form of mutual import tariffs and/or export restrictions imposed by countries that result in significant disruptions in international trade. These economic conflicts usually arise when one country takes action to combat perceived unfair trade practices by another, and they expand into trade wars as penalized countries retaliate with measures of their own.

Shortly after taking office this year, President Donald Trump carried through on his campaign promises to actively use tariffs to rebalance the United States' trade relations with other countries and to increase domestic manufacturing.[29] By the end of March, President Trump had imposed tariffs ranging from 10 percent to 25 percent on all products coming into the United States from Canada and Mexico, with a temporary exception for goods traded under the United States–Mexico–Canada Agreement (USMCA). Additionally, he had imposed 20 percent tariffs on all goods imported from China and 25 percent tariffs on all steel and aluminum imports to the United States. It is anticipated that a more extensive set of tariffs on dozens of other countries will be enacted beginning in April.

While countries are still developing their own tariff and non-tariff responses to President Trump's actions, it is clear that a trade war that would adversely affect Southern California's Trade and Logistics industry cluster. Eastern Asia is the primary source of imports into Southern California, so the region certainly would be impacted by a trade war involving China. However, the impact might not be very large even if imports were reduced, especially since the region handles a greater proportion of domestic trade flows than imports or exports. Jerry Nickelsburg, an economics professor at UCLA's Anderson School of Management, stated that "none of the evidence we have from past increases in tariffs show a lot of impact on employment at the ports, employment in transportation or warehousing." Additionally, he noted that conflicts in the Middle East and

[27] https://www.hcd.ca.gov/planning-and-community-development/housing-elements
[28] Vincent, R. (2024, November 4). West Hollywood concrete plant closes to make way for deluxe tower. *Los Angeles Times*. https://www.latimes.com/business/story/2024-11-02/after-a-century-concrete-plant-that-helped-build-l-a-makes-way-for-a-deluxe-tower
[29] Swanson, A., M. Stevis-Gridneff, & S. Romero. (2024, November 26). Trump plans tariffs on Canada, China and Mexico that could cripple trade. *New York Times*. https://www.nytimes.com/2024/11/25/business/economy/trump-tariffs-canada-mexico-china.html

low water levels in the Panama Canal are currently driving increased ship traffic to Southern California ports, and this would help mitigate any adverse effects from potential tariffs.[30]

Global Conflicts

Global conflicts have the potential to impact Southern California's Trade and Logistics industry cluster by altering traditional supply chain routes. Examples include the ongoing hostilities between Russia and Ukraine, and the attacks by Houthis in Yemen on naval and maritime shipping. These conflicts have markedly reduced the access of cargo ships to the Black Sea and Red Sea, respectively, affecting trade through the Mediterranean. Depending on its size and location, a global conflict could make competitors to the Ports of Los Angeles and Long Beach more attractive and divert trade away from the region.

A discussed elsewhere in the report (see the Geographic Comparison section), imports into Southern California represent only about 20 percent of the tonnage and 25 percent of the value of all trade flows in the region. Export make up another 4 percent of tonnage and 6 percent of value. As a result, the typical global conflict would be expected to have only a small impact on the region.

That said, if the United States is directly involved in the conflict, this likely would result in impacts that go beyond changing trade routes. The likelihood of a conflict between China and the United States over Taiwan is increasing with every passing month, as some believe some sort of action will occur by 2027.[31] A conflict in the Taiwan Straits with a major trading partner would have large negative consequences for Southern California's Trade and Logistics industry cluster, not just at the ports but across the entire region. Local businesses would have trouble accessing goods and commodities for use in their supply chain, which would impact truck transportation as well as warehousing and storage. Moreover, industries across the region could be subject to cyberwarfare and other hostile actions.

Labor Issues—Port Automation

Port automation is the integration of technology into the operations at seaports. Container terminal automation, for example, incorporates robotized and remotely controlled handling systems into equipment such as stacking cranes and straddle carriers. These technologies increase predictability, reliability and situational awareness, helping to avoid delays and cost overruns. Other innovations like simulation technology can help to accurately determine the design and number of vehicles required for different port operations.

[30] Horseman, J. & D. Littlejohn. (2024, November 26). How might Donald Trump's tariffs affect Southern California ports, logistics industries? *San Bernardino Sun*. https://www.sbsun.com/2024/11/22/how-might-donald-trumps-tariffs-affect-southern-california-ports-logistics-industries/

[31] Beckley, M. & H. Brands. (2024, February 4). How Primed for War Is China? Risk signals for a conflict are flashing red. *Foreign Policy*. https://foreignpolicy.com/2024/02/04/china-war-military-taiwan-us-asia-xi-escalation-crisis/

Overall, the goals of these technologies are to increase operating efficiencies, expand capacity, and lower labor costs, while at the same time meeting stringent environmental standards.

Automation inherently involves the replacement of labor with capital. That is, when existing processes become automated, machines perform the functions previously carried out by humans. While automation does not result in the complete removal of human labor from a particular process, automation does seek to reduce the amount of human interaction required. This can generate resistance from those being replaced and those who could be replaced in the future, resulting in work stoppages, intervention by government officials, and other costly delays.

Ports across the globe have incorporated some amount of automation into their processes, and the Ports of Los Angeles and Long Beach are no exception. Specifically, the Port of Los Angeles has transformed its TraPac and APM terminals, outfitting them with large robots; some tasked with moving shipping containers from ships to stacks, and others tasked with loading those stacked containers onto trucks for the next leg of their distribution journey. The Port of Long Beach has redeveloped its Middle Harbor terminal, investing nearly $1.5 billion in infrastructure and another $700 million in cargo handling equipment, highly sophisticated computer and software systems.

The labor strife that automation brings is real. For instance, early efforts to automate the APM terminal resulted in the International Longshore and Warehouse Union (ILWU), which represents dockworkers across the West Coast, enlisting support from local, state and federal politicians to stop the Port from allowing the automation to proceed.[32] However, the ILWU and the Pacific Maritime Association, representing cargo carriers and terminal operators, demonstrated in the summer of 2023 that they could successfully find common ground on these issues by reaching a six-year agreement that prioritized wages and the role of automation.[33]

New Technology—Autonomous Vehicles

Recent years have seen the introduction of autonomous vehicles in trade and logistics operations. Examples of autonomous freight transportation companies include Kodiak Robotics, which now operates a fleet of 36 long-haul trucks that delivers 50 loads a week between its Dallas hub and Houston, Austin, Oklahoma City, and Atlanta; and Gatik, which operates a fleet of medium duty, autonomous box trucks that transports goods between distribution centers, fulfillment centers, stores and warehouses in Texas, Arkansas and Ontario, Canada.[34] These autonomous trucks increase efficiency and reliability while lowering operating costs.

The increased use over time of autonomous freight transportation has the potential to adversely impact Southern California's Trade and Logistics industry cluster. First, autonomous trucking could entail some of the region's drivers losing their jobs, which could lead to work stoppages affecting the region's supply chains and result in intervention by government officials. Note that automation and the loss of truck driver jobs is already being scrutinized by Congress.[35] Additionally, there currently are more than 81,000 workers in truck transportation in Southern California. Their loss of income could impact the region's economy more broadly than just the cluster. Finally, the autonomous freight transportation companies stand to benefit the most

[32] Varghese, R. (2019, May 22). In middle of trade war, America's busiest port gets ready for robots. *Bloomberg*. https://www.bloomberg.com/news/features/2019-05-20/in-middle-of-trade-war-america-s-busiest-port-gets-ready-for-robots
[33] https://pma.uberflip.com/i/1517839-2023-pma-annual-report/13?
[34] Autonomous Vehicle Industry Association. (2024). *State of AV: 2024*. https://theavindustry.org/resources/2024_StateOfAV.pdf
[35] Gallagher, J. (2023, September 13). Truck driver jobs at center of House hearing on automation. *Freight Waves*. https://www.freightwaves.com/news/truck-driver-jobs-at-center-of-house-hearing-on-automation

from the adoption of their technologies. To the extent that these companies are located outside of Southern California, the regional economy could potentially lose these benefits as well.

At the present moment, however, it is unlikely that widespread adoption of autonomous freight transportation will occur in Southern California over near- and medium-term. California officials have been slower than other states to adopt governing regulations for autonomous trucks on state and local roads. Only recently (August 2024) did California's Department of Motor Vehicles present a draft framework proposal that will be used to inform standards for operating heavy-duty autonomous trucks weighing 10,001 pounds or more. The framework would allow autonomous trucks to operate on roads with speed limits of 50 mph or more and on frontage access roads, essentially allowing for long-haul deliveries along hub-to-hub routes and in less complex operational areas.[36]

Global Pandemics

Southern California's Trade and Logistics industry cluster, and the region as a whole, experienced severe economic dislocations from the COVID-19 pandemic. The pandemic disrupted supply chains for many goods and commodities from China, including pharmaceuticals and medical supplies, and resulted in scarcity and higher prices. This was compounded by the fact that economic lockdowns in California left dozens of container ships offshore for large stretches of time and unable to be off-loaded.[37]

While the outbreak of the next pandemic cannot be predicted with certainty, it is unlikely to come within the next ten years. But even if it did, would we expect to see similar severe economic dislocations from the next global pandemic? The answer generally is no, and this is because of reshoring and nearshoring.

Reshoring and nearshoring, which occur when U.S. businesses relocate their manufacturing bases from more distant countries to either the United States or to nearby countries like Mexico and Canada, began in earnest as a response to COVID-19 supply chain disruptions. Reshoring and nearshoring help increase supply chain reliability by mitigating the political risk seen in some foreign countries[38] and by reducing the dependence on ocean shipping. The Conference Board reports that companies are building new manufacturing facilities in the United States at a pace not seen in decades; construction spending on manufacturing increased 40 percent from 2021 to 2022, and 62 percent from September 2022 to September 2023.[39]

[36] Gallagher, J. (2024, August 30). California issues draft framework for autonomous heavy trucks. *Freight Waves*. https://www.freightwaves.com/news/california-issues-draft-framework-for-autonomous-heavy-trucks
[37] Cookson, J. (2022, February 7). Congestion in Southern California slowly improving. *Port Technology International*. https://www.porttechnology.org/news/congestion-in-southern-california-slowly-improving/
[38] https://www.stlouisfed.org/on-the-economy/2020/april/covid-19-protectionism-imports-essential-medical-equipment
[39] The Conference Board. (2023, November 14). *Reshoring Trend Boosts US Manufacturing Growth, Drivers and Business Implications*. Economy, Strategy & Finance Center. https://www.conference-board.org/publications/reshoring-trend-boosts-US-manufacturing-growth

Takeaways

Of the ten threats identified to Southern California's Trade and Logistics industry cluster, some already exist today while others have only a likelihood of occurring. Land use regulations restricting the development of warehouses and environmental regulations addressing air pollution and climate change are here today and have the potential to drastically curtail the current performance and future growth of the industry cluster. Competition from other regions is ongoing and significant, especially as they continue to invest in modernizing their facilities and developing new capabilities such as deeper ports. And land use regulations pertaining to the rezoning of industrial land are having impacts today, although the effects are piecemeal and compound over time.

The remaining threats are less immediate but still important. Global threats such as trade wars, conflicts and pandemics could occur in the near-to-medium term, but their likelihood is tied to factors outside of the control of policymakers and stakeholders in Southern California. Labor issues involving port automation or autonomous vehicles are always possible, however these types of issues are not new and regional parties have demonstrated their ability to reach compromises in the past.

It should be reiterated that these ten threats pertain to the near- and medium-term. Others could be expected to emerge when looking beyond the next ten years.

8 Conclusion

Southern California's Trade and Logistics industry cluster remains a cornerstone of the regional economy, generating nearly $497.6 billion in total economic output and supporting nearly 2 million jobs across the five-county region.

As the nation's largest trade gateway, this industry facilitates the movement of goods across global markets, leveraging world-class infrastructure, a highly skilled workforce, and an expansive multimodal transportation network.

However, the industry faces significant challenges, including intensifying competition from Gulf and East Coast ports, evolving regulatory frameworks, workforce shortages, and infrastructure constraints. The continued expansion of rival trade hubs, such as the Port of Savannah's $4.5 billion terminal expansion and New York/New Jersey's intermodal investments, signals a shifting competitive landscape that Southern California must navigate strategically.

Key Takeaways and Strategic Considerations

Unmatched Economic Contribution

- The Trade and Logistics industry cluster contributes 13.1 percent of the regional GDP, with the industry cluster's $90,600 average annual wage exceeding the regional average by 26 percent, underscoring its high-value economic impact.
- Its interconnections with supply chains, e-commerce, and foreign trade position it as a critical pillar for sustained economic growth.

Growing Workforce Demands and Talent Gaps

- The industry cluster is projected to experience 335,300 job openings over the next five years, largely driven by retirements and replacement needs.
- Training programs must align with technological advancements in automation, AI-driven logistics, and sustainability practices to address workforce shortages and skills mismatches.

Infrastructure and Sustainability Pressures

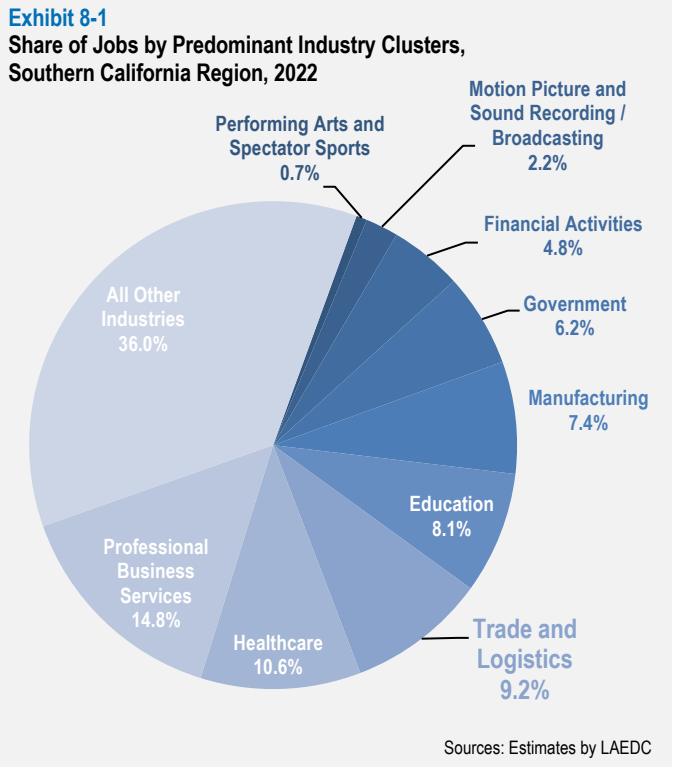
- Southern California's freight corridors, intermodal yards, and seaports require continued investments to ease congestion, improve efficiency, and accommodate future growth.
- The push toward zero-emission freight solutions, clean energy adoption, and digital logistics represents both an opportunity and a regulatory challenge.

Competitive Threats and Regional Adaptation

- Southern California remains dominant in cargo volume but shifting trade routes and supply chain disruptions are reshaping global logistics.
- Strategic initiatives, such as expanding intermodal capacity, integrating automation, and fostering trade partnerships, will be crucial to maintaining competitiveness.

Trade and Logistics in the Context of Southern California's Broader Economy

A comparison with other key industry sectors highlights the Trade and Logistics industry cluster's relative strengths and challenges within the regional economy, where it accounts for 9.2 percent of total jobs:



- **Professional and Business Services (14.8 percent):** Encompassing legal services, consulting, and corporate management, this sector plays a crucial role in supporting various industries, including those in the Trade and Logistics industry cluster. However, it is susceptible to economic cycles and shifts in corporate spending.
- **Healthcare Industry (10.6 percent)**: A consistently growing sector with a large employment base and stable demand. Unlike the Trade and Logistics industry cluster, it is less affected by global trade fluctuations but faces workforce shortages and regulatory shifts.
- **Trade and Logistics (9.2 percent):** As the backbone of regional and international commerce, this industry cluster relies on strong infrastructure and a skilled workforce but faces increasing competition from other U.S. trade hubs, automation, and evolving regulatory policies.
- **Education (8.1 percent):** A stable sector that provides essential workforce training and skill development but is influenced by public funding and demographic shifts.
- **Manufacturing (7.4 percent):** A key contributor to Southern California's economy, manufacturing remains vital to supply chains and trade-related industries but faces challenges from automation and offshoring.
- **Government and Public Administration (6.2 percent):** A stable employment base that provides essential services but does not generate the same level of private-sector economic dynamism as the Trade and Logistics industry cluster. *Note: This figure excludes government jobs within the other highlighted industry clusters, such as public-sector healthcare and education roles.*
- **Financial Activities (4.8 percent):** Including banking, insurance, and real estate, this sector underpins business growth and consumer financial health but is impacted by interest rate fluctuations and economic conditions.
- **Motion Picture and Sound Recording/Broadcasting Industry (2.2 percent):** Southern California's creative economy, historically driven by content production, streaming, and independent artists, continues to grow but is experiencing slowing job growth due to industry disruptions, automation, and AI-driven shifts in production and distribution.

- **Performing Arts and Spectator Sports Industry (0.7 percent):** Sports franchises, live entertainment, and major events are significant drivers of regional economic activity, particularly in Los Angeles' tourism and hospitality ecosystem.

Final Outlook

To sustain its position as a global trade hub, Southern California must prioritize infrastructure modernization, workforce development, and policy adaptations that balance environmental goals with economic efficiency. By embracing technological innovations, enhancing multimodal connectivity, and fostering global trade resilience, the region can ensure its Trade and Logistics industry cluster remains a key driver of economic prosperity for decades to come.

Appendices

Economic Contribution Analysis Methodology

Economic contribution analysis is used to describe that portion of a region's economy that can be attributed to an existing industry (or an industry cluster). It is a method to assess the value of an industry or a group of industries within a specific region, based on their existing production levels. It captures the industry's value through its backward linkages — such as purchases in the supply chain, payments of labor income to local workers, and tax revenues generated from operations and multiplier effects. This analysis models address questions such as what would happen if an industry did not exist for those whose economic activity depends on supplying the industry.

Contribution analysis measures not only direct activity but also indirect and induced effects. These effects depend on payments made by the industry of interest to suppliers of goods and services, which ripple through the economy as these funds circulate to employees, business owners, and other establishments that supply the industry. Moreover, the industry also spends billions of dollars every year for the wages and benefits of employees and contingent workers. These workers, as well as the employees of all suppliers, spend a portion of their income on groceries, rent, vehicle expenses, healthcare, entertainment, and so on. This recirculation of household earnings multiplies the initial industry spending through such indirect and induced effects.

The extent to which the initial expenditures multiply is estimated using economic models that depict the relationships between industries (such as those in the Trade and Logistics industry cluster and their suppliers) and among different economic agents (such as households and institutions).

These models are built upon actual data of expenditure patterns that are reported to the U.S. Bureau of Labor Statistics, the U.S. Census Bureau, and the Bureau of Economic Analysis of the U.S. Department of Commerce. Data is regionalized so that it reflects and incorporates local conditions such as prevailing wages rates, expenditure patterns, and resource availability and costs. The model does not assess other factors related to the industry outside of these measures, such as environmental, governmental, or social costs and benefits.

The magnitude of the multiplying effect differs from one region to another depending on the extent to which the local region can fill the demand for all rounds of supplying needs. For example, the automobile manufacturing industry has high multipliers in Detroit and Indiana since these regions have deep and wide supplier networks, while the same industry multiplier in Phoenix is quite small. In another example, the jobs multiplier for the construction industry is higher in, say, Arkansas, than in California because the same amount of spending will purchase fewer workers in Los Angeles than in Little Rock.

Multipliers can also differ from year to year as relative material and labor costs change and as the production "recipe" of industries change. For example, the IT revolution significantly reduced the job multiplier of many industries (such as manufacturing, accounting, architecture, and publishing) as computers replaced administrative and production workers.

The metrics used to determine the value of the economic contribution are employment, labor income, value-added and the value of output. Employment includes full-time, part-time, permanent, and seasonal employees and the self-employed, and is measured on a job-count basis regardless of the number of hours worked. Labor income includes all income received by both payroll employees and the self-employed, including wages and benefits such as health insurance and pension plan contributions. Value-added is the

measure of the contribution to GDP made by the industry, and consists of compensation of employees, taxes on production and gross operating surplus. Output is the value of the goods and services produced. For most industries, this is simply the revenues generated through sales; for others, in particular wholesale trade and retail industries, output is the value of the services supplied.

Estimates are developed using software and data from IMPLAN Group, LLC, which traces inter-industry transactions resulting from an increase in demand in a given region. The economic region of interest is the five-county Southern California region (including Los Angeles, Orange, Riverside, San Bernardino and Ventura) and the State of California, and the activity is reported for 2022, the most recent year for which a complete set of data is available. Estimates for labor income, value added, and output are expressed in 2022 dollars to maintain consistency with the reported industry activity.

The total estimated economic contribution includes direct, indirect, and induced effects. Direct activity includes the materials purchased and the employees hired by the industry itself. Indirect effects are those which stem from the employment and business revenues motivated by the purchases made by the industry and any of its suppliers. Induced effects are those generated by the spending of employees whose wages are sustained by both direct and indirect spending.

Contribution analysis differs from economic impact analysis in that feedback linkages to the industry (or the group of industries) being analyzed are removed so that indirect activity is not double-counted as it is already part of current direct activity of the industry (industries group). For example, firms in the Trade and Logistics industry cluster purchase transportation services from smaller truck transportation firms, which would then be included as both direct revenue of the trucking firm and as an expense of the Trade and Logistics industry cluster, resulting in a double-counting of overall revenue. Breaking these interindustry linkages eliminates this double-counting and is a more accurate method of estimating the economic contribution of the industry cluster.

Direct activity related to the economic activity of the trade and logistic industry cluster was based on employment and wage data from the Quarterly Census of Employment and Wages and Non-employer statistics from the U.S. Census Bureau with imputed nondisclosed data estimated by IMPLAN.

Description of Industry Sectors

The industry sectors used in this report are established by the North American Industry Classification System (NAICS). NAICS divides the economy into twenty sectors, and groups industries within these sectors according to production criteria. Listed below is a short description of each sector as taken from the sourcebook, North American Industry Classification System, published by the U.S. Office of Management and Budget (2017).

Agriculture, Forestry, Fishing and Hunting: Activities of this sector are growing crops, raising animals, harvesting timber, and harvesting fish and other animals from farms, ranches, or the animals' natural habitats.

Mining: Activities of this sector are extracting naturally occurring mineral solids, such as coal and ore; liquid minerals, such as crude petroleum; and gases, such as natural gas; and beneficiating (e.g., crushing, screening, washing and flotation) and other preparation at the mine site, or as part of mining activity.

Utilities: Activities of this sector are generating, transmitting, and/or distributing electricity, gas, steam, and water and removing sewage through a permanent infrastructure of lines, mains, and pipes.

Construction: Activities of this sector are erecting buildings and other structures (including additions); heavy construction other than buildings; and alterations, reconstruction, installation, and maintenance and repairs.

Manufacturing: Activities of this sector are the mechanical, physical, or chemical transformation of material, substances, or components into new products.

Wholesale Trade: Activities of this sector are selling or arranging for the purchase or sale of goods for resale; capital or durable non-consumer goods; and raw and intermediate materials and supplies used in production and providing services incidental to the sale of the merchandise.

Retail Trade: Activities of this sector are retailing merchandise generally in small quantities to the general public and providing services incidental to the sale of the merchandise.

Transportation and Warehousing: Activities of this sector are providing transportation of passengers and cargo, warehousing and storing goods, scenic and sightseeing transportation, and supporting these activities.

Information: Activities of this sector are distributing information and cultural products, providing the means to transmit or distribute these products as data or communications, and processing data. This industry contains all aspects of motion picture recording and distribution as well as the sound and telecommunications industry.

Finance and Insurance: Activities of this sector involve the creation, liquidation, or change of ownership of financial assets (financial transactions) and/or facilitating financial transactions.

Real Estate and Rental and Leasing: Activities of this sector are renting, leasing, or otherwise allowing the use of tangible or intangible assets (except copyrighted works) and providing related services.

Professional, Scientific, and Technical Services: Activities of this sector are performing professional, scientific, and technical services for the operations of other organizations.

Management of Companies and Enterprises: Activities of this sector are the holding of securities of companies and enterprises, for the purpose of owning controlling interest or influencing their management decision, or administering, overseeing, and managing other establishments of the same company or enterprise and normally undertaking the strategic or organizational planning and decision-making of the company or enterprise.

Administrative and Support and Waste Management and Remediation Services: Activities of this sector are performing routine support activities for the day-to-day operations of other organizations, such as: office administration, hiring and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services.

Educational Services: Activities of this sector are providing instruction and training in a wide variety of subjects. Educational services are usually delivered by teachers or instructors that explain, tell, demonstrate, supervise, and direct learning. Instruction is imparted in diverse settings, such as educational institutions, the workplace, or the home through correspondence, television, or other means.

Health Care and Social Assistance: Activities of this sector are operating or providing health care and social assistance for individuals.

Arts, Entertainment and Recreation: Activities of this sector are operating facilities or providing services to meet varied cultural, entertainment, and recreational interests of their patrons, such as: (1) producing, promoting, or participating in live performances, events, or exhibits intended for public viewing; (2) preserving and exhibiting objects and sites of historical, cultural, or educational interest; and (3) operating facilities or providing services that enable patrons to participate in recreational activities or pursue amusement, hobby, and leisure-time interests.

Accommodation and Food Services: Activities of this sector are providing customers with lodging and/or preparing meals, snacks, and beverages for immediate consumption.

Other Services (except Public Administration): Activities of this sector provide services not specifically provided elsewhere in the classification system. Establishments in this sector are primarily engaged in activities, such as equipment and machinery repairing, promoting, or administering religious activities, grant-making, advocacy, and providing dry-cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

Economic Contribution of Trade and Logistics Industry Cluster by Industry

Exhibit A1

Distribution of Employment Contributions of Trade and Logistics Industry Cluster by Industry in 2022 (jobs)

	Direct	Total		
	SoCal Region	SoCal Region	Rest of CA	State Total
Ag, Forestry, Fish & Hunting	0	1,540	230	1,770
Mining	0	510	210	720
Utilities	0	1,330	60	1,390
Construction	0	7,140	140	7,280
Manufacturing	0	18,900	2,630	21,530
Wholesale trade	414,780	414,780	810	415,590
Retail trade	52,300	117,860	1,820	119,680
Transportation and warehousing	435,290	545,550	1,970	547,520
Information	0	23,620	1,380	25,000
Finance and insurance	0	72,300	1,150	73,450
Real estate and rental	0	89,240	950	90,190
Professional, scientific technical	0	98,260	3,660	101,920
Management of companies	0	37,590	430	38,020
Administrative and waste services	0	151,300	3,580	154,880
Educational services	0	22,020	430	22,450
Health and social services	0	109,670	2,230	111,900
Arts, entertainment and recreation	0	23,600	440	24,040
Accommodation and food services	0	98,890	2,230	101,120
Other services	0	103,090	1,690	104,780
Government	0	24,250	490	24,740
Total	**902,370**	**1,961,420**	**26,560**	**1,987,980**

Source: Estimates by LAEDC

Exhibit A2

Distribution of Output Contributions of Trade and Logistics Industry Cluster by Industry in 2022 (millions of 2022$)

	Direct	Total		
	SoCal Region	SoCal Region	Rest of CA	State Total
Ag, Forestry, Fish & Hunting	$0.0	$157.0	$48.3	$205.3
Mining	$0.0	$565.2	$277.9	$843.2
Utilities	$0.0	$1,797.6	$72.8	$1,870.4
Construction	$0.0	$1,871.7	$40.0	$1,911.7
Manufacturing	$0.0	$15,762.2	$1,608.2	$17,370.4
Wholesale trade	$184,381.3	$184,381.3	$440.0	$184,821.3
Retail trade	$12,999.2	$21,977.3	$299.8	$22,277.1
Transportation and warehousing	$92,254.6	$98,956.8	$272.9	$99,229.7
Information	$0.0	$19,771.0	$1,483.5	$21,254.5
Finance and insurance	$0.0	$21,744.9	$365.1	$22,110.0
Real estate and rental	$0.0	$36,002.1	$599.7	$36,601.8
Professional, scientific technical	$0.0	$23,242.3	$937.6	$24,179.9
Management of companies	$0.0	$9,635.9	$132.4	$9,768.3
Administrative and waste services	$0.0	$17,683.2	$486.0	$18,169.2
Educational services	$0.0	$1,959.9	$41.9	$2,001.8
Health and social services	$0.0	$13,691.5	$302.1	$13,993.6
Arts, entertainment and recreation	$0.0	$3,080.9	$39.8	$3,120.7
Accommodation and food services	$0.0	$10,261.3	$249.1	$10,510.4
Other services	$0.0	$9,670.1	$180.4	$9,850.4
Government	$0.0	$5,674.8	$122.2	$5,797.0
Total	**$289,635.1**	**$497,887.1**	**$7,999.5**	**$505,886.6**

Source: Estimates by LAEDC

Exhibit A3

Distribution of Labor Income Contributions of Trade and Logistics Industry Cluster by Industry in 2022 (millions of 2022$)

	Direct	Total		
	SoCal Region	SoCal Region	Rest of CA	State Total
Ag, Forestry, Fish & Hunting	$0.0	$73.0	$13.6	$86.6
Mining	$0.0	$30.8	$17.4	$48.2
Utilities	$0.0	$311.4	$14.6	$326.0
Construction	$0.0	$516.3	$12.1	$528.4
Manufacturing	$0.0	$1,648.9	$284.2	$1,933.1
Wholesale trade	$44,505.6	$44,505.6	$114.6	$44,620.2
Retail trade	$1,043.6	$4,751.2	$105.0	$4,856.2
Transportation and warehousing	$38,042.7	$40,501.3	$118.6	$40,620.0
Information	$0.0	$4,874.6	$368.6	$5,243.3
Finance and insurance	$0.0	$6,866.6	$129.9	$6,996.5
Real estate and rental	$0.0	$5,240.0	$72.1	$5,312.1
Professional, scientific technical	$0.0	$10,339.5	$601.1	$10,940.6
Management of companies	$0.0	$5,185.6	$79.1	$5,264.7
Administrative and waste services	$0.0	$8,441.1	$223.0	$8,664.1
Educational services	$0.0	$1,264.7	$27.9	$1,292.5
Health and social services	$0.0	$7,885.6	$183.9	$8,069.5
Arts, entertainment and recreation	$0.0	$1,579.2	$17.9	$1,597.1
Accommodation and food services	$0.0	$3,972.4	$96.8	$4,069.2
Other services	$0.0	$5,568.9	$106.3	$5,675.2
Government	$0.0	$2,956.3	$57.3	$3,013.6
Total	**$83,591.9**	**$156,513.0**	**$2,644.0**	**$159,156.9**

Source: Estimates by LAEDC

Exhibit A4
Top 50 Occupations in the Trade and Logistics Industry Cluster by number of Workers in 2023

SOC	Description	Emp. in Trade and Logistics (2023)	Job Growth (2023 - 2028)	% Change (2023 - 2028)	% of Total Jobs in Trade and Logistics (2023)	Median Annual Wage	Typ. Entry Level Edu.	Work Exp. Req.	Typ. On-The-Job Training
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	74,383	6,684	9%	13.1%	$40,059	8	None	ST OJT
53-3032	Heavy and Tractor-Trailer Truck Drivers	62,823	6,275	10%	11.1%	$57,993	6	None	ST OJT
53-7065	Stockers and Order Fillers	42,334	3,469	8%	7.4%	$38,397	7	None	ST OJT
53-7051	Industrial Truck and Tractor Operators	33,629	2,835	8%	5.9%	$47,071	8	None	ST OJT
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	31,521	(1,608)	(5%)	5.5%	$66,204	7	None	MT OJT
43-5071	Shipping, Receiving, and Inventory Clerks	13,911	(62)	(0%)	2.4%	$39,643	7	None	ST OJT
53-1047	First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	12,184	1,015	8%	2.1%	$60,585	7	<5 years	None
53-7064	Packers and Packagers, Hand	11,547	490	4%	2.0%	$36,511	8	None	ST OJT
53-3033	Light Truck Drivers	10,883	491	5%	1.9%	$42,604	7	None	ST OJT
11-1021	General and Operations Managers	10,488	345	3%	1.8%	$115,617	3	>5 years	None
53-2031	Flight Attendants	9,888	965	10%	1.7%	$79,138	7	<5 years	MT OJT
43-5011	Cargo and Freight Agents	9,733	603	6%	1.7%	$51,708	7	None	ST OJT
43-9061	Office Clerks, General	9,363	(251)	(3%)	1.6%	$45,252	7	None	ST OJT
43-4051	Customer Service Representatives	9,345	(131)	(1%)	1.6%	$45,217	7	None	ST OJT
11-2022	Sales Managers	8,607	(495)	(6%)	1.5%	$114,909	3	<5 years	None
43-1011	First-Line Supervisors of Office and Administrative Support Workers	7,774	51	1%	1.4%	$70,017	7	<5 years	None
43-3031	Bookkeeping, Accounting, and Auditing Clerks	6,732	(258)	(4%)	1.2%	$52,183	5	None	MT OJT
11-3071	Transportation, Storage, and Distribution Managers	6,725	623	9%	1.2%	$99,353	7	>5 years	None
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	6,705	325	5%	1.2%	$39,079	7	None	ST OJT
53-3031	Driver/Sales Workers	6,579	320	5%	1.2%	$39,893	7	None	ST OJT
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	5,511	(428)	(8%)	1.0%	$106,707	3	None	MT OJT
53-2011	Airline Pilots, Copilots, and Flight Engineers	5,492	357	7%	1.0%	$263,410	3	<5 years	MT OJT
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	4,656	337	7%	0.8%	$71,444	7	None	LT OJT
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	4,119	(190)	(5%)	0.7%	$49,382	7	None	ST OJT
43-5061	Production, Planning, and Expediting Clerks	4,011	207	5%	0.7%	$58,323	7	None	MT OJT
13-1161	Market Research Analysts and Marketing Specialists	3,888	(77)	(2%)	0.7%	$75,457	3	None	None
41-3091	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	3,850	185	5%	0.7%	$69,135	7	None	MT OJT
13-2011	Accountants and Auditors	3,665	(30)	(1%)	0.6%	$84,970	3	None	None
49-3011	Aircraft Mechanics and Service Technicians	3,603	385	11%	0.6%	$79,120	6	None	None
43-5032	Dispatchers, Except Police, Fire, and Ambulance	3,584	196	5%	0.6%	$49,043	7	None	MT OJT
13-1199	Business Operations Specialists, All Other	3,484	50	1%	0.6%	$79,029	3	None	None
49-9071	Maintenance and Repair Workers, General	3,317	410	12%	0.6%	$48,923	7	None	MT OJT
15-1252	Software Developers	3,138	(9)	(0%)	0.6%	$151,944	3	None	None
13-1081	Logisticians	3,133	499	16%	0.6%	$81,417	3	None	None

Exhibit A4
Top 50 Occupations in the Trade and Logistics Industry Cluster by number of Workers in 2023

SOC	Description	Emp. in Trade and Logistics (2023)	Job Growth (2023 - 2028)	% Change (2023 - 2028)	% of Total Jobs in Trade and Logistics (2023)	Median Annual Wage	Typ. Entry Level Edu.	Work Exp. Req.	Typ. On-The-Job Training
13-1028	Buyers and Purchasing Agents	3,002	(158)	(5%)	0.5%	$74,842	3	None	MT OJT
41-2031	Retail Salespersons	2,806	66	2%	0.5%	$35,890	8	None	ST OJT
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	2,615	(19)	(1%)	0.5%	$47,371	7	None	MT OJT
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	2,607	121	5%	0.5%	$81,096	7	<5 years	None
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	2,591	170	7%	0.5%	$46,496	7	None	ST OJT
13-1071	Human Resources Specialists	2,413	99	4%	0.4%	$75,302	3	None	None
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2,400	247	10%	0.4%	$36,993	8	None	ST OJT
27-1026	Merchandise Displayers and Window Trimmers	2,365	85	4%	0.4%	$40,051	7	None	ST OJT
43-4151	Order Clerks	2,269	(191)	(8%)	0.4%	$42,795	5	None	ST OJT
51-2098	Miscellaneous Assemblers and Fabricators	2,263	(178)	(8%)	0.4%	$39,941	7	None	MT OJT
11-2021	Marketing Managers	2,221	(131)	(6%)	0.4%	$161,913	3	>5 years	None
41-1012	First-Line Supervisors of Non-Retail Sales Workers	2,074	(37)	(2%)	0.4%	$81,792	7	<5 years	None
11-3031	Financial Managers	2,008	51	3%	0.4%	$165,086	3	>5 years	None
13-1082	Project Management Specialists	1,962	(67)	(3%)	0.3%	$101,697	3	None	None
43-3021	Billing and Posting Clerks	1,877	(50)	(3%)	0.3%	$49,343	7	None	MT OJT
11-9199	Managers, All Other	1,859	(38)	(2%)	0.3%	$156,535	3	<5 years	None

Education: *1=Doctoral or professional degree; 2=Master's degree; 3=Bachelor's degree; 4=Associate's degree; 5=Postsecondary non-degree award; 6=Some college, no degree; 7=High school diploma or equivalent; 8=Less than high school;* ***On-the-Job Training:*** *I/R=Internship/Residency; APP=Apprenticeship; LT OJT=Long-term on-the-job training (more than one year); MT OJT=Moderate-term on-the-job training (1-12 months); ST OJT=Short-term on-the-job training (1 month or less)*
Sources: Lightcast, Estimates by LAEDC; Education and skills requirements from BLS

Exhibit A5
Top 100 Occupations by Projected Openings in the Trade and Logistics Industry Cluster, 2023-2028 with Job Requirements

SOC	Description	New Jobs	Replacement Jobs	Total Job Openings	Median Annual Wage	Typ. Entry Level Edu.	Work Exp. Req.	Typ. On-The-Job Training
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	6,684	50,193	56,877	$40,059	8	None	ST OJT
53-3032	Heavy and Tractor-Trailer Truck Drivers	6,275	34,315	40,590	$57,993	6	None	ST OJT
53-7065	Stockers and Order Fillers	3,469	35,253	38,723	$38,397	7	None	ST OJT
53-7051	Industrial Truck and Tractor Operators	2,835	16,895	19,729	$47,071	8	None	ST OJT
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	(1,608)	13,553	11,945	$66,204	7	None	MT OJT
53-7064	Packers and Packagers, Hand	490	8,469	8,959	$36,511	8	None	ST OJT
53-2031	Flight Attendants	965	6,793	7,758	$79,138	7	<5 years	MT OJT
53-1047	First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	1,015	6,290	7,305	$60,585	7	<5 years	None
43-5071	Shipping, Receiving, and Inventory Clerks	(62)	7,055	6,993	$39,643	7	None	ST OJT
53-3033	Light Truck Drivers	491	5,785	6,276	$42,604	7	None	ST OJT
43-4051	Customer Service Representatives	(131)	6,246	6,114	$45,217	7	None	ST OJT
43-5011	Cargo and Freight Agents	603	5,077	5,680	$51,708	7	None	ST OJT
43-9061	Office Clerks, General	(251)	5,522	5,271	$45,252	7	None	ST OJT
11-1021	General and Operations Managers	345	4,217	4,562	$115,617	3	>5 years	None
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	325	3,792	4,116	$39,079	7	None	ST OJT
53-3031	Driver/Sales Workers	320	3,504	3,823	$39,893	7	None	ST OJT
43-1011	First-Line Supervisors of Office and Administrative Support Workers	51	3,721	3,772	$70,017	7	<5 years	None
43-3031	Bookkeeping, Accounting, and Auditing Clerks	(258)	3,848	3,589	$52,183	5	None	MT OJT
53-2011	Airline Pilots, Copilots, and Flight Engineers	357	3,185	3,542	$263,410	3	<5 years	MT OJT
11-3071	Transportation, Storage, and Distribution Managers	623	2,745	3,368	$99,353	7	>5 years	None
11-2022	Sales Managers	(495)	3,015	2,520	$114,909	3	<5 years	None
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	337	1,980	2,317	$71,444	7	None	LT OJT
43-5061	Production, Planning, and Expediting Clerks	207	2,080	2,286	$58,323	7	None	MT OJT
41-2031	Retail Salespersons	66	2,057	2,123	$35,890	8	None	ST OJT
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	(190)	2,248	2,058	$49,382	7	None	ST OJT
41-3091	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	185	1,836	2,021	$69,135	7	None	MT OJT
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	247	1,753	2,000	$36,993	8	None	ST OJT
49-9071	Maintenance and Repair Workers, General	410	1,584	1,994	$48,923	7	None	MT OJT
43-5032	Dispatchers, Except Police, Fire, and Ambulance	196	1,718	1,914	$49,043	7	None	MT OJT
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	(428)	2,337	1,909	$106,707	3	None	MT OJT
13-1081	Logisticians	499	1,330	1,829	$81,417	3	None	None
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	170	1,640	1,810	$46,496	7	None	ST OJT
49-3011	Aircraft Mechanics and Service Technicians	385	1,372	1,757	$79,120	6	None	None
13-1161	Market Research Analysts and Marketing Specialists	(77)	1,732	1,655	$75,457	3	None	None
13-1199	Business Operations Specialists, All Other	50	1,493	1,542	$79,029	3	None	None
27-1026	Merchandise Displayers and Window Trimmers	85	1,398	1,484	$40,051	7	None	ST OJT
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	(19)	1,491	1,473	$47,371	7	None	MT OJT

Exhibit A5
Top 100 Occupations by Projected Openings in the Trade and Logistics Industry Cluster, 2023-2028 with Job Requirements

SOC	Description	New Jobs	Replacement Jobs	Total Job Openings	Median Annual Wage	Typ. Entry Level Edu.	Work Exp. Req.	Typ. On-The-Job Training
13-2011	Accountants and Auditors	(30)	1,389	1,359	$84,970	3	None	None
53-6032	Aircraft Service Attendants	115	1,174	1,289	$39,474	7	None	ST OJT
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	121	1,095	1,216	$81,096	7	<5 years	None
13-1028	Buyers and Purchasing Agents	(158)	1,322	1,164	$74,842	3	None	MT OJT
53-6061	Passenger Attendants	77	1,079	1,156	$36,717	7	None	ST OJT
13-1071	Human Resources Specialists	99	1,010	1,108	$75,302	3	None	None
33-9099	Protective Service Workers, All Other	79	982	1,061	$36,847	7	None	ST OJT
43-4151	Order Clerks	(191)	1,240	1,049	$42,795	5	None	ST OJT
53-7061	Cleaners of Vehicles and Equipment	66	953	1,020	$35,229	8	None	ST OJT
51-2098	Miscellaneous Assemblers and Fabricators	(178)	1,158	980	$39,941	7	None	MT OJT
53-2012	Commercial Pilots	156	802	958	$132,719	7	None	MT OJT
41-9099	Sales and Related Workers, All Other	(92)	1,036	944	$47,573	7	None	None
41-2022	Parts Salespersons	(53)	991	938	$38,034	8	None	MT OJT
13-1151	Training and Development Specialists	138	778	916	$64,257	3	<5 years	None
33-9032	Security Guards	82	827	909	$38,526	7	None	ST OJT
43-3021	Billing and Posting Clerks	(50)	948	898	$49,343	7	None	MT OJT
41-2011	Cashiers	(70)	912	843	$34,816	8	None	ST OJT
15-1252	Software Developers	(9)	829	820	$151,944	3	None	None
27-1022	Fashion Designers	23	794	817	$75,558	3	None	None
41-1012	First-Line Supervisors of Non-Retail Sales Workers	(37)	834	798	$81,792	7	<5 years	None
53-7199	Material Moving Workers, All Other	32	735	767	$35,934	8	None	ST OJT
41-2021	Counter and Rental Clerks	(37)	804	767	$39,019	8	None	ST OJT
51-9111	Packaging and Filling Machine Operators and Tenders	46	713	758	$37,755	7	None	MT OJT
11-3031	Financial Managers	51	680	731	$165,086	3	>5 years	None
11-2021	Marketing Managers	(131)	842	711	$161,913	3	>5 years	None
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	62	597	659	$75,890	7	None	LT OJT
13-1041	Compliance Officers	30	614	644	$83,544	3	None	MT OJT
11-9199	Managers, All Other	(38)	663	625	$156,535	3	<5 years	None
49-9099	Installation, Maintenance, and Repair Workers, All Other	(6)	611	605	$47,307	7	None	MT OJT
13-1082	Project Management Specialists	(67)	667	599	$101,697	3	None	None
13-1111	Management Analysts	(38)	611	573	$96,572	3	<5 years	None
51-1011	First-Line Supervisors of Production and Operating Workers	32	512	544	$71,623	7	<5 years	None
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	(8)	530	522	$32,949	8	None	ST OJT
15-1232	Computer User Support Specialists	(53)	574	521	$68,289	5	None	None
19-5011	Occupational Health and Safety Specialists	101	420	521	$109,940	3	None	None
51-9199	Production Workers, All Other	(21)	537	517	$37,266	7	None	MT OJT
11-3021	Computer and Information Systems Managers	(7)	508	501	$179,302	3	>5 years	None
51-6031	Sewing Machine Operators	21	478	499	$34,411	8	None	ST OJT
19-5012	Occupational Health and Safety Technicians	122	352	474	$55,701	7	None	MT OJT
41-1011	First-Line Supervisors of Retail Sales Workers	6	461	467	$47,409	7	<5 years	None
15-1299	Computer Occupations, All Other	(8)	472	464	$98,324	3	None	None
49-9062	Medical Equipment Repairers	13	402	414	$63,830	4	None	MT OJT

Exhibit A5
Top 100 Occupations by Projected Openings in the Trade and Logistics Industry Cluster, 2023-2028 with Job Requirements

SOC	Description	New Jobs	Replacement Jobs	Total Job Openings	Median Annual Wage	Typ. Entry Level Edu.	Work Exp. Req.	Typ. On-The-Job Training
53-1041	Aircraft Cargo Handling Supervisors	37	359	395	$53,668	7	<5 years	None
49-3023	Automotive Service Technicians and Mechanics	22	369	390	$62,329	6	None	ST OJT
53-7063	Machine Feeders and Offbearers	62	317	379	$40,902	8	None	ST OJT
27-1024	Graphic Designers	(37)	416	379	$71,886	3	None	None
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	31	345	376	$52,061	4	None	None
43-4171	Receptionists and Information Clerks	(21)	385	364	$38,144	7	None	ST OJT
43-6011	Executive Secretaries and Executive Administrative Assistants	(118)	477	359	$77,297	7	<5 years	None
39-6011	Baggage Porters and Bellhops	28	325	353	$38,382	7	None	ST OJT
53-5011	Sailors and Marine Oilers	22	318	340	$46,012	8	None	MT OJT
53-3099	Motor Vehicle Operators, All Other	18	313	330	$42,030	8	None	ST OJT
43-3011	Bill and Account Collectors	(57)	383	326	$45,359	7	None	MT OJT
53-5021	Captains, Mates, and Pilots of Water Vessels	28	295	323	$65,207	6	<5 years	None
43-9199	Office and Administrative Support Workers, All Other	(29)	346	317	$48,043	7	None	ST OJT
49-2011	Computer, Automated Teller, and Office Machine Repairers	(89)	388	299	$46,369	5	None	ST OJT
11-3012	Administrative Services Managers	(6)	295	289	$114,786	3	<5 years	None
43-3051	Payroll and Timekeeping Clerks	(24)	309	286	$59,372	7	None	MT OJT
11-3121	Human Resources Managers	16	264	280	$154,019	3	>5 years	None
49-9041	Industrial Machinery Mechanics	2	274	276	$63,373	7	None	LT OJT
11-3013	Facilities Managers	43	223	267	$106,279	3	<5 years	None
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	37	228	266	$63,955	6	None	LT OJT
51-9198	Helpers--Production Workers	(6)	269	263	$37,995	7	None	ST OJT

Education: *1=Doctoral or professional degree; 2=Master's degree; 3=Bachelor's degree; 4=Associate's degree; 5=Postsecondary non-degree award; 6=Some college, no degree; 7=High school diploma or equivalent; 8=Less than high school;* ***On-the-Job Training:*** *I/R=Internship/Residency; APP=Apprenticeship; LT OJT=Long-term on-the-job training (more than one year); MT OJT=Moderate-term on-the-job training (1-12 months); ST OJT=Short-term on-the-job training (1 month or less)*

Sources: Lightcast, Estimates by LAEDC; Education and skills requirements from BLS

Major Investment Initiatives at Competing Seaports

Port of New York/New Jersey:[40]

- Amended leases that allow CMA CGM (the world's third-largest ocean carrier) to invest more than $600 million and assume operations at the former GCT container terminals at the Port Jersey-Port Authority Marine Terminal and at the Howland Hook Marine Terminal. The investments will fund reconstruction and rehabilitation of wharves and ship berths, as well as upgrades to cargo handling equipment and expansion of yard capacity, allowing them to handle an additional 750,000 additional lifts per year when construction is completed.

- Commencement of major construction work on the $220 million Port Street Corridor Improvement Project to redesign and rebuild Port Newark's northern entrance at Port and Corbin streets. This redesign will feature a more efficient roadway configuration with a wider turning radius, allowing for safer trucking operations. The ramp from Port Street to Corbin Street serves approximately 3,600 vehicles during a typical peak hour, 40 percent of which is truck traffic.

- In December 2023, the Port Authority approved $19.2 million to study next steps as the port and the U.S. Army Corps of Engineers look to deepen the port's shipping channels to 55 feet. The project would allow the port to accommodate bigger container ships and ease harbor navigation.

- Furthering the Port Authority's sustainability goals, four DC fast chargers are expected to be available this year, enabling electric trucks serving the port to get a quick jolt. The initiative dovetails with the Port Authority's wider sustainability priorities, including incentives toward the use of cleaner trucks, ships, and cargo handling equipment, en route to the agency's overall goal of net-zero carbon emissions by 2050.

Port of Savannah:[41]

- Garden City Terminal's Berth 1 has been reconstructed and straightened to expand capacity and allow the Authority to dock four 16,000 TEU container ships and three additional vessels simultaneously, adding approximately 1 million in TEU berth capacity on an annualized basis. This project is expected to cost approximately $138.3 million.

- Two additional ship-to-shore cranes of 152 feet of lift height (and 90 feet of crane gauge), which will allow for vessel operations of ships up to 15,000 TEUs, will be acquired. Additionally, six ship-to-shore cranes of 164 feet of lift height (and 130 feet of crane gauge), which will allow for vessel operations of ships with more than 20,000 TEUs, will be acquired and, at completion, will be the largest cranes at the Port of Savannah. This project cost $121.4 million.

- In 2019, the Authority acquired 145 acres of property to expand its Garden City Terminal. The first of two development phases was completed in 2022 and provides 25 acres of storage area for operations. The second was completed in 2024 and provides approximately 90 acres of full container yard capability including multi-lane gate operation with direct access from SR 307; fifteen (15)

[40] Port Authority NY NJ. (2024.) *2023 Annual Report: A Year of Milestones: Continuing to Deliver*; Port Authority NY NJ. (2024, January 30.) *Amid Roadway and Harbor Access Projects, NY/NJ Seaport Sees Strong 2024 Ahead*. Blog Post.
[41] Georgia Ports Authority. (2024.) *Annual Comprehensive Financial Report For the Fiscal Years Ended June 30, 2024 and 2023*

electric rubber tire gantry cranes; and container storage to provide approximately 1 million TEUs of capacity at full build out. This project cost $230.9 million.

- Modification of Garden City Terminal Container storage facilities at Berths 7, 8 and 9 provide additional container storage capacity and equipment for the Port and were completed in late FY2023. This project encompasses approximately 75 acres and adds approximately 800,000 TEUs of annual capacity. This project cost $86.9 million.

- The Ocean Terminal Dock Realignment will reconfigure the three small berths known as Berths 12, 13 and 18 into a continuous, 2,650 linear foot wharf that will allow service of two large container vessels. The first large berth is expected to be completed in mid-2027. This project is expected to cost approximately $407.7 million.

- Following the reconfiguration of the Ocean Terminal berths (as described above), the newly expanded berth will be fitted with eight (8) ship-to-shore cranes of 165 feet of lift height and 130 feet of crane gauge. The cranes are expected to be installed at Ocean Terminal upon delivery. This project is expected to cost approximately $164.4 million.

- Approximately 150 of the 200 existing acres of the Ocean Terminal facility will be redeveloped to better support container operations. This project will include demolishing existing warehouses, constructing additional container storage space, raising the elevation of the property and increasing its yard equipment. The first phase of the project is expected to be completed in mid-2027. The budget for this project is expected to be approximately $520.9 million.

- The property formerly known as the Georgia Steamship Terminal is undergoing redevelopment to create the Savannah Transload Facility that consists of approximately eighty-one (81) acres located one mile up-river from Garden City Terminal. The state-of-the-art trans-shipment facility consists of a 300,000 square foot warehouse facility, a container field with nine (9) electric rubber tire gantry cranes that operate three (3) container stacks and approximately 90 acres of paved area for truck staging and storage. An access road connecting Garden City Terminal to this property along with a separate gate is also under construction. Substantial completion of the project occurred in September 2023 with an estimated cost of $126.3 million.

Port of Houston:[42]

- Project 11, the Houston Ship Channel Expansion Project, is the eleventh major ship channel expansion project since the mid-nineteenth century. The Authority is partnering with the U.S. Army Corps of Engineers and private industry on plans to widen at an accelerated pace the channel by 170 feet along its Galveston Bay reach, from 530 feet to 700 feet. It will also deepen certain upstream segments to 45 feet and make other safety and efficiency improvements. The project is being funded by two rounds of revenue bonds of $322.1 million and $393.6 million.

- The construction of Wharf 6 at Bayport began in mid-2021 and completed in the fourth quarter of 2023. Three Super Post Panamax STS cranes were also delivered in 2023 to support this wharf expansion. Three additional Super Post Panamax cranes are expected to arrive in April 2024. Twelve additional RTGs will arrive in 2024, which will increase the Bayport fleet from 66 to 78.

[42] Port of Houston Authority. (2024.) *Annual Comprehensive Financial Report for the Years Ended December 31, 2023 and 2022*.

- Design efforts began in 2022 for an Exit Gate expansion at Bayport to help support increased gate activity from the additional yard and wharf capacity. Design and construction involves working with U.S. Customs and Border Protection, with construction planned to begin in 2024.

- The construction work for Wharf 4/5 at Barbours Cut began in 2023, with estimated completion for this wharf section in mid-2025. Four Super Post Panamax wharf cranes will be added as part of this project, and two older wharf cranes are set for demolition to accommodate the new cranes.

- Reconstruction of yard areas 4 and 5 North at Barbours Cut was completed in 2023 and pairs with a complement of 14 new RTGs, expected to arrive in 2024. Container yard areas 6 and 7 began redevelopment in late 2023. This 87 acres will be reconfigured to provide more efficiencies and additional capacity for refrigerated units. Five additional RTGs are scheduled to arrive in 2025.

- The West End Interim yard development is near completion. This effort will provide about 26 acres of container stacking space and is scheduled for completion in the second quarter of 2024.

- The new maintenance facility is also nearing completion by Summer 2024, which will be an area to help consolidate some of the maintenance activities for Barbours Cut terminal.

Port of Seattle-Tacoma (NWSA):[43]

NWSA projects for the next five years reflect a focus on strategic container terminal development in both harbors. With this focus the NWSA has reviewed potential assets for revenue generation to ensure that financial and economic growth goals are met. Major 2025–29 capital projects include:

- Seattle Harbor
    - Completion of improvements at Terminal 5
    - Design of Terminal 18 shore power installation and wharf rehabilitation

- Tacoma Harbor
    - Husky terminal expansion
    - Rebuild of Wapato Creek culvert
    - Modernize terminal 7D
    - Maintenance dredging at various terminals
    - Design shore power at PCT and WUT
    - Ongoing maintenance of facilities

- Both Harbors
    - Clean air and stormwater investments
    - Asset preservation projects such as paving and fender repairs
    - Maintenance dredging at multiple terminals in both harbors

The NWSA's 2025 Capital Investment Plan of $169.8 million represents the first year of the NWSA's 2025-29 Capital Improvement Plan, a package totaling $481.3 million in new projects and investments.

[43] The Northwest Seaport Alliance. (2024.) *The Northwest Seaport Alliance 2025 Budget*

Port of Charleston:[44]

- Invested $500 million to modernize Wando Welch Terminal with enhanced capacity and operations. Fifteen ship-to-shore cranes now stand 155 feet above the wharf deck at Wando Welch Terminal; it also has a strengthened wharf, enhanced container yard, expanded refrigerated cargo yard, new container-handling equipment, improved traffic patterns and IT systems, and an on-terminal transload facility for mega retailers.

- Expanding Inland Port Greer to better support the supply chains of port-dependent businesses in the Upstate and throughout the Southeast. The more than $30 million investment will double cargo capacity and enhance rail capabilities. The rail component is already complete; it adds 8,000 feet of new rail to handle trains filled with cargo.

- Developing a rail-served intermodal yard that provides near-dock rail to the Port of Charleston. Class I railroads CSX and Norfolk Southern will both serve the Navy Base Intermodal Facility, helping to speed goods to market for port-dependent businesses. The state of South Carolina is investing $400 million to support this project, which is set to open in 2025.

- Developing an inner-harbor barge operation that will support the Navy Base Intermodal Facility by moving containers via waterways between Wando Welch Terminal and Leatherman Terminal. The state of South Carolina is investing $150 million to support this project.

- Deepening Charleston Harbor to 52 feet. Charleston now has the deepest harbor on the East Coast at 52 feet, enabling the biggest ships calling the East Coast to access SC Ports' terminals any time, any tide. Widened channels and turning basins also make it easier and safer for large vessels to navigate the harbor. The roughly $580 million project was done in partnership with the U.S. Army Corps of Engineers.

- The $1 billion Phase One of Leatherman Terminal opened in 2021, marking the country's first new container terminal since 2009. Leatherman Terminal deploys five ship-to-shore cranes with 169 feet of lift height and 700,000 TEUs of capacity. The state-of-the-art container terminal adds a much-needed berth to the East Coast port market. Leatherman Terminal will be built in three phrases through 2032. At full buildout, the three-berth Leatherman Terminal will have 2.4 million TEUs of capacity.

Port of Oakland:[45]

The 5-Year Maritime Capital Improvement Plan (CIP) provides for continued investment in the modernization of core infrastructure such as sanitary sewer, roads, and wharves to meet changing and growing regulatory compliance requirements in addition to industry needs. The CIP also includes various projects that support the Port's transition to zero emission operations.

The CIP is not reflective of all the capital investments at the Seaport, but rather includes only those capital investments that the Port will perform and/or pay for directly. Other major investments include the 7th Street Grade Separation East project, a $350 million investment delivered by Alameda CTC and funded through state and regional sources that broke ground in late 2023; and a new 18-acre bulk sand/aggregate

[44] https://scspa.com/about-the-port/port-expansion/infrastructure-investments/
[45] Port of Oakland. (2024.) *Budget Summary: One-Year Operating and Capital Budget, Fiscal Year ended June 30, 2025* and *Five-Year Operating Forecast and Capital Improvement Plan, Fiscal Years ending June 30, 2025 through 2029*

marine terminal at the Outer Harbor that is expected to break ground in fall 2025 and reflects a private investment of approximately $65 million.

The 5-Year CIP includes approximately $491.0 million, as follows:

- Over the 5-year period:
  - Marine Terminal improvements totaling approximately $189.0 million. The majority ($176.1 million) is for wharf, yard, and crane repairs and upgrades, including reconstruction and grading of the backlands at Berths 24 and 33-34;
  - Dredging and dredging-related improvements totaling $161.0 million;
  - Utility improvements totaling $118.8 million, the majority of which ($88.0 million) is for a new project called the Green Power Microgrid and trash capture regulatory compliance across the Seaport;
  - Roadway improvements totaling about $0.3 million; and
  - Miscellaneous projects totaling $22.0 million, of which $13.9 million is for improvements at the Middle Harbor Shoreline Park related to permit compliance, $4.3 million is for capital equipment, and $1.4 million is for improvements to the Port's harbor facilities complex.

- FY 2025 capital budget:
  - $59.6 million for essential projects primarily in the Marine Terminal and Utilities categories.

Port of Vancouver:[46]

- Roberts Bank Terminal 2 Project. Roberts Bank Terminal 2 is a future marine container terminal that will increase container terminal capacity by more than 30 percent on Canada's west coast, strengthen reliable access to goods, and support Canadian exporters. The Government of Canada and Government of B.C. approved Roberts Bank Terminal 2 in 2023, after a rigorous federal and provincial environmental assessment process. Construction will begin in the late 2020s with completion in the mid-2030s.

- Annacis Auto Terminal Optimization Project. Developed in partnership with Wallenius Wilhelmsen (WW), the project will allow the port authority to consolidate two existing port automobile terminals into one, improving efficiency of the terminal's existing operations and increasing its capacity to handle a greater volume of automobile imports in the future. The project is currently under construction.

- Fraser Surrey Port Lands. Road and rail improvements are intended to alleviate traffic congestion and rail crossing delays, and improve the ability of port tenants to move trade. These changes will improve safety, security, and vehicle access by creating more reliable travel times, security oversight, and better emergency response access. The project is currently under construction.

- Fraser Richmond Industrial Lands. This is an active industrial area for warehouse and transload businesses for containers moving to and from the Port of Vancouver. This corridor has some of the most concentrated activity in the Greater Vancouver area for moving goods from marine terminals to rail lines and trucks, and then off to other destinations. Traffic flow in the area is impacted by a busy rail crossing. The project is currently in the planning, designing and permitting phase.

[46] https://www.portvancouver.com/projects

- Holdom Overpass project. This new four-lane overpass will extend Holdom Avenue south, over the rail corridor and Still Creek, connecting it with Douglas Road. This will replace the Douglas Road rail crossing. As a result, there will be improved safety and connections for the Burnaby community, improved emergency response, and reduced greenhouse gas emissions.

Port of Virginia:[47]

The port is making gains on its $1.4 billion Gateway Investment Program that is creating a modern, efficient and sustainable port. The fiscal year's (July 1, 2023 – June 30, 2024) highlights include:

- Work begins on the $650 million modernization of the North Berth at Norfolk International Terminals (NIT) to enhance the port's capability to serve larger, fully-laden container ships. Virginia will have three ultra-modern marine terminals capable of handling the largest ships afloat when the project is complete in 2027.

- Portsmouth Marine Terminal's transformation into the Mid-Atlantic's leading offshore-wind energy logistics hub progresses with the arrival of the first shipment of components that will be used in the Coastal Virginia Offshore Wind project.

- All Port of Virginia terminals begin using electricity from clean resources, accelerating the port's goal of becoming carbon-neutral by 2040. Using clean electricity helps the port offset its carbon footprint by reducing carbon emissions by up to 45 percent per container.

- Following dredging, the port debuted the U.S. East Coast's widest shipping channel that allows for safe, two-way passage of ultra-large container vessels. The continuous vessel flow in the harbor helps reduce the amount of time vessels spend on berth by up to 15 percent. The port will open its 55-foot-deep commercial channel – to be the deepest on the U.S. East Coast – in 2025.

- The port expands its western and southern reach with a new daily rail service between the port's primary container terminals and Memphis, a growing logistics hub.

[47] Port of Virginia. (2024, July 30.) *Virginia Completes FY 2024 with Growth in Cargo Volumes and Progress on Infrastructure Projects*. News Release

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LOS ANGELES COUNTY
ECONOMIC DEVELOPMENT CORPORATION

MEDIA ADVISORY – VIRTUAL PRESS EVENT
FOR IMMEDIATE RELEASE
April 18, 2025

Virtual Press Event - Southern California Leadership Council (SCLC) and Los Angeles County Economic Development Corporation (LAEDC) release Trade and Logistics Report highlighting industry's economic impact and challenges in light of recent tariffs impacting Southern California

When:

Tuesday, April 22, 2025 – 10:30AM to 11:00AM

Who:

- **Gray Davis**, Co-Chair of Southern California Leadership Council (SCLC) – Former Governor of California
- **Fran Inman** – Chair of SCLC Goods Movement and Transportation Committee – Senior Vice President of Majestic Realty
- **Jeff Jennison** – Immediate past Co-Chair of SCLC - CEO of Watson Land Company
- **Stephen Cheung**, CEO of Los Angeles County Economic Development Corporation (LAEDC) and World Trade Center Los Angeles (WTCLA)

What:

The Southern California Leadership Council (SCLC) announced the release of *Goods on the Move: Trade and Logistics in Southern California*, a comprehensive report conducted by the Los Angeles County Economic Development Corporation's (LAEDC) Institute for Applied Economics. The report provides an in-depth analysis of the trade and logistics industry's role as a cornerstone of Southern California's economy.

The full report will be released immediately following the virtual press event on 4/22/2025 at 11AM and will be available at www.laedc.org . The video recording of the press event will also be posted on 4/22/25.

How:

Media and press are invited to attend the virtual press conference by registering at the following link:

Webinar Registration - Zoom

Key Findings:

- In 2022, the Trade and Logistics industry cluster directly employed nearly 902,400 workers in Southern California, supporting a total of nearly 2 million jobs across the region
- The industry cluster contributed nearly $497.6 billion in total economic output,
- including $289.6 billion in direct output, and generated $157 billion in labor income, making it one of the most significant economic drivers in the region.
- In 2022, the average annual wage in the Trade and Logistics industry cluster in Southern California was $90,600. This was over 26 percent higher than the average annual wage of $71,617 reported across all industries in the five-county region.
-

- Economic activities directly and indirectly tied to the Trade and Logistics industry cluster generated a total of $93.3 billion in tax revenues in 2022.
- With over 70% of Port of LA's and Port of Long Beach's imports coming from Pacific Rim countries, there is the strong likelihood that new, higher tariffs and a trade war will significantly reduce port activities, leading to negative economic and employment impacts.

Los Angeles, CA – The Southern California Leadership Council (SCLC) today announced the release of *Goods on the Move: Trade and Logistics in Southern California*, a comprehensive report conducted by the Los Angeles County Economic Development Corporation's (LAEDC) Institute for Applied Economics. The report provides an in-depth analysis of the trade and logistics industry's role as a cornerstone of Southern California's economy, employing nearly 2 million workers and generating $497.6 billion in total economic output.

The report's findings will be presented during a virtual press conference on April 22, 2025, at 10:30 AM PT, featuring SCLC Co-Chair and Former California Governor Gray Davis, SCLC Goods & Transportation Committee Chair Fran Inman, along with LAEDC President and CEO Stephen Cheung.

"With nearly 35% of all U.S. waterborne containerized trade flowing through our region, Southern California is the gateway to the nation's economy," said Gray Davis, Co-Chair of the Southern California Leadership Council and Former Governor of California. "This report underscores the immense impact of trade and logistics on our workforce and local businesses. However, larger tariffs, an emerging trade war, growing competition from Gulf and East Coast ports, supply chain disruptions, and evolving regulations mean we must act now to strengthen our competitive edge."

The study highlights key industry challenges, including trade wars, port congestion, workforce shortages, increasing environmental regulations, and shifting global trade routes. It also provides policy recommendations to sustain Southern California's leadership in global commerce, such as investing in infrastructure modernization, expanding workforce development initiatives, and advancing sustainable logistics solutions.

"The trade and logistics sector is a major economic engine for our region, supporting good-paying jobs and driving innovation," said Mike Roos, President of the Southern California Leadership Council. "As other regions invest heavily in infrastructure to attract cargo, Southern California must double down on policies that enhance our efficiency, workforce readiness, and long-term sustainability."

The report calls for continued investment in transportation infrastructure, workforce training programs, and regulatory frameworks that balance economic growth with environmental sustainability. It also emphasizes the importance of foreign direct investment (FDI), digital transformation in supply chain management, and intermodal connectivity improvements to maintain the region's global trade dominance.

The virtual press conference will take place on Tuesday, April 22, 2025, at 10:30 AM PT. Members of the media can RSVP to receive access details: **Webinar Registration - Zoom**

MEDIA CONTACT:
For more information, contact Erik Conley at erik.conley@laedc.org or **www.LAEDC.org**.

About the Southern California Leadership Council
Three former Governors and over three dozen President/CEOs of major companies and agencies comprise the Southern California Leadership Council, a nonprofit, nonpartisan organization formed in 2005 to provide leadership on major public policies critical to economic vitality, job growth and the quality of life in Southern California.

About the Los Angeles County Economic Development Corporation
The Los Angeles County Economic Development Corporation (LAEDC) is a nonprofit organization focused on advancing opportunity and prosperity for all in the Los Angeles region. Through economic research, business assistance, workforce development, and policy advocacy, LAEDC supports a thriving and inclusive regional economy.

KEY HIGHLIGHTS OF THE TRADE & LOGISTICS REPORT

Economic Significance of Trade & Logistics in California

- Major Economic Driver: The industry contributed nearly **$497.6 billion in total economic output** in 2022, generating **$157 billion in labor income**.
- Employment Impact: The industry directly employed **902,400 workers**, supporting nearly **2 million total jobs** across Southern California.
- Wages & Workforce: The **average annual wage in the sector was $90,600**, 26% higher than the regional average of $71,617.

Key Strengths & Competitive Position

- Largest Trade Gateway in North America: Southern California's ports handle 35% of all U.S. waterborne containerized trade, with over 19 million TEUs processed in 2022.
- Multimodal Connectivity: The region's highway, rail, and airport networks move 598.3 million tons of freight valued at $1.7 trillion annually.
- Foreign Direct Investment (FDI): Over 2,000 foreign-owned enterprises (FOEs) in trade and logistics employ 67,000 workers and generate $5.8 billion in wages.

Challenges & Policy Needs

- Tariffs: China is the Ports of LA and LB's #1 trading partner. A decrease in US-China trade brought about by increased tariffs will have a direct impact on port activities and employment, and our regional. economy. The U.S. has imposed a cumulative tariff of 145% on most Chinese goods. In response, China has implemented tariffs up to 125% on U.S. exports. The World Trade Organization (WTO) projects an 80% decrease in U.S.-China merchandise trade for 2025, indicating a significant decoupling of the two economies.
- Competition from Other Ports: Gulf and East Coast ports (e.g., Savannah, Houston, New York/New Jersey) are increasing their market share. Strategic investments are required to maintain California's trade dominance.
- Infrastructure Investment: Increased freight volumes are straining transportation networks, causing congestion and delays. Legislators should support funding for port expansions, highway improvements, and intermodal hubs.

- Workforce Development: The industry anticipates 335,300 job openings in the next five years. Expanding apprenticeship programs, vocational training, and digital logistics education will be critical.
- Regulatory Balance: Environmental and labor policies must align sustainability goals with trade efficiency, ensuring California remains competitive.

Legislative Priorities for Sustainable Growth

- Modernize Infrastructure: Increase funding for ports, highways, and rail networks to reduce congestion and improve trade efficiency.
- Invest in Workforce Training: Expand technical education and workforce development programs to prepare workers for automation and supply chain roles.
- Trade Policy: Strengthen trade partnerships, FDI incentives, and supply chain innovation to maintain California's leadership.