TECHNICAL MEMORANDUM 5a –
ECONOMIC BENEFITS AND COSTS OF GROWTH IN GOODS MOVEMENT
MULTI-COUNTY GOODS MOVEMENT ACTION PLAN

Prepared for:

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June 15, 2007
A31418

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Exhibits

Southern California's goods movement sectors create considerable impact due to the wide variety of activities involved in moving goods within and through the region. The facilities involved include the region's four ports, its numerous airports led by Los Angeles International Airport (LAX), its two long-haul and four short-haul rail lines, several intermodal railyards, hundreds of cross-docks, and thousands of warehouses. The system is largely tied together by trucks that move nearly all goods the "last mile" to consumers. Trucks also transfer cargo from the ports and airports to the intermodal yards, warehouses, and cross-docks. The activity flowing through every element of this system is at or near (in the case of air cargo) record levels, the facilities and the supporting infrastructure are straining against capacity, and the volumes for every activity are forecasted to increase significantly.[1]

E.1 Economic Challenge

This report examines the role the logistics group of activities plays in generating jobs and economic activity in Southern California, now and in the long run. It begins by looking at the primary challenge facing Southern California's economy. As of 2006, 21.3 million people live in the seven county regions (Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura). By 2030, forecasters expect this number to increase to 26.8 million, with most of the growth resulting from the natural increase in the area's existing population. The region must therefore seriously consider ways to expand its job base. Complicating this need is the fact that 43.8% of the region's adults, age 25 and over, have not attended a single college class.

Historically, manufacturing provided the good entry-level pay and job ladders that allowed many people in this group to work in blue collar jobs and climb into the middle class. This is defined as the income range containing the 12.5% of Southern California's households below ($37,163) and above ($66,099) its 2004 median income of $49,435. With demise of manufacturing as a growth force in Southern California (1990-2005: down 361,300 jobs or -28.2%), an alternate route for upward economic mobility is needed.[2] Thus, the region needs significant job growth, with a considerable portion of that growth aimed at employing these workers. If this challenge is not met, Southern California's income divide will grow. Already, the top 3.5% of the area's households earned 17.6% of its total income in 2004 while the bottom 50% earned just a little more at 18.6%.

E.2 Starting Pay and Job Ladders

Logistics (wholesale trade; trucking; supply chain management; warehousing; couriers; air, sea, and rail transportation) has the essential characteristics that can allow it to replace manufacturing in this role. It offers a median beginning pay at 32.1% above the minimum wage ($8.91 or $18,542 per year) to workers with virtually no training or experience. It also has defined paths by which workers can graduate to median pay levels of well over $40,000 per year, placing them inside the middle class. These estimates make no allowance for the fact that overall pay in logistics sub-sectors appears to run 12.5% to 14.4% above that derived from the general occupational pay scales used to calculate incomes in this report (explanation: pages 3-2 to 3-3).[3]

In wholesale sub-sectors, 80.6% of the jobs require no advanced schooling and another 5.7% require either trade or community college training. In transportation and warehousing sub-sectors, 92.9% of the jobs require no advanced schooling and another 1.1% require trade school training. Taken together, all logistics jobs in 2005 average $47,411 per year, just 2% below all manufacturing jobs ($48,397).[4] Meanwhile, the alternative sectors without educational barriers to entry pay much more modestly: retail trade ($28,840), gaming ($28,385), accommodation ($24,019), agriculture ($22,793) other services (automotive, household and electric repair and maintenance, personal care, laundry, member associations, household workers) ($22,340), eating and drinking ($15,132). In sum, the logistics sector offers Southern California a means of meeting its economic challenge of providing significant job growth and upward income mobility to a vulnerable segment of its workforce.

E.3 Competitive Position

From 1990-2005, the logistics sector grew by 103,400 jobs (18.4%) and is competitively situated to continue growing. In 2005, the ports of Los Angeles and Long Beach were ranked second and third in their dollar volume of U.S. international trade, and LAX was ranked seventh. In container terms, these ports, in combination with the Port of San Diego and Port Hueneme, handled 41.8% of 2005 U.S. imports and 68.4% of all containers reaching the West Coast (including Vancouver). Meanwhile, Southern California's burgeoning population requires a logistics sector that matches its size and growth. The rapid growth of e-commerce is adding to this pressure. Nationally, the advent of "just in time" inventory processes plus the rise of low-cost Asian manufacturing, due to the freeing of competition there, has made international supply chain management a key ingredient in corporate cost control. Southern California's West Coast location and deep water ports create an ideal entry point for Asian goods into the North American market. Companies that manage their inventories from the area have shorter time lags between sales forecasts and goods delivery than those that manage their inventories from Asia, reducing inventory costs by 18%-20%.[5]

A major difficulty for the logistics sector is the fact that it is straining the facilities and supporting infrastructure needed to accommodate its growth. This is highlighted by the challenge that communities face in approving new facilities. From 1994 to 2000, the amount of space needed to support a single job in this field averaged 1,994 square feet. From 2001 to 2006, that figure grew to an average of 2,284 square feet per job. In comparison, the space needed to support a single manufacturing job remained at an average of roughly 1,000 square feet during that entire twelve-year period. These data, in addition to the fact that logistics is growing and manufacturing is in decline, create a dilemma for local policy makers trying to balance land use and blue collar job creation.[6]

E.4 Macro-Economic Impact

One way that the author used to calculate the impact of logistics activity was the use of the IMPLAN model to identify how much of Southern California's economy is directly within them in 2003. This included: $90.7 billion of $1,375 billion in total economic activity in Southern California (6.6%); $63.6 billion of $812.6 billion in economic value created (7.8%); 687,837 of 11,321,518 people employed (6.1%); $52.6 billion of $750.6 billion earned income (7.0%); and $11.1 billion of $62.0 billion in sales taxes, property taxes, fees, licenses, and excise taxes paid to government (17.8%). However, this did not account for activity in other sectors,

since logistics firms buy goods and service from them (indirect effect). It also misses the fact that the incomes paid to workers cause activity to rise throughout the economy (induced effect). Including these, the 2005 impact of logistics rises to: $170.4 billion of $1,375 billion in total economic activity (12.4%); $113.2 billion of $812.6 billion in economic value created (13.9%); 1,441,016 of the 11,321,518 people employed (12.7%); $98.6 billion of $750.6 billion earned income (13.1%); and $14.6 billion of $62.0 billion in tax and fee revenues to government (23.5%).

Note: In estimating the size of the impact of logistics as of 2005, no allowance was made for the fact that without the sector some of the workers and resources used within it might have helped growth other parts of the economy. Such an analysis is essentially impossible as it would require a rewriting of history to examine such a potential outcome including the degree to which workers and resources now devoted to logistics may have left the Southern California or been unemployed if the sector did not exist.

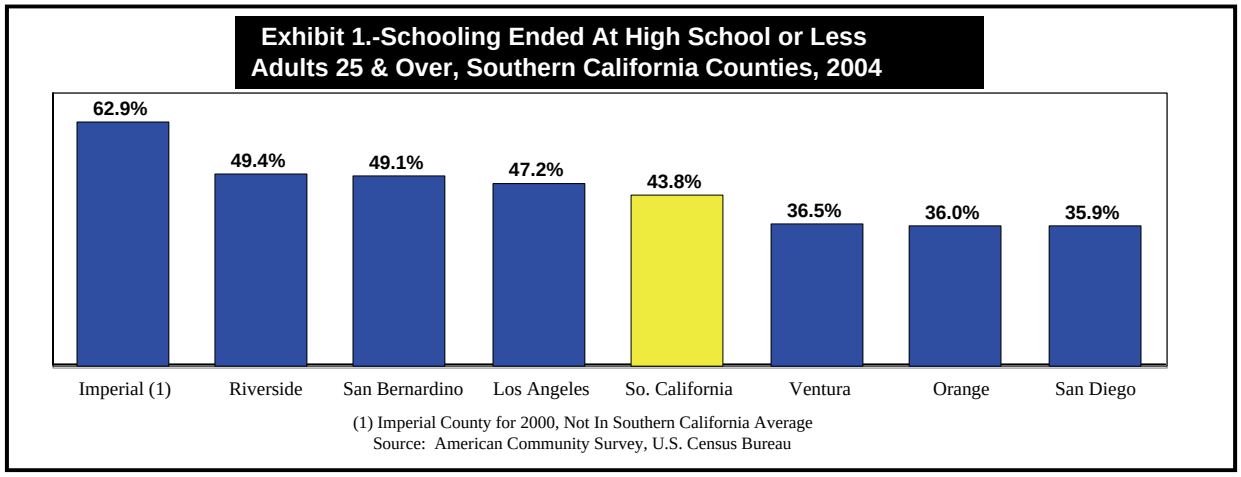
Finally, the report looks at how changes in future logistics activity will impact Southern California's economy. Here, the focus is on the "multipliers" or extent to which increases in logistics activity, caused by money entering the region from elsewhere, will impact the full economy. It found that each new logistics job supports a total of 2.19 new jobs in the economy. A $1.00 increase in logistics activity sets off a total of 1.97 times that amount in the local economy. Similar ratios were determined for the impact of additional jobs or activity in each of the major sub-sectors of logistics.[7] The relevant table is shown below:

Exhibit 41.-Logistics Sub-Sectors Output and Employment Multipliers

Logistics Sector	Direct Impact & Jobs Impact	Indirect Impact	Induced Impact	Total Impact & Jobs Impact	Total Multiplier Jobs Multiplier
Wholesale Trade Only	$1,000,000,000	$239,235,367	$712,566,964	$1,951,802,331	1.95
	7,166	2,009	7,211	16,386	2.29
Air Transportation	$1,000,000,000	$509,515,482	$540,084,339	$2,049,599,821	2.05
	4,541	3,765	5,241	13,547	2.98
Rail Transportation	$1,000,000,000	$307,172,558	$510,291,441	$1,817,463,999	1.82
	3,943	2,283	4,885	11,111	2.82
Water Transportation	$1,000,000,000	$380,790,248	$472,802,455	$1,853,592,703	1.85
	2,147	5,417	4,601	12,165	5.67
Truck Transportation	$1,000,000,000	$520,062,441	$592,974,407	$2,113,036,848	2.11
	9,280	3,630	5,659	18,569	2.00
Couriers	$1,000,000,000	$293,998,557	$591,121,230	$1,885,119,787	1.89
	15,122	1,988	5,621	22,731	1.50
Warehousing & Storage	$1,000,000,000	$244,287,506	$597,373,127	$1,841,660,633	1.84
	11,204	1,763	5,652	18,619	1.66

Source: IMPLAN Model Used with $1,000,000,000 assumption for each logistics sub-sector
Note: Throughout this report, the sources shown are those providing the data for the analysis. The calculations based upon these sources, such as rates of growth, percentage distributions, weighted averages, summations, means and medians are the responsibility of the author.

Southern California faces an economic challenge. In January 2006, the seven county regions (Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura) had 21.3 million people. If it were a separate state, only Texas (23.0 million) would have more people. In an era when income and education are increasingly correlated, the U.S. Census Bureau's 2004 American Community Survey found that 43.8% of the region's adults aged 25 and over had stopped their formal educations without a single college class as shown in Exhibit 1. The range was from 36% in Ventura, Orange, and San Diego counties to 47%-49% in Los Angeles, San Bernardino, and Riverside counties. It was 62.9% in Imperial County in 2000.[8]



1.1 Falling Per Capita Income Rank

These data may help explain a difficulty that has emerged in the region's per capita income ranking. From 1987-2003, the Southern California Association of Governments (SCAG) found that its area has fallen from a rank of fourth in per capita income to 17th and lowest among the seventeen multi-county regions in the U.S.[9] This means that its per capita income growth has not matched that of the other major American regions.

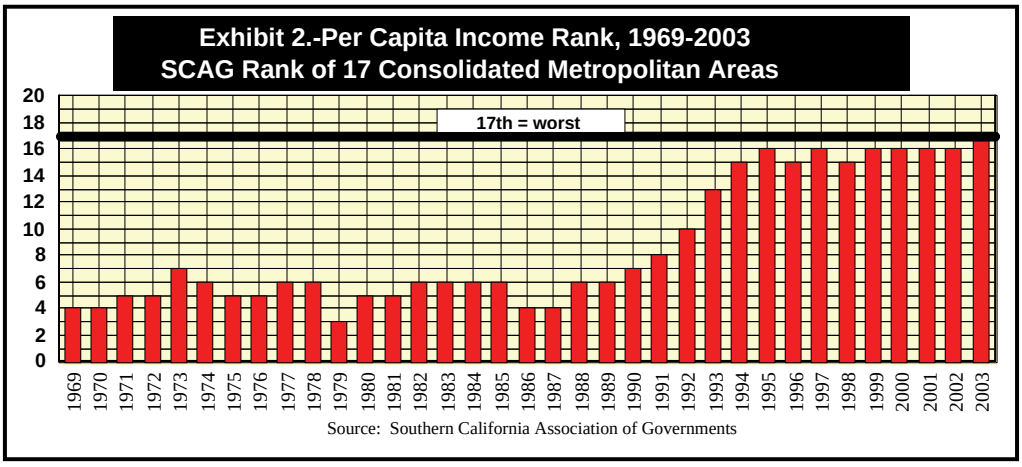
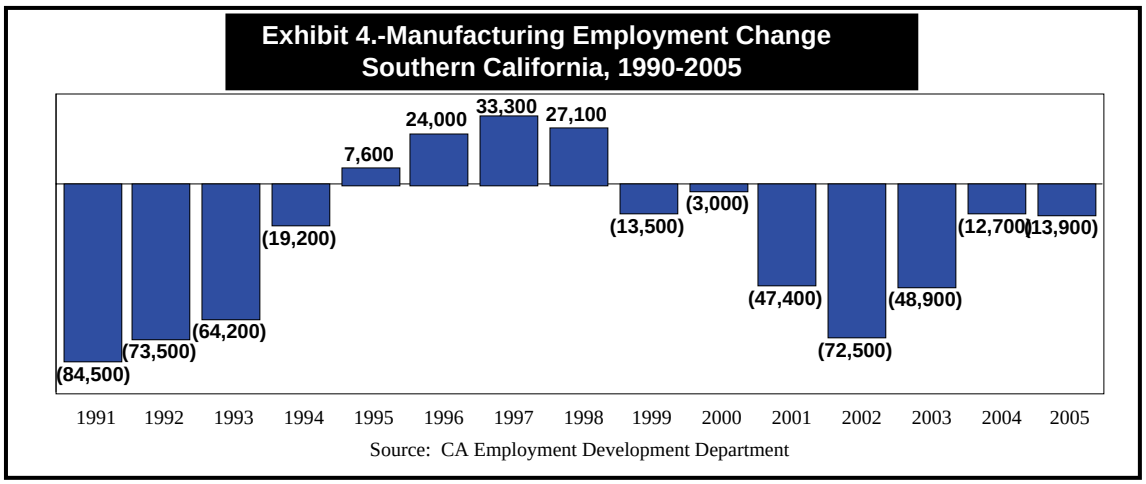


Exhibit 3 shows that this deterioration began during the severe economic dislocations that accompanied Southern California's post-Cold War recession from 1990-1993. The region lost 488,700 jobs in this period. Much of this reduction occurred in its high paying aerospace/defense manufacturing base. More difficult is the fact that from the low point in 1993 until 2005, the area has added 1,571,800 jobs (*comparing 12-month averages for each year*), a gain of 23.0%. Yet, in this period, the SCAG area fell from 13th to 17th lowest among the 17-multi-county regions in per capita income. Thus, while the region recovered from its job losses, the quality of the new positions was not as great as those being created in other parts of the U.S.



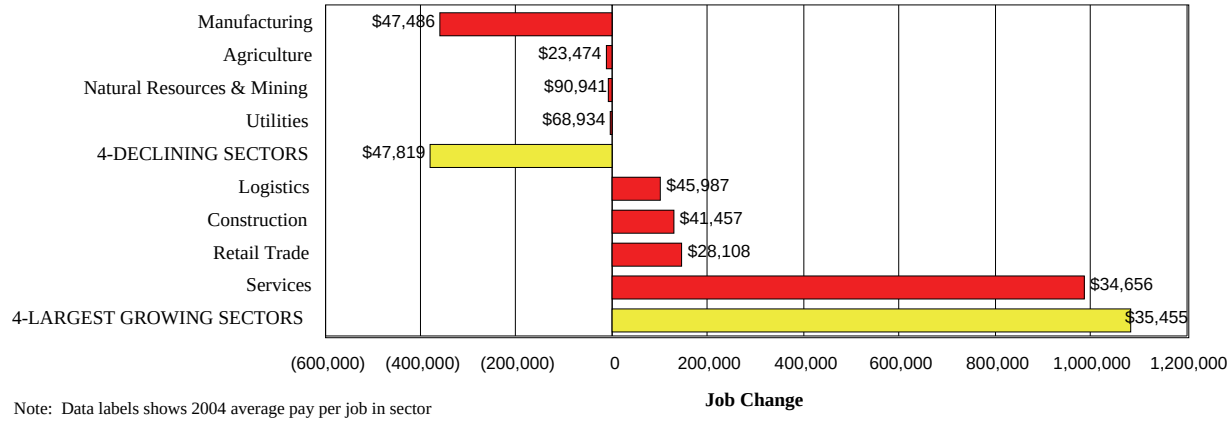
1.2 Manufacturing Sector Difficulties

Difficulties in the manufacturing also help explain what happened over the longer period. From 1990-2005, the sector fell from 1,279,600 to 918,300 jobs, a loss of 361,300 positions or -28.2% as shown in Exhibit 4. In the early 1990's, aerospace/defense jobs were lost. In the late 1990's, there was a high technology recovery that stopped when the tech bubble burst. Since then, the manufacturing decline has occurred because production has increasingly moved to Asia. That has occurred as the Chinese economy has begun a rapid transition from a state-controlled to a competitive model and the Indian economy has been less controlled by its bureaucracy. With their lower wage rates, both have therefore been able to compete and win billions of dollars in U.S. and European manufacturing contracts (see pages 5-5 & 5-6, with Exhibit 33, on Asian import growth). Certainly, this has been major factors in the 211,900 production jobs lost in Southern California during the 1999-2005. Altogether, for the full 1990-2005 period, the loss of manufacturing jobs represented 94.8% of the job decline in Southern California's four shrinking sectors.[10]

1.3 Loss of Better-Paying, Gain In Weaker Paying Jobs

With average manufacturing pay at $47,486 per job in 2004, the sector has been largely responsible for Southern California's declining sectors, removing 381,000 jobs with an average pay of $47,819. Data labels in Exhibit 5 show average pay per job, and bar length indicates job change. Meanwhile, from 1990-2005, the four sectors adding the most new jobs to Southern California's economy grew by 1,083,000 positions. However, in 2004, their average pay was only $35,455. There has thus been a $12,000 difference between the pay in shrinking sectors versus that in the four fastest-growing sectors due to the extent to which lower paying retail trade (*$28,108*) and the full range of service sectors (*$35,455*) played the major roles in the region's job growth. This is likely a major contributing factor for Southern California's falling per capita income ranking.

Exhibit 5.-Major Gaining & Losing Sectors, Southern California
Size of Job Change, 1990-2005 & 2004 Average Pay



Note: Data labels shows 2004 average pay per job in sector
Source: CA Employment Development Department

1.4 Manufacturing and Upward Economic Mobility

When the shrinkage of the manufacturing sector is combined with the fact that 43.8% of Southern California's adults have stopped their formal schooling with high school or less, the economic challenge facing the region starts to come into focus. Historically, manufacturing has provided one of the principal means of upward income mobility for people who have chosen to depend upon workplace experience for their economic success. The sector did this by providing employees with:

- Southern California-based employment
- Blue collar work
- Reasonably good entry-level pay
- Defined skill ladders up which they could move to "middle class" incomes
- The ability to move up those ladders via on-the-job learning
- An environment where new technology added to their productivity and pay

With the manufacturing sector shrinking, that 43.8% of the population faces a challenge in relying upon their physical abilities plus work place experience to provide rising incomes to their families.

Definition of "Middle Class" & Dilemma of Income Inequality

One standard used to measure if a sector is helpful to those who stopped their formal educations at high school or less is the degree to which it provides career paths to the "middle class." The Census Bureau's 2004 American Community Survey found that the median household income of Southern California's seven counties was $49,435. Defining "middle class" as the quartile of households containing 12.5% of households earning on either side of $49,435 put the lower bound at $37,163, with 12.5% of the region's families earning between that amount and $49,435. The upper bound was $66,099 with 12.5% of the area's families earning between that amount and $49,435 figure. If a sector provides career paths bringing single worker families into this range, it is providing workers a route into the middle class. The need to move more families into the middle class is seen in that the bottom 50% of Southern California's households ($49,435 & below) made 18.6% of the area's 2004 income. The top 3.5%, making $200,000 and up, received almost as much: 17.6% of total income.

Note: At SCAG's 2007 Economic Conference entitled "The Middle Class on Life Support ... Strategies for Revitalizing Southern California's Economy, Dr. Anil Puri, Dean of the School of Business & Economics at California State University Fullerton delivered a review of definitions of the Middle Class and concluded that $40,000 to $60,000 would be the "middle middle class".

1.5 Logistics

Of the four sectors that have added the most new jobs to the Southern California economy from 1990-2004, logistics offered the highest average pay. This group (Section 2.1 below for detailed description) added 103,400 jobs in this period. The average 2004 pay for the sector's wage and salary was $45,987, or within 3% of manufacturing (Exhibit 5). The following sections discuss in greater depth logistics sector's ability to provide a vehicle for workers to overcome the difficulties brought on by the slowing of manufacturing. Its growth path has cycled with the economy (Exhibit 6). It slowed in the early 1990's due to

the recession/depression in Southern California that accompanied the end of the Cold War. It soared with the local economic recovery and the growth of international trade. There was a pause in the 2002-2003 largely due to the impact on air transportation of the September 11 attacks. It has subsequently moved back on a growth path.

1.6 Goods Movement Framework

To further the discussion of the logistics sector, it is helpful to broadly understand how goods move through the U.S. economy and the important role played by Southern California.

Major Trade Nodes

The starting or entry points for supply chains are often outside of the country. By sea, containerized cargo mostly connects to the region through the ports of Los Angeles and Long Beach. Breakbulk cargo goes through those harbors as well as the Port of San Diego and Port Hueneme (Ventura County). International truck traffic connects to the region through San Diego and Imperial counties. The bulk of domestic and international air freight flows through LAX. Ontario International Airport (ONT) was a distant second. In 2004, the Port of Los Angeles (2nd), the Port of Long Beach (3rd), and LAX (7th) ranked in the top ten and accounted for 13.6% of the value of U.S. total trade and 16.5% of imported trade as shown in Exhibit 7.

Exhibit 7.-Top Ten U.S. Gateways By Total Trade, 2004 (billions)

2004 Rank	2003 Rank	Gateway name	Imports	Exports	Total Trade
1	2	John F. Kennedy International Airport, NY	$72.6	$52.7	$125.3
2	1	Port of Los Angeles, CA (water)	105.1	16.4	121.4
3	5	Port of Long Beach, CA (water)	102.8	18.6	121.3
4	3	Detroit, MI (land)	55.6	58.2	113.8
5	4	New York and New Jersey, NY/NJ (water)	90.4	23.1	113.5
6	6	Laredo, TX (land)	51.1	38.4	89.5
7	7	Los Angeles International Airport, CA (air)	34.8	33.9	68.7

Exhibit 7.-Top Ten U.S. Gateways By Total Trade, 2004 (billions)

8	9	Buffalo-Niagara Falls, NY (land)	36.6	31.7	68.3
9	11	Houston, TX (water)	37.2	29.2	66.4
10	8	Port Huron, MI (land)	42.3	23.6	65.9
		TOTAL, ALL GATEWAYS	$1,469.70	$816.5	$2,286.20
		Southern California Share	16.5%	8.4%	13.6%

Source: U.S. Bureau of Transportation Statistics

Ports

As indicated, four ports handle the movement of goods into and out of Southern California. There are essentially two ways to classify the movement of goods through these ports. One is to look at the containerized volume moving through the ports. This is measured in 20-foot equivalent units (TEUs). The other is to look at the volume of breakbulk cargo (non-containerized). It is measured in short tons (2,000 pounds).

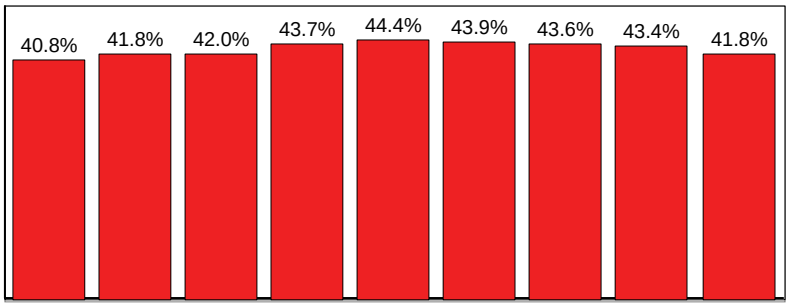
Exhibit 7A.-Port Volumes, Southern California, West Coast, U.S., 2005

	Loaded Containers (*TEUs*)			Breakbulk (*Short Tons*)				
	Imports	Export	Total	General	Lumber/Logs	Autos	Bulk	Total
Los Angeles	3,821,325	1,042,707	4,864,032	3,259,530	13,647	2,186,948	4,565,374	10,025,499
Long Beach	3,354,711	1,023,735	4,378,446	1,249,609	232,658	4,446,609	8,350,281	14,279,157
San Diego	46,010	2,796	48,807	314,593	114,572	2,569,112	1,402,122	4,400,399
Port Hueneme	13,471	3,384	16,855	875,837	0	3,201,174	142,967	4,219,978
So. California	7,235,517	2,072,623	9,308,139	5,699,569	360,877	12,403,843	14,460,744	32,925,033
West Coast (1)	10,584,884	4,241,264	14,826,148	9,519,101	1,731,207	21,674,858	62,475,184	95,400,350
So. Calif. Share	68.4%	48.9%	62.8%	59.9%	20.8%	57.2%	23.1%	34.5%
U.S.	17,290,350	8,577,808	25,868,158					
So. Calif. Share	41.8%	24.2%	36.0%					

Source: Containers from Port Import Export Reporting Service (*PIERS*), collected from vessel manifests and bills of lading. Breakbulk from Pacific Maritime Association as required by the ILWU contract.
Note (1): West Coast container volume includes Vancouver BC. Breakbulk volume does not.

Container volumes show that Southern California's ports handled 9.3 million (62.8%) of the 14.8 million loaded containers moving in and out of West Coast ports in 2005. They also accounted for 36.0% of the U.S. volume of 25.9 million containers. For imports, the region handled 68.4% of West Coast loaded containers and 41.8% of U.S. volume. At the same time, Southern California's ports handled 34.5% (32.9 million tons) of the West Coast's breakbulk cargo volume (95.4 million tons). Interestingly, the Port of San Diego (4.4 million tons) and Port Hueneme (4.2 million tons) played important roles in the breakbulk cargo business but insignificant roles with containers as shown in Exhibit 7A.

Exhibit 8.-Share of Imported Loaded Containers Southern California of U.S., 1997-2005



Source: Port Import Export Reporting Service (PIERS)

An issue of interest is the recent difficulties that shippers have had moving containers through the ports of Los Angeles and Long Beach, causing them to divert traffic elsewhere. While volume at the two ports has continued growing, there was a decline in the share of imported containers handled in Southern California in 2004-2005 from 43.4% to 41.8% as shown in Exhibit 8. This could represent some trade diversion due in part to the Port of Los Angeles being dredged in 2005 to allow the 8,200 TEU ships to dock.

Airports

In 2005, Southern California's air cargo needs were essentially served by five airports. By far the largest were LAX (2.1 million tons), which handled 70.5% of the 3.0 million tons of air cargo, and ONT (575,000 tons), which handled 19.0%, as shown in Exhibit 9. ONT is largely in this position because it hosts the western regional hub for UPS.

Exhibit 9.-Air Cargo Volume, 2005 & 2030 forecast, Southern California Airports

Airport	2005	Share	2030	Share
LAX	2,138,188	70.5%	2,340,000	25.2%
Ontario	575,369	19.0%	2,252,000	24.3%
March JPA	NA	0.0%	1,117,000	12.0%
San Bernardino	NA	0.0%	1,092,000	11.8%
Palmdale	NA	0.0%	1,024,000	11.0%
San Diego	187,706	6.2%	554,600	6.0%
SCLA	NA	0.0%	504,000	5.4%
Long Beach	54,298	1.8%	137,000	1.5%
Palm Springs	100	0.0%	128,000	1.4%
Burbank	53,223	1.8%	87,000	0.9%
John Wayne	24,073	0.8%	43,000	0.5%
Southern California	3,032,957	100.0%	9,278,600	100.0%

Source: 2005 data from each airport. 2030 forecasts from Southern California Association of Governments and San Diego County Regional Airport Authority.

Looking forward, a very different picture emerges. Volume is expected to essentially triple from 3.0 million tons in 2005 to 9.3 million tons in 2030. While LAX will remain the volume leader (2.34 million tons), its share will fall to 25.2% of the regional volume. The airport is already at 91.4% of this forecast. Ontario (2.25 million tons) will stay number two, but its volume will nearly equal that of LAX. It is currently 25.5% of the way to this forecast. Los Angeles World Airways, an agency of the city of Los Angeles that owns both facilities, hopes to have LAX specialize in international cargo and divert other cargo to ONT. In that light, the agency has plans for a major cross-dock soon to be built at ONT.

Interestingly, several major inland airports that currently have little or no air cargo are anticipated by SCAG to handle major quantities of air cargo by 2030. These include joint-use March Air Reserve Base (1.11 million tons), which just became the western regional headquarters of DHL; San Bernardino International Airport (1.09 million tons), which currently has no service; Palmdale (1.2 million tons), which also has no current service; and Southern California Logistics Airport in Victorville, which has intermittent service (504,000 tons).

Railroads

[See Railroad Maps in Technical Memo 4a Freight Demand, Pgs. 1-6 & 1-7]

Southern California is served by two long-haul railroads: Burlington Northern Santa Fe (BNSF) Railway and Union Pacific (UP) Railroad. These two companies combined to move more intermodal cargo than any other rail system in the world. The area is also served by two short-haul lines:[11]

Alameda Corridor

Southern California's long-haul railroad system essentially starts with the Alameda Corridor, which connects the Ports of Los Angeles and Long Beach, moving parallel to the I-710 freeway, to the switching yards of BNSF and UP railroads near downtown Los Angeles. Since the completion of this public-private project in 2002, the line allows rail traffic to leave the ports with no at-grade street crossings along its full 21-mile length.

Burlington Northern Santa Fe Railway

BNSF was formed by the 1995 merger of the Atchison Topeka & Santa Fe Railway and the Burlington Northern Railroad. The company's main line runs from Los Angeles through Orange County to Santa Ana Canyon. From there, it moves through Western Riverside County to San Bernardino and traverses Cajon Pass on its way to Barstow. The line then connects east through Needles to the southwestern states.

Union Pacific Railroad

In its current configuration, UP Railroad is the result of the merger of the UP and Southern Pacific railroads in 1996. The company maintains four major rail corridors:

- The southwestern route that goes from Los Angeles via the San Gabriel Valley to Colton and through San Gorgonio Pass and the Coachella Valley to the southwestern states
- A coastal route that runs from Los Angeles through Ventura County and north through the coastal counties to the Bay Area
- A central valley line running from Los Angeles through Burbank to Palmdale; it then goes on to connect with UP's Central Valley line at Mojave, then proceeds north to Oregon
- A northern route that goes from Colton through Cajon Pass to Barstow and then on to Las Vegas and Salt Lake City, where it connects to mid-western and eastern states

Short Haul

There are also two short-haul lines serving Southern California that are owned by RailAmerica, a specialist in such operations:

- Ventura County Railroad connects Port Hueneme to UP Railroad's coastal route.
- San Diego and Imperial Valley Railroad connects San Diego to San Ysidro and Imperial County.

There are two additional operations:

- Pacific Harbor Line at the ports of Los Angeles and Long Beach
- Los Angeles Junction Railway near downtown Los Angeles

Intermodal Railyards

Whether goods enter Southern California through its four ports or are manufactured in the region, a significant share ultimately leaves the region in landside containers[12] via either BNSF or UP railroads. This is most often true of containers moving beyond 769 miles, the distance at which rail generally has a least-cost shipping advantage.[13] Containers are moved on to container-carrying rail cars in intermodal yards.

On-Dock Intermodal

To reduce transfer time and costs, the ports of Los Angeles and Long Beach have on-dock rail serving most of their container terminals. These facilities allow goods to be placed on railcars in marine containers or transferred from marine to rail containers (transloaded) and then transported along the Alameda Corridor and out of California. Approximately 21% of all containers moving through the Ports of Los Angeles and Long Beach were transferred to and from trains at on-dock rail yards in 2005.[14]

Near-Dock Intermodal

Rail traffic dealing with the ports is also expedited via near-dock rail such as the UP Intermodal Container Transfer Facility (ICTF) located approximately five miles from the ports of Los Angeles and Long Beach. There, containers are lifted on and off of trucks which connect the facility to the harbors. BNSF has been selected to build a second such facility nearby called the Southern California International Gateway. Facilities of this type are needed because existing rail yards are nearing capacity and a location nearer the docks has the potential to reduce truck generated emissions and congestion.

Off-Dock Intermodal

There are several off-dock rail yards near the Ports of Los Angeles and Long Beach. Containers are towed to these facilities by truck and transferred to trains in the yards. BNSF operates facilities in Vernon and Commerce. UP Railroad has yards in East Los Angeles, at the Los Angeles Transportation Center, and in the City of Industry. To serve the growing base of logistics firms in the Inland Empire, BNSF has a large inland facility in San Bernardino and is planning another one, likely in Victorville.

Trucking

Trucking firms are a key element in the logistics system because nearly all goods travel the last mile to their destination by truck, with trucking ton-miles growing faster than other modes.[15] In Southern California, over 75% of truck tonnage moves less than 50 miles, with the average length of haul for a truck at 144 miles. The companies providing trucking service can be classified in numerous ways. Among the important types are:

Full Load

Full load trucking firms like Schneider, JB Hunt, and Swift move full containers cross-country, locally within Southern California, and between originations and intermodal railyards.

LTL

Less-than-a-load trucking firms (LTL) like Yellow Freight Systems generally pick up or deliver products in smaller trucks. These companies operate with cross-docking facilities where products literally move across a dock between larger trucks hauling full containers and smaller trucks connecting to customers. LTLs generally operate inside Southern California and often haul full containers to intermodal rail yards for shipment cross country.

Couriers

A nuance of the LTL business is that undertaken by firms like UPS, FedEx, and DHL. These are fully integrated firms combining truck and air cargo carriers. They use smaller vehicles to deliver packages that have traveled cross-country or internationally via their dedicated fleets of aircraft, interstate trucks, or in containers shipped by rail.

3PL

Third party logistics (3PL) firms like BAX Global and CR England maintain fleets of long distance and LTL trucks that are used to move the merchandise of clients who have outsourced their logistics functions to them. These operations generally maintain warehousing facilities and often contract with rail lines for long distance shipping.

Corporate Fleets

Numerous companies like Stater Brothers Markets and Long Drugs continue to maintain their own local fleets of trucks for delivery of merchandise to their outlets throughout Southern California. Generally, these vehicles operate in conjunction with the company's local warehousing operation.

Independent Truckers

In Southern California, a crucial role in the supply chain is by entrepreneurial truck drivers. These individuals pick-up and deliver containers at the ports and connect them to the region's intermodal yards, warehouses, or cross-docks. Due to difficulties such as turn-around time at the ports, national trucking companies do not provide this link in Southern California's supply chain.

Private Carriage

Another group that carriers a good deal of freight are private carriage operations. These are firms whose primary business is not logistics but maintain trucks as part of their operations and contract with other firms

as part of their business plans. For instance, if a Stater Brothers's truck takes a load from its central warehouse in Colton to their store in Downey, they could contract to pick up a load from a third party in the Downey area and deliver it to an unrelated firm on the way back to Colton. Drivers working in this sector are not included in the truck transportation data as their employers are in other sectors. This lowers the size of the logistics sector and leaves out the wages and salaries of the drivers and the entrepreneurial earnings of private carriage owner-operators.

PierPASS OffPeak Program

With the rising volume of containers moving from the Ports of Los Angeles and Long Beach to various Southern California destinations, a key trucking innovation has been the OffPeak Program. Containers moving during peak traffic hours Monday through Friday (3:00 a.m.-6:00 p.m.) are assessed a fee, while those moving during off-peak hours are not. The result has been to move 30-35% of truck trips from the harbors to off-peak hours, surpassing the goal of 15-20% announced when the program began in July 2005.[16]

Operation of the Logistics Network

When a container ship arrives, longshore workers unload imports and reload the ship with exports and empties. Using cranes capable of reaching across cargo ships 22-containers wide, crane operators lift the boxes onto trailers that will be pulled by yard tractors for dray to the port gate or an on-dock rail line. Most ships typically carry 6,000 TEUs, with the largest now at 8,200. The keels have been laid for 10,000 TEU ships.

Transportation Options

Before an ocean carrier arrives at port, supply chain managers and third party logistics firms have determined the combination of transportation modes for the next segments in the supply chain, given the need to move goods rapidly and reliably. As discussed, their secondary choices include trucks, rail, and air, often via intermodal connections. The complexity of the process exists because each mode can involve a network of logistic firms, freight forwarders, truckers, distribution centers, and other trade workers. Moreover, modes and companies within the support network are under the ownership of different operators, including multiple levels of government. A problem in a single mode, whether caused by infrastructure constraints, labor shortages, or mode management, can slow the entire system.

Transportation Mode Selection

Faced with multiple options and destinations, supply chain managers must consider factors such as product characteristics (weight, bulk vs. packaged, fragility, need for refrigeration, liquid vs. dry) plus time in transit and the amount of safety stock (current inventory) at the destination. Although mode decisions are usually made on a least-cost basis, other factors can prevail such as inventory shortages or end-of-the-month sales that might prompt use of an air carrier instead of rail. The dollar value of goods also plays a role, with lightweight high-value goods more likely to travel by air and bulky lower-cost items by rail or truck.

Transloading

Although the rail lines and trucks can accommodate marine containers, usually 40 feet (2 TEUs), goods may first be transloaded into larger containers for cost savings. This may take place on-dock, at the intermodal railyard, or at a redistribution center or warehouse.

Warehousing and Redistribution

Warehousing and redistribution sites may be located as far as 60 miles inland from the ports. Though the objective may be to send goods out of Southern California, they must first be trucked to these facilities. Once inside, the containers are deconsolidated for short term storage or transloading into domestic trailers or containers. In some cases, the nature of the goods is changed (e.g., a label is added). On occasion, international and domestic goods may be mixed for routing to a final destination. When goods leave these facilities, they may go to their ultimate destination by truck, rail, or air, depending on supply chain factors.

Volumes

A frequently asked question is the degree to which imported goods arriving at the Ports of Los Angeles and Long Beach take various routes on their way to Southern California or national destinations. A 2002 study for the Alameda Corridor Transportation Authority partially addressed this question.[17] The answers are shown in Exhibit 10.

Exhibit 10.-How Imports Move, Southern California, 2002

Imports	TEUs	Share
To Rail to Eastern Destinations	2,343,000	41.7%
To Consolidator to Rail to Eastern Destinations	1,251,000	22.3%
Total Rail to Eastern Destinations	3,594,000	63.9%
To Consolidator to Local or Interstate Trucks	1,931,000	34.3%
To Truck to Local or Interstate Destination	97,000	1.7%
Total Imported TEU	5,622,000	100.0%

Source: BST Associates under contract to Alameda Corridor Transportation Authority

- 2,343,000 TEUs (41.7%) went directly to trains for eastern destinations. These containers created very little work in Southern California.
- 97,000 TEUs (1.7%) went directly to trucks for interstate delivery. They also created very little Southern California employment.

A SCAG commissioned study of port traffic elasticity found that the higher the container fees charged at the ports, the more these forms of trade would be diverted to other locations. The major loss would be the $250-$300 paid to the Pacific Maritime Association and through it to port workers and purveyors. Ultimately, the diversion would free capacity for more of the trade that creates jobs in Southern California. If the fees were invested into transportation infrastructure that increased the speed and reliability of trade

flows through the region, the result would be to increase the amount of trade that does create jobs. The ideal fees and investment would total $180-$200 per container.[18]

Note: Currently, it is trade that leaves the ports by truck to undergo greater processing in Southern California that creates the greatest employment impacts.

- 1,251,000 TEUs (22.3%) went through some form of transloading process before going on to trains for eastern destination. The movement of these containers by trucks and their handling at transloading, warehousing (including possible storage), and intermodal railyards created jobs in Southern California.
- 1,931,000 TEUs (34.3%) went through some form of transloading process before going on to either local or interstate trucks. The movement of these containers to transloading, warehousing, and intermodal railyards created local jobs. So also did the management of them in local warehouses, as did the process of moving them to customers either locally or cross country.
- Of the 3,182,00 TEUs that were processed in the region: 1,942,000 TEUs (61.0%) went to the local facilities of national retailers; 853,000 TEUs (26.8%) were handled by 3PLs; and 387,000 TEUs (12.2%) went to smaller warehousing operations.

One question that arises is the relationship of average pay per worker in the logistics group of sectors versus other sectors with limited educational barriers for workers to obtain employment.

2.1 Logistics

While the logistics group is often referred to as a "sector," it is in fact composed of separate goods movement sectors that, until recently, were not considered closely bound together. The components of the group are thus spread across the recently adopted Northern American Industry Classification System (NAICS). The need to think of them as a "sector" has come about for two reasons. First, rapid changes in supply chain management procedures, technologies, and economics have tightly bound each segment of the logistics process together. Second, the acceleration in Asian imports has increased the importance of the economic and environmental impact of this group of activities. The activities encompassed include firms involved in ordering, receiving, processing, storing, moving, and tracking the flow of goods across multiple modes of transportation.

Logistics Sectors

Ranked by employment as shown in Exhibit 11, the sectors involved, including their payroll and average pay per worker, in the seven counties Southern California area (Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura) are as follows:

NAICS 42 Wholesale Trade

These establishments engage in buying, selling, storing, transporting, and tracking goods that ultimately are used by other firms or divisions. They may be a subsidiary of a retail or production company (e.g, Walmart or Toyota Motor Parts). They may be a dedicated 3PL firm that contracts to handle the movement and storage of merchandise for a single company. They may be involved with the products of multiple companies. In Southern California, many of these operations are involved in international trade. They normally handle durable (NAICS 421) or non-durable (NAICS 422) goods from warehouses. However, merchant wholesalers (NAICS 423 & 424) generally operate from offices and do not actually manage the storage of goods.

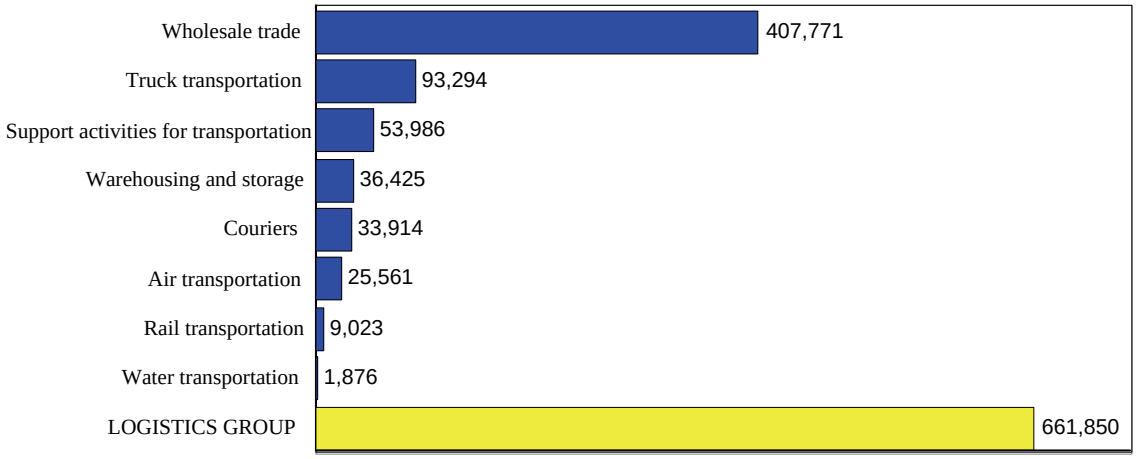
According to the California Employment Development Department (EDD), there were 407,771 workers in the 16 sub-sectors of NAICS 42 in second quarter 2005.[19] The quarterly payroll was $5,168,836,264 or an average of $50,703 per worker per year. The sector represented 61.6% of employment in the logistics group and 65.9% of its payroll.

NAICS 484 Truck Transportation

These firms move goods within a region or across the country. They include companies that move full container loads of merchandise (e.g., JB Hunt and Schneider). Others collect partial container loads (LTL) in an area and move them to cross-docks where they are transferred to full containers bound for a single

location (e.g., Yellow Freight Systems). These containers then either move cross-country by truck or go to intermodal yards so they can move cross-country by rail. At their destination, the process is reversed.

Exhibit 11.-Employment By Logistics Sector Southern California (7-Counties), 2005



Sources: CA Employment Development Department, U.S. Railroad Retirement Board, U.S. Bureau of Economic Analysis
U.S. Bureau of Economic Analysis, 2002 Economic Census, U.S. Census Bureau

According to EDD, there were 63,847 workers in NAICS 484 in second quarter 2005 (exhibit includes self-employed drivers, see below). The quarterly payroll was $618,143,893 or an average of $38,827 per worker per year. The sector represented 9.6% of jobs in the logistics group and 7.9% of its payroll.

A difficulty with this sector is the large share of drivers moving containers to and from the ports who are not wage and salary employees. A study of port drivers concluded that: "Their pay, while comparable to national figures on workers with a high school diploma at $29,903 [2003], involves working 33% more hours than a typical full-time worker. It is also notable that these drivers are paid substantially lower than the national average for owner operators and employees."[20] (Parenthetical date added.)

The Census Bureau's Non-Employer Statistics for 2003 in the seven Southern California counties identified 29,447 self-employed trucking operations. These data are by sector by county for businesses that have no paid employees and are subject to federal income tax updated each year. "Data are primarily comprised of sole proprietorship businesses filing IRS Form 1040, Schedule C, although some of the data is derived from filers of partnership and corporation tax returns that report no paid employees."[21] Assuming this group averaged the $29,903 earned by port drivers in 2003, and that their incomes grew at just 50% of the 7.96% rate of inflation in the Los Angeles, Anaheim, Riverside Standard Metropolitan Area from 2003-2005 (3.98%), their average 2005 income was $31,093. That yields estimated 2005 annual earnings of $915,583,466 or an average of $228,895,867 per quarter. No change in the number of these entrepreneurs is assumed from 2002-2005 due to lack of data.

Combined, the wage and salary truckers plus independent truckers in NAICS 484 would total 93,294 workers in 2005 as shown in Exhibit 11. Their combined quarterly payroll would be $847,039,760. Their average income would be $36,317 per worker per year. The sector represented 14.1% of employment in the logistics group and 10.8% of its payroll.

Note: these data are an underestimate of employment in trucking as they do not include drivers working for private carriage operations that are actually in other NAICS codes, as well owner-operators of this type. The data also do not include the influence of the income of these workers. This has the effect of underestimating the size of the logistics sector.

To look further at this issue, data for the seven counties for pay levels and 2004 employment levels data for OES 533032 Truck Drivers, Heavy and Tractor Trailer and OES 533033 Truck Drivers, Light or Delivery Services were reviewed. It was found that there were 130,850 truck drivers across all sectors in 2004. The median pay for Truck Drivers, Heavy and Tractor Trailer was $36,919. It was $23,711 for Truck Drivers, Light or Delivery. The combined median pay was $30,444. The employment figure was larger than the 93,294 for the trucking sector alone, which includes all workers in the sector, not just drivers. The pay level of $36,919 for heavy truck drivers was similar to the average for all workers in the trucking sector. The combined rate including light or delivery trucks of $30,444 was closer to the level found here for entrepreneurial drivers.

NAICS 488 Support Services for Transportation

This eclectic group includes operations involved in such ancillary transportation functions as freight forwarding (management of shipments across several modes of transportation), the loading and unloading of ships and rail cars at ports and intermodal rail yards, motor vehicle towing, air traffic controllers, and firms that provide packaging and labeling services. According to EDD, there were 53,986 workers in NAICS 488 in second quarter 2005. The quarterly payroll was $661,477,456 or an average of $49,011 per worker per year. The sector represented 8.2% of employment in the logistics group and 8.4% of its payroll.

NAICS 493 General Warehousing and Storage

These are third party warehousing and storage operations that strictly hold general merchandise (e.g., U.S. Logistics Corp.), refrigerated products (e.g., Amerigold Logistics) or farm products (e.g., Osram Sylvania Inc.). This may also be the way that the warehousing branch of a major retailer self-classifies its operation. According to EDD, there were 36,425 workers in NAICS 493 in second quarter 2005. The quarterly payroll was $362,442,805 or an average of $39,802 per worker per year. The sector represented 5.5% of employment in the logistics group and 4.6% of its payroll.

NAICS 492110 Non-Local Couriers

These companies generally move packages between metropolitan areas and around the world (e.g., UPS, Federal Express, and DHL). They generally pick up packages in smaller vehicles and take them to a facility where they move “across a dock” into fully loaded containers that ultimately reach their destination by air, truck, or rail. These firms may be integrated with an air cargo arm. According to EDD, there were 33,914

workers in NAICS 492110 in second quarter 2005. The quarterly payroll was $314,856,104 or an average of $37,136 per worker per year. The sector represented 5.1% of jobs in the logistics group and 4.0% of its payroll.

NAICS 481 Air Transportation

These operations include passenger airlines (e.g., Southwest Airlines), cargo airlines (e.g., DHL Airways), and companies integrating both activities (e.g., Korean Air). LAX has cross-docks that allow air cargo shipments to be assembled into air cargo containers headed for specific destinations. A similar facility is planned for ONT. According to EDD, there were 25,561 workers in NAICS 481 second quarter 2005. The quarterly payroll was $308,389,778, an average of $48,259 per worker per year. The sector represented 3.9% of employment in the logistics group and 3.9% of its payroll.

Note: At *3.9%*, Air Transportation is a small part of the logistics group. At that, its logistics jobs and payroll are overestimated as many jobs deal primarily with passenger service, not air cargo traffic. The difficulty in separating them occurs as belly cargo of passenger aircraft is a major part of the air logistics system. The result of not being able to solely focus on air cargo is to give greater weight to the declines in payroll and employment in this portion of logistics group since it is the air passenger activity that has faltered as the airline industry has consolidated.

NAICS 482 Rail Transportation

As discussed, Southern California has two long distance rail lines: Burlington Northern Santa Fe Railway (BNSF) and Union Pacific Railroad (UP). There are two short-haul lines owned by RailAmerica: Ventura County Railroad (Port Hueneme to UP) and San Diego and Imperial Valley Railroad. The two long-haul railroads operate intermodal yards to which trucking firms either bring or pick-up containers that are moving in and out of the Southland by rail. Most of the work handling containers in intermodal yards is outsourced to firms operating within the yards (e.g., Eagle Intermodal Services).

Railroad employment at the county level is not available through EDD. According to the U.S. Railroad Retirement Board, there were 9,023 railroad workers in the seven Southern California counties in 2004.[22] The average national pay in 2004 was $69,637 according to the U.S. Bureau of Economic Analysis.[23] Given the unionized condition of this labor force, that is likely a good proxy for Southern California pay scales. If it grew at the 3.2% gain in the U.S. Consumer Price Index from 2004-2005, the rate for 2005 would be $71,871. The 2005 annual payroll would thus be $648,491,675 or an average of $162,122,919 per quarter. The sector represented 1.4% of employment in the logistics group and 2.1% of its payroll.

NAICS 483 Water Transportation

These are the shipping lines that operate out of the Ports of Los Angeles and Long Beach (e.g., American President Lines). They are primarily involved in the movement of containers between Southern California and the Far East. Some, however, move cargo up and down the California coast.

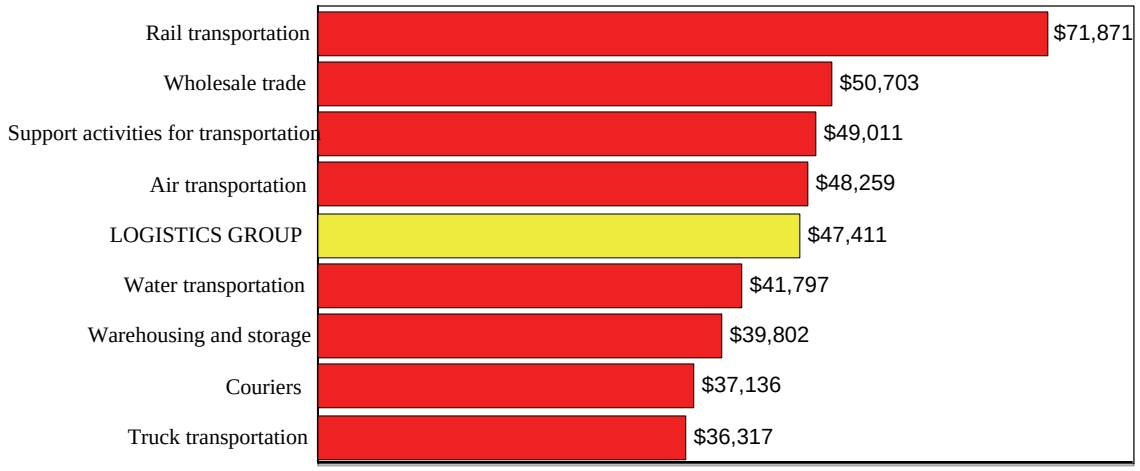
According to EDD, there were 1,876 workers in NAICS 483 second quarter 2005. The quarterly payroll was $19,602,709 or an average of $41,797 per worker per year. The sector represented 0.3% of employment in the logistics group and 0.2% of its payroll.

Altogether, Southern California's logistics group had 661,850 workers in second quarter 2005. Quarterly payroll was $7,844,767,794 or an average of $47,411 per worker per year as shown in Exhibit 12.

Logistics: Mean Annual Pay

In the logistics group of sectors, the highest mean annual pay levels were in the small rail transportation sector ($71,871), large wholesale trade ($50,703), and support services sectors ($49,011). The lowest was among truck transportation, including independent drivers ($36,317), couriers ($37,136), and general warehousing and storage ($39,802). The weighted average for the group was $47,411 as shown in Exhibit 12.

Exhibit 12.-Mean Average Pay Per Worker By Logistics Sector Southern California (7-Counties), 2005

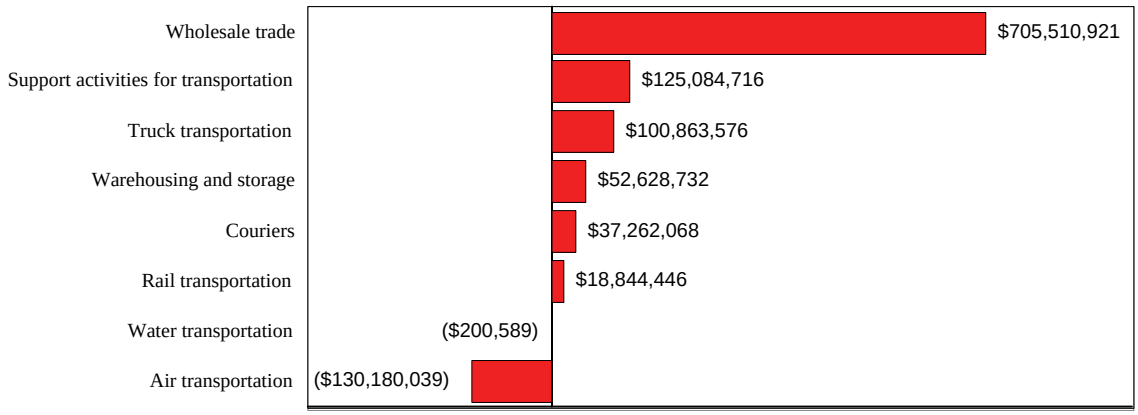


Sources: CA Employment Development Department, U.S. Railroad Retirement Board, U.S. Bureau of Economic Analysis
U.S. Bureau of Economic Analysis, 2002 Economic Census, U.S. Census Bureau

Logistics: Payroll Growth

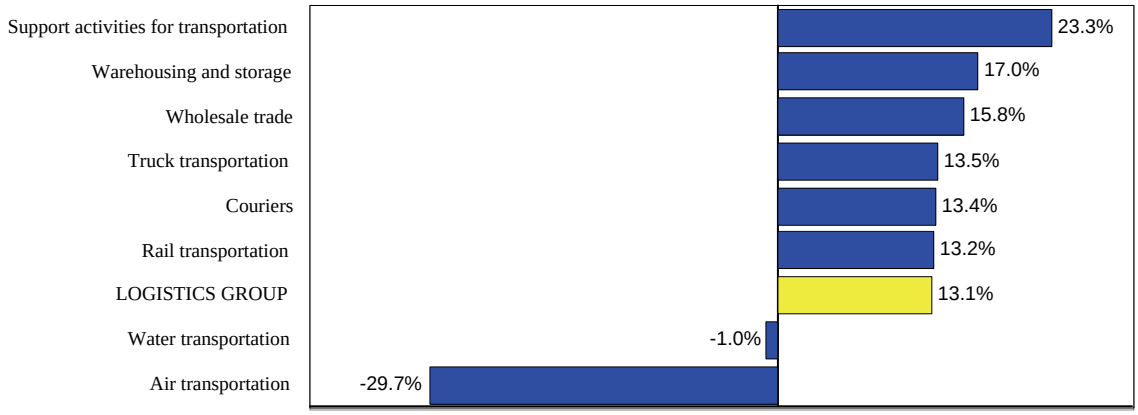
It is instructive to see where changes in payroll within the logistics group have occurred. If the same conventions used above with 2005 information were applied to 2001 data, the results show that the logistics group's total payroll grew from $6.9 billion to $7.8 billion, a gain of roughly $900 million or 13.1%. In that period, the largest gain was in the large wholesale trade sector, which expanded by $705.5 million. The worst performance was in air transportation, which declined $130.2 million due to consolidations in that sector as shown in Exhibit 13.

Exhibit 13.-Change in Payroll by Logistics Sector Southern California (7-Counties), 2001-2005



Sources: CA Employment Development Department, U.S. Railroad Retirement Board, U.S. Bureau of Economic Analysis
U.S. Bureau of Economic Analysis, 2002 Economic Census, U.S. Census Bureau

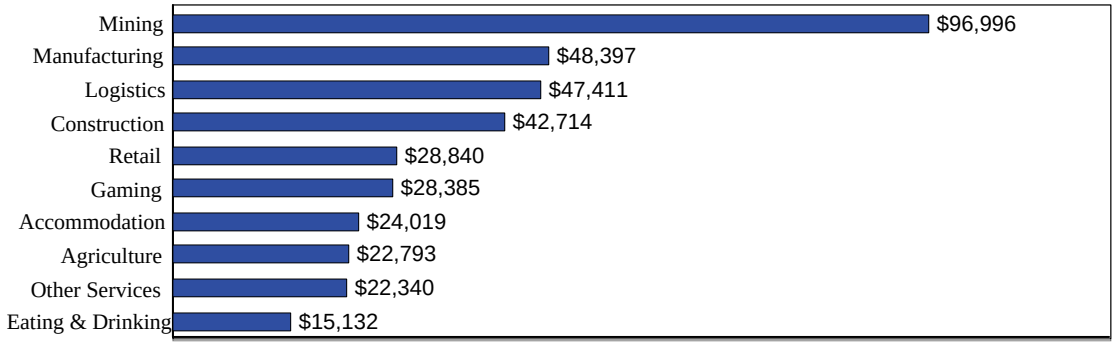
Exhibit 14.-Percent Gain in Payroll by Logistics Sector Southern California (7-Counties), 2001-2005



Sources: CA Employment Development Department, U.S. Railroad Retirement Board, U.S. Bureau of Economic Analysis
U.S. Bureau of Economic Analysis, 2002 Economic Census, U.S. Census Bureau

In calculating payroll growth rates, the decline in air transportation translates into a -29.7% rate, clearly one that inhibited the growth of payroll and average pay scales in the logistics group as shown in Exhibit 14. Meanwhile, the fastest increase was seen in "support activities," up 23.3%. These are the workers performing functions such as running supply chain management systems, undertaking clerical functions in support of the goods movement system, repairing trucks along freeways, lifting containers in intermodal yards, and loading and unloading ships. That sector was followed by the gain in the general warehousing and storage payroll, up 17.0%, and the very large wholesale trade sector, up 15.8%.

Exhibit 15.-Mean Average Pay Per Job Sectors With Few Barriers To Entry Southern California (7-Counties), 2005

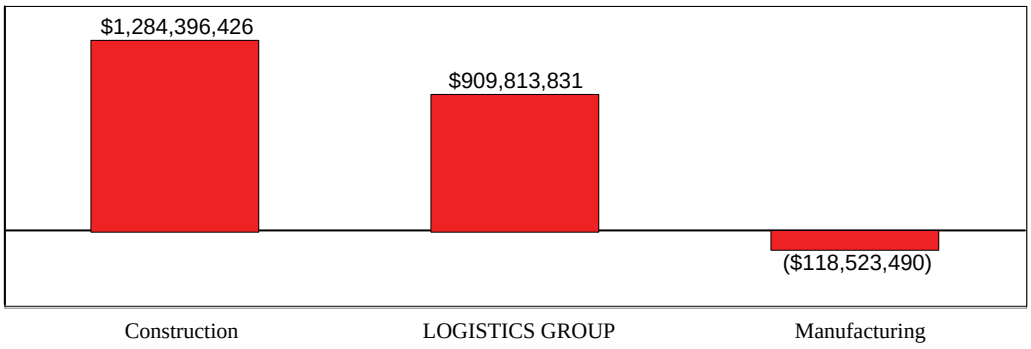


Sources: CA Employ. Develop. Dpt., U.S. RR Retirement Bd, U.S. Bureau of Econ. Analysis
U.S. Bureau of Econ. Analysis, 2002 Econ. Census, U.S. Census Bureau

2.2 Manufacturing

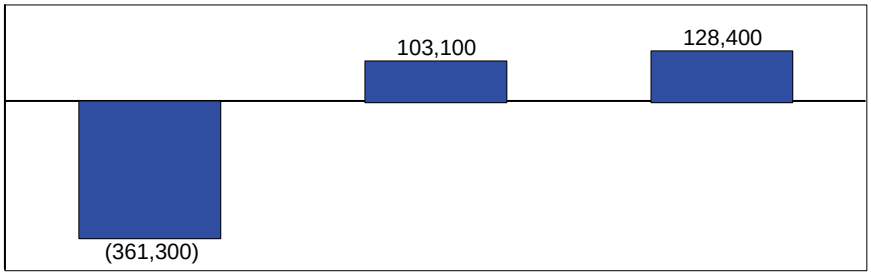
In second quarter 2005, Southern California's seven counties had 917,835 workers employed in the manufacturing sector. The combined quarterly payroll of these firms was $11,105,085,009. The average pay per worker per year was $48,397. At $47,411, the logistics group's average pay was $986 or 2.0% below manufacturing as shown in Exhibit 15.[24] Meanwhile, from 2001-2005, the total manufacturing payroll shrank by -$118,523,490 or -1.2%, while the logistics payroll increased $909,813,831 or 13.1%, as can be derived from Exhibit 16. This occurred in large part because of employment trends in the two sectors as shown in Exhibit 17.

Exhibit 16.-Change in Blue Collar Payrolls Southern California (7-Counties), 2001-2005



Sources: CA Employment Development Department, U.S. Railroad Retirement Board, U.S. Bureau of Economic Analysis
U.S. Bureau of Economic Analysis, 2002 Economic Census, U.S. Census Bureau

Exhibit 17.-Wage & Salary Job Growth, Blue Collar Sectors Southern California (7-Counties), 1990-2005



Source: CA Employment Development Department

Manufacturing Job Trend

Manufacturing wage and salary employment went from 1,279,600 jobs in 1990 down to 918,300 jobs in 2005, a decline of 361,300 positions or -28.2%. The sector has been impacted by the loss of aerospace and defense jobs in the early 1990s, the technology implosion of the late 1990s, and the migration of jobs to Asia and out of California in the 2000s (*see Exhibit 4 page 1-2 for annual job changes to show timing of sector's ebbs and flows*).

Logistics Job Trend

Logistics wage and salary employment went from 551,200 jobs in 1990 up to 654,300 jobs in 2005.[25] That has been a gain of 103,100 or 18.7%, as shown in Exhibit 17. Job growth in the sector has been positively impacted by the advent of just-in-time inventory control, the rise of e-commerce, and the increase in Asian trade. It has been negatively affected by increases in the productivity of facilities and the capacity issues affecting the flow of goods entering Southern California through Los Angeles and Long Beach harbors plus LAX and ONT airports. Job growth has also been inhibited by airline consolidation (*see Exhibit 6 page 1-5 for annual job changes to show timing of sector's ebbs and flows*).

2.3 Construction

In second quarter 2005, Southern California's seven counties had 482,081 wage and salary construction jobs. The combined quarterly payroll in the sector was $5,147,873,747. The average pay per worker per year was $42,714. At $47,411, average pay in the logistics group was $4,697 or 11.0% above the construction sector as shown in Exhibit 15. From 2001-2005, the total construction payroll increased by $1,284,396,426 or 33.2%. That was more than the $909,813,831 increase in the logistics payroll as shown in Exhibit 16. Construction has benefited from strong long-term job growth. From 1990-2005, the sector went from 352,250 to 480,650 jobs, up 128,400 (36.5%). That was faster than the logistics growth of 103,100 jobs (18.7%) as shown in Exhibit 17.

2.4 Other Sectors, Few Education Barriers to Entry

There are a variety of other sectors with limited barriers to workers obtaining jobs in them (Exhibit 15, page 2-6). Two are blue collar: mining ($96,996) pays well but had just 6,655 workers in 2005; agriculture pays modestly ($22,793) and is shrinking with urbanization. The others are service sectors that are growing with the population but pay well below the blue collar group, other than agriculture: retail trade ($28,840), gaming ($28,385), accommodation ($24,019), other services (automotive, household and electric repair and maintenance, personal care, laundry, member associations, household workers) ($22,340), eating and drinking ($15,132).

2.5 Summary

Comparing the logistics group to the manufacturing and construction sectors, as well as to pay in other expanding sectors with limited barriers to entry, results in the following:

Manufacturing and Logistics

Average pay per worker in the logistics sector was $47,411 in 2005, including entrepreneurial truck drivers. That was 2.0% below the manufacturing sector ($48,397). However, the manufacturing sector lost 361,300 jobs from 1990-2005, a decline of 28.2%. In that period, the logistics group added 103,100 jobs or 18.7%. More recently, from 2001-2005, manufacturing's total payroll declined $118,523,490 or -1.2%. During this time, the logistics payroll grew $909,813,821 or 13.1%. In the current decade, the national trend towards the off-shoring of production is hurting the manufacturing sector but aiding the logistics sector.

Construction and Logistics

Average pay per worker in the logistics sector was $47,411 in 2005, including entrepreneurial truck drivers. That was 11.0% above the construction sector ($42,714), though that sector's entrepreneurial, casual and immigrant workers were not studied. Both sectors have seen positive long term job trends. Construction added 128,400 jobs from 1990-2005, up 36.5%. As indicated, the logistics group added 103,100 jobs or 18.7% in that period. In the more recent 2001-2005 period, construction's total payroll grew $1,284,396,426 or 33.2%, while the logistics payroll grew $909,813,821 or 13.1%. Ultimately, the increases occurring in residential and retail construction will impact growth in logistics activity. The added population and consumer spending will increase the volume of goods moving within Southern California. E-commerce deliveries to the expanded base of households will also contribute to this.

Note: The fact that non-wage and salary workers were not included in the construction figures likely meant that this sector's pay was over-estimated as the casual, immigrant and self-employed workers in the sector are most probably paid below the levels of those making wages and salaries. As a result, the logistics groups pay advantage over construction is very likely more than that shown here.

Other Sectors with Few Barriers and Logistics

Except for the small mining sector (*$96,996*), the other sectors that have few barriers for workers to obtain jobs within them offer substantially less pay (*$15,132-$28,840*) than logistics (*$47,411*).

Two other issues with respect to the logistics group of sectors are the extent to which they offer entry-level pay that is well above the minimum wage ($6.75 per hour) as well as opportunities for workers to advance into better-paying positions within the group through on-the-job learning or community college/trade school courses.

3.1 Analytic Procedures

To establish these facts a 10-step process was used:

1. The fundamental data source was the Occupational Employment Statistics (OES) that result from surveys conducted by EDD under contract to Bureau of Labor Statistics (BLS).[26] The most recent data is for 3rd quarter 2005 pay levels. The OES data covers over 500 occupational codes within each of the standard metropolitan areas (SMA) that make up Southern California.[27]
2. For each OES code, in each Southern California area, data were provided on 2004 total employment as well as the 3rd quarter 2005 mean, median, entry-level (mean of the first 1/3 of the wage distribution), and experienced-level (mean of the top 2/3 of the wage distribution).
3. Southern California-wide pay levels were determined by finding the weighted averages of the mean, median, entry-level, and experienced-level pay scales for each occupational code. The weighting for each OES code was based upon the total 2004 employment provided by EDD for each OES code in each county.
4. Industry Staffing Patterns for each of 16 sub-sectors of wholesale trade and each of seven sectors of trucking and warehousing were obtained from EDD.[28] These data show the occupations by OES codes that make up the labor force in each sector of California's economy. One of eight training or educational levels required to work in each OES code is also available (see #6). To allow an estimate of the job pattern within each sub-sector, EDD provides 2002 California employment by OES code within each sub-sector. Using the job pattern (*2005 not available*) implies that the Southern California's firms emulate those for the state and that there was not a significant change in the pattern between 2002 and 2005.
5. Where an OES-coded occupation was shown to exist in one or more of the sectors within the logistics group, the 3rd quarter 2005 Southern California weighted averages for the mean, median, entry-level, and experienced-level pay scales for that OES code were applied to it.

   IMPORTANT NOTE: This process implicitly assumed that firms in each logistics sub-sector must compete for workers in Southern California and thus must pay at least the average mean, median, entry-level, and experienced-level pay for an OES-coded occupation to obtain them. This assumption requires a cross-check on the final outcome of the process to determine if the average pay levels for all workers in an OES code overestimate or underestimate OES pay levels within the logistics group of sectors (see #8 below).

6. As indicated in #4, EDD divides the OES codes into the eleven levels of education and/or length of on-the-job training defined by BLS.[29] Eight apply to logistics:
   - Bachelor's degree or higher and some work experience. These occupations generally require work experience in an occupation requiring a bachelor's or higher degree. Most occupations in this category are managerial occupations that require work experience in a related non-managerial occupation.
   - Bachelor's degree. These occupations require the completion of at least four but not more than five years of full-time academic study beyond high school resulting in a bachelor's degree.
   - Associate's degree. These occupations require the completion of at least two years of full-time academic study beyond high school.
   - Post-secondary vocational education. These occupations require completion of vocational school training.
   - Long-term on-the-job-training. These occupations require more than 12-months of on-the-job training or combined work experience and formal classroom instruction for workers to develop the skills needed for average job performance.
   - Moderate-term on-the-job-training. In these occupations, workers can develop average job performance after 1-12 months of combined on-the-job experience and informal training.
   - Work experience. These occupations require skills obtained through work experience in a related occupation.
   - Short-term on-the-job-training. In these occupations, workers can develop skills needed after a short demonstration or up to one month of on-the-job experience and instruction.

   These levels were used to build skill ladders for the logistics sector.[30] To do so, the weighted average of mean, median, entry-level, and experienced-level pay for those OES codes that fall into each of the eight levels of education and training, within each of the sub-sectors, were derived. Here, the weighting was the 2002 California employment level for the OES code in the sub-sector as provided by EDD (*2005 not provided*).

7. To consolidate the skill ladder across the full group of 16 wholesale trade sub-sectors, and, separately, for the full group of seven transportation and warehousing sectors, weighted average pay levels across the sectors in these two groups were derived for each education/training level. Here, the weighting was also based upon the 2002 California employment within the eight educational levels inside each sector. This final calculation provides a picture of the overall ability of someone in these two broad portions of the economy to migrate up the job ladder via more on-the-job training or education.

8. A cross-check on the outcome of this process was available by looking at the overall mean pay levels that emerged from this process. For instance, for the wholesale trade group, the mean pay level that emerged was $44,326, as shown in Exhibit 18 below. However, using the 3rd quarter 2005 ES 202 payroll for all of wholesale trade and dividing it by the total number of workers in the sector, the actual figure was $50,703, as shown in Exhibit 12 above, a result 14.4% higher than the level derived here. Similarly, for transportation and warehousing jobs, the mean pay using the methodology here was $36,093, as shown in Exhibit 22 below. However, the ES 202 data[31]

showed the actual figure to be $40,556 or 12.4% higher. This difference could come from two sources:

- It could mean that the goods movement sectors actually pay more than the OES pay levels assumed here. This would be the case since the pay levels used here are averages for OES occupations in the full Southern California economy, not just logistics.
- It could mean that the 2002 California distribution of jobs by OES code derived by the EDD's survey of 113,000 establishments was biased to the lower side of the pay scale compared to the actual pattern in Southern California.

Given the size of EDD's sample, and the fact that the logistics industry's technologies and forms are the result of national, not local economic forces, the first explanations appears to be the more likely. That result would mean that workers in the logistics sectors are, on average, paid better than equally skilled workers throughout the economy. Recent work on entry-level logistics jobs in San Bernardino County have documented this fact.[32]

9. A second way to look at skill ladders is functionally. This is the case as there is more than one track up which people can move to higher levels of responsibility and income. To allow a look into this fact, the OES codes were classified by this analyst as being part of one of six functional groups within logistics portion of the economy:
   - Warehousing, Field, or Maintenance Operations. The OES codes for occupations in this group were those largely involving non-office jobs conducted at a fixed site such as a warehouse facility.
   - Trucking Operations. These OES codes involve moving goods or maintaining vehicles needed to do so.
   - Administrative & Administrative Support. These are the OES codes for general management as well as such white collar functions as clerical and inventory control.
   - Sales, Marketing, and Customer Support. These are the OES codes for jobs involved in merchandising goods and performing such customer support functions as tracking goods and undoing problems as they arise in the often lengthy supply chain.
   - Craft or Repair Positions. These are the OES codes for skilled craftsmen and equipment repairers as well as those in skilled jobs who produce goods.
   - Finance & Information Systems. These are the OES codes for those undertaking various financial or information functions.

   Using procedures similar to those described above, the weighted average of mean, median, entry-level, and experienced-level pay for those OES codes that fall into each of the six functional groups were derived. Here, again, the weighting was the 2002 California employment level for the OES code in the sub-sector as provided by EDD.

10. For the full array of wholesale trade sub-sectors, and, separately, transportation and warehousing sectors, weighted average pay levels were derived for each of the six functional groups. Here, the weighting was again based upon the California 2002 employment within each group inside each

sector. This calculation provides a picture of the strength of pay within each function performed within each portion of the logistics economy.

3.2 Wholesale Trade (*2005: 407,771 Jobs*)

As indicated, in 3rd Quarter 2005, the ES 202 data showed that the wholesale trade sector had a mean annual income of $50,703 for its 407,771 jobs, as shown in Exhibits 11 and 12. Using Southern California average pay scales for the many OES job categories that EDD identifies as part of the sector, the methodology used here derived a mean of $44,326, as shown in Exhibit 18. The actual pay scales in the sector were thus 14.4% above the calculated mean, based upon all wage and salary workers in each OES category. The conclusion (please refer to section 5.3.1, step #8) is that the earnings estimates used in this analysis are likely conservative ones.

Job Ladders by Experience and/or Education

Given that caveat, EDD's data reveals the following experience and/or education skill ladder profile of wholesale trade for the 86.3% of the sector's workers who require either no formal training after high school (80.6%) or completion of either community college or trade school (5.7%) for their jobs:

Short Term On-the-Job Training (43.9% of Wholesale Trade Jobs)

In 3rd quarter 2005, those workers who came to the wholesale trade group of sectors and developed skills requiring only a short demonstration or up to one month of on-the-job experience and instruction earned a median income of $11.65 per hour or $24,236 per year. The mean for employees at this level of training was $12.79 or $26,597 per year. Workers whom EDD defines as experienced (mean of the top 2/3 of the wage distribution) earned $14.71 or $30,593 per year. At the low end, workers entered the sector at $8.91 per hour or $18,542 per year. That rate was $2.16 per hour or 32.1% above the minimum wage ($6.75).

Note: Truck drivers fall within this group. To further identify facts about this important group, regardless of whether they are in logistics or other sectors, OES data for the seven counties for pay levels and 2004 employment levels for OES 533032 Truck Drivers, Heavy and Tractor Trailer and OES 533033 Truck Drivers, Light or Delivery Services were reviewed. It was found that there were 130,850 truck drivers across all sectors in 2004. The median pay for Truck Drivers, Heavy and Tractor Trailer was $36,919 putting them well above the $24,236 median for all workers with short term on-the-job training. It was $23,711 for Truck Drivers, Light or Delivery putting them just below the median for all workers in this category.

Exhibit 18.-Wholesale Trade, Pay By Experience/Education, Southern California, 3rd Quarter 2005

	Share	Median		Mean		Experienced		Entry	
Work Experience & Bachelor's or Higher	7.5%	$44.14	$91,803	$50.11	$104,236	$60.69	$126,230	$27.61	$57,421
Bachelor's Degree	6.3%	$27.87	$57,975	$29.79	$61,968	$35.20	$73,226	$18.96	$39,434
Post-Secondary Vocational Education	4.7%	$19.85	$41,279	$21.16	$44,014	$24.89	$51,763	$13.56	$28,209
Associate's Degree	1.2%	$21.05	$43,781	$23.60	$49,082	$28.22	$58,702	$14.07	$29,274
Long-Term On-the-Job Training	4.5%	$27.80	$57,829	$30.76	$63,983	$37.54	$78,081	$16.90	$35,158
Moderate-Term On-the-Job Training	5.6%	$21.49	$44,694	$23.34	$48,556	$27.77	$57,758	$14.43	$30,023
Work Experience Related Occupation	26.3%	$20.37	$42,377	$23.19	$48,230	$28.32	$58,904	$12.92	$26,880
Short-Term On-the-Job Training	43.9%	$11.65	$24,236	$12.79	$26,597	$14.71	$30,593	$8.91	$18,542
Wholesale Trade Sector	100.0%	$19.17	$39,882	$21.31	$44,326	$25.42	$52,874	$12.95	$26,932
No Schooling after High School	80.6%	$15.67	$32,590	$17.41	$36,219	$20.66	$42,980	$10.88	$22,634
Trade or Community College	5.7%	$26.43	$54,971	$29.30	$60,951	$35.64	$74,137	$16.33	$33,960
Bachelor's or More	13.7%	$36.72	$76,382	$40.85	$84,968	$49.07	$102,067	$23.66	$49,221

Source: CA Employment Development Department, Occupational Employment Survey, 3rd Quarter 2005; Industry Staffing Patterns, 2005 (*see Appendix A for OES Codes in each educational group by sector*)
Note: These figures do not include any allowance for the apparent 14.4% differential between pay in the wholesale trade sector and pay in the same OES codes for Southern California's economy as a whole. For instance, at that differential, the lowest entry level rate of $8.91 per hour would be $10.20 per hour or $21,210 per year (*see footnote 31 documenting this fact in San Bernardino County*).

In any case, it is possible for essentially unskilled workers to earn a modest living even if they do not progress beyond the entry level jobs in the wholesale trade sector. Examples of these occupations include:

- Laborers and Freight, Stock, and Material Movers, Hand Operations
- Customer Service Representatives
- Shipping, Receiving, and Traffic Clerks
- Truck Drivers, Heavy and Tractor-Trailer
- Industrial Truck and Tractor Operators
- Packers and Packagers, Hand Operations
- Team Assemblers
- Office Clerks, General
- Order Clerks
- Stock Clerks and Order Fillers

Work Experience (26.3% of Wholesale Trade Jobs)

Those workers who came to the wholesale trade group of sectors with skills obtained through work experience in a related occupation or who move into such positions through their experience within the sector earned a median income of $20.37 per hour or $42,377 per year in 3rd quarter 2005. The mean for employees at this level was $23.19 or $48,230. Workers whom EDD defines as experienced earned $28.32 per hour or $58,904 per year. People just entering these occupations earned $12.92 per hour or $26,880 per year.

Many of the occupational codes in this category represent the first rung of management. The positions are thus occupied by people who have come up through the ranks. Samples of the relevant jobs include:

- First-Line Supervisors/Managers of Transportation
- First-Line Supervisors/Managers of Mechanics, Installation
- First-Line Supervisors/Managers of Production/Operation
- First-Line Supervisors/Managers of Helpers, Laborers
- Inspectors, Testers, Sorters, Samplers, and Weighers
- Cost Estimators
- Managers, All Other

Moderate Term On-the-Job Training (5.6% of Wholesale Trade Jobs)

Those workers who enter wholesale trade occupations in which workers can develop average job performance after 1-12 months of combined on-the-job experience and informal training earned a median income of $21.49 per hour or $44,694 per year in 3rd quarter 2005. The mean for workers at this level was $23.34 or $48,556. Employees whom EDD defines as experienced earned $27.77 per hour or $57,758 per year. People just entering these occupations earned $14.43 per hour or $30,023 per year.

Many of the occupational codes in this category represent positions that require increased responsibility and/or specific skills. Often they require knowledge of the industry that can be acquired on the job. In some cases, their function is to represent the firm with customers. This function includes sales as well as trouble shooting the supply chain when it fails to deliver goods in a timely fashion. Examples include:

- Sales Representatives, Wholesale and Manufacturing
- First-Line Supervisors/Managers of Office and Administrative
- Dispatchers, except Police, Fire, and Ambulance
- Conveyor Operators and Tenders
- Crane and Tower Operators
- Bookkeeping, Accounting, and Auditing Clerks
- Executive Secretaries and Administrative Assistants
- Packaging and Filling Machine Operators and Tenders
- Painters, Transportation Equipment

Long Term On-the-Job Training (4.5% of Wholesale Trade Jobs)

Those workers who enter wholesale trade occupations that require more than 12 months of on-the-job training or combined work experience and formal classroom instruction to develop the skills needed for average job performance earned a median income of $27.80 per hour or $57,829 per year in 3rd quarter 2005. The mean for workers at this level was $30.76 or $63,983. Workers whom EDD defines as experienced earned $37.54 per hour or $78,081 per year. Those workers just entering these occupations earned $16.90 per hour or $35,158 per year.
Many of the occupational codes in this category represent people who must keep warehouse and transportation equipment operational and repair it when necessary. Examples are:

- Maintenance and Repair Workers, General
- Machinists
- Bus and Truck Mechanics and Diesel Engine Specialists
- Heating, Air Conditioning, and Refrigeration Mechanics
- Mobile Heavy Equipment Mechanics, except Engines
- Maintenance Workers, Machinery
- Chemical Equipment Operators and Tenders
- Outdoor Power Equipment and Other Small Engine Mechanics
- Precision Instrument and Equipment Repairers, Other

Associate of Arts or Post-Secondary Technical Education (5.7% of Wholesale Trade Jobs)

Employees who enter wholesale trade occupations that require the completion of at least 2 years of full-time academic study beyond high school or completion of vocational school training earned a median income of $26.43 per hour or $54,971 per year in 3rd quarter 2005. The mean for workers at this level was $29.30 or $60,951. Workers whom EDD defines as experienced earned $35.64 per hour or $74,137 per year. People just entering these occupations earned $16.33 per hour or $33,960 per year as derived from combined data for Trade and Community College categories in Exhibit 18.

Many of the occupational codes in this category represent people who perform skilled white or blue work within the sector. Examples include:

- Graphic Designers
- Market Research Analysts
- Public Relations Specialists
- Technical Writers
- Chemical Technicians
- All Other drafters, Engineering, and Mapping Technology
- Sales Representatives, Wholesale and Manufacturing
- Electric Motor, Power Tool, and Related Repairers
- Printing Machine Operators

Job Ladders by Functional Group

A second way to classify EDD's OES data is according to the functions performed within the sector. Doing so allows a look at average pay levels that workers can achieve if they stay within these functional groups, as shown in Exhibit 19.

Exhibit 19.-Wholesale Trade, Pay By Functional Group, Southern California, 3rd Quarter 2005

Functional Group	2002 Jobs	Median		Mean		Experienced		Entry	
Fixed Site Operations	30.3%	$15.60	$32,446	$17.47	$36,342	$20.61	$42,867	$11.12	$23,131
Trucking or Field Operations	9.1%	$14.87	$30,938	$15.85	$32,958	$18.40	$38,262	$10.75	$22,361
Administration & Admin. Support	16.9%	$19.19	$39,910	$21.01	$43,704	$24.48	$50,918	$13.42	$27,918
Sales & Customer Support	27.6%	$23.17	$48,196	$26.79	$55,717	$33.07	$68,795	$14.16	$29,461
Craft & Repair	6.4%	$19.60	$40,762	$20.30	$42,223	$23.46	$48,800	$13.88	$28,866
Finance & Information	9.6%	$22.74	$47,307	$24.07	$50,060	$28.22	$58,702	$15.86	$32,980
Wholesale Trade Sector	100.0%	$19.17	$39,882	$21.31	$44,326	$25.42	$52,874	$12.95	$26,932

Source: CA Employment Development Department, Occupational Employment Survey, 3rd Quarter 2005; Industry Staffing Patterns, 2005 (*see Appendix A for OES Codes in each functional group by sector*)

Fixed Site Operations (30.3% of Wholesale Trade Jobs)

Those workers who are in OES codes for occupations involving non-office jobs conducted at a fixed site in wholesale trade earned a median income of $15.60 per hour or $32,446 per year in 3rd quarter 2005. The mean for workers at this level was $17.47 or $36,342. Employees whom EDD defines as experienced earned $20.61 per hour or $42,867 per year. People just entering these occupations earned $11.12 per hour or $23,131 per year.

The occupational codes in this category represent people who handle, inspect, track, and inventory inside wholesale goods facilities. It also includes support personnel like maintenance, janitorial, and security people, plus operations managers. Examples include:

- Laborers and Freight, Stock and Material Movers, Hand
- General and Operations Managers
- Stock Clerks and Order Fillers
- Packers and Packagers, Hand
- Maintenance and Repair Workers, General
- Janitors and Cleaners, except Maids and Housekeeping
- Shipping, Receiving, and Traffic Clerks
- First-Line Supervisors/Managers of Production/Operation
- Inspectors, Testers, Sorters, Samplers, and Weighers
- Production, Planning, and Expediting Clerks

Trucking Operations (9.1% of Wholesale Trade Jobs)

Those workers who are in OES codes for wholesale trade occupations involving moving goods, maintaining vehicles, or managing these functions earned a median income of $14.87 per hour or $30,938 per year in 3rd quarter 2005. The mean for employees at this level was $15.85 or $32,958. Workers whom EDD defines as experienced earned $18.40 per hour or $38,262 per year. People just entering these occupations earned $10.75 per hour or $22,361 per year.

The occupational codes in this category represent people who handle, inspect, track, inventory inside wholesale goods facilities. It also includes support personnel like maintenance, janitorial, and security people plus operations managers. Examples include:

- Truck Drivers, Heavy and Tractor-Trailer
- Truck Drivers, Light or Delivery Services
- Industrial Truck and Tractor Operators
- First-Line Supervisors/Managers of Transportation
- Automotive Service Technicians and Mechanics
- Cleaners of Vehicles and Equipment
- Bus and Truck Mechanics and Diesel Engine Specialists
- Automotive Body and Related Repairers
- Motor Vehicle Operators, All Other
- Painters, Transportation Equipment

Administration and Administrative Support (16.9% of Wholesale Trade Jobs)

Those workers who are in OES codes for wholesale trade occupations involving general management as well as white collar functions like clerical and inventory control earned a median income of $19.19 per hour or $39,910 per year in 3rd quarter 2005. The mean for employees at this level was $21.01 or $43,704. Workers whom EDD defines as experienced earned $24.48 per hour or $50,918 per year. People just entering these occupations earned $13.42 per hour or $27,918 per year. The pay levels in this group are impacted by a disproportionate number of positions requiring college degrees.

The occupational codes in this category represent the senior managers of wholesale operations, plus the people directly supporting them, as well as people involved in clerical functions involving tasks such as purchasing and inventory control. Examples include:

- Office Clerks, General
- Cashiers
- Order Clerks
- File Clerks
- Executive Secretaries and Administrative Assistants
- First-Line Supervisors/Managers of Office and Administration
- Chief Executives

- Purchasing Agents, excluding Wholesale, Retail, and Farm
- Receptionists and Information Clerks
- Secretaries, except Legal, Medical, and Executive
- Wholesale and Retail Buyers, except Farm Products

Sales and Customer Support (27.6% of Wholesale Trade Jobs)

Those workers in wholesale trade OES codes involved in merchandising goods and performing customer support functions like tracking goods and undoing supply chain problems earned a median income of $23.17 per hour or $48,196 per year in 3rd quarter 2005. The mean for people at this level was $26.79 or $55,717. Employees whom EDD defines as experienced earned $33.07 per hour or $68,795 per year. Those workers just entering these occupations earned $14.16 per hour or $29,461 per year. Workers at most levels of the sales and customer service function earn higher incomes than others with similar education or experience.

The occupational codes in this category represent every level of the sales or customer support function. These individuals maintain contact with customers both to sell products/services to them and solve supply chain problems for them. The latter is becoming an increasingly important function due to the length of the supply chain, which for Southern California-based operations often extends from Asia to the East Coast. Examples include:

- Sales Representatives, Wholesale and Manufacturing, Not Scientific or Technical
- Sales Representatives, Wholesale and Manufacturing, Scientific or Technical
- Customer Service Representatives
- Telemarketers
- Driver/Sales Workers
- First-Line Supervisors/Managers of Retail Sales Work
- Sales Managers
- Marketing Managers

Craft and Repair (6.4% of Wholesale Trade Jobs)

Those employed in wholesale trade OES codes who are craftsmen and equipment repairers or those in skilled positions producing goods earned a median income of $19.60 per hour or $40,762 per year in 3rd quarter 2005. The mean for workers at this level was $20.30 or $42,223. People whom EDD defines as experienced earned $23.46 per hour or $48,800 per year. Those workers just entering these occupations earned $13.88 per hour or $28,866 per year.

The occupational codes in this category mostly represent skilled positions for which workers have had to complete formal training beyond high school at either a trade school or a community college. A few positions requiring 4-year degrees are also included:

- Machinists

- Welders, Cutters, Solderers, and Brazers
- First-Line Supervisors/Managers of Mechanics, Installers, and Repairers
- Carpenters
- Electricians
- Electrical and Electronic Engineering Technicians
- Printing Machine Operators
- Electrical and Electronic Equipment Assemblers
- Engineers, All Other
- Engineering Managers

Finance and Information (9.6% of Wholesale Trade Jobs)

Those workers in wholesale trade OES codes who undertake various levels of financial or information functions earned a median income of $22.74 per hour or $47,307 per year in 3rd quarter 2005. The mean for employees at this level was $24.07 or $50,060. Workers whom EDD defines as experienced earned $28.22 per hour or $58,702 per year. People just entering these occupations earned $15.86 per hour or $32,980 per year.

The occupational codes in this category involve people who handle the books of the operation as well as maintaining and adapting its information systems. The second function has become crucial in modern logistics facilities due to their heavy dependence on information technology to increase the speed, reliability, and efficiency of their operations:

- Bookkeeping, Accounting, and Auditing Clerks
- Payroll and Timekeeping Clerks
- Billing and Posting Clerks and Machine Operators
- Accountants and Auditors
- Financial Managers
- Computer Support Specialists
- Computer Systems Analysts
- Computer Programmers
- Computer Software Engineers
- Network and Computer Systems Administrators

Exhibit 20.-Median Pay by Functional Group by Wholesale Trade Sub-Sectors
Southern California, 3rd Quarter 2005

Wholesale Sub-Sector	Fixed Site Operations	Trucking Operations	Administration & Admin. Support	Sales & Customer Support	Craft & Repair	Finance & Information	Total
Electric	$39,378	$27,092	$42,208	$55,411	$54,909	$50,754	$47,660
Commercial	$35,076	$29,165	$42,488	$54,720	$54,376	$53,691	$46,550
Agents & Brokers	$29,298	$30,698	$40,627	$49,926	$54,029	$45,648	$42,618
Motor Vehicle	$35,792	$29,075	$43,246	$41,704	$46,465	$45,566	$38,529
Machinery	$40,558	$31,611	$36,397	$48,874	$43,308	$42,982	$42,382
Chemical	$38,690	$32,163	$39,023	$53,201	$47,768	$44,242	$42,284
Alcohol	$37,439	$32,188	$43,828	$47,480	NA	$53,684	$41,675
Wholesale Trade	$32,446	$30,938	$39,910	$48,196	$40,762	$47,307	$39,882
Plumbing	$33,366	$29,315	$36,454	$48,338	$42,455	$40,280	$39,085
Paper	$36,099	$30,850	$36,507	$44,697	$32,385	$38,621	$38,755
Metals & Minerals	$36,944	$32,823	$43,078	$48,825	$30,633	$42,581	$38,487
Lumber	$32,700	$32,682	$42,693	$51,884	$32,668	$40,998	$37,974
Apparel	$32,550	$26,813	$38,064	$46,670	$25,006	$43,800	$36,819
Misc. Non-Durable	$28,528	$30,534	$35,965	$44,190	$30,010	$44,621	$35,403
Misc. Durable	$27,541	$32,569	$38,053	$46,860	$36,325	$46,090	$34,924
Furniture	$29,001	$32,427	$35,570	$47,137	$24,042	$38,726	$34,675
Grocery	$28,534	$31,457	$39,262	$38,328	$22,948	$42,813	$32,836

Source: CA Employment Development Department, Occupational Employment Survey, 3rd Quarter 2005; Industry Staffing Patterns, 2005 (*see Appendix A for OES Codes in each functional group by sector*)
NOTE: Highest & Lowest Pay shaded for each functional group

Median Pay by Wholesale Sub-Sector and Functional Group

Exhibit 19 shows the median pay by wholesale sub-sector and functional group. Another way to view the OES data is to break it down by functional group for each of the 16 sub-sectors of wholesale trade as shown in Exhibit 20. To do this, median pay scales were used, as they have the advantage of not being pulled to the high side by disproportionately high-paying jobs:

Overall Median Pay

Overall, the highest total median pay was in the electrical goods wholesale sector ($47,660; $22.91 per hour). The lowest was in grocery wholesaling ($32,836; $15.79 per hour). These contrasted with a median for the entire group of 16 sectors of $39,882 or $19.17 per hour.

Fixed Site

The highest median pay for fixed site functions was in machinery wholesaling ($40,558; $19.50 per hour). The lowest was in miscellaneous durable wholesaling ($27,541; $13.24 per hour). The overall median was $32,446 ($15.60 per hour).

Trucking Operations

The highest median pay for the trucking function was in the metals and minerals wholesaling ($32,823; $15.78 per hour). The lowest was in apparel wholesaling ($26,813; $12.89 per hour). The overall median was $30,938 ($14.87 per hour).

Administration and Administrative Support Operations

The highest median pay for the administrative function was among the alcohol wholesale sector ($43,828; $21.07 per hour). The lowest was in furniture wholesaling ($35,570; $17.10 per hour). The overall median was $39,910 or $19.19 per hour.

Sales and Customer Support

The highest median pay for the sales and customer support function was in the electrical goods wholesale sector ($55,411; $26.64 per hour). The lowest was in grocery wholesaling ($38,328; $18.43 per hour). The overall median was $48,196 or $23.17 per hour.

Craft and Repair

The highest median pay for the craft and repair function was in the electrical goods wholesale sector ($54,909; $26.40 per hour). The lowest was in grocery wholesaling ($22,948; $11.03 per hour). The overall median was $40,762 ($19.60 per hour).

Finance and Information

The highest median pay for the finance and information functions was in the commercial wholesale sector ($53,691; $25.81 per hour). The lowest was in paper wholesaling ($38,621; $18.57 per hour). The overall median was $47,307 or $22.74 per hour.

Wholesale Trade Summary

On the question of whether the logistics group of sectors can deliver entry-level pay scales well above the minimum wage to workers without formal educations, the data indicates the answer is “yes” with regards to the wholesale trade group. Some 43.9% of jobs in the sector require “short-term on-the-job training.” Entry level pay of $8.91 ($18,542) is 32.1% above the $6.75 minimum wage in California. These figures make no allowance for the 14.4% differential between pay in the wholesale sector and pay for the same OES codes

for Southern California's economy as a whole. Meanwhile, the median pay in this group was $11.65 per hour ($24,236), and experienced pay was $14.71 per hour ($30,593).

It was further shown that there are both educational and functional skill ladders up which workers in the field can move to higher incomes. In the wholesale sector, 80.6% of the jobs require no advanced schooling and another 5.7% require either trade or community college training. Finally, the differences between the various sub-sectors were shown, with median pay levels in the vast majority of cases over $30,000 per year.

3.3 Transportation and Warehousing (*2005: 254,079 Jobs*)

Earlier, data were presented on 3rd Quarter 2005 employment and mean pay levels for the 254,079 jobs in Southern California's various transportation and warehousing sectors, using ES 202 data (Exhibits 11-12). For the full region, the mean pay scales for the OES job categories that EDD identifies within these sectors, the methodology used here derived weighted average mean pay scales as shown in Exhibit 21, column #1. These are shown along with the actual 2005 mean pay levels derived from ES 202 data as shown in column #2. Again, the early ES 202 data show that actual pay in these sectors is generally higher than that estimated using OES job categories and job levels. As discussed earlier (Section 3.1 Analytic Procedures #8), this is very likely because mean pay for the OES occupations in the logistics group tends to be more than mean pay for the same positions in all of Southern California:

Exhibit 21.-Mean Pay, Transportation & Warehousing Sectors
OES-Generated vs. ES 202, Southern California, 3rd Qrtr. 2005

Sector	Mean Pay Using OES Pay Levels	ES 202 For Sector	Difference	ES 202 Advantage
Rail Transportation	$49,128	$71,871	NA	NA
Sea Transportation	$43,987	$41,797	($2,190)	-5.0%
Air Transportation	$41,979	$48,259	$6,280	15.0%
All Support Functions	$41,225	$49,011	$7,786	18.9%
Truck Transportation	$36,890	$38,827	$1,937	5.2%
Transportation & Warehousing	$36,093	$40,556	$4,463	12.4%
Warehousing	$33,580	$39,802	$6,222	18.5%
Courier	$31,184	$37,136	$5,952	19.1%

(1) Short-haul only. Rail not included in transportation & warehousing to allow comparison
Source: CA Employment Development Department, Occupational Employment Survey, 3rd Quarter 2005; Industry Staffing Patterns, 2005

- Truck transportation (93,294 jobs). The mean based upon area-wide OES pay levels for jobs in this sector was $36,890 per year. The ES 202 showed that actual mean pay was $38,727 per year. That was $1,937 per year or 5.2% higher.

- Support activities (53,986 jobs). These are workers in firms supporting trucking (road repair), railroad (cranes), air cargo (load/unload), and ocean-shipping (stevedores) lines, plus workers in independent supply chain management firms. The mean pay for jobs in the sector, based upon Southern California-wide OES pay levels, was $41,225 per year. The ES 202 showed an actual mean pay level of $49,011 per year. That was $7,786 per year or 18.9% higher.

- Warehousing (36,425 jobs). The mean based upon Southern California-wide OES pay levels for jobs in the sector was $33,580 per year. The ES 202 showed an actual mean pay level of $39,802 per year. That was $6,222 per year or 18.5% higher.

- Couriers (33,914 jobs). The mean based upon Southern California-wide OES pay levels for jobs in the sector was $31,184 per year. The ES 202 showed an actual mean pay level of $37,136 per year. That was $5,952 per year or 19.1% higher.

- Air transportation (25,561 jobs). The mean based upon Southern California-wide OES pay levels for jobs in the sector was $41,979 per year. The ES 202 showed an actual mean pay level of $48,259 per year. That was $6,280 per year or 15.0% higher.

- Sea transportation (1,876 jobs). The mean based upon Southern California-wide OES pay levels for jobs in the sector was $43,987 per year. The ES 202 showed an actual mean pay level of $41,797 per year. This small group was the only case where the OES methodology yielded a higher pay than the actual figure from the ES 202 data. The ES 202 figure was $2,190 less per year or 5.0% lower.

- Rail transportation (9,023 jobs). The mean based upon Southern California-wide OES pay levels for jobs in the sector was $49,128 per year. The actual mean pay level from data supplied by the Railroad Retirement Board was $71,871 per year. However, the second figure includes long-haul railroad workers while the first does not. For that reason, the two sets of information are not comparable.

- Transportation & Warehousing Group. For the full group of transportation and warehousing sectors (railroad excluded due to data incompatibility), the mean based upon Southern California-wide OES pay levels for jobs in the group was $36,093 per year. The ES 202 showed an actual mean pay level of $40,556 per year. The ES 202 figure was $4,463 per year or 12.4% higher.

Job Ladders by Experience and/or Education

Given that caveat, EDD's data reveals the following experience and/or education skill ladder profile of transportation and warehousing sectors for the 93.9% of the sector's workers who require either no formal training after high school (92.9%) or completion of either community college or trade school (1.0%) for their jobs, as shown in Exhibit 22.

Short Term On-the-Job Training (74.0% of Transportation & Warehousing Jobs)

In 3rd quarter 2005, those workers who came to the transportation and warehousing group of sectors and developed skills requiring only a short demonstration or up to one month of on-the-job experience and instruction earned a median income of $13.56 per hour or $28,209 per year. The mean for people at this level of training was $14.49 or $30,146 per year. Workers whom EDD defines as experienced (mean of the top 2/3 of the wage distribution) earn $16.62 or $34,579 per year. At the low-end, employees entered the sector at $10.17 per hour. That rate was $3.42 per hour or 50.6% above the minimum wage ($6.75).

Exhibit 22.-Transportation & Warehousing, Pay By Experience/Education
Southern California, 3rd Quarter 2005

	Share	Median		Mean		Experienced		Entry	
Work Experience & Bachelor's Degree or Higher	4.4%	$41.13	$85,547	$45.50	$94,638	$54.96	$114,324	$25.41	$52,850
Bachelor's Degree	1.6%	$25.04	$52,074	$26.28	$54,666	$30.20	$62,821	$18.20	$37,857
Work Experience	4.9%	$22.35	$46,488	$23.85	$49,604	$28.23	$58,717	$15.09	$31,386
Associate's Degree	0.0%	$0.00	NA	$0.00	NA	$0.00	NA	$0.00	NA
Post-Secondary Vocational Education	1.0%	$17.25	$35,880	$17.81	$37,054	$20.38	$42,384	$12.69	$26,403
Long-Term On-the-Job Training	4.2%	$20.25	$42,126	$23.92	$49,762	$28.09	$58,426	$15.61	$32,466
Moderate-Term On-the-Job Training	9.8%	$17.74	$36,897	$19.04	$39,607	$22.42	$46,639	$12.28	$25,547
Short-Term On-the-Job Training	74.0%	$13.56	$28,209	$14.49	$30,146	$16.62	$34,579	$10.17	$21,146
Transportation & Warehousing Sector	100.0%	$16.13	$33,560	$17.40	$36,189	$20.21	$42,031	$11.68	$24,291
No Schooling After High School	92.9%	$14.77	$30,716	$15.89	$33,052	$18.36	$38,196	$10.89	$22,659
Trade or Community College	1.1%	$17.25	$35,880	$17.81	$37,054	$20.38	$42,384	$12.69	$26,403
Bachelor's Or More	6.1%	$36.78	$76,506	$40.31	$83,841	$48.28	$100,412	$23.46	$48,800

Source: CA Employment Development Department, Occupational Employment Survey, 3rd Quarter 2005; Industry Staffing Patterns, 2005 (*see Appendix A for OES Codes in each educational group by sector*)
Note: These figures do not include any allowance for the apparent 12.4% differential between pay in the transportation and warehousing group of sectors and pay in the same OES codes for Southern California's economy as a whole. For instance, at that differential, the lowest entry level rate of $8.91 per hour would be $11.42 per hour.

In any case, it is possible for essentially unskilled workers to earn a modest living even if they do not progress beyond the entry level jobs in the Wholesale Trade sector. Examples of these occupations include:

- Truck Drivers, Heavy and Tractor-Trailer
- Truck Drivers, Light or Delivery Services

- Tank Car, Truck, and Ship Loaders
- Laborers and Freight, Stock, and Material Movers, Hand
- Stock Clerks and Order Fillers
- Industrial Truck and Tractor Operators
- Cleaners of Vehicles and Equipment
- Payroll and Timekeeping Clerks
- Cargo and Freight Agents
- Sailors and Marine Oilers

Moderate Term On-the-Job Training (9.8% of Transportation & Warehousing Jobs)

Those workers who entered transportation and warehousing occupations in which workers can develop average job performance after 1-12 months of combined on-the-job experience and informal training earned a median income of $17.74 per hour or $36,897 per year in 3rd quarter 2005. The mean for employees at this level was $19.04 or $39,607. Workers whom EDD defines as experienced earned $22.42 per hour or $46,639 per year. Those just entering these occupations earned $12.28 per hour or $25,547 per year.

Many of the occupational codes in this category represent positions that require increased responsibility and/or specific skills. Often, they require knowledge of the industry that can be acquired on the job. In some cases, their function is to represent the firm with customers. This function includes sales as well as trouble shooting the supply chain when it fails to deliver goods in a timely fashion. Examples include:

- Bookkeeping, Accounting, and Auditing Clerks
- Sales Representative, Wholesale and Manufacturing, except Technical and Scientific Products
- Conveyor Operators and Tenders
- Computer Operators
- First-Line Supervisors/Managers of Office and Administrative Support Workers
- Dispatchers, except Police, Fire, and Ambulance
- Cutting and Slicing Machine Setters, Operators, and Tenders
- Transportation Workers, All Other

Long Term On-the-Job Training (4.2% of Transportation & Warehousing Jobs)

Those people who enter transportation and warehousing occupations that require more than 12 months of on-the-job training or combined work experience and formal classroom instruction for workers to develop the skills needed for average job performance earned a median income of $20.25 per hour or $42,126 per year in 3rd quarter 2005. The mean for employees at this level was $23.92 or $49,762. Workers whom EDD defines as experienced earned $28.09 per hour or $58,426 per year. Those just entering these occupations earned $15.61 per hour or $32,466 per year.

Many of the occupational codes in this category represent people who are highly skilled and operate and maintain very complex equipment used in either transportation or warehousing. Examples are:

- Bus and Truck Mechanics and Diesel Engine Specialists
- Avionics Technicians
- Airline Pilots, Copilots, and Flight Engineers, Commercial Pilots
- Aircraft Mechanics and Service Technicians
- Machinists
- Petroleum Pump System Operators, Refinery Operators, and Gaugers
- Maintenance Workers, Machinery
- All Other Drafters, Engineering, and Mapping Technologists
- First-Line Supervisors/Managers of Non-Retail Sales Workers
- Maintenance and Repair Workers, General

Post Secondary Education (1.0% of Transportation & Warehousing Jobs)

Workers entering transportation and warehousing occupations that require completion of vocational school training earned a median income of $17.25 per hour or $35,880 per year in 3rd quarter 2005. The mean for employees at this level was $17.81 or $37,054. Workers whom EDD defines as experienced earned $20.38 per hour or $42,384 per year. People just entering these occupations earned $12.69 per hour or $26,403 per year. Note: There were no jobs requiring an associate's degree.

There were relatively few occupations in this group. Examples include:

- Executive Secretaries and Administrative Assistants
- Avionics Technicians
- Sheet Metal Workers
- Welders, Cutters, Solderers, and Brazers
- Data Entry Keyers
- Secretaries, except Legal, Medical, and Executive

Work Experience (4.9% of Transportation & Warehousing Jobs)

Those workers who came to the transportation and warehousing group of sectors with skills obtained through work experience in a related occupation or who move into such positions through their experience within the sector earned a median income of $22.35 per hour or $46,488 per year in 3rd quarter 2005. The mean for employees at this level was $23.85 or $49,604. Workers whom EDD defines as experienced earned $28.23 per hour or $58,717 per year. People just entering these occupations earned $15.09 per hour or $31,386 per year.

Many of the occupational codes in this category represent the first rung of management. Those positions are thus occupied by people who have come up through the ranks. Other occupations involved time learning complex equipment or functions include:

- First-Line Supervisors/Managers of Production and Operating Workers

- First-Line Supervisors/Managers of Trans and Material-Moving Vehicle Operators
- First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand
- Transportation Attendants, except Flight Attendants and Baggage Porters
- Rail Yard Engineers, Dinkey Operators, and Hostlers
- Locomotive Engineers
- Captains, Mates, and Pilots of Water Vessels
- Aircraft Cargo Handling Supervisors
- Compliance Officers, except Agricultural, Construction, Health-Safety, and Transportation
- Inspectors, Testers, Sorters, Samplers, and Weighers

Job Ladders by Functional Group

A second way to classify EDD's OES data is by group jobs involved in functional activities within the sector. Doing so allows a look at average pay levels that workers can achieve if they stay within these functional groups as shown in Exhibit 22A.

Exhibit 22A.-Transportation & Warehousing, Pay By Functional Group
Southern California, 3rd Quarter 2005

Functional Group	2002 Jobs	Median		Mean		Experienced		Entry	
Fixed Site Operations	35.4%	$14.31	$29,762	$15.70	$32,653	$18.29	$38,049	$10.47	$21,773
Trucking or Field Operations	43.5%	$16.20	$33,703	$17.13	$35,620	$19.71	$41,000	$11.96	$24,877
Administration & Admin. Support	14.0%	$19.32	$40,189	$20.95	$43,576	$24.40	$50,761	$13.42	$27,908
Sales & Customer Support	4.4%	$17.50	$36,410	$20.05	$41,702	$24.31	$50,562	$11.53	$23,982
Craft & Repair	0.6%	$20.27	$42,165	$21.24	$44,179	$24.44	$50,836	$14.18	$29,485
Finance & Information	2.0%	$20.29	$42,199	$21.46	$44,635	$25.02	$52,050	$14.34	$29,817
Total	100.0%	$16.13	$33,560	$17.40	$36,189	$20.21	$42,031	$11.68	$24,291

Source: CA Employment Development Department, Occupational Employment Survey, 3rd Quarter 2005; Industry Staffing Patterns, 2005 (*see Appendix A for OES Codes in each functional group by sector*)

Fixed Site Operations (35.4% of Transportation & Warehousing Jobs)

Those workers who are in OES codes for occupations involving non-office jobs conducted at a fixed site in transportation and warehousing earned a median income of $14.31 per hour or $29,762 per year in 3rd quarter 2005. The mean for employees at this level was $15.70 or $32,653. Workers whom EDD defines as experienced earned $18.29 per hour or $38,049 per year. People just entering these occupations earned $10.47 per hour or $21,773 per year.

The occupational codes in this category represent people who handle, inspect, track, and inventory inside warehousing facilities. It also includes support personnel like maintenance, janitorial, and security people, plus operations managers. Examples include:

- Laborers and Freight, Stock, and Material Movers, Hand
- Stock Clerks and Order Fillers
- Transportation, Storage, and Distribution Managers
- Shipping, Receiving, and Traffic Clerks
- Inspectors, Testers, Sorters, Samplers, and Weighers
- Production, Planning, and Expediting Clerks
- Cargo and Freight Agents
- Weighers, Measurers, Checkers, and Samplers, Recordkeeping
- Material Moving Workers, All Other
- Maintenance Workers, Machinery
- Conveyor Operators and Tenders
- Tank Car, Truck, and Ship Loaders

Vehicle Operations (43.5% of Transportation & Warehousing Jobs)

Those workers who are in OES codes for transportation and warehousing occupations involving moving goods, maintaining vehicles, or managing these functions earned a median income of $16.20 per hour or $33,703 per year in 3rd quarter 2005. The mean for people at this level was $17.13 or $35,620. Employees whom EDD defines as experienced earned $19.71 per hour or $41,000 per year. Those workers just entering these occupations earned $11.965 per hour or $24,877 per year.

The occupational codes in this category represent people who handle or maintain a wide variety of transportation vehicles. Examples include:

- Truck Drivers, Heavy and Tractor-Trailer
- Truck Drivers, Light or Delivery Services
- Industrial Truck and Tractor Operators
- Cleaners of Vehicles and Equipment
- Bus and Truck Mechanics and Diesel Engine Specialists
- Aircraft Mechanics and Service Technicians
- Airline Pilots, Copilots, and Flight Engineers
- Sailors and Marine Oilers
- Avionics Technicians
- Captains, Mates, and Pilots of Water Vessels
- Rail Yard Engineers, Dinkey Operators, and Hostlers
- Ship Engineers
- Locomotive Engineers

Administration and Administrative Support (14.0% of Transportation & Warehousing Jobs)

Those workers who are in OES codes for transportation and warehousing occupations involving general management as well as white collar functions like clerical and inventory control earned a median income of

$19.32 per hour or $40,189 per year in 3rd quarter 2005. The mean for people at this level was $20.95 or $43,576. Employees whom EDD defines as experienced earned $24.40 per hour or $50,761 per year. Those workers just entering these occupations earned $13.42 per hour or $27,908 per year. The pay levels in this group are impacted by a disproportionate number of positions requiring college degrees.

The occupational codes in this category represent the senior managers of transportation and warehousing operations, plus the people directly supporting them as well as people involved in clerical functions involving inventory control. Examples include:

- First-Line Supervisors/Managers of Office and Administrative Support Workers
- Receptionists and Information Clerks
- Executive Secretaries and Administrative Assistants
- Office Clerks, General
- Compliance Officers, except Agricultural, Construction, Health-Safety, and Transportation
- Purchasing Managers
- Employment, Recruitment, and Placement Specialists
- Order Clerks
- File Clerks
- Wholesale and Retail Buyers, except Farm Products

Sales and Customer Support (4.4% of Transportation & Warehousing Jobs)

Those workers in transportation and warehousing OES codes involved in merchandising goods and performing customer support functions like tracking goods and undoing supply chain problems earned a median income of $17.50 per hour or $36,410 per year in 3rd quarter 2005. The mean for people at this level was $20.05 or $41,702. Workers whom EDD defines as experienced earned $24.31 per hour or $50,562 per year. Those employees just entering these occupations earned $11.53 per hour or $23,982 per year. Workers at most levels of the sales and customer service function earn higher incomes than others with similar education or experience.

The occupational codes in this category represent every level of the sales or customer support function. These individuals maintain contact with customers both to sell products/services to them and solve supply chain problems for them. The latter is becoming an increasingly important function due to the length of the supply chain, which for Southern California-based operations often extends from Asia to the East Coast. Examples include:

- Customer Service Representatives
- Sales Managers
- Driver/Sales Workers
- Marketing Managers
- Sales and Related Workers, All Other
- Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products
- Telemarketers

Craft and Repair (0.6% of Transportation & Warehousing Jobs)

A small number of workers in transportation and warehousing OES codes are craftsmen and equipment repairers or those in skilled positions producing goods. They earned a median income of $20.27 per hour or $42,165 per year in 3rd quarter 2005. The mean for employees at this level was $21.24 or $44,179. People whom EDD defines as experienced earned $24.44 per hour or $50,836 per year. Those workers just entering these occupations earned $14.18 per hour or $29,485 per year.

The occupational codes in this category mostly represent skilled positions for which workers have had to complete formal training beyond high school at a trade school. A few positions requiring 4-year degrees are also included:

- Petroleum Pump System Operators, Refinery Operators, and Gaugers
- Sheet Metal Workers
- Machinists
- Welders, Cutters, Solderers, and Brazers
- Marine Engineers and Naval Architects
- All Other Drafters, Engineering, and Mapping Technologists

Finance and Information (2.0% of Transportation & Warehousing Jobs)

Those workers in transportation and warehousing OES codes who undertake various levels of financial or information functions earned a median income of $20.29 per hour or $42.199 per year in 3rd quarter 2005. The mean for employees at this level was $21.46 or $44,635. Workers whom EDD defines as experienced earned $25.02 per hour or $52,050 per year. Those just entering these occupations earned $14.34 per hour or $29,617 per year.

The occupational codes in this category involve people who handle the books of the operation as well as maintain and adapts its information systems. Again, the second function has become crucial in modern logistics due to their heavy dependence on information technology to increase the speed, reliability, and efficiency of their operations:

- Bookkeeping, Accounting, and Auditing Clerks
- Accountants and Auditors
- Financial Managers
- Computer Support Specialists
- Bill and Account Collectors
- Computer Systems Analysts
- Payroll and Timekeeping Clerks
- Cost Estimators
- Computer Operators
- Computer Programmers

Median Pay by Transportation and Warehousing Sector and Functional Group

Another way to view the OES data is to break it down by functional group for each of the seven sectors of transportation and warehousing, as shown in Exhibit 23. To do this, median pay scales were used, as they have the advantage of not being pulled to the high side by disproportionately high pay scales:

Exhibit 23.-Median Pay by Functional Group by Transportation & Warehousing Sector
Southern California, 3rd Quarter 2005

Wholesale Sub-Sector	Fixed Site Operations	Vehicle Operations	Administration & Admin. Support	Sales & Customer Support	Craft & Repair	Finance & Information	Median Pay
Rail Transportation	$70,170	NA	$44,338	NA	$39,227	NA	$49,015
Sea Transportation	$37,414	$37,957	$44,715	$33,041	$71,884	NA	$39,785
All Support Activities	$41,369	$33,723	$42,134	$37,505	$52,605	$39,827	$38,742
Air Transportation	$31,349	$46,558	$43,369	$74,928	$56,352	$43,916	$36,126
Truck Transportation	$27,469	$36,045	$40,401	$41,632	NA	NA	$34,968
Transport/Warehousing	$29,762	$33,703	$40,189	$36,410	$42,165	$42,199	$33,560
Warehousing	$25,688	$33,270	$46,554	$29,847	$31,926	$45,611	$30,578
Couriers	$28,127	$26,898	$31,907	$42,099	$70,899	$40,646	$28,503

Source: CA Employment Development Department, Occupational Employment Survey, 3rd Quarter 2005; Industry Staffing Patterns, 2005 (*see Appendix A for OES Codes in each functional group by sector*)
NOTE: Highest & Lowest Pay shaded for each functional group

Median Pay

Over all, the highest overall median pay was in the rail transportation sector ($49,015; $23.56 per hour). The lowest was in the courier sector, due to the large number of part time workers ($28,503; $13.70 per hour). These contrasted with a median for the entire group of 7 sectors of $33,560 or $16.13 per hour.

Fixed Site

The highest median pay for the fixed site function was in rail transportation ($70,170; $33.74 per hour). The lowest was in warehousing ($25,688; $12.35 per hour). The overall median was $29,762 ($14.31 per hour).

Vehicle Operations

The highest median pay for the vehicle operations function was in the air transportation ($46,558; $22.38 per hour). The lowest was in courier ($26,898; $12.93 per hour). The overall median was $33,703 ($16.20 per hour).

Administration and Administrative Support Operations

The highest median pay for the administrative function was in the public warehousing sector ($46,554; $22.38 per hour). The lowest was among couriers ($31,907; $15.34 per hour). The overall median was $40,189 or $19.32 per hour.

Sales and Customer Support

The highest median pay for the sales and customer support function was in the air transportation sector ($74,928; $36.02 per hour). The lowest was in warehousing ($29,847; $14.35 per hour). The overall median was $36,410 or $17.50 per hour.

Craft and Repair

The highest median pay for the small craft and repair function was in the sea transportation sector ($71,884; $34.56 per hour). The lowest was in warehousing ($31,926; $15.35 per hour). The overall median was $42,165 ($20.27 per hour).

Finance and Information

The highest median pay for the finance and information functions was in warehousing ($45,611; $21.93 per hour). The lowest was in the support group ($39,827; $19.15 per hour). The overall median was $42,199 or $20.29 per hour.

Transportation and Warehousing Summary

Can the transportation and warehousing portion of logistics deliver entry-level pay scales well above the minimum wage to workers without formal educations? Again, the data indicates the answer is “yes.” Some 74.0% of jobs in the group require “short-term on-the-job training.” Entry-level pay of $10.17 ($21,146) is 50.6% above the $6.75 minimum wage in California. These figures make no allowance for the 12.4% differential between pay in the transportation and warehousing group and pay in the same OES codes for Southern California’s economy as a whole. Meanwhile, the median pay in this group was $13.56 per hour ($28,209), and experienced pay was $16.62 per hour ($34,579).

It was further shown that there are both educational and functional skill ladders up which workers in the field can move to higher incomes. In the transportation and warehousing sectors, 92.9% of the jobs require no advanced schooling and another 1.1% required trade school training. Finally, the differences between the various sub-sectors of transportation and warehousing were shown with median pay levels in the vast majority of the cases over $30,000 per year.

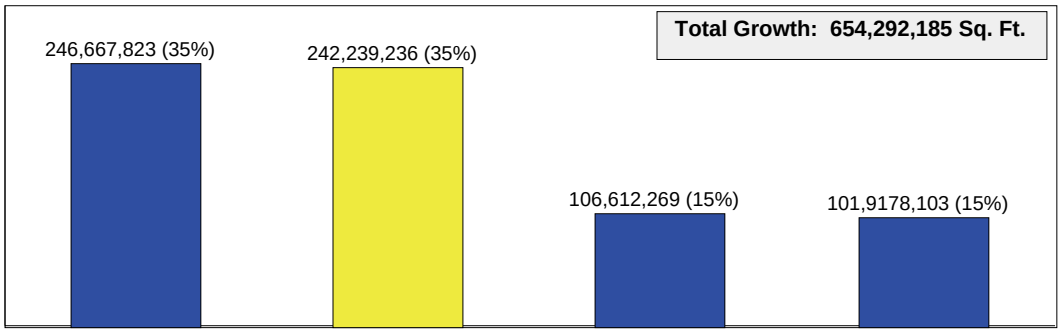
An issue that has frequently arisen among communities where logistics companies are seeking to locate facilities is the number square feet of space needed to generate one job. This question arises as the facilities are frequently very large, and communities are concerned about the number of jobs created when they allow industrially zoned land to be developed.

4.1 Analytic Procedures

This is not an area of economics where a great deal of consistent information is available. Typically, analysts studying economic development have assumed that the number of square feet of space per job to be much lower than the experience with logistics in Southern California. For instance, a December 2004 study of redevelopment in Massachusetts stated: "Direct employment projections are based on industry standard space demands: 250 square feet per office employee, 350 square feet per flex space employee, and 650 square feet per warehouse distribution employee."[33]

More typically, all types of industrial space are lumped into a single square feet per worker estimate. Thus, worksheets provide to the National Association of Office and Industrial Properties (NAIOP) Research Foundation to study the economic impact of industrial development states: "Persons working in the industrial building(s) at 900 square feet per worker."[34]

Exhibit 24.-Industrial Real Estate Market, Inventory Growth (Sq. Ft.)
Southern California, 1991-2005



Source: Grubb & Ellis

However, the issue of "square feet per job" of logistics building space emerged in San Bernardino and Riverside counties (Inland Empire) during the early 1990s, when the region began to see very rapid development of its industrial land. At that time, the Inland Empire Economic Partnership (IEEP) was asked to create a database tracking major projects in order to develop factual information to track this issue. The database was started in January 1994, and Economics & Politics, Inc., has maintained it since that date. The experience within the Inland Empire is relevant here, since, from 1991-2005, the area has seen 220 million square feet of industrial space created or 34% of Southern California's increase in space as shown in Exhibit 24. That was just less than the 232 million square feet created in Los Angeles County (35%).

Average Square Feet per Job

In the 1994-2006 period, 1,366 projects were tracked using information from the major brokerage firms operating in the Inland Empire, as well as information otherwise made available to Economics & Politics, Inc., or the IEEP, as shown in Exhibit 25. These projects have involved 172,843,408 square feet of gross industrial space. Altogether, some 123,435 jobs were added to the region's economic base at the time the projects in this database were announced. Across all types of projects, over the full time period, the database showed that one job required 1,400 square feet of space. However, this fact hides significant differences between the sector groups:

Exhibit 25.-Major Firms Buy or Lease Space for Expansion
Inland Empire, 1994 to April 2006

Sector	Firms	Percent	Jobs	Workers	Percent	Workers/Firm
Manufacturing	692	50.7%	Manufacturing	49,542	40.1%	71.6
Distribution	498	36.5%	Distribution	55,017	44.6%	110.5
Service	163	11.9%	Service	15,254	12.4%	93.6
Govt. Agencies	13	1.0%	Govt. Agencies	3,622	2.9%	278.6
TOTAL	1,366	100.0%	TOTAL	123,435	100.0%	90.4
Source	**Firms**	**Percent**	**Other**	**Square Feet**	**Percent**	**Feet/Worker**
Migrate from LA/OR	313	22.9%	Manufacturing	47,503,196	27.5%	959
New Growth	529	38.7%	Distribution	119,188,022	69.0%	2,166
New To Inland Empire	842	61.6%	Service	4,109,990	2.4%	269
Expand Locally	524	38.4%	Govt. Agencies	2,042,200	1.2%	564
TOTAL	1,366	100.0%	TOTAL	172,843,408	100.0%	1,400

Source: CB Richard Ellis, Grubb & Ellis, Cushman & Wakefield, Lee & Associates, IEEP, Economics & Politics, Inc.

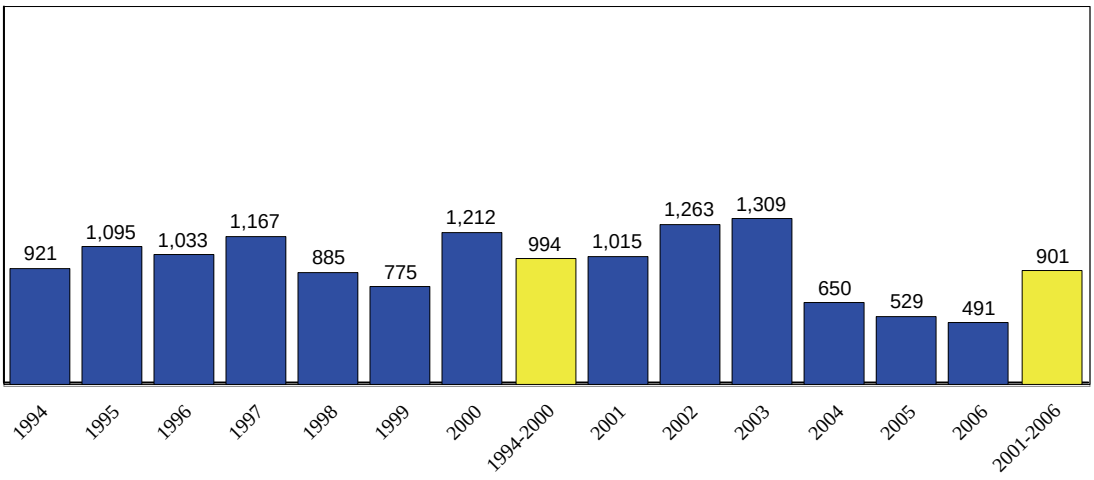
The inland migration of firms was in response to lack of space in coastal areas as well as lower costs, newer facilities and lower labor costs in the inland area. The data come from inland commercial brokers and newspaper articles on the migrating firms. Though no analyst has studied what has happened to space freed in coastal areas as firms have moved, the extremely low vacancy rates in Los Angeles (*1.5%*) and Orange (*3.5%*) counties strongly implies it has been put to other uses.

Manufacturing firms took 47,503,196 square feet of space (27.5% of the total). The firms indicated their intention to initially open with 49,542 jobs. The ratio was one job per 959 square feet of space.

Logistics firms took 119,188,022 square feet of space (69.0% of the total). The firms indicated their intention to initially open with 55,017 jobs. The ratio was one job per 2,166 square feet of space. The square foot of space needed for one job in logistics was thus 2.26 times the amount needed in manufacturing or a little more than double.

Office firms and government agencies took 6,152,190 square feet of space (3.6% of the total). They indicated their intention to initially open with 18,876 jobs. The ratio was thus one job per 326 square feet of space.

Exhibit 26.-Square Feet Per Job
Manufacturing Sector, Inland Empire, 1994-2006

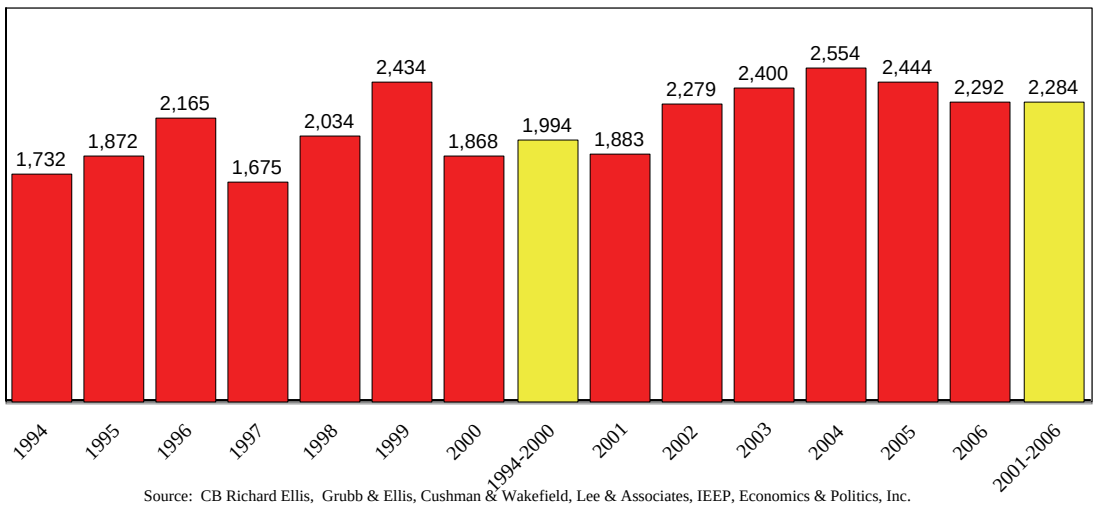


Source: CB Richard Ellis, Grubb & Ellis, Cushman & Wakefield, Lee & Associates, IEEP, Economics & Politics, Inc.

Jobs per Square Foot: Over Time

Over the past 12 years, there have been changes in space utilization by companies. This has been particularly relevant to manufacturers and logistics and distribution firms as shown in Exhibit 26 and Exhibit 27.

Exhibit 27.-Jobs Per Square Feet
Logistics Sector, Inland Empire, 1994-2006



Source: CB Richard Ellis, Grubb & Ellis, Cushman & Wakefield, Lee & Associates, IEEP, Economics & Politics, Inc.

Manufacturing

From 1994-2000, manufacturers created 41,400 new jobs in the Inland Empire. In this period, the amount of industrial space for each new job in the sector varied from 1,000 to 1,300 square feet, with an average of 994 square feet. From 2001-2005, manufacturing stopped growing in the inland region, adding a net of just 100 jobs. In the two-county region, the amount of space taken by manufacturers shrank to an average of 901 square feet per job, including a steep fall to 564 square feet per job from 2003 to 2006. The conclusion from these data is that a healthy manufacturing sector generally requires 900-1,000 square feet of space to support one job as shown in Exhibit 26.

Logistics

As with the balance of Southern California, the Inland Empire's logistics firms have expanded consistently since 1994. In the 1994-2000 period, the area saw the sector add 28,200 jobs. For this period, the industrial space per job averaged 1,994 square feet. From 2001-2005, another 23,500 new logistics jobs were created. In the 2001-2006 period, 2,284 square feet of space per job were required, a 14.5% increase over the earlier period. In 2006, the 2,292 square feet per job was roughly at that level, as shown in Exhibit 27.

Summary: Manufacturing vs. Logistics Space per Job

Ready comparison of the square footage per job required in manufacturing and logistics has become more difficult due to the sudden decline in the health of the manufacturing sector. Two observations appear relevant:

Logistics Firms Asking Workers to Handle Greater Amounts of Space

This is seen by the fact that the average square footage per job increased 14.5% when comparing 1994-2000 (1,994 sq. ft.) and 2001-2006 (2,284 sq. ft.).

Logistics Firms Need Over Twice the Space per Job as Manufacturers

This is seen in that manufacturing firms generally have needed 900-1,000 square feet per job, while logistics firms have averaged over 2,284 square feet per job. At the maximum in 2004, the newly occupied facilities had 2,554 square feet per worker.

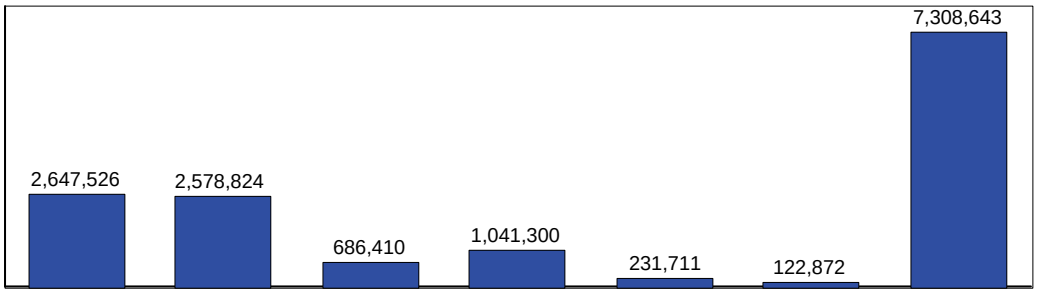
The fact that logistics facilities are using up to 2½ times the space per job as manufacturers has caused many communities to state a preference for manufacturing over distribution development in their industrial areas. The problem with this strategy is the fact that Southern California's manufacturers have lost 361,300 jobs from 2001-2005, while logistics firms have gained 103,400.

Any strategy dealing with economic development, infrastructure construction, or environmental mitigation that concerns the rising flow of goods through Southern California must take into account the degree to which the recent rapid growth in volume is likely to continue over the long run. Here, the long run is defined as through 2030, since that is the ending date for the currently adopted Regional Transportation Programs by SCAG and the San Diego Association of Governments (SANDAG). Determining the extent to which the volume of goods moving through the region will likely continue requires a review of the various factors that are driving that volume.

5.1 Southern California Population Growth

A principal driver of growth within Southern California's logistics sector is the continuing expansion of the region's population. This is the case because the higher the population, the greater the volume of domestic and international cargo that must flow through the local logistics system to local consumers.

Exhibit 28.-Forecasted Population Increases Southern California, 2000-2030



Source: Southern California Association of Governments & San Diego Association of Governments

The population forecasts adopted by SCAG and SANDAG as part of their Regional Transportation Programs (RTP) indicate that the region will go from 19,477,342 people in 2000 to 26,785,985 in 2030, a gain of 7,308,643 people or 25.1% as shown in Exhibit 28. That is nearly 200,000 more people than currently live in Orange, San Diego, Ventura, and Imperial counties combined (7,123,087). This represents a compound annual growth rate of 1.07%. Importantly, this forecast depends much more heavily on the natural increase of the local population (births over deaths) than it does upon immigration. Thus, in discussing its part of the forecast, SCAG indicated that: "Population growth resulted from large net increases in three population groups: aging 'Baby Boomers,' their young children 'the echo-boomers', and immigrants, mostly from Mexico, Central America and Southeast Asia. The natural increase through births accounted for most of the population gain in the Region, as births over deaths accounted for two-thirds of population gain."[35]

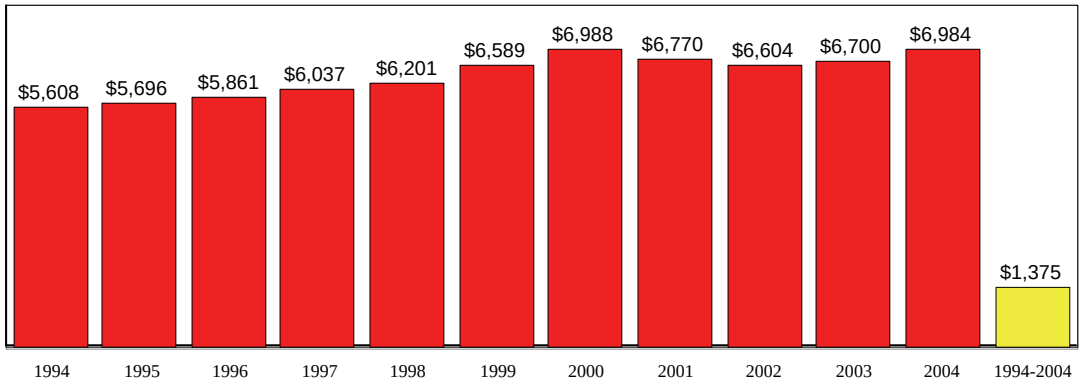
As has often occurred in Southern California, the area's population growth is already ahead of the forecasts. From 2000-2006, 1,836,476 people have been added to the population in Southern California, reaching a total of 21,313,818 (a 9.4% gain).[36] In six years, the region has thus added 25.1% of the total people expected to be added in a 30-year period. As a result, the early draft work on the 2008 RTP for

SCAG has its portion of the Southern California region growing by 6,889,086 from 2000-2030 rather than the 6,267,343 found in the agency's 2004 RTP. That would be 621,743 or 9.9% more than the current forecast.[37]

5.2 Southern California Retail Volume Per Capita

There are two forces that raise the volume of goods moving to local households in Southern California. One is the size of the population. As noted above, the compound annual rate of growth from 2000-2030 was estimated at 1.07% in the RTPs. The second is the constant dollar volume of retail sales per capita. This refers to the amount of retail sales for each person in the region, adjusted for inflation. As such, it provides an estimate of the per capita physical volume of goods moving through the region. From 1994-2004, the California Board of Equalization data shows that this volume has grown from $5,608 to $6,984, up $1,375 or 24.5%.[38] This occurred despite the pause due to the recession that impacted consumers from 2001-2003. On a compound annual basis, the growth was 2.01% over this eleven year period. This finding is consistent with the idea that, except during periodic recessions, the standard of living of the average person gradually improves, allowing him or her to acquire more goods in succeeding years.

Exhibit 29.-Per Capita Taxable Retail Sales (constant dollar) Southern California, 1994-2004 (1984-1986=100)



Sources: CA Board of Equalization, CA Department of Finance, U.S. Bureau of Labor Statistics

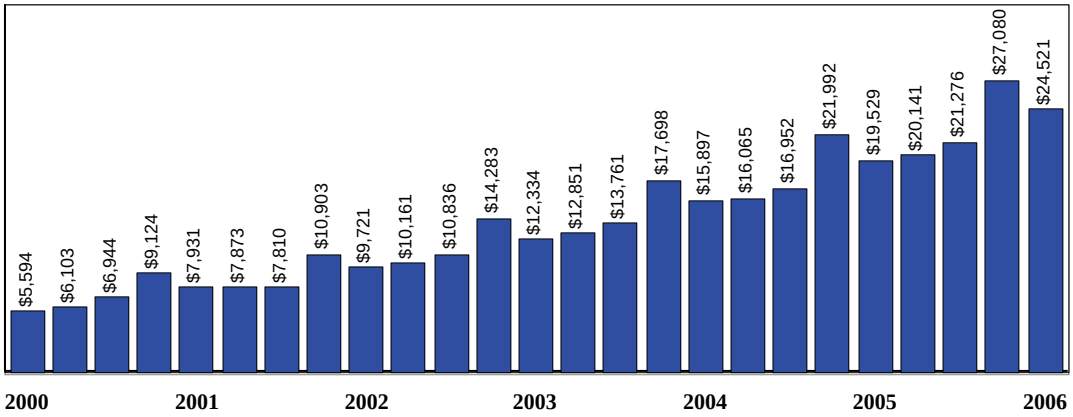
For the goods movement system, the rising volume of retail volume per capita is another reason that local logistics firms and the local transportation network must be prepared to handle an increased flow of domestic and international goods headed for local households.

5.3 E-Commerce

Another factor impacting the logistics firms and the goods movement infrastructure in Southern California is the increasing tendency of American households to purchase goods on-line and have them delivered directly to their homes. This e-commerce phenomenon started to become an important part of American consumer habits in 2000. From 1st quarter 2000 to 1st quarter 2006, the national e-commerce volume went

from $5.6 billion to $24.5 billion, as shown in Exhibit 30. The compound annual rate of growth in this period was an extremely aggressive 27.9%. From 1st quarter 2005 to 1st quarter 2006, that rapid growth continued, with e-commerce sales up 25.6%. The per capita level was $90.46 in fourth quarter 2005.

Exhibit 30.-E-Commerce Volume (millions)
U.S., 2000-2006, Quarterly, Not Seasonally Adjusted



Source: Estimated Quarterly U.S. Retail Sales (Not Seasonally Adjusted), U.S. Census Bureau, 2006

This phenomenon will likely continue growing rapidly for a very long period of time. This is seen by the fact that the share of total U.S. retail sales involving e-commerce was 0.8% in 1st quarter 2000. Despite the aggressive expansion of this form of retail activity, the share was up to just 2.7% in 1st quarter 2006 ($24.5 billion of $906.5 billion).[39]

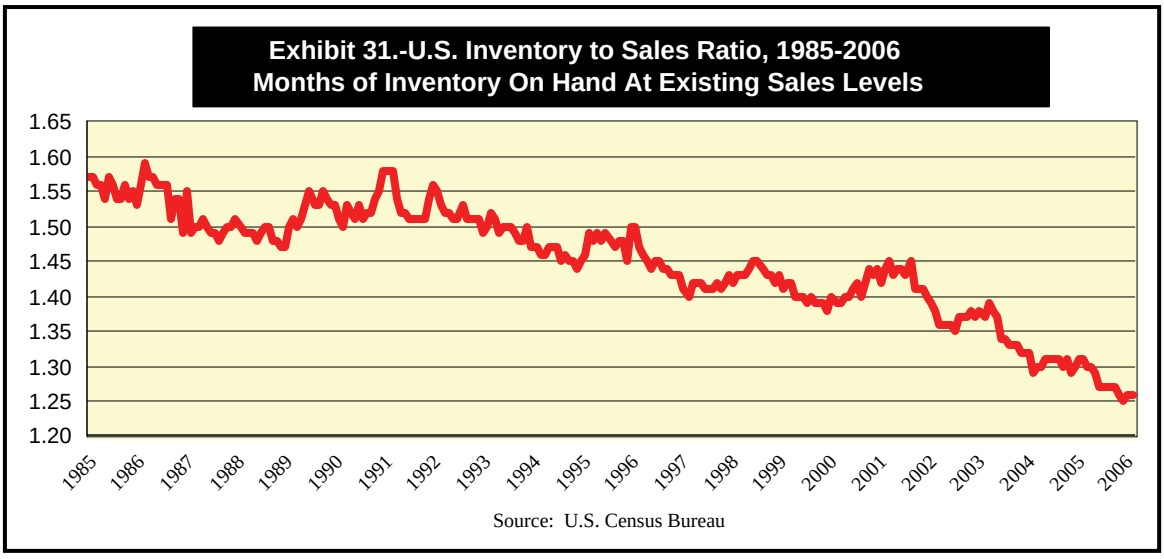
E-commerce is undoubtedly affecting the amount of air cargo moving through Southern California's transportation system. Airports are affected because a good deal of e-commerce is carried by dedicated air cargo planes flown for firms like UPS, FedEx and DHL. Intermodal rail yards are impacted because these companies ship goods cross-country by rail when that is less expensive and still meets their time schedules. For instance, the principal customer of Burlington Northern Santa Fe Railway's (BNSF) intermodal yard in San Bernardino is the UPS package handling facility at Ontario International Airport (ONT).[40]

Once containers reach local airports and intermodal yards, they must move to cross-docking facilities. Where rail is used, trucks must tow the containers along freeway routes to these cross-docks. Packages are then removed from the containers and loaded onto smaller trucks for delivery to local homes and businesses.

Given the acceleration in the volume of e-commerce, plus the rising number of people and retail trade in Southern California, this form of activity will have an increasing impact on the area's transportation infrastructure and associated environmental impacts.

5.4 Inventory: Sales Ratio Decline

In the early 1990s, the rising sophistication of information technology and advances in laser scanners created a revolution in the way retailers and manufacturers handled their inventories. Rather than borrowing money and buying inventories they hoped they would need, firms began ordering goods only after inventories were clearly disappearing. This "just in time" process made supply chain managers key players in allowing corporations to contain their inventory costs. It has forced the goods movement sectors to begin acting as an integrated industry. With the rise of the Asian economies and the stretching of inventory supplying lines across the Pacific Ocean, this process has made Southern California the key U.S. region in the goods movement business.



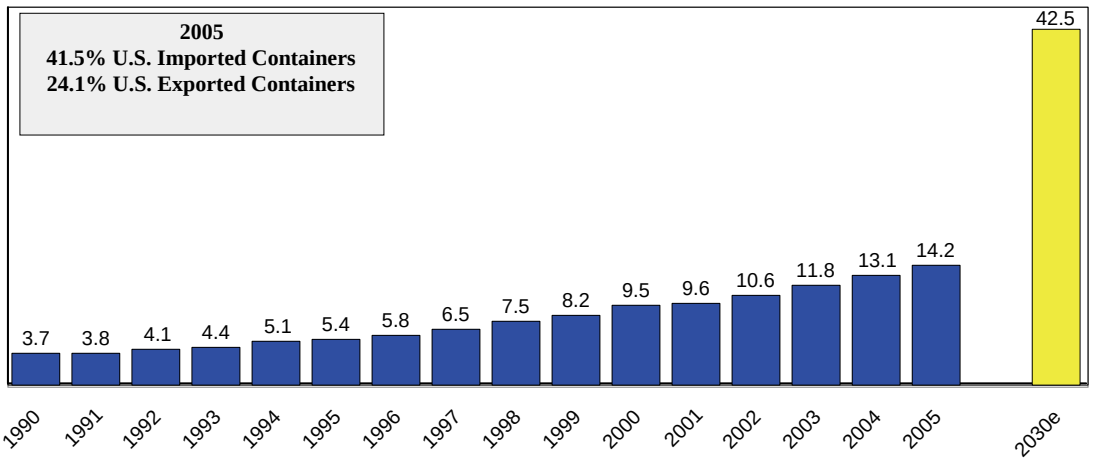
In 2006, the process continues. This is seen by the fact that the inventory to sales ratio in the U.S. continues to fall. When "just in time" processes were first being adopted, companies were maintaining an average of 1.58 months' worth of inventory relative to their sales levels. Now this ratio has reached new lows at 1.26 months' worth of inventory, as shown in Exhibit 31. That is a 20.3% reduction in the volume of inventories sitting on shelves. It is the reason why the top 10 firms trying to rapidly move Asian imports through the Ports of Los Angeles and Long Beach are all major retailers: Wal-Mart Stores, Inc., The Home Depot, Inc., Target Corporation, Lowe's Companies, Kmart Corporation, IKEA International A/S, Payless Shoe Source, Inc., Pier 1 Imports Inc., Big Lots Inc., Toys 'R Us, Inc., Limited Brands, Inc., and Michaels Stores.

5.5 Port Container Volume

For the "just in time" process to work efficiently, an important development was the standardization of container sizes and processes. As a result, a huge share of domestic and international trade now moves in these large boxes. From 1990-2005, the Ports of Los Angeles and Long Beach saw their volume increase

from 3.7 million TEUs in 1990 to 14.2 million TEUs in 2005. The growth has been particularly aggressive since 2000, when volume went from 9.5 million to 14.2 million TEUs, an average annual increase of 8.47%, as shown in Exhibit 32. The 2005 volume included 9,242,478 TEUs of imported containers (41.5% of U.S. volume), 2,066,443 TEUs (24.1% of U.S. volume) of exported containers, and 2,928,001 exported empty containers.[41]

Exhibit 32.-Port Container Traffic
Ports of Los Angeles & Long Beach, 1990-2005 & 2030e (million TEUs)



TEU=20 foot equivalent container units
Source: Port Import Export Reporting Service; forecast: Moffatt & Nichol Engineers

Looking ahead, unpublished internal studies performed for the Port of Long Beach by Moffatt & Nichol Engineers and JWD Group in support of the on-going Middle Harbor Environmental Impact Report forecasts that volume will reach 42,500,000 TEUs by 2030. That would represent a compound annual growth rate of 4.47% or just more than half the rate experienced from 2000-2005.

The major driver of port imports is the growing level of imports into the United States due to the acceleration in the production of low-cost Asian goods. From 1990-2005, the volume of Asian imports into the U.S. (annual value adjusted for changes in Asian import prices) have grown 4.5 times from $151.8 billion to $676.3 billion, as shown in Exhibit 33. They are up 1.5 times from 2000-2005. This has primarily been caused by the acceleration of Chinese imports, which grew 22.1 fold from 1990-2005 and 2.8 fold from 2000-2005. In light of the fact that Asian trade of this kind represents a newly emergent international force, it is likely that it will be playing out for a very long time. Therefore, the handling of imported merchandise will remain an important force in Southern California's economy.

Exhibit 33.-U.S. Imports from Asia, 1990-2005 (millions)
Adjusted For Changes In Asian Import Prices (2000=100)

Country	1990	2000	2005	Growth Factor 1990-2005	Growth Factor 2000-2005
China	$12,551	$100,723	$277,359	22.1	2.8
Japan	$73,875	$147,512	$156,035	2.1	1.1
Korea	$15,227	$40,592	$49,468	3.2	1.2
Taiwan	$18,670	$40,788	$39,365	2.1	1.0
Malaysia	$4,343	$25,749	$38,083	8.8	1.5
Thailand	$4,356	$16,501	$22,477	5.2	1.4
India	$2,633	$10,762	$21,251	8.1	2.0
Singapore	$8,073	$19,313	$17,082	2.1	0.9
Indonesia	$2,752	$10,440	$13,578	4.9	1.3
Philippines	$3,199	$14,033	$10,450	3.3	0.7
Australasian	$3,663	$6,483	$8,294	2.3	1.3
Vietnam	$0	$827	$7,492	NA	9.1
Pakistan	$502	$2,182	$3,676	7.3	1.7
New Zealand	$986	$2,095	$3,565	3.6	1.7
Bangladesh	$444	$2,435	$3,043	6.9	1.2
Sri Lanka	$443	$2,016	$2,354	5.3	1.2
Cambodia	$0	$831	$1,996	NA	2.4
Brunei	$24	$386	$636	26.3	1.6
Nepal	$60	$231	$126	2.1	0.5
Laos	$5	$10	$5	1.0	0.5
Bhutan	$0	$1	$1	8.2	0.8
Burma	$32	$474	$0	0.0	0.0
Asia	$151,839	$444,384	$676,335	4.5	1.5
2000-2005			8.76%		
1990-2005			10.47%		

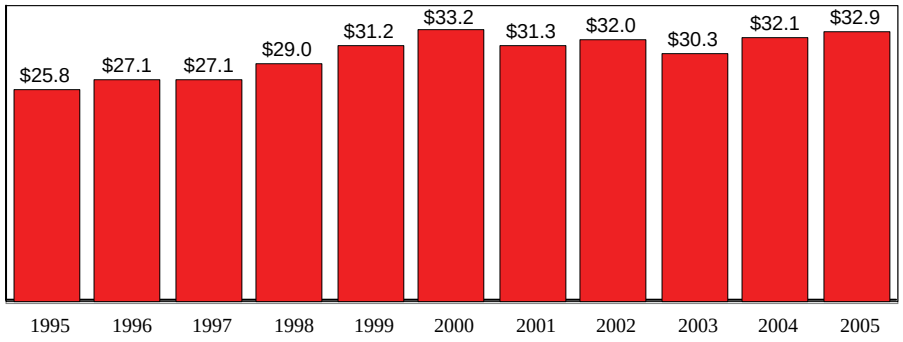
Source: U.S. Trade in Goods (*Imports, Exports, and Balance*) by Country, U.S. Census Bureau

5.6 Port Breakbulk Tonnage

With containerized shipping becoming the dominant method of moving trade, it is not surprising to find that the volume of breakbulk cargo moving through Southern California's four harbors has not grown as fast as container traffic. From 1995-2005, volume has gone from 25.8 million tons to 32.9 million tons, a gain of 7.1 million tons or 27.5%, a compound annual rate of 2.5%. However, volume is down 314,521 tons from the record of 33.2 million in 2000, as shown in Exhibit 34. Breakbulk cargo includes such items as vehicles, lumber, bananas and pineapples, and petroleum. One day, it might include a product like ethanol.

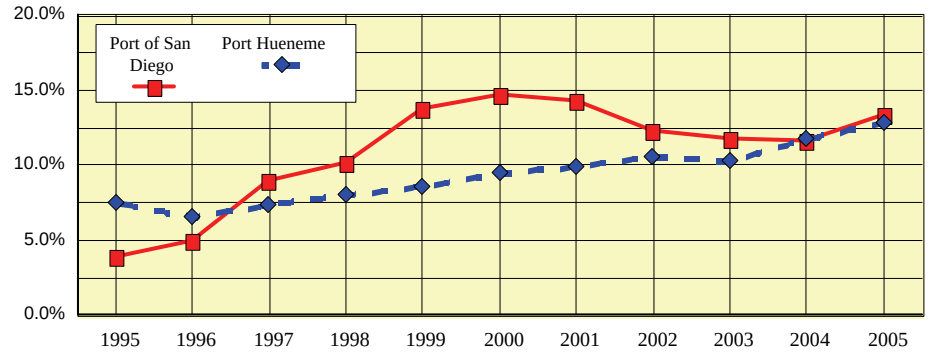
An important consideration for breakbulk cargo is the growing role in this trade being played by the Port of San Diego and Port Hueneme. From 1995-2005, the Port of San Diego has seen its share of Southern California's breakbulk tonnage increase from 3.9% to 13.4%. However, the share is down from a high of 14.7% in 2000. At the same time, the share handled by Port Hueneme went from 7.5% in 1995 to a record 12.8% in 2005, as shown in Exhibit 35. These facts are consistent with the fact that containerized cargo is putting significant pressure on the Ports of Los Angeles and Long Beach opening up the possibility of seeing an increasing distribution of breakbulk cargo to Southern California's other two ports.

Exhibit 34.-Breakbulk Cargo Growth
Southern California Ports, 1995-2005 (millions)



Source: Pacific Maritime Association

Exhibit 35.-Share of Southern California Breakbulk Cargo
Port of San Diego & Port Hueneme, 1995-2005



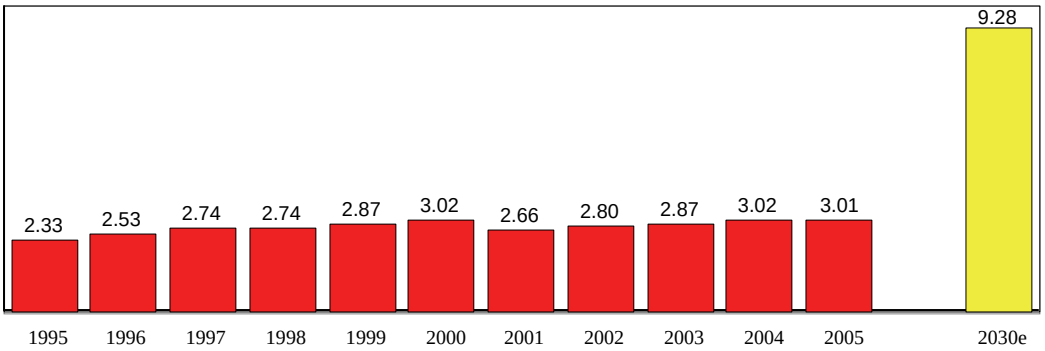
Source: Pacific Maritime Association

5.7 Air Cargo Tonnage

Like other airport-related operations, Southern California's air cargo was significantly impacted by the September 11 attacks. From 1995-2000, air cargo tonnage at airports from San Diego International through LAX grew at a 5.3% compound annual rate, growing from 2.33 million tons to 3.02 million, up 692,000 tons or 29.7%. In 2001, trade fell 357,500 tons to 2.66 million, a drop of 11.8%. From 2001-2005, air cargo has

been growing at a compound annual rate of 3.1%, growing from 347,000 tons to 3.01 million, up 13.0%. However, volume was down slightly in 2005 from 3.02 million tons the prior year, as shown in Exhibit 36.

Exhibit 36.-Air Cargo Volume
Southern California, 1995-2005 & 2030e (million tons)



Note (1): San Diego estimated 1995-1998 based upon 8.5% growth rate
Source: Each Airport, Southern California Association of Governments

Looking forward, industry professionals working with SCAG have concluded that air cargo will increase its rate of growth to a compound annual rate of 4.6% from 2005-2030. This will cause volume to triple to 9.29 million tons by 2030. If this forecast is realized, this sector will also have a buoying impact on the logistics group of sectors.

5.8 Local Manufacturing

Only one force impacting the volume of Southern California's goods movement volume and the pressure on its transportation infrastructure is in decline. That is the local manufacturing sector. It was shown earlier that from 1990-2005, this sector's employment decreased from 1,279,600 to 918,300 jobs, down 361,300 positions or -28.2%. (See Section 1.1, Exhibit 4) As indicated, much of the economic difficulty facing workers who have not gone beyond high school can be traced to the shrinkage of this sector.

From the standpoint of logistics, the slowing of local manufacturing cuts in two ways. Certainly it means that fewer goods are moving from Southern California producers to local warehouses and stores. That reduces pressure on the transportation network and decreases the number of jobs handling this merchandise. However, the lack of local production means that many goods used by local consumers must now enter the region from elsewhere. Some items come from other states by rail, truck, or air. A significant volume enters Southern California through its ports and airports. As a result, the reduction of local production has created increased demand for logistics jobs. On balance, it has probably led to a net increase in pressure on the region's transportation network.

6.1 Macro-Economic Impact Defined

How important is the logistics group of sectors to the total volume of economic activity in Southern California's economy?

Time Frame

There are two time frames for looking at this question:

Current Economy

Determine the extent to which the total level of economic activity in today's 7-county Southern California economy is attributable to the current size and range of activities in the goods movement sectors.

Future Economy

Determine how the future size of the region's overall economy would be affected by changes in volume of various logistics sectors.

Measures of Economic Impact

In either case, there are four conventional measures of total economic impact:

Total Economic Activity

This is the total amount of direct spending in an economy coming from a study sector that would not occur without it, as well as the indirect spending that is set off when this money is received and used by the study sectors suppliers and service providers, plus the induced spending this combination of money flows sets off because households have additional income to spend.

Total Value Added

This measure is akin to the U.S. Gross Domestic Product. It adds up the value created by each company to give an estimate of the total value created in an economy and by each sector. It differs from total sales activity since it eliminates the double counting that occurs when one firm's products are reused by another firm. For instance, if one firm sells flour and another buys it to make and sell bread, the sum of their sales would count the flour twice. Value added would subtract the flour's value from the second firm's sales. Value added allows an understanding of the share of the total value created in the economy that comes from logistics.

Total Jobs

For those concerned with employment, this provides a measure of how the logistics sectors impact the number of wage and salary and self-employed jobs in the economy. The impact includes both wage and salary and self-employed jobs.

Income

For those worried about household spending power, this gives a measure of how the logistics sectors impact the dollar amount of household spending power that comes through employee, proprietor, and property (e.g., corporate profits and rent) income.

Indirect Business Taxes

For those wishing to measure the impact that the logistics sector has on the sales taxes, property taxes, fees, licenses, and excise taxes paid to government, this provides a measure of this effect.

6.2 IMPLAN

A standard method of determining the impact of a sector is to use an input-output model of the study area economy. This model was developed at the University of Minnesota and is widely used in California for determining the economic and fiscal impacts of changes in a region's economy.[42] In this case, that study area is composed of the Southern California counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura. The IMPLAN organization provides 2003 data on the levels of employment and payroll in each sector of these counties as well as on how each sector of the region's economy interacts with every other sector. This information is based upon information generated by the U.S. Bureau of Economic Analysis. The model allows the seven county regions to be aggregated into a single economy. This process generated estimates that Southern California in 2003 was characterized by:

- Wage and Salary Jobs and Self-Employment: 11,321,518
- Total Personal Income: $652.4 billion
- Population: 20,323,861
- Households: 6,963,723

Note: There are two basic models used by economists to measure economic impact: IMPLAN and RIMS II developed by the U.S. Bureau of Economic Analysis (*BEA*). They yield very similar results because IMPLAN is based upon RIMS II and uses the basic data BEA annually updates for economic impact work in areas across the nation. IMPLAN is preferred by analysts because it is offered in a software framework that makes it more efficient to use. The third alternative would be to create a Southern California input-output model from scratch … which would be prohibitively expensive for most projects.

6.3 Current Economy

What is the current size of the logistics group of sectors in relation to the 7-county Southern California economy?

Logistics Sectors: Size

One way to measure impact of the logistics sectors is their combined size relative to Southern California's economy in 2003. This is a partial impact measure as it does not show the extent to which activity in the sector is responsible for activity in other sectors that depend upon it, as shown in Exhibit 37. It overstates "impact" as it does not answer the question of what other activities might have absorbed the workers and resources that were devoted to logistics, assuming that workers and resources did not end up unemployed or leave the area. As it is impossible to rewrite two decades of economic history, the best that can be said about such alternatives is that the slowing of the manufacturing sector has left a large share of the region's workers who have stopped their educations at high school or less with limited employment options. If the 687,837 people working in logistics in 2003 (*2005 pay: $47,411*) had needed to find work in other sectors, it would likely have be those with few educational barriers to entry. As shown (*Exhibit 15 page 2-6*), this would be limited to construction (*$42,714*) which is likely operating at capacity, plus agriculture (*$22,793*) and several population-serving sectors with relatively low 2005 annual average pay including: retail trade (*$28,840*), gaming (*$28,385*), accommodation (*$24,019*), other services (*automotive, household and electric repair and maintenance, personal care, laundry, member associations, household workers*) (*$22,340*), plus eating and drinking (*$15,132*). If they could not find work in these sectors, the other alternative would have been for the workers and other resources to leave Southern California or remain idle.

Exhibit 37.-Logistics Share of Southern California Economy, 2003

Activity	Full Economy	Full Economy No Logistics	Logistics Share	Percent Share
Economic Activity	$1,375,317,451,279	$1,284,650,259,262	$90,667,190,016	6.6%
Value Added	$812,662,857,216	$749,033,013,513	$63,629,838,928	7.8%
Employment	11,321,518	10,633,681	687,837	6.1%
Income	$750,618,332,001	$698,046,780,608	$52,571,546,809	7.0%
Employee Income	$448,056,070,268	$414,233,307,450	$33,822,760,088	7.5%
Proprietor Income	$75,336,482,236	$71,845,848,522	$3,490,633,569	4.6%
Other Property Income	$227,225,779,497	$211,967,624,636	$15,258,153,152	6.7%
Indirect Business Taxes	$62,044,525,215	$50,986,232,905	$11,058,290,946	17.8%

Source: IMPLAN Model, Southern California's seven counties

Logistics Sectors: Full Impact

A second way to measure impact of the logistics sectors on Southern California's economy in 2003 is to look at the degree to which removing them would reduce the size of the overall economy. This gives an indication of the extent to which activity in other sectors is dependent upon activity in the combined logistics sectors. Again, this is a partial analysis as it does not show the offset if workers and resources had been able to move into the other sectors likely to absorb them by 2003. Here, the offsets would likely be much less than the impact of logistics for two reasons. First, the sectors to which they would have been qualified to work instead of logistics pay from 39% to 68% less per job. Second, most are almost entirely local population-serving sectors, giving them small indirect and induced impacts upon the economy (*see "impacts explained" below*).

Procedure

The following procedure was used to estimate the impact of eliminating the logistics sectors:

The Southern California IMPLAN model was run, assuming reductions in the logistics sectors equal to their 2003 input-output volume, employment, and value added.

The results of the run showed the extent to which shrinkage in the logistics sector equal to its size would create indirect and induced reductions in the various sectors of the regional economy. As some of these indirect and induced effects reflect changes inside the logistics sectors themselves, that impact was subtracted out to look only at the effects on the balance of the economy.

The logistics reduction was divided into the total reduction including logistics to see the multiple by which the economy would fall without the logistics group.

Indirect Impacts Explained

When a cutback occurs in a sector, the purchases that firms in that sector were making from other sectors are also reduced. This is the indirect impact of the reduction. Thus, a logistics firm may buy fuel and accounting services from local providers. If the logistics firm disappears, those indirect impacts disappear.

Induced Impacts Explained

When a cutback occurs in a sector, the incomes that went to households from that sector, as well as to other sectors with which it does business, are no longer paid. Because incomes have fallen, the general spending reaching various sectors of the economy also falls. This is the induced impact of the reduction. Thus, a logistics firm pays its workers as do the fuel and accounting firms that deal with it. If the logistics firm disappears, those incomes disappear as does the spending throughout the economy that the families that did not receive that income would have made.

An example may help explain these phenomena. After World War II, the U.S. Navy used to pay its fleet in $2.00 bills when they reached a U.S. port. The sailors would spend money on the economy, thus indirectly

helping the firms that received their money. They knew the U.S. Navy was responsible because of the $2.00 bills they were receiving. When they paid their employees, this gave people the funds to spend supporting their families. Often, this was also in $2.00 bills which showed up in venues that had nothing to do with the sailors. However, those stores also knew that the ultimate source of their revenue was the money the U.S. Navy brought to the port.

Indirect and Induced Impact of Logistics

Using these procedures and concepts, the following is the result, as shown in Exhibit 38.
Economic Activity: If the $90.7 billion in economic activity associated with logistics had not occurred, there would have been $79.7 billion less indirect and induced activity in other parts of the economy. Combined, the economy would have had $170.4 billion fewer transactions. That was 1.88 times the economic activity in the sector itself.

Value Added: If the $63.6 billion in value added associated with logistics had not occurred, there would have been $49.5 billion less indirect and induced activity in other parts of the economy. Combined, the economy would have had $113.2 billion less value created. That was 1.78 times the value added from the sector itself.

Exhibit 38.-Direct, Indirect, Induced Impact of No Logistics Sector, 2003

Activity	Logistics Reduction	Indirect Reduction	Induced Reduction	Indirect/Induced Reductions	Total Reduction	Multiple
Economic Activity	$90,667,190,016	$22,761,908,986	$56,967,781,859	$79,729,690,845	$170,396,880,861	1.88
Value Added	$63,629,838,928	$12,369,287,323	$37,160,158,749	$49,529,446,073	$113,159,285,001	1.78
Employment	687,837	174,553	578,626	753,179	1,441,016	2.09
Income	$52,571,546,809	$11,555,061,766	$34,448,772,298	$46,003,834,063	$98,575,380,872	1.88
Employee Income	$33,822,760,088	$6,875,660,063	$21,187,629,895	$28,063,289,957	$61,886,050,045	1.83
Proprietor Income	$3,490,633,569	$1,417,713,527	$2,762,695,437	$4,180,408,964	$7,671,042,533	2.20
Other Property Income	$15,258,153,152	$3,261,688,176	$10,498,446,966	$13,760,135,142	$29,018,288,294	1.90
Indirect Business Taxes	$11,058,290,946	$814,225,573	$2,711,386,479	$3,525,612,052	$14,583,902,998	1.32

Source: IMPLAN Model, Southern California's seven counties

Wage and Salary Jobs and Self-Employment: If the 687,837 employed persons associated with logistics had not had work, the sector's indirect and induced impact on other parts of the economy would have meant that 753,179 other people would not have jobs. Combined, the economy would have had 1,441,016 fewer wage and salary jobs and self-employed people. That was 2.09 times the jobs associated with the sector itself.

Income: Without the logistics sectors, $52.6 billion in income would not have been paid to people associated with the group. In addition, $46.0 billion in income would not have been earned elsewhere in the economy, as the indirect and induced would not have occurred. Combined, people would have earned $98.6 billion less income. That was 1.88 times the income loss from the sector itself.

- Employee Income: Without the logistics sectors, $33.8 billion in income would not have been paid to workers associated with the group. In addition, $28.1 billion in income would not have been earned elsewhere in the economy, since the indirect and induced impacts would not have been created. Combined, people would have been paid $61.9 billion less in wages and salaries. That was 1.83 times the income loss from the sector itself.
- Self Employment Income: Without logistics sectors, $3.5 billion in income would not have been paid to entrepreneurs associated with the group. In addition, $4.2 billion in income would not have been earned by proprietors elsewhere in the economy, as the indirect and induced impacts would not have occurred. Combined, these business owners would have earned $7.7 billion less income. That was 2.20 times the income loss from the sector itself.
- Other Property Income: Without the logistics sectors, $15.3 billion in corporate profits, rents, and other property income would not have been paid to people associated with the group. In addition, $13.8 billion in such income would not have been earned elsewhere in the economy, as the indirect and induced impacts would not have occurred. Combined, these property owners would have earned $29.0 billion less income. That was 1.90 times the income loss from the sector itself.

Indirect Business Taxes: Without the logistics sectors, $11.1 billion in sales taxes, property taxes, fees, licenses and excise taxes would not have been paid to government. In addition, government would have lost another $3.5 billion in revenue since the indirect and induced activity would not occur in other parts of the economy. Combined, the government would not have seen $14.6 billion in indirect business taxes. That was 1.32 times the tax loss in the sector itself.

Exhibit 39.-Full Impact of Logistics Sectors on Southern California Economy, 2003

Activity	Full Economy	Logistics Reduction	Other Sectors Indirect/Induced	Total Reduction	Share of Economy
Economic Activity	$1,375,317,451,279	$90,667,190,016	$79,729,690,845	$170,396,880,861	12.4%
Value Added	$812,662,857,216	$63,629,838,928	$49,529,446,073	$113,159,285,001	13.9%
Employment	11,321,518	687,837	753,179	1,441,016	12.7%
Income	$750,618,332,001	$52,571,546,809	$46,003,834,063	$98,575,380,872	13.1%
Employee Income	$448,056,070,268	$33,822,760,088	$28,063,289,957	$61,886,050,045	13.8%
Proprietor Income	$75,336,482,236	$3,490,633,569	$4,180,408,964	$7,671,042,533	10.2%
Other Property Income	$227,225,779,497	$15,258,153,152	$13,760,135,142	$29,018,288,294	12.8%
Indirect Business Taxes	$62,044,525,215	$11,058,290,946	$3,525,612,052	$14,583,902,998	23.5%

Source: Exhibits 37-38

Full Economic Impact of Existing Logistics Sectors

Putting these results together, the following are the full impacts of the logistics sectors on Southern California's economy, as shown in Exhibit 39.

Economic Activity: $170.4 billion of the region's $1,375.3 billion in economic transactions occurred because of the logistics group, a 12.4% share.

Value Added: $113.2 billion of the region's $812.7 billion in total value created occurred because of the logistics group, a 13.9% share.

Employment: 1,441,016 of the region's 11,321,518 wage and salary and self-employment jobs existed because of the logistics group, a 12.7% share.

Income: $98.6 billion of the region's $750.6 billion in total income was earned due to the logistics group, a 13.1% share. This included:

- Wage & Salary Income: $61.9 billion of the region's $448.1 billion in wage and salary income or 13.8% existed because of logistics.
- Self-Employment Income: $7.7 billion of the region's $75.3 billion in proprietorship income or 10.2% existed because of logistics.
- Property Income: $29.0 billion of the $227.2 billion in corporate profit, rent, and other property income or 12.8% existed because of logistics.

Indirect Business Taxes: $14.6 billion of the region's $62.0 billion in sales taxes, property taxes, fees, licenses, and excise taxes paid to government occurred because of the logistics group, a 23.5% share.

Note: The importance of logistics to indirect business taxes likely comes about because direct sales of taxable items from warehousing firms is a major growing source of sales taxes in those communities with high concentrations of such facilities.[43]

Note: The full impacts described do not include any offsets if workers and resources could have found their way into other sectors willing to employ them as opposed to leaving or not coming to the region or remaining idle.

6.4 Multipliers and Forecasting the Impact of Logistics Sector Growth

How will changes in the logistics sector impact the 7-county Southern California economy? The key is to determine the multiple by which $1.00 reaching Southern California's economy through its logistics sectors causes the economy to increase as the money changes hands locally. A corollary is to find the extent to which one new job that is financed by funds entering Southern California's logistic sector, in turn, supports jobs elsewhere in the economy. These ratios are referred to in an economist's shorthand as "multipliers."

The primary use of the IMPLAN model is to forecast these kinds of impacts. The model uses its input-output equations to determine the direct impact of the new dollars flowing into an economy and the indirect and induced effects created as the money circulates through it.

Here, an analogy to an Old Western gold mining town might be helpful. There, the direct effect came about as outside monies came to the town's miners in exchange for gold. The miners, in turn, created the secondary tier of the town's economy when they re-spent the money locally:

- Indirect effects occurred when the mines purchased tools at the general store.
- Induced effects occurred when the miners and general store employees bought food, went to the barber shop, paid the sheriff, or went to the saloon.

The bigger the flow of "outside" money to the gold mines, the larger the "secondary" tier of indirect and induced activity that occurred in a town. However, when the mines went dry, the flow of "outside" dollars dried up, and the secondary tier of indirect and induced effects disappeared, creating a ghost town.

Assumptions: To facilitate calculations, assume that the logistics sector's activity increases 10% above its 2003 level ($90.7 billion) or $9.1 billion. Further, assume that this increase comes entirely from funds flowing into the sector from entities not in Southern California (e.g., international or non-Southern California shippers using the area's logistics system). For simplicity, assume that each logistics group is affected proportionately.

Note: The level of extra spending is not the key. The multiplier ratios apply to any level. The purpose of the exercise is thus to determine the size of the multipliers. The example assumed a hypothetical increase in funds entering from the outside world so that those multipliers could be generated.

A question arises about the fact that some trade creates a lot of impact on Southern California and other trade very little. The IMPLAN equations that determine multipliers were created from the actual economy in which the existing dollar values impacting Southern California's economy come from a mix of activities some of which have a significant local economic impact (*i.e., those subjected to extensive local handling*) and some of which do not (*i.e., those that directly leave the area by rail*). As a result, the impact of these differences are already in the modeling and incorporated into the multiplier ratios resulting from this exercise. The fact that some imported trade immediately leaves Southern California is the reason the multipliers are relatively small compared to those often found in this form of work.

In applying these multipliers to an increase in trade activity in Southern California, the key is to sort out the difference between changes at the ports driven by local dollars and those driven by outside dollars. Once that is done, then the multipliers apply as derived. That is done in looking at forecasts of changes in levels of trade entering the region.

Direct Spending Multiplier

The IMPLAN model for Southern California finds that the extra $9.1 billion in direct economic activity in the logistic sectors would have the following effects:

- As logistics firms buy goods and services from other Southern California firms, the model indicates that an additional $2.7 billion in indirect activity would be created.
- With more firms receiving and spending money, and household incomes rising and being spent on local goods and services, the IMPLAN model estimates that an additional $6.1 billion in induced economic activity would be created.
- Ultimately, all these forces will have played out as the money eventually leaks away to other regions. By then, the full impact will be $9.1 billion in direct, $2.7 billion in indirect and $6.1 billion in induced activity or an increase of $17.9 billion in Southern California's total economic activity.
- Each $1.00 reaching Southern California through its logistics group would thus raise the region's activity by 1.97 times that amount.

Exhibit 40.-Direct, Indirect, and Induced Multipliers From Increased Logistics Activity

Logistics Sector	Direct Impact	Share	Indirect Impact	Induced Impact	Total Secondary	Total Impact	Multiplier
Wholesale Trade	$6,422,546,000	70.8%					
Air Transportation	$622,382,000	6.9%					
Rail Transportation	$148,610,000	1.6%					
Water Transportation	$108,242,000	1.2%					
Truck Transportation	$1,086,682,000	12.0%					
Couriers	$366,327,000	4.0%					
Warehousing & Storage	$311,930,000	3.4%					
Economic Activity	$9,066,719,000	100.0%	$2,721,995,000	$6,086,901,000	$8,808,896,000	$17,875,615,000	1.97
Value Added	$6,362,984,000		$1,540,037,000	$3,992,341,000	$5,532,378,000	$11,895,362,000	1.87
Employment	68,784		21,393	60,770	82,163	150,947	2.19
Income	5,257,154,712		1,419,652,663	1,408,693,247	2,828,345,910	8,085,500,622	1.54
Wages & Salaries	3,382,276,101		854,972,995	2,264,734	857,237,729	4,239,513,830	1.25
Self-Employed Pay	349,063,338		161,920,695	291,189,722	453,110,417	802,173,755	2.30
Property Income	1,525,815,273		402,758,973	1,115,238,791	1,517,997,764	3,043,813,037	1.99
Indirect Business Taxes	1,105,829,147		120,384,053	321,552,750	441,936,803	1,547,765,950	1.40

Source: IMPLAN model with assumptions as indicated

Employment Multiplier

As the economic activity described in the Measures of Economic Impact section takes places, the IMPLAN model also shows the employment impacts of the new spending. Specifically:

- There would be 68,784 new jobs directly created in Southern California's logistic sectors.
- As logistics firms buy goods and services from other Southern California firms, 21,393 additional jobs would be indirectly created.

- With more firms receiving and spending money and household incomes rising and being spent on local goods and services, an additional 60,770 jobs would result from the induced economic activity.
- The full impact of creating the initial 68,784 jobs would thus be a total wage and salary and self employment expansion of 150,947 jobs.
- Each new job created in Southern California's logistics group would thus support 2.19 times that number of jobs in the economy. The workers in those other jobs would likely not know that it was the logistics sector that ultimately created work for them.

Other Impacts

As the economic scenario described under the Direct Spending Multiplier section plays out, the IMPLAN model also shows that other forms of economic activity would expand as shown in Exhibit 40.

Income

Total income would expand due to increased direct ($5.3 billion), indirect ($1.4 billion), and induced ($2.8 billion) impacts, giving local households $8.1 billion in extra income. This would include extra wages and salaries ($4.2 billion), self-employment income ($0.8 billion), and property income ($3.0 billion).

Indirect Taxes

As the new funds move through Southern California's economy, the direct, indirect, and induced impacts will cause sales taxes, property taxes, fees, licenses, and excise taxes paid to government to rise by a total of $1.5 billion.

Logistics Multipliers by Sub-Sector

Rather than lump the logistics sectors together, it is possible to determine the output and employment multipliers from increased outside spending reaching any one of the sub-sectors. Calculations were made assuming a $1 billion increase in each sector, separately, to calculate these expansion ratios. Again, the level of extra spending is not the key, the multiplier ratios apply to any level as shown in Exhibit 41.

Wholesale Trade

$1 billion in outside funding injected into the Southern California economy through the wholesale trade sector would create a total of $1.95 billion in direct, indirect, and induced economic activity, a multiplier of 1.95. In addition, that level of new spending would add 7,166 jobs directly in the sector and a total of 16,386 into the economy, a multiplier of 2.29.

Air Transportation

$1 billion in outside funding injected into the Southern California economy through the air transportation sector would create a total of $2.05 billion in direct, indirect, and induced economic activity, a multiplier of

2.05. In addition, that level of new spending would add 4,541 jobs directly in the sector and a total of 13,547 into the economy, a multiplier of 2.98. The sector's lower level of direct employment reflects its high level of capital intensiveness.

Exhibit 41.-Logistics Sub-Sectors Output and Employment Multipliers

Logistics Sector	Direct Impact	Indirect Impact	Induced Impact	Total Impact	Multiplier
Wholesale Trade Only	$1,000,000,000	$239,235,367	$712,566,964	$1,951,802,331	1.95
	7,166	2,009	7,211	16,386	2.29
Air Transportation	$1,000,000,000	$509,515,482	$540,084,339	$2,049,599,821	2.05
	4,541	3,765	5,241	13,547	2.98
Rail Transportation	$1,000,000,000	$307,172,558	$510,291,441	$1,817,463,999	1.82
	3,943	2,283	4,885	11,111	2.82
Water Transportation	$1,000,000,000	$380,790,248	$472,802,455	$1,853,592,703	1.85
	2,147	5,417	4,601	12,165	5.67
Truck Transportation	$1,000,000,000	$520,062,441	$592,974,407	$2,113,036,848	2.11
	9,280	3,630	5,659	18,569	2.00
Couriers	$1,000,000,000	$293,998,557	$591,121,230	$1,885,119,787	1.89
	15,122	1,988	5,621	22,731	1.50
Warehousing & Storage	$1,000,000,000	$244,287,506	$597,373,127	$1,841,660,633	1.84
	11,204	1,763	5,652	18,619	1.66

Source: IMPLAN Model Used with $1,000,000,000 assumption for each logistics sub-sector

Rail Transportation

$1 billion in outside funding injected into the Southern California economy through the rail transportation sector would create a total of $1.82 billion in direct, indirect, and induced economic activity, a multiplier of 1.82. In addition, that level of new spending would add 3,943 jobs directly in the sector and a total of 11,111 into the economy, a multiplier of 2.82. The sector's still lower level of direct employment reflects its even higher level of capital intensiveness.

Water Transportation

$1 billion in outside funding injected into the Southern California economy through the water transportation sector would create a total of $1.85 billion in direct, indirect, and induced economic activity, a multiplier of 1.85. In addition, that level of new spending would add 2,147 jobs directly in the sector and a total of 12,165 into the economy, a multiplier of 5.67. The sector had the lowest level of direct employment, reflecting its highest capital intensiveness. However, it takes many workers to support the sector, and workers are well paid, so the direct and induced effects yield the highest employment multiplier of the group.

Truck Transportation

$1 billion in outside funding injected into the Southern California economy through the truck transportation sector would create a total of $2.11 billion in direct, indirect, and induced economic activity, a multiplier of 2.11. In addition, that level of new spending would add 9,280 jobs directly in the sector and a total of 18,569 into the economy, a multiplier of 2.00. The sector had relatively high direct employment as the sector's output requires a lot of workers (e.g., one per truck).

Couriers

$1 billion in outside funding injected into the Southern California economy through the courier sector would create a total of $1.89 billion in direct, indirect, and induced economic activity, a multiplier of 1.89. In addition, that level of new spending would add 15,122 jobs directly in the sector and a total of 22,731 into the economy, a multiplier of 1.50. The sector's very high direct employment exists because its activities remain relatively labor intensive. Its low employment multiplier is a reflection of the lower average pay compared to the other logistics sectors.

Warehousing

$1 billion in outside funding injected into the Southern California economy through the warehousing sector would create a total of $1.84 billion in direct, indirect, and induced economic activity, a multiplier of 1.84. In addition, that level of new spending would add 11,204 jobs directly in the sector and a total of 18,619 into the economy, a multiplier of 1.66. The sector's relatively high direct employment exists because it is still somewhat labor intensive. Its low employment multiplier is also a reflection of somewhat lower average pay compared to the other logistics sectors.

Direct Rail Versus Transloaded Freight.

An important issue for which no multipliers exist is the question of the economic and job impacts of the differences between two kinds of cargo flows. One is freight that comes off of ships and is directly loaded on to trains for shipments out of Southern California. The other is for freight that arrives at the ports and moves by truck to cross docks, intermodal facilities or warehouses for further processing. This is called "transloaded" freight.

Freight that moves directly out of the area by train has almost no Southern California impact since it involves very little local value added activity or employment creation. It would thus have multipliers close to zero. On the other hand, almost all of the economic impact from goods movement involves freight that undergoes some form(s) of local handling or transloading. The multipliers for this type of cargo would be higher than those shown above. That is the case as the multipliers above are averages that that include the impact of both directly shipped freight and transloaded freight. The directly shipped freight thus dampens the size of the multipliers.

To the extent that Southern California wishes to maximize the economic impact of goods movement, this distinction argues for having the area seek to maximize transloaded freight and discourage cargo that directly leaves the region by rail.

Economic Impact Summary

When outside money reaches Southern California's logistics sectors, it directly expands the region's economic activity, employment, income, and government revenues. As the same money reaches firms supplying goods and services to the sector, an indirect expansion occurs. Ultimately, the funds reach other firms and households. As they spend, it induces a further expansion in the economy. The IMPLAN model quantifies the level of these expansions, depending on what sectors first receive the new funds.

Other

A request was made to comment on work by the Public Policy Institute of California (*PPIC*) on the issue of international trade through the ports. The 2004 study, California's Globe Gateways: Trends and Issues was thus reviewed. The study is a good understanding of the issue in 2003-2004. However, thinking has advanced considerably since then. The need for environmental and the infrastructure investments are clearer as well as what those investments need to be. There has been a sharpening of the potential mix of public and private financing vehicles that can finance both. There has also been specificity developed in terms of the federal legislation needed to deal with these issues. The one area that is not covered in the PPIC report is the employment impact of trade, not in gross numbers, but in terms of the potential that job creation related to trade offers to blue collar workers in terms of career paths leasing to the Middle Class largely via on-the-job learning. This is an important factor given the 44% share of adult workers in Southern California who have not been educated beyond high school.

[1] See Sections 1.6 for detailed discussion of logistics facilities and operation of the system.

[2] See Sections 1.1 to 1.5 for detailed discussion of the economic challenge facing Southern California.

[3] See detailed discussion of pay levels and skill ladders of logistics sectors in Section 3.0.

[4] See Section 2.0 for details of logistics sector definitions and mean pay scales for workers in blue collar sectors.

[5] See Section 5.0 for detailed discussion of the drivers impacting the growth of logistics in Southern California.

[6] See Section 4.0 for detailed discussion of square footage per job in logistics and manufacturing.

[7] See Section 6.0 for detailed discussion of macro-economic impacts.

[8] Imperial County is not in the Southern California average as it was too small to be included in the 2004 American Community Survey. If its share were unchanged by 2004, it would raise the Southern California figure to 44.2%.

[9] San Diego County's communities are part of the San Diego Association of Governments, not SCAG.

[10] The others were: agriculture (-9,700), mining (-6,600), and utilities (-3,400).

[11] Port of Los Angeles Portwide Rail Synopsis, Jones and Stokes, page 10.

[12] Sea-going containers are typically 40 feet long (2 TEUs); landside containers are most often 53 feet long. Goods are typically transloaded from one to the other in Southern California.

[13] Port and Modal Elasticity Study Elasticity Study, Dr. Robert Leachman, Ph.D., under contract to Southern California Association of Governments, 2005. According to Leachman, the breakeven point for a rail versus truck decision is at 769 miles.

[14] Southern California Regional Strategy for Goods Movement: A Plan For Action, 2005, page 18.

[15] Goods Movement Truck and Rail Study, The Tioga Group under contract to Southern California Association of Governments, 2003, Executive Summary.

[16] Pier*PASS* OffPeak Program Diverts 2 Millionth Truck from Los Angeles Daytime Traffic, news release, May 25, 2006.

[17] Consolidation Activity in Southern California Area, BST Associates under contract to Alameda Corridor Transportation Authority, 2003.

[18] Port & Modal Elasticity Study, Dr. Robert Leachman, Leachman & Associates under contract to SCAG

[19] Quarterly Census of Employment and Wages. These data are generated quarterly and provide the employment, number of establishments, and payroll for employers enrolled in the Unemployment Insurance Program. This information is collected through a federal-state cooperative agreement between the U.S. Bureau of Labor Statistics and the California EDD. To access these data :http://www.labormarketinfo.edd.ca.gov/cgi/dataanalysis/AreaSelection.asp?tableName=Industry. The program was formerly called the ES202 Program.

[20] The Labor Market for Port Drivers in Southern California, Kristen Monaco, California State University Long Beach, August 30, 2005, pages 17-18. This paper used information from Study of Drayage at the Ports of Los Angeles and Long Beach, Kristen Monaco and Lisa Grobar, December 15, 2004.

[21] Non-Employer Statistics, Truck Transportation, U.S. Census Bureau. 2003 data based upon Non-Employer Statistics that provide U.S. and sub-national economic data by industry for businesses that have no paid employees and are subject to federal income tax. Data are primarily comprised of sole proprietorship businesses filing IRS Form 1040, Schedule C, although some of the data is derived from filers of partnership and corporation tax returns that report no paid employees. Updated annually using 2002 Census data as a base.

[22]Total Railroad Employment by State And County, Calendar Year 2004, U.S. Railroad Retirement Board.

[23]Wage and Salary Accruals per Full-Time Equivalent Employee by Industry, Table 6.6D, U.S. National Income and Product Accounts, U.S. Bureau of Economic Analysis, 2004.

[24] In a prior study (Logistics & Distribution: An Answer to Regional Upward Social Mobility, Husing, 2004) using 2003 data for just SCAG counties (San Diego omitted) and without independent truckers, it was found that logistics paid a little more than manufacturing. The 2005 data yield the same result. In the SCAG area only, manufacturing averaged $47,466 and the logistics group without independent truckers averaged $48,048. The inclusion of independent truckers (average pay: $31,093) lowers the 2005 logistics in the SCAG region to $47,270. The inclusion of San Diego County (manufacturing average: $55,620) raised the manufacturing to $48,397 and logistics with independent truckers to $47,411.

[25] The use of wage and salary data for this comparison omits the changes in self-employed truckers due to lack of data for 1990.

[26]Occupational Employment Statistics (OES) survey is a semiannual mail survey measuring occupational employment and occupational wage rates for wage and salary workers in non-farm establishments, by industry, by area. The survey samples about 37,000 establishments per year, taking 3 years to fully collect the sample of approximately 113,000 establishments in California. Wage data for all geographical areas are updated by applying the U. S. Department of Labor's Employment Cost Index to the wage database. The updated wage data have not been validated by BLS. However, EDD indicates that they feel that the updated information is useful to users of wage data.

[27]http://www.labormarketinfo.edd.ca.gov/cgi/dataanalysis/AreaSelection.asp?tableName=Oeswage provides Occupational Employment Statistics by SMA for the major counties and Imperial under OES Survey Region.

[28] CA Industry Staff Patterns are created from the data on the 113,000 establishments sampled during the OES survey. Using http://www.calmis.ca.gov/file/IOMatrix/Staffing-Patterns1.htm, staffing patterns and experience or educational levels by OES code are available for the numerous sub-sectors of the logistics group.

[29] BLS Training Level Definitions at EDD website:
http://www.calmis.cahwnet.gov/FILE/resource/BLStrainlvl.htm

[30] Note that four of the categories involve no institutional training beyond high school. The exceptions are two levels involving community college or trade school degrees and two levels involving college degrees.

[31]From the Quarterly Census of Employment and Wages based on unemployment insurance filings (*see footnote 1*).

[32] A study of entry-level pay in various logistics functions in San Bernardino County found: general warehouse associate (no equipment usage) $10/hour; forklift operator, few at $10/hour, most $12-$14/hour; Class A truck drivers, $12-$18/hour; receptionist (no computer usage) $9-$10/hour; data entry clerk/shipping clerk/receiving clerk $12-$14/hour, Kathi Rodriquez, Director of High Growth Job Initiatives, Chaffey College.

[33] Merrick-Memorial Neighborhood Redevelopment, Plan, Vanasse Hanger Brustlin, Inc., December 1, 2004.

[34] Documenting the Economic Contribution of Office, Industrial, and Retail Real Estate to the Local Community, Stephen Fuller, Ph.D., George Mason University, October 2004.

[35] 2004 Regional Transportation Program, Southern California Association of Governments, 2004, page. 36.

[36] E-5 Report, Demographic Research Unit, CA Department of Finance, 2006.

[37] SCAG draft Preliminary 2008 RTP baseline technical projections, 2006.

[38] Taxable Sales in California, CA State Board of Equalization, 1994-2004; adjusted by Los Angeles-Anaheim-Riverside Consumer Price Index, U.S. Bureau of Labor Statistics, E-5 Report, CA Department of Finance. 1994 used as starting point, as Southern California's 1990-1993 recession/depression was an extreme anomaly due to the end of the Cold War and the loss of 485,956 jobs in a region inordinately dependent on defense spending.

[39] Quarterly U.S. Retail Sales (Not Adjusted): Total and E-commerce in Quarterly Retail E-Commerce Sales, U.S. Census Bureau, http://www.census.gov/mrts/www/ecomm.html.

[40] Interview with Jerry Washington, former manager, BNSF's Intermodal yard, San Bernardino.

[41] Port Import Export Reporting Service data collected from vessel manifests and bills of lading.

[42] IMPLAN Professional Version 2.0, Minnesota IMPLAN Group, Inc.

[43] Examples: In Ontario, 31.2% of its 1990-2004 change in retail sales is from non-store sales. In Corona, it was 41.0%. It was 36.3% in Chino. By contrast, it was 14.5% in Temecula, a suburban city without a concentration of such facilities, and 26.0% in Garden Grove, a mature city with a modest sized industrial area.

OES Codes for Educational & Functional Categories

By Sector, With 2002 Weights

Code	Education Level Category
1	Work Experience & Bachelor's or Higher
2	Bachelor's Degree
3	Post-Secondary Vocational Education
4	Associate's Degree
5	Long-Term On-the-Job Training
6	Moderate-Term On-the-Job Training
7	Work Experience Related Occupation
8	Short-Term On-the-Job Training

Code	Functional Category
1	Fixed Site Operations
2	Trucking or Field Operations
3	Administration & Admin. Support
4	Sales & Customer Support
5	Craft & Repair
6	Finance & Information

Note: Median Pay By Category Used With This Information Was The Weighted Average of Median Pay for OES Codes In The Seven Southern California Counties

WAREHOUSING & DISTRIBUTION SECTORS

Motor Vehicle/Part Merchant Wholesalers NAICS Code 423100

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	1,100
113071	1	1	Transportation, Storage, and Distribution Managers	100
119199	3	1	Managers, All Other	400
339032	8	1	Security Guards	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	100
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	600
435061	8	1	Production, Planning, and Expediting Clerks	100
435071	8	1	Shipping, Receiving, and Traffic Clerks	1,600
435081	8	1	Stock Clerks and Order Fillers	1,900
435111	8	1	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	500
499042	6	1	Maintenance and Repair Workers, General	300
499099	6	1	Installation, Maintenance, and Repair Workers, All Other	200
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	200
512092	8	1	Team Assemblers	500
519061	3	1	Inspectors, Testers, Sorters, Samplers, and Weighers	400
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	200
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	2,300
537064	8	1	Packers and Packagers, Hand	100
493021	6	2	Automotive Body and Related Repairers	500
493023	6	2	Automotive Service Technicians and Mechanics	600
493031	6	2	Bus and Truck Mechanics and Diesel Engine Specialists	1,300
493052	6	2	Motorcycle Mechanics	100
519122	7	2	Painters, Transportation Equipment	100
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	100
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	300
533033	8	2	Truck Drivers, Light or Delivery Services	3,000
533099	8	2	Motor Vehicle Operators, All Other	1,400
537051	8	2	Industrial Truck and Tractor Operators	300
537061	8	2	Cleaners of Vehicles and Equipment	300
111011	1	3	Chief Executives	300
113011	1	3	Administrative Services Managers	100
113021	1	3	Computer and Information Systems Managers	100
113040	1	3	Human Resources Managers	100
113061	1	3	Purchasing Managers	100
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	400
131023	2	3	Purchasing Agents, Except Wholesale, Retail, and Farm Products	300
131073	2	3	Training and Development Specialists	100
131111	2	3	Management Analysts	200
131199	1	3	Business Operations Specialists, All Other	1,400
412011	8	3	Cashiers	200
412021	8	3	Counter and Rental Clerks	200
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	600
432011	7	3	Switchboard Operators, Including Answering Service	100

434151	8	3	Order Clerks	700
434171	8	3	Receptionists and Information Clerks	100
436011	7	3	Executive Secretaries and Administrative Assistants	500
436014	7	3	Secretaries, Except Legal, Medical, and Executive	200
439061	8	3	Office Clerks, General	1,900
439999	8	3	All other secretaries, administrative assistants,	300
112011	1	4	Advertising and Promotions Managers	100
112021	1	4	Marketing Managers	100
112022	1	4	Sales Managers	400
193021	4	4	Market Research Analysts	100
271024	4	4	Graphic Designers	100
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	300
412022	8	4	Parts Salespersons	2,200
412031	8	4	Retail Salespersons	400
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	200
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	4,100
419041	8	4	Telemarketers	200
434051	8	4	Customer Service Representatives	500
533031	8	4	Driver/Sales Workers	1,100
172141	2	5	Mechanical Engineers	100
172199	2	5	Engineers, All Other	100
173023	2	5	Electrical and Electronic Engineering Technicians	0
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	400
514041	6	5	Machinists	500
514121	5	5	Welders, Cutters, Solderers, and Brazers	300
113031	1	6	Financial Managers	300
132011	2	6	Accountants and Auditors	400
132041	2	6	Credit Analysts	100
151021	2	6	Computer Programmers	200
151041	2	6	Computer Support Specialists	100
151051	2	6	Computer Systems Analysts	100
151071	2	6	Network and Computer Systems Administrators	0
433011	8	6	Bill and Account Collectors	300
433021	8	6	Billing and Posting Clerks and Machine Operators	200
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	1,400
433051	8	6	Payroll and Timekeeping Clerks	100
439011	7	6	Computer Operators	100
439021	7	6	Data Entry Keyers	100
				41,200

Lumber and Supply Merchant Wholesalers NAICS Code 423300

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	700
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	0
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	400
435032	7	1	Dispatchers, Except Police, Fire, and Ambulance	100
435071	8	1	Shipping, Receiving, and Traffic Clerks	400
499042	6	1	Maintenance and Repair Workers, General	100
499099	6	1	Installation, Maintenance, and Repair Workers, All Other	0
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	100
512092	8	1	Team Assemblers	800
512099	8	1	Assemblers and Fabricators, All Other	100
519061	3	1	Inspectors, Testers, Sorters, Samplers, and Weighers	100
519111	7	1	Packaging and Filling Machine Operators and Tenders	0
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	200
537011	7	1	Conveyor Operators and Tenders	0
537032	7	1	Excavating and Loading Machine and Dragline Operators	100
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	2,900
537064	8	1	Packers and Packagers, Hand	100
493031	6	2	Bus and Truck Mechanics and Diesel Engine Specialists	100
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	200
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	2,100
533033	8	2	Truck Drivers, Light or Delivery Services	1,000
537051	8	2	Industrial Truck and Tractor Operators	1,500
111011	1	3	Chief Executives	100
113011	1	3	Administrative Services Managers	100
113061	1	3	Purchasing Managers	100
131021	3	3	Purchasing Agents and Buyers, Farm Products	0
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	200
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	400
434151	8	3	Order Clerks	300
434171	8	3	Receptionists and Information Clerks	200
436011	7	3	Executive Secretaries and Administrative Assistants	100
436014	7	3	Secretaries, Except Legal, Medical, and Executive	100
439061	8	3	Office Clerks, General	400
112022	1	4	Sales Managers	200
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	100
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	3,300
472031	3	5	Carpenters	100
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	100
514041	6	5	Machinists	100
514121	5	5	Welders, Cutters, Solderers, and Brazers	0
517042	6	5	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	200
519032	7	5	Cutting and Slicing Machine Setters, Operators, and Tenders	0
113031	1	6	Financial Managers	100

131051	3	6	Cost Estimators	100
132011	2	6	Accountants and Auditors	100
433011	8	6	Bill and Account Collectors	100
433021	8	6	Billing and Posting Clerks and Machine Operators	100
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	800
				18,400

Commercial Goods Merchant Wholesalers NAICS Code 423400

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	2.200
113071	1	1	Transportation, Storage, and Distribution Managers	100
119199	3	1	Managers, All Other	200
339032	8	1	Security Guards	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	100
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	1.200
435032	7	1	Dispatchers, Except Police, Fire, and Ambulance	100
435061	8	1	Production, Planning, and Expediting Clerks	600
435071	8	1	Shipping, Receiving, and Traffic Clerks	4.000
435081	8	1	Stock Clerks and Order Fillers	2.900
435111	8	1	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	100
499042	6	1	Maintenance and Repair Workers, General	1.000
499098	8	1	Helpers--Installation, Maintenance, and Repair Workers	100
499099	6	1	Installation, Maintenance, and Repair Workers, All Other	200
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	300
512092	8	1	Team Assemblers	3.300
512099	8	1	Assemblers and Fabricators, All Other	300
519061	3	1	Inspectors, Testers, Sorters, Samplers, and Weighers	500
519111	7	1	Packaging and Filling Machine Operators and Tenders	300
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	200
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	1.100
537064	8	1	Packers and Packagers, Hand	700
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	200
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	200
533033	8	2	Truck Drivers, Light or Delivery Services	1.000
537051	8	2	Industrial Truck and Tractor Operators	1.500
537061	8	2	Cleaners of Vehicles and Equipment	100
111011	1	3	Chief Executives	400
113011	1	3	Administrative Services Managers	200
113021	1	3	Computer and Information Systems Managers	900
113040	1	3	Human Resources Managers	200
113061	1	3	Purchasing Managers	200
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	1.000
131023	2	3	Purchasing Agents, Except Wholesale, Retail, and Farm Products	200
131041	3	3	Compliance Officers, Except Ag, Constr, Health-Safety, and Transportation	100
131073	2	3	Training and Development Specialists	100
131111	2	3	Management Analysts	100
131199	1	3	Business Operations Specialists, All Other	900
273042	4	3	Technical Writers	100
273043	4	3	Writers and Authors	100
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	1.300
432011	7	3	Switchboard Operators, Including Answering Service	200
434071	8	3	File Clerks	100
434151	8	3	Order Clerks	1.500
434161	8	3	Human Resources Assistants, Except Payroll and Timekeeping	100
434171	8	3	Receptionists and Information Clerks	700
436011	7	3	Executive Secretaries and Administrative Assistants	900
436014	7	3	Secretaries, Except Legal, Medical, and Executive	700
439051	8	3	Mail Clerks and Mail Machine Operators, Except Postal Service	300
439061	8	3	Office Clerks, General	1.900
439071	8	3	Office Machine Operators, Except Computer	800
492011	3	3	Computer, Automated Teller, and Office Machine Repairers	5.000

112011	1	4	Advertising and Promotions Managers	100
112021	1	4	Marketing Managers	400
112022	1	4	Sales Managers	1,200
193021	4	4	Market Research Analysts	400
271024	4	4	Graphic Designers	100
273031	4	4	Public Relations Specialists	100
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	100
412031	8	4	Retail Salespersons	300
413011	8	4	Advertising Sales Agents	100
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	7,300
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	9,100
419031	7	4	Sales Engineers	400
419041	8	4	Telemarketers	900
419099	7	4	Sales and Related Workers, All Other	200
434051	8	4	Customer Service Representatives	2,100
533031	8	4	Driver/Sales Workers	100
113051	1	5	Industrial Production Managers	100
119041	1	5	Engineering Managers	200
172031	2	5	Biomedical Engineers	0
172061	2	5	Computer Hardware Engineers	200
172071	2	5	Electrical Engineers	100
172072	2	5	Electronics Engineers, Except Computer	200
172112	2	5	Industrial Engineers	100
172141	2	5	Mechanical Engineers	100
173023	2	5	Electrical and Electronic Engineering Technicians	900
173024	2	5	Electro-Mechanical Technicians	400
193099	4	5	Social Scientists and Related Workers, All Other	200
472031	3	5	Carpenters	200
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	800
492094	5	5	Electrical and Electronics Repairers, Commercial and Industrial Equipment	100
499061	6	5	Camera and Photographic Equipment Repairers	200
499062	6	5	Medical Equipment Repairers	300
499069	6	5	Precision Instrument and Equipment Repairers, All Other	700
512022	3	5	Electrical and Electronic Equipment Assemblers	200
514041	6	5	Machinists	200
514121	5	5	Welders, Cutters, Solderers, and Brazers	100
519083	3	5	Ophthalmic Laboratory Technicians	200
113031	1	6	Financial Managers	700
132011	2	6	Accountants and Auditors	1,000
132041	2	6	Credit Analysts	100
132051	2	6	Financial Analysts	100
132099	2	6	Financial Specialists, All Other	100
151021	2	6	Computer Programmers	2,000
151031	2	6	Computer Software Engineers, Applications	700
151032	2	6	Computer Software Engineers, Systems Software	800
151041	2	6	Computer Support Specialists	2,300
151051	2	6	Computer Systems Analysts	1,100
151061	2	6	Database Administrators	200
151071	2	6	Network and Computer Systems Administrators	600
151081	2	6	Network Systems and Data Communications Analysts	100
151099	2	6	Computer Specialists, All Other	1,200
433011	8	6	Bill and Account Collectors	700
433021	8	6	Billing and Posting Clerks and Machine Operators	1,600
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	1,900
433051	8	6	Payroll and Timekeeping Clerks	100
434041	8	6	Credit Authorizers, Checkers, and Clerks	200

434999	8	6	All other financial. information. and record clerk	0
439011	7	6	Computer Operators	900
439021	7	6	Data Entry Keyers	200
				85.600

Metal and Mineral Merchant Wholesalers NAICS Code 423500

OES Code	Education	Function	Job Title	*2002 Weights*
111021	1	1	General and Operations Managers	500
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	200
435071	8	1	Shipping, Receiving, and Traffic Clerks	600
435081	8	1	Stock Clerks and Order Fillers	400
499042	6	1	Maintenance and Repair Workers, General	100
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	200
512092	8	1	Team Assemblers	300
519111	7	1	Packaging and Filling Machine Operators and Tenders	100
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	100
537021	7	1	Crane and Tower Operators	200
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	900
537064	8	1	Packers and Packagers, Hand	0
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	100
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	700
533033	8	2	Truck Drivers, Light or Delivery Services	300
537051	8	2	Industrial Truck and Tractor Operators	600
111011	1	3	Chief Executives	100
113011	1	3	Administrative Services Managers	100
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	200
131199	1	3	Business Operations Specialists, All Other	100
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	200
434151	8	3	Order Clerks	200
434171	8	3	Receptionists and Information Clerks	100
436011	7	3	Executive Secretaries and Administrative Assistants	100
436014	7	3	Secretaries, Except Legal, Medical, and Executive	100
439061	8	3	Office Clerks, General	400
112022	1	4	Sales Managers	100
412031	8	4	Retail Salespersons	100
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	1,600
434051	8	4	Customer Service Representatives	100
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	0
512041	3	5	Structural Metal Fabricators and Fitters	200
514031	7	5	Cutting, Punching, and Press Machine Operators, Metal and Plastic	300
514041	6	5	Machinists	500
514121	5	5	Welders, Cutters, Solderers, and Brazers	600
514199	5	5	Metal Workers and Plastic Workers, All Other	200
113031	1	6	Financial Managers	100
132011	2	6	Accountants and Auditors	100
433011	8	6	Bill and Account Collectors	100
433021	8	6	Billing and Posting Clerks and Machine Operators	200
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	300
				11,400

Electric Goods Merchant Wholesalers NAICS Code 423600

OES Code	Education	Function	Job Title	*2002 Weights*
111021	1	1	General and Operations Managers	1,800
113071	1	1	Transportation, Storage, and Distribution Managers	200
119199	3	1	Managers, All Other	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	100
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	1,400
435061	8	1	Production, Planning, and Expediting Clerks	500
435071	8	1	Shipping, Receiving, and Traffic Clerks	2,700
435081	8	1	Stock Clerks and Order Fillers	1,300
435111	8	1	Weighers, Measurers, Checkers, and Samplers, Record keeping	100
499042	6	1	Maintenance and Repair Workers, General	100
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	300
512092	8	1	Team Assemblers	1,300
512099	8	1	Assemblers and Fabricators, All Other	200
519061	3	1	Inspectors, Testers, Sorters, Samplers, and Weighers	1,000
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	200
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	1,100
537064	8	1	Packers and Packagers, Hand	500
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	100
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	100
533033	8	2	Truck Drivers, Light or Delivery Services	900
537051	8	2	Industrial Truck and Tractor Operators	300
537061	8	2	Cleaners of Vehicles and Equipment	0
111011	1	3	Chief Executives	300
113011	1	3	Administrative Services Managers	100
113021	1	3	Computer and Information Systems Managers	300
113040	1	3	Human Resources Managers	100
113061	1	3	Purchasing Managers	300
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	900
131023	2	3	Purchasing Agents, Except Wholesale, Retail, and Farm Products	200
131073	2	3	Training and Development Specialists	0
131199	1	3	Business Operations Specialists, All Other	500
412021	8	3	Counter and Rental Clerks	100
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	700
432011	7	3	Switchboard Operators, Including Answering Service	200
433061	8	3	Procurement Clerks	0
434151	8	3	Order Clerks	1,100
434161	8	3	Human Resources Assistants, Except Payroll and Timekeeping	100
434171	8	3	Receptionists and Information Clerks	500
436011	7	3	Executive Secretaries and Administrative Assistants	700
436014	7	3	Secretaries, Except Legal, Medical, and Executive	600
439061	8	3	Office Clerks, General	1,900
492011	3	3	Computer, Automated Teller, and Office Machine Repairers	100

112011	1	4	Advertising and Promotions Managers	100
112021	1	4	Marketing Managers	200
112022	1	4	Sales Managers	900
193021	4	4	Market Research Analysts	100
271024	4	4	Graphic Designers	100
412022	8	4	Parts Salespersons	100
412031	8	4	Retail Salespersons	200
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	5,100
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	6,300
419031	7	4	Sales Engineers	500
419099	7	4	Sales and Related Workers, All Other	300
434051	8	4	Customer Service Representatives	2,000
119041	1	5	Engineering Managers	300
172061	2	5	Computer Hardware Engineers	100
172071	2	5	Electrical Engineers	400
172072	2	5	Electronics Engineers, Except Computer	700
172112	2	5	Industrial Engineers	100
172141	2	5	Mechanical Engineers	200
172199	2	5	Engineers, All Other	0
173023	2	5	Electrical and Electronic Engineering Technicians	1,000
173024	2	5	Electro-Mechanical Technicians	100
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	100
492022	3	5	Telecommunications Equip Installers and Repairers, Except Line Installers	100
492092	5	5	Electric Motor, Power Tool, and Related Repairers	1,500
492094	5	5	Electrical and Electronics Repairers, Commercial and Industrial Equipment	700
492097	5	5	Electronic Home Entertainment Equipment Installers and Repairers	100
499052	6	5	Telecommunications Line Installers and Repairers	100
514041	6	5	Machinists	200
514121	5	5	Welders, Cutters, Solderers, and Brazers	400
514199	5	5	Metal Workers and Plastic Workers, All Other	100
113031	1	6	Financial Managers	500
131051	3	6	Cost Estimators	100
132011	2	6	Accountants and Auditors	800
132041	2	6	Credit Analysts	100
151021	2	6	Computer Programmers	300
151031	2	6	Computer Software Engineers, Applications	200
151032	2	6	Computer Software Engineers, Systems Software	100
151041	2	6	Computer Support Specialists	300
151051	2	6	Computer Systems Analysts	300
151061	2	6	Database Administrators	100
151071	2	6	Network and Computer Systems Administrators	200
433011	8	6	Bill and Account Collectors	400
433021	8	6	Billing and Posting Clerks and Machine Operators	300
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	1,200
434041	8	6	Credit Authorizers, Checkers, and Clerks	200
439011	7	6	Computer Operators	200
439021	7	6	Data Entry Keyers	300
				50,700

Hardware & Plumbing Merchant Wholesalers NAICS Code 423700

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	800
113071	1	1	Transportation, Storage, and Distribution Managers	100
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	500
435061	8	1	Production, Planning, and Expediting Clerks	200
435071	8	1	Shipping, Receiving, and Traffic Clerks	1,200
435081	8	1	Stock Clerks and Order Fillers	1,100
499042	6	1	Maintenance and Repair Workers, General	100
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	100
512092	8	1	Team Assemblers	800
512099	8	1	Assemblers and Fabricators, All Other	100
519061	3	1	Inspectors, Testers, Sorters, Samplers, and Weighers	100
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	300
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	1,300
537064	8	1	Packers and Packagers, Hand	1,000
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	100
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	300
533033	8	2	Truck Drivers, Light or Delivery Services	800
537051	8	2	Industrial Truck and Tractor Operators	400
111011	1	3	Chief Executives	100
113061	1	3	Purchasing Managers	100
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	500
131023	2	3	Purchasing Agents, Except Wholesale, Retail, and Farm Products	0
412011	8	3	Cashiers	100
412021	8	3	Counter and Rental Clerks	100
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	500
432011	7	3	Switchboard Operators, Including Answering Service	100
434151	8	3	Order Clerks	800
434171	8	3	Receptionists and Information Clerks	300
436011	7	3	Executive Secretaries and Administrative Assistants	300
436014	7	3	Secretaries, Except Legal, Medical, and Executive	100
439061	8	3	Office Clerks, General	700
112022	1	4	Sales Managers	200
271026	4	4	Merchandise Displayers and Window Trimmers	0
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	100
412022	8	4	Parts Salespersons	200
412031	8	4	Retail Salespersons	200
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	700
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	4,300
419031	7	4	Sales Engineers	100
419099	7	4	Sales and Related Workers, All Other	100
434051	8	4	Customer Service Representatives	700
172141	2	5	Mechanical Engineers	0
173023	2	5	Electrical and Electronic Engineering Technicians	100

491011	3	5 First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	200
493042	6	5 Mobile Heavy Equipment Mechanics, Except Engines	0
493053	6	5 Outdoor Power Equipment and Other Small Engine Mechanics	600
499021	6	5 Heating, Air Conditioning, and Refrigeration Mechanics and Installers	400
514041	6	5 Machinists	100
113031	1	6 Financial Managers	100
132011	2	6 Accountants and Auditors	200
151021	2	6 Computer Programmers	100
151041	2	6 Computer Support Specialists	100
433011	8	6 Bill and Account Collectors	200
433021	8	6 Billing and Posting Clerks and Machine Operators	300
433031	7	6 Bookkeeping, Accounting, and Auditing Clerks	700
439011	7	6 Computer Operators	100
439021	7	6 Data Entry Keyers	100
			22,900

Machinery & Supply Merchant Wholesalers NAICS Code 423800

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	2,200
113071	1	1	Transportation, Storage, and Distribution Managers	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	200
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	1,100
435032	7	1	Dispatchers, Except Police, Fire, and Ambulance	100
435061	8	1	Production, Planning, and Expediting Clerks	100
435071	8	1	Shipping, Receiving, and Traffic Clerks	2,400
435081	8	1	Stock Clerks and Order Fillers	1,000
499041	6	1	Industrial Machinery Mechanics	400
499042	6	1	Maintenance and Repair Workers, General	1,600
499043	6	1	Maintenance Workers, Machinery	100
499098	8	1	Helpers--Installation, Maintenance, and Repair Workers	100
499099	6	1	Installation, Maintenance, and Repair Workers, All Other	300
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	300
512092	8	1	Team Assemblers	800
519061	3	1	Inspectors, Testers, Sorters, Samplers, and Weighers	200
519111	7	1	Packaging and Filling Machine Operators and Tenders	200
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	200
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	1,500
537064	8	1	Packers and Packagers, Hand	500
493023	6	2	Automotive Service Technicians and Mechanics	200
493031	6	2	Bus and Truck Mechanics and Diesel Engine Specialists	400
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	200
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	800
533033	8	2	Truck Drivers, Light or Delivery Services	1,600
537051	8	2	Industrial Truck and Tractor Operators	200
111011	1	3	Chief Executives	200
113011	1	3	Administrative Services Managers	100
113021	1	3	Computer and Information Systems Managers	100
113040	1	3	Human Resources Managers	0
113061	1	3	Purchasing Managers	200
131021	3	3	Purchasing Agents and Buyers, Farm Products	100
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	500
131023	2	3	Purchasing Agents, Except Wholesale, Retail, and Farm Products	200
131199	1	3	Business Operations Specialists, All Other	0
412011	8	3	Cashiers	100
412021	8	3	Counter and Rental Clerks	500
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	800
432011	7	3	Switchboard Operators, Including Answering Service	100
434151	8	3	Order Clerks	1,600
434171	8	3	Receptionists and Information Clerks	500
436011	7	3	Executive Secretaries and Administrative Assistants	400
436014	7	3	Secretaries, Except Legal, Medical, and Executive	300

439061	8	3	Office Clerks, General	2,200
112022	1	4	Sales Managers	400
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	300
412022	8	4	Parts Salespersons	1,100
412031	8	4	Retail Salespersons	300
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	1,600
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	10,900
419031	7	4	Sales Engineers	200
419041	8	4	Telemarketers	100
434051	8	4	Customer Service Representatives	700
533031	8	4	Driver/Sales Workers	100
172112	2	5	Industrial Engineers	200
173023	2	5	Electrical and Electronic Engineering Technicians	200
173024	2	5	Electro-Mechanical Technicians	100
472111	3	5	Electricians	100
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	700
492092	5	5	Electric Motor, Power Tool, and Related Repairers	100
492094	5	5	Electrical and Electronics Repairers, Commercial and Industrial Equipment	100
492098	5	5	Security and Fire Alarm Systems Installers	0
493041	6	5	Farm Equipment Mechanics	1,200
493042	6	5	Mobile Heavy Equipment Mechanics, Except Engines	2,000
514041	6	5	Machinists	600
514121	5	5	Welders, Cutters, Solderers, and Brazers	600
113031	1	6	Financial Managers	300
132011	2	6	Accountants and Auditors	400
151021	2	6	Computer Programmers	100
151041	2	6	Computer Support Specialists	100
151071	2	6	Network and Computer Systems Administrators	0
433011	8	6	Bill and Account Collectors	500
433021	8	6	Billing and Posting Clerks and Machine Operators	400
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	1,300
434041	8	6	Credit Authorizers, Checkers, and Clerks	100
439011	7	6	Computer Operators	100
				49,600

Misc Durable Goods Merchant Wholesalers NAICS Code 423900

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	1,200
113071	1	1	Transportation, Storage, and Distribution Managers	100
339032	8	1	Security Guards	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	100
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	700
435061	8	1	Production, Planning, and Expediting Clerks	100
435071	8	1	Shipping, Receiving, and Traffic Clerks	2,300
435081	8	1	Stock Clerks and Order Fillers	1,000
435111	8	1	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	100
499042	6	1	Maintenance and Repair Workers, General	200
499099	6	1	Installation, Maintenance, and Repair Workers, All Other	100
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	200
512092	8	1	Team Assemblers	2,100
519061	3	1	Inspectors, Testers, Sorters, Samplers, and Weighers	1,000
519111	7	1	Packaging and Filling Machine Operators and Tenders	1,400
519199	8	1	Production Workers, All Other	100
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	400
537011	7	1	Conveyor Operators and Tenders	200
537021	7	1	Crane and Tower Operators	100
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	8,500
537064	8	1	Packers and Packagers, Hand	500
537081	8	1	Refuse and Recyclable Material Collectors	100
493031	6	2	Bus and Truck Mechanics and Diesel Engine Specialists	100
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	200
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	1,200
533033	8	2	Truck Drivers, Light or Delivery Services	800
537051	8	2	Industrial Truck and Tractor Operators	900
111011	1	3	Chief Executives	200
113011	1	3	Administrative Services Managers	100
113021	1	3	Computer and Information Systems Managers	100
113040	1	3	Human Resources Managers	0
113061	1	3	Purchasing Managers	100
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	700
131023	2	3	Purchasing Agents, Except Wholesale, Retail, and Farm Products	100
131199	1	3	Business Operations Specialists, All Other	100
412011	8	3	Cashiers	200
412021	8	3	Counter and Rental Clerks	100
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	700
432011	7	3	Switchboard Operators, Including Answering Service	100
434151	8	3	Order Clerks	700
434171	8	3	Receptionists and Information Clerks	300
436011	7	3	Executive Secretaries and Administrative Assistants	400
436014	7	3	Secretaries, Except Legal, Medical, and Executive	400
439061	8	3	Office Clerks, General	2,100
112011	1	4	Advertising and Promotions Managers	100
112021	1	4	Marketing Managers	0
112022	1	4	Sales Managers	200
193021	4	4	Market Research Analysts	200
271021	4	4	Commercial and Industrial Designers	0
271024	4	4	Graphic Designers	200

273031	4	4	Public Relations Specialists	100
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	100
412031	8	4	Retail Salespersons	400
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	100
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	5,800
419011	7	4	Demonstrators and Product Promoters	200
419041	8	4	Telemarketers	100
419099	7	4	Sales and Related Workers, All Other	100
434051	8	4	Customer Service Representatives	700
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	100
493042	6	5	Mobile Heavy Equipment Mechanics, Except Engines	100
514041	6	5	Machinists	100
514121	5	5	Welders, Cutters, Solderers, and Brazers	200
519071	3	5	Jewelers and Precious Stone and Metal Workers	200
113031	1	6	Financial Managers	300
132011	2	6	Accountants and Auditors	600
132041	2	6	Credit Analysts	0
151021	2	6	Computer Programmers	100
151041	2	6	Computer Support Specialists	100
151051	2	6	Computer Systems Analysts	0
151071	2	6	Network and Computer Systems Administrators	100
433011	8	6	Bill and Account Collectors	400
433021	8	6	Billing and Posting Clerks and Machine Operators	200
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	900
433051	8	6	Payroll and Timekeeping Clerks	0
434041	8	6	Credit Authorizers, Checkers, and Clerks	100
439021	7	6	Data Entry Keyers	200
				42,200

Paper/Paper Product Merchant Wholesalers NAICS Code 424100

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	500
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	200
435061	8	1	Production, Planning, and Expediting Clerks	100
435071	8	1	Shipping, Receiving, and Traffic Clerks	800
499042	6	1	Maintenance and Repair Workers, General	0
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	100
512092	8	1	Team Assemblers	400
512099	8	1	Assemblers and Fabricators, All Other	100
519111	7	1	Packaging and Filling Machine Operators and Tenders	200
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	100
537011	7	1	Conveyor Operators and Tenders	0
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	600
537064	8	1	Packers and Packagers, Hand	200
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	100
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	500
533033	8	2	Truck Drivers, Light or Delivery Services	600
537051	8	2	Industrial Truck and Tractor Operators	600
111011	1	3	Chief Executives	0

131022	2	3	Wholesale and Retail Buyers, Except Farm Products	400
131023	2	3	Purchasing Agents, Except Wholesale, Retail, and Farm Products	100
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	400
433061	8	3	Procurement Clerks	100
434071	8	3	File Clerks	100
434151	8	3	Order Clerks	300
434171	8	3	Receptionists and Information Clerks	400
436011	7	3	Executive Secretaries and Administrative Assistants	100
436014	7	3	Secretaries, Except Legal, Medical, and Executive	300
439061	8	3	Office Clerks, General	600
112022	1	4	Sales Managers	200
271024	4	4	Graphic Designers	100
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	100
412031	8	4	Retail Salespersons	300
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	200
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	3,100
419041	8	4	Telemarketers	200
419099	7	4	Sales and Related Workers, All Other	300
434051	8	4	Customer Service Representatives	800
515021	5	5	Job Printers	100
515023	5	5	Printing Machine Operators	100
113031	1	6	Financial Managers	100
132011	2	6	Accountants and Auditors	100
433011	8	6	Bill and Account Collectors	100
433021	8	6	Billing and Posting Clerks and Machine Operators	100
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	800
439021	7	6	Data Entry Keyers	100
				14,700

Apparel/Piece Goods Merchant Wholesalers NAICS Code 424300

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	700
113071	1	1	Transportation, Storage, and Distribution Managers	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	100
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	400
435061	8	1	Production, Planning, and Expediting Clerks	200
435071	8	1	Shipping, Receiving, and Traffic Clerks	2,100
435081	8	1	Stock Clerks and Order Fillers	1,200
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	700
512092	8	1	Team Assemblers	100
519061	3	1	Inspectors, Testers, Sorters, Samplers, and Weighers	1,100
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	100
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	1,100
537064	8	1	Packers and Packagers, Hand	900
533033	8	2	Truck Drivers, Light or Delivery Services	100
537051	8	2	Industrial Truck and Tractor Operators	100
111011	1	3	Chief Executives	100
113021	1	3	Computer and Information Systems Managers	0
113040	1	3	Human Resources Managers	0
113061	1	3	Purchasing Managers	100
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	400
131199	1	3	Business Operations Specialists, All Other	0
412011	8	3	Cashiers	100
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	1,000
432011	7	3	Switchboard Operators, Including Answering Service	100
433061	8	3	Procurement Clerks	100
434151	8	3	Order Clerks	700
434161	8	3	Human Resources Assistants, Except Payroll and Timekeeping	0
434171	8	3	Receptionists and Information Clerks	200
436011	7	3	Executive Secretaries and Administrative Assistants	200
436014	7	3	Secretaries, Except Legal, Medical, and Executive	200
439061	8	3	Office Clerks, General	1,500
112011	1	4	Advertising and Promotions Managers	100
112021	1	4	Marketing Managers	100
112022	1	4	Sales Managers	100
193021	4	4	Market Research Analysts	200
271021	4	4	Commercial and Industrial Designers	100
271022	4	4	Fashion Designers	1,000
271024	4	4	Graphic Designers	200
271026	4	4	Merchandise Displayers and Window Trimmers	100
271099	4	4	All other art and design workers	500
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	300
412031	8	4	Retail Salespersons	500
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	0
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical & Scientific Products	4,000
419099	7	4	Sales and Related Workers, All Other	100
434051	8	4	Customer Service Representatives	600
113051	1	5	Industrial Production Managers	100
515023	5	5	Printing Machine Operators	600
516021	5	5	Pressers, Textile, Garment, and Related Materials	100
516031	7	5	Sewing Machine Operators	1,100
516051	7	5	Sewers, Hand	1,600
516062	7	5	Textile Cutting Machine Setters, Operators, and Tenders	0
516092	7	5	Fabric and Apparel Patternmakers	700
519031	7	5	Cutters and Trimmers, Hand	800
113031	1	6	Financial Managers	200

131051	3	6	Cost Estimators	100
132011	2	6	Accountants and Auditors	200
151021	2	6	Computer Programmers	100
151041	2	6	Computer Support Specialists	100
433011	8	6	Bill and Account Collectors	200
433021	8	6	Billing and Posting Clerks and Machine Operators	200
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	600
433051	8	6	Payroll and Timekeeping Clerks	0
434041	8	6	Credit Authorizers, Checkers, and Clerks	100
439011	7	6	Computer Operators	100
439021	7	6	Data Entry Keyers	100
				28,600

Grocery Product Merchant Wholesalers NAICS Code 424400

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	2,000
113071	1	1	Transportation, Storage, and Distribution Managers	300
119199	3	1	Managers, All Other	0
339032	8	1	Security Guards	100
352021	8	1	Food Preparation Workers	300
353021	8	1	Combined Food Preparation and Serving Workers, Including Fast Food	600
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	800
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	1,200
435032	7	1	Dispatchers, Except Police, Fire, and Ambulance	100
435061	8	1	Production, Planning, and Expediting Clerks	100
435071	8	1	Shipping, Receiving, and Traffic Clerks	1,800
435081	8	1	Stock Clerks and Order Fillers	2,800
435111	8	1	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	0
451011	8	1	First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers	100
452011	8	1	Agricultural Inspectors	0
452041	8	1	Graders and Sorters, Agricultural Products	1,700
452092	8	1	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	100
499042	6	1	Maintenance and Repair Workers, General	700
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	700
512092	8	1	Team Assemblers	1,200
519061	3	1	Inspectors, Testers, Sorters, Samplers, and Weighers	900
519111	7	1	Packaging and Filling Machine Operators and Tenders	2,200
519199	8	1	Production Workers, All Other	200
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	1,000
537011	7	1	Conveyor Operators and Tenders	100
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	9,100
537064	8	1	Packers and Packagers, Hand	2,700
493031	6	2	Bus and Truck Mechanics and Diesel Engine Specialists	300
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	600
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	4,600
533033	8	2	Truck Drivers, Light or Delivery Services	4,300
537051	8	2	Industrial Truck and Tractor Operators	1,800
537061	8	2	Cleaners of Vehicles and Equipment	200
111011	1	3	Chief Executives	200
113011	1	3	Administrative Services Managers	100
113021	1	3	Computer and Information Systems Managers	100
113040	1	3	Human Resources Managers	100
113061	1	3	Purchasing Managers	300
131021	3	3	Purchasing Agents and Buyers, Farm Products	500
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	1,000
131073	2	3	Training and Development Specialists	0
131199	1	3	Business Operations Specialists, All Other	100
412011	8	3	Cashiers	700
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	1,000
432011	7	3	Switchboard Operators, Including Answering Service	100

433061	8	3	Procurement Clerks	100
434071	8	3	File Clerks	100
434151	8	3	Order Clerks	800
434161	8	3	Human Resources Assistants, Except Payroll and Timekeeping	100
434171	8	3	Receptionists and Information Clerks	300
436011	7	3	Executive Secretaries and Administrative Assistants	500
436014	7	3	Secretaries, Except Legal, Medical, and Executive	300
439061	8	3	Office Clerks, General	1,600
112011	1	4	Advertising and Promotions Managers	100
112021	1	4	Marketing Managers	100
112022	1	4	Sales Managers	500
193021	4	4	Market Research Analysts	0
271026	4	4	Merchandise Displayers and Window Trimmers	400
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	100
412031	8	4	Retail Salespersons	600
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	100
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	9,000
419011	7	4	Demonstrators and Product Promoters	0
419041	8	4	Telemarketers	100
419091	8	4	Door-To-Door Sales Workers, News and Street Vendors, and Related Workers	0
434051	8	4	Customer Service Representatives	1,200
533031	8	4	Driver/Sales Workers	6,000
113051	1	5	Industrial Production Managers	0
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	100
499091	6	5	Coin, Vending, and Amusement Machine Servicers and Repairers	100
513011	7	5	Bakers	1,700
513021	7	5	Butchers and Meat Cutters	500
513022	7	5	Meat, Poultry, and Fish Cutters and Trimmers	1,300
513023	7	5	Slaughterers and Meat Packers	100
513091	7	5	Food and Tobacco Roasting, Baking, & Drying Machine Operators & Tenders	0
513092	7	5	Food Batchmakers	200
513099	7	5	All other food processing workers	700
113031	1	6	Financial Managers	400
132011	2	6	Accountants and Auditors	500
132041	2	6	Credit Analysts	0
151021	2	6	Computer Programmers	100
151041	2	6	Computer Support Specialists	100
151071	2	6	Network and Computer Systems Administrators	0
433011	8	6	Bill and Account Collectors	300
433021	8	6	Billing and Posting Clerks and Machine Operators	600
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	1,700
433051	8	6	Payroll and Timekeeping Clerks	100
434041	8	6	Credit Authorizers, Checkers, and Clerks	100
439011	7	6	Computer Operators	300
439021	7	6	Data Entry Keyers	100
				77,800

Alcoholic Beverage Merchant Wholesalers NAICS Code 424800

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	200
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	400
435071	8	1	Shipping, Receiving, and Traffic Clerks	100
435081	8	1	Stock Clerks and Order Fillers	400
499042	6	1	Maintenance and Repair Workers, General	0
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	100
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	600
537064	8	1	Packers and Packagers, Hand	100
493031	6	2	Bus and Truck Mechanics and Diesel Engine Specialists	100
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	100
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	1,200
533033	8	2	Truck Drivers, Light or Delivery Services	800
537051	8	2	Industrial Truck and Tractor Operators	700
111011	1	3	Chief Executives	0
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	100
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	200
434171	8	3	Receptionists and Information Clerks	100
436011	7	3	Executive Secretaries and Administrative Assistants	100
436014	7	3	Secretaries, Except Legal, Medical, and Executive	100
439061	8	3	Office Clerks, General	300
112022	1	4	Sales Managers	300
271026	4	4	Merchandise Displayers and Window Trimmers	400
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	100
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	3,700
419011	7	4	Demonstrators and Product Promoters	100
434051	8	4	Customer Service Representatives	100
533031	8	4	Driver/Sales Workers	300
113031	1	6	Financial Managers	100
132011	2	6	Accountants and Auditors	100
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	200
				11,100

Misc Nondurable Goods Merchant Whsle NAICS Code 424900

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	1,300
113071	1	1	Transportation, Storage, and Distribution Managers	100
339032	8	1	Security Guards	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	100
373011	8	1	Landscaping and Groundskeeping Workers	200
373012	8	1	Pesticide Handlers, Sprayers, and Applicators, Vegetation	100
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	900
435032	7	1	Dispatchers, Except Police, Fire, and Ambulance	100
435061	8	1	Production, Planning, and Expediting Clerks	100
435071	8	1	Shipping, Receiving, and Traffic Clerks	2,300
435081	8	1	Stock Clerks and Order Fillers	4,400
451011	8	1	First-Line Supervisors/Managers of Farming, Fishing, & Forestry Workers	200
452041	8	1	Graders and Sorters, Agricultural Products	600
452091	8	1	Agricultural Equipment Operators	100
452092	8	1	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	2,300
499042	6	1	Maintenance and Repair Workers, General	400
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	300
512092	8	1	Team Assemblers	1,200
512099	8	1	Assemblers and Fabricators, All Other	100
519111	7	1	Packaging and Filling Machine Operators and Tenders	600
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	200
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	2,600
537064	8	1	Packers and Packagers, Hand	1,100
537199	8	1	Material Moving Workers, All Other	100
493031	6	2	Bus and Truck Mechanics and Diesel Engine Specialists	0
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	200
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	1,200
533033	8	2	Truck Drivers, Light or Delivery Services	1,800
537051	8	2	Industrial Truck and Tractor Operators	400
111011	1	3	Chief Executives	100
113011	1	3	Administrative Services Managers	100
113021	1	3	Computer and Information Systems Managers	100
113040	1	3	Human Resources Managers	100
113061	1	3	Purchasing Managers	100
131021	3	3	Purchasing Agents and Buyers, Farm Products	100
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	300
131199	1	3	Business Operations Specialists, All Other	200
273041	4	3	Editors	100
412011	8	3	Cashiers	600
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	800
433061	8	3	Procurement Clerks	100
434151	8	3	Order Clerks	1,000
434161	8	3	Human Resources Assistants, Except Payroll and Timekeeping	100
434171	8	3	Receptionists and Information Clerks	200
436011	7	3	Executive Secretaries and Administrative Assistants	300
436014	7	3	Secretaries, Except Legal, Medical, and Executive	300
439061	8	3	Office Clerks, General	1,700
439081	8	3	Proofreaders and Copy Markers	100

439999	8	3	All other secretaries, administrative assistants,	200
112011	1	4	Advertising and Promotions Managers	100
112021	1	4	Marketing Managers	100
112022	1	4	Sales Managers	400
193021	4	4	Market Research Analysts	100
271023	4	4	Floral Designers	400
271024	4	4	Graphic Designers	200
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	300
412022	8	4	Parts Salespersons	100
412031	8	4	Retail Salespersons	1,000
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	800
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical & Scientific Products	6,900
419011	7	4	Demonstrators and Product Promoters	100
419041	8	4	Telemarketers	300
419099	7	4	Sales and Related Workers, All Other	100
434051	8	4	Customer Service Representatives	1,000
533031	8	4	Driver/Sales Workers	800
194011	4	5	Agricultural and Food Science Technicians	100
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	100
493041	6	5	Farm Equipment Mechanics	100
515023	5	5	Printing Machine Operators	100
516031	7	5	Sewing Machine Operators	200
519023	7	5	Mixing and Blending Machine Setters, Operators, and Tenders	100
113031	1	6	Financial Managers	200
132011	2	6	Accountants and Auditors	500
151021	2	6	Computer Programmers	200
151031	2	6	Computer Software Engineers, Applications	200
151032	2	6	Computer Software Engineers, Systems Software	100
151041	2	6	Computer Support Specialists	200
151071	2	6	Network and Computer Systems Administrators	100
151081	2	6	Network Systems and Data Communications Analysts	100
433011	8	6	Bill and Account Collectors	300
433021	8	6	Billing and Posting Clerks and Machine Operators	300
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	1,800
433051	8	6	Payroll and Timekeeping Clerks	100
439011	7	6	Computer Operators	100
439021	7	6	Data Entry Keyers	200
				47,500

Furniture & Furnishings Wholesalers NAICS 423200

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	600
113071	1	1	Transportation, Storage, and Distribution Managers	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	100
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	200
435061	8	1	Production, Planning, and Expediting Clerks	200
435071	8	1	Shipping, Receiving, and Traffic Clerks	1300
435081	8	1	Stock Clerks and Order Fillers	300
499099	6	1	Installation, Maintenance, and Repair Workers, All Other	300
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	200
512092	8	1	Team Assemblers	1800
512099	8	1	Assemblers and Fabricators, All Other	200
531021	3	1	First-Line Super.s/Mgrs. of Helpers, Laborers, & Material Movers, Hand	200
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	2600
537064	8	1	Packers and Packagers, Hand	500
531031	3	2	First-Line Super./Mgrs., Transport, Material-Moving Machine & Vehicles	100
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	300
533033	8	2	Truck Drivers, Light or Delivery Services	200
537051	8	2	Industrial Truck and Tractor Operators	500
111011	1	3	Chief Executives	100
113061	1	3	Purchasing Managers	0
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	200
131199	1	3	Business Operations Specialists, All Other	100
431011	7	3	First-Line Supervisors/Managers of Office & Admin. Support Workers	300
434151	8	3	Order Clerks	400
434161	8	3	Human Resources Assistants, Except Payroll and Timekeeping	0
434171	8	3	Receptionists and Information Clerks	200
436011	7	3	Executive Secretaries and Administrative Assistants	200
436014	7	3	Secretaries, Except Legal, Medical, and Executive	100
439061	8	3	Office Clerks, General	1400
112022	1	4	Sales Managers	100
271024	4	4	Graphic Designers	100
271025	4	4	Interior Designers	200
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	0
412031	8	4	Retail Salespersons	100
414012	7	4	Sales Reps. Wholesale and Manufacturing, Except Technical & Scientific	2900
419031	7	4	Sales Engineers	100
434051	8	4	Customer Service Representatives	500
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	100
514121	5	5	Welders, Cutters, Solderers, and Brazers	100
516031	7	5	Sewing Machine Operators	400
516051	7	5	Sewers, Hand	100
516093	6	5	Upholsterers	200
517021	6	5	Furniture Finishers	200
113031	1	6	Financial Managers	100

132011	2	6	Accountants and Auditors	200
151071	2	6	Network and Computer Systems Administrators	0
433011	8	6	Bill and Account Collectors	200
433021	8	6	Billing and Posting Clerks and Machine Operators	200
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	600
439021	7	6	Data Entry Keyers	100
				19,200

Chemical Merchant Wholesalers, NAICS 424600

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	700
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	200
435061	8	1	Production, Planning, and Expediting Clerks	100
435071	8	1	Shipping, Receiving, and Traffic Clerks	500
435081	8	1	Stock Clerks and Order Fillers	100
499042	6	1	Maintenance and Repair Workers, General	200
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	300
512092	8	1	Team Assemblers	200
519061	3	1	Inspectors, Testers, Sorters, Samplers, and Weighers	200
519111	7	1	Packaging and Filling Machine Operators and Tenders	600
519198	8	1	Helpers--Production Workers	100
531021	3	1	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	100
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	600
537064	8	1	Packers and Packagers, Hand	200
531031	3	2	First-Line Super/Mgr. Transport & Material-Moving Machine & Vehicle Operator	100
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	500
533033	8	2	Truck Drivers, Light or Delivery Services	400
537051	8	2	Industrial Truck and Tractor Operators	300
111011	1	3	Chief Executives	100
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	100
131199	1	3	Business Operations Specialists, All Other	100
431011	7	3	First-Line Supervisors/Managers of Office and Administrative Support Workers	200
434151	8	3	Order Clerks	300
434171	8	3	Receptionists and Information Clerks	100
436011	7	3	Executive Secretaries and Administrative Assistants	200
436014	7	3	Secretaries, Except Legal, Medical, and Executive	100
439061	8	3	Office Clerks, General	500
112022	1	4	Sales Managers	200
414011	8	4	Sales Reps, Wholesale & Manufacturing, Technical & Scientific Products	600
414012	7	4	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific	1500
434051	8	4	Customer Service Representatives	400
172141	2	5	Mechanical Engineers	100
192031	4	5	Chemists	100
519011	6	5	Chemical Equipment Operators and Tenders	0
519023	7	5	Mixing and Blending Machine Setters, Operators, and Tenders	100
113031	1	6	Financial Managers	100
132011	2	6	Accountants and Auditors	200
433011	8	6	Bill and Account Collectors	100
433021	8	6	Billing and Posting Clerks and Machine Operators	100
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	400
				11,000

Electronic Market Agent and Brokers, NAICS 425000

OES Code	Education	Function	Occupation	2002 Weights
119199	3	1	Managers, All Other	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	200
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	1,400
435011	8	1	Cargo and Freight Agents	200
435061	8	1	Production, Planning, and Expediting Clerks	100
435071	8	1	Shipping, Receiving, and Traffic Clerks	1,700
435081	8	1	Stock Clerks and Order Fillers	1,200
499042	6	1	Maintenance and Repair Workers, General	400
499043	6	1	Maintenance Workers, Machinery	100
499099	6	1	Installation, Maintenance, and Repair Workers, All Other	200
511011	3	1	First-Line Supervisors/Managers of Production and Operating Workers	100
512092	8	1	Team Assemblers	300
512099	8	1	Assemblers and Fabricators, All Other	100
519111	7	1	Packaging and Filling Machine Operators and Tenders	400
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	200
537011	7	1	Conveyor Operators and Tenders	400
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	2,300
537064	8	1	Packers and Packagers, Hand	600
113071	1	1	Transportation, Storage, and Distribution Managers	100
493023	6	2	Automotive Service Technicians and Mechanics	100
493031	6	2	Bus and Truck Mechanics and Diesel Engine Specialists	400
493093	8	2	Tire Repairers and Changers	200
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	100
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	900
533033	8	2	Truck Drivers, Light or Delivery Services	1,700
536099	8	2	Transportation Workers, All Other	200
537051	8	2	Industrial Truck and Tractor Operators	1,200
111011	1	3	Chief Executives	100
111021	1	3	General and Operations Managers	2,000
113040	1	3	Human Resources Managers	0
113061	1	3	Purchasing Managers	100
131021	3	3	Purchasing Agents and Buyers, Farm Products	100
131022	2	3	Wholesale and Retail Buyers, Except Farm Products	600
131023	2	3	Purchasing Agents, Except Wholesale, Retail, and Farm Products	100
131073	2	3	Training and Development Specialists	0
131111	2	3	Management Analysts	0
131199	1	3	Business Operations Specialists, All Other	300
412011	8	3	Cashiers	200
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	1,300
432011	7	3	Switchboard Operators, Including Answering Service	100
434071	8	3	File Clerks	100
434151	8	3	Order Clerks	2,200
434161	8	3	Human Resources Assistants, Except Payroll and Timekeeping	100

434171	8	3	Receptionists and Information Clerks	1,100
436011	7	3	Executive Secretaries and Administrative Assistants	800
436014	7	3	Secretaries, Except Legal, Medical, and Executive	1,700
439061	8	3	Office Clerks, General	4,400
492011	3	3	Computer, Automated Teller, and Office Machine Repairers	600
112011	1	4	Administrative Services Managers	100
112021	1	4	Computer and Information Systems Managers	100
112021	1	4	Marketing Managers	100
112022	1	4	Sales Managers	600
193021	4	4	Market Research Analysts	100
271024	4	4	Graphic Designers	0
271026	4	4	Merchandise Displayers and Window Trimmers	300
411011	6	4	First-Line Supervisors/Managers of Retail Sales Workers	100
412022	8	4	Parts Salespersons	100
412031	8	4	Retail Salespersons	100
414011	8	4	Sales Rep, Wholesale and Manuf, Technical and Scientific Products	3,800
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	16,200
419011	7	4	Demonstrators and Product Promoters	500
419031	7	4	Sales Engineers	200
419041	8	4	Telemarketers	500
419099	7	4	Sales and Related Workers, All Other	300
434051	8	4	Customer Service Representatives	1,700
533031	8	4	Driver/Sales Workers	200
119041	1	5	Engineering Managers	0
172072	2	5	Electronics Engineers, Except Computer	200
172112	2	5	Industrial Engineers	100
173023	2	5	Electrical and Electronic Engineering Technicians	300
472152	6	5	Plumbers, Pipefitters, and Steamfitters	100
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	200
492022	3	5	Telecommunications Equip Installers and Repairers, Except Line Installers	200
492094	5	5	Electrical and Electronics Repairers, Commercial and Industrial Equipment	200
493042	6	5	Mobile Heavy Equipment Mechanics, Except Engines	100
514041	6	5	Machinists	100
514081	7	5	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	100
514121	5	5	Welders, Cutters, Solderers, and Brazers	0
519061	3	5	Inspectors, Testers, Sorters, Samplers, and Weighers	100
113031	1	6	Financial Managers	300
131051	3	6	Cost Estimators	100
132011	2	6	Accountants and Auditors	800
151021	2	6	Computer Programmers	200
151031	2	6	Computer Software Engineers, Applications	100
151032	2	6	Computer Software Engineers, Systems Software	400
151041	2	6	Computer Support Specialists	100
151051	2	6	Computer Systems Analysts	0
151061	2	6	Database Administrators	100
151071	2	6	Network and Computer Systems Administrators	100
151081	2	6	Network Systems and Data Communications Analysts	0
433011	8	6	Bill and Account Collectors	300

433021	8	6	Billing and Posting Clerks and Machine Operators	500
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	1,700
433051	8	6	Payroll and Timekeeping Clerks	100
434041	8	6	Credit Authorizers, Checkers, and Clerks	300
439011	7	6	Computer Operators	200
439021	7	6	Data Entry Keyers	700
				53,500

TRANSPORTATION SECTORS

Air Transportation, NAICS 481

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	300
113071	1	1	Transportation, Storage, and Distribution Managers	200
391021	3	1	First-Line Supervisors/Managers of Personal Service Workers	100
396032	3	1	Transportation Attendants, Except Flight Attendants and Baggage Porters	100
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	100
531011	3	1	Aircraft Cargo Handling Supervisors	300
499099	6	1	Installation, Maintenance, and Repair Workers, All Other	200
435032	7	1	Dispatchers, Except Police, Fire, and Ambulance	0
434181	8	1	Reservation and Transportation Ticket Agents and Travel Clerks	8500
396011	8	1	Baggage Porters and Bellhops	700
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	100
339032	8	1	Security Guards	200
435061	8	1	Production, Planning, and Expediting Clerks	0
435011	8	1	Cargo and Freight Agents	1200
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	800
537199	8	1	Material Moving Workers, All Other	800
492091	5	2	Avionics Technicians	0
532012	6	2	Commercial Pilots	500
493011	6	2	Aircraft Mechanics and Service Technicians	300
532011	6	2	Airline Pilots, Copilots, and Flight Engineers	700
536099	7	2	Transportation Workers, All Other	1900
537061	8	2	Cleaners of Vehicles and Equipment	0
131199	1	3	Business Operations Specialists, All Other	0
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	1100
436011	7	3	Executive Secretaries and Administrative Assistants	200
439061	8	3	Office Clerks, General	100
434171	8	3	Receptionists and Information Clerks	0
112022	1	4	Sales Managers	100
112021	1	4	Marketing Managers	100
434051	8	4	Customer Service Representatives	100
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	100
132011	2	6	Accountants and Auditors	200
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	200
				19,200

Rail Transportation, NAICS 482

OES Code	Education	Function	Occupation	2002 Weights
113071	1	1	Transportation, Storage, and Distribution Managers	400
534011	3	2	Locomotive Engineers	1,400
534013	3	2	Rail Yard Engineers, Dinkey Operators, and Hostlers	200
472211	7	5	Sheet Metal Workers	100
				2,100

Water Transportation, NAICS 483

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	100
434181	8	1	Reservation and Transportation Ticket Agents and Travel Clerks	400
352021	8	1	Food Preparation Workers	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	100
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	100
113071	1	1	Transportation, Storage, and Distribution Managers	100
535031	3	2	Ship Engineers	300
535021	3	2	Captains, Mates, and Pilots of Water Vessels	500
535011	8	2	Sailors and Marine Oilers	400
131023	2	3	Purchasing Agents, Except Wholesale, Retail, and Farm Products	100
436014	7	3	Secretaries, Except Legal, Medical, and Executive	100
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	100
131199	1	3	Business Operations Specialists, All Other	100
436011	7	3	Executive Secretaries and Administrative Assistants	100
434051	8	4	Customer Service Representatives	100
419099	7	4	Sales and Related Workers, All Other	100
172121	2	5	Marine Engineers and Naval Architects	100
				2,900

Truck Transportation, NAICS 484

OES Code	Education	Function	Occupation	2002 Weights
491011	3	1	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	400
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	1200
514121	5	1	Welders, Cutters, Solderers, and Brazers	100
493031	6	1	Bus and Truck Mechanics and Diesel Engine Specialists	3,200
493023	6	1	Automotive Service Technicians and Mechanics	200
499042	6	1	Maintenance and Repair Workers, General	600
518093	6	1	Petroleum Pump System Operators, Refinery Operators, and Gaugers	100
499099	6	1	Installation, Maintenance, and Repair Workers, All Other	100
435032	7	1	Dispatchers, Except Police, Fire, and Ambulance	2,800
537121	7	1	Tank Car, Truck, and Ship Loaders	2,000
536099	7	1	Transportation Workers, All Other	300
537081	8	1	Refuse and Recyclable Material Collectors	100
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	11,800
537064	8	1	Packers and Packagers, Hand	700
499098	8	1	Helpers--Installation, Maintenance, and Repair Workers	200
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	800
537061	8	1	Cleaners of Vehicles and Equipment	300
339032	8	1	Security Guards	100
536031	8	1	Service Station Attendants	100
113071	1	2	Transportation, Storage, and Distribution Managers	900
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	2,500
536051	3	2	Transportation Inspectors	0
533033	8	2	Truck Drivers, Light or Delivery Services	4,400
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	19,500
537051	8	2	Industrial Truck and Tractor Operators	2,600
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	29,500
533033	8	2	Truck Drivers, Light or Delivery Services	3,000
113040	1	3	Human Resources Managers	100
111011	1	3	Chief Executives	200
113011	1	3	Administrative Services Managers	100
113031	1	3	Financial Managers	200
131199	1	3	Business Operations Specialists, All Other	100
111021	1	3	General and Operations Managers	1,900
132011	2	3	Accountants and Auditors	300
131071	2	3	Employment, Recruitment, and Placement Specialists	100
131051	3	3	Cost Estimators	200
436014	5	3	Secretaries, Except Legal, Medical, and Executive	400
439021	5	3	Data Entry Keyers	200
436011	5	3	Executive Secretaries and Administrative Assistants	500
433031	7	3	Bookkeeping, Accounting, and Auditing Clerks	1,700
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	1,500
433021	8	3	Billing and Posting Clerks and Machine Operators	1,400
433051	8	3	Payroll and Timekeeping Clerks	200

435199	8	3	All other material recording, scheduling, dispatch	100
434051	8	3	Customer Service Representatives	1,800
439061	8	3	Office Clerks, General	3,300
433011	8	3	Bill and Account Collectors	300
434151	8	3	Order Clerks	200
434171	8	3	Receptionists and Information Clerks	200
435081	8	3	Stock Clerks and Order Fillers	500
435111	8	3	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	100
435011	8	3	Cargo and Freight Agents	500
435071	8	3	Shipping, Receiving, and Traffic Clerks	2,000
435021	8	3	Couriers and Messengers	100
419041	8	3	Telemarketers	100
435061	8	3	Production, Planning, and Expediting Clerks	300
434161	8	3	Human Resources Assistants, Except Payroll and Timekeeping	100
112022	1	4	Sales Managers	400
419099	7	4	Sales and Related Workers, All Other	1,300
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	400
533031	8	4	Driver/Sales Workers	800
				109,100

Water Transport Support NAICS Code 488300

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	100
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, & Material Movers, Hand	100
499042	6	1	Maintenance and Repair Workers, General	300
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	1,000
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	100
535021	3	2	Captains, Mates, and Pilots of Water Vessels	400
131199	1	3	Business Operations Specialists, All Other	100
434051	8	4	Customer Service Representatives	200
514121	5	5	Welders, Cutters, Solderers, and Brazers	100
172121	2	5	Marine Engineers and Naval Architects	100
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	100
				2,600

Road Support, NAICS 488400

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	300
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	100
499042	6	1	Maintenance and Repair Workers, General	0
435032	7	1	Dispatchers, Except Police, Fire, and Ambulance	800
434181	8	1	Reservation and Transportation Ticket Agents and Travel Clerks	100
372011	8	1	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	100
435111	8	1	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	0
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	1,400
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	500
493023	6	2	Automotive Service Technicians and Mechanics	500
493031	6	2	Bus and Truck Mechanics and Diesel Engine Specialists	400
536099	7	2	Transportation Workers, All Other	100
533033	8	2	Truck Drivers, Light or Delivery Services	1,100
533099	8	2	Motor Vehicle Operators, All Other	600
537061	8	2	Cleaners of Vehicles and Equipment	100
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	4,900
131199	1	3	Business Operations Specialists, All Other	0
113011	1	3	Administrative Services Managers	0
436011	7	3	Executive Secretaries and Administrative Assistants	100
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	200
436014	7	3	Secretaries, Except Legal, Medical, and Executive	100
434171	8	3	Receptionists and Information Clerks	0
412011	8	3	Cashiers	100
412021	8	3	Counter and Rental Clerks	0
434151	8	3	Order Clerks	100
439061	8	3	Office Clerks, General	700
434051	8	4	Customer Service Representatives	100
491011	3	5	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	100
132011	2	6	Accountants and Auditors	0
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	200
433021	8	6	Billing and Posting Clerks and Machine Operators	100
				12,800

Freight Arranging, 488500

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	1,000
113071	1	1	Transportation, Storage, and Distribution Managers	300
119199	3	1	Managers, All Other	200
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	200
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	0
435032	7	1	Dispatchers, Except Police, Fire, and Ambulance	400
435011	8	1	Cargo and Freight Agents	4,700
435071	8	1	Shipping, Receiving, and Traffic Clerks	700
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	1,600
536051	3	2	Transportation Inspectors	0
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	200
493023	6	2	Automotive Service Technicians and Mechanics	0
536099	7	2	Transportation Workers, All Other	200
435021	8	2	Couriers and Messengers	600
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	1,700
533033	8	2	Truck Drivers, Light or Delivery Services	1,100
537051	8	2	Industrial Truck and Tractor Operators	400
111011	1	3	Chief Executives	100
113021	1	3	Computer and Information Systems Managers	0
113011	1	3	Administrative Services Managers	100
131199	1	3	Business Operations Specialists, All Other	1,100
131073	2	3	Training and Development Specialists	100
131041	3	3	Compliance Officers, Except Ag, Constr, Health-Safety, and Transportation	200
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	1,800
436011	7	3	Executive Secretaries and Administrative Assistants	300
436014	7	3	Secretaries, Except Legal, Medical, and Executive	100
439999	8	3	All other secretaries, administrative assistants,	100
434151	8	3	Order Clerks	200
439061	8	3	Office Clerks, General	1,200
434161	8	3	Human Resources Assistants, Except Payroll and Timekeeping	0
434171	8	3	Receptionists and Information Clerks	200
112022	1	4	Sales Managers	200
419099	7	4	Sales and Related Workers, All Other	600
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	100
434051	8	4	Customer Service Representatives	1,300
113031	1	6	Financial Managers	100
132011	2	6	Accountants and Auditors	400
151021	2	6	Computer Programmers	100
131051	3	6	Cost Estimators	0
439011	7	6	Computer Operators	100
439021	7	6	Data Entry Keyers	200
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	1,000
433021	8	6	Billing and Posting Clerks and Machine Operators	400
433011	8	6	Bill and Account Collectors	100
				23,400

Freight Arranging, 488500

OES Code	Education	Function	Occupation	2002 Weights
111021	1	1	General and Operations Managers	1,000
113071	1	1	Transportation, Storage, and Distribution Managers	300
119199	3	1	Managers, All Other	200
531021	3	1	First-Line Sup/Mgrs of Helpers, Laborers, and Material Movers, Hand	200
411012	6	1	First-Line Supervisors/Managers of Non-Retail Sales Workers	0
435032	7	1	Dispatchers, Except Police, Fire, and Ambulance	400
435011	8	1	Cargo and Freight Agents	4,700
435071	8	1	Shipping, Receiving, and Traffic Clerks	700
537062	8	1	Laborers and Freight, Stock, and Material Movers, Hand	1,600
536051	3	2	Transportation Inspectors	0
531031	3	2	First-Line Sup/Mgrs of Trans and Material-Moving Vehicle Operators	200
493023	6	2	Automotive Service Technicians and Mechanics	0
536099	7	2	Transportation Workers, All Other	200
435021	8	2	Couriers and Messengers	600
533032	8	2	Truck Drivers, Heavy and Tractor-Trailer	1,700
533033	8	2	Truck Drivers, Light or Delivery Services	1,100
537051	8	2	Industrial Truck and Tractor Operators	400
111011	1	3	Chief Executives	100
113021	1	3	Computer and Information Systems Managers	0
113011	1	3	Administrative Services Managers	100
131199	1	3	Business Operations Specialists, All Other	1,100
131073	2	3	Training and Development Specialists	100
131041	3	3	Compliance Officers, Except Ag, Constr, Health-Safety, and Transportation	200
431011	7	3	First-Line Sup/Mgrs of Office and Administrative Support Workers	1,800
436011	7	3	Executive Secretaries and Administrative Assistants	300
436014	7	3	Secretaries, Except Legal, Medical, and Executive	100
439999	8	3	All other secretaries, administrative assistants,	100
434151	8	3	Order Clerks	200
439061	8	3	Office Clerks, General	1,200
434161	8	3	Human Resources Assistants, Except Payroll and Timekeeping	0
434171	8	3	Receptionists and Information Clerks	200
112022	1	4	Sales Managers	200
419099	7	4	Sales and Related Workers, All Other	600
414012	7	4	Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products	100
434051	8	4	Customer Service Representatives	1,300
113031	1	6	Financial Managers	100
132011	2	6	Accountants and Auditors	400
151021	2	6	Computer Programmers	100
131051	3	6	Cost Estimators	0
439011	7	6	Computer Operators	100
439021	7	6	Data Entry Keyers	200
433031	7	6	Bookkeeping, Accounting, and Auditing Clerks	1,000
433021	8	6	Billing and Posting Clerks and Machine Operators	400
433011	8	6	Bill and Account Collectors	100
				23,400