

2013

Goods Movement & Transportation Cluster Workforce Analysis: Labor Market and Gap Analysis



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1. Introduction

Pacific Gateway¹, a public workforce agency in Southern California, helps businesses connect with skilled workers across the Lomita, Long Beach, Signal Hill, and Torrance communities. Administered by the City of Long Beach, Pacific Gateway coordinates services supporting the workforce needs of residents and businesses, and also serves alongside local elected officials as the policy and oversight entity for the Workforce Investment Act (WIA), and other county/state/federal funds that serve these communities. Recently, Pacific Gateway received funding to learn more about employment needs among businesses in the goods movement sector, with a specific emphasis on the impact of alternative fuel vehicles and equipment. As part of this effort, ICF International (ICF): 1) collected and analyzed industry and occupational data in order to identify and examine the trends in the industry; 2) examined the educational and training requirements for entry into occupations within the industry sectors; and, 3) conducted a gap analysis to identify the occupations where shortages and excesses of workers are projected.

Goods Movement refers to the transportation of for-sale products from the location of their manufacture or harvest to their final retail destination². Goods are transported via over-seas shipping, air, freight trucking, rail, and other methods. There are key changes to the way goods are bought, sold and transported in recent times that makes adopting clean and energy-efficient technologies a critical issue. These changes apply locally, nationally, and internationally and include increases in international trade, increases in Web-based shopping, concerns over emissions, etc., all of which impact the goods movement sector.

This report details the findings of ICF's analysis of the goods movement sector in the Southern California Counties of Los Angeles, Orange, Riverside, and San Bernardino.

1.1. Research Context

In order to understand the direction of the goods movement/logistics sector, it is important for Pacific Gateway to understand both its current and forecasted state. Pacific Gateway partnered with ICF to conduct an analysis of the industry and its associated occupations, as well as to develop a labor market and gap analysis that compares completers of formal educational or training programs with openings between 2012 and 2020. Overall, the focus of the study was current and future employment needs of the goods movement/logistics sector in Los Angeles, Orange, Riverside, and San Bernardino Counties.

1.2. Project Background

In 2012, ICF submitted organizational qualifications for Pacific Gateway's Workforce Services/Subject Matter Expertise opportunity. As a result, ICF was added to a list of organizations eligible for the organization's tasks orders. Subsequently, ICF responded to the *Goods Movement & Transportation Cluster Workforce Analysis* project and was funded. The project's associated tasks and deliverables are detailed in Figure 1.

¹ Additional information about Pacific Gateway can be found at:

<https://www.longbeachvos.org/default.asp?domain=pacificgatewayworkforce.com>

² University of Southern California. (n.d). What is goods movement? Retrieved from

<http://hydra.usc.edu/scehsc/web/Resources/What%20is%20Goods%20Movement/What%20is%20Goods%20Movement.html>

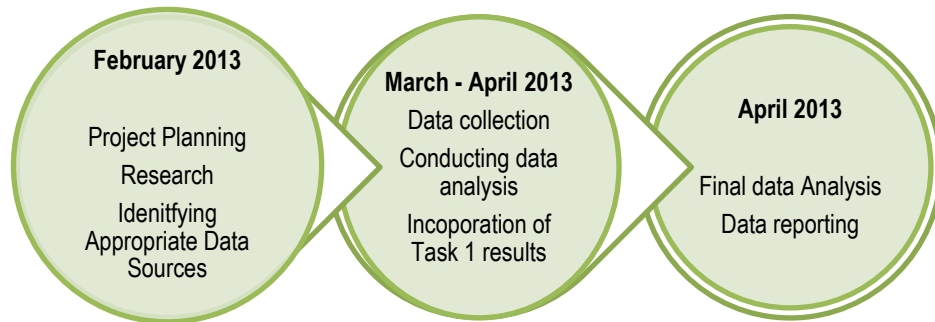
Figure 1. Goods Movement & Transportation Cluster Workforce Analysis Description

Task	Project Activities	Deliverables
Task 1: Employer Survey Design, Development, Implementation, and Analysis	<ul style="list-style-type: none"> • Purchase of firm level data from • Questionnaire development • Survey administration • Data analysis • Data reporting • Technical assistance to survey respondents 	<ul style="list-style-type: none"> • List of firms in the goods movement industries in Los Angeles, Orange, Riverside, and San Bernardino Counties, including NAICS codes and estimated employment levels • Survey questionnaire listing all questions and answers from all participating firms, among the 40 employers contacted • Analysis of survey responses • Written report describing the study and analysis of survey responses and all supporting documentation and data collected
Task 2: Labor Market and Gap Analysis	<ul style="list-style-type: none"> • Labor market and gap analysis detailed industry and occupational data, based on the NAICS and SOC coding systems • Educational and training data 	<ul style="list-style-type: none"> • All Industry, occupational, and educational data related to the goods movement sector in Los Angeles, Orange, Riverside, and San Bernardino Counties, as described above • Gap Analysis results • Report describing the results of the gap analysis, including all supporting documentation and data collected

The focus of this report is the activities and deliverables associated with Task 2. As part of Task 2, ICF completed the following tasks: 1) collecting relevant data from private and public sources; 2) incorporating findings from Task 1—the Good Movement Survey; 3) managing project activities; and, 4) analyzing and reporting data.

Figure 2 depicts a timeline of key milestones of the project.

Figure 2. Timeline of Key Data Collection and Analysis Milestones



1.3. Organization of the Remainder of the Report

The remainder of the report provides greater detail about the research approach including:

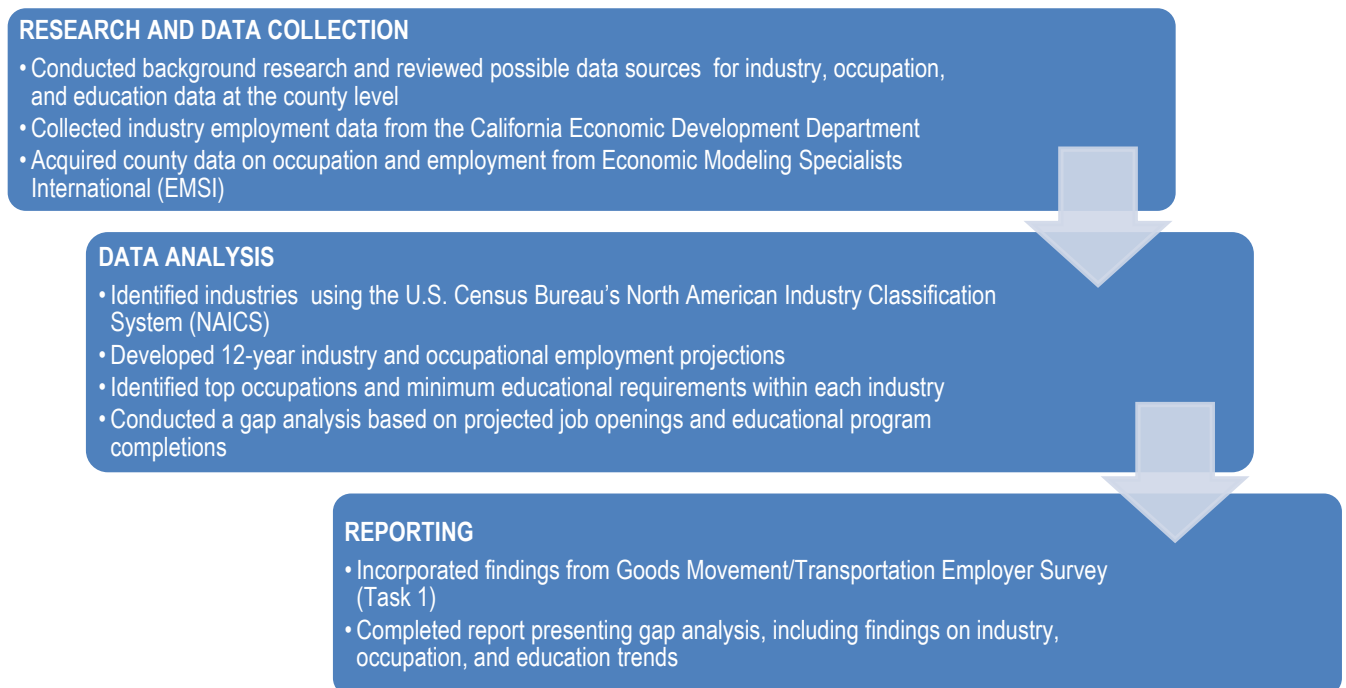
- An overview of the process for data collection and analysis;
- Detailed industry, occupation, and educational findings, including 2012-2022 projections and a gap analysis; and
- Appendices, which include complete 2012-2022 occupational projections for Goods Movement/Transportation occupations.

2. Approach/Methodology

ICF used a sequential approach to develop the Labor Market and Gap Analysis. ICF defined the industry clusters using the Census Bureau's North American Industry Classification System (NAICS) and identified top occupations within these clusters using Bureau of Labor Statistics' Standard Occupational Codes (SOC). Once the list of in-demand occupations within the goods movement industry clusters were defined, the Team developed short- and long-term projections by both industry and occupation. ICF then examined industry size and the regional concentration of jobs within each industry cluster, and identified top in-demand occupations within each region and statewide. Also, ICF identified the relevant education, training, competencies, and certifications needed for each of the in-demand occupations linked to Southern California's goods movement industry.

Once the data analysis was completed, ICF did a thorough review of all findings and developed recommendations on dynamic ways to identify and react to future occupational developments. Overall, the approach described was implemented to optimize accuracy, as well as to provide an innovative and detail-oriented approach to statewide and regional labor market analyses.

Figure 3. Key Activities in the Jobs Market Benchmarking



2.1. Methodology Overview – Data Collection and Analysis

ICF began by researching California’s Goods Movement/Transportation sector and possible public and private data sources on industry and occupations in the four identified counties. ICF identified key industries within the sector using the U.S. Census Bureau’s North American Industry Classification System (NAICS). Identified industries are listed below, in Figure 4, at the three-digit NAICS code level; ICF aggregated the data at the four-digit level to provide a more robust and consistent industry level analysis throughout the Labor Market and Gap Analysis.

Figure 4. Goods Movement/Transportation Industries

NAICS CODE	Industry
481	Air Transportation
482	Rail Transportation
483	Water Transportation
484	Truck Transportation
488	Support Activities for Transportation
493	Warehousing and Storage

Source: [http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart_code=48&search=2012 NAICS Search](http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart_code=48&search=2012%20NAICS%20Search)

ICF then began the data collection phase of the task, gathering labor market information from the California Economic Development Department. ICF also acquired data from Economic Modeling Specialists International (EMSI) on occupational training completions in Southern California relevant to the goods movement industry. Both the private and public data used for Task 2 was based on the U.S. Department of Labor’s Quarterly Census of Employment and Wages (QCEW).³

ICF then identified key industry characteristics, such as employment by industry and occupation, number of establishments and average weekly pay, among Goods Movement/Transportation industries in the four identified counties. ICF also used available data on average monthly employment to create ten-year industry employment projections, from 2012-2022. More information about the detailed industry findings is located in Section 3.

Once the industry analysis had been completed, ICF identified top occupations (based on percentage of industry employment) and minimum educational/training requirements for each of the occupations. Detailed findings on occupational employment and educational requirements can be found in Section 3.

Building on this, ICF identified occupations within the sector that required the equivalent of a post-secondary degree or higher or specialized training and/or certification as a minimum requirement. The team then conducted a gap analysis on these industries, using data on projected occupations and annual educational and occupational training program completions in the four counties to project a surplus or shortage in the labor force for each of those occupations that require training. Detailed reporting on these findings is included in Section 3.

³ A service of the U.S. Department of Labor, Bureau of Labor Statistics, the QCEW program publishes a quarterly count of employment and wages reported by employers covering 98% of U.S. jobs, available at the county, MSA, state and national levels by industry.

3. Detailed Findings

This section provides the findings for the industry and occupational analysis for the goods movement industry in Los Angeles, Orange, Riverside, and San Bernardino counties.

3.1. INDUSTRY FINDINGS

As shown in Figure 5, below, the goods movement industry in Los Angeles, Orange, Riverside, and San Bernardino counties is dominated by *Truck Transportation* and *Support Activities for Transportation* with those two industries representing about 83 percent of industries for which data were available. With regard to average weekly pay, the *Water Transportation* industry, which is made up primarily of over-seas shipping companies, had the highest average weekly pay but also represents the fewest number of establishments.

Figure 5. 2011 Goods Movement/Transportation Industry Characteristics in Los Angeles, Orange, Riverside, and San Bernardino Counties

NAICS CODE	Industry	Number of Establishments	Total Annual Payroll	Average Weekly Pay
481	Air Transportation	232	\$1,267,884,702	\$1,118
483	Water Transportation	77	\$211,231,005	\$1,147
484	Truck Transportation	3,192	\$2,179,457,870	\$804
488	Support Activities for Transportation	2,384	\$2,796,379,140	\$886
493	Warehousing and Storage	805	\$1,826,412,844	\$879
TOTAL		6,690	\$8,281,365,561	\$967

Source: Quarterly Census of Employment and Wages (QCEW)

Figure 6 details the average monthly employment for the goods movement sector in the four target areas. Consistent with the findings in the previous table, *Truck Transportation* showed the highest monthly employment in 2012 and is projected to add the greatest number of jobs, 11,306, in the goods movement sector from 2012 to 2020. Also, the *Support Activities for Transportation* industry is projected to add approximately 11,000 jobs by 2020. Growth in the *Air Transportation* industry is projected to remain relatively flat over the next 10 years.

Figure 6. 2012-2022 Average Monthly Employment for Goods Movement/Transportation Sector in Los Angeles, Orange, Riverside, and San Bernardino Counties⁴

NAICS	Industry	2012	2022	2012-2020 Numerical Change	Annual % Change
481	Air Transportation	20,298	20,196	-102	-0.05%
484	Truck Transportation	53,421	64,728	11,306	2.21%
488	Support Activities for Transportation	50,515	61,484	10,969	2.27%
493	Warehousing and Storage	42,630	52,625	9,995	2.46%
TOTAL		166,864	199,033	32,169	19.28%

Source: the California Economic Development Department

3.2. OCCUPATION AND EDUCATION FINDINGS

At the occupational level, ICF explored the top occupations for each of the identified goods movement industries in the four targeted counties.

Figure 7 details the top occupations in the Air Transportation industry, the percent of the total jobs in that industry that each occupation represents, and the minimum educational requirement for entry into those occupations. The *Air Transportation* industry includes a diverse mix of occupations such as *Flight Attendants, Reservation and Transportation Ticket Agents and Travel Clerks, Aircraft Mechanics and Service Technicians, Commercial Pilots, Couriers and Messengers*, etc. Most of the occupations identified under this industry do not require training beyond short- to moderate-term employment. The occupations that require the highest levels of education are Airline Pilots, Copilots, and Flight Engineers and General and Operations Managers. In addition, in order to become Commercial Pilots, workers have to complete postsecondary non-degree training. Based on the minimum education requirement, there are opportunities for both new entrants and trained or experienced workers within *the Air Transportation* industry's top occupations.

⁴ Growth rates available at <http://www.labormarketinfo.edd.ca.gov/Content.asp?pageid=145>

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Figure 7. 2012 Top Occupations in Air Transportation (4811, 4812) in Los Angeles, Orange, Riverside, and San Bernardino Counties

SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
53-2031	Flight Attendants	4,414	21.4%	Moderate-term on-the-job training
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	3,932	19.0%	Short-term on-the-job training
53-2011	Airline Pilots, Copilots, and Flight Engineers	3,254	15.8%	Bachelor's degree
49-3011	Aircraft Mechanics and Service Technicians	1,193	5.8%	Postsecondary non-degree award
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	650	3.1%	Short-term on-the-job training
43-5011	Cargo and Freight Agents	643	3.1%	Short-term on-the-job training
53-2012	Commercial Pilots	571	2.8%	Postsecondary non-degree award
53-6099	Transportation Workers, All Other	519	2.5%	Short-term on-the-job training
43-4199	Information and Record Clerks, All Other	505	2.4%	Short-term on-the-job training
43-1011	First-Line Supervisors of Office and Administrative Support Workers	463	2.2%	Work experience in a related occupation
43-4051	Customer Service Representatives	438	2.1%	Short-term on-the-job training
43-5021	Couriers and Messengers	81	0.4%	Short-term on-the-job training
11-1021	General and Operations Managers	56	0.3%	Bachelor's or higher degree, plus work experience

Figure 8 details the top occupations in the Rail Transportation industry. Similar to the *Air Transportation* industry, the *Rail Transportation* industry has opportunities for both new entrants and seasoned or trained workers. For example, in order to become *Signal and Track Switch Repairers or Welders, or Cutters, Solderers, and Brazers*, workers have to complete a postsecondary non-degree award. The remaining top occupations require short- to long-term on-the-job training.

Figure 8. 2012 Top Occupations in Rail Transportation (4821) in Los Angeles, Orange, Riverside, and San Bernardino Counties

SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
53-4031	Railroad Conductors and Yardmasters	1,396	17.8%	Moderate-term on-the-job training
53-4011	Locomotive Engineers	1,316	16.7%	Moderate-term on-the-job training

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SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
53-4021	Railroad Brake, Signal, and Switch Operators	767	9.8%	Moderate-term on-the-job training
49-3043	Rail Car Repairers	430	5.5%	Long-term on-the-job training
47-4061	Rail-Track Laying and Maintenance Equipment Operators	361	4.6%	Moderate-term on-the-job training
51-4041	Machinists	235	3.0%	Long-term on-the-job training
49-9097	Signal and Track Switch Repairers	228	2.9%	Postsecondary non-degree award
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	183	2.3%	Postsecondary non-degree award
51-4121	Welders, Cutters, Solderers, and Brazers	155	2.0%	Postsecondary non-degree award
53-6051	Transportation Inspectors	151	1.9%	Short-term on-the-job training

Figure 9 details the top occupations in the Water Transportation industry. The Water Transportation industry contains a mix of occupations with requirements that range from a Bachelor's degree to short-term on-the-job training. Captains, Mates, and Pilots of Water Vessels, Ship Engineers, Accountants and Auditors, and General Operations Managers all require a Bachelor's degree for entry. These higher-level occupations likely account for the fact that the average weekly pay for this industry is the highest of all the goods movement industries at an average of \$1,147 per week (see Figure 5).

Figure 9. 2012 Top Occupations in Water Transportation (4831, 4832) in Los Angeles, Orange, Riverside, and San Bernardino Counties

SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
53-5011	Sailors and Marine Oilers	577	15.2%	Short-term on-the-job training
53-5021	Captains, Mates, and Pilots of Water Vessels	439	11.6%	Bachelor's degree
53-5031	Ship Engineers	318	8.4%	Bachelor's degree
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	191	5.0%	Short-term on-the-job training
43-4051	Customer Service Representatives	145	3.8%	Short-term on-the-job training
11-1021	General and Operations Managers	132	3.5%	Bachelor's or higher degree, plus work experience
43-5011	Cargo and Freight Agents	130	3.4%	Short-term on-the-job training
41-3099	Sales Representatives, Services, All Other	89	2.3%	Short-term on-the-job training

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SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
43-1011	First-Line Supervisors of Office and Administrative Support Workers	84	2.2%	Work experience in a related occupation
13-2011	Accountants and Auditors	67	1.8%	Bachelor's degree
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	15	0.4%	Short-term on-the-job training
53-3032	Heavy and Tractor-Trailer Truck Drivers	9	0.2%	Short-term on-the-job training
35-2012	Cooks, Institution and Cafeteria	6	0.2%	Short-term on-the-job training
43-5032	Dispatchers, Except Police, Fire, and Ambulance	6	0.2%	Moderate-term on-the-job training
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	6	0.2%	Work experience in a related occupation

Figure 10 details the top occupations in the Truck Transportation industry. The requirements to enter into occupations in the trucking industry are perhaps the lowest in the goods movement sector; this is also the sector that contains the greatest number of jobs. Most of the top occupations in the trucking sector require only on-the-job training with the exception of *Bus and Truck Mechanics and Diesel Engine Specialists* and the management or administrative jobs of *General and Operations Managers*; those occupations require a postsecondary non-degree award and a Bachelor's degree or higher, respectively. *Heavy and Tractor Trailer Drivers* make up more than half (59.3%) of total jobs and requires only short-term on-the-job training.

Figure 10. 2012 Top Occupations in Truck Transportation (4841, 4842) in Los Angeles, Orange, Riverside, and San Bernardino Counties

SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
53-3032	Heavy and Tractor-Trailer Truck Drivers	40,348	59.3%	Short-term on-the-job training
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	5,006	7.4%	Short-term on-the-job training
53-3033	Light Truck or Delivery Services Drivers	3,365	4.9%	Short-term on-the-job training
43-5032	Dispatchers, Except Police, Fire, and Ambulance	1,689	2.5%	Moderate-term on-the-job training
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	1,649	2.4%	Postsecondary non-degree award
43-9061	Office Clerks, General	1,371	2.0%	Short-term on-the-job training

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SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	1,339	2.0%	Work experience in a related occupation
53-7051	Industrial Truck and Tractor Operators	969	1.4%	Short-term on-the-job training
11-1021	General and Operations Managers	919	1.4%	Bachelor's or higher degree, plus work experience
43-3031	Bookkeeping, Accounting, and Auditing Clerks	775	1.1%	Moderate-term on-the-job training
53-7064	Packers and Packers, Hand	293	0.4%	Short-term on-the-job training

Figure 11 details the top occupations in the Support Activities in Transportation industry. Many occupations in this industry are also found in the transportation sectors above. The top occupations in *Support Activities in Transportation* represent quite a diverse listing of jobs and entry requirements. This category includes everything from customer service workers to aircraft mechanics. Just as in the previous industries and occupations, this industry's jobs present a myriad of opportunities for a diverse worker pool. For example, entrants with none to little training can enter the occupation with the highest proportion of jobs in this industry—*Laborers and Freight, Stock, and Material Movers, Hand*—by engaging in short-term on the job training. There are a few occupations in this industry that require more formal training such as *Captains, Mates, and Pilots of Water Vessels*, which requires a Bachelor's degree but overall many of the occupation present opportunities for a large subset of inexperienced entrants.

Figure 11. 2012 Top Occupations in Support Activities in Transportation (4881, 4882, 4883, 4884, 4885, 4889) in Los Angeles, Orange, Riverside, and San Bernardino Counties

SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	6,421	15.2%	Short-term on-the-job training
43-5011	Cargo and Freight Agents	6,206	14.7%	Short-term on-the-job training
53-3032	Heavy and Tractor-Trailer Truck Drivers	3,776	8.9%	Short-term on-the-job training
49-3011	Aircraft Mechanics and Service Technicians	1,821	4.3%	Postsecondary non-degree award
53-7051	Industrial Truck and Tractor Operators	1,640	3.9%	Short-term on-the-job training
43-1011	First-Line Supervisors of Office and Administrative Support Workers	1,242	2.9%	Work experience in a related occupation
43-4051	Customer Service Representatives	1,111	2.6%	Short-term on-the-job training
53-3033	Light Truck or Delivery Services Drivers	1,065	2.5%	Short-term on-the-job training

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SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
41-3099	Sales Representatives, Services, All Other	962	2.3%	Short-term on-the-job training
43-5071	Shipping, Receiving, and Traffic Clerks	824	1.9%	Short-term on-the-job training
53-6099	Transportation Workers, All Other	780	1.8%	Short-term on-the-job training
43-3031	Bookkeeping, Accounting, and Auditing Clerks	688	1.6%	Moderate-term on-the-job training
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	650	1.5%	Work experience in a related occupation
11-1021	General and Operations Managers	618	1.5%	Bachelor's or higher degree, plus work experience
43-5032	Dispatchers, Except Police, Fire, and Ambulance	615	1.5%	Moderate-term on-the-job training
53-7199	Material Moving Workers, All Other	615	1.5%	Short-term on-the-job training
53-7121	Tank Car, Truck, and Ship Loaders	602	1.4%	Short-term on-the-job training
39-6011	Baggage Porters and Bellhops	591	1.4%	Short-term on-the-job training
53-7064	Packers and Packagers, Hand	470	1.1%	Short-term on-the-job training
53-5021	Captains, Mates, and Pilots of Water Vessels	427	1.0%	Bachelor's degree
53-5011	Sailors and Marine Oilers	401	0.9%	Short-term on-the-job training
53-7021	Crane and Tower Operators	387	0.9%	Long-term on-the-job training
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	346	0.8%	Short-term on-the-job training
53-3099	Motor Vehicle Operators, All Other	342	0.8%	Short-term on-the-job training
53-7061	Cleaners of Vehicles and Equipment	325	0.8%	Short-term on-the-job training
43-9061	Office Clerks, General	304	0.7%	Short-term on-the-job training
49-2091	Avionics Technicians	265	0.6%	Postsecondary non-degree award
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	228	0.5%	Work experience in a related occupation
11-9199	Managers, All Other	196	0.5%	High school diploma or equivalent
49-3023	Automotive Service Technicians and Mechanics	187	0.4%	Postsecondary non-degree award
41-2011	Cashiers	184	0.4%	Short-term on-the-job training
49-3043	Rail Car Repairers	76	0.2%	Long-term on-the-job training
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	57	0.1%	Work experience in a related occupation

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SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
51-9111	Packaging and Filling Machine Operators and Tenders	45	0.1%	Moderate-term on-the-job training
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	44	0.1%	Moderate-term on-the-job training
53-4021	Railroad Brake, Signal, and Switch Operators	25	0.1%	Moderate-term on-the-job training
53-4099	Rail Transportation Workers, All Other	25	0.1%	Moderate-term on-the-job training

Figure 12 details the top occupations in the Warehousing and Storage industry. The Warehousing and Storage industry, like many of the previously discussed industries, includes occupations that present opportunities for entrants with mostly short-term-on-the-job training. In fact, the only occupation in this industry that requires prior experience is that of a supervisor. In terms of the spread of jobs in this industry *Laborers and Freight, Stock, and Material Movers, Hand* and *Industrial Truck and Tractor Operators* make up almost 40 percent of all jobs; both offer opportunities to workers who are able to complete training on the job for a short amount of time. *Customer Service Representatives* make up the smallest proportion of jobs in this industry—1.8 percent.

Figure 12. 2012 Top Occupations in Warehousing and Storage (4931) in Los Angeles, Orange, Riverside, and San Bernardino Counties

SOC	Occupation	Employed in Industry (2012)	% of the Total Jobs in Industry (2012)	Minimum Education Requirement
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	10,284	25.6%	Short-term on-the-job training
53-7051	Industrial Truck and Tractor Operators	4,397	11.0%	Short-term on-the-job training
43-5081	Stock Clerks and Order Fillers	3,240	8.1%	Short-term on-the-job training
53-7064	Packers and Packagers, Hand	3,019	7.5%	Short-term on-the-job training
43-5071	Shipping, Receiving, and Traffic Clerks	2,153	5.4%	Short-term on-the-job training
53-3032	Heavy and Tractor-Trailer Truck Drivers	1,503	3.7%	Short-term on-the-job training
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	1,388	3.5%	Work experience in a related occupation
53-7063	Machine Feeders and Offbearers	1,080	2.7%	Short-term on-the-job training
53-3033	Light Truck or Delivery Services Drivers	834	2.1%	Short-term on-the-job training
43-4051	Customer Service Representatives	718	1.8%	Short-term on-the-job training

3.3. GAP ANALYSIS

In order to examine the gap between supply and demand for the top occupations, ICF conducted a gap analysis of occupations within the goods movement/transportation sector. The gap analysis, the results of which are shown in Figure 14, examines the requirements for entry into occupations, such as minimum educational attainment, postsecondary non-degree awards, and other occupational training programs and/or certifications. Analyzing only occupations that have these entry requirements within goods movement, it is projected that there will be a shortage of roughly 9,000 qualified workers for those openings in the four-county region, over the next eight years. Between 2012 and 2020, an estimated 24,000 openings will be available in those occupations that have entry requirements and only 15,000 new workers with the credentials to attain jobs in those occupations. *Bus and Truck Mechanics* and *Diesel Engine Specialists* are projected to have among the greatest shortage of new qualified workers, potentially leaving roughly 2,700 jobs unfilled between 2012 and 2020. At the other end of the spectrum, there are a number of occupations that are projected to have a surplus of qualified workers. General Operations Managers, which typically requires a minimum of a Bachelor's degree in Business Administration for entry, is projected to have 175,049 new qualified workers entering the workforce between 2012 and 2020 and only 23,093 jobs in that occupation will be available in the goods movement sector. As a result, it is unlikely that goods movement firms will have any difficulty finding qualified General Operations Managers, during this time period.

Figure 13. Gap Analysis--Occupations Requiring Formal Education and/or Training

SOC	Description	Education	2012-2022 Openings	2012-2022 Completions	Estimated 2012-2022 Gap
11-1021	General and Operations Managers	Business Administration and Management, General (52.0201)	23,093	198,142	(175,049)
13-2011	Accountants and Auditors	Accounting (52.0301)	23,892	14,792	9,100
49-2091	Avionics Technicians	Avionics Maintenance Technology/Technician (47.0609)	262	34	228
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	Heavy Equipment Maintenance Technology/Technician (47.0302)	214	44	170
49-3011	Aircraft Mechanics and Service Technicians	Airframe Mechanics and Aircraft Maintenance Technology/Technician (47.0607)	2,206	3,426	(1,220)
49-3023	Automotive Service Technicians and Mechanics	Automobile/Automotive Mechanics Technology/Technician (47.0604)	13,329	23,702	(10,373)
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	Diesel Mechanics Technology/Technician (47.0605)	3,419	730	2,689

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SOC	Description	Education	2012-2022 Openings	2012-2022 Completions	Estimated 2012-2022 Gap
49-9097	Signal and Track Switch Repairers	Electrician (46.0302)	79	14,418	(14,339)
51-4121	Welders, Cutters, Solderers, and Brazers	Welding Technology/Welder (48.0508)	4,600	2,550	2,050
53-2011	Airline Pilots, Copilots, and Flight Engineers	Airline/Commercial/Professional Pilot and Flight Crew (49.0102)	1,908	360	1,548
53-2012	Commercial Pilots	Airline/Commercial/Professional Pilot and Flight Crew (49.0102)	905	360	545
53-3032	Heavy and Tractor-Trailer Truck Drivers	Truck and Bus Driver/Commercial Vehicle Operator and Instructor (49.0205)	25,511	3,500	22,011
53-3033	Light Truck or Delivery Services Drivers	Truck and Bus Driver/Commercial Vehicle Operator and Instructor (49.0205)	14,642	3,500	11,142
53-5021	Captains, Mates, and Pilots of Water Vessels	Truck and Bus Driver/Commercial Vehicle Operator and Instructor (49.0205)	1,160	3,500	(2,340)
53-5031	Ship Engineers	Marine Transportation, Other (49.0399)	464	78	386

4. Conclusion

Overall, the data suggest that there are many opportunities for employment and growth in the goods movement sector in the four-county target area, particularly for workers in trucking and transportation support occupations. Many of the occupations in this sector are poised to grow and to offer opportunities for new entrants, as well as current workers. In fact, growth projections for occupations in the the sector range from 170 to over 22,000. Although a few of the occupations will be oversaturated in terms of supply between 2012 and 2022, the majority are well positioned to grow. Also, most of the occupations in the goods movement sector require short- to long-term on-the-job training, which means that workers can enter most of these career pathways with little to no experience and can progress with increased experience on-the-job. All in all, the goods movement sector in Southern California has some promising occupational forecasts for the future; the data presented in this report are critical to determining the types of investments that should be made in order to take full advantage of those opportunities.

Appendix A: 2012-2022 Occupation Projections in Goods Movement/Transportation Sector

SOC	Description	2012 Jobs	2022 Jobs	Numeric Change	Percent Change
41-2011	Cashiers	154,473	179,141	24,668	16.0%
43-9061	Office Clerks, General	166,139	188,211	22,072	13.3%
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	130,921	151,425	20,504	15.7%
43-4051	Customer Service Representatives	99,634	114,920	15,286	15.3%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	96,246	106,973	10,727	11.1%
53-3032	Heavy and Tractor-Trailer Truck Drivers	71,270	80,781	9,511	13.3%
43-1011	First-Line Supervisors of Office and Administrative Support Workers	84,437	93,791	9,354	11.1%
43-5081	Stock Clerks and Order Fillers	97,724	107,034	9,310	9.5%
13-2011	Accountants and Auditors	70,580	78,197	7,617	10.8%
41-3099	Sales Representatives, Services, All Other	43,583	49,335	5,752	13.2%
53-7064	Packers and Packagers, Hand	49,470	54,999	5,529	11.2%
53-3033	Light Truck or Delivery Services Drivers	47,666	51,941	4,275	9.0%
49-3023	Automotive Service Technicians and Mechanics	34,677	38,425	3,748	10.8%
53-7061	Cleaners of Vehicles and Equipment	23,578	27,308	3,730	15.8%
53-7051	Industrial Truck and Tractor Operators	28,121	31,602	3,481	12.4%
2666211	Managers, All Other	42,216	45,200	2,984	7.1%
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	11,393	14,287	2,894	25.4%
51-9111	Packaging and Filling Machine Operators and Tenders	20,703	22,671	1,968	9.5%
43-5011	Cargo and Freight Agents	8,497	10,437	1,940	22.8%
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	18,267	20,188	1,921	10.5%
35-2012	Cooks, Institution and Cafeteria	10,998	12,797	1,799	16.4%
51-4041	Machinists	17,775	19,431	1,656	9.3%
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	10,532	11,951	1,419	13.5%
43-5032	Dispatchers, Except Police, Fire, and Ambulance	10,140	11,471	1,331	13.1%
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	9,686	10,829	1,143	11.8%
11-1021	General and Operations Managers	108,348	109,317	969	0.9%
51-4121	Welders, Cutters, Solderers, and Brazers	11,890	12,732	842	7.1%
43-4199	Information and Record Clerks, All Other	9,354	9,931	577	6.2%
53-3099	Motor Vehicle Operators, All Other	5,420	5,977	557	10.3%
53-5021	Captains, Mates, and Pilots of Water Vessels	1,377	1,914	537	39.0%
39-6011	Baggage Porters and Bellhops	2,351	2,796	445	18.9%
53-5011	Sailors and Marine Oilers	1,198	1,623	425	35.5%
49-3011	Aircraft Mechanics and Service Technicians	5,476	5,882	406	7.4%

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SOC	Description	2012 Jobs	2022 Jobs	Numeric Change	Percent Change
53-7021	Crane and Tower Operators	1,412	1,739	327	23.2%
53-7199	Material Moving Workers, All Other	2,184	2,510	326	14.9%
53-6099	Transportation Workers, All Other	2,460	2,702	242	9.8%
53-2012	Commercial Pilots	1,605	1,828	223	13.9%
43-5021	Couriers and Messengers	8,239	8,434	195	2.4%
53-5031	Ship Engineers	549	727	178	32.4%
53-4031	Railroad Conductors and Yardmasters	1,482	1,657	175	11.8%
53-6051	Transportation Inspectors	844	1,018	174	20.6%
49-3043	Rail Car Repairers	547	705	158	28.9%
53-4011	Locomotive Engineers	1,340	1,496	156	11.6%
53-2011	Airline Pilots, Copilots, and Flight Engineers	3,847	3,976	129	3.4%
53-7121	Tank Car, Truck, and Ship Loaders	848	932	84	9.9%
49-2091	Avionics Technicians	726	796	70	9.6%
43-5071	Shipping, Receiving, and Traffic Clerks	48,597	48,659	62	0.1%
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	643	690	47	7.3%
47-4061	Rail-Track Laying and Maintenance Equipment Operators	452	480	28	6.2%
53-4021	Railroad Brake, Signal, and Switch Operators	807	830	23	2.9%
49-9097	Signal and Track Switch Repairers	309	327	18	5.8%
53-4099	Rail Transportation Workers, All Other	96	107	11	11.5%
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	161	160	(1)	(0.6%)
53-2031	Flight Attendants	4,450	4,219	(231)	(5.2%)
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	6,568	6,266	(302)	(4.6%)
53-7063	Machine Feeders and Offbearers	5,648	5,238	(410)	(7.3%)

Appendix B: Median Hourly Salary and Minimum Education Requirements for Occupations in Goods Movement/Transportation Sector

SOC	Description	Median Hourly Earnings	Education Level
11-1021	General and Operations Managers	\$52.94	Bachelor's or higher degree, plus work experience
13-2011	Accountants and Auditors	\$31.35	Bachelor's degree
26-6211	Managers, All Other	\$35.36	Work experience in a related occupation
35-2012	Cooks, Institution and Cafeteria	\$12.70	Short-term on-the-job training
39-6011	Baggage Porters and Bellhops	\$9.95	Short-term on-the-job training
41-2011	Cashiers	\$9.60	Short-term on-the-job training
41-3099	Sales Representatives, Services, All Other	\$26.17	Short-term on-the-job training
43-1011	First-Line Supervisors of Office and Administrative Support Workers	\$26.13	Work experience in a related occupation
43-3031	Bookkeeping, Accounting, and Auditing Clerks	\$18.53	Moderate-term on-the-job training
43-4051	Customer Service Representatives	\$16.89	Short-term on-the-job training
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	\$16.39	Short-term on-the-job training
43-4199	Information and Record Clerks, All Other	\$19.15	Short-term on-the-job training
43-5011	Cargo and Freight Agents	\$19.27	Short-term on-the-job training
43-5021	Couriers and Messengers	\$12.14	Short-term on-the-job training
43-5032	Dispatchers, Except Police, Fire, and Ambulance	\$17.27	Moderate-term on-the-job training
43-5071	Shipping, Receiving, and Traffic Clerks	\$13.72	Short-term on-the-job training
43-5081	Stock Clerks and Order Fillers	\$10.89	Short-term on-the-job training
43-9061	Office Clerks, General	\$14.32	Short-term on-the-job training
47-4061	Rail-Track Laying and Maintenance Equipment Operators	\$23.36	Moderate-term on-the-job training
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	\$32.60	Work experience in a related occupation
49-2091	Avionics Technicians	\$28.05	Postsecondary non-degree

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SOC	Description	Median Hourly Earnings	Education Level
			award
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	\$29.82	Postsecondary non-degree award
49-3011	Aircraft Mechanics and Service Technicians	\$28.24	Postsecondary non-degree award
49-3023	Automotive Service Technicians and Mechanics	\$15.77	Postsecondary non-degree award
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	\$22.23	Postsecondary non-degree award
49-3043	Rail Car Repairers	\$17.74	Long-term on-the-job training
49-9097	Signal and Track Switch Repairers	\$24.33	Postsecondary non-degree award
51-4041	Machinists	\$17.91	Long-term on-the-job training
51-4121	Welders, Cutters, Solderers, and Brazers	\$16.73	Postsecondary non-degree award
51-9111	Packaging and Filling Machine Operators and Tenders	\$10.65	Moderate-term on-the-job training
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	\$21.68	Work experience in a related occupation
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	\$26.96	Work experience in a related occupation
53-2011	Airline Pilots, Copilots, and Flight Engineers	\$52.83	Bachelor's degree
53-2012	Commercial Pilots	\$35.35	Postsecondary non-degree award
53-2031	Flight Attendants	\$17.11	Moderate-term on-the-job training
53-3032	Heavy and Tractor-Trailer Truck Drivers	\$18.40	Short-term on-the-job training
53-3033	Light Truck or Delivery Services Drivers	\$14.19	Short-term on-the-job training
53-3099	Motor Vehicle Operators, All Other	\$13.62	Short-term on-the-job training
53-4011	Locomotive Engineers	\$24.90	Moderate-term on-the-job training
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	\$18.05	Moderate-term on-the-job training
53-4021	Railroad Brake, Signal, and Switch Operators	\$28.99	Moderate-term on-the-job training
53-4031	Railroad Conductors and Yardmasters	\$27.21	Moderate-term on-the-job training
53-4099	Rail Transportation Workers, All Other	\$22.54	Moderate-term on-the-job training
53-5011	Sailors and Marine Oilers	\$11.39	Short-term on-the-job training

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SOC	Description	Median Hourly Earnings	Education Level
53-5021	Captains, Mates, and Pilots of Water Vessels	\$27.69	Bachelor's degree
53-5031	Ship Engineers	\$38.88	Bachelor's degree
53-6051	Transportation Inspectors	\$30.21	Short-term on-the-job training
53-6099	Transportation Workers, All Other	\$16.24	Short-term on-the-job training
53-7021	Crane and Tower Operators	\$37.41	Long-term on-the-job training
53-7051	Industrial Truck and Tractor Operators	\$16.15	Short-term on-the-job training
53-7061	Cleaners of Vehicles and Equipment	\$9.56	Short-term on-the-job training
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	\$11.37	Short-term on-the-job training
53-7063	Machine Feeders and Offbearers	\$12.47	Short-term on-the-job training
53-7064	Packers and Packagers, Hand	\$9.37	Short-term on-the-job training
53-7121	Tank Car, Truck, and Ship Loaders	\$17.97	Short-term on-the-job training
53-7199	Material Moving Workers, All Other	\$19.68	Short-term on-the-job training

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Appendix C: 2007-2012 Educational Program Completions in Los Angeles, Orange, Riverside, and San Bernardino Counties

Program	2007	2008	2009	2010	2011	Annual Average
Accounting (52.0301)	2,240	1,977	1,061	1,114	1,004	1,479
Accounting and Business/Management (52.0305)	2	2	167	63	236	94
Accounting and Computer Science (30.1601)	10	6	16	31	17	16
Accounting and Finance (52.0304)	20	38	63	58	82	52
Accounting and Related Services, Other (52.0399)	107	103	97	88	76	94
Accounting Technology/Technician and Bookkeeping (52.0302)	96	62	1,124	1,201	1,428	782
Agricultural Mechanics and Equipment/Machine Technology (01.0205)	3	0	0	0	0	1
Aircraft Powerplant Technology/Technician (47.0608)	105	75	105	84	104	95
Airframe Mechanics and Aircraft Maintenance Technology/Technician (47.0607)	397	322	318	298	378	343
Airline Flight Attendant (49.0106)	57	68	70	71	80	69
Airline/Commercial/Professional Pilot and Flight Crew (49.0102)	35	41	34	37	33	36
Alternative Fuel Vehicle Technology/Technician (47.0614)	2	1	19	16	37	15
Applied Behavior Analysis (42.2814)	0	0	0	0	19	4
Applied Psychology (42.2813)	0	0	0	0	38	8
Arts, Entertainment, and Media Management, General (50.1001)	0	0	0	0	6	1
Automobile/Automotive Mechanics Technology/Technician (47.0604)	2,581	2,211	2,054	2,414	2,591	2,370
Automotive Engineering Technology/Technician (15.0803)	0	0	0	0	393	79
Avionics Maintenance Technology/Technician (47.0609)	0	1	0	16	0	3
Business Administration and Management, General (52.0201)	18,542	19,216	20,222	20,041	21,050	19,814
Business Administration, Management and Operations, Other (52.0299)	501	530	652	572	685	588
Business, Management, Marketing, and Related Support Services, Other (52.9999)	102	139	184	225	292	188
Business/Commerce, General (52.0101)	1,382	1,546	1,600	1,590	1,582	1,540
Clinical Research Coordinator (51.0719)	0	0	0	1	0	0
Clinical, Counseling and Applied Psychology, Other (42.2899)	0	0	0	0	139	28
Construction/Heavy Equipment/Earthmoving Equipment Operation (49.0202)	0	0	0	0	0	0
Cooking and Related Culinary Arts, General (12.0500)	584	699	788	809	760	728

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Program	2007	2008	2009	2010	2011	Annual Average
Culinary Arts and Related Services, Other (12.0599)	0	0	0	0	170	34
Customer Service Management (52.0207)	0	0	3	0	0	1
Customer Service Support/Call Center/Teleservice Operation (52.0411)	0	0	4	31	60	19
Diesel Mechanics Technology/Technician (47.0605)	56	81	78	61	87	73
Electrician (46.0302)	1,639	2,058	1,170	1,207	1,135	1,442
Entrepreneurship/Entrepreneurial Studies (52.0701)	179	169	159	158	167	166
Fine and Studio Arts Management (50.1002)	46	0	0	8	12	13
Food Preparation/Professional Cooking/Kitchen Assistant (12.0505)	0	0	0	60	3	13
Foodservice Systems Administration/Management (19.0505)	53	79	59	67	55	63
General Office Occupations and Clerical Services (52.0408)	44	55	58	29	182	74
Golf Course Operation and Grounds Management (31.0302)	0	0	0	0	4	1
Ground Transportation, Other (49.0299)	10	51	59	0	0	24
Heavy Equipment Maintenance Technology/Technician (47.0302)	6	4	3	8	1	4
Homeland Security (43.0301)	0	0	0	0	370	74
Institutional Food Workers (12.0508)	0	0	0	0	0	0
International Business/Trade/Commerce (52.1101)	405	248	402	292	324	334
Machine Shop Technology/Assistant (48.0503)	15	14	11	31	12	17
Machine Tool Technology/Machinist (48.0501)	802	868	960	699	580	782
Marine Transportation, Other (49.0399)	4	2	2	11	20	8
Medical/Health Management and Clinical Assistant/Specialist (51.0711)	0	0	0	11	121	26
National Security Policy Studies (45.0902)	0	0	0	0	27	5
Non-Profit/Public/Organizational Management (52.0206)	26	26	40	43	18	31
Office Management and Supervision (52.0204)	93	88	347	175	319	204
Operations Management and Supervision (52.0205)	0	0	0	0	0	0
Political Economy (45.1004)	0	0	0	6	3	2
Project Management (52.0211)	0	0	0	4	1	1
Public Administration (44.0401)	691	748	628	757	904	746
Public Administration and Social Service Professions, Other (44.9999)	431	404	106	82	38	212
Retail Management (52.0212)	0	0	0	27	45	14
Retailing and Retail Operations (52.1803)	15	16	33	0	0	13
Selling Skills and Sales Operations (52.1804)	8	7	7	12	23	11
Small Business Administration/Management	129	46	102	45	75	79

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Program	2007	2008	2009	2010	2011	Annual Average
(52.0703)						
Taxation (52.1601)	33	95	142	132	178	116
Terrorism and Counterterrorism Operations (43.0304)	0	0	0	0	2	0
Theatre/Theatre Arts Management (50.1004)	0	0	2	2	2	1
Tourism and Travel Services Management (52.0903)	0	0	0	0	0	0
Tourism and Travel Services Marketing Operations (52.1905)	61	71	71	45	31	56
Truck and Bus Driver/Commercial Vehicle Operator and Instructor (49.0205)	451	732	165	240	162	350
Vehicle Emissions Inspection and Maintenance Technology/Technician (47.0612)	26	32	11	21	0	18
Welding Technology/Welder (48.0508)	229	180	278	306	281	255