

Ready for the Job:

Understanding Occupational and Skill Demand in New Jersey's Transportation and Logistics Industry

Local and Interurban Passenger Transit, and Trucking & Warehousing

A Report of the New Jersey State Employment and Training Commission



Prepared by the
John J. Heldrich Center for Workforce Development at Rutgers University

With the Assistance of the Workforce Investment Boards of
Bergen, Cumberland/Salem, Hudson, Mercer and Passaic Counties,
and Cumberland County College, Mercer County Community College, and William Paterson University

James E. McGreevey, Governor

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Preface and Acknowledgements

The *Ready for the Job* project was developed by the New Jersey State Employment and Training Commission (SETC) with the New Jersey Departments of Labor and Education. The project was directed by Henry Plotkin, Executive Director of the SETC, and was funded by the New Jersey Department of Education. The research was conducted by the John J. Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey, with assistance from the local Workforce Investment Boards of Bergen, Cumberland/Salem, Hudson, Mercer, and Passaic Counties and from researchers at William Paterson University, Cumberland County College, and Mercer County Community College.

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Project Summary

Economic prosperity for New Jersey, its citizens, and its businesses depends on a well-trained workforce. This joint effort of the New Jersey State Employment and Training Commission, the New Jersey Department of Education, and the New Jersey Department of Labor is designed to collect up to date information from employers on the skill needs of eight key industries in the state. The eight industries that are the focus of this effort are: health care, finance/insurance, construction, utilities/infrastructure, manufacturing, tourism/hospitality, transportation/logistics, and information technology.

The entire effort, led by the local Workforce Investment Boards of Bergen, Cumberland/Salem, Hudson, Mercer, and Passaic Counties and guided by Industry Advisory Groups, involved over thirty focus groups and eighty interviews with employers and educators. The Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey, with assistance from researchers from William Paterson University, Cumberland County College, and Mercer County Community College, conducted this research to identify the skills, knowledge, and educational requirements of seventy-four select occupations and eleven areas of work. The Heldrich Center and its research partners also identified the key trends in each industry that affect skill requirements and identified strategies for meeting the key workforce challenges of each industry.

The information collected through this effort will be disseminated through this series of reports and through an Internet website (www.njnextstop.org) that will include a searchable database of each profiled occupation. This information will assist a variety of users. Students and job seekers can use this information to make decisions about education and careers. Educational and training institutions can use this information to develop course and programs of study that will provide individuals with necessary skills. Policy makers at the state level can use this information to ensure that government resources are invested in programs and efforts that will benefit individuals and businesses.

Understanding Occupational and Skill Demand in New Jersey's Transportation and Logistics Industry

Executive Summary

The transportation and logistics industry in New Jersey is an integral part of the state's economy. The trucking and warehousing and local and interurban passenger transit sectors, which form the focus of this report, together employ over 94,000 people and generate over \$6 billion in revenue, accounting for 1.6% of the Gross State Product (GSP) in 2001.¹ New Jersey's ideal location at the center of the Washington, DC/Boston urban corridor, squarely between the two major markets of New York and Philadelphia, has made it an attractive base for many employers.

The trucking and warehousing sector conveys goods from producers to consumers, and includes public and contract warehousing, trucking, and full service logistics companies. The local and interurban passenger transit sector is concerned with moving people from one place to another within the state via bus lines, demand response providers (as-needed bus and van services), and commuter rail and subway systems. On both a national and a state level, employment in both of these sectors is expected to grow in coming years, particularly the local and interurban passenger transit sector, where job growth in New Jersey could be as high as 18% between 2000-2010.²

Jobs in the transportation and logistics industry are evolving in response to increases in the use of technology, stricter security regulations, and, in the case of the trucking and warehousing sector, an increased focus on management of the supply chain as more companies provide "just-in-time" delivery services. Workers in the industry must now possess solid academic skills to handle increased reporting responsibilities. Many must also have the ability to apply principles of supply chain management and to work effectively with technology on the job. Companies are now striving to provide better customer service, requiring employees at all levels of the organization to demonstrate strong interpersonal skills.

However, as skill requirements at all levels of the industry increase, employers contend that many workers, especially those applying for entry level positions, lack the basic academic, workplace readiness, and cross-industry demand skills to perform well. At higher levels of employment, employers report difficulties in finding workers with the technical skills and experience necessary in many logistics oriented positions. At the same time, incumbent workers are struggling to stay abreast of changes in the industry and acquire the skills needed to remain competitive.

This report, based on focus groups and interviews that included over twenty separate employers and educators, summarizes the skill, knowledge, and educational requirements of key transportation and logistics occupations and identifies strategies for meeting the important workforce challenges facing the industry.³



Skill Requirements of Selected Job Groups

An industry advisory group convened to guide the study selected ten occupations that largely fall into six “job groups” that share a common set of core competencies, basic educational requirements, and skill sets. While within each job group the level of skill mastery required varies, the occupations with-

in the job group share a common continuum of competencies and tasks. In a dynamic and fluid economy, the definitions and requirements of occupations change often and can vary from one employer to another. The grouping of occupations into job groups minimizes the effect of these differences.

Administration

Occupations: Office clerk	
Core Competencies	Sample Skills
<p>Use keen and consistent attention to detail to file, code, and communicate industry records for billing, tracking, and research purposes.</p> <p>Communicate confidently and effectively with members of the industry, relying on strong familiarity with industry terminology.</p>	<p>Communication and teamwork</p> <p>Attention to detail</p> <p>Research skills</p> <p>Computer skills</p>

The Administration job group includes office clerks. These workers perform clerical duties, including the handling of government required paperwork, to support company operations. They must understand regulations governing required paperwork and be able to accurately sort forms and perform data entry when necessary, though most data entry activities are being replaced by more complex interactions with technology. Administrative workers must be able to perform

merging, editing, reporting, and other tasks on computer systems used to store and track company information. In some cases, employers report that these workers perform basic maintenance on computer systems, such as backing up data, which used to be performed by more highly skilled technical employees. Most employers require these workers to have only a high school education or GED, although specific training or experience may be required depending upon the complexity of the work.

Analytical Work

Occupations: Logistics professional	
Core Competencies	Sample Skills
<p>Apply knowledge of financial, math, statistics, and technology systems concepts routinely and accurately.</p> <p>Demonstrate understanding of the various components of a system, project layout or business practices, and an ability to quantify those components in terms of time, resources, and labor.</p> <p>Communicate goals and resource needs effectively with various types of project partners.</p> <p>Identify problems, inconsistencies or inefficiencies within systems, sets of information or business practices.</p> <p>Initiate innovation in technical problem solving.</p> <p>Develop and implement effective solutions to address problems identified.</p> <p>Use technology effectively to complete tasks. Demonstrate thorough capabilities in using specialized software.</p>	<p>Problem solving and critical thinking</p> <p>Mathematics</p> <p>Systems evaluation</p> <p>Reading comprehension</p> <p>Interdisciplinary knowledge</p> <p>Writing</p>

The Analytical job group includes logistics professionals, a category of jobs representing several evolving occupations that focus on various aspects of managing a company’s supply chain, usually at the corporate level. Increasingly in demand throughout the trucking and warehousing sector, these workers must apply financial, math, statistics, and technology systems concepts to analyze information and determine more efficient use of processes, technology or other business systems for the

purpose of maximizing the efficiency of product delivery. In addition, they must communicate effectively with technical and non-technical staff to solve supply chain problems. Workers also must effectively utilize technology, including specialized software, to perform forecasting, data analysis, and other tasks. Many of these positions are highly skilled and require a college degree. Additional certifications may be necessary, as well.



Labor and Skilled Trades Work

Occupations: Bus & truck diesel mechanic, packer and packager, electrical and electronics installer/repairer Core Competencies	Sample Skills
Select and use tools and materials with precision to meet task specifications. Apply knowledge of math and technology concepts relevant to industry. Understand and adhere to safety precautions with consistency. Demonstrate initiative and an ability to think critically and solve problems in a timely and cost efficient manner. Demonstrate ability to work cooperatively as a team member. Some positions in this job group require workers to conduct quality control analysis.	Mathematics Problem solving and critical thinking Equipment selection and maintenance Operation and control Installation and repairing Reading comprehension

Comprising both highly skilled and entry level workers who perform the “hands on” building, repairing, installing, and controlling of equipment and materials at their jobsite, the Labor and Skilled Trades job group in the transportation and logistics industry includes occupations such as bus and truck diesel mechanics, packers and packagers, and electrical and electronics installers/repairers. To be successful, workers must master and precisely apply a range of tools and materials to the task at hand, particularly as new tools, equipment, and materials are introduced to the industry. Employers report that these workers must also understand and effectively apply

engineering and math concepts, as well as technology. Employers stress that the more highly skilled workers in this job group, such as bus and truck diesel mechanics and electrical and electronics installers/repairers, among which there currently is a severe shortage of workers, must demonstrate the ability to quickly and precisely diagnose the cause of problems and equipment malfunctions. Workers in these positions typically must have a high school diploma or GED. Many employers also require a certificate based credential specific to the job, especially for more advanced maintenance/repair positions.

Management/Supervision

Occupations: Storage and distribution manager Core Competencies	Sample Skills
Use effective judgment and decision making to allocate resources and personnel to meet project budget and deadline. Communicate and coordinate the efforts of multiple project partners, vendors, and workers to share common organizational goals. Provide technical leadership across projects/disciplines.	Problem solving and critical thinking Entrepreneurship and business skills Coordination Communication and teamwork Monitoring Time management Management of personnel resources

The Management/Supervision job group includes storage and distribution managers. These workers oversee day-to-day operations, supervise a variety of employees, and provide reports to upper level management. These workers must have strong communication skills to motivate employees and interact with clients and co-workers. Storage and distribution managers, in particular, must interpret the charts, statistics, and policies developed by logistics professionals and apply supply chain management principles. These workers need to have advanced

problem-solving skills in order to re-distribute work in the case of a disruption and they must be able to understand and operate the computer systems that control inventory and other aspects of the business. For these jobs, employers report that experience is more important to them than formal education such as a bachelor’s degree, though more companies are beginning to hire individuals with a college degree in logistics or business areas.

Safety and Security Work

Occupations: Transit inspector, transit and railroad police	
Core Competencies	Sample Skills
<p>Communicate effectively with the public, co-workers, and others.</p> <p>Identify and investigate suspicious activities and/or accidents effectively.</p> <p>Ability to speak another language, such as Spanish, is highly desirable.</p>	<p>Problem solving and critical thinking</p> <p>Communication</p> <p>Monitoring</p> <p>Social perceptiveness</p>

The Safety and Security job group in this industry includes transit inspectors and transit and railroad police. These workers investigate suspicious activity and/or accidents, enforce laws and regulations, and interact with the public to ensure safety and security. They must communicate effectively with the public, co-workers, and others in the course of their monitoring and investigative work. These positions typically require at least two years of college education or military experience. Inspectors are required to obtain a state approved

engineer's license and possess a college engineering degree, though some can advance via on the job training and experience. Transit and railroad police must meet other state requirements for age, citizenship, criminal background, physical status, and other factors. Employers prefer that many of these workers, especially those who work in New Jersey's urban areas, have the ability to speak at least one other language in addition to English. Spanish is the most preferred additional language.

Vehicle Operation

Occupations: Tractor-trailer truck driver, transit and intercity bus driver	
Core Competencies	Sample Skills
<p>Operate and navigate the vehicle effectively.</p> <p>Apply knowledge of math concepts relevant to loading vehicle, if applicable.</p> <p>Understand and adhere to safety precautions and relevant regulations with consistency.</p> <p>Apply knowledge of technology concepts relevant to operating the vehicle effectively.</p> <p>Represent the company to customers and handle conflict effectively.</p> <p>Demonstrate ability to lift at least fifty pounds.</p>	<p>Operation and control</p> <p>Operation monitoring</p> <p>Reading comprehension</p> <p>Judgement and decision making</p>

Workers in the Vehicle Operation job group, which includes tractor-trailer truck drivers and transit and intercity bus drivers, control a wide variety of vehicles as a primary component of their job. They must be able to read, write, and understand English well, effectively apply laws, safety procedures, and math concepts related to the operation, loading, and unloading of the vehicle, and properly record activities as required by the law and/or employers. While all vehicle operators must be able to communicate effectively, workers who interact extensively with the public must be able to handle conflict, demonstrate empathy and cultural awareness when interacting with

customers, and be responsive to customer needs. Many vehicle operators must also become familiar with new technology. For example, some tractor-trailer drivers must now operate up to 15 on-board computers. Workers in these jobs typically have a high-school diploma or GED, as well as special licenses and certifications required in specific positions. In addition, workers must have clean driving records and must meet a variety of government and employer-imposed requirements for specific positions. Stricter government-imposed requirements for some tractor-trailer drivers are contributing to a severe shortage of workers in this occupation.



Key Workforce Challenges

The transportation industry in New Jersey is facing three primary workforce challenges:

Challenge 1: Attracting and Recruiting Workers.

Employers report difficulties in attracting and recruiting workers, contributing to current labor shortages among long haul tractor-trailer drivers, bus and truck diesel mechanics, electrical and electronics installers/repairers, and logistics professionals. In addition, the industry is likely to experience a wider labor shortage if growth in the industry proceeds at or near the pace projected. Labor shortages in transportation and logistics are exacerbated by the poor public image that many employers report plagues the industry.

Challenge 2: Preparing Skilled, Qualified Entry-Level Workers.

As the skill needs of employers increase, employers believe that the K-12 educational system is not adequately preparing entry level workers with the basic academic, workplace readiness, and cross industry demand skills necessary to succeed in the transportation industry. In addition, post-secondary programs in the state are not giving students the analytical background or the “hands-on” experience necessary to excel in higher skill occupations. Finally, employers fear that the high cost of many certificate based programs is contributing to labor shortages.

Challenge 3: Upgrading the Skills of Current Workers.

The nature of work in the transportation industry is evolving and employers report that many current workers are having difficulty keeping pace with these changes. Workers must adapt to the growing use of technology, stricter reporting requirements, and the increased importance of effective supply chain management.

While the industry and other entities have taken some steps to address these challenges, the transportation and logistics industry must work with the public sector, as well as educational institutions, to improve the preparation of new workers and to help current workers adjust to recent changes affecting the industry.

Recommendations

1. Recommendations to Attract and Recruit Workers

Increase Awareness of Careers in the Industry Among High School Students

Education, workforce development, and industry groups should work together to better educate students of all ages regarding the full range of career opportunities available to them, including careers in the transportation and logistics industry. Informational websites, career awareness fairs, internship opportunities, and career awareness activities integrated into school curricula could be initiated on state and local levels to further these efforts.

Recruit Workers from Untapped Labor Pools

The industry, with assistance from the workforce development system, should also continue to reach out to untapped labor pools, such as women, immigrants, those in the military, and minorities. Job seekers transitioning off welfare, people collecting unemployment insurance, and users of the One-Stop Career Center system should be informed about opportunities in the transportation industry.

Provide Funding for Training

To increase the flow of workers entering quality programs and alleviate worker shortages, creative funding strategies that combine public and private funding are needed. One option for such public-private collaboration would be for the education and workforce systems to collaborate on funding training programs that prepare workers for jobs where severe worker shortages threaten industry growth and stability.

Improve the Working Environment

To increase the supply of qualified new workers to the industry, employers must make efforts to minimize unattractive aspects of certain jobs. For example, transit companies should review scheduling patterns to ensure that they are not unduly unfair to new workers. Trucking companies should also continue efforts to mitigate the loneliness and long periods away from home experienced by many long haul drivers. This could be accomplished by taking steps such as continuing to recruit husband and wife teams and making greater efforts to respond to drivers’ personal and family needs.

2. Recommendations to Prepare Skilled, Qualified Entry-Level Workers

Strengthen Secondary Education

The New Jersey educational system must incorporate workplace readiness and cross-industry demand skills needed in the workplace into school curriculums. Employers in this and other industries report that many entry level workers lack workplace readiness skills and cross-industry demand skills, in addition to key academic skills, that are necessary to succeed in nearly all jobs in the twenty-first century world of work. High schools should work to incorporate these key skills into the curriculum. To accomplish this, schools should consider adopting programs such as School Counts!, a new initiative designed to reward the development of workplace readiness and cross-industry demand skills in high school youth.

Strengthen Postsecondary Education and Training

Employers note that New Jersey does not have a wide enough range of postsecondary educational opportunities for workers in the industry, nor do many of the existing programs provide needed “hands-on” training presented in a “real world,” work-based context. More and better education and training programs are needed, particularly in areas such as supply chain management, to prepare supervisors and logistics professionals. Programs ranging from short term certificate-based occupational training to associate’s, bachelor’s, master’s, and doctoral degree programs are needed. Expanded postsecondary opportunities are also necessary to adequately train tractor-trailer truck drivers.

3. Recommendations to Upgrade the Skills of Current Workers

Employers should create career advancement opportunities and market these career ladders to their workers. Local employers, with assistance from Workforce Investment Boards, can work together to create self-help planning materials for workers, including skill and interest inventories and custom career ladder maps that help workers see what their options may be for moving among various jobs within a given company. These maps should include information on the training necessary to advance from one occupation to another and the funding options available to pursue such training.

Reader’s Note

Ready for the Job Identifies Four Skill Types

The *Ready for the Job* project identifies four types of skills that are required by or important to employers. Employers require basic skills and workplace readiness skills for nearly all jobs. Cross-industry demand skills, identified through the focus groups and interviews with employers, are important in a variety of occupations in many industries. Finally, employers require advanced technical and professional skills for many jobs. These skills are job-specific and are typically obtained through post-secondary education and training either provided by educational institutions or by employers.

Type of Skill	Definition	Level of Importance
Basic Skills	Ability to read, write, and perform basic mathematical calculations.	Criteria for most entry level or low-level or low-skilled types of jobs.
Workplace Readiness Skills	Minimum expectations for functioning in the workplace, that include meeting standards for attendance and promptness, reliability and integrity, as well as dress and decorum.	Criteria for all jobs in the workforce.
Cross-Industry Demand Skills	Broader skills sets that are in the highest demand among employers in today’s economy, and indicative of success in the workforce. These cross-industry demand skills include: - Math and technology skills - Problem solving and critical thinking skills - Communication and teamwork skills - Entrepreneurship and business skills	Strength in these skill areas can lead to expanded employment opportunities and career success across industries.
Advanced Technical/ Professional Skills	Skills acquired through education and training needed to perform specific tasks and succeed in specific jobs.	Criteria for performance in specific jobs. Education and training is provided by post-secondary education institutions and /or employers.

¹ New Jersey Department of Labor. “Gross State Product for New Jersey by Industry, 1977-2001 (Millions of Current Dollars).” 7 July 2003. <<http://www.wnjp.in.net/OneStopCareerCenter/LaborMarketInformation/lmi09>> (8 September 2003).

² New Jersey Department of Labor. “Estimated and Projected Employment by Industry, 2000-2010.” November 2002. <<http://www.wnjp.in.state.nj.us/OneStopCareerCenter/LaborMarketInformation/lmi04/state/detailind.htm>> (21 August 2003).

³ A full discussion of the methodology used for this study is included in Appendix A.



Understanding Occupational and Skill Demand in New Jersey's Transportation and Logistics Industry

I. Introduction

At the center of the Washington, DC/Boston urban corridor and home to a large number of residents and commuters, New Jersey is a key base for many employers in the transportation and logistics industry. In fact, over 94,000 workers are employed within the trucking and warehousing and local and interurban passenger transit sectors. This report, based on focus groups and interviews that included over forty separate employers and seven educators, summarizes the skill, knowledge, and educational requirements of key transportation occupations and identifies strategies for meeting the primary workforce challenges facing the industry.⁴

The Bergen County Workforce Investment Board (WIB) convened an advisory group of industry stakeholders to guide the effort.⁵ This advisory group selected two industry sectors, the trucking and warehousing and local and interurban passenger transit, upon which to focus the study. Together, these two sectors are referred to throughout this report as the transportation and logistics industry. The advisory group also chose ten key occupations within the industry for in-depth skill demand analysis and provided input on focus group and interview participants, research, and recommendations. The Heldrich Center and William Paterson University held four focus groups with industry and educational stakeholders regarding industry trends and the skill, knowledge, and educational requirements of the selected occupations. Researchers from the Heldrich Center and William Paterson University also conducted fifteen interviews with industry human resource and management personnel regarding education, training, and recruitment issues.⁶

II. Profile of the Industry and Its Skill Needs

a. *Background on the Transportation and Logistics Industry and its Importance to New Jersey*

The transportation and logistics industry includes workers employed in a wide variety of occupations throughout the trucking and warehousing and local and interurban passenger transit sectors. The trucking and warehousing sector conveys goods from producers to consumers, and includes public and contract warehousing, trucking, and full service logistics companies. The local and interurban passenger transit sector is concerned with moving people from one place to another within the state. It encompasses bus lines, demand response providers, (as-needed bus and van services) and commuter rail and subway systems. Both sectors are involved in activities such as customer service, transportation, purchasing, strategic planning, and forecasting. The trucking and warehousing sector also performs activities related to storing goods (warehousing), materials handling, and inventory control.

The transportation and logistics industry is important to both the state and local economies. In New Jersey, the trucking and warehousing and local and interurban passenger transit sectors combined to account for nearly \$6 billion, or 1.6% of the Gross State Product (GSP), in 2001.⁷ On a national level, these two sectors accounted for approximately 1.4% of the Gross Domestic Product (GDP) during the same year.⁸ Nationally, nearly 2.3 million people, or 1.6% of the nation's workforce, were employed in these two sectors in 2001.⁹ In New Jersey, the industry provided jobs to 94,000 individuals in 2003, or nearly 2.5% of the state's total number of workers.¹⁰ Business throughout the industry has been negatively impacted by recent economic downturns, but other trends and indicators suggest that the industry remains robust and will continue to grow in coming years. These trends include a history of government investment in public transportation infrastructure and increases in shipping to New Jersey's ports, which is creating jobs in the trucking and warehousing sector.

**Figure 2.1: At-a-Glance:
The Transportation and Logistics Industry**

Economic Impact: National and State		
Industry as share of GDP (2001) ¹¹	1.4%*	
Industry as share of GSP (2001) ¹²	1.6%*	
Employment and Compensation: National		
	Local and Interurban Passenger Transit	Trucking and Warehousing
Number employed (2001) ¹³	491,660	1.8 million
Average Hourly Earnings (2000) ¹⁴	\$12.06	\$16.00
Projected Growth in Employment from 2000-2010 ¹⁵	39.8%	22% ¹⁶
Employment and Compensation: New Jersey¹⁷		
Number employed (2003)	29,730	64,440
Average Hourly Earnings (2003)	\$12.70	\$16.70
Projected Growth in Employment from 2000-2010	18.0%	5.2%

*Combined figure for trucking and warehousing and local and interurban passenger transit sectors only.

Trucking and Warehousing

The credo in the trucking and warehousing sector is to insure that “the right product, in the right quantity, in the right condition, is delivered to the right customer, at the right place, at the right time, at the right cost.”¹⁸ To accomplish this mission successfully, the industry must focus on the logistics, as well as the transportation and storage, involved in the movement of goods. Logistics involves planning, implementing, and controlling the flow and storage of goods between the point of origin and the consumer. This process also is known as supply chain management. Various modes of transportation then are used to move goods from warehouses and other distribution facilities to retail and wholesale establishments and, eventually, to the customer. The importance of supply chain management has increased dramatically in recent years as the industry has developed powerful forecasting and other planning tools which have allowed for the development of “just-in-time” delivery practices, now the standard method used throughout the industry. “Just-in-time” delivery involves manufacturing goods directly in response to demand, minimizing storage time and ensuring quick, cost-effective delivery of product to its destination. This practice contrasts with past methods, in which companies would produce and store large amounts of goods for longer periods of time. “Just-in-time” delivery saves companies money in terms of storage overhead and minimizes costly overproduction. However, the new method requires companies to maximize planning and efficiency capabilities, thus impacting the skills workers need.

Increasingly, trucking and warehousing firms provide full-service logistical services encompassing the entire transportation process, including inventory management, materials handling, and warehousing. Firms that offer these services often are referred to as third-party logistics providers. However, companies that specialize simply in trucking, warehousing or logistics alone are also included in this sector.

More than three-fourths of the 1.8 million employees in the trucking and warehousing sector work in small firms (those with fewer than ten employees). At the national level, the average workweek is longer (40.5 hours) than that for workers in all industries (34.5 hours). However, the average weekly earnings among nonsupervisory personnel in the trucking and warehousing sector (\$579) exceed those for all private industry (\$474). A slightly larger share of employees in this industry (19%) is unionized than are employees in all industries combined (15%).¹⁹ Truck drivers hold more than half of all jobs in the trucking and warehousing industry. Other positions in this industry include other transportation and materials moving jobs, managers, mechanics and engine specialists, and administrative and sales positions.²⁰

Nationwide employment growth in the trucking and warehousing sector from 2000 through 2010 (22%) is expected to exceed that for all industries combined (16%).²¹ Contract, or leased, warehousing is the fastest growing segment of the logistics industry and is expected to grow at a rate of 12% to 15% over the next two years. Public warehousing is also expected to grow by a rate of 6% to 8% during that time.²²



Public warehousing involves the owner of goods paying a per-use fee for the storage space and labor provided by a warehousing company. Opportunities for qualified truck drivers are expected to be favorable, and courier and delivery services is one of the most rapidly growing segments of the industry. Employment opportunities for diesel service technicians and mechanics also are expected to be favorable, particularly for applicants with formal postsecondary training.²³ Similarly, employers and industry experts note that demand for logistics managers has also grown. In fact, the sector is currently experiencing a critical shortage of advanced degree logistics professionals who specialize in supply chain management.²⁴

Although trucking and warehousing is a national industry, firms are most heavily concentrated in areas such as California, Texas, and New Jersey. Over sixty million consumers with a collective purchasing power of \$800 billion live within overnight ground delivery of New Jersey.²⁵ With over 64,000 workers employed in this sector throughout the state, New Jersey ranks among the country's top employers in the area of trucking and warehousing.²⁶ The state also ranks third in the nation with regard to the number of general warehousing and storage establishments.²⁷ Truck terminals are located throughout the state, with a heavy concentration in Port Newark/Elizabeth, marine facilities in Camden and Gloucester counties and Newark International Airport. The center of warehousing activity is near Exit 8A of the New Jersey Turnpike in Middlesex county, where an estimated twenty-five million square feet of warehousing and distribution space is located.²⁸ However, the Meadowlands area and parts of Hudson county are quickly becoming warehousing and distribution hubs for retailers and others wanting quick and easy access to northern New Jersey and New York City markets.²⁹

Truck transportation is essential to almost every industry in New Jersey. Trucks deliver freight for 12,370 manufacturing companies, supply goods to 50,180 retail stores, and stock 27,130 wholesale trade companies. Trucks also supply goods to over 5,000 agricultural businesses and transport the produce and products to the market. Trucks exclusively serve 86% of New Jersey's communities.³⁰

In New Jersey, industry and employment experts predict that jobs in the trucking and warehousing sector will continue to grow. The New Jersey Department of Labor projects that an additional 3,400 jobs will be added to this sector by 2010, with much of that the result of strong growth in the number of drivers.³¹ Of 120 businesses that stated an intention to relocate to New Jersey in the near future, twenty-seven of them (23%) are logistics firms, more than any other single industry.³² New Jersey employers report severe labor shortages in occupations including tractor-trailer drivers, diesel mechanics, electrical and electronic installers/repairers and logistics professionals.

As the health of the trucking and warehousing sector generally parallels the state of the national economy, the growth trends mentioned above have undoubtedly been tempered by the nation's recent economic downturn.³³ However, this sector is generally one of the first to recover when the economy

improves. In addition, New Jersey is likely to continue to experience growth because internationally based firms increasingly are utilizing ocean container methods to ship goods.³⁴ This has resulted in increased traffic to east coast ports, including Port Elizabeth in New Jersey, one of the nation's leading commercial ports. This increase in port inventory has increased demand for some trucking and warehousing sector workers to move these goods off the docks and on to other destinations in the product supply chain.

Local and Interurban Passenger Transit

The local and interurban passenger transit sector is concerned with transporting people from one location to another within the state. It encompasses bus lines, demand response providers, (as-needed bus and van services) and commuter rail and subway systems.

Nationwide, nearly 500,000 people are employed within the local and interurban passenger transit sector. The sector's most visible staff members are bus drivers and train conductors. These workers are supplemented by a large number of support staff (mechanics, installers, inspectors, etc.) and technical specialists. Non-supervisory employees in the sector earn an average hourly wage just over \$12.00 per hour, which is equivalent to approximately \$482 per week, slightly above the average weekly wage for all private sector jobs (\$474).³⁵

In New Jersey, local and interurban passenger transit is one of the state's fastest growing sectors. According to the New Jersey Department of Labor (NJDOL), the sector will grow 18% by 2010, making it the ninth most-rapidly-growing sector in the state.³⁶ As of 2003, there were 29,720 workers employed within this sector. By 2010, NJDOL projects this number will grow to nearly 35,000.³⁷ Currently, the state's workforce accounts for roughly 6% of all employment nationally in this sector, placing New Jersey securely among the national leaders in local and interurban passenger transit employment.³⁸ The average hourly wage for employees of this sector within New Jersey (including management) is, at \$12.70 per hour, or \$508 a week, roughly 5% greater than the national sector average.³⁹

Government spending has also been generous in the passenger transit sector. The 1998 Transportation Equity Act for the 21st Century (TEA-21) authorized over \$8 billion in funding for new transit systems by 2003.⁴⁰ TEA-21 awarded New Jersey a number of grants for transit projects, including \$70 million for a rail system linking Bergen County with Hoboken, Jersey City and Bayonne, and \$60 million for the first stage of the Newark-Elizabeth rail link. The bill also authorized \$3 million for the New Jersey Job Access Reverse Commute Program.⁴¹ NJ Transit is now the nation's third largest provider of bus, rail, and light rail transit.⁴² While the future of such aggressive funding programs for public transportation is in question as Congress debates whether to renew funding for new development under the re-authorization of TEA, employment in this sector will continue to be an important source of jobs in New Jersey.

b. Skill Requirements of Selected Job Groups

The advisory group for this effort selected ten occupations for in-depth skill demand analysis. These ten occupations were selected by the advisory group to include the occupations with the largest number of annual openings or that were expected to experience significant growth in openings in the next ten years. The advisory group members used estimates and projections produced by the New Jersey Department of Labor, as well as their own knowledge of the industry. In addition, the advisory group also considered occupations with a shortage of qualified workers. Finally, the advisory group ensured that the selected occupations represented a diversity of education and training requirements.

In 2000, across all industries, 205,700 individuals were employed throughout the state in the seven selected occupations for which employment information was available (see Figure 2.2). The number of individuals employed in these occupations is expected to grow across all industries by an average of 10.3% from 2000 to 2010 and produce a combined 6,170 openings each year. The mean annual wages of these occupations ranged from \$17,655 to \$49,940 in 2003.

Figure 2.2: New Jersey Employment³⁶ and Earnings³⁷ in Selected Occupations* Throughout All Industries

Occupation	Mean Annual Wages 2003	Estimated Number Employed 2000	Projected Number Employed 2010	Percent Change 2000–2010	Annual Openings (due to both growth & replacement)
ADMINISTRATION					
Office Clerk	\$24,350	102,400	113,400	10.7	3,060
ANALYTICAL WORK					
Logistician/logistics professional	N/A	N/A	N/A	N/A	N/A
LABOR AND SKILLED TRADE WORK					
Bus and truck diesel mechanic	\$40,00	56,600	6,900	4.7	200
Packer/Packager	\$17,655	44,400	48,900	10.2	1,590
Electrical & Electronics Installers/Repairers	\$44,330	300	300	0	10
MANAGEMENT/SUPERVISION					
Storage and Distribution Mgr.	N/A	N/A	N/A	N/A	N/A
SAFETY AND SECURITY WORK					
Transportation Inspector	\$49,940	700	700	7.9	20
Transit and Railroad Police	N/A	N/A	N/A	N/A	N/A
VEHICLE OPERATION					
Tractor-trailer Truck Driver	\$36,885	46,100	50,800	10.2	1,100
Transit and Intercity Bus Driver	\$29,110	5,200	5,800	10.3	190

* Totals may not add due to rounding. Employment data are rounded to 100. Percent changes are based on unrounded data.

No wage or employment data are available for logisticians because this is a new occupation that is not yet classified in O*Net, the United States Department of Labor’s database of occupations, or within New Jersey’s wage and employment data. Data regarding transit and railroad police and storage and distribution managers are unavailable because, while the occupations are classified in O*Net, these jobs are not identified in the New Jersey employment and wage statistics information.

The ten selected occupations in the transportation and logistics industry largely fall into six “job groups” that share a common set of core competencies, basic educational requirements, and skill sets (see Figure 2.3). These include

Administration, including office clerks; Analytical Work, including those who work as logisticians; Labor and Skilled Trade positions, including bus and truck diesel mechanics, packers and packagers, and electrical and electronics installers/repairers; Management/Supervision jobs, including storage and distribution managers; Safety and Security Work, including public transportation inspectors and transit and railroad police; and Vehicle Operation, including tractor-trailer truck drivers and transit and intercity bus drivers. A description of these selected occupations, their skill requirements and key workforce issues can be found in Appendix D. A searchable database of all selected occupations in the eight industries is available at www.njnextstop.org.

Figure 2.3: Profile of Transportation and Logistics Industry Job Groups

Job Groups	Description of Job Group	Occupations Included in Job Group	Education/Training Required or Preferred by Employers	Core Competencies ⁴⁵	Sample Occupational Skills
Administration	Work that involves the daily organization and management of business affairs.	Office clerk	HS Diploma/GED Work experience	Use keen and consistent attention to detail in order to file, code, and communicate industry records for billing, tracking, and research purposes Communicate confidently and effectively with members of the industry, relying on strong familiarity with industry terminology	Communication and teamwork Attention to detail Research skills Computer skills
Analytical Work	Work that involves mathematical, statistical, and systems analysis and planning.	Logistics professional	B.A., B.S. preferred. Specialized certificates and/or licenses specific to job may be necessary.	Apply knowledge of financial, math, statistics, and technology systems concepts routinely and accurately. Demonstrate understanding of the various components of a system, project layout, or business practices and an ability to quantify those components in terms of time, resources and labor. Communicate goals and resource needs effectively with various types of project partners. Identify problems, inconsistencies or inefficiencies within systems, sets of information or business practices. Initiates innovation in technical problem solving. Develop and implement effective solutions to address problems identified. Use technology effectively to complete tasks. Demonstrate thorough capabilities in using specialized software.	Problem solving and critical thinking Mathematics Systems evaluation Reading comprehension Interdisciplinary knowledge Writing Communication and teamwork Organization

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Figure 2.3: continued

Job Groups	Description of Job Group	Occupations Included in Job Group	Education/Training Required or Preferred by Employers	Core Competencies ⁴⁵	Sample Occupational Skills
Labor and Skilled Trade Work	Work that involves building, repairing, installing, controlling, or operating equipment and materials. Also includes work such as cleaning buildings, landscaping grounds, and preparing foods.	Bus & truck diesel mechanic Packer/packager Electrical and electronics installer/repairer	Union workers: HS diploma/GED and apprenticeship, which includes classroom and on-the-job training. Non-union workers: On-the-job training. Often, technical/vocational certification required.	Select and use tools and materials with precision to meet task specifications. Apply knowledge of math concepts relevant to industry. Understand and adhere to safety precautions with consistency. Apply knowledge of technology concepts relevant to industry. Demonstrate initiative and an ability to think critically and solve problems in a timely and cost efficient manner. Demonstrate ability to work cooperatively as a team member. Some positions in this job group require workers to conduct quality control analysis.	Mathematics Problem solving and critical thinking Equipment selection and maintenance Operation and control Installation and repairing Reading comprehension
Management/Supervision	Work that involves supervising, coordinating, and planning work of site and staff.	Storage and distribution manager	HS Diploma/GED Work experience Bachelor's degree preferred for managers, especially among those applicants who do not have past experiences with the hiring company Associate's degree typically preferred for supervisors.	Use effective judgment and decision making to allocate resources and personnel to meet project budget and deadline Communicate and coordinate the efforts of multiple project partners, vendors, and workers to share common organizational goals Understand and adhere to safety precautions with consistency Provide technical leadership across projects/disciplines.	Problem solving and critical thinking Entrepreneurship and business skills Coordination Communication and teamwork Monitoring Time management Management of personnel resource
Safety and Security Work	Work that involves investigating suspicious activity and/or accidents, enforcing laws and regulations, interacting with the public to ensure safety and security.	Safety and Security Work Transit inspectors Transit and railroad police	At least 2 years of college education or military experience generally required. Inspectors require state approved engineer's license.	Communicate effectively with the public, co-workers and others. Identify and investigate suspicious activities and/or accidents effectively. Demonstrated ability in speaking other languages, especially Spanish, is highly desirable.	Problem solving and critical thinking Communication Monitoring Social perceptiveness

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Figure 2.3: continued

Job Groups	Description of Job Group	Occupations Included in Job Group	Education/Training Required or Preferred by Employers	Core Competencies ⁴⁵	Sample Occupational Skills
Vehicle Operation	Work that involves driving, controlling or otherwise operating moving vehicles.	Tractor-trailer truck driver Transit and intercity bus driver	H.S. diploma/G.E.D. Commercial driver's license (CDL). Other training might be required if working with hazardous materials.	Operate and navigate the vehicle effectively. Apply knowledge of math concepts relevant to loading vehicle, if applicable. Understand and adhere to safety precautions and relevant regulations with consistency. Apply knowledge of technology concepts relevant to operating the vehicle effectively. Represent the company to customers and handle conflict effectively. Demonstrate ability to lift at least fifty pounds.	Operation and control Operation monitoring Reading comprehension Judgement and decision making

While within each job group the level of skill mastery required varies, the occupations within the job group share a common continuum of competencies and tasks. In a dynamic and fluid economy, the definitions and requirements of occupations change often and can vary from one employer to another. The grouping of occupations into job groups minimizes the affect of these differences.

Administration

The first job group is the Administration job group, which includes office clerks. These workers perform clerical duties to support company operations. Employers in both the trucking and warehousing and the local and interurban passenger transit sectors require clerical personnel to handle much of the government required paperwork associated with the work they do.

Administration workers in the trucking and warehousing and the local and interurban passenger transit sectors must be able to accurately sort paperwork and perform data entry, when necessary. As technology increases, however, most data entry activities are being replaced by more complex interactions with technology. Administrative workers must become familiar with the computer systems that are used to enter and track necessary forms and information, and be able to manipulate these systems to perform merging, editing, reporting, and other tasks. In some cases, employers report that these workers perform basic maintenance on computer systems, such as backing up data, which used to be performed by more highly skilled technical employees.

Most employers require these workers to have only a high school education or GED, although specific training or experience may be required depending upon the complexity of the work. For example, workers who handle import/export paperwork must understand all current regulations that apply to the handling of these documents.

Emerging Skills

Homeland security laws, other regulations, and the increased reliance on technology in many offices have made these jobs more complex and demanding. Workers must file additional paperwork and be familiar with the rules governing such duties. In addition, workers in this field increasingly are relied on to perform basic computer maintenance and they must interface with various types of technology, from complex phone systems, to computers and software and other equipment, to perform many of their job duties.

Workforce Trends and Issues

As traffic to East Coast ports increases and customs and security regulations tighten, employers report a growing need for skilled workers to fill job openings in this area, particularly in the area of Port Elizabeth, NJ.

Analytical Work

People who hold Analytical Work jobs are responsible for analyzing information and systems to determine more efficient use of processes, technology or other business systems or to perform other necessary tasks for the organization.

Occupations that fit into this category in the trucking and warehousing sector include those that fall under the heading of logistician. Logistics involves planning, implementing, and controlling the flow and storage of goods between the point of origin and the consumer. Logistician occupations actually represent an evolving category of jobs that are concerned with assisting companies to manage their supply chain effectively, usually at the corporate level. Job titles and descriptions within this category can vary widely from company to company, but include: vice president of logistics, business solutions experts, analysts and consultants, inventory control and supply chain managers, and many others.

Workers in analytical occupations in the transportation industry must correctly apply financial, math, statistics, and technology systems concepts to identify and address problems, inconsistencies or inefficiencies within systems, sets of information, or business practices as they relate to managing the supply chain of goods and services. In addition, they must communicate effectively with technical and nontechnical staff to solve problems. Workers also must effectively utilize technology, including specialized software, to complete tasks. Many of these positions are highly skilled and require a college degree. Additional certifications may be necessary, as well.

Emerging Skills

Logisticians and the advanced skills they need to be successful are relatively new in the transportation and logistics industry. Deregulation of some aspects of the industry has led to a growing need for better decision making supported by complex analysis of companies' logistical needs.⁴⁶ More recently, "just-in-time" delivery practices have made the planning and analytical skills of logistics professionals even more critical to the industry. Increased use of technology also has affected the skill requirements for many jobs in the Analytical job group more than in other job groups. Technology is increasingly used to support decisions made by analytical workers. For example, decisions to bring a new product to market often depend heavily on the challenges and opportunities identified by logistics professionals using sophisticated forecasting and analysis software tools.⁴⁷ Therefore, workers must be familiar with both computer hardware and the complex software packages that allow these workers to perform statistical analysis, forecasting and inventory management, among other duties.

Due to this dramatic increase in decision making authority among logistics professionals, occupations in this area, while primarily analytical in nature, increasingly incorporate a strong management component. Employers report that many organizations now are reliant on workers in these positions to manage people and supply chains based on their analytical findings.

Workforce Trends and Issues

Due to increases in the complexity of logistics management, also referred to as supply chain management, the trucking and warehousing sector currently is experiencing a critical shortage of logistics professionals with advanced degrees.⁴⁸

Labor and Skilled Trades

This job group includes both highly skilled and entry level workers who perform the "hands on" building, repairing, installing, and controlling equipment and materials at their jobsite. Occupations that fit into this category include bus and truck diesel mechanics, packers and packagers, and electrical and electronics installers/repairers.

To be successful, all workers in this job group must be able to demonstrate various competencies. They must master and precisely apply a range of tools and materials to the task at hand, particularly as new tools, equipment, and materials are introduced to the industry. Employers report that these workers also must understand and apply engineering and math concepts, as well as technology, to the work they perform. Employers stress that the more highly skilled workers in this job group, such as bus and truck diesel mechanics and electrical and electronics installers/repairers, must demonstrate the ability to quickly and precisely diagnose the cause of problems and equipment malfunctions. In fact, some employers require new applicants to identify and fix certain common problems within fifteen minutes as a condition of hire.

Workers in these positions typically must have a high school diploma or GED. Many employers also require a certificate-based credential specific to the job, especially for more advanced maintenance/repair positions.

Emerging Skills

Changes in the complexity of the equipment used within many jobs in this job group have increased, particularly for bus and truck diesel mechanics and electrical/electronics installers/repairers. Workers in these occupations must be trained to use, diagnose, and repair equipment that is becoming more technologically advanced. Even packers and packagers must be able to operate more advanced machinery and computers. Employers report that existing workers trained in older technology do not always adapt well to the new technologies, and adequately trained new workers are in short supply.

Workforce Trends and Issues

Employers report severe shortages among occupations in this job group, most notably among bus and truck diesel mechanics. Shortages within this occupation are driven primarily by a lack of awareness and/or interest among jobseekers and a related decrease in the availability of training programs, which are often expensive to run. Training providers in New Jersey note recent closings of diesel mechanic programs due to the lack of adequate tuition revenues despite high employer



demand. These providers claim that neither students, nor government, nor the industry itself is willing to fund the full cost of training, so they have been forced to close down their programs out of economic necessity.

Despite estimates and projections produced by the New Jersey Department of Labor, which indicate very limited demand for electrical and electronics installers/repairers, employers report a strong need for workers qualified to fill these jobs in the transportation and logistics industry. Employers feel that a growing number of these jobs are becoming available as use of electronic technology increases throughout the industry.

Management/Supervision

The fourth job group is Management/Supervision, which includes storage and distribution managers. These workers oversee day-to-day operations, supervise a variety of employees and provide reports to upper level management.

Workers in the Management/Supervision job group in both the trucking and warehousing and the local and interurban passenger transit sector must have strong communication skills to motivate employees and interact with clients and co-workers. Specific competencies that emerged from our discussion with employers regarding storage and distribution managers included the ability to understand the principles of supply chain management. That is, these workers must be able to understand the charts, statistics, and policies developed by logistics professionals at higher levels in the organization and translate recommendations into action. These workers need to have advanced problem solving skills, as well, to effectively redistribute work according to accepted supply chain principles in the case of a disruption. These managers also must be able to understand and operate the computer systems that control inventory and other aspects of the business. For these jobs, employers report that experience is currently more important to employers than formal education such as a bachelor's degree.

Discussions with employers reveal that most on-site, frontline and midlevel managers throughout the trucking and warehousing and local and interurban passenger transit sectors need similar competencies to perform well. While a knowledge of "supply chain management," per se, is not required in most jobs in the local and interurban passenger transit sector, there is a need for these individuals to understand similar principles involving the efficient movement of passengers to keep the system flowing smoothly.

Emerging Skills

As in other occupational groups, the skill requirements of the Management/Supervision job group are impacted by increasingly complex government regulations and a growing use of technology. Managers must be able to read, interpret, implement, and effectively communicate with their employees about new, constantly evolving government regulations. According to employers, these regulations require increasing amounts of written documentation and interpretation of often complex,

vague or conflicting mandates. Managers often are the front-line for interpreting these regulations and ensuring that their area of the company is in compliance with the law.

As in the Analytical job group, the use of technology to organize and predict the flow of the supply chain is increasing at a rapid rate, especially since the industry has adopted cost-saving "just-in-time" delivery practices. Therefore managers, particularly those in the trucking and warehousing sector, must be able to understand, operate, and monitor inventory control systems. While these managers may not need to use the advanced modeling and forecasting software employed by corporate logistics professionals, supply chain managers must interpret the output from these systems. They must be able to integrate the results of statistical analysis with their knowledge about "real-world" operations and identify conflicts between the two.

Workforce Trends and Issues

Employers tell us that they prefer to draw workers in these positions from the ranks of existing employees, such as the packers and packagers and other occupations that fall under the Labor and Skilled Trades job group. Many of these supervisors include workers who have been in the industry for many years, have worked their way up to their position and have extensive experience in the industry, as well as familiarity with the jobs of the workers they will be supervising. However, the growth in the industry, its increasing reliance on technology and complex forecasting data, and a relative lack of qualified existing workers have caused some employers to look outside their companies to hire workers with more formal education, such as an associate's or bachelor's degree in a logistics or business management field.

Safety and Security Work

The Safety and Security job group includes public transportation inspectors and transit and railroad police. These positions typically are responsible for investigating suspicious activity and/or accidents, enforcing laws and regulations and interacting with the public to ensure safety and security.

Workers in these occupations must have the ability to communicate effectively with the public, co-workers, and others in the course of their monitoring and investigative work. They must also be able to quickly identify and investigate suspicious behavior or circumstances. These positions typically require at least two years of college education or military experience. Inspectors are required to obtain a state-approved engineer's license and possess a college engineering degree, though some can advance via on the job training and experience. Transit and railroad police must meet other state requirements for age, citizenship, criminal background, physical status, and other factors. Employers prefer that many of these workers, especially those who work in New Jersey's urban areas, have the ability to speak at least one other language in addition to English. Spanish is the most preferred additional language.

Emerging Skills

Security concerns following the events of September 11, 2001, have increased the complexity of many safety and security jobs. These workers must be extremely vigilant and perceptive of suspicious behavior and circumstances as a preventive measure against terrorism and other types of crime. They also are required to fill out more accurate and detailed reports regarding the investigations they conduct, usually with the assistance of computers. Therefore, they must have good technology skills, as well as a high level of reading comprehension and writing skill to completely and accurately record necessary information.

Workforce Trends and Issues

Employers report increased demand for highly skilled workers in these areas. As customer and workplace safety increasingly depend on the skills employees in this job group possess, employers are more concerned about the quality of their new recruits. Increasingly, employers are seeking to hire those with more college education and/or military or job experience than is minimally required.

Vehicle Operation

Description and Skill Requirements

Vehicle operators control a wide variety of vehicles as a primary component of their job. Selected occupations in the trucking and warehousing and local and interurban passenger transit sectors that fit into this cluster include tractor-trailer truck drivers and transit and intercity bus drivers.

All workers in these jobs must be able to read, write and understand English well, effectively apply laws and safety procedures related to the operation, loading and unloading of the vehicle and properly record activities as required by the law and/or employers. Workers must also be able to quickly and efficiently apply math concepts to calculate load capacities and other information needed on the job.

Vehicle operators fall into two categories: those who interact extensively with the public, such as bus drivers, and those that do not, such as tractor-trailer truck drivers. While all employees in this cluster must be able to communicate effectively with coworkers, those who interact with the public require specific competency in the area of customer service. Specifically, employers note that workers in these more public positions must be able to handle conflict effectively, as when an altercation occurs on the bus, demonstrate empathy and cultural awareness when interacting with customers, and be responsive to customer needs. However, tractor-trailer driver employers also report that there is a strong need for their drivers to have good communication skills to interact with clients and coworkers.

Workers in these jobs typically have a high-school diploma or GED, as well as the special licenses and certifications that are required to operate a particular vehicle or handle its contents.

Some of the most common credentials include the commercial driver's license (CDL), classes "A" and "B." In addition, workers in these positions must have clean driving records and meet the age requirements associated with specific positions. Most jobs require that workers also be United States citizens and pass physical tests, including drug tests, as a condition of employment.

Emerging Skills

While the ability to understand, speak, and write basic English has always been a requirement of the job, employers note that increasingly complex security laws and reporting requirements have raised the bar regarding the use of English language skills. Many drivers must complete more detailed forms regarding their activities and cargo and are held more accountable for this information than they may have been in the past.

Another major change in the way that drivers operate relates to technology. Employers report that tractor-trailers now contain up to fifteen on-board computers that drivers must know how to operate, including electronic global positioning systems and other route tracking devices. Bus drivers must also operate on-board electronic systems with increasing frequency.

Workforce Trends and Issues

Employers throughout New Jersey express concern over the growing shortage of qualified tractor-trailer drivers. The position pays relatively well, but many workers leave the career because of the lengthy periods away from home, long hours of driving, and the negative public image drivers face. Stricter requirements for obtaining-and keeping-a commercial driver's license also make truck driving less attractive as a career. In fact, many employers claim government regulations are shrinking the labor pool from which the industry traditionally has drawn its tractor-trailer drivers, making it difficult to fill jobs. For example, regulations such as the 2001 U.S.A. PATRIOT Act, which is related to homeland security, have increased criminal background check requirements for some tractor-trailer drivers in recent years. These regulations are expected to become stricter and more inclusive of all driver occupations over the next few years. In addition, high turnover often is created among tractor-trailer truck drivers and other driver occupations as employees move horizontally between competing companies to receive higher pay or better benefits, rather than remaining with the same company.⁴⁹

Exacerbating the labor shortage is the fact that the skills and credentials demanded by many jobs in the Vehicle Operation job group are becoming more complex. Employers report that simple CDL certification is not enough for many workers, as most of these courses do not impart many of the technology-based recording skills, customer service acumen, more advanced reading and writing skills, and other competencies necessary to perform well on the job.



III. Key Workforce Challenges

Several challenges facing the industry impact the supply of workers and the skill needs of employers in the trucking and warehousing and local and interurban passenger transit sectors, including:

Challenge 1: Attracting and Recruiting Workers.

Employers report difficulties in attracting and recruiting workers, contributing to labor shortages currently in certain occupations.

New Jersey employers report severe labor shortages in occupations including long-haul tractor-trailer drivers, bus and truck diesel mechanics, electrical and electronics installers/repairers, and logistics professionals. In addition, the industry is likely to experience a wider labor shortage if growth in the industry proceeds at or near the pace projected. The New Jersey Department of Labor projects that the local and interurban passenger transit sector will grow 18% by 2010, making it the ninth most rapidly growing sector in the state, while the trucking and warehousing sector is expected to grow by 5%.⁵⁰

Labor shortages in transportation and logistics are exacerbated by the poor public image that many employers report plagues the industry. For example, employers feel that the severe shortage of long-haul tractor-trailer drivers is worsened by the image many people have of the profession—lengthy periods away from home, long hours of driving and a rough, mostly male contingent of coworkers. Workers in the industry, such as drivers, mechanics, and transit police are often required to work unpredictable hours, and many positions do not have a clearly identified career path associated with them.⁵¹ Employers feel that the public should be made aware that many jobs in the industry, from tractor-trailer drivers to logistics professionals, command high salaries and involve high-tech work environments. Industry groups such as the American Public Transportation Association suggest that there is a need “to strengthen the overall image of public transportation—to position our industry as ‘an employer of choice.’”⁵²

Challenge 2: Preparing Entry-Level Skilled, Qualified Workers. The growing use of technology, the introduction of new regulations, and the industry’s rising focus on supply chain management is increasing the demand for more highly skilled workers. At the same time, the skill levels of workers entering the field are declining, and employers tell us that many workers lack the basic educational skills needed to perform well on the job.

In interviews and focus groups, employers cite the need for workers to be familiar with computers and willing to learn new technologies. Employers also note that today’s workers must have a higher level of reading comprehension, writing, and interpersonal skills to comply with new regulations and help companies remain competitive. Homeland security regulations in the U.S.A Patriot Act are also increasing requirements for entry into some vehicle operation positions, such as hazardous materials drivers, by requiring drivers to have a clean criminal record. These requirements are expected to grow to include all tractor-trailer drivers over the next several years. Finally, the

process of supply chain management throughout the trucking and warehousing sector has become more complex over the years, requiring employees at many levels of the organization to understand the principles and actions that govern a well-managed logistics plan.

In general, employers report that they are increasingly hiring new workers with a high level of education and skills to fill positions that, in the past, may have been filled by existing employees who had been promoted. Thus, while the industry remains in need of entry-level workers, the demand for workers with high-level analytical, management, and technical skills is also increasing as jobs become more sophisticated and outpace the skill sets of current workers.

While jobs in the transportation and logistics industry are becoming more complex, employers report that the skills of many workers entering the industry are not rising at an equal pace. Employers maintain that it is difficult to find entry-level workers who have the basic academic skills to perform well in available jobs or advance from within the company to more highly skilled positions. Many of these workers also lack workplace readiness skills, such as those described in the Secretary’s Commission on Achieving Necessary Skills (SCANS), as well as more advanced communication and problem solving skills that many employers now consider “basic skills.”⁵³ These skills include business writing skills, such as the capacity to write professional memos and make accurate log entries, interpersonal skills such as interacting effectively with customers, and critical-thinking skills such as analyzing and reacting to new situations.

Challenge 3: Upgrading the Skills of Current Workers.

Incumbent workers struggle to acquire new skills to keep pace with the rapidly changing nature of the industry. In addition, employers report difficulties in promoting existing workers to higher-skilled positions.

Several factors contribute to the growing complexity of skills and credentials workers need to stay competitive in many jobs throughout the transportation and logistics industry. The growing complexity of technology on the job is leading to more stringent training requirements for many workers. An increased focus on supply chain management principles throughout many levels of employment, particularly in the trucking and warehousing sector, has also increased the complexity of skills needed by incumbent workers to succeed in many industry occupations. Stricter regulations regarding the credentials needed by tractor-trailer drivers are impacting incumbent workers. As mentioned above, truck drivers who handle hazardous materials are in danger of losing their jobs if they do not meet new U.S.A. Patriot Act regulations regarding criminal history. These requirements will be expanded gradually over the next few years to affect all tractor-trailer drivers.

While government regulations have always posed challenges to the transportation industry, complex rules governing this sector continue to become more demanding as various federal and state agencies take steps to improve the health and welfare of employees in terms of both safety and working conditions, as well as to protect the public. Employers report that many of

these new regulations necessitate increased reporting and special handling procedures that require new training requirements and job responsibilities for employees in the industry.

Whereas in the past, most supervisors and many managers were promoted from within the ranks of existing employees, employers now report that many entry-level workers lack either the skills or credentials to advance to higher-skilled positions. Employers report that they are increasingly forced to hire new workers with at least some college education or other credentials to assume more advanced positions. However, as skilled new workers also are difficult to find, employers would like to find new ways to help incumbent workers move up within their companies.

IV. Meeting the Challenges

Employers, industry associations, government, and the educational community have developed a number of responses to address the worker shortages and skills gap issues that are impacting the transportation and logistics industry. However, these responses are not adequate to meet employer needs. More work must be done to attract and prepare skilled workers to fill available jobs.

Strategies to Attract and Recruit Workers

In the past, unions played a large role in the recruiting process, attracting many new workers into the industry with the advantages of membership, including relatively high pay, quality training, and other benefits. However, union membership is in decline in the transportation and logistics industry. In addition, several employers we spoke with report that they cannot afford to pay union-level pay and benefits. Therefore, the responsibility for recruiting new workers falls more heavily on individual companies, many of which are not experienced at implementing large-scale marketing efforts.

Unfortunately, one employer response to attracting qualified workers to jobs where worker shortages occur has been to lower their hiring standards to the extent allowed by federal law. Some firms have reduced their requirements for hiring drivers. For example, one employer used to require that potential drivers be twenty-five years of age with one year's experience. Now, they accept drivers at the age of twenty-two, just one year older than the federal law requires. Other employers say that while they would prefer to hire drivers who have specialized truck driver training in addition to a commercial driver's license, they often hire workers without this advanced training due to the scarcity of workers who possess these credentials.

Others employers have taken more positive approaches to attracting skilled workers. For example, some employers are attempting to draw individuals to the industry as young as possible by offering summer and part-time jobs to introduce students and younger workers to the industry and spark their interest in careers in transportation and logistics. Some have

improved internal scheduling to make the job more attractive to employees, while still others offer educational benefits and make special efforts to respond to workers' personal and family-related needs as a means of encouraging skilled new employees to join their organization. One common industry tactic to attract long-haul tractor-trailer drivers has been to market the job to husband and wife teams, promising freedom and a shared "life on the road." Industry associations are now targeting limited marketing efforts at immigrants and military personnel to attract drivers and other workers in demand. Employers in the local and interurban passenger transit sector hope that progressively advancing equipment will allow transit sector occupations to steady their fluctuating work times and gradually deconstruct the perception of unattractiveness with which jobs in the sector are burdened. Some out-of-state employers have agreed to fund two year training programs in exchange for a four year commitment of employment.⁵⁴

Companies and industry associations also lobby against regulations they perceive to be counterproductive to attracting skilled new workers into jobs in the industry. For example, industry associations are making efforts to change federal regulations that require interstate tractor-trailer drivers to be at least twenty-one years of age. While those over the age of eighteen can drive the same vehicles intrastate, employers argue that it is difficult to attract these intrastate drivers to long-haul driving once they reach the age of twenty-one.

Many employers feel the public education system creates barriers to attracting new workers into many jobs by discouraging students from entering the transportation and logistics industry. According to employers, schools wrongly encourage all students to attend academic colleges, while at the same time discouraging these students from pursuing education in technical programs and entering "blue collar" jobs.

Strategies to Prepare Skilled, Qualified Entry-Level Workers

Employers report that New Jersey does not have a sufficient number of secondary and postsecondary level training programs to meet the demand of the state's employers. For example, many schools are closing their diesel mechanic programs for cost reasons despite a long-standing shortage of these workers throughout the industry. In addition, the state has only one program for training tractor-trailer drivers that meets the requirements of the Professional Truck Drivers Institute (PTDI), the nationally recognized leader in establishing curriculum requirements for truck drivers. Employers also complain that there are few college level programs in New Jersey that provide industry workers with the "hands-on" skills in supply chain management that the industry requires today. In fact, employers report that they prefer to hire graduates of out-of-state programs, such as the University of Pennsylvania or the University of Tennessee, both of which have exemplary programs in transportation and logistics.

As jobs become more complex due to the growing sophistication of technology and regulations, the federal government increases the mandated training requirements for many jobs in the industry, especially those in the Vehicle Operation and Labor and Skilled Trades job groups. These regulations force training programs to upgrade their equipment and curriculum requirements, which cost educators money and contribute to the decline in the number of available programs.

At the same time, educators report that as the cost of providing training rises in response to new requirements, public funding levels are not increased at the same rate. The gap between the cost of programs and the availability of government funding assistance is widening. For example, educators state that the average cost for a postsecondary diesel mechanic program is between \$15,000 and \$20,000. However, the Workforce Investment Act and other workforce development funds will only cover \$4,000 of this cost and students often cannot make up the difference and are unwilling to enter into debt. Educators claim that many state-based financial aid programs, such as the Garden State Scholars, Distinguished Scholars, and Equal Opportunity Program funds also are not available to fund technical school training. Low student demand for these training programs, fueled by the industry's negative image, also makes it difficult for educators to recoup costs by providing training to high numbers of students.

In addition, community college educators complain that state laws limit funding available for technical education programs that would otherwise be available for degree-based programs. They also claim that the state does not allow community colleges to “upgrade” their technical curricula to an associate’s degree level, as they have been able to do with less technical fields. These limitations have made many technical education programs unprofitable for schools to run. Educators state that, while they are aware of employer needs, their decision to close technical programs often comes down to what one educator termed “simple economics.”

While employers report that the educational opportunities in New Jersey for those entering the transportation and logistics industry are inadequate, various postsecondary education programs do exist within the state. For example, Rutgers University offers an MBA in Supply Chain Management and a doctoral program in the field. A number of other institutions, such as Stevens Institute of Technology and Middlesex County College, offer relevant courses and programs within broader disciplines. In addition, the New Jersey Department of Labor has approved 254 transportation and logistics related courses to train workers across the state. While only one training provider in New Jersey offers the Professional Truck Drivers Institute certified program, many schools throughout the state offer programs leading to a commercial driver’s license, which is a minimum requirement for most truck driving jobs.

Several states and organizations have developed skill standards for the transportation and logistics industry to help employers work with educational institutions to develop better curriculums. These standards include the Kentucky

Transportation Skill Standards, developed by the Kentucky Department of Education in collaboration with industry, which present detailed skill and competency areas related to workplace safety, communication, math and measurement, science, and other skills. Ohio State University has developed Integrated Technical and Academic Competencies in Transportation, which include core skills such as communicating and applying technology in a transportation work environment. The Professional Truck Driving Institute has developed industry-recognized skill standards for truck drivers.

Outside of New Jersey, a number of leading universities offer both graduate and undergraduate programs in various aspects of transportation and logistics. Employers often cite superior programs at the University of Pennsylvania, the University of Tennessee, and the University of Michigan. They note that these programs employ a “hands-on” approach and emphasize the tools necessary to manage the distribution of goods effectively.

There are a significant number of specialized certificate programs developed for the logistics industry. Many of these certificate programs were developed by industry associations or educational institutes, such as the American Production and Inventory Control Society (APICS), also known as the Educational Society for Resource Management, and are available through on-line courses or through local technical schools and colleges. Certifications range from logistics accounting to inventory control to high-end logistics management certificates.⁵⁵ The Council on Logistics Management, a leading industry association, also has developed student intern program that puts employers in touch with students and promotes future employment in the field of logistics management.

An abundance of emerging strategies attempt to address the workforce difficulties that rapid modernization in the sector is creating. A prime example is an initiative in British Columbia that attempts to involve existing mechanics and drivers in the design of new technological specifications, in the hopes of creating technology that is inherently user-friendly.⁵⁶ Many companies also are encouraging employees to crosstrain in different occupations.

Strategies to Upgrade the Skills of Current Workers

Although managers, supervisors and hourly personnel still learn many day-to-day skills through on-the-job training, employers and others have taken numerous additional steps to address skill gaps among incumbent workers, both at the national and local levels. Employers have taken some positive approaches, such as encouraging workers to evolve from one job category into another as a means of retaining and promoting qualified workers. In fact, one New Jersey employer currently encourages entry-level dockworkers to use tuition reimbursement plans to obtain their commercial driver’s license and thus enjoy both a better career path and a more meaningful job.

Some large industry firms provide in-house training for their workers. One employer told us that the company sends all new front line supervisors to a one week program focusing on supervisory skills, laws and regulations. Entry-level management personnel are sent to a similar course and employees throughout the company must attend ongoing seminars on corporate philosophy, administrative requirements, and new regulations. Other companies provide in-house training on proper equipment use, safety procedures, and other topics. Some employers work closely with equipment manufacturers to develop training programs.

However, many smaller firms rely on outside sources for employee training. Many employers take advantage of industry association or union-based training programs, such as those offered by the United Transportation Union, the Brotherhood of Maintenance of Way Employees, the Association of American Railroads, the Transportation Intermediaries Association, New Jersey Motor Truck Association, the Council on Logistics Management, and others. A large number of companies also rely on workers to take advantage of tuition reimbursement plans to pursue needed job-related training.

Other resources exist to help employers meet the training needs of their current workforce. The Wisconsin Youth Apprenticeship developed Skills for the Future: Logistics Skill Standards Checklist. This list provides managers with basic tools to assess employee skill levels in various areas to determine workers' training needs. It covers skills in customer service, global distribution management, transportation, and other topics. In New Jersey, the New Jersey Department of Labor has provided several customized training grants to companies in the state's transportation and logistics industry. These grants help employers to work with a local community college to develop specialized training to address the skill needs of existing workers.

V. Recommendations

Industry leaders, educational representatives, workforce investment boards, and other government agencies must work together to develop and expand positive approaches to address workers shortages, increase the number of skilled new workers, and ensure that existing workers are able to keep up with the pace of change in the industry.

1. Recommendations to Attract and Recruit Workers

Increase Awareness of Careers in the Industry Among High School Students

Create Better Career Education Opportunities for High School and Elementary School Students. Employers note that many young people do not have an accurate understanding of the nature of work in the transportation industry, nor do they understand what career opportunities exist. Education, workforce development, and industry groups should work together

to better educate students of all ages regarding the full range of career opportunities available to them, including careers in the transportation and logistics industry. Informational websites, career awareness fairs, internship opportunities, and career awareness activities integrated into school curriculums could be initiated on state and local levels to further these efforts.

Recruit Workers from Untapped Labor Pools

Attract Women and Other Untapped Groups to the Industry.

The industry, with assistance from the workforce development system, should also continue to reach out to untapped labor pools, such as women, immigrants, those in the military and minorities. Job seekers transitioning off welfare, people collecting unemployment insurance, and users of the One-Stop Career Center system should be informed about opportunities in this industry.

Provide Funding for Training

Create Partnerships to Provide Funding for Training for Targeted Occupations.

Employers and educators complain that the high cost of quality training contributes to the limited availability of such training, as well as to skilled worker shortages in occupations such as bus and truck diesel mechanics, electrical and electronics installers and repairers, and tractor-trailer truck drivers.

To increase the flow of workers entering quality programs, creative funding strategies that combine public and private funding are needed. Employers must be willing to provide some support to train the workers they need to stay competitive, possibly through scholarships that require a work commitment following training. However, government must work with employers to support such initiatives. One option for such public-private collaboration would be for the education and workforce systems to target more aggressive financial support to training programs that prepare workers for jobs where severe worker shortages threaten industry growth and stability.

Improve the Working Environment

Improve the Working Environment. To increase the supply of qualified new workers to the industry, employers must make efforts to minimize unattractive aspects of certain jobs. For example, transit companies should review scheduling patterns to ensure that they are not unduly unfair to new workers. Trucking companies should also continue efforts to mitigate the loneliness and long periods away from home experienced by many long-haul drivers. This could be accomplished by taking steps such as continuing to recruit husband and wife teams and making greater efforts to respond to drivers' personal and family needs.



2. Recommendations to Prepare Skilled, Qualified Workers

Strengthen Secondary Education

Incorporate Workplace Readiness and Cross-industry Demand Skills Needed in the Workplace into School Curriculums. Employers in this and other industries complain that many entry-level workers lack workplace readiness skills and cross-industry demand skills that are necessary to succeed in nearly all jobs in the twenty-first century world of work. High schools should work to incorporate these key skills into the curriculum. Since cross-industry demand skills, such as interpersonal, communication, critical-thinking, and problem solving skills can be applied in any discipline, these skills can be incorporated into existing curricula.

Workplace readiness skills should also be integrated into the high school experience, as well. While still in its infancy, the *SchoolCounts!* Program, in place in several counties in New Jersey and developed by the Business Coalition for Education Excellence at the New Jersey Chamber of Commerce, may be a promising approach. This program rewards students by issuing an employer-recognized certificate to students for promising behavior such as consistently high attendance rates, above average academic performance, finishing high school on time, and taking initiative by enrolling in extra courses. Local employers enrolled in the program agree to accept the *SchoolCounts!* Certificate as evidence of workforce preparedness.

Strengthen and Expand PostSecondary Education and Training

Improve the Content and Range of Training Curricula. Employers note that New Jersey does not have a wide enough range of postsecondary educational opportunities for many workers in the transportation and logistics industry, nor do many of the existing programs provide needed “hands-on” training. More and better education and training programs are

needed, particularly in areas such as supply chain management to prepare supervisors and logistics professionals. As jobs in these categories involve a wide range of skill levels, programs ranging from short term certificate-based occupational training to associate’s, bachelor’s, master’s, and doctoral degree programs are needed. Employers stress that all of these programs must incorporate “real world” scenarios into their classroom-based curricula and provide opportunities for students to practice skills in a work-based environment. Expanded postsecondary opportunities also are necessary to adequately train tractor-trailer truck drivers. Several states and industry-based groups have developed occupationally based skill standards specifically designed to help educators develop curricula that meet industry needs.

3. Recommendations to Upgrade the Skills of Current Workers

Create Career Advancement Opportunities. Information about career advancement opportunities will help existing workers to maximize benefits such as tuition reimbursement plans and company-provided professional development opportunities. This information also may help to attract new workers into the industry. Local employers, with assistance from Workforce Investment Boards, can work together to create self-help planning materials for workers, including custom career ladder maps that help workers learn the options for moving among various jobs within a given company. These maps should include information on the training necessary to advance from one occupation to another and the funding options available to pursue such training. As part of a self-help company career planning package, employers and WIBs could also create skill and interest inventories to help workers gauge their current skill levels and plan future directions for training and job development within the company (see Figure 5.1).

Figure 5.1: Recommendations by Stakeholder

	State Government	Workforce Investment Boards	Secondary Education	Post Secondary Education	Employers/Associations	Unions
Recommendations to Attract and Recruit Workers						
Increasing the Awareness of Careers in the Industry Among High School Students						
Create Better Career Education Opportunities for Students	X	X	X		X	X
Recruit Workers from Untapped Labor Pools						
Attract Women and Other Untapped Groups to the Industry	X	X			X	X
Improve the Working Environment						
Improve the Working Environment					X	X
Recommendations to Prepare Skilled, Qualified Entry-Level Workers						
Strengthen Secondary Education						
Incorporate Workplace Readiness and Cross-Industry Demand Skills Needed in the Workplace into School Curriculums	X		X			
Strengthen and Expand Post Secondary Education and Training						
Improve the Content and Range of Training Curricula	X			X	X	
Create Career Advancement Opportunities					X	X

VI. Conclusion

Transportation and logistics is a \$6 billion dollar industry in New Jersey alone. Over 94,000 of the state’s workers are employed in jobs throughout the trucking and warehousing and local and interurban passenger sectors. While business has been negatively impacted throughout the industry by recent economic downturns, other indicators suggest that employment in the transportation and logistics industry is likely to grow significantly over the next several years. In fact, many employers currently face worker shortages in some occupations, such as long-haul tractor-trailer drivers, bus and truck diesel mechanics, electrical and electronic installers/repairers and logistics professionals.

Employers throughout the industry also face challenges with regard to increasing the number of skilled workers entering transportation and logistics jobs and keeping current workers’ skills up-to-date. Many jobs in the industry have increased in complexity due to new technology, the growing number of regulations governing the industry and the use of sophisticated methods of supply chain management used to ensure on time delivery of products and people. These increased skill require-

ments make it difficult for less skilled workers to enter the field and pose challenges to current workers trying to stay competitive. In addition, employers cite the industry’s poor public image, coupled with a lack of effective marketing about careers in the field and the limited and declining availability of some types of training programs, as contributing to labor shortages and difficulties in increasing the supply of skilled workers entering the industry.

Several strategies are being implemented to address worker shortages, increase the supply of skilled workers entering the industry, and help existing workers to learn new skills. However, many of these approaches are not sufficient to address the skilled worker challenges facing the transportation and logistics industry. The industry should collaborate with educational institutions and government to improve training programs and funding options and raise awareness about career opportunities at many levels of the educational system. The industry itself also must make special efforts to improve the work environment for some workers, as well as lobby lawmakers and work with industry regulators to ensure that new regulations do not unduly restrict worker supply.

- ⁴ A full discussion of the methodology used for this study is included in Appendix A.
- ⁵ A full list of advisory group members is included in Appendix B.
- ⁶ A full list of focus group and interview participants is included in Appendix C.
- ⁷ New Jersey Department of Labor. "Gross State Product for New Jersey by Industry, 1977-2001 (Millions of Current Dollars). 7 July 2003. <<http://www.wnjp.in.net/OneStopCareerCenter/LaborMarketInformation/lmi09>> (8 September 2003).
- ⁸ Bureau of Economic Analysis, U.S. Department of Commerce. "Industry Accounts Data: Gross Domestic Product by Industry." 28 October 2002, <<http://www.bea.doc.gov/bea/dn2/gposhr.htm>> (21 August 2003).
- ⁹ Bureau of Labor Statistics, U.S. Department of Labor. "Employment by Occupation, 2000 and Projected 2010." 10 December 2001. <<http://www.bls.gov/emp/emptab21.htm>> (8 September 2003).
- ¹⁰ New Jersey Department of Labor. *Occupational Employment Statistics Wage Survey: 2003 Edition*. January 2003. <<http://www.wnjp.in.state.nj.us/OneStopCareerCenter/LaborMarketInformation/lmi23/index.html>> (8 September 2003).
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- ¹⁸ Council of Logistics Management. *Careers in Logistics*. <<http://www.clm1.org/career/downloads/careerstudy.pdf>> (8 September 2003), 2.
- ¹⁹ Bureau of Labor Statistics, U.S. Department of Labor. "Trucking and Warehousing." *Career Guide to Industries, 2002-2003 Edition*. <<http://www.bls.gov/oco/cg/cgs021.htm>> (21 August 2003).
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- ²¹ Bureau of Labor Statistics, U.S. Department of Labor. "Trucking and Warehousing." *Career Guide to Industries, 2002-2003 Edition*. <<http://www.bls.gov/oco/cg/cgs021.htm>> (21 August 2003).
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Appendix A: Methodology

The Workforce Investment Boards of Bergen, Cumberland/Salem, Hudson, Mercer and Passaic counties, in partnership with the New Jersey State Employment and Training Commission, selected the industries for study based on their prevalence in the state and regional economies, their current employment rate, and their potential for job creation.

The Heldrich Center, with input from each WIB, conducted a thorough literature search, or “knowledge inventory,” for each industry. The Heldrich Center compiled background research using the Internet and published research reports on the current and emerging national and state trends, and focused on emerging trends and growth projections in the selected industries. The knowledge inventory formed the basis of the industry reports.

The WIBs convened an advisory group for each industry to guide the project. The Advisory Group consisted of employers and other key industry stakeholders. The Advisory Group aided in the selection of occupations for study and provided input regarding report recommendations. The groups met twice throughout the project.

The Heldrich Center utilized New Jersey Department of Labor Labor Market Information (LMI) data to create a list of occupations for each industry. The primary criterion was gross openings and expected growth. The secondary criterion was occupations with a shortage of qualified workers and those that displayed a diversity of income and educational levels. The Heldrich Center created a ranking of occupations for review by the WIBs. The WIBs, based on input from each Sectoral Advisory Committee, selected a subset of occupations for study that represented the above criteria and/or their own experience within the industry.

The Workforce Investment Boards, with assistance from the Heldrich Center, Cumberland County College, Mercer County College, and William Paterson University, convened four or more focus groups for each industry. These focus groups were facilitated by the Heldrich Center, and included industry and educational representatives. In addition, the Heldrich Center and its research partners conducted ten or more phone interviews per industry with human resource or key operations managers regarding current and future skill issues and requirements.

Appendix B: Advisory Group Members

Bill Cunningham	Teamsters Local 641
Paul Gessner	Port Commerce Department Port Authority of NY & NJ
Al Giunchi	The Hartz Mountain Corporation
Roman Horodysky	State of NJ Dept. of Transportation Bureau of Freight Services
David Letteney	Letteney Consultants
Don Lotz	The Port Authority of NY & NJ
Krishna Muthy	Meadowlink
Ilan Plawker	Bergen County Public/ Private Partnerships division
Gail E. Toth	NJ Motor Truck Association
Keith Weirtz	New Jersey Transit

Appendix C: Focus Group and Interview Participants

Cesar Alvia	Garden State Transportation Corp.
John Anastasio	Metropolitan Marine Maintenance Contractors Assn.
Emma Astudillo	Z & B Tours
Wilma Baker	Port Authority/PACT
Mary Leigh Barbusin	Garden State Towman's Assn.
Glen Bleakley	Greyhound Lines, Inc.
Marvin Bleiberg	Avon Corp.
Peter DellaRosa	Roadway Express, Inc.
Mike Edwards	Lincoln Technical Institute
Christopher Ennis	U.S. Postal Service
Ellen Flamholz	ARCORP Properties/ New York Waterway
Chuck Grappuso	Yellow Freight System
Melissa Goldberg	BCC-Div. Of Cont. Ed.
Steve Greet	U.S. Postal Service
Chuck Hellyer	Greyhound Lines, Inc.
Jeff Herman	Herman Services
Andrew Kanter	Hertz Truck & Car
Dan Kasper	Engine City Technical Institute
Lt. Bob Kilmurray	NJ State Police
Jim Klaiber	Norfolk Southern Railroad
Stewart Laubenstein	Fed-EX Eastern Region
David Levinson	BCC (Bergen Community College)
David Lindner	United Parcel Service
David Malazzo	International Brotherhood of Electrical Workers-Local #164
Gail Marien	BCC-Center for Customized Training
Frank Martorano	Jersey Tractor Trailer Training, Inc.
Louis Natale	New England Motor Freight
John O'Neil	Federal Reserve Bank of NY E. Rutherford Operations Center
Steve Olmo	Port Authority
William Oliver	Jersey Tractor Trailer Training, Inc.
Bill Paladeau	NJ Turnpike Authority
Steve Parkoff	SP Consultants
Dan Pucciarelli	Ultra Coach Express
Donna Racioppi	United Parcel Service
Ranie Rampasud	Port Authority
Theresa Reynolds	FedEx Express
Paul Richardson	Richardson Consulting
Ken Scott	Winsor Tractor Trailer Driving School
Hal Swartz	Advantage Leasing & Rental
Nick Testa	Nick's Towing Service, Inc.
Tony Thomas	Penske Truck Leasing
Burton Trebour	APA Truck and Leasing Company
Bill Tucker	Tucker Company
John Tumino	Garden State Towman's Assn.
Nicole Vidal	New Jersey Transit
John Warrington	Federal Reserve Bank of NY E. Rutherford Operations Center
Jack Widman	Avon Corp.
Larry Wirth	Yellow Transportation, Inc.
Marco Zambrano	Z & B Tours
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Appendix D: Profile of Selected Occupations

1. TRACTOR-TRAILER TRUCK DRIVERS

Tractor-trailer truck drivers have one of the most visible occupations in the country. Their job is to convey goods from one point to another. Their cargo ranges from raw materials to finely finished products, from lumber to automobiles, but they must nearly always meet a number of standards for delivery.

Tractor-trailer truck drivers need a solid knowledge of geography. They must have rudimentary mechanical skills, and be familiar with the many laws and regulations that govern the trucking industry. Like most occupations, truck drivers are also increasingly reliant on computers, which has created a need for computer facility. Drivers must be familiar with basic math, and must have solid communication skills. High school graduation is often required, though not always. Interstate drivers must be at least 21 years old, be U.S. citizens, and possess a clean driving record. All drivers must obtain and regularly renew a commercial driver's license (CDL).

Though turnover is not high, employers noted that the workforce is aging, and that an influx of younger workers is necessary. New drivers are constantly in high demand. Additionally, an increasing number of drivers are functioning as the public face of their organization. The occupation is therefore progressing toward a greater focus on customer service. Rapidly changing public safety guidelines in the wake of the September 11th also require drivers to keep detailed records on their inventory and other aspects of their job. That requirement has in turn raised the level of reading and writing skill that drivers must possess. Finally, recent regulatory changes (specifically, an addendum to the USA PATRIOT Act) have mandated that drivers seeking to transport HAZMAT cargoes undergo a background check. The law requires that drivers wishing hazmat certification must not have been convicted of a felony in the past seven years, or released from prison in the past five.⁵⁷

2. TRANSIT AND INTERCITY BUS DRIVERS

Bus drivers drive passenger busses, either locally (transit) or from city to city (intercity). Depending on the configuration of the route, drivers may collect fares from passengers or even be required to help passengers with luggage and other packages. Drivers are often expected to make regular rudimentary inspections of the bus.

Bus drivers must have a good knowledge of geography. They must have basic skills in speaking and listening, and must be excellent communicators. The ability to defuse conflict and solve problems is a key requirement of this position. Basic mechanical knowledge is often required. No high school graduation is required, but all bus drivers must obtain and regularly renew a commercial driver's license (CDL).

Much like truck drivers, bus drivers have been forced to rapidly adapt to the changing public safety guidelines put in place after September 11th. As a result of these regulatory changes, the job has become more complex.

3. BUS AND TRUCK DIESEL MECHANICS

Bus and truck diesel mechanics specialize in the diagnosis and repair of diesel engines. They are responsible for a wide variety of tasks, not all of which are engine-related (for example, they are often called on to maintain and repair transmissions, clutches, or pumps). Diesel mechanics must read and understand work orders, and occasionally write reports detailing what they have done.

Diesel mechanics must have extensive mechanical knowledge. They must be good critical thinkers, with skills in troubleshooting and problem solving. Diesel mechanics must have a high school diploma or GED, as well as training as a mechanic, with accompanying licenses and certifications (for example, ASE certification). Many employers also require a commercial driver's license (CDL).

Increasingly, diagnosis and repairs are done with the help of a computer. Diesel mechanics (often known as "Diesel Technicians") must be able to interact effectively with computers and computer systems in order to stay competitive. Some employers noted that the growing reliance on computers has led to a dichotomous relationship between younger and older mechanics: younger mechanics have an easier time diagnosing the problem, using the high-technology diagnosis systems, while older mechanics are more mechanically skilled, and can fix the problem more easily once it has been diagnosed.

4. PACKERS AND PACKAGERS

Employees in this occupation are responsible for the packaging of a variety of products for shipping or sale. The products can range from electronics to meat, but the packaging is always done by hand. Packers and packagers must often handle heavy and awkward products, and do so quickly. They sort products, assemble packing materials, and mark completed materials according to various marking systems. They are often required to do some product assembly, also called "light manufacturing." Packers and packagers are occasionally required to fill out forms or registers.

Packers and packagers must be in good physical shape in order to cope with the often difficult demands of the job. Many are called on to stand for long periods of time, lift heavy items, and carry heavy and awkward items for short distances. They must have good cognitive ability and pattern recognition, in order to sort products quickly and accurately. The ability to communicate effectively in English is often required. For this occupation, a high school diploma or GED is preferred, but not necessary.

More than many other occupations, employers have a difficult time attracting qualified workers to this position, because of the heavy stigma often associated with working in a warehouse.

⁵⁷ Transportation Safety Administration, *Frequently Asked Questions: Hazmat Driver Documentation Rule*, May 2003 <<http://www.tsa.gov/interweb/assetlibrary/PatriotActFAQv14.doc>> (5 September 2003).

5. ELECTRICAL AND ELECTRONICS INSTALLERS/REPAIRERS

Electrical and electronics installers and repairers are responsible for installing electronics on transportation equipment, including trains, boats, buses, and trucks. They are often required to inspect already-installed systems, and repair them when necessary. Items within their purview can include starters, generators, or distributors, which they must build, rebuild, or repair as called for.

In addition to the solid grasp of electronics required by this occupation, electrical installers and repairers must have an intimate knowledge of the mechanical concepts with which they're working. They must be good critical thinkers, with effective troubleshooting and problem solving skills. A high school diploma or a GED is required. In addition, many employers prefer that these positions be filled by licensed electricians, and further prefer that they have current HVAC certifications.

There is a trend toward technological modernization within this occupation, but it is not expected to be a difficult transformation. The workers within this occupation have always interacted with high technology, so the shift is unlikely to create any serious problems.

6. LOGISTICIANS

Logisticians, or logistics professionals, represent an emerging and fluid group of occupations, including supply chain managers, consultants, business solutions providers, vice presidents of logistics, and other job titles, that perform a wide variety of tasks related to planning and managing a company's supply chain of goods from production through to final delivery. These workers perform tasks such as using software to forecast production and delivery estimates, creating plans and systems to control the flow of inventory, consulting with management regarding logistics related issues, and, often, managing others.

Logisticians must possess a high degree of analytical and technical ability to properly use and interpret data generated from complex forecasting software. These individuals must also have good communication skills in order to translate sophisticated concepts regarding supply chain management to workers, managers, and technical staff. While the degree required to be a logistician depends on the exact job a person is entering, the large majority requires at least a bachelor's degree and often a master's degree in transportation, logistics, or business management. Many successful consultants and academics in this area possess a doctoral degree in logistics or other related field.

7. TRANSPORTATION INSPECTORS

Public transportation inspectors monitor public transportation systems for deviations from the regulatory norms. They are often responsible for investigating accidents, inspecting property, and determining the causes of disruptions of service. Additionally, transportation inspectors are often responsible for ensuring regulatory compliance among an organization's employees. Inspectors may sometimes be called on to formulate new plans or schedules that would use resources more safely and effectively. They are frequently required to submit written reports of their findings.

Transportation inspectors must have an intimate knowledge of the laws and regulations governing the transportation industry. They must have good knowledge of safety and security procedures, and should usually have some basic skills in administration and management. Inspectors must have familiarity with blueprints and schemat-

ics, and should be good problem solvers. Inspectors usually have a bachelor's degree, though an associate's degree will suffice in some cases. They often complete significant on-the-job training once they are hired.

In the aftermath of September 11th, the regulatory environment surrounding public transportation is more complex than ever before. New inspectors must be intimately familiar with new laws and rules that have been created in the last two years, and must continually upgrade their skills and knowledge as the regulations continue to evolve.

8. TRANSIT AND RAILROAD POLICE

Transit and railroad police officers serve a similar function to general police officers, with a focus on transportation equipment and property. They might be called on to oversee investigations (often in tandem with transportation inspectors), guard or patrol stations and vehicles, or even arrest criminals. They interact heavily with the public, and should be prepared to serve as one of the public faces of a transportation organization. Transit and railroad police are often required to write reports and summaries of their activities.

The knowledge and skills required for this job are similar to that of a general police officer: Transit and railroad police officers must have a good sense of safety and security, and an in-depth knowledge of the laws and regulations governing everyday conduct. They must be excellent critical thinkers and adept problem solvers. Good communication skills are paramount, as is a solid sense of social perceptiveness (awareness of others' reactions and emotions). They must be in good physical shape, and U.S. citizenship is required. In addition to all these, transit and railroad police officers must have an intimate grasp of the laws and regulations governing the transportation industry. They must generally have at least two years of college, or two years in the military, and more on-the-job training may be required once they are hired.

In the wake of the attacks of September 11th, transit and railroad police must consistently upgrade their knowledge, staying up-to-date with the current legislation, in order to remain effective.

9. STORAGE AND DISTRIBUTION MANAGERS

Storage and distribution managers are responsible for the physical direction of resources, storing and distributing materials as necessary. They formulate operating procedures and manage their implementation. They are often required to manage a substantial staff. Storage and distribution managers are often the informal director of a company's shipping operation, and must therefore negotiate with a variety of stakeholders to ensure the best deal for the company.

Storage and distribution managers require a number of skills. They must be efficient administrators and accomplished human resources managers, as well as having an aptitude for teaching and instruction. They must be impeccably organized, and possess nearly flawless time management skills. Storage and distribution managers normally have a bachelor's degree, and incoming managers are usually expected to have a fair amount of related experience.

Employers noted that many of these positions are filled via promotions from within the company. Comparatively few of these jobs are available to applicants outside the company structure. Computer knowledge is becoming steadily more important, as more organizations move to reliance on complicated inventory control systems. Additionally, workers in these positions are increasingly expected to have basic familiarity with the mechanics of supply chain management.



10. OFFICE CLERKS

General office clerks perform a wide variety of tasks, depending on the situation of their employment. Their responsibilities can include answering telephones, organizing filing systems, and many other administrative tasks. Within the transportation industry, clerks are often expected to keep track of the voluminous paperwork required by other employees (for example, truck drivers). Providing drivers with the correct forms is a crucial part of a transportation clerk's job. Additionally, clerks must sometimes interact with clients and end-users, and must be adept at customer service.

Office clerks must be efficient and organized. They usually have basic knowledge of accounting procedures, and are fluent in English. Familiarity with computers and computer systems is crucial. Clerks must also have solid communication skills, and be able to speak and write fluently and coherently. Most companies will provide specialized training to their clerks once they are hired, detailing the practices and standards of that particular company. Clerks are generally required to have a high school diploma or GED.

Rapidly evolving regulations in the transportation industry have made much of the paperwork significantly more complex. New clerks must familiarize themselves with new processing methods, in order to effectively file many forms (such as import/export documentation).