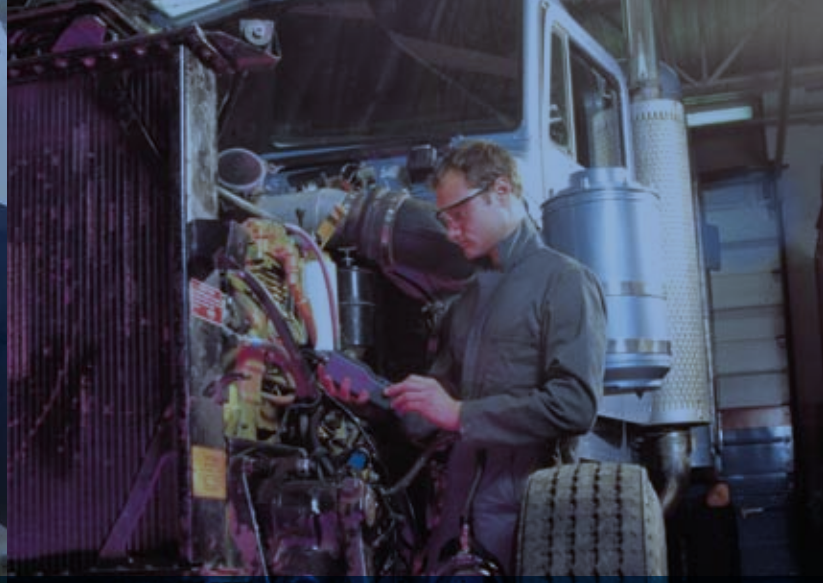
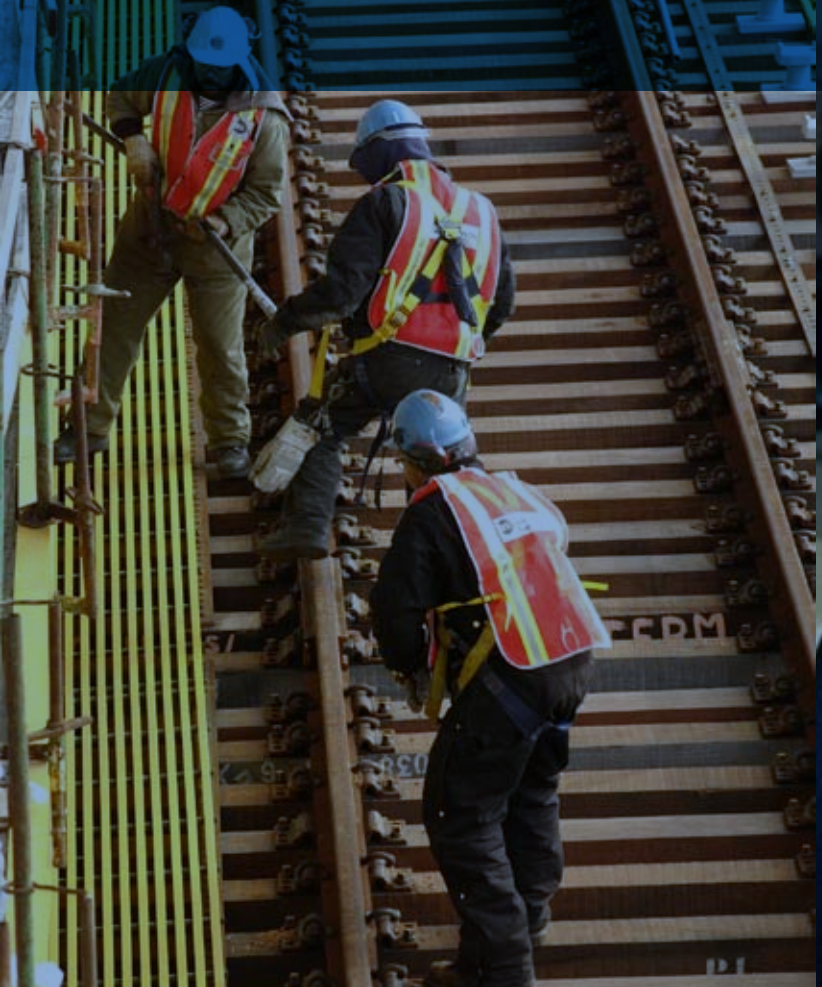


Employment in New York City's Transportation Sector

AIR ■ TRUCK ■ TRANSIT AND GROUND PASSENGER ■ SUPPORT ACTIVITIES



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About the NYCLMIS

The New York City Labor Market Information Service (NYCLMIS) provides labor market analysis for the public workforce system. The service is a joint endeavor of the New York City Workforce Investment Board (WIB) and the Center for Urban Research at The Graduate Center of the City University of New York. The NYCLMIS' objectives are to:

- Develop action-oriented research and information tools that will be used by workforce development service providers and policy makers to improve their practice.
- Be the portal for cutting-edge and timely labor market data about New York City.

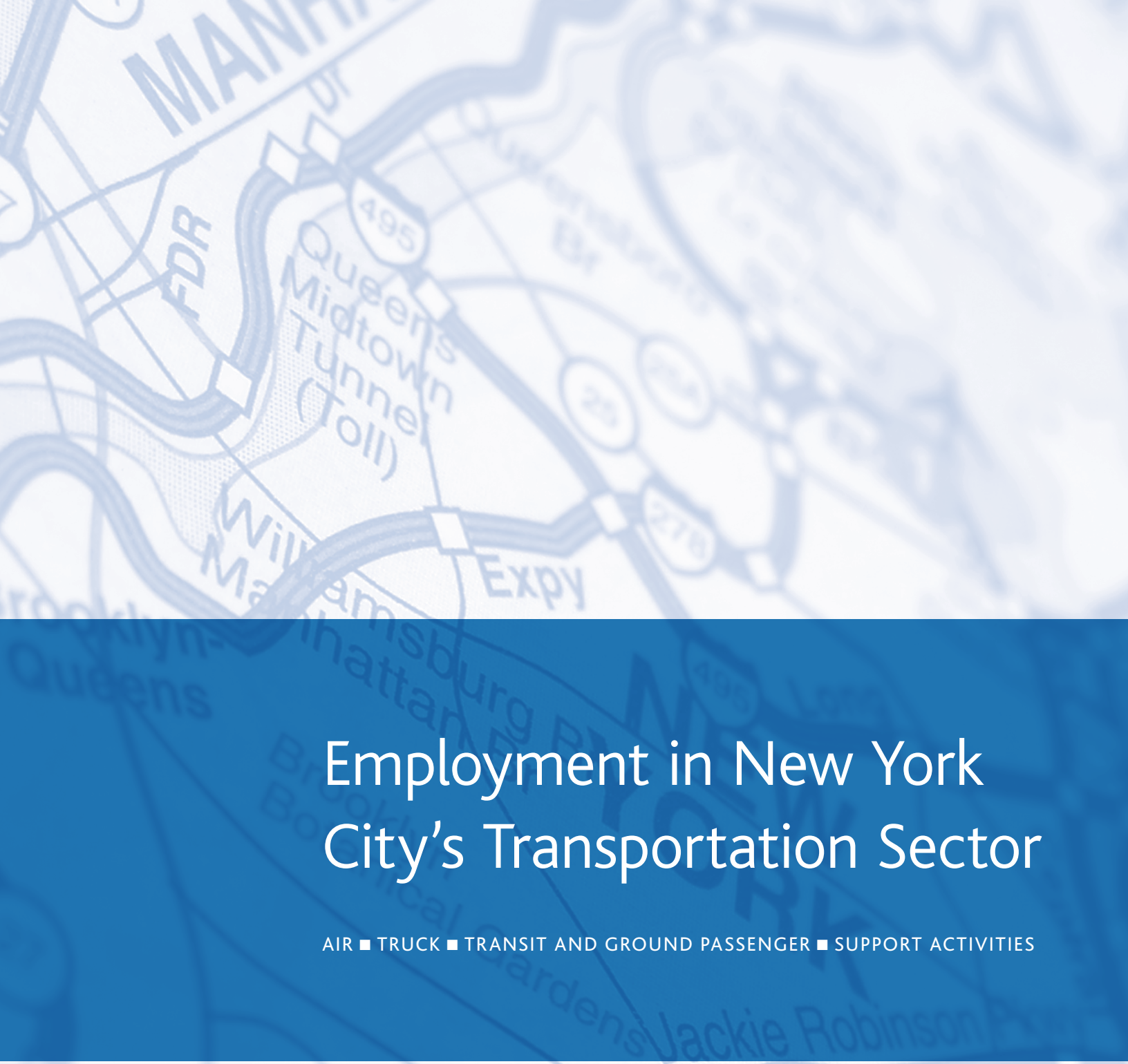
The NYCLMIS primarily serves the program and policy needs of the public workforce system. The NYCLMIS creates research and associated products that are of service to the broader practitioner and policy communities in their day-to-day and strategic decision-making. These products help distill, frame, and synthesize the volumes of data available for the practical use of the public workforce system's partners and stakeholders, with the overall goal of raising public awareness of the importance of workforce development in New York City.

About the WIB

The New York City Workforce Investment Board (WIB) administers the federal Workforce Investment Act funds in New York City and oversees the public workforce system run by the Department of Small Business Services and the Department of Youth and Community Development. The WIB is made up of over 40 volunteer members, appointed by the Mayor, representing local businesses, educational institutions, labor unions, community-based organizations, and other government agencies.

About the Center for Urban Research

Working with the City University of New York Graduate Center's faculty and students, the Center for Urban Research organizes basic research on the critical issues that face New York and other large cities in the U.S. and abroad; collaborates on applied research with public agencies, nonprofit organizations, and other partners; and holds forums for the media, foundations, community organizations and others about urban research at The Graduate Center of the City University of New York.



Employment in New York City's Transportation Sector

AIR ■ TRUCK ■ TRANSIT AND GROUND PASSENGER ■ SUPPORT ACTIVITIES

September 2008

NYC LMIS
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Table of Contents

Executive Summary

Transportation is the lifeblood of American cities. The capacity to deliver goods, services, and workers into, through, and out of a city is a primary determinant of its economic vitality. New York City is among the most vibrant transportation hubs in the nation, consistently ranking first among U.S. cities in passenger miles flown, transit passenger miles,[1] and truck freight volume in the country.

This report is geared to serve the need of workforce development service providers, policy makers, and advocates for information about the status and economic importance of strategic transportation subsectors and the opportunities they provide for the customers of the city's public workforce system.

The four subsectors examined in this report are air, truck, transit/ground passenger, and support activities for transportation. For each subsector we examine economic and industry dynamics, trends in jobs, wages, occupations, workforce demographics, and career advancement pathways.

Key findings, assembled from analyses of secondary data, trade and scholarly literature, and interviews with industry experts are briefly outlined below, followed by recommendations to the public workforce system:

Key Findings

1. TRANSPORTATION SECTOR

- At the time of this writing, oil prices are high and volatile ranging between $130 and $150 per barrel,[2] national unemployment is at 5.5 percent (almost a full percentage point higher than one year ago),[3] the national gross domestic product (GDP) is one percent,[4] and inflation is at its highest since 1991.[5] Across the subsectors, transportation establishments are highly susceptible to economic cycles. As a result, short-term economic and employment prospects — at least in the private sector — are not positive.

- However, longer term prospects for the transportation sector are brighter, and must be considered in the context of the region's persistent advantages as a hub for commerce, tourism, and international travel and immigration.
- According to official records there are about 83,000 private sector transportation jobs accounting for just over two percent of all private sector employment in New York City. This does not include the self-employed, public sector employees, or those employed in related occupations that are not officially counted within the sector as defined by the North American Industry Classification System (NAICS). All in all, the total number of transportation jobs is likely to be more than double the official estimate.
- The transportation sector holds opportunities for individuals seeking jobs through the public workforce system including entry-level transportation occupations that offer wages well above the minimum and which require little or no formal postsecondary training and opportunities for advancement.
- The following were the top ten occupations across the selected transportation subsectors according to the *absolute number of jobs* they represent, their *growth potential* as gauged by recent gains, the *average wages* they command, and the *basic educational requirements* for holding these positions:
  - Bus drivers
  - Bus and truck mechanics
  - Cargo/freight agents
  - Customer service representatives
  - Dispatchers
  - Light truck drivers/sales drivers
  - Laborers/material movers
  - Supervisors of laborers
  - Reservation and ticket agents
  - Transportation attendants
- Across the board, males tend to predominate in all of the transportation subsectors in New York City.
- In three of the four subsectors reviewed in this report — air, truck, and transit/ground passenger transportation — the workforce appears to be undergoing an "aging out" process. In addition to a growing number of older workers (ages 55 and over), the data suggest that fewer young people are entering transportation jobs.

2. AIR TRANSPORTATION

- Queens is the hub of aviation activity in New York City and is highly specialized in aviation compared to the nation as a whole.
- Passenger flight loads into and out of New York City's airports have met and surpassed their pre-2000 peak levels, but freight cargo aviation has suffered a slow decline since 2000, some of which is attributable to truck transport substitution.
- There were about 25,000 New York City jobs in the subsector, a vast majority of which are in Queens. Subsector jobs numbers have decreased between 2000 and 2007 by 20 percent, however. This may be due to a declining volume of air cargo moving through New York City.
- The average annual wage for air transportation jobs in New York City is about $60,000, up 11 percent since 2000 even after adjusting for inflation.
- Occupations accounting for the most jobs in air transportation are: transportation attendants, pilots/flight engineers, reservation/ticket agents, customer service representatives, and aircraft mechanics.

3. TRUCK TRANSPORTATION

- There were 9,374 jobs in the truck transportation subsector in New York City in 2007, down somewhat from just over 10,000 jobs in 2000. Job losses were not experienced throughout the city: the Bronx and Queens gained trucking jobs between 2000 and 2007.
- Queens leads the boroughs with 35 percent of New York City's truck transportation workforce followed by Brooklyn with 27 percent.
- There are trucking jobs in almost every zip code in the city. The largest numbers of jobs are clustered near airports, marine terminals, and around food distribution centers.
- The average annual salary in the truck transportation subsector ($40,118) has increased since 2000 even after adjusting for inflation.
- Top occupations in the subsector are sales and truck drivers, laborers and material movers, supervisors of material movers, general office clerks and dispatchers.
- Security regulations are anticipated to increase which may be expected to create additional barriers for new drivers to enter the workforce and further limit the pool of qualified drivers for employers.

4. TRANSIT AND GROUND PASSENGER TRANSPORTATION

- This subsector is more accurately defined as two distinct sets of industry groups with different dynamics and workforce needs.
- The most prevalent occupations in the subsector are bus drivers, bus and truck mechanics, supervisors of material movers, child-care workers (also known as school bus attendants), transportation attendants, and reservation and ticket agents.
- There are approximately 69,000 Metropolitan Transportation Authority (MTA) jobs in the subsector, of which about 49,000 are in the New York City Transit.
- Queens has the most private sector establishments in the subsector.
- There were about 28,000 jobs in private sector ground passenger transportation: i.e., in taxi, limousine, "black car" companies, and private shuttle and paratransit services.
- Private sector subsector employment in the Bronx and Brooklyn grew dramatically since 2000, and only slightly less so in Staten Island.
- The average annual salaries in private sector ground passenger transportation rose a great deal between 2000 and 2006 ($35,871), even after adjusting for inflation.
- Salaries in private ground passenger transportation are lower than salaries in the other transportation subsectors and lower than salaries earned in public sector transit agencies nationwide and in New York City. Private companies may offer good entry-level opportunities.

5. SUPPORT ACTIVITIES FOR TRANSPORTATION

- The support activities for transportation subsector is made up of distinct industry groups that provide services to air, marine, trucking, and ground transportation establishments, respectively. Firms in this subsector include airport operations, air traffic control, aircraft repair and maintenance, car and truck transportation, carpools, vanpools, freight forwarding and customs agents.
- A majority of both establishments and jobs in the support subsector are located around the airports in Queens. Additional jobs are in midtown and downtown Manhattan, Staten Island near Howland Hook, and throughout northern Queens and Brooklyn.
- The annual average salary in the subsector was $46,085 in 2006, with higher salaries in Manhattan and Staten Island and lower salaries in the remaining boroughs.
- Young people — workers ages 18 to 34 — constitute more than 40 percent of the transportation support workforce: a trend that is somewhat contrary to the other transportation subsectors.

Recommendations for the Public Workforce System

- Given the advantages and needs of the region's transportation infrastructure, the transportation sector is not expected to go the way of the New York City manufacturing sector. However, considering the current economic outlook in the nation as a whole and for the New York City region, the selected subsectors are not expected to provide a substantial number of entry- and mid-level jobs in the short term. Instead, service providers and policy makers should think of ways to work with industry leaders and educational institutions to craft a longer-term solution to their staffing challenges.
- Workforce development account executives can more efficiently conduct sector outreach in the geographic locations where jobs are clustered — within and across subsectors. For example, many transportation and related jobs cluster around marine and air cargo terminals and distribution centers.
- In addition to providing one-on-one counseling to jobseekers, managers and policy makers in the public workforce system could be helpful to jobseekers by collecting and aggregating data about transportation–related job vacancies. Vacancies generated by large employers and the public sector can be acquired from the city contracts database.
- The New York City agencies that administer the public workforce system need access to dependable and up-to-date business lists that are currently compiled and managed by New York State Department of Labor. Currently, these lists are not readily available due to confidentiality concerns.
- The public workforce system line staff should use the occupational profiles that appear in this report to inform and refine their career advising and job-matching activities. In addition, jobseekers themselves can use these profiles to better understand the nature of the occupations in the transportation sector and determine their own interest and compatibility.

- The national O*NET occupational database is a promising resource (http://online.onetcenter.org/). Yet, since it is based on national data, the information needs to be verified with New York City employers to ensure that it reflects the local employment experience. Workforce development account executives should speak with employers directly to obtain more specific, local information about their workforce needs and challenges.
- Rapid advancements in computers and electronics require a workforce that possesses appropriate technical and technological skills. Such skills are also essential for career advancement and to connect to mid- and professional level jobs in other sectors.
- While the scope of education and training appears to be beyond the capacity of any single agency to provide, the public workforce system is uniquely positioned to identify the issues and bring together the relevant actors to address these systemic needs. Policy makers should work on developing relationships that connect educational institutions — such as the New York City Department of Education, the City University of New York's community and senior colleges, and large private universities located in the city — to employers so that they can jointly plan formal training and education pipelines that are adequate for the sector's needs.
- Policy makers should be aggressive in identifying the skills that the primary public education system should address and use existing networks to create introductory work opportunities for youth.
- Although short-term employment prospects in the air, trucking, support activities, and ground passenger transportation subsectors are not as positive as they are for public transit, there clearly is a need for young people to reinvigorate the transportation workforce and replace retiring workers in the years ahead. Youth-serving providers need to assess if the populations they serve are going to be ready to take positions in these fields, and if not, identify what kind of preparation they need. The development of adequate education and training pipelines will require making successful linkages to the education and training institutions of New York City.

More detailed findings and recommendations can be found at the end of each section of this report, and in Section 7: Conclusions and Recommendations.

Endnotes

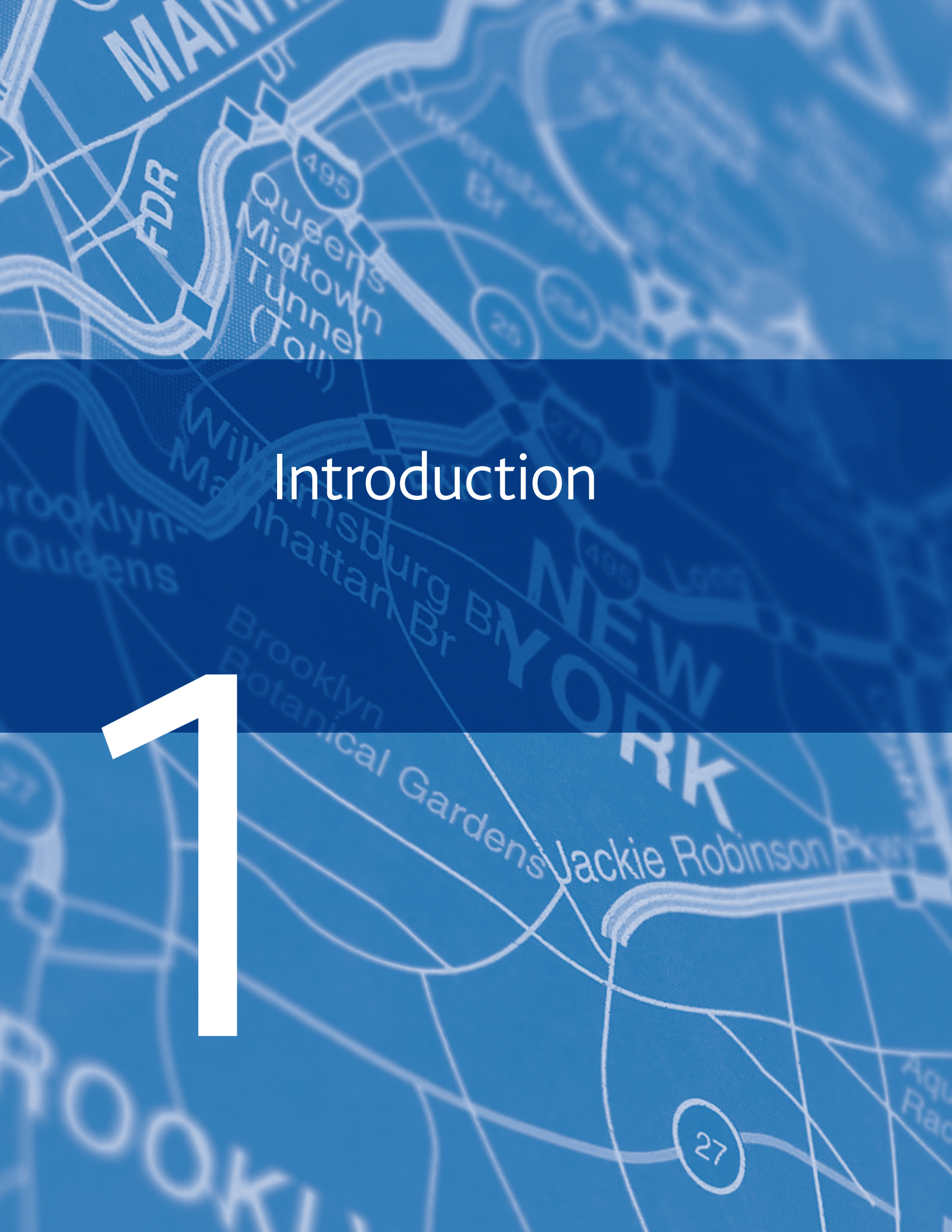
1 Transportation Research Board of the National Academies, *The workforce challenge: recruiting, training, and retaining qualified workers for transportation and transit agencies*, Special Report 275, Washington, DC, 2003. (http://onlinepubs.trb.org/onlinepubs/sr/sr275.pdf).

2 Habiby, M. Oil Rises for first time in four days after U.S. stocks slump, *Bloomberg.com*, 18 July 2008.

3 Bureau of Labor Statistics, Current Population Survey, June 2008. www.bls.gov/cps/.

4 Bureau of Economic Analysis, National Economic Accounts, First Quarter 2008 final calculation. www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm.

5 Troianovski, A. and S. Reddy, Fed confronts spike in inflation, *Wall Street Journal*, 17 July 2008, p.1.



1 Introduction

Transportation is the lifeblood of American cities. The capacity to deliver goods, services, and workers into, through, and out of a city is a primary determinant of its economic vitality. New York City is among the most vibrant transportation hubs in the nation, consistently ranking first among U.S. cities in passenger miles flown, transit passenger miles,[1] and truck freight volume in the country. It is safe to presume that there will continue to be jobs in the transportation sector in New York City and that job growth in its subsectors will be both the foundation for and the beneficiary of the city's expansion. This report provides data and additional context to enable individuals working in the public workforce system to determine how many, where, and what kind of jobs there are, and to form educated estimations about the future outlook for jobs in the transportation sector.

In *Employment in New York City's Transportation Sector,* we examine the status and economic importance of four strategic transportation subsectors and the opportunities they provide to the customers of the city's public workforce system. The transportation sector provides thousands of jobs for entry- and mid-level workers in New York City.

In addition to recognizing the transportation sector's potential as a source of good jobs, the New York City Workforce Investment Board (WIB) saw evidence in its own operational data: high numbers of placements and training grants for jobseekers. Also, in 2007 the Workforce1 Transportation Center opened in Queens focusing on the unique needs of the sector's employers and jobseekers.

Recognizing the importance of the transportation sector to the public workforce system and its partners and stakeholders, the WIB asked the NYCLMIS to focus its first research project on the transportation sector. Specifically, we examine the transportation sector's 1) economic importance and performance, 2) viability for job growth, and 3) implications for the workforce system's strategic focus. This report is intended to help line staff, managers, and policy makers in the public workforce system to improve their work with employers

Research Questions

1. How is each subsector organized and best understood in an employment context?
2. How has each subsector withstood economic upturns and downturns?
3. What major supply and demand dynamics affect the supply and mix of jobs in each subsector?
4. How many jobs are there and where are they located?
5. How much do people earn?
6. What are the characteristics of the current workforce?
7. What are the top occupations?
8. What activities and conditions can workers expect in these top occupations?
9. How much experience, education, and training are required to get a job in the top occupations?
10. What other occupations are similar in terms of job requirements and transferable skills?
11. What job pathways are available to entry-level workers?

and jobseekers to facilitate job counseling, training, and placement services in the transportation sector. In this report, we address research questions as they apply to the top four subsectors of transportation based on the number of workers: air, truck, transit/ground, and support activities. These research questions appear in the text box on this page. We hope that workforce professionals and policy makers will use this information to:

- Better understand the economic context in which transportation employers operate;
- Make informed decisions about targeting services and resources;
- Broaden and refine educational and training offerings to better meet the needs of employers, as well as potential and incumbent workers; and
- Make appropriate placements within a changing environment.

Finally, we hope to inform all readers with an interest in transportation about the sector's workforce needs and how changing economic and industry conditions might affect those needs moving forward.

A. Methods

The findings in this report are derived from three main sources.

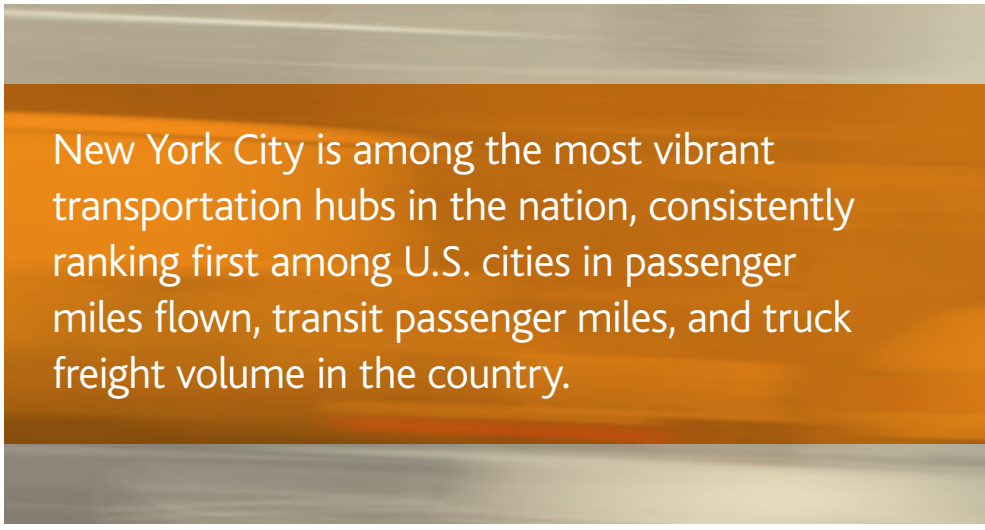
- **Analysis of secondary data sources.** The NYCLMIS compiled, analyzed, and mapped data from the Quarterly Census of Employment and Wages, from the New York State Department of Labor; the 2000 Census and the 2005 and 2006 American Community Surveys from the Bureau of the Census; and O*NET Online, the United States Department of Labor, Employment and Training Agency's comprehensive database of occupational information. In all cases, we rely on the most current data available. We obtained establishment lists from Dun & Bradstreet and ReferenceUSA, two of the leading commercially available business lists in the nation. Additional data were collected from the Port Authority of New York and New Jersey, and the Metropolitan Transportation Authority's respective websites to research public sector employment trends.
- **Subsector expert interviews.** We consulted with government and industry experts to identify six individuals who could provide the most incisive insight on the dynamics of New York City's transportation subsectors represented in this report and who could also speak eloquently to the specific implications to jobseekers and the public workforce system. The names of the six experts and their institutional affiliations are included in an appendix to this report.
- **Review of relevant journalistic, trade, and scholarly literature.** We consulted trade weeklies, major national news sources, industry association research, academic research and scholarly journals. A full bibliography, organized by subsector, is included in an appendix to this report.
- **Data limitations.** We recognize that there are many additional questions to be asked and answered about the transportation sector that would be useful to New York City's workforce professionals. For example, although it would be helpful to hear from the firms in each subsector about their staffing needs and experiences, such extensive interviewing was outside of the scope of this effort. It would be helpful to

have a definite count of job turnover and stable jobs in the sector, but these data are currently in development in New York State. Finally, we do not cover self-employment because of the limitations of the available data. As a result, we have treated the ground passenger transportation industry group (within the transit and ground passenger subsector) in less detail than might be desired because its workforce is primarily self-employed.[2]

We offer New York City's occupational projections from the Bureau of Labor Statistics Occupation Employment Survey Program because they are recognized as the state of the art in labor market information. They are not without their limitations, however. First, occupational projections are derived from *national* industry staffing patterns and may not necessarily represent the staffing patterns in New York City. Second, the validity of these projections also depends on several assumptions about the U.S. economy remaining unchanged since 2004, such as consumer, business, or government (including military) spending; hours worked by employees; and ways in which goods and services are produced. We recommend that readers weigh these projections against what is learned from other data — e.g., interviews with subsector experts, and employment specialization figures (i.e. "location quotients") — to develop the most accurate picture of various occupational outlooks in the transportation sector in New York City.

B. Organization and Use of the Report

This report is presented in seven sections. Section 1 explains the scope and coverage and contains an overview of the transportation sector. Sections 2 through 5 focus on Air Transportation, Truck Transportation, Urban Transit and Ground Passenger Transportation, and Support Activities for Transportation. These sections locate each subsector within the city's and metropolitan economy and labor market and describe the status of jobs and wages; occupations and advancement pathways for entry- and mid-level workers; employers; workforce demographics. Sections 2 through 5 conclude with observations drawn from the foregoing findings and implications for the workforce development system. In Section 6 we examine occupations and occupational trends across the four subsectors. Finally,



Section 7 contains major findings and recommendations for workforce development policy makers and practitioners seeking to work with employers and jobseekers in the transportation sector.

Employment in New York City's Transportation Sector is geared to serve the need of workforce development service providers, policy makers, and advocates for comprehensive industry data and provides a detailed discussion of the data's implications for the New York City public workforce development system. The NYCLMIS also has prepared four companion Subsector Profiles that distill the findings and implications for practice for each of the four subsectors. The more concise Profiles are intended to meet the specific needs of workforce service providers, **particularly account executives, career advisors, and trainers**.

C. A Note About the Current Economic Context

At the time of this writing, oil prices are high and volatile ranging between $130 and $150 per barrel,[3] national unemployment is at 5.5 percent (almost a full percentage point higher than one year ago),[4] the national gross domestic product (GDP) is one percent,[5] and inflation at its highest since 1991.[6] Many economic observers already place the nation and the region in a recession; others claim it is too early to say. Nonetheless, this report on the current status of the transportation sector is necessarily embedded in its time.

The last recession experienced in New York City officially began in 2001 and was worsened by the attacks on the World Trade Center towers on September 11 of that year. By most measures, as will be seen in this report, the city had rebounded by 2007. In mid-2007, the financial markets experienced the first in a series of shocks that in the last year have spread outward beyond their origin in the mortgage market.

As noted above, the price of a barrel of crude oil has risen sharply from $60 in 2006 to well over $100 in 2008. While some of that run-up in price may relax as a result of slumping demand and a possible reversal in the decline of the value of the U.S. dollar, there is no evidence that oil prices will revert to historically lower levels.[7] The effects of this rapid run-up in prices on the oil-dependent transportation sector are profound and possibly permanent.

As a result, with the possible exception of public transit, the short-term employment prospects in most of the subsectors covered in this report are not strong. Although it is too early to assess the long-term effects of these market changes on the sector, we provide information about the sensitivity of each subsector to economic cycles, and other factors that have in the past and can be expected to influence jobs and economic vitality for that subsector so as to give an empirical basis for inferring possible outcomes. Finally, it should be noted that any prospects for the transportation sector must be considered in the context of the region's persistent advantages as a hub for commerce, tourism, and international travel and immigration.

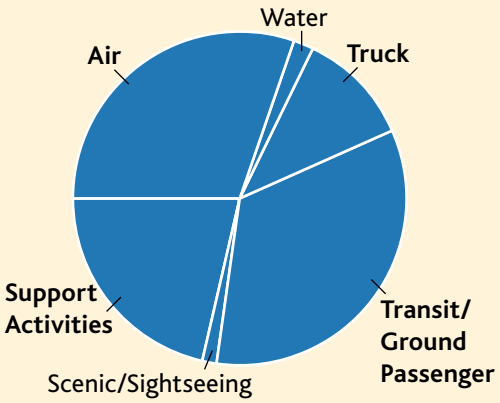
North American Industry Classification System (NAICS) Definition of Transportation Sector (NAICS 48)

The Transportation sector includes industries providing transportation of passengers and cargo, and support activities related to modes of transportation. Transportation establishments use equipment and facilities as a productive asset. The type of equipment depends on the mode of transportation. The modes of transportation are air, rail, water, road, and pipeline.

NOTE See Appendix for a full list of transportation subsectors and a brief explanation of the NAICS.

FIGURE 1a New York City Private Sector Employment in Transportation*

Air	**25,248**
Truck	**9,374**
Transit/Ground Passenger	**27,899**
Support Activities	**17,583**
Scenic/Sightseeing	1,280
Water	1,500
Private Sector Transportation	**82,884**
Selected Subsectors	**80,104**
All Private Sector Jobs	**3,514,234**



SOURCE New York State Department of Labor, Quarterly Census of Employment and Wages, 2007.

* In 2007, transportation accounted for 2.3% of all private sector jobs in New York City.

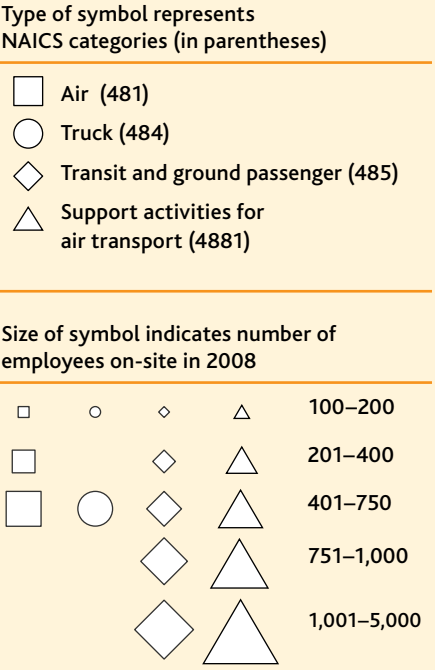
D. The Transportation Sector in New York City

Transportation accounts for just over two percent of New York City's private sector with 82,884 jobs. Figure 1a shows a breakdown of private sector transportation jobs in New York City by subsector. The transit and ground passenger transportation subsector accounts for the largest portion with nearly 28,000 (or 34% of the total). The second largest transportation subsector is air transportation accounting for over 25,000 or 31 percent of the private sector jobs in transportation. There are almost 18,000 jobs in support activities for transportation, accounting for 21 percent of all private sector jobs in transportation.

It is important to note that many transportation-related jobs are *not* included in Figure 1a such as the self-employed, public sector jobs, and jobs in related industries that are not officially counted within the sector as defined by the North American Industry Classification System (NAICS). For example the Metropolitan Transportation Authority (MTA), the largest employer in the transit and ground passenger transportation subsector employs about 69,000 workers. Similarly, according to Professor José Holguín-Veras of Rensselaer Polytechnic Institute, Figure 1a undercounts the true number of trucking jobs in New York City: private trucking carriers[8] account for about half of all trucks on the road in the region and are not officially part of the transportation sector. A better estimate of total

number of trucking jobs is probably closer to 18,000. **All in all, the total number of transportation jobs is likely to be more than double the official estimate.**

Given its reach and importance, it is easy to see how transportation is linked to every other sector in the economy. Transportation is essential to commerce, finance, recreation, and cultural activities alike. Although some subsectors tend to cluster geographically — e.g., aviation jobs occur in and around the airports — subsector establishments are located throughout the city. Figure 1b shows a map of the largest establishments (by number of jobs) in each of the four subsectors.



SOURCES Employer data from Dun & Bradstreet as provided to NYC Department of Small Business Services.

FIGURE 1b Largest Local Employers in Selected Transportation Sectors[9]

E. Top Occupations in the Selected Transportation Subsectors

Several occupations occur in most or all of the transportation subsectors and are explored in greater depth in Section 6. Across the four subsectors examined in this report, the top 10 occupations as determined by a combination of factors — including number of people employed, recent job growth trends, wages, and educational requirements — are:

- Bus drivers
- Bus and truck mechanics
- Cargo and freight agents
- Customer service representatives
- Dispatchers
- Light truck drivers/sales drivers
- Laborers/material movers
- Supervisors of laborers
- Reservation and ticket agents
- Transportation attendants

F. Workforce Challenges

According to a national sample of transportation executives, several workforce-related challenges face employers.[10] In their estimation, jobseekers typically do not see transportation jobs as attractive and the public workforce system has not fully realized the potential for partnership with sector employers. Transportation employers believe that their workforce is "aging out" as a result of the general demographic shifts in the U.S., and that too few new and young workers are replacing them. Employers further admit that they could improve recruitment efforts, especially among populations requiring targeted and extensive outreach. Finally, employers perceive the cost of training as prohibitive for both new and incumbent workers. High-cost professional development is a clear disincentive to recruiting a workforce with no prior experience in the sector and is likely to restrict the sector's ability to retain and advance incumbent workers.

Several of these themes are borne out in the New York data we present throughout this report. Fortunately, most of the challenges are amenable to change. The transportation sector faces several longstanding, interrelated challenges to recruiting, training, and retaining the sector workforce that the public workforce system is uniquely situated to address. In later sections of this report, we review the specific challenges in New York City associated with recruitment, training and retention in the selected subsectors and recommend ways these might be addressed by the workforce system.

Endnotes

1 Transportation Research Board of the National Academies, *The workforce challenge: recruiting, training, and retaining qualified workers for transportation and transit agencies*, Special Report 275, Washington, DC, 2003. (http://onlinepubs.trb.org/onlinepubs/sr/sr275.pdf).

2 New data to be released in the coming months by the New York State Department of Labor ("Quarterly Workforce Indicators" http://leha.did.census.gov/led/datatools/qwiapp.html) will assist workforce managers and staff to better target new and replacement jobs and understand the nature and extent of job turnover in transportation as well as other job sectors.

3 Habiby, M. Oil Rises for first time in four days after U.S. stocks slump, Bloomberg.com, 18 July 2008.

4 Bureau of Labor Statistics, Current Population Survey, June 2008. www.bls.gov/cps/.

5 Bureau of Economic Analysis, National Economic Accounts, First Quarter 2008 final calculation. www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm.

6 Troianovski, A. and S. Reddy, Fed confronts spike in inflation, *Wall Street Journal*, 17 July 2008, p.1.

7 Brown, S., Virmani, R. and R. Alm, Crude awakening: Behind the surge in oil prices, *Economic Letter: Insights from the Federal Reserve Bank of Dallas,* 3:5, May 2008. (http://dallasfed.org/research/eclett/2008/el0805.html).

8 The distinction between private and common carriers is discussed in Section 3, which examines the trucking subsector in greater detail.

9 Will there be an Endnote for Figure 1b?

10 United States Department of Labor, Transportation Industry: Identifying and Addressing Workforce Challenges in America's Transportation Industry, March 2007.

Air Transportation

2

To the general public, passenger air travel is the most familiar part of the air transportation subsector. In reality, the subsector is more diverse. Carriers can move passengers and/or cargo; can be scheduled or on-demand (i.e., charter); and may range in size from major airlines, regional carriers, to private carriers.

A good deal of aviation-related activity technically falls outside of NAICS code 481: not included are both "landside" establishments (parking, airport operations, and airport vendor relations) and "airside" establishments (air traffic control and suppliers of business and manufacturing services). Airlines often outsource functions such as aircraft cleaning and dispatch to specialized business services firms. Manufacturing firms build avionics, hardware, geographic positioning systems. Some manufacturers — like Bombardier — have maintained a strong presence in New York City; however, most manufacturing is outside of the region where the large aircraft plants are. Although outsourcing is increasing, not all service firms are locating outside of New York City.

The air transportation subsector is known for its unique combination of strong competition and high capital and labor costs. Carriers typically operate on low profit margins. They provide a "perishable commodity," in that they must fill space on a flight — by passengers or cargo — *before* the flight takes off or it will never be sold. Air transportation is highly susceptible to fluctuations in the economy. Demand for passenger travel and cargo shipment declines during downturns and increases in boom times. Fluctuations in demand for air transportation lag slightly behind the economy, however.

A. Economic and Industry Dynamics

National deregulation in the late 1970s had an enormous impact on the air transportation subsector. The resulting competitive environment has favored businesses that can operate efficiently and maintain a cash flow substantial enough to withstand economic downturns.[1] Despite the movement toward a "leaner" business model, aviation establishments must still resort to laying off substantial numbers of employees during economic downturns.

At least in the near term, *soaring and volatile fuel prices* directly affect subsector profit: rising prices increase the cost of operating aircraft. At the time of this writing, crude oil prices have surged 40 percent in the past six months to over $130/barrel. As a result of fuel prices and the simultaneous economic downturn being experienced nationwide, several carriers have made dramatic cuts in flight routes and announced layoffs. For example, American Airlines has announced its intention to cut

NAICS Definition of the Air Transportation Subsector (NAICS 481)

Industries in this subsector provide air transportation for passengers and/or cargo. The subsector includes carriers that specialize in scheduled and nonscheduled air transportation. Scheduled carriers fly regular routes on regular schedules and operate even if flights are only partially loaded. Nonscheduled carriers provide chartered air transportation of passengers, cargo, or specialty flying services.

NOTE **See Appendix for a full list of transportation subsectors and a brief explanation of the NAICS.**

6,800 positions; Continental Airlines, 3,000; Northwest Airlines, 2,500 positions; United Airlines, 950; and AirTran Airways 480 positions.[2] Of these carriers, only American has specifically announced that it plans to cut flights into and out of the New York area, however.[3] In addition, five airlines declared bankruptcy and/or ceased operations altogether in the spring of 2008 alone.[4]

B. New York City's Air Transportation Subsector

New York City and the outlying region is a global destination for passenger travel (business and tourism) and a world-class cargo hub as well. In fact, the John F. Kennedy Airport (JFK) is the 16th largest aviation cargo destination in the world — just ahead of Chicago and London — moving 1.6 million tons in 2007.[6]

New York City's economy thrives on access to national and global markets; the aviation infrastructure affords the city direct access to over 200 cities throughout the world.

As Table 2.1 below shows, New York City is one and a half times more specialized in aviation-related employment than the United States as a whole. Given the location of LaGuardia and JFK Airports, it is not at all surprising that Queens is the most highly specialized borough with respect to air transportation jobs, with a specialization 12 times greater than the nation as a whole.

According to two leading commercially available establishment lists, the following are the largest New York City aviation employment sites (Table 2.2). (The remaining air transportation firms that appear in the commercial lists each employ fewer than 200 workers at any given employment site.) As suggested by Figure 2c, all of these establishments are located in or around LaGuardia or JFK.

This report uses 2000 as a base year in many tables, so it is important to note that 2000 was a peak year for air transportation in New York City. The subsector suffered a great deal during the recession that began in 2001, accentuated by the attack on the World Trade Center that year, and the subsequent scare related to the spread of the SARS virus. New York City passenger traffic has recovered and surpassed the 2000 peak: international traffic is up 8.7 percent and domestic traffic up 5.1 percent since 2000, according to Eugene Spruck, former chief economist of the Port Authority of New York and New Jersey.

Regional economists pay special attention to international travel trends since foreign visitors stay in the city longer and spend more money while here. International tourism is, of course, entirely dependent on air travel and accounts for the growth in

both visitors and expenditures. According to Mr. Spruck, the number of foreign tourists to New York set a new record of 8.5 million in 2007, a 17.1 percent increase over 2006. As we shall see later in this report, the increase in international tourism did not result in new jobs in the subsector; however leisure, and hospitality employment increased 14 percent between 2003 and 2007.

The Port Authority of New York and New Jersey reports, however, that air cargo traffic has not recovered since 2000 and air freight volume remains 335,000 tons per day below its peak. Currently, more than 80 percent of the city's freight volume is moved by trucks and there has been a great deal of air-to-truck and air-to-ship substitution in the past few years due to the higher costs associated with air cargo. Nonetheless, perishable goods and high-value items continue to be shipped into and out of the city via air. For example, the shipment of diamonds, flowers, and art are totally dependent on air cargo.

The number of air transportation establishments in New York City has decreased since 2000 (Table 2.3). Percentagewise, the number of Manhattan air transportation establishments — generally headquarters and management offices — has declined much more than the operating units in Queens. Some of this decline is likely the result of the subsector's continuing consolidation.

New York City's economy thrives on access to national and global markets; the aviation infrastructure affords the city direct access to over 200 cities throughout the world. The city's strategic industries, such as finance and professional services, require easy access to air travel. *Underinvestment in aviation infrastructure* could seriously undermine growth in the aviation subsector and the region's economic vitality

TABLE 2.1 Location Quotient* of the Air Transportation Subsector by Borough/County, 2006

Manhattan	0.11
Queens	12.27
NYC MSA	1.49
Nassau	0.19
Westchester	1.11
Chicago MSA	2.13
LA MSA	0.95

SOURCE Quarterly Census of Employment and Wages, 2006.

*Location Quotient is (1) the ratio of aviation employment to all employment in the specified area — divided by — (2) the ratio of the aviation employment to all employment in the U.S.

About New York City's Largest Air Transportation Employment Site

British Airways, headquartered in London, one of the world's largest passenger and cargo carriers, specializes in Transatlantic flights.

Evergreen Eagle, based in McMinnville, Oregon, is a privately held global aviation services company that operates through several subsidiary companies using the Evergreen name: cargo transportation and charter services, maintenance, logistics, and aircraft sales.

North American Airlines, headquartered in Queens, New York, originated to specialize in linking El Al flights to domestic and international locations from the United States. NAA ceased scheduled airline operations in May 2008.

American Airlines, headquartered in Fort Worth, Texas, is the second largest airline in the world and the only major passenger airline that has never filed for bankruptcy.

JetBlue Airways, headquartered in Queens, New York, uses JFK as its home airport. It is one of a very few discount carriers that has thrived in the severe competition of post-deregulation.

TABLE 2.2 Largest Air Transportation Employment Sites in New York City

ESTABLISHMENTS	ON-SITE EMPLOYMENT
British Airways North America*	900
Evergreen Eagle*	600
North American Airlines*	580
American Airlines Inc+	500
JetBlue Airways+	420
United Air Lines+	300
Alitalia Cargo*	250
British Airways Executive Club*	250
Continental Airlines+	250
Deutsche Lufthansa+	200

SOURCES *ReferenceUSA and +Dun & Bradstreet 2007 establishment lists. Retrieved May 2008 (NAICS 4811 and 4812).

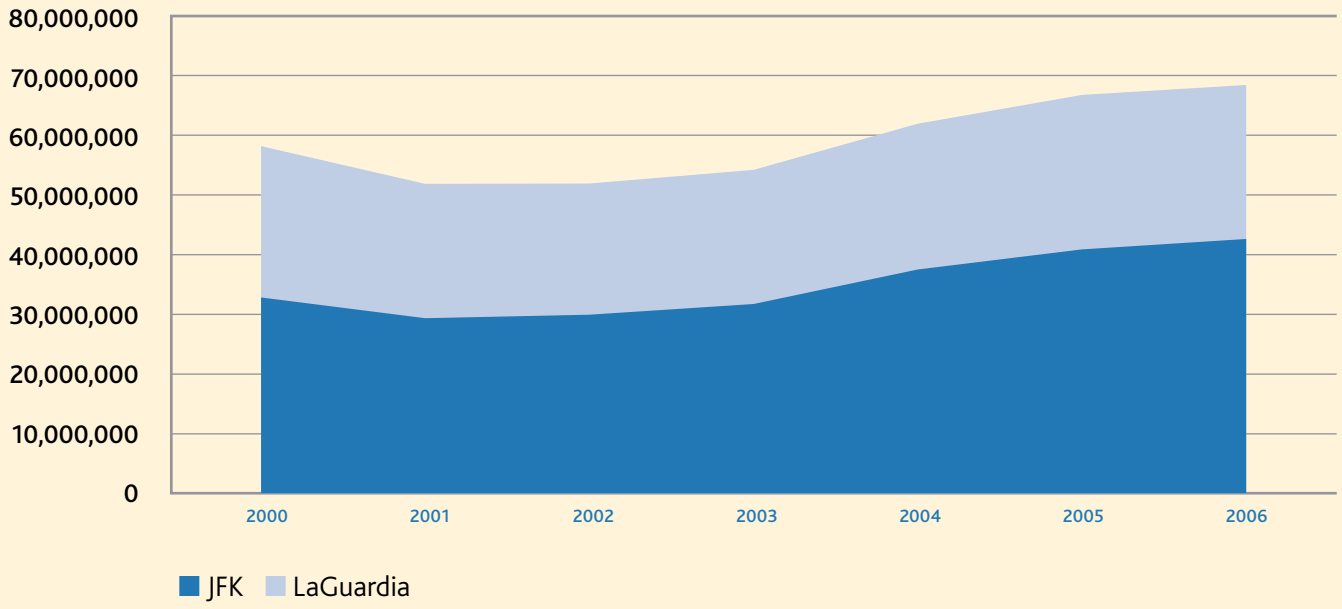
in the long term. According to Triant Flouris, Ph.D., Director of CUNY's Aviation Institute and Professor at York College, the three greatest challenges facing the city's aviation subsector are related to resolving the city's *congestion* problems. They are:

- Improving ground access to airports and expanding alternative access routes;
- Increasing aircraft flow efficiency within the airports; and
- Increasing the efficiency of cargo operations.

According to Mr. Spruck, resolving these infrastructure limitations is critical to the long-term prospects of the air transportation subsector in this region and can be expected to influence corporate location decisions of firms that are dependent on reliable air travel. The responsibility for much of this investment, of course, falls squarely on the shoulders of the Port Authority of New York and New Jersey, which has budgeted 6.4 billion dollars in its capital investment plan over the next seven years to airport improvements alone.[5] Professor Flouris also cited the following factors as the primary challenges facing aviation on a more national and global level:

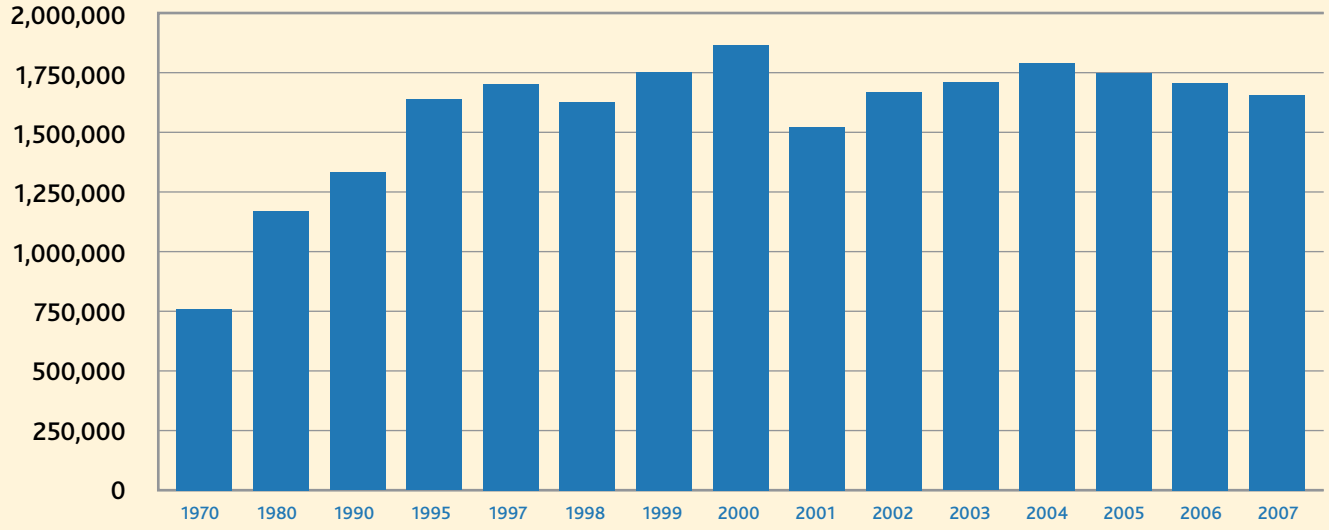
- Finding more sustainable fuels;
- Maintaining safety and security;
- Upgrading the American air traffic control system; and
- Managing volatility in fuel prices.

FIGURE 2a Number of Passengers Served at New York City Airports, 2000–2006



SOURCE Port Authority of New York and New Jersey, Airport Fact Sheet, 2008.
www.panynj.gov/commutingtravel/airports/html/lg_facts.html and www.panynj.com/commutingtravel/airports/html/ken_facts.html

FIGURE 2b Air Cargo Tonnage Handled at New York City Airports, 1970–2007



SOURCE Port Authority of New York and New Jersey, Airport Fact Sheet, 2008.
www.panynj.com/commutingtravel/airports/html/ken_facts.html)

TABLE 2.3 Air Transportation Establishments in the NYC Region by Borough/County, 2000–2007

	2007	INCREASE/DECREASE 2000 TO 2007 # +/-	% +/-
Manhattan	61	-21	-25.6%
Queens	99	-5	-4.8%
Nassau	23	5	27.8%
Westchester	28	9	47.4%
Total	**211**	**-12**	**-5.4%**

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2007.

TABLE 2.4 Air Transportation Jobs in the NYC Region by Borough/County, 2000–2007

	2007	INCREASE/DECREASE 2000 TO 2007 # +/-	% +/-
Manhattan	897	-1,424	-61.4%
Queens	24,351	-4,729	-16.3%
Nassau	454	-283	-38.4%
Westchester	1,444	1,115	338.9%
Total	**27,146**	**-5,321**	**-16.4%**

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2007.

C. Jobs and Wages

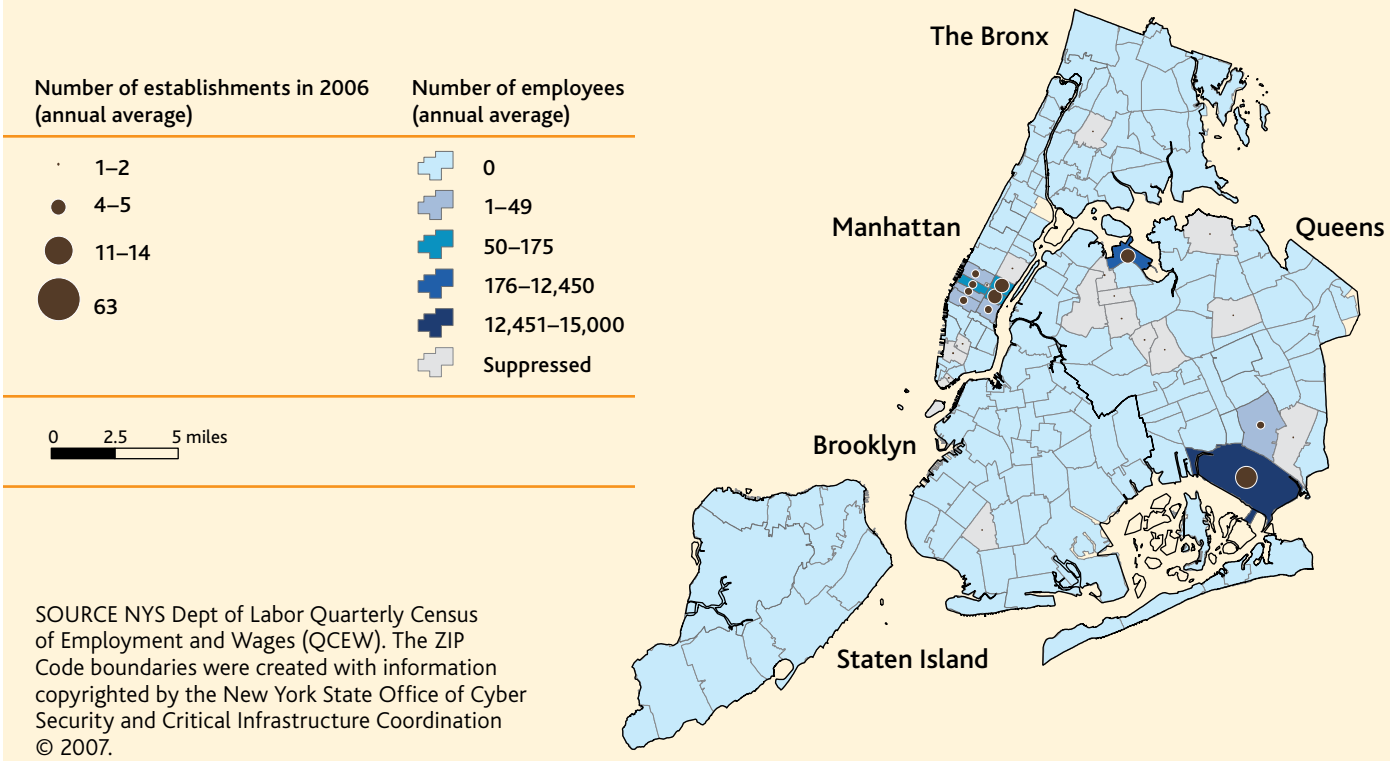
Table 2.4 shows that there were 25,248 jobs in the air transportation subsector in New York City in 2007, down substantially (20%) from the 31,401 in 2000. Although passenger air travel has recovered from the last recession, declining air cargo volume, recent fuel price hikes, tightening credit, and the current economic downturn all have apparently had a depressing effect on jobs in the subsector.

More than 90 percent of New York City's aviation jobs are in Queens (Table 2.4). The table below also shows comparable job numbers in the suburban counties just outside of New York. Although Westchester is experiencing tremendous job growth in air transportation due to the establishment and expansion of the White Plains Airport, the absolute number of jobs available in Westchester still pales in comparison to Queens.

Figure 2c is a map showing both the number of air transportation establishments in 2006 in New York City and the concentration of jobs by zip code.[7] In general, we see that both air transportation establishments and jobs are — with minor exceptions — clustered fairly tightly around the two airports in Queens and in midtown Manhattan. Below, we examine job trends by borough.

Even after adjusting for inflation, the average salary in the subsector has increased over time — with the greatest increases occurring outside of New York

FIGURE 2c Air Transportation Employment and Establishments in New York City, 2006[8]



SOURCE NYS Dept of Labor Quarterly Census of Employment and Wages (QCEW). The ZIP Code boundaries were created with information copyrighted by the New York State Office of Cyber Security and Critical Infrastructure Coordination © 2007.

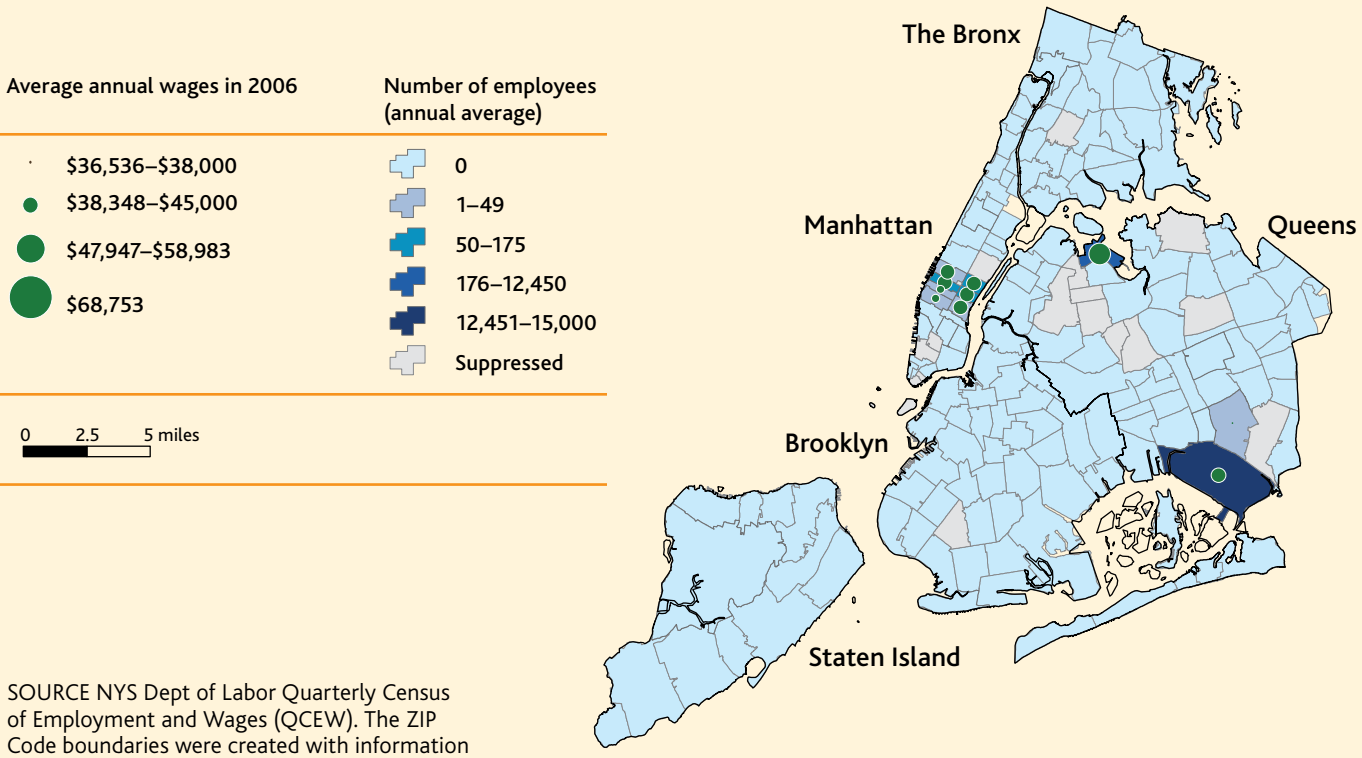
TABLE 2.5 Average Annual Salary* in Air Transportation: NYC Region by Borough/County, 2000–2006

	2006	INCREASE/DECREASE 2000 TO 2006 $ +/-	% +/-
Manhattan	$60,052	$6,590	12.3%
Queens	$56,289	$2,727	5.1%
Nassau	$61,422	$19,310	45.9%
Westchester	$99,170	$51,112	106.4%
Total	**$59,169**	**$5,930**	**11.1%**

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2006

* In current $

FIGURE 2d Air Transportation Employment and Wages in New York City, 2006



SOURCE NYS Dept of Labor Quarterly Census of Employment and Wages (QCEW). The ZIP Code boundaries were created with information copyrighted by the New York State Office of Cyber Security and Critical Infrastructure Coordination © 2007.

City. Manhattan jobs in the subsector paid $60,052 per year on average, while the average in Queens was $56, 289 (Table 2.5). One explanation may be that the job cuts reported above were disproportionately targeted to lower wage jobs, although neither aviation expert we consulted was certain why such "belt-tightening" by carriers would have had a disproportionate effect on low-wage jobs in the subsector.

Figure 2d is a map that overlays average salary and concentration of aviation jobs by zip code. The figure conveys that average air transportation salaries range from a low of $36,500 per year to a high of almost $69,000. And, although there are somewhat fewer jobs at LaGuardia, they are somewhat higher paying on average than those at JFK. A possible explanation for this wage differential is that there are many more cargo-related jobs at JFK[9] and that these are less well-paid than passenger aviation jobs.

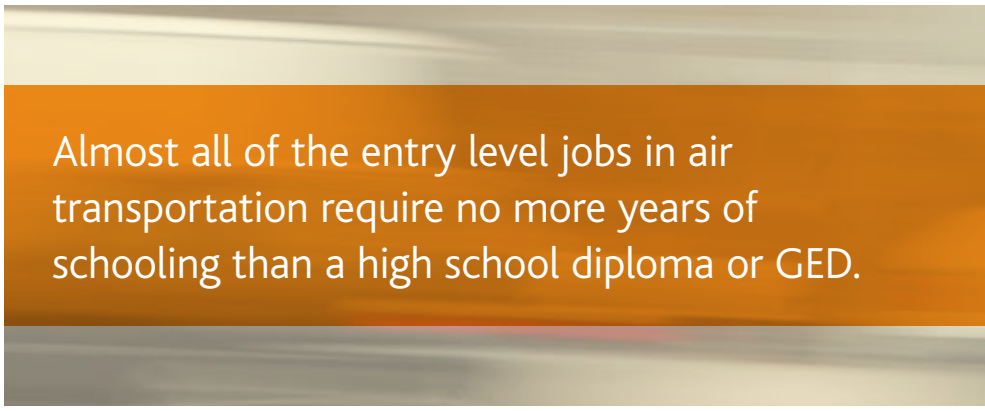
The outlook for job growth in the air transportation subsector is uncertain. In addition to fuel prices and the general state of the economy, other factors, reviewed below, stand to influence the number of air transportation jobs in entry- and mid-level occupations.

Automation represents a potential threat to the number of entry- and mid-level jobs in the air transportation subsector. As almost anyone who has traveled by air in the past several years can attest, booking, customer service, and check-in functions have become automated so that travelers may not have to interact with a human being to book a flight or check in.

In addition, some airlines operate *off-site call centers* to handle reservations and ticketing. These jobs typically are not located in New York City. For example, JetBlue employs Utah homemakers as ticket agents and customer service representatives.

More and more, regular aircraft *maintenance* is moving to South and Central America, where labor costs are much lower. According to Professor Flouris, there have been real job losses in this area. Light or "line" maintenance — such as tire or signal light changes, repairs of an immediate nature — still occur on-site at the airport. As such, there will always be some number of aircraft maintenance jobs in the region.

Finally, it is reasonable to expect that there will be an influx of *qualified new aviation job applicants* from the military when combat in Iraq and Afghanistan subsides. Nationally, wages may be expected to be pulled downward as a result of this increased competition, but this effect is unlikely to occur locally. According the National Priorities Project, in 2007, there were an estimated 1,100 New York City residents enlisted in the Army and National Reserve.[10]



D. Occupations and Advancement Pathways

Occupations in the air transportation subsector fall into one of two categories: operations or management. Operations jobs occur wherever aviation happens and include dispatchers, pilots, and flight attendants. Management jobs occur at headquarter locations and include marketing, strategic planning, finance, and revenue management functions. Airlines that are headquartered in New York City, such as JetBlue, provide a wider variety of jobs in both management and operations.

Skills testing and other requirements may apply to specialized occupations within air transportation, especially for Transportation Security Officers (TSOs) and "airside" occupations requiring applicants to pass credit and criminal background checks in order to obtain security clearance.

Table 2.6 shows the top occupations in air transportation ranked by the total number of jobs in New York City in 2006. Listed in the first column are the most common occupations within the subsector. The top five occupations are transportation attendants, aircraft pilots, reservation and ticket agents, customer service representatives, and aircraft mechanics. Job opportunities in four of the top five occupations are expected to grow, except for reservation and ticket agents.[11] It is important to look beyond job numbers and growth, however, to examine other job characteristics such as educational requirements, wages, and turnover.

Table 2.6 also presents the *percent of replacement job openings* (as opposed to new jobs that are created when subsector employment numbers expand). A majority of the projected jobs are in fact replacement jobs, which suggests a higher rate of turnover in these positions. Among the top five occupations, all but airline pilots require no more than a high school diploma or its functional equivalent, the General Educational Development certificate (GED). In fact, almost all entry level jobs in air transportation require no more than a high school diploma or GED. Some employers may require less education depending on the applicant's level of skill and experience.

Also shown in Table 2.6 are typical hourly wages earned by entry-, mid-, and high-level earners in each of the top ranking occupations in the air transportation subsector. Police/patrol officers, and transportation and all other managers receive the highest wages starting at about $20 per hour. Transportation attendants, material movers, and data entry keyers start out just above minimum wage levels and peak out under $20 per hour. Aircraft mechanics, automotive technicians, and bookkeeping and auditing clerks, have wider pay ranges: workers in these occupations could earn as much as some supervisors and managers. Wider pay ranges suggest more room for career advancement within a single occupation.

TABLE 2.6 Top Ranking Occupations in the Air Transportation Subsector: Employment Outlook, Educational Requirements, and Wages

TOP RANKING OCCUPATIONS *(IN ORDER OF # OF JOBS IN 2006)*	2014 OUTLOOK GROWTH/DECLINE	% REPLACEMENT	EDUCATIONAL REQUIREMENTS*	2006 HOURLY WAGES ENTRY	MEDIAN	HIGH
Transportation Attendants	^	73.3%	HS/GED	$7.32	$8.71	$12.37
Aircraft Pilots and Flight Engineers	^	70.6%	BA	na	na	na
Reservation and Transportation Ticket Agents and Travel Clerks	v	100.0%	HS/GED	$9.84	$15.90	$23.20
Customer Service Representatives	^	64.9%	HS/GED	$9.96	$15.96	$26.12
Aircraft Mechanics and Service Technicians	^	100.0%	HS/GED	$18.20	$25.90	$32.07
Managers All Other	^	79.2%	AA/TRADE	$25.51	$45.81	na
Transportation Storage and Distribution Managers	^	75.0%	AA/TRADE	$29.55	$44.99	na
Laborers and Freight Stock and Material Movers Hand	v	100.0%	HS/GED	$7.55	$11.17	$18.73
Baggage Porters Bellhops and Concierges	^	84.6%	HS/GED	$7.41	$12.03	$19.98
Bookkeeping Accounting and Auditing Clerks	v	100.0%	AA/TRADE	$11.49	$17.85	$25.74
Police and Sheriffs Patrol Officers	^	84.1%	HS/GED	$19.70	$29.29	$44.20
Janitors and Building Cleaners	^	65.5%	HS/GED	$7.58	$12.10	$20.00
Security Guards and Gaming Surveillance Officers	^	80.2%	HS/GED	$7.96	$11.91	$20.63
Automotive Service Technicians and Mechanics	^	87.1%	HS/GED	$9.62	$17.77	$30.16
Data Entry Keyers	v	100.0%	HS/GED	$8.82	$13.18	$19.63

SOURCE **Occupational ranking** from US Bureau of the Census, American Community Survey, Public Use Microdata Sample, 2005–06
Educational requirements and wage data from O*NET Online (http://online.onetcenter.org/)
Occupational outlooks and replacement jobs from the Bureau of Labor Statistics, Occupation Employment Survey, 2006.

* Indicates the level of education attained by most individuals in this occupation in New York City.
Some employers may require less or more years of education.

HS/GED = high school diploma or GED usually required.
AA/TRADE = 2-year college degree or postsecondary vocational or trade school usually required.
BA = 4-year college degree usually required.
na = Hourly wage is not available for this occupation.

According to Professor Flouris almost all entry level jobs in air transportation require no more than a high school diploma or GED. Skills testing and other requirements may apply to specialized occupations within air transportation, especially for Transportation Security Officers (TSOs) and "airside" occupations requiring applicants to pass credit and criminal background checks in order to obtain security clearance.

Professor Flouris characterized a typical advancement pathway for entry-level workers as beginning with a line staff position within a small regional or discount airline or business services establishment and moving up to a supervisory position after obtaining a two- or four-year degree. In general, air transportation employees cannot easily advance into supervisory or management positions without a two- or four-year college degree.

After a few years, when workers can command a higher salary, they can move into larger carriers or government positions with the Port Authority or Federal Aviation Administration (FAA). According to Professor Flouris, larger carriers generally do not hire inexperienced workers. An alternative advancement route is to earn trade school certification in a skilled trade such as aircraft mechanics.

With some exceptions — such as York College's aviation department and Vaughan College's FAA-certified air traffic controller program — few formal education and training opportunities for clear career pathways seem to exist in New York City. In a recent report, the National Aerospace Revitalization Task Force pointed to the need to build stronger pipelines through both traditional education for skilled workers and stronger nontraditional pathways such as apprenticeship and retraining for adults transitioning into or advancing within the aerospace industry.[12]

Professor Flouris also explained that air transportation establishments need workers with management, communications, customer service, and resource management skills. Professor Flouris emphasized that communication and management skills are equally essential, adding: "Even a pilot is a human resource manager."

E. Workforce Demographics

Table 2.7 below shows the characteristics of the air transportation workforce according to estimates derived from the 2000 Census and the 2005 and 2006 American Community Surveys.

Out of the approximately 25,000 air transportation employees working in New York City, just over a half reside in the city itself and that share did not change substantially between 2000 and 2006. This is important because the half of these jobs currently employing non-New York City residents could become available through turnover or retirement.

In a recent report, the U.S. Department of Labor noted that the national air transportation workforce lacks gender and racial/ethnic diversity. Yet, in 2000, more than half of New York City's air transportation workforce was female and racial ethnic diversity was adequate (Table 2.7).[13] Racial/ethnic diversity improved in 2006, with roughly equivalent percentages of Black, White, and Hispanic persons working in local air transportation firms; however

Asian persons are slightly under-represented. Males now predominate in the local air transportation workforce.

National trends suggest that the air transportation workforce is indeed undergoing an "aging out" process. According to the Commission on the Future of the United States Aerospace Industry, 26 percent of the national air transportation workforce is eligible for retirement this year.[14] The data also indicate that, in New York City, fewer young people are entering occupations in aviation: the percent of employees between the ages of 18 and 34 has decreased from 45 percent in 2000 to 36 percent in 2006.

In 2005 and 2006, about half of the adults employed in New York City's air transportation subsector had either dropped out of high school or completed a high school diploma or GED. The percentage of high school graduates increased substantially between 2000 and 2006 from 22 percent to 36 percent.

TABLE 2.7 Demographic Characteristics of the New York City Air Transportation Workforce, 2000 and 2005/06

PERCENT OF NEW YORK CITY AVIATION EMPLOYEES WHO ARE	2000	2005/06
New York City residents*	54.7%	53.5%
Male	47.6%	56.4%
White	35.9%	30.5%
Black	26.1%	30.7%
Hispanic	23.3%	26.8%
Asian	8.4%	9.0%
Age 18–34	45.2%	36.2%
35–44	26.4%	40.1%
44–54	18.0%	14.6%
Age 55+	10.4%	9.1%
Less than high school or GED	9.9%	12.3%
High school diploma or GED	21.9%	35.6%
Some college	25.5%	22.7%

SOURCE U.S. 2000 Decennial Census and 2005 and 2006 American Community Surveys public use microdata (PUMS) files.

*The remaining percentages that appear in this table are of people who both live *and* work in New York City.

F. Observations and Workforce Implications

KEY OBSERVATIONS

- Air transportation inhabits a relatively small share of employment and economic activity in New York City, but plays a critically important role in the economic vitality of New York City.
- The air transportation subsector is highly intertwined with all of the region's economic sectors and is therefore highly susceptible to economic fluctuations.
- Queens is the hub of air transportation activity in New York City. The Queens workforce is highly specialized in air transportation compared to the nation as a whole.
- Passenger flight loads into and out of New York City's airports have met and surpassed their pre-2000 peak levels. A weak dollar has contributed to an overall increase in international travel.
- Freight cargo air transportation has suffered a slow decline since 2000, some of which is attributable to truck transport substitution. In all likelihood, precious and perishable goods — such as jewels and art — will continue to be shipped into and out of New York City via air transportation.
- Long-term industry restructuring, recent economic downturns, and skyrocketing fuel prices have contributed to a decrease in the number of air transportation establishments in New York City.
- In 2007, there were about 25,000 New York City jobs in the subsector, a vast majority of which are in Queens. The number of jobs in the subsector has decreased between 2000 and 2007 by 20 percent.
- The average annual wage for air transportation jobs in New York City is about $60,000, up 11 percent since 2000 even after adjusting for inflation.
- Occupations that account for the most jobs in air transportation are transportation attendants, pilots/flight engineers, reservation/ticket agents, customer service representatives, and aircraft mechanics. The highest growth occupations are pilots, customer service agents, patrol officers, managers (transportation and general), and janitors.
- Most subsector employees are male, but the local aviation workforce appears to be diversifying along racial/ethnic lines.
- For the most part, entry-level positions in the subsector do not require education beyond a high school diploma or GED. Almost half of the local aviation workforce has a high school diploma or GED or fewer years of education.

WORKFORCE IMPLICATIONS

New York City's workforce system can be helpful to jobseekers and the industry by:

- Developing clear traditional and nontraditional education and training pipelines for entering into and advancing within the subsector. Although jobs may not be expected to surge in the near future, given current economic circumstances, the long-range prospects for jobs in the subsector are good.
- Assisting employers with recruiting from among nontraditional populations such as women, people with disabilities, and veterans.

■ Building relationships with regional and discount airlines that are more likely to hire entry-level workers than their larger "legacy" airline cousins. Caution is warranted in that these carriers may also be more vulnerable to economic hardship and layoffs than their larger, national counterparts.

Endnotes

1 More recently, discount carriers have begun to earn a larger share of the passenger market, but the extent to which this will be sustained is unknown.

2 Maynard, M., Citing fuel costs, Northwest plans to cut 2,500 jobs, *New York Times,* 10 July 2008; Maynard, M., Big job cuts announced at American, *New York Times,* 3 July 2008; Associated Press, United to eliminate 950 pilot jobs, *New York Times*, 24 June 2008; Maynard, M., Continental cuts jobs and grounds jets, *New York Times,* 6 June 2008.

3 Maynard, M., Deals fade, and airlines look to cut, *New York Times*, 29 May 2008.

4 Bowley, G. and K. Bradsher, Frontier Airlines files for bankruptcy, *New York Times,* 12 April 2008; Bailey, J., Fuel costs just part of airlines' list of woes, *New York Times,* 10 April 2008; Bloomberg News, Low-fare airline files for bankruptcy, *New York Times,* 7 April 2008.

5 The Port Authority of New York and New Jersey 2008 Budget and Updated Capital Investment Plan.

6 The top 15 air cargo hubs in the world are (in order of volume) Memphis, Hong Kong, Anchorage, Seoul, Shanghai, Paris, Tokyo, Frankfurt, Louisville, Miami, Singapore, Los Angeles, Dubai, and Taiwan. (Airport Council International, Cargo Traffic 2007 Preliminary, March 2008).

7 At the time of this writing, 2006 was the most recent year for which Quarterly Census of Employment and Wages data were available at the zip code level.

8 The data in this map includes private sector employment only. The New York State Department of Labor (NYSDOL) suppresses employee and wage data for any ZIP Code that includes fewer than three establishments or contains a single unit that accounts for 80 percent or more of the industry's employment. This map omits any establishment in the five boroughs that reported ZIP Code outside of New York City to the NYSDOL. In 2006, there were 9 of these firms (out of 157) in this NAICS code with 64 employees (out of almost 25,000) and annual average wages of almost $110,000.

9 According to New York Metropolitan Transportation Council (NYMTC), 44 percent of JFK jobs are cargo-related. NYMTC, *Freight Village Feasibility*, Presentation to the American Metropolitan Planning Organization, September 2007.

10 National Priorities Project Database. Recruit numbers for The U.S. Navy, Air Force, and Marine Corps were not available.

11 Occupational projections from the Bureau of Labor Statistics Occupation Employment Survey Program is presented here because they are recognized as the state of the art in labor market information. Some of the limitations of these projections are reviewed in **Section 1** under **Methods**. We recommend that readers weigh these data against other data presented in this report to develop the most accurate outlook for the various occupations in the transportation sector.

12 Report of the Interagency Aerospace Revitalization Task Force, Washington, DC: United States Department of Labor, February 2008, p. 14.

13 Report of the Interagency Aerospace Revitalization Task Force, Washington, DC: United States Department of Labor, February 2008.

14 Report of the Interagency Aerospace Revitalization Task Force, Washington, DC: United States Department of Labor, February 2008, p. 7.

3

Truck Transportation

Everything that is consumed or manufactured is considered freight, and everything that is used or produced in the course of a day was at one time considered freight.[1] When we take into consideration that New York City's freight is disproportionately transported by trucks, it is reasonable to conclude that the more we consume and produce as a city, the more we will depend on truck transportation. At the very least, as the population of New York City increases so will the amount of materials needed to sustain us.

To the general public the truck transportation subsector is associated with large fleets of long-haul trucks run by common carriers. The subsector is much more complex and diverse however. Its diversity can be meaningfully understood by the size of freight being shipped (truckload, less-than-truckload), industry specialization (electronics, produce, high-end goods), the size of the trucker's market (regional, national), trip origins and destinations (ports, regional distribution centers, warehouses, retail outlets) and the availability of the trucker's services to shippers (common, contract, or private).

Some truck transportation is not officially counted within NAICS 484; the most notable exclusions are private and integrated carriers. Private carriers haul their own freight and no one else's. For example, WalMart has its own huge truck fleet used solely to move goods to and from WalMart and its distribution centers. Professor José Holguín-Veras of Renssalaer Polytechnic Institute estimates that about half of all freight in New York City is carried by private carriers.[2] Integrated carriers employ their own multimodal freight fleets, such as UPS, Federal Express, and DHL. In sum, using NAICS category 484 specifically directs our focus to the "common carriers" or carriers that provide their services to the common market including independent contractors. Also included within the NAICS are firms that specialize in moving household goods, offices, auction houses, and conference/convention materials.

A. Economic and Industry Dynamics

The truck transportation subsector is highly sensitive to economic fluctuations and is often among the first arenas of economic activity feeling the effects of economic booms and busts. Recent reports reveal that carriers are bearing the brunt of the economic downturn as shippers fail to pay for services because of their own declining demand.[3] Recent bankruptcies in other sectors leave "trucking companies holding the bag," according to the chairperson of the

NAICS Definition of the Truck Transportation Subsector (NAICS 484)

Industries in the Truck Transportation subsector provide over-the-road transportation of cargo using motor vehicles, such as trucks and tractor trailers. The subsector is subdivided into general freight trucking and specialized freight trucking. This distinction reflects differences in equipment used, type of load carried, scheduling, terminal, and other networking services. General freight transportation establishments handle a variety of commodities usually and transported in a container or van trailer. Specialized freight transportation is the transportation of cargo that, because of size, weight, shape, or other inherent characteristics requires specialized equipment.

NOTE **See Appendix for a full list of transportation subsectors and a brief explanation of the NAICS.**

American Trucking Association.[4] An "*easy entry, easy exit*" subsector, according to the experts we interviewed, trucking undergoes high firm turnover especially during difficult economic times. Firms that are well-capitalized can withstand and even survive economic downturns more readily; generally these are the larger, more established carriers. At the other end of the spectrum are the small independent owner-operators. Nationally, almost 1,000 trucking carriers went out of business in the first quarter of 2008, representing about 2 percent of the nation's 2 million trucks on the road. The current loss rate is comparable to subsector experiences in the recession that officially began in 2001.[5] It is reasonable to expect that a large share of the carriers who have been closing up shop in recent months are either smaller businesses or large businesses carrying too much debt.

Increased oil prices translate to decreased profits and less money to maintain and replace trucking fleets.

Trucking demand emanates indirectly from consumers and directly from other business entities. Changes in the nature of demand for truck transportation services that have had important effects on subsector activity include: fuel costs, just-in-time delivery, the emergence of Internet retail and the proliferation of niche marketing it has engendered, and consolidation of the retail sector nationally.

Rising oil prices have had a tremendous effect on the truck transportation subsector. An industry leader recently described the tension created between carriers who are trying to pass their costs on in the form of higher prices and shippers who are confronting declining demand as a result of the recent economic downturn as a "bloody battle."[6] Carriers must not only make enough profit to keep their current fleets on the road, they must also put enough aside so that they can replace their fleets. Increased oil prices translate to decreased profits and less money available to maintain and replace fleets, especially for smaller firms. Subsector observers refer to the phenomenon of driving one's fleet into the ground as "eating one's truck."

On the business side, there has been a revolution in the past 20 years in the movement to *just-in-time delivery*. The function and costs of storing and inventorying are outsourced from manufacturing and other sectors of the economy to the truck transportation and logistics subsectors. The logistics industry times the delivery — usually by truck — of key parts when business entities need them: no sooner and no later. For example, restaurants, manufacturing and construction firms have predetermined, scheduled needs for materials and no incentive to receive them any earlier than is absolutely necessary. This has increased reliance on the truck transportation subsector, especially as a greater number of trucks travel the roads with less-than-truckload cargo.

The emergence of *internet retail* and the general *proliferation of niche goods* have increased the diversity and volume of goods traveling by truck. People are less likely than ever before to go to a store and carry goods home with them. The larger variety of merchandise available from small businesses — many of which operate online only — also increases reliance on and the volume of goods being hauled by the commercial trucking subsector.[7]

Finally, according to Professor Holguín-Veras, the national *consolidation of the retail sector* has shifted the balance of power away from the truck transportation subsector. Twenty years ago, trucking firms — and truck drivers in particular — had a larger share of power and could control their terms of business with their retail customers. With the emergence of the big box stores like Target and WalMart dealers are increasingly able to dictate their terms to carriers.

ATA estimates that 80 percent of carrier costs are labor-related and labor-controlled. Teamsters, labor representatives of a majority of the common carrier driving workforce, at one time wielded a great deal of bargaining power in setting terms of contracts with dealers. As a result of retail consolidation, the unions have declined in power as well.

Additional trends facing the subsector identified by trade groups include: [8, 9]

- **Regulations.** Recent trends limiting the number of hours drivers can spend on the road restrict firms' flexibility to meet deadlines.
- **Driver shortages.** There is a longstanding national shortage of truck drivers which is worsened by the aging out of the existing driving workforce. If hours of service rules remain, then even more drivers will be needed just to maintain current levels of service.
- **Congestion.** Road congestion decreases the predictability and efficiency of truck transportation activities.
- **Driver training.** Private sector oversight bodies are expected to recommend new entry-level driver training standards to increase safety. Although widely recognized as useful, firms also fear that these standards will make it harder for new drivers to join the workforce and increase training costs for carriers.
- **Environmental concerns.** Popular concern over neighborhood noise and carbon emissions caused by truck traffic has grown.
- **Technology.** Emergence of on-board truck technology such as geographic positioning systems improves dispatching and tracking of cargo. Larger carriers are better positioned to take advantage of newer technologies; however, smaller carriers can be expected to employ them as prices fall.

The truck transportation subsector is undergoing another transformation that is not yet fully understood by firms *or* subsector observers according an Professor Holguín-Veras. Firms in the sector are beginning to become more integrated into a broader range of economic activities. As recently as 10 years ago, trucking firms may have simply transported goods from one location to another. The unloading of goods may have been handled by other firms, and

the pricing and repackaging of those goods to yet others. More recently, trucking companies have been *expanding their range of services* to include unloading, repackaging, pricing and labeling, and then reloading and hauling cargo to the next set of locations.

B. New York City's Truck Transportation Subsector

Freight is moved "intermodally," usually in containers, between trucks, rail cars, and ships. Throughout the nation, trucks carry the majority of freight (in terms of weight, value, and ton-miles). Eighty percent of the freight (by weight) that is moved in the New York metropolitan region is by truck; the area moves very few goods by rail at all.[10] New York City has two marine terminals (Howland Hook, Staten Island; and Red Hook, Brooklyn). The Howland Hook terminal handles containers and Red Hook handles both roll-on/roll-off cargo and containers; however, the primary marine terminal in the region is Port Elizabeth/ Port Newark, New Jersey.[11] On the other hand, JFK airport is among the busiest air-cargo facilities in the nation as measured by weight. Air cargo shippers are entirely dependent on trucking to move their goods off of airport grounds.

In New York City, the construction, food services and accommodations, and retail sectors account for a high percentage of trucking volume and miles. For example, Professor Holguín-Veras estimates that each of New York City's approximately 6,500 restaurants receives 6–8 truck deliveries each day: *40,000 truck trips occur in New York City daily for restaurants alone*.

Despite New York City's disproportionate reliance on truck transportation, Table 3.1 shows, that neither Queens nor Manhattan is as specialized in truck-related employment as the United States as a whole. (Data were not available to calculate location quotients for the remaining boroughs.)

Queens surpasses the other boroughs and outlying counties in the absolute number of trucking establishments (Table 3.2). The table also shows that the number of local trucking establishments has declined in all but two of the boroughs/counties

TABLE 3.1 Location Quotient* of the Truck Transportation Subsector by Borough/County, 2006

Manhattan	**0.07**
Queens	**0.59**
Nassau	**0.35**
Westchester	**0.23**
Chicago MSA	**1.04**
LA MSA	**0.53**

SOURCE Quarterly Census of Employment and Wages, 2006.

*Location Quotient is (1) the ratio of transit and ground passenger transportation employment to *all* employment in the specified area — divided by — (2) the ratio of the transit/ground passenger employment to all employment in the U.S.

TABLE 3.2 Truck Transportation Establishments in the NYC Region by Borough/County, 2000–2007

	2007	INCREASE/DECREASE 2000 TO 2007 # +/-	% +/-
Bronx	121	-7	-5.5%
Brooklyn	353	46	15.0%
Manhattan	113	-40	-26.1%
Queens	382	-12	-3.0%
Staten Island	84	0	0.0%
Nassau	364	9	2.5%
Rockland	59	-2	-3.3%
Westchester	146	-13	-8.2%
Total	**1,622**	**-12**	**-5.4%**

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2007.

listed. The greatest decrease was in Manhattan which lost more than one quarter of the trucking firms it had had in 2000 likely due to increased real estate costs and congestion. The largest gain was in Brooklyn.

With regard to economic contribution, the largest (common) carriers *in the nation* include Werner, Schneider, JB Hunt, Swift, Con-Way, Yellow Freight and Roadway, and New England Motor Freight. These companies are typically not headquartered in New York City although several have depots or terminals here. Table 3.3 lists the largest employment sites in the truck transportation subsector according to two leading commercially available establishment lists. (The remaining trucking firms employed fewer than 200 workers at any given site.) A majority of the largest sites are located in Queens; some are also located in the Bronx and Brooklyn.

The siting of trucking and warehousing establishments typically follows patterns of space and land cost. Historically, many carriers have purchased "greenfields" (i.e., former agricultural land) for terminal and depot operations because of the lower cost of land and the size of available tracts. Observers have noted that trucking and logistics firms established 10,100 acres of operational property in New Jersey over the past two decades.[12] A recent study by Rutgers University reports that skyrocketing land prices have been driving trucking and warehousing firms further over the Delaware River to Pennsylvania.[13] Howard Mann, manager of the freight planning unit at the New York Metropolitan Transportation Council (NYMTC) identified an even more

About New York City's Top Trucking Employment Sites

Velocity headquartered in Westport, CT, employees a workforce of independent contractors to provide regional delivery and logistics services. Velocity mainly serves the office services, retail, health, and financial sectors.

Mystic Tank Lines headquartered in Queens operates a fleet of more than 300 trucks and specializes in delivery of deliver heating oil, gasoline, kerosene, diesel, biodiesel, ethanol, jet fuel, lubricants, asphalt, cement, cement by-products. Outside of its corporate offices, Mystic operates two terminals in Queens.

Roadway Express is the nation's largest long-haul common intermodal carrier and logistics firm with a fleet of over 30,000 trucks. Operates in New York City out of a Brooklyn terminal.

Guardian Transport and Worldwide is a single-location, local trucking with storage firm, headquartered in the Bronx.

Padded Wagon is New York's largest moving company with a fleet of 75 vehicles, headquartered in the Bronx with additional offices in Manhattan and other major metropolitan areas.

NewPenn is a regional less-than-truckload carrier providing service throughout the Northeastern United States. New Penn operates a fleet of over 2,500 vehicles. New Penn has a local terminal in Flushing.

TABLE 3.3 Truck Transportation Employment Sites in New York City, 2008

ESTABLISHMENTS	BOROUGH	ON-SITE EMPLOYMENT
Velocity Express Inc.*	Manhattan	700
Mystic Tank Lines Corp+	Queens	545
Roadway Express Inc.*	Brooklyn	300
Guardian Transport & Worldwide*	Bronx	250
Padded Wagon Inc.*	Bronx	250
New Penn*	Queens	225
Oz Moving & Storage Inc.*	Manhattan	200
J & J Air Container Station*	Queens	200
Time Moving & Storage*	Brooklyn	200
Truck Rite Distribution System+	Brooklyn	180

SOURCES *ReferenceUSA and +Dun & Bradstreet 2007 establishment lists. Retrieved May 2008 (NAICS 4841 and 4842).

recent trend that appears to be afoot within the truck transportation subsector. Because of a combination of rising fuel prices and the efficiencies of locating operations nearer to population centers, trucking carriers are beginning to consider "brownfield" lots (i.e., former manufacturing sites requiring environmental remediation) that may be smaller but are cost-effective because they are closer to where the demand is.

In order to assist the metropolitan region in capitalizing on this trend, NYMTC is undertaking a feasibility study about locating "freight villages" in or around New York City. According to the European Association of Freight Villages (where the model originates and is most frequently employed), a freight village is "a defined area within which all activities relating to transport, logistics and the distribution of goods, both for national and international transit, are carried out by various operators."[14] Freight villages feature multimodal service (i.e., rail, marine, and trucking), warehousing, distribution centers, intermodal terminals, customs capability, and freight forwarding business activities. NYMTC's regional freight planning unit has recommended Maspeth, Queens; South Brooklyn; and Harlem River Yard in the Bronx as possible sites for a New York City-based freight village.[15]

C. Jobs and Wages

There were 9,374 jobs in the truck transportation subsector in New York City in 2007, down somewhat from just over 10,000 jobs in 2000. Job losses were not experienced in all boroughs however: the Bronx and Queens gained jobs between 2000 and 2007 (Table 3.4). (The table also shows that the suburban counties just outside of New York are experiencing trucking job losses.)

As suggested by the location quotient data discussed above (Table 3.1), Queens leads the boroughs with 3,555 or 35 percent of New York City's truck transportation workforce followed by Brooklyn with 27 percent.

Figure 3a shows the number of trucking establishments in 2006 in New York City and the concentration of jobs by zip code.[16] Among the most striking features conveyed by this map is the presence of trucking jobs in almost every zip code in the city. Not surprisingly, subsector establishments and jobs are clustered near the airports and marine terminals in Jamaica, Queens; Red Hook, Brooklyn; and Howland Hook, Staten Island. Additional job and establishment clusters can also be found in Maspeth and Flushing Queens; Ridgewood, Brooklyn; and around the Hunts Point food distribution center in the Bronx. Both Professor Holguín-Veras and Howard Mann expected that there are additional, private "mom-and-pop" carriers operating around Hunts Point that may not be included in the official data.

The average salary in the truck transportation subsector has increased over time even after adjusting for inflation (Table 3.5). The average annual salary is lower in the New York City boroughs than in the outlying suburban counties. Within New York City, Queens trucking jobs paid the most ($41,439 per year) on average and Staten Island trucking jobs paid the least ($33,972).

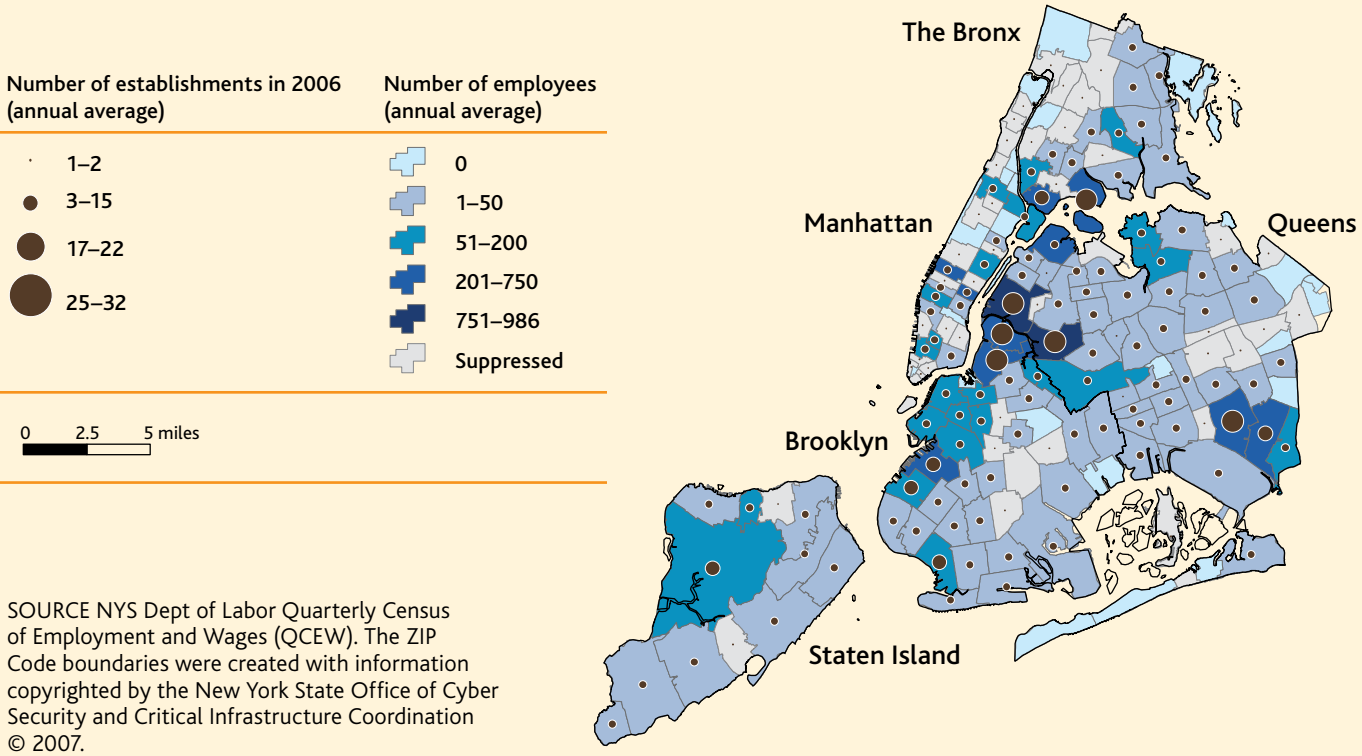
Figure 3a overlays on a map of New York City the average salary and the number of jobs by zip code. The figure conveys that average air transportation salaries range from a low of $12,327 per year to a high of $115,963. The highest paying jobs appear to be those that are located away from the highest concentration of jobs such as in Canarsie, Brooklyn; Co-Op City, the Bronx, and Midtown, Manhattan which may be due to executives working in offices that are located away from depots.

TABLE 3.4 Truck Transportation Jobs in the NYC Region by Borough/County, 2000–2007

		INCREASE/DECREASE 2000 TO 2007	
	2007	# +/-	% +/-
Bronx	1,292	285	28.3%
Brooklyn	2,572	-434	-14.4%
Manhattan	1,537	-699	-31.3%
Queens	3,555	296	9.1%
Richmond	418	-148	-26.1%
Nassau	2,231	-281	-11.2%
Rockland	306	-134	-30.5%
Westchester	947	-217	-18.6%
Total	12,858	-1,332	-9.4%

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2007.

FIGURE 3a Truck Transportation Employment and Establishments in New York City[17]



SOURCE NYS Dept of Labor Quarterly Census of Employment and Wages (QCEW). The ZIP Code boundaries were created with information copyrighted by the New York State Office of Cyber Security and Critical Infrastructure Coordination © 2007.

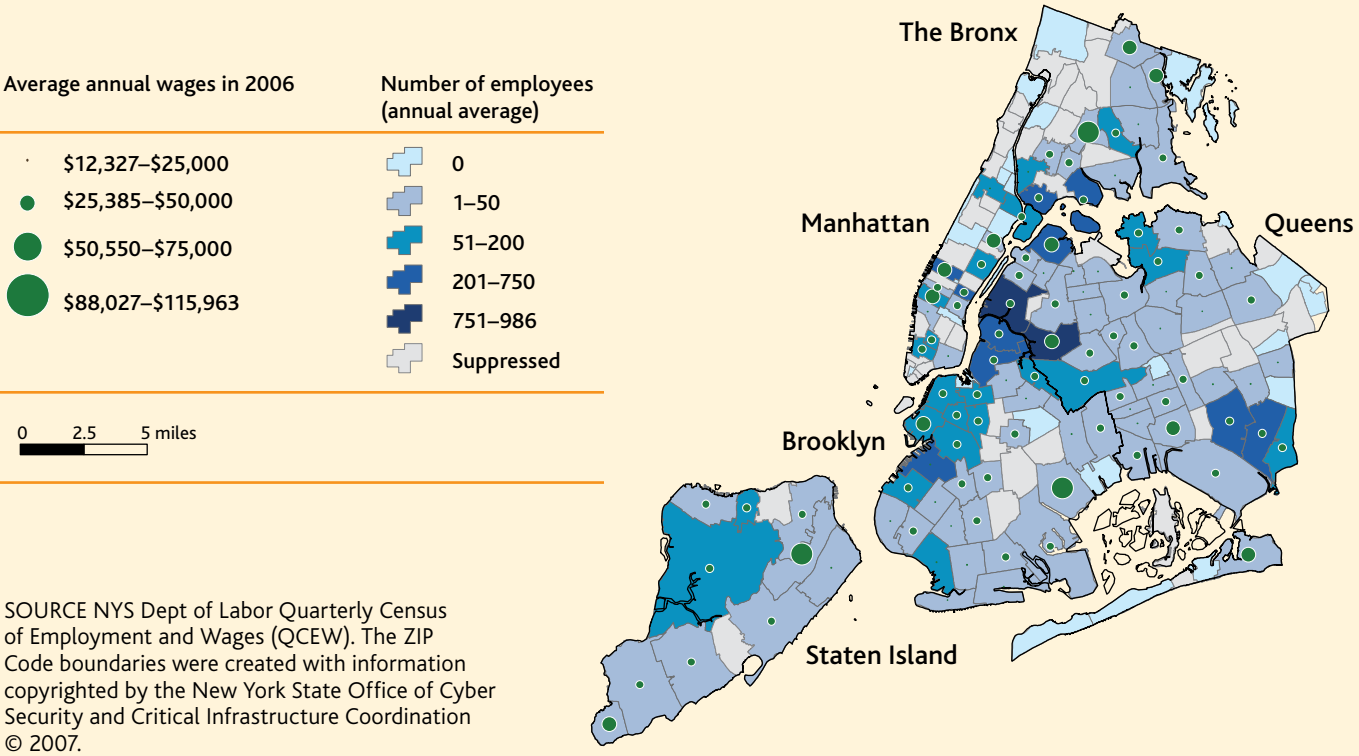
TABLE 3.5 Average Annual Salary* in Truck Transportation: NYC Region by Borough/County, 2000–2006

	2006	INCREASE/DECREASE 2000 TO 2006 $ +/-	% +/-
Bronx	$38,638	$4,527	13.3%
Brooklyn	$39,464	$6,566	20.0%
Manhattan	$41,057	$5,539	15.6%
Queens	$41,439	$6,773	19.5%
Staten Island	$33,972	$2,494	7.9%
Nassau	$44,708	$7,670	20.7%
Rockland	$47,499	$9,666	25.5%
Westchester	$43,980	$8,217	23.0%
NYC Region	$41,449	$6,581	18.9%

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2006.

* In current $

FIGURE 3b Truck Transportation Employment and Wages in New York City



SOURCE NYS Dept of Labor Quarterly Census of Employment and Wages (QCEW). The ZIP Code boundaries were created with information copyrighted by the New York State Office of Cyber Security and Critical Infrastructure Coordination © 2007.

Labor unions and prospects for the *overall supply of workers* are likely to play the largest role in predicting wage outlooks in the truck transportation subsector. Union membership remains a primary predictor of driver earnings even after the deregulation of the industry over the past decade: a recent study showed that member-drivers earn 18 to 21 percent more than their non-member counterparts.[18] The extent to which the local trucking labor force remains organized can be expected to have a strong effect on future wage levels.

Union membership remains a primary predictor of driver earnings, even after the deregulation of the trucking industry.

The primary labor unions representing New York City truck drivers working for common and integrated carriers are Teamsters Locals 707 and 807. Other local members of Joint Council 16 represent truck drivers in the construction (Local 282), food (Local 202), and moving and storage industries (Local 814). According to Local 807's recording secretary, about half of all New York City truck drivers are union members, but this percentage varies by industry. Overall, private carriers are much less unionized than are common or integrated carriers; an estimated 80 percent of the truck drivers working for common carriers are unionized.[19]

Recently the United States Department of Defense and trucking industry officials struck a formal agreement to create a pipeline for experienced drivers in private industry to serve in the National Reserves to meet the current high military demand in the Middle East. Once military operations subside, the agreement also stipulates that there will be a pipeline to assist military drivers back into the private sector.[20] In the short-term, this means that the local driver shortage may worsen which could drive up wages and increase the need to recruit new drivers. In the longer-term, however, it is reasonable to expect more competition for driving jobs which could push wages downward.

D. Occupations and Advancement Pathways

Listed in the first column of Table 3.6 are the top ranking occupations in truck transportation according to the total number of jobs in New York City in 2006. The top five occupations are truck drivers, laborers/movers, supervisors of laborers/movers, office clerks and dispatchers. Job opportunities in only two of the top five occupations are expected to grow: supervisors and dispatchers.[21]

To gain an accurate sense of the quality of jobs, it is necessary to look beyond job numbers and growth, to examine other job characteristics such as educational requirements, wages, and turnover. Table 3.6 also presents the *percent of replacement job openings* (as opposed to new jobs that are created when subsector employment num-

TABLE 3.6 Top Ranking Occupations in the Truck Transportation Subsector: Employment Outlook, Educational Requirements, and Wages

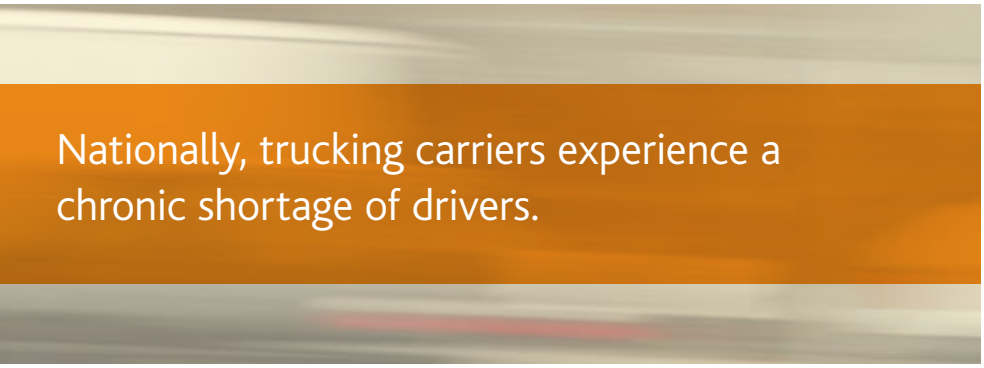
TOP RANKING OCCUPATIONS *(IN ORDER OF # OF JOBS IN 2006)*	2014 OUTLOOK GROWTH/DECLINE	% REPLACEMENT	EDUCATIONAL REQUIREMENTS*	2006 HOURLY WAGES ENTRY	MEDIAN	HIGH
Drivers: sales workers	v	100.0%	HS/GED	$7.48	$13.45	$25.73
Laborers and freight, stock, and material movers, hand	v	100.0%	HS/GED	$7.55	$11.17	$18.73
Supervisors, transportation and material moving workers	^	75.0%	AA/TRADE	$16.41	$28.47	$41.50
Office clerks, general	v	100.0%	HS/GED	$7.58	$12.80	$20.06
Dispatchers	^	90.9%	HS/GED	$10.15	$16.70	$28.59
Secretaries and administrative assistants	^	96.7%	AA/TRADE	$10.35	$15.75	$23.08
Managers, all other	^	79.2%	BA	$25.51	$45.81	na
Material moving workers, all other including tank car, truck and ship loaders	v	100.0%	HS/GED	$9.35	$17.79	$24.00
Billing and posting clerks and machine operators	v	100.0%	HS/GED	$11.85	$16.85	$23.49
Bookkeeping, accounting, and auditing clerks	v	100.0%	AA/TRADE	$11.49	$17.85	$25.74
Other installation, maintenance, and repair workers including commercial divers, and signal and track switch repairers	v	76.6%	HS/GED	$9.78	$17.42	$29.89
Motor vehicle operators, all other	^	100.0%	HS/GED	$8.63	$16.22	$23.35
Packers and packagers, hand	v	100.0%	HS/GED	$7.26	$8.52	$14.68
Transportation inspectors	^	90.0%	AA/TRADE	$18.48	$25.53	$34.11

SOURCE **Occupational ranking** from US Bureau of the Census, American Community Survey, Public Use Microdata Sample, 2005–06
Educational requirements and wage data from O*NET Online (http://online.onetcenter.org/)
Occupational outlooks and replacement jobs from the Bureau of Labor Statistics, Occupation Employment Survey, 2006.

* Indicates the level of education attained by most individuals in this occupation in New York City.
Some employers may require less or more years of education.

HS/GED = high school diploma or GED usually required.
AA/TRADE = 2-year college degree or postsecondary vocational or trade school usually required.
BA = 4-year college degree usually required.
na = Hourly wage is not available for this occupation.

bers expand). Almost all of the projected jobs are in fact replacement jobs, which suggests a very high rate of turnover in these positions. Among the top five occupations, all but supervisors require no more than a high school diploma or its functional equivalent, the General Educational Development certificate (GED). Some employers may require less education depending on the applicant's level of skill and experience.



Also shown in Table 3.6 are typical hourly wages earned by entry-, mid-, and high-level earners in each of the top ranking occupations in the truck transportation subsector. As expected, supervisors and managers receive higher wages, starting out above $15 per hour. Entry-level wages for laborers/material movers, packers, and office clerks are just above minimum wage and peak out at or under $20 per hour. Transportation inspectors, installation and maintenance workers, and dispatchers, have a wider pay range: workers in these occupations could earn as much as some supervisors and managers indicating room for career advancement within these occupations. Similarly, although non-manual material movers (e.g., loaders/unloaders of trucks and ships) start at just above $9 per hour, they can earn as much as $24 per hour without any postsecondary education.

By far, the most visible and common occupation in the subsector is the truck driver. Nationally, carriers experience a chronic shortage of drivers attributable to the low quality of life associated with spending long periods of time away from home associated with long-haul driving, and having unpredictable work schedules that do not enable drivers to follow family-related or recreational routines.[22]

New York City truck drivers must hold a state-issued Commercial Driver's License (CDL). To hold a CDL, a driver must:

- Be at least 18 years of age;[23]
- Hold a valid, a regular drivers' license from any state in the U.S.,
- Have a Social Security Card;
- Pay appropriate fees (at the time of this writing, a minimum of $75 for the application, learner's permit, road test, and temporary license);
- Pass a written test (requiring oral and written English language comprehension);
- Pass a road test that entails driving the type of vehicle the driver plans to drive; and
- In most cases, have a medical examiner's certificate from a licensed medical professional.

The New York State Department of Motor Vehicles recommends — but does not require — that drivers wishing to obtain a CDL receive professional training and some carriers require their drivers to graduate from private training schools.[24]

Some CDL requirements present real obstacles to many New Yorkers. For example, lifelong New Yorkers often do not hold regular driver's licenses. Recent immigrants may not have a valid U.S. license, let alone a Social Security Card, and may need to obtain English proficiency before applying. Strictly speaking, drivers with moderately clean driving records can obtain CDLs. Yet, according to workforce professionals with whom we spoke for this report, many companies are hesitant to hire anyone with more than two points on his or her driving record.

In addition to the distinction between CDL-A and the CDL-B, which has to do with the maximum combined weight of the vehicles to be driven, endorsements are required to drive school buses (S), tanks (N), double or triple trailers (T), and to carry hazardous materials (H). Additional fees, and written and skills test apply for most of these endorsements. Drivers who wish to carry a hazardous materials endorsement must pass additional security checks.

Traditionally, truck driving has provided some opportunities for ex-offenders wishing to return to the workforce. Some employers — for example, those hauling valuable cargo — may prefer *not* to hire drivers with criminal backgrounds, however. In the longer term, security regulations that apply to drivers are anticipated to increase which may create additional barriers for ex-offenders to enter the workforce and further limit the pool of qualified drivers.[25]

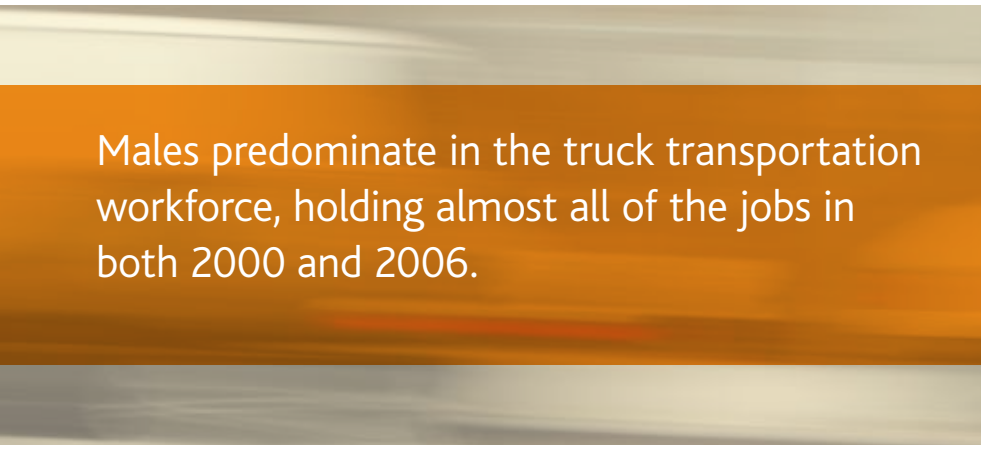
Conversations with workforce professionals revealed that smaller trucking carriers in New York City are less likely to be unionized, and may offer slightly lower wages to drivers, but may be more open to hiring less experienced, less credentialed jobseekers or jobseekers with criminal backgrounds. Truck drivers with new CDLs, more points on their driving record, or who have few or no additional endorsements may be able to earn a living while they clean their records and acquire more advanced credentials on the job.

The key stakeholders whom we interviewed believed that the subsector is on the verge of two major changes that will affect its workforce: computer and communication technology advancements and industrial diversification.

Advances in communications and computer technology already have begun to enable better dispatching and cargo tracking. Currently, only the larger carriers can afford on-board communications and geographic positioning systems (GPS) for every truck in their fleet. When the price of these technologies falls — as has been the case with several generations of computer and communications technologies in the past 20 years — smaller fleets are expected to follow suit to increase their efficiency and competitiveness. The workforce will need to be able to operate these applications. Research has demonstrated that adoption of some on-board trucking technology can have a positive effect on drivers' earnings.[26]

Trucking firms' recent *diversification* into new fields of activity such as logistics and scheduling, freight forwarding, packaging and labeling, and warehousing also provides a broader array of job opportunities for new workers and opportunities for the subsector's current workforce to acquire new skills. New Jersey is further along in this transformation, according to Mr. Mann, and has set the foundations for high-tech warehousing and logistics industry that has added value to the state's economy.

In sum, incorporating sophisticated technologies and expanding the range of activities undertaken by truck transportation firms can be expected to provide skills for advancement within the truck transportation subsector or into other sectors.



Career pathways in trucking follow three tracks: vehicle operation and maintenance, moving and handling, and office-related. Truck drivers, material handlers, and office clerks are the respective entry level occupations in the three tracks. The tracks are not mutually exclusive, however. For example, experienced drivers and material handlers may advance into office jobs. Advancement in the subsector depends on on-the-job experience, advanced credentials, or specialized training such as in logistics technology, mechanics, or management. Generally speaking, it is easier for jobseekers and existing workers with some college or trade school experience to get supervisory and management positions.

The information we have presented in this section suggest that less experienced jobseekers interested in a truck driving career in New York City begin their search with smaller companies that may help them to acquire experience, additional endorsements or clean their driving records on the job. As a next step in their careers, drivers can seek employment in larger companies that are more likely to provide exposure to advanced, on-board technologies and pay somewhat higher wages with the benefits that often accompany union membership.

E. Workforce Demographics

Table 3.7 below shows the characteristics of the truck transportation workforce according to estimates derived from the 2000 Census and the 2005 and 2006 American Community Surveys. Out of the approximately 9,500 truck transportation employees working in New York City, almost three quarters resided in the city in 2000 and that share increased to 80 percent in 2006.

Males predominate in the truck transportation workforce, holding almost all of the jobs in both 2000 and 2006. (According to Howard Mann, more women are entering the truck transportation subsector over the past decade in other regions in the nation, with some taking positions of leadership in the industry as well. This does not appear to be the case in New York City, however.) The subsector's workforce is fairly racially/ethnically diverse with roughly equivalent percentages of black, white, and Hispanic employees. However Asians are under-represented within the subsector workforce. The data indicate that the percentage of Blacks in the truck transportation workforce may be declining: in 2000 they represented 31 percent and in 2006 they were 24 per-

TABLE 3.7 Demographic Characteristics of the New York City Truck Transportation Workforce, 2000 and 2005/06

PERCENT OF NEW YORK CITY TRUCK TRANSPORTATION EMPLOYEES WHO ARE	2000	2005/06
New York City residents*	72.5%	79.5%
Male	95.9%	97.8%
White	25.0%	32.9%
Black	31.2%	23.7%
Hispanic	27.9%	32.1%
Asian	8.7%	8.0%
Age 18–34	39.4%	31.0%
35–44	31.0%	34.5%
44–54	19.2%	22.3%
Age 55+	10.4%	12.5%
Less than high school or GED	31.2%	21.1%
High school diploma or GED	40.8%	53.2%
Some college	6.0%	7.9%

SOURCE U.S. 2000 Decennial Census and 2005 and 2006 American Community Surveys public use microdata (PUMS) files.

*The remaining percentages that appear in this table are of people who both live *and* work in New York City.

cent. The data also indicate that fewer young people are entering truck transportation occupations: the percent of employees between the ages of 18 and 34 decreased from 39 percent in 2000 to 31 percent in 2006.

In both 2000 and 2006, almost three quarters of New York City's truck transportation workforce had either dropped out of high school or completed a high school diploma or GED. The percentage of high school graduates increased substantially between 2000 and 2006 from 41 percent to 53 percent.

Workforce professionals may look to smaller carriers as a promising entry point into truck driving for less experienced and less credentialed drivers.

F. Observations and Workforce Implications

KEY OBSERVATIONS

- The truck transportation subsector is highly sensitive to economic fluctuations and is often among the first arenas of economic activity feeling the effects of economic booms and busts.
- Changes in demand for truck transportation services that have had major effects on the nature and volume of subsector activity include: fuel costs, just-in-time delivery, the emergence of Internet retail and the proliferation of niche marketing it has engendered, as well as consolidation in the retail industry nationally.
- Additional influences on the subsector include hours of service regulations, driver shortages, road congestion, environmental concerns, emergent technology systems, and diversification of trucking firms into related industries.
- NYMTC is undertaking a feasibility study about locating "freight villages" in or around New York City. Sites recommended by the NYMTC freight planning unit include Maspeth, Queens; South Brooklyn; and Mott Haven (Port Morris) in the Bronx.
- There were 9,374 jobs in the truck transportation subsector in New York City in 2007, down somewhat from just over 10,000 jobs in 2000. Job losses were not experienced throughout the city: the Bronx and Queens gained trucking jobs between 2000 and 2007.
- Queens leads the boroughs with 35 percent of New York City's truck transportation workforce followed by Brooklyn with 27 percent.

- There are truck transportation jobs in almost every zip code in the city. However, jobs tend to cluster near the airports and marine terminals in Jamaica, Queens; Red Hook, Brooklyn; and Howland Hook, Staten Island. Additional job clusters exist in Maspeth and Flushing Queens; Ridgewood, Brooklyn; and around the Hunts Point food distribution center in the Bronx.
- The average salary in the truck transportation subsector has increased over time even after adjusting for inflation.
- Truck driving provides opportunities for work and advancement for New York City jobseekers without postsecondary education. However, CDL requirements presents special barriers to New Yorkers who do not hold a valid driver's license, do not have clean driving records, or do not have written or spoken English proficiency.
- Career pathways in truck transportation follow three tracks: vehicle operation and maintenance, moving and handling, and office-related. Truck drivers, material handlers, and office clerks are the respective entry level occupations in the three tracks. The tracks are not mutually exclusive, however. For example, experienced drivers and material handlers may advance into supervisory office jobs. Advancement in the subsector depends on on-the-job experience, advanced credentials, or specialized training such as in logistics technology, mechanics, or management.
- Traditionally, ex-offenders have been able to find jobs in truck driving. Some employers may prefer not to hire drivers with any criminal background, however.In the longer term, increased licensing, screening, and security requirements represent barriers to entry for transportation jobseekers with criminal histories or imperfect driving records.
- The adoption of on-board technology, unionization, and worker supply are expected to be important factors determining the future of trucking wages moving forward.
- At sometime in the future, security regulations are anticipated to increase which may be expected to create additional barriers for new drivers to enter the workforce and further limit the pool of qualified drivers.
- Males predominate in the truck transportation workforce, holding almost all of the jobs in both 2000 and 2006.
- Fewer young people are entering truck transportation occupations: the percent of employees between the ages of 18 and 34 decreased from 39 percent in 2000 to 31 percent in 2006.

WORKFORCE IMPLICATIONS

- Efficient sector outreach should focus on geographic locations where trucking jobs cluster. Since related industries tend to co-locate around marine and air cargo terminals, additional jobs may be readily identified in the related logistics and warehousing subsectors.
- Career advisors and counselors should inform jobseekers about the diversity of opportunities in the truck subsector. For example, jobseekers who may be concerned about heavy physical exertion or long trips away from home may find short-haul driving, driving positions that do not entail lifting, and office-related occupations to be more attractive alternatives.
- Career advisors and job counselors can help jobseekers overcome the barriers that the CDL may present to New York City residents who want to become truck drivers. For example, individuals who do not already hold a regular U.S. driver's license will need to obtain one before attempting to acquire a CDL.
- Career advisors should be aware that drivers with more than two points on their records may earn a CDL, but later confront obstacles to landing jobs.
- Currently, ex-offenders can find job opportunities in truck transportation. Workforce professionals should be aware of a trend toward increased licensing, screening, and security requirements that experts expect to see in the future.
- Workforce professionals may look to smaller carriers as a promising entry point into truck driving for less credentialed, less experienced drivers.
- Incumbent worker training in logistics and scheduling could pay off as trucking firms increasingly diversify and New York City invests in the freight village model for organizing cargo handling.
- Outreach to women should emphasize the variety of occupations which may ease their concerns about truck transportation, such as office jobs, short haul drivers, and drivers who are not required to lift heavy objects.

Endnotes

1 New York Metropolitan Transportation Council (NYMTC), *The Basics of Freight Transportation in the New York Region*, New York, n.d., p. 2.

2 According to Census estimates, the top 10 non-transportation sectors that employ truck drivers in New York City are: groceries and related products, restaurants and food service, couriers and messengers, waste management, construction, dry cleaning and laundry, grocery stores, bakeries, postal service, and building materials and supply services. (Source: 2005–2006 American Community Survey)

3 Barbaro, M. Retailing chains caught in a wave of bankruptcies, *New York Times,* 15 April 2008.

4 Reiskan, Jonathan. Trucking failures hit highest level since 01 recession, *Transport Topics*, 21 April 2008, p. 3.

5 Reiskan, 2008.

6 Reiskan, 2008.

7 Frost & Sullivan, U.S. Trucking Industry Challenges and Emerging Multimode Network Architectures, 2006.

8 Frost & Sullivan, 2006.

9 American Transportation Research Institute, *Critical Issues in the Trucking Industry: 2007*. Report to the American Trucking Association, October 2007.

10 New York Metropolitan Transportation Council (NYMTC), *The Basics of Freight Transportation in the New York Region*, New York, n.d.

11 Moss, M. and H. O'Neill, *Tunnel vision: An analysis of the proposed tunnel and deepwater port in Brooklyn*, Taub Urban Research Center, New York University, November 1998.

12 New York Metropolitan Transportation Council, *Freight village: What it is, what it does, and feasibility in the NYMTC region*, A brownbag presentation to NYMTC, September 2007.

13 Hughes, J. and J. Seneca. *New Jersey logistical competitiveness: Ominous trend lines*. A 2008 Trend Study by Rutgers University Edward J. Bloustein School of Planning and Public Policy, June 2008.

14 The European Association of Freight Villages

15 New York Metropolitan Transportation Council Regional Freight Planning Project, *NYMTC regional freight plan: An element of the regional transportation plan,* April 2004.

16 At the time of this writing, 2006 was the most recent year for which Quarterly Census of Employment and Wages Salary Average Annual data were available at the zip code level.

17 The data in this map includes private sector employment only. The New York State Department of Labor (NYSDOL) suppresses employee and wage data for any ZIP Code that includes fewer than three establishments or contains a single unit that accounts for 80 percent or more of the industry's employment. This map omits any establishment in the five boroughs that reported ZIP Code outside of New York City to the NYSDOL. In 2006, there were 47 of these firms (out of 994) in this NAICS code with 431 employees (out of 9,316) and annual average wages of $36,000.

18 Belman, D. and K. Monaco, The effects of deregulation, de-unionization, technology, and human capital on the work and work lives of truck drivers, *Industrial and Labor Relations Review*, 54:2A, 2001, 502–524.

19 Brudie, K. Recording Secretary, Local 807, International Brotherhood of Teamsters, Personal communication with the author, August 2008.

20 Watson, R. ATA, Army Reserve agree to join forces to encourage vets to become truck drivers, *Transport Topics*, 21 April 2008, p. 2; and Bingham, P. *Freight Transportation Megatrends,* Presentation to the Freight Demand Modeling Conference, Washington, DC, September 2006.

21 Occupational projections from the Bureau of Labor Statistics Occupation Employment Survey Program is presented here because they are recognized as the state of the art in labor market information. Some of the limitations of these projections are reviewed in **Section 1** under **Methods**. We recommend that readers weigh these data against other data presented in this report to develop the most accurate outlook for the various occupations in the transportation sector.

22 Frost & Sullivan, 2006.

23 Drivers between the ages of 18 and 21 must have at least one year of driving experience. Young truck drivers may obtain a CDL, but may not drive out of state, nor obtain passenger, school bus, or hazardous material endorsements.

24 United States Department of Labor, *Transportation industry: identifying and addressing workforce challenges in America's transportation industry*, March 2007; Federal Motor Carrier Safety Administration, *Commercial driver's license program*.

25 Bingham, 2006.

26 Belman, D. and K. Monaco, 2001.

Transit and Ground Passenger Transportation

4

The transit and ground passenger transportation subsector makes cities run: transit agencies operate light and heavy rail (subways), buses, and transportation for specialized populations; the private sector operates taxis, limousines, and charter buses, and private shuttle services. Urban residents rely more heavily on transit and ground passenger services than do people residing in suburbs. This is especially true in New York City, which operates the largest public transportation authority in the country and the only transit system in the world that operates year-round, 24 hours a day, seven days a week.[1]

The subsector is more accurately described as two disparate sets of industry groups with very different dynamics and needs. On the one hand, the private sector serves almost no role in the United States in the provision of transit services, with the exception of paratransit (special van and bus service intended for people with disabilities, the elderly and the infirm), which is often contracted out. On the other hand, ground passenger transportation is dominated by the private sector: charter buses, private shuttle services, and privately owned taxis, and limousines.

In light of these differences, and the associated differences in the extent to which data gathered for this report covers one or the other of the respective industry groups, we have separated our treatment of the two industry groups in this section of the report. Section A on the urban transit industry group mainly relies on expert interviews and our review of relevant trade and scholarly literature. Section B relies mainly on analyses of analyses of quantitative data available for the private sector only. In Section C, we review findings from analyses we were able to conduct on both industry groups, representing the entire subsector.

A. Urban Transit Industry Group

ECONOMIC AND INDUSTRY DYNAMICS

The urban transit industry group (NAICS 4851) is a critical underpinning of the urban economy. Especially in New York City, no enterprise would function without it. Trip destinations (e.g., office or other work site, meetings with others, conferences, culture and recreation) are always of value to the passenger, and so, the mode of transportation to get to these destinations is also of inherent value. In addition to direct employment in the subsector, maintenance and

NAICS Definition of the Transit and Ground Passenger Transportation Subsector (NAICS 485)

This subsector includes several passenger transportation, such as urban transit systems; chartered bus, school bus, and interurban bus transportation; and taxis (including limousines and "black cars"). Within the subsector, there are scheduled industry groups (urban transit, interurban and rural bus transportation, and school and employee bus transportation) and nonscheduled industry groups (charter buses and taxis and limousines). Other transit and ground passenger transportation includes paratransit (transportation for the elderly, people with disabilities, and the infirm) and shuttle services.

NOTE See Appendix for a full list of transportation subsectors and a brief explanation of the NAICS.

infrastructure building also creates tens of thousands of jobs in other sectors because of its tremendous resource and service needs. Transit infrastructure projects require a broad variety of goods (e.g., fuel, cement, steel) and consulting services (e.g., planning and management).

The most frequently cited benefits of urban transit is that it eases traffic congestion; creates and sustains jobs; stimulates economic development; reduces energy consumption; increases real estate values; improves the mobility of seniors and people with disabilities; improves mobility during emergencies; saves households money; and is safer than driving.[2]

The most distinctive characteristic of transit is its sole focus on meeting a huge daily public demand.

The most distinctive characteristic of transit is its sole focus on meeting a huge daily public demand. Every day, the public transit system must determine how many and which cars, buses, and railcars will be needed, how many and which ones will be inspected, repaired, or maintained. The transit system not only must ensure that it has sufficient equipment capacity, it must also schedule the equipment to meet consumer demand. In addition, support services are needed to manage and operate the system such as station attendants, station cleaners, train announcers, and pension fund managers. There are all kinds of functions and all kinds of jobs needed to meet the enormous demand. Public transit is about as diverse as any complex enterprise can be.

The transit industry group is also distinctive in its high degree of unionization — essentially, all line-level transit employees are union members as is some portion of the ground passenger transportation workforce. The largest unions in the subsector are the Transit Workers Union (TWU), Amalgamated Transit Union (ATU), the Bridge and Tunnel Officers Benevolent Association (BTOBA), and the railroad workers unions (Teamsters).

Nationally, there are about 370,000 public transportation employees working in over 6,400 transit agencies; fares collected in 2006 amounted to over $11 billion dollars.[3] A 1999 study conducted by private research firm Cambridge Systematics estimated that "every dollar taxpayers invest in public transportation generates about $6 in economic returns."[4]

Transit agencies receive about 40 percent of their funding through passenger fares and other agency sources (tariffs, purchased agreements, and subsidies from other agencies); the remaining funds come from financial assistance or targeted taxation from local, state, and federal governments.[5] Any *slowdown in the general economy* — such as the one being currently experienced throughout the nation at the time of this writing — translates to lower tax receipts, so there is less money available for transit services.[6]

According to Professor Robert Paaswell, Director of the University Transportation Research Center at City College and former Chief Executive of the Chicago Transit Authority, there is underway in the subsector a national movement to replace mechanical parts and systems with computers and electronic parts and systems. New vehicles use new and more computerized technology with standard modules that can be popped in and out; it is more cost effective to convert to the new systems because of parts standardization than to attempt to repair the older mechanical parts. Moreover, transit agencies are increasingly running out of options: at some point, suppliers simply will not make the old buses and rail cars anymore.

Finally, and perhaps most salient to the immediate prospects for the subsector, is the effect of *fuel prices*. As fuel prices have risen to more than $4.00/gallon as of this writing, drivers are more likely to turn to rapid transit systems in an effort to avoid the high costs associated with refilling their family- or employer-owned cars. Ridership benefits can also be expected to be mitigated somewhat for transit agencies. First, the public sector must foot the bill for materials to be transported to them from manufacturers and from site to site within the system. Second, some city buses and paratransit vans still operate on diesel fuel. For the private sector — namely shuttle, taxi, and limousine services — operating costs are rising and these will need to be passed on the consumer.

NEW YORK CITY'S URBAN TRANSIT INDUSTRY GROUP

New York City is the largest transit agency in the nation with over 1.8 billion trips in 2006, more than five times the number of passenger trips than the next largest (Chicago), and more passengers than the next six largest transit agencies combined.[7] A key stakeholder interviewed for this study reported that the New York City region accounts for about one-third of the public transit ridership in the country with approximately 8 million riders a day (5.5 million of whom are subway riders). Ridership is on the upswing too: according to the New York City Economic Development Corporation, 2007 ridership alone was 131 million, an increase of 4.3 percent from the previous year.[8]

New York City's transit activities are entirely overseen by the Metropolitan Transportation Authority (MTA) with an operating budget of about $11 million dollars a day. Separate units operate the subways, buses, and paratransit (New York City Transit); railroad (Metro North and Long Island Railroad), and bridges and tunnels (Triborough Bridge and Tunnel Authority). Out of the approximately 69,000 employees working within the MTA, about 49,000 are employed at New York City Transit (NYCT) (Table 4.1).

New York City's transit system confronts several challenges and opportunities in the years ahead. Chief among them are the three cited by Professor Paaswell and Valerie Bynoe-Kasden, Esq., Vice President, Human Resources at NYCT: infrastructure capacity, technology updates, and workforce recruitment. The first two issues are

addressed in this section; workforce challenges are addressed in *Jobs and wages* immediately following.

In the 1970s, the subways were dirty and unreliable, and many New Yorkers simply refused to use the system. Over the past 15 years, to be sure, there have been tremendous improvements to the system and — along with the general growth and development of the city — these improvements have brought about tremendously increased ridership. More recently, ridership has increased as a result of increased fuel costs which serve as a disincentive to driving. In January and February of 2008, New York City Transit ridership was up 6.8 percent.[9]

While maintenance is important to the operation of the transit system, there is a real need for *capacity expansion*. According to Professor Paaswell, the city must confront its transit system's capacity limitations if it is to continue its current trajectory of development and growth. Maintenance, improvement, and expansion of the transit system are *all* essential — how well these tasks are accomplished will in large part determine New York City's ability to sustain the tremendous growth it has been undergoing.

To be sure, the importance of such expansion is recognized by city officials. Several large-scale infrastructure projects are currently under way including the devel-

TABLE 4.1 Metropolitan Transportation Authority Statistics at a Glance

2008 operating budget	**$10.8 billion**
Average weekday ridership	**8,505,966**
Rail and subway lines, and bus routes	**422**
Rail and subway cars	**8,934**
Buses	**6,346**
Track miles	**2,057**
Bus route miles	**3,903**
Rail and subway stations	**734**
Employees	
New York City Transit	48,910
Long Island Railroad	6,471
Long Island Bus	1,103
Metro North	5,855
Metro North Bus	3,303
Triborough Bridge & Tunnel	1,772
Central office (estimated)	1,703
Total	**69,111**

SOURCE Metropolitan Transportation Authority, Budget as of February 2008. Other statistical information as of December 31, 2007. (www.mta.info/mta/network.htm)

opment of the 2nd Avenue Subway line slated for completion in 2013, the extension of the Number 7 train to the west side of Manhattan, and the development of a Fulton Street transit hub.[10]

The MTA has done a great deal to upgrade the transit system's *integration of new technology*. The largest and most visible of these transformations has been the adoption of the MetroCard® as a seamless payment medium for city buses and subways. Yet, according to Professor Paaswell, there are additional opportunities for technological improvement such as sharing scheduling information to improve maintenance operations. Such improvements, when implemented, will change the skills needed from the transit workforce.

OCCUPATIONS AND ADVANCEMENT PATHWAYS

Ms. Bynoe-Kasden observed that public transit is among the last remaining opportunities in the city for job seekers with limited work experience and educational attainment to obtain stable, long-term employment, career advancement opportunities, full benefits, and labor union protection. As Professor Paaswell aptly remarked, "Transit is the new manufacturing sector in New York City."

A series of studies by the Transportation Research Board of the National Academies identified the following workforce challenges confronting transit agencies nationwide: [11]

- *Aging workforce* and high levels of retirement anticipated in the next five to ten years.
- Critical need to *upgrade the technological/microelectronic skills* of the workforce, with specific concern for the maintenance workforce as agencies upgrade and equipment warranties expire.
- Need to *upgrade the workforce's interpersonal and work skills*, particularly skills associated with teamwork and flexible work environment.
- Difficulty *competing with the private sector for skilled workers* because of comparatively low wages, rigid hierarchical work environment, little flexibility in hours, and requirements to pass occasional drug and alcohol screening.
- The need to *integrate human resources* practices (recruiting, training, and retaining) into central strategic planning of the agencies.

New York City Transit is the largest transit agency in the nation with over 1.8 billion passenger trips in 2006, more than five times the number of trips than the next largest.

- Insufficient *curricular and training programs* at the community college and four-year college levels. Research indicates that agencies rarely have partnerships with training programs or colleges opting instead to provide training informally on the job, or through the vendors selling new equipment.
- High cost of *specialized training* and the difficulty of retaining workers once they have been trained. As a result, transpor-

tation agencies have a comparatively low investment in training: 0.5 percent on average, whereas the private sector invests about two percent.

- Difficulties, sensitivities and extra time involved because transit agencies operate in what is among the *most unionized employment environments*.

The research board and other national subsector industry leaders have found that transit agencies have the most difficult time recruiting and retaining vehicle operators, mechanics, and customer service representatives, citing a relatively *high skill demand* compared to other entry-level work, a comparatively *inflexible work scheduling*; *relentless nature* of the work activities in that transit agencies have tremendous pressures to operate efficiently and perform seamlessly for the riding public; and the *stress associated with public interaction*.[12]

Public transit is among the last remaining opportunities for jobseekers with limited work experience and educational attainment to obtain stable, long-term employment, career advancement opportunities, full benefits, and labor union protection.

Workforce professionals have a unique role to play in addressing these challenges, to the extent that they are experienced by the transit industry in New York City. For example:

- Youth service providers can communicate the opportunities available in transit and the benefits of working in a unionized, public sector career with opportunities for advancement and better than average pay without the requirement for substantial postsecondary training.
- Education and training professionals should continue to work closely with the MTA in determining the type of skills needed in the transit workforce such as higher level technical and "soft" workforce skills, such as communication and customer service.

With regard to advancement pathways, the subsector experts who we consulted believed that a combination of experience and education were the essential components to building a career in transit.

In the public sector, a vast majority of applicants are recruited through the civil service examination process and vacancy notices are typically advertised in *The Chief*; at the respective administrative offices, the largest of which is the New York City Transit (NYCT) at 180 Livingston Street, 6th floor, in Brooklyn; or online. Exams are typically given every 12 to 15 months, with some exceptions. According to Ms. Bynoe-Kasden, train operator, conductor, track worker, and station agent exams may only be scheduled every three to four years; signal maintainers and car inspector exams are typically offered every year.[13]

Entry-level jobs at the NYCT range from $13 to $26 per hour, including operators, cleaners, conductors, track workers, electrical helpers, signal maintainers, and protection agents. Skilled trade careers at the NYCT include carpentry, masonry, ironwork, sheet metal workers, plumbers, electricians, and mechanics. Skilled trade careers typically require three- to four years of full-time service as journeyman and some postsecondary education. The MTA offers cooperative and experiential programs to qualified college students and internships, apprenticeships, and summer jobs with the New York City Department of Education. The MTA also offers a broad variety of in-house training opportunities. Job candidates typically undergo some form of training after passing the civil service exam, credentialing and screening requirements for their specific positions.

The *Transit Certificate Program* assists workers in selected entry-level titles to move up the career ladder at the NYCT. The program consists of three courses that prepare workers for promotional tests within the NYCT. Two of the three courses are offered by the City University of New York's School of Professional Studies in cooperation with Local 100 of the Transit Workers' Union (TWU). As part of its *Training and Upgrading Fund*, the TWU provides additional training and adult educational opportunities to assist incumbent workers with career advancement. Members may:

- *Take courses* in GED preparation, electronics, computer applications and computer hardware, or one of several languages.
- Participate in a three-year *apprenticeship program* in skilled trades such as lighting, carpentry, plumbing, and heating, ventilating and air conditioning (HVAC).
- Obtain one of three certificate tracks at the City University of New York's School of Professional Studies in *Telecommunications and Technology, Computer Technology, or Electronic Technology*. Participants are also placed in technical English and Math courses to ensure that they have the basic skills required to complete the certificate programs.

B. Private Sector Ground Passenger Transportation Industry Group

The private sector ground passenger transportation industry groups (NAICS 4853, 4855, and 4859) consist of firms that operate limousines and "black cars," taxis, charter buses, private shuttle and paratransit services, most of which rely a great deal on demand from New York City's economic power sectors: finance and professional management firms. As such, the industry groups do well when the city's economy is doing well and suffer during downturns. International tourism serves as a buffer to the ground passenger group's dependence on the corporate sector: the weak dollar has resulted in record increases in the number of international tourists who also demand services from the private sector ground transportation industry groups.

Looking now to the distribution of private sector establishments, we see that Queens has the highest number of establishments. Table 4.2 also shows that the number of private sector ground passenger establishments has declined in the Bronx,

Brooklyn, and Manhattan, but risen in Queens and Staten Island. As we found in the case of truck transportation, decreases in the number of establishments are probably related to increases in real estate costs.

A much higher percentage of New York City's workforce is employed in ground passenger transportation industries than the nation's as a whole (Table 4.3). In particular, Brooklyn employment is seven times more specialized than the nation; Queens is more than six times more specialized. On the other hand, the Manhattan workforce is less than one-third as specialized in ground passenger transportation as the nation overall. Workforce professionals should focus their efforts to develop jobs in ground passenger transportation where they exist in the greatest concentrations: i.e., in Brooklyn and Queens.

JOBS AND WAGES

According to *private sector* unemployment records, there were 27,899 jobs in taxi, limousine, "black car" companies, and private shuttle and paratransit services. Private sector ground passenger transportation employment in the Bronx and Brooklyn grew dramatically since 2000, and only slightly less so in Staten Island. Brooklyn and Queens have the most jobs in these industry groups, however.

Figure 4a is a map displaying the geographic distribution of private sector ground passenger transportation establishments and employees in New York City by zip code. The workforce system should focus on the darkest shaded zip codes with smallest numbers of establishments, which would indicate the presence of a few large establishments with more employment

TABLE 4.2 Transit and Ground Transportation Private Sector Establishments in the NYC Region by Borough/County, 2000–2007

		INCREASE/DECREASE 2000 TO 2007	
	2007	# +/-	% +/-
Bronx	97	-23	-19.2%
Brooklyn	482	-62	-11.4%
Manhattan	157	-21	-11.8%
Queens	493	22	4.7%
Staten Island	79	4	5.3%
Nassau	241	-3	-1.2%
Rockland	41	-9	-18.0%
Westchester	245	-10	-3.9%
Total	1,835	-102	-5.3%

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2007.

TABLE 4.3 Location Quotient* of the Private Sector Transit and Ground Passenger Transportation Subsector by Borough/County, 2006

Bronx	3.38
Brooklyn	7.11
Manhattan	0.30
Queens	6.24
Staten Island	5.24
NYC MSA	2.72
Nassau	1.98
Westchester	5.40
Chicago MSA	1.36
LA MSA	0.85

SOURCE Quarterly Census of Employment and Wages, 2006.

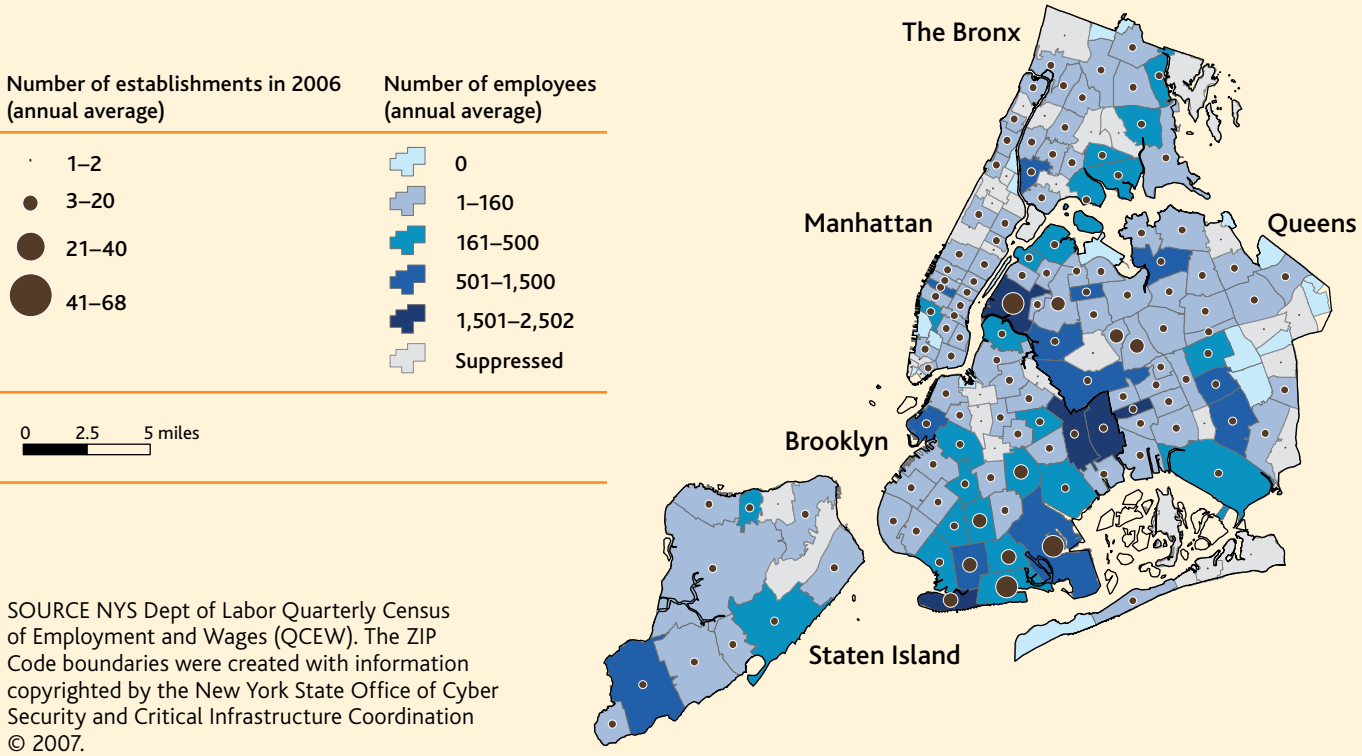
*Location Quotient is (1) the ratio of transit and ground passenger transportation employment to all employment in the specified area — divided by — (2) the ratio of the transit/ground passenger employment to all employment in the U.S.

TABLE 4.4 Private Sector Transit and Ground Passenger Transportation Jobs in the NYC Region by Borough/County, 2000–2007

		INCREASE/DECREASE 2000 TO 2007	
	2007	# +/-	% +/-
Bronx	2,625	846	47.6%
Brooklyn	11,377	4,485	65.1%
Manhattan	1,870	-318	-14.5%
Queens	10,358	-900	-8.0%
Richmond	1,669	269	19.2%
Nassau	4,730	694	17.2%
Rockland	1,247	-27	-2.1%
Westchester	6,238	203	3.4%
NYC Region	37,914	5,252	15.1%

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2007.

FIGURE 4a Transit and Ground Passenger Transportation Employment and Establishments in New York City[14]



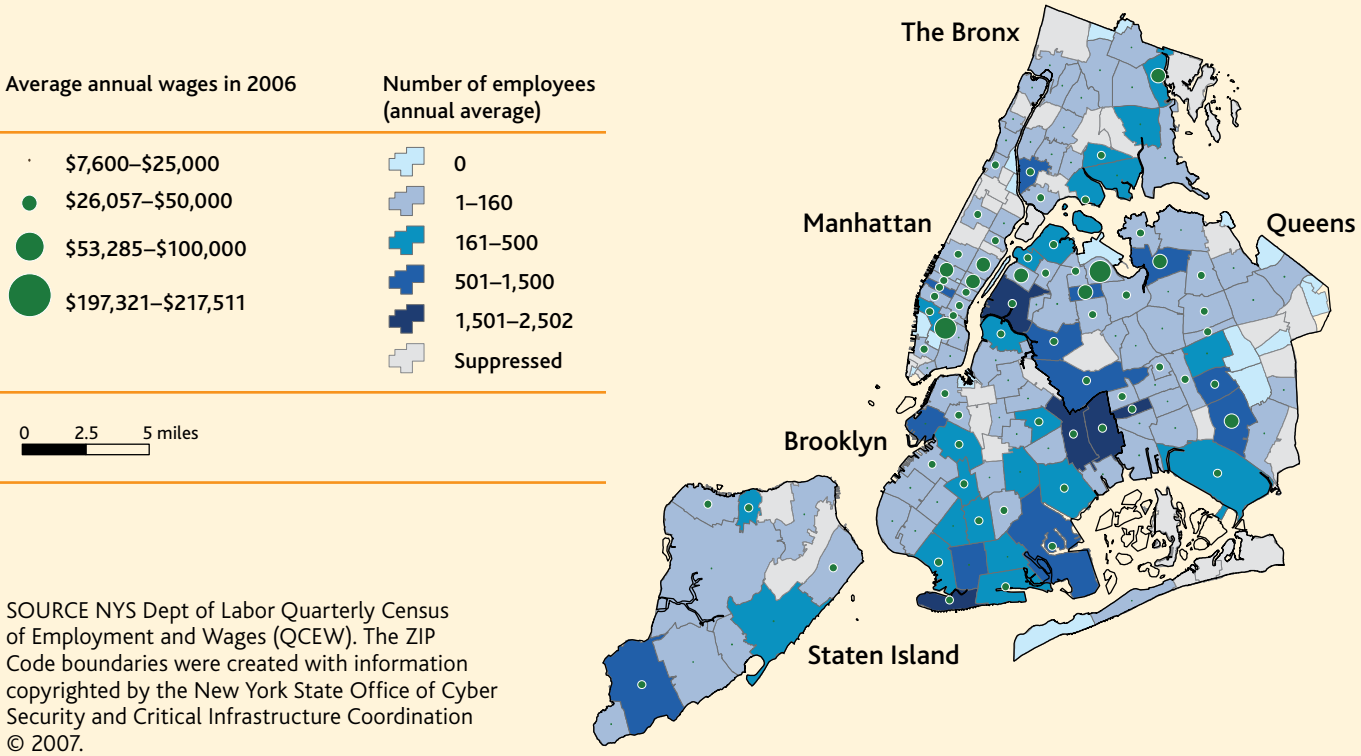
SOURCE NYS Dept of Labor Quarterly Census of Employment and Wages (QCEW). The ZIP Code boundaries were created with information copyrighted by the New York State Office of Cyber Security and Critical Infrastructure Coordination © 2007.

opportunities. The most strategic areas for the public workforce system are High Bridge, the Bronx; Sunnyside-Long Island City, Queens; and Bushwick-East New York, Brooklyn.

Average salaries in private sector ground passenger transportation rose a great deal between 2000 and 2006, even after adjusting for inflation (Table 4.5). Queens salaries were the highest among the boroughs at $41,792 and salaries in Brooklyn, although lowest, rose the most on a percentage basis during those years. New York City salaries are higher than those in the outlying counties. Salaries in these industry groups are lower than salaries in the other subsectors being examined in this report and lower than salaries earned in public transit agencies nationwide. The American Public Transportation Association estimates that average annual compensation for public transit employees was $57,342 per employee in 2006.[15]

Figure 4b shows average annual salaries in the subsector and the concentration of jobs by zip code. The map shows that annual salaries range from a low of $7,600 per year to over $200,000, with the highest salaries paid in lower Manhattan and in Flushing, Queens near LaGuardia Airport.

FIGURE 4b Transit and Ground Passenger Transportation Employment and Wages in New York City



SOURCE NYS Dept of Labor Quarterly Census of Employment and Wages (QCEW). The ZIP Code boundaries were created with information copyrighted by the New York State Office of Cyber Security and Critical Infrastructure Coordination © 2007.

TABLE 4.5 Average Annual Salary* in Private Sector Transit and Ground Passenger Transportation: NYC Region by Borough/ County, 2000–2006

	2006	INCREASE/DECREASE 2000 TO 2006 $ +/-	% +/-
Bronx	$35,856	$7,018	24.3%
Brooklyn	$30,984	$8,056	35.1%
Manhattan	$36,250	$6,459	21.7%
Queens	$41,792	$8,987	27.4%
Staten Island	$31,069	$7,258	30.5%
Nassau	$23,779	$4,930	26.2%
Rockland	$21,188	$2,432	13.0%
Westchester	$32,068	$5,858	22.4%
Total	**$33,456**	**$6,627**	**24.7%**

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2006.

* In current $

The map also indicates that the workforce in areas with the highest concentration of jobs in private sector ground passenger transportation (High Bridge, Bushwick, East New York, South Jamaica and JFK Airport, and Coney Island) earned low- to moderate salaries in 2006.

C. Combined Public and Private Sector Industry Groups within NAICS 485

Table 4.6 lists the largest subsector employment sites in New York City as reported to two leading commercially available establishment lists. Work sites in this subsector are quite large, with the top ten employing 500 or more each. About 40 percent of the transit and ground passenger transportation firms listed in the commercially available lists employed between 100–199 workers at any given site; another 40 percent employed between 200–499 workers per site.

OCCUPATIONS AND ADVANCEMENT PATHWAYS

According the American Public Transportation Association, nearly two-thirds of the national transit workforce is employed in bus agencies and nearly two thirds are vehicle operators.[16] Indeed, in New York City, bus drivers are the most prevalent occupation in the subsector. New York City bus drivers must hold a state-issued Commercial Driver's License (CDL), which requires a written exam and a bus-driving skills test. Additional endorsements are required for drivers that wish to drive school or city transit buses.[17] The Transportation Research Board reports that the second most prevalent occupations in transit agencies nationwide are in vehicle maintenance;[18] again, their observation is borne out in the Census estimates for New York City.

Listed in the first column of Table 4.7 are the most common occupations in transit and ground passenger transportation — *in*

TABLE 4.6 Largest Ground Passenger Transportation Establishments in New York City, 2008

ESTABLISHMENTS	BOROUGH	ON-SITE EMPLOYMENT
Amboy Bus Co Inc.+	Bronx	1,000
Varsity*	Manhattan	800
Grandpa's & Bobby's*	Manhattan	800
Executive Cars Last Radio*	Manhattan	700
Executive Cars*	Manhattan	700
Phyllis Transportation Corp*	Manhattan	700
Dial Car*	Manhattan	600
Parochial Bus System Inc+	Bronx	600
Triboro Coach Corp*	Manhattan	580
Grandpa's & Bobby's Bus Co*	Manhattan	500

SOURCES *ReferenceUSA and +Dun & Bradstreet 2007 establishment lists. Retrieved May 2008.

both the public and private sectors — ranked in order of the number of jobs in New York City in 2006. The top five occupations are bus drivers, bus/truck mechanics, supervisors of transportation material movers, child-care workers,[19] and transportation attendants. Job opportunities in all five top occupations are expected to grow.[20] It is important to look beyond job numbers and growth, to obtain a more accurate sense of these occupations.

Table 4.7 also presents the *percent of replacement job openings* (as opposed to new jobs that are created when subsector employment numbers expand). A majority of the projected jobs are replacement jobs, which suggests a higher rate of turnover in these positions. Among the top five occupations, supervisors and mechanics typically require additional training beyond a high school diploma. Bus drivers, child care workers, and transportation attendants generally are not required to have any postsecondary educational experience, however. Some employers may require less education depending on the applicant's level of skill and experience.

Hourly wage rates for entry-, mid-, and high-level earners in each of the top ranking occupations in the transit and ground passenger transportation subsector are also shown in Table 4.7. As expected, the supervisors receive the highest wages, starting out above $20 per hour. Transportation attendants and child care workers start out just above minimum wage levels, but peak out under $15 per hour indicating little room for advancement in these occupations. Bus drivers, bus and truck mechanics, transportation inspectors, and locomotive engineers/operators have wider pay ranges: workers in these occupations could earn as much as some supervisors and managers. Bus drivers, in particular, can earn more than $25 per hour and are generally not required to have any postsecondary education except what is needed to obtain a commercial drivers' license with a passenger endorsement, known as a CDL-P.

According to the Bureau of Labor Statistics, job opportunities in the transit and ground passenger transportation subsector's top occupations are expected to grow.

Although considered a growth occupation by the Bureau of Labor Statistics, taxi driving has fairly high barriers to entry that may present barriers to jobseekers in New York City's public workforce system. The number of yellow taxicabs in New York City is limited (currently about 13,000), and there are about 40,000 additional for-lease cars available in New York City. The New York City Taxi and Limousine Commission (TLC) requires taxi drivers to hold a valid Class D (Chauffeur's) license. To be eligible, drivers must: be 19 years of age, hold a valid driver's license and Social Security Card, have no more than seven points on their license, have no outstanding judgments (such as parking tickets),

TABLE 4.7 Top Ranking Occupations in the Transit and Ground Passenger Transportation Subsector: Employment Outlook, Educational Requirements, and Wages

TOP RANKING OCCUPATIONS *(IN ORDER OF # OF JOBS IN 2006)*	2014 OUTLOOK GROWTH/DECLINE	% REPLACEMENT	EDUCATIONAL REQUIREMENTS*	2006 HOURLY WAGES ENTRY	MEDIAN	HIGH
Bus drivers	^	80.0%	HS/GED	$12.82	$21.18	$27.40
Bus and truck mechanics and diesel engine specialists	^	88.2%	AA/TRADE	$15.65	$23.93	$30.41
Supervisors, transportation and material moving workers	^	75.0%	AA/TRADE	$16.41	$28.47	$41.50
Child care workers	^	77.2%	HS/GED	$7.59	$11.09	$15.05
Transportation attendants	^	73.3%	HS/GED	$7.32	$8.71	$12.37
Reservation and transportation ticket agents and travel clerks	v	100.0%	HS/GED	$9.84	$15.90	$23.20
First-line supervisors, transportation and material moving workers	^	84.6%	BA	$21.19	$32.69	$46.76
Office clerks, general	v	100.0%	BA	$7.58	$12.80	$20.06
Transportation inspectors	^	90.0%	AA/TRADE	$18.48	$25.53	$34.11
Locomotive engineers and operators	v	100.0%	AA/TRADE	$17.03	$25.74	$35.20
Managers, all other	^	79.2%	BA	$25.51	$44.99	na
Tour and travel guides	^	60.0%	AA/TRADE	$12.18	$16.61	$21.67
Taxi drivers and chauffeurs	^	41.7%	HS/GED	$8.25	$11.65	$19.66

SOURCE **Occupational ranking** from US Bureau of the Census, American Community Survey, Public Use Microdata Sample, 2005–06
Educational requirements and wage data from O*NET Online (http://online.onetcenter.org/)
Occupational outlooks and replacement jobs from the Bureau of Labor Statistics, Occupation Employment Survey, 2006.

* Indicates the level of education attained by most individuals in this occupation in New York City.
Some employers may require less or more years of education.

HS/GED = high school diploma or GED usually required.
AA/TRADE = 2-year college degree or postsecondary vocational or trade school usually required.
BA = 4-year college degree usually required.
na = Hourly wage is not available for this occupation.

file an application, show proof of recent defensive driving training, pass a drug test, submit child support and medical certification, attend either 24 or 80 hours of "taxi school" at an accredited location, and pass a written exam.[21] Taxi school costs $175 for 24 hours and $325 for 80 hours; license, application, and required fees are estimated at an additional $195.

Once licensed, the cost of taxi driving can be prohibitive, especially given current fuel prices. Drivers either lease or own their own taxis. All yellow cabs in New York City must have a TLC medallion affixed to their hoods. Issuance of the medallions is tightly restricted; as a result, medallion costs are quite high. Medallions may be purchased from current owners or in a city-

wide auction. In May 2008, 89 new medallions were auctioned and the winning bid was $413,000.[22] Driver-owners must maintain their car(s), make regular payments on medallion financing, and gasoline. Most drivers are independent contractors who lease their taxis daily, weekly, or monthly. Drivers earn the difference between their total revenues (fares and tips) and their expenses (lease payments and gasoline).[23]

WORKFORCE DEMOGRAPHICS

Table 4.8 shows the characteristics of the public transit and private ground passenger transportation workforce according to estimates derived from the 2000 Census and the 2005 and 2006 American Community Surveys. Public transit — including both public *and* private sectors — are New York City residents, and that share remained the same in 2006.

Males predominated in the transit and ground passenger transportation workforce in 2000, holding four out of five jobs that year. That percentage has decreased somewhat to 73 percent in 2006. The subsector's workforce is fairly racially/ethnically diverse with a strong representation among Black employees at about half of the transit and ground passenger transportation workforce. As national data would suggest, fewer young people are entering transit and ground passenger occupations in New York City: the percent of employees between the ages of 18 and 34 decreased from 21 per-

TABLE 4.8 Demographic Characteristics of the New York City Transit and Ground Passenger Transportation Workforce, 2000 and 2005/06

PERCENT OF NEW YORK CITY TRANSIT AND GROUND PASSENGER TRANSPORTATION EMPLOYEES WHO ARE	2000	2005/06
New York City residents*	81.0%	80.0%
Male	79.8%	72.8%
White	20.5%	22.8%
Black	44.0%	49.3%
Hispanic	20.6%	21.3%
Asian	4.2%	5.2%
Age 18–34	20.7%	13.5%
35–44	34.0%	31.8%
44–54	27.9%	32.8%
Age 55+	17.4%	21.9%
Less than high school or GED	18.2%	15.1%
High school diploma or GED	37.2%	48.3%
Some college	36.3%	28.1%

SOURCE U.S. 2000 Decennial Census and 2005 and 2006 American Community Surveys public use microdata (PUMS) files.

*The remaining percentages that appear in the table are of people who both live *and* work in New York City.

and older age groups grew during the same time period.

In 2000, about half of New York City's transit and ground passenger workforce had either dropped out of high school or completed a high school diploma or GED. The percentage of high school graduates increased substantially between 2000 and 2006 from 37 percent to 48 percent, and the percentage of employees without a diploma or GED decreased slightly form 18 to 15 percent. Particularly in transit jobs, as technology advances, younger and more recently trained employees will be needed with the skills that match the requirements of the jobs in the subsector or industry leaders will need to train incumbent workers in these skills.

D. Observations and workforce implications

OBSERVATIONS

- The transit and ground passenger transportation subsector includes disparate industry groups with different economic and workforce dynamics. On the one hand, there are public transit agencies, which operate light and heavy rail (subways), buses, and transportation for specialized populations. On the other, there are private sector taxi and limousine services, charter buses, and private shuttle services.

Public Sector

- New York City is the largest transit agency in the nation with over 1.8 billion trips in 2006, more than five times the number of passenger trips than the next largest (Chicago), and more passengers than the next six largest transit agencies combined.
- New York City's transit activities are entirely overseen by the Metropolitan Transportation Authority (MTA).
- There are approximately 69,000 MTA jobs in the subsector, of which about 49,000 are in the New York City Transit (NYCT).
- Major workforce recruitment and retention challenges in the public sector transit subsector include: a relatively high skill demand, work schedule pressures to operate efficiently and perform seamlessly for the riding public; and the stress associated with public interaction.

- In the public sector, a vast majority of applicants are recruited through the civil service examination process and vacancy notices are typically advertised in a newsletter, at the various MTA headquarters, or on the MTA website.
- Entry-level low skill jobs at the NYCT range from $13 to $26 per hour, including operators, cleaners, conductors, track workers, electrical helpers, signal maintainers, and protection agents.
- The MTA offers cooperative and experiential programs to qualified college students and internships, apprenticeships, and summer jobs with the New York City Department of Education.
- Public transit is among the last remaining opportunity for New York City jobseekers with limited work experience and educational attainment to obtain stable, long-term career advancement opportunities, full benefits, and labor union protection.

Private Sector

- Queens has the highest number of private sector establishments in the subsector. The number of local transit and ground passenger establishments has declined in the Bronx, Brooklyn, and Manhattan, but risen in Queens and Staten Island.
- New York City's workforce is highly specialized in private sector ground passenger transportation employment. Brooklyn employment is seven times more specialized than the nation in this regard; Queens is more than six times more specialized.
- There were about 28,000 jobs in private sector ground passenger transportation.
- Private sector subsector employment in the Bronx and Brooklyn grew dramatically since 2000, and only slightly less so in Staten Island.
- The most strategic areas for the public workforce system to target its efforts with private sector firms in the subsector are High Bridge, the Bronx; Sunnyside-Long Island City, Queens; and Bushwick-East New York, Brooklyn.
- Average salaries in private sector ground passenger transportation rose a great deal between 2000 and 2006, even after adjusting for inflation. Queens salaries were the highest among the boroughs at $41,792.

Combined Public and Private

- The most prevalent occupations in the transit and ground passenger transportation subsector are bus drivers, bus and truck mechanics, supervisors of material movers, child-care workers, transportation attendants, and reservation and ticket agents.
- There are several occupations in the subsector that pay relatively high median hourly wages to workers with little or no postsecondary education.
- As in the other transportation subsectors reviewed in this report, males predominated in the transit and ground passenger transportation workforce, although the share decreased somewhat from 2000 to 2006.
- The subsector workforce is fairly racially/ethnically diverse with a strong representation among Black employees at about half of the transit and ground passenger transportation workforce.

■ Fewer young people are entering transit and ground passenger occupations: the percent of employees between the ages of 18 and 34 decreased from 21 percent in 2000 to 14 percent in 2006.

WORKFORCE IMPLICATIONS

■ On the public sector side, the public workforce system could: communicate the variety of openings, opportunities, and advancement pathways available to MTA employees; provide jobseeker advice for filing and successful completion of civil service examinations; and ensure that there are adequate, affordable educational opportunities for incumbent workers to advance within their careers.

■ Despite the sensitivity of public transit to tax revenue cycles, workforce professionals — including youth service providers — should increase their focus on the MTA in general, and the NYCT in particular as an important job source for jobseekers.

■ The public workforce system could be helpful to jobseekers by collecting and aggregating data about job vacancies in the subsector that are generated by New York City agencies or the companies that contract from them (e.g., from the New York City Department of Education or Vendex, the central contracting database for all New York City agencies).

■ On the private sector side, the public workforce system could help entrants to obtain the needed licensing and identify employers with higher than average workforce needs. The data also suggest that there are literally hundreds of private sector employers in this subsector with no apparent shared ability to advertise for job openings.

■ The MTA already coordinates with the New York City Department of Education and the City University of New York to provide training, internships, and apprenticeships in transit-related occupations. Tighter coordination, as well as additional communication and recruitment efforts are needed to attract a younger and gender-diverse workforce in the subsector. Youth service providers can play an important role in connecting teens and young adults to existing programs and to developing new entry points to the transit industry.

Endnotes

1 In this section, we focus special attention to the transit portion of the subsector precisely because it plays an outsized role in New York and provides an overwhelming majority of employment in the subsector.

2 American Public Transportation Association, 2008.

3 American Public Transportation Association, *Public Transportation Fact Book 59th edition*, Washington, DC: APTA, May 2008.

4 Cambridge Systematics, *Public transportation and the nation's economy: A quantitative analysis of public transportation's economic impact*, Washington, DC, October 1999, p. x.

5 American Public Transportation Association, 2008.

6 Neuman, W. So Soon? Fares and Tolls Rise in M.T.A. Plan, *New York Times*, 22 July 2008, p. 1.

7 American Public Transportation Association, 2008.

8 New York City Economic Development Corporation, *Economic Snapshot*, April 2008.

9 Krauss, C. Gas prices send surge of riders to mass transit, *New York Times*, 10 May 2008.

10 Metropolitan Transportation Authority, *Engaging, recognizing, and developing the MTA workforce: Recommendations to Elliot G. Sander, Executive Director and CEO*, November 2007; Partnership for New York City, *Transportation choices and the future of the New York City economy*, 2004; and Metropolitan Transportation Authority Information Page.

11 Transportation Research Board of the National Academies, *The workforce challenge: Recruiting, training, and retaining qualified workers for transportation and transit agencies*, Special Report 275, Washington, DC, 2003. (http://onlinepubs.trb.org/onlinepubs/sr/sr275.pdf); and Transit Cooperative Research Program, *Closing the knowledge gap for transit maintenance employees: A systems approach*, Report 29, Washington, DC: Transportation Research Board of the National Academies, 2003; and Transportation Research Board of the National Academies, *Transit Cooperative Research Program, Managing transit's workforce in the new millennium*, Report 77, 2003; Diewald, W. Commentary: Training to meet transportation agency workforce needs, *Public Works Management and Policy*, 9: 1, July 2004, pp. 3–7.

12 Transit Cooperative Research Program, *Managing transit's workforce in the new millennium*, Report 77, Washington, DC: Transportation Research Board of the National Academies, 2003; and United States Department of Labor, *Transportation industry: Identifying and addressing workforce challenges in America's transportation industry*, March 2007.

13 Metropolitan Transportation Authority, *New York City Transit: Express to success* (jobs and careers circular), 2008.

14 The data in this map includes private sector employment only. The New York State Department of Labor (NYSDOL) suppresses employee and wage data for any ZIP Code that includes fewer than three establishments or contains a single unit that accounts for 80 percent or more of the industry's employment. This map omits any establishment in the five boroughs that reported ZIP Code outside of New York City to the NYSDOL. In 2006, there were 58 of these firms (out of 1,277) in this NAICS code with 462 employees (out of > 27,500) and annual average wages of $23,400.

15 American Public Transportation Association, *Public transportation fact book 59th edition*, June 2008.

16 American Public Transportation Association, *2008 public transportation fact book*, 59th edition, June 2008.

17 New York State Department of Motor Vehicles, www.nydmv.state.ny.us/cdl.htm.

18 Transit Cooperative Research Program, *The workforce challenge: recruiting, training, and retaining qualified workers for transportation and transit agencies*, Special Report 275, Washington, DC: Transportation Research Board of the National Academies, 2003.

19 According to New York State Department of Labor's New York City regional economist, child-care worker is the occupational title most closely related to New York City school bus guardians (formerly known as "school bus matrons"). (Brown, J., Personal communication with the author, April 2008.)

20 Occupational projections from the Bureau of Labor Statistics Occupation Employment Survey Program is presented here because they are recognized as the state of the art in labor market information. Some of the limitations of these projections are reviewed in **Section 1** under **Methods**. We recommend that readers weigh these data against other data presented in this report to develop the most accurate outlook for the various occupations in the transportation sector.

21 Full instructions for obtaining a Class D license and accredited training locations are at: www.nyc.gov/html/tlc/downloads/pdf/driver_license_how_to_guide.pdf.

22 www.nyc.gov/html/tlc/downloads/pdf/press_release_medallion_auction.pdf.

23 Schaller, B. and G. Gilbert, Factors of production in a regulated industry: New York taxi drivers and the price for better service, *Transportation Quarterly*, 49:4, 1995.

5

Support Activities for Transportation

The Support Activities for Transportation subsector is made up of five distinct industry groups, each specializing in different modes of transportation: air, rail, marine, ground, and other.[1] *Air support* firms include airport operators and aircraft service, repair (except factory conversion and aircraft overhaul), maintenance, storage, and aircraft ferrying firms. *Road support* firms include motor vehicle towing, bridge and tunnel operators, car and truck delivery service, and weigh station operators. *Freight support* firms provide logistical and management support for shippers and carriers such as freight forwarding, customs brokerage, and shipping agents. Finally, the *other support* services industry group includes vanpools, carpools, and pipeline service providers.

A. Economic and industry dynamics

In general, we refer readers to Sections 2 through 4 of this report to identify the primary factors that influence the respective industrial subsectors: air, truck, and transit and ground passenger. Firms in the support activities subsector are closely tied to — and in most cases dependent upon demand from — firms in the other transportation subsectors, and are subject to many of the same economic influences. For example, aircraft maintenance firms see a decline in demand when airlines cut flight routes or the number of active aircraft. To the extent that fuel prices are causing individuals to move to public transportation from driving, towing companies can be expected to see their demand drop as well. If freight cargo shipments recede, so will the demand for logistical support, freight forwarding, and customs agents. If the dollar weakens, exporting activity can be expected to pick up, however; so, customs agents may see an increase in the demand for their services.

There are exceptions. For example, air traffic controllers are federal employees and must be present in certain numbers to maintain safety and order regardless of the state of the economy. Similarly, the Metropolitan Transportation Authority (MTA) oversees and operates seven bridges and two tunnels in New York City, and employment at the quasi-public authority is dependent on budget contributions of the state and city as well as the authority's own debt and revenue streams.

NAICS Definition of Support Activities for Transportation (NAICS 488)

Industries in the Support Activities for Transportation subsector provide services to transportation carrier establishments or to the general public. This subsector includes a wide array of establishments, including air traffic control services, marine cargo handling, and motor vehicle towing. The Support Activities for Transportation subsector is separated by the mode of transportation being served. The Support Activities for Air Transportation industry includes air traffic control, maintenance, and other services to the aviation industry. Excluded are establishments primarily engaged in providing factory conversion and overhaul of transportation equipment and those providing rental and leasing of transportation equipment without operators.

NOTE **See Appendix for a full list of transportation subsectors and a brief explanation of the NAICS.**

B. Support activities for transportation in New York City

Labor union representation in the support activities subsector varies both by industry and occupation. In New York City, workers in both truck and air freight and air services (maintenance and operations contractors) are represented by Locals 295 and 851 of the Teamsters Union. The Bridge and Tunnel Officers Benevolent Association (BTOBA) represents the Triborough Bridge and Tunnel Authority's employees.

Labor union representation in the support activities subsector varies both by industry and occupation.

Other than in Queens and Staten Island, the New York City labor market is not especially specialized in the support activities subsector (Table 5.1). Queens is more than five times more specialized and Staten Island more than twice as specialized in subsector employment as the nation as a whole. Queens' specialization is undoubtedly the result of the large aviation and trucking presence; Staten Island's is reliant on marine and truck cargo operations out of Howland Hook.

Figure 5a shows that there is at least one transportation support establishment in nearly every zip code in New York City. The concentration of jobs — as seen by the gradation of colors by zip code — suggests that many of those located outside of traditional commerce or shipping areas are small

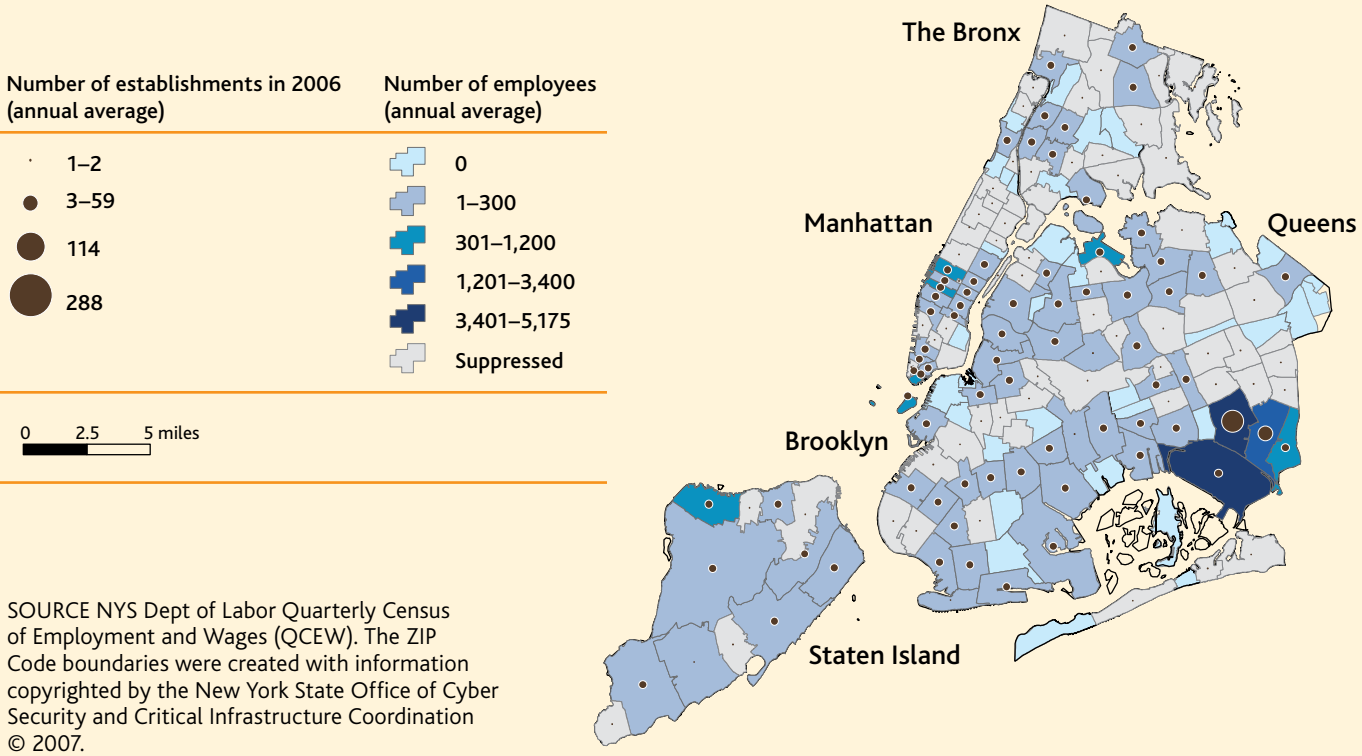
TABLE 5.1 Location Quotient* of the Support Activities for Transportation Subsector in NYC Region by Borough/County, 2006

Bronx	**0.28**
Brooklyn	**0.48**
Manhattan	**0.29**
Queens	**5.20**
Staten Island	**2.30**
Nassau	**1.28**
Westchester	**0.35**

SOURCE Quarterly Census of Employment and Wages, 2006.

*Location Quotient is (1) the ratio of transportation support employment to all employment in the specified area — divided by — (2) the ratio of the transportation support employment to all employment in the U.S.

FIGURE 5a Support Activities for Transportation Employment and Establishments in New York City[2]



SOURCE NYS Dept of Labor Quarterly Census of Employment and Wages (QCEW). The ZIP Code boundaries were created with information copyrighted by the New York State Office of Cyber Security and Critical Infrastructure Coordination © 2007.

neighborhood businesses, probably motor vehicle towing companies. The largest number of transportation support establishments is in John F. Kennedy Airport (JFK) and nearby South Jamaica, followed by a large number scattered throughout northern Queens and Brooklyn, in Staten Island, and Midtown Manhattan.

Table 5.2 lists the largest subsector employment sites in New York City as reported to leading commercially available establishment lists. Of the top 10, four are located in Queens and Manhattan respectively, and two are located in Staten Island. The second and ninth largest employment sites are operated by the Metropolitan Transportation Authority's Metro North Railroad and the Triborough Bridge and Tunnel Authority (TBTA), respectively.

TABLE 5.2 Largest Support Activities for Transportation Establishments in New York City, 2008

ESTABLISHMENTS	BOROUGH	ON-SITE EMPLOYMENT
American Airlines, Inc.+	Queens	4,000
Metro-North Commuter Railroad+	Manhattan	1,000
Hudson General Corp+	Queens	1,000
Worldwide Flight Services Inc+	Queens	1,000
Port Authority of New York and New Jersey+	Queens	900
Port Authority of New York and New Jersey+	Manhattan	600
American Sales & Management*	Manhattan	500
New York Container Terminal+	Staten Island	450
Triborough Bridge Tunnel Authority+	Manhattan	400
Reinauer Transportation Co.+	Staten Island	400

SOURCES *ReferenceUSA and +Dun & Bradstreet 2007 establishment lists. Retrieved May 2008.

C. Jobs and wages

According to the Table 5.3, Queens outstrips all other regional boroughs and counties in the number of jobs in the support activities subsector with 12,388 jobs in 2007, down three percent since 2000. Manhattan has almost 3,000 jobs but that number has decreased by more than 16 percent since 2000 likely due to higher real estate prices and firms moving to the outer boroughs. The Bronx had less than 300 jobs in support activities for transportation, but that number represents a 50 percent increase since 2000.

Salaries in the support activities subsector went up across the board since 2000, even after accounting for inflation (Table 5.4). The regional average annual salary in the subsector — across industry groups — was nearly $50,000, with lower salaries in Queens ($37,173), Brooklyn ($38,289), and the Bronx ($34,199), and higher salaries in Manhattan ($79, 392). Again, although occupational data are not available at the establishment level, the data indicate that manual and line staff jobs are located in the outer boroughs, while better paying corporate jobs are located in Manhattan.

Figure 5b shows the concentration of transportation support jobs and average annual wages by zip code. Average wages in the airports are comparatively low; however, wages in South Jamaica, South Brooklyn, Hunts Point, and Staten Island are above average for the subsector. Wages in downtown and midtown Manhattan, where corporate offices are likely located, are also above average for the subsector.

TABLE 5.3 Jobs in Support Activities for Transportation in the NYC Region by Borough/County, 2000–2007

	2007	INCREASE/DECREASE 2000 TO 2007 # +/-	% +/-
Bronx	284	95	50.3%
Kings	1,142	156	15.8%
Manhattan	2,738	-545	-16.6%
Queens	12,388	-396	-3.1%
Richmond	1,031	-194	-15.8%
Nassau	3,351	352	11.7%
Rockland	67	-61	-47.7%
Westchester	649	160	32.7%
Total	**21,650**	**-433**	**-2.0%**

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2007.

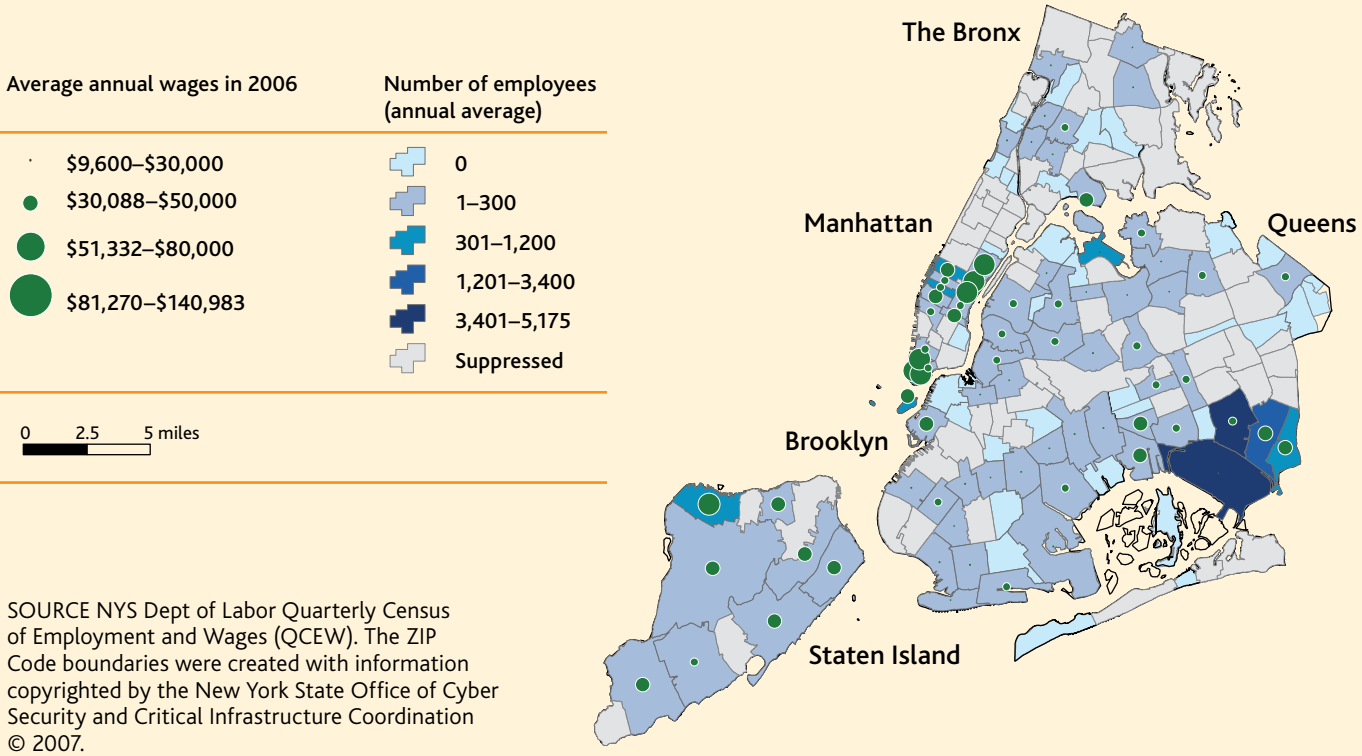
TABLE 5.4 Average Annual Salary* in Support Activities for Transportation: in the NYC Region by Borough/County, 2000–2006

	2006	INCREASE/DECREASE 2000 TO 2006 $ +/-	% +/-
Bronx	$34,199	$6,100	21.7%
Kings	$38,289	$4,333	12.8%
Manhattan	$79,392	$20,677	35.2%
Queens	$37,173	$5,708	18.1%
Staten Island	$71,991	$13,945	24.0%
Nassau	$65,418	$15,912	32.1%
Rockland	$46,451	$16,493	55.1%
Westchester	$65,501	$21,533	49.0%
Total	**$49,745**	**$9,954**	**25.0%**

SOURCE Quarterly Census of Employment and Wages, New York State Department of Labor, 2000–2006.

* In current $

FIGURE 5b Support Activities for Transportation Employment and Wages in New York City



SOURCE NYS Dept of Labor Quarterly Census of Employment and Wages (QCEW). The ZIP Code boundaries were created with information copyrighted by the New York State Office of Cyber Security and Critical Infrastructure Coordination © 2007.

Two relevant developments highlighted in the trucking section of this report bear repeating in the context of the support activities subsector. Professor José Holguín-Veras of Rensselaer Polytechnic Institute told us about the *diversification of trucking firms into logistics and packaging*. Howard Mann Freight Planning Unit Manager at the New York Metropolitan Transportation Council (NYMTC) raised a study currently being conducted by NYMTC on the feasibility of locating "*freight villages*" in or around New York City. If the freight village model is adopted, we can expect to see more of both diversification and co-location of air, freight, marine, and rail services offered by establishments in the support activities for transportation subsector.

In general, the major factors influencing the jobs outlook in the air, truck, and transit and ground passenger transportation subsectors — *economic cycles, fuel prices, strength of the dollar, infrastructure development, and technological advancements* discussed in greater detail in the respective subsector sections of this report — also influence the jobs outlook in support activities.

D. Occupations and advancement pathways

The first column of Table 5.5 lists the most common occupations in the support activities subsector as ranked by the number of jobs in New York City in 2006. The most common occupations are truck drivers, customer service representatives, managers, cashiers, and laborers/material movers. Job opportunities for customer service representatives, managers, and cashiers are expected to grow.[3]

It is important to look beyond job numbers and growth, to obtain a more accurate sense of these occupations, however. Table 5.5 also presents the *percent of replacement job openings* (as opposed to new jobs that are created when subsector employment numbers expand). All of the projected jobs for truck drivers and laborers/material movers are replacement jobs, an indication of the high turnover and the anticipated flattening of demand for these positions. Among the top five occupations, only managers typically require additional education beyond a high school diploma or a certificate of General Educational Development (GED). Some employers may require less education depending on the applicant's level of skill and experience.

Hourly wage rates for entry-, mid-, and high-level earners in each of the top ranking occupations in support activities for transportation are also shown in Table 5.5. As expected, managers and supervisors receive the highest wages, both with starting wages above $16 per hour. Transportation attendants and cashiers start out just above minimum wage levels and peak out at $12–13 per hour indicating a low degree of opportunity for advancement in either of these occupations. (Workers may move from these occupations to others in the subsector, of course.) Truck drivers, dispatchers, and shipping and receiving clerks have wider pay ranges: workers in these occupations could earn $22 per hour or more.

Eight out of the 10 most common occupations in support activities typically require jobseekers to have no more than a high school diploma or GED.

Career advancement pathways in support activities follow the same pattern as that found in the air, truck, and transit and ground passenger transportation subsectors. Subsector or related experience — often in combination with a two-year degree or trade school certification indicating that relevant skills have been upgraded — are generally required to advance to supervisory positions. In particular, the logistics and warehousing industries depend on computer applications to track and schedule shipments. Individuals with training in these systems will be more likely to advance beyond entry-level clerical or manual positions. Although there are exceptions, management positions in the subsector are generally held by individuals holding four-year postsecondary degrees.

TABLE 5.5 Top Ranking New York City Occupations in Support Activities for Transportation: Employment Outlook, Educational Requirements, and Wages

TOP RANKING OCCUPATIONS *(IN ORDER OF # OF JOBS IN 2006)*	2014 OUTLOOK GROWTH/DECLINE	% REPLACEMENT	EDUCATIONAL REQUIREMENTS*	2006 HOURLY WAGES ENTRY	MEDIAN	HIGH
Sales Workers and Truck Drivers	v	100.0%	HS/GED	$7.48	$13.45	$25.73
Customer Service Representatives	^	64.9%	HS/GED	$9.96	$15.96	$26.12
Managers, All Other	^	79.2%	BA	$25.51	$45.81	na
Cashiers	^	96.4%	HS/GED	$7.26	$8.52	$13.07
Laborers and Freight, Stock, and Material Movers, Hand	v	100.0%	HS/GED	$7.55	$11.17	$18.73
Office Clerks, General	v	100.0%	HS/GED	$7.58	$12.80	$20.06
Taxi Drivers and Chauffeurs	^	41.7%	HS/GED	$8.25	$11.65	$19.66
Supervisors, Transportation and Material Moving Workers	^	75.0%	AA/TRADE	$16.41	$28.47	$41.50
Baggage Porters, Bellhops, and Concierges	^	84.6%	HS/GED	$7.41	$12.03	$19.98
Transportation Attendants	^	93.1%	HS/GED	$7.32	$8.71	$12.37
Dispatchers	^	90.9%	HS/GED	$10.15	$16.70	$28.59
Shipping, Receiving, and Traffic Clerks	v	100.0%	HS/GED	$8.29	$13.57	$22.37

SOURCE **Occupational ranking** from US Bureau of the Census, American Community Survey, Public Use Microdata Sample, 2005–06
Educational requirements and wage data from O*NET Online (http://online.onetcenter.org/)
Occupational outlooks and replacement jobs from the Bureau of Labor Statistics, Occupation Employment Survey, 2006.

* Indicates the level of education attained by most individuals in this occupation in New York City.
Some employers may require less or more years of education.

HS/GED = high school diploma or GED usually required.
AA/TRADE = 2-year college degree or postsecondary vocational or trade school usually required.
BA = 4-year college degree usually required.
na = Hourly wage is not available for this occupation.

E. Workforce demographics

Table 5.6 shows the characteristics of the support activities workforce according to estimates derived from the 2000 Census and the 2005 and 2006 American Community Surveys. In 2000, 70 percent of subsector employees were New York City residents, and that share increased to over 80 percent in 2006.

Males predominated in the workforce in 2000, holding four out of five jobs that year. That percentage has decreased somewhat to 69 percent in 2006. The subsector's workforce is fairly racially/ethnically diverse with a strong and growing representation among Black employees, but decreasing numbers of Hispanic workers. Notably, Asian employees are better represented in this subsector than in air, truck, or transit and ground passenger transportation. Contrary to the trend in the other transportation subsectors examined in this report, a sizable share of the workforce in this subsector was between the ages of 18 and 34 and that percentage increased somewhat in 2006. The size of the 55 and over age group has decreased during the same time period from 14 to eight percent.

In 2000, about 57 percent of New York City's transportation support workforce had either dropped out of high school or completed a high school diploma or GED. The percentage of high school graduates or GED recipients increased substantially between

TABLE 5.6 Demographic Characteristics of the New York City Support Activities for Transportation Workforce, 2000 and 2005/06

PERCENT OF NEW YORK CITY SUPPORT ACTIVITIES FOR TRANSPORTATION EMPLOYEES WHO ARE	2000	2005/06
New York City residents*	70.0%	81.1%
Male	79.7%	68.7%
White	23.7%	28.7%
Black	32.5%	38.7%
Hispanic	26.6%	17.7%
Asian	11.9%	13.8%
Age 18–34	38.3%	41.9%
35–44	28.3%	26.7%
44–54	19.8%	23.7%
Age 55+	13.5%	7.7%
Less than high school or GED	25.1%	15.5%
High school diploma or GED	31.6%	46.1%
Some college	32.1%	23.3%

SOURCE U.S. 2000 Decennial Census and 2005 and 2006 American Community Surveys public use microdata (PUMS) files.

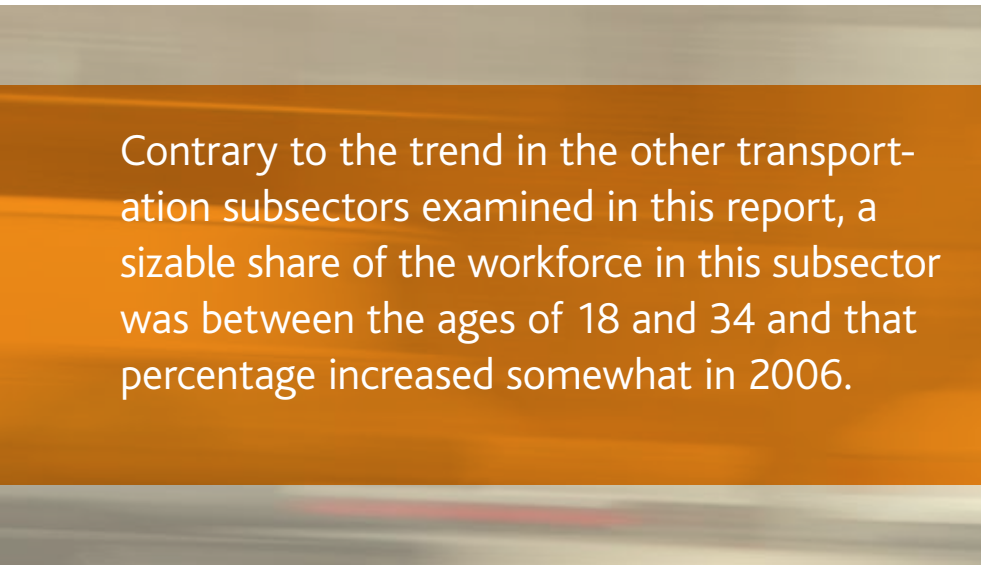
*The remaining percentages that appear in this table are of people who both live *and* work in New York City.

2000 and 2006 from 32 percent to 46 percent, and the percentage of employees without a diploma or GED decreased from 25 to 16 percent.

F. Observations and workforce implications

OBSERVATIONS

- Support activities for transportation is made up of distinct industry groups that provide services for air, marine, trucking, and ground transportation respectively. Firms in this subsector include airport operations, air traffic control, aircraft repair and maintenance, car and truck transportation, carpools, vanpools, freight forwarding and customs agents.



- Support activities are dependent on primary transportation carriers and, therefore, are subject to many of the same economic influences as they are. The short-term business and employment prospects in this subsector can be expected to follow those of the subsectors they serve.
- Diversification and co-location of services appear to be important trends in the subsector. Trucking firms that operate near air cargo facilities and distribution centers are beginning to move into other areas such as logistics and packaging. NYMTC is exploring the establishment of "freight villages" that would directly link carriers with one another and with their support services in a single location.
- A majority of both establishments and jobs in the support activities subsector are located around the airports in Queens. Additional jobs are in midtown and downtown Manhattan, Staten Island near Howland Hook, Hunts Point, South Brooklyn, and throughout northern Queens and Brooklyn.

- Average salary in the subsector is about $50,000 per year. Salaries are lower at the core of establishment operations, near the airports and marine terminals.
- There are several occupations in support activities that require no postsecondary education and pay well beyond the minimum wage.
- Young people — workers ages 18 to 34 — constitute more than 40 percent of the transportation support workforce: a trend that is somewhat contrary to the other transportation subsectors.

WORKFORCE IMPLICATIONS

- The most efficient geographic searches for account executives in this subsector are near New York City's distribution and cargo hubs: in and near the airports in Queens, South Brooklyn, Howland Hook in Staten Island, and Hunts Point in the Bronx. Additionally, comparatively well-paying clerical jobs may be available in Manhattan corporate offices in this subsector.
- Aside from direct business relationships, the public workforce system could benefit by communicating with the major labor unions in the subsector that could provide insight into job opportunities for adults and entry opportunities for youth.
- Career advancement in the support activities subsector relies on experience and the acquisition of skills that are in demand. The experts we interviewed for this study agreed that computer skills are critical to advancement in any transportation sector. Workforce professionals should seek qualified community college and training programs to prepare entry-level and incumbent workers with skills in scheduling, modeling, and geographic positioning systems to organize and keep track of a huge volume of shipments.

Endnotes

1 In this report, we focus mainly on the industries supporting the air, truck, and transit and ground passenger subsectors.

2 The data in this map includes private sector employment only. The New York State Department of Labor (NYSDOL) suppresses employee and wage data for any ZIP Code that includes fewer than three establishments or contains a single unit that accounts for 80 percent or more of the industry's employment. This map omits any establishment in the five boroughs that reported ZIP Code outside of New York City to the NYSDOL. In 2006, there were 59 of these firms (out of > 1,100) in this NAICS code with 545 employees (out of almost 17,000) and annual average wages of $45,000.

3 Occupational projections from the Bureau of Labor Statistics Occupation Employment Survey Program is presented here because they are recognized as the state of the art in labor market information. Some of the limitations of these projections are reviewed in **Section 1** under **Methods**. We recommend that readers weigh these data against other data presented in this report to develop the most accurate outlook for the various occupations in the transportation sector.

6 Occupations and Occupational Trends

In this section, we provide a closer review of several occupations in the transportation sector to facilitate career counseling by improving workforce professionals' level of understanding of the required skills, education, and experience in the sector. Working with New York City Department of Small Business Services, the NYCLMIS identified the top occupations across the selected transportation subsectors according to the *absolute number* of jobs they represent, their *growth potential* as gauged by recent gains, the average wages they command, and the educational requirements for holding these positions.

This section of the report is presented in three parts. The first part contains the results of an analysis of Census data that provides information about the:

- size of the workforce
- age, gender, race/ethnicity, educational attainment, and
- average salaries earned by workers in the top occupations.

The second part includes a set of detailed occupational profiles and a set of summary charts that can be used to compare — at a glance — the characteristics of the selected occupations. The third and final part of this section includes three tables that summarize useful information contained in the profiles for service providers and jobseekers about the top 10 occupations.

A. Workforce characteristics

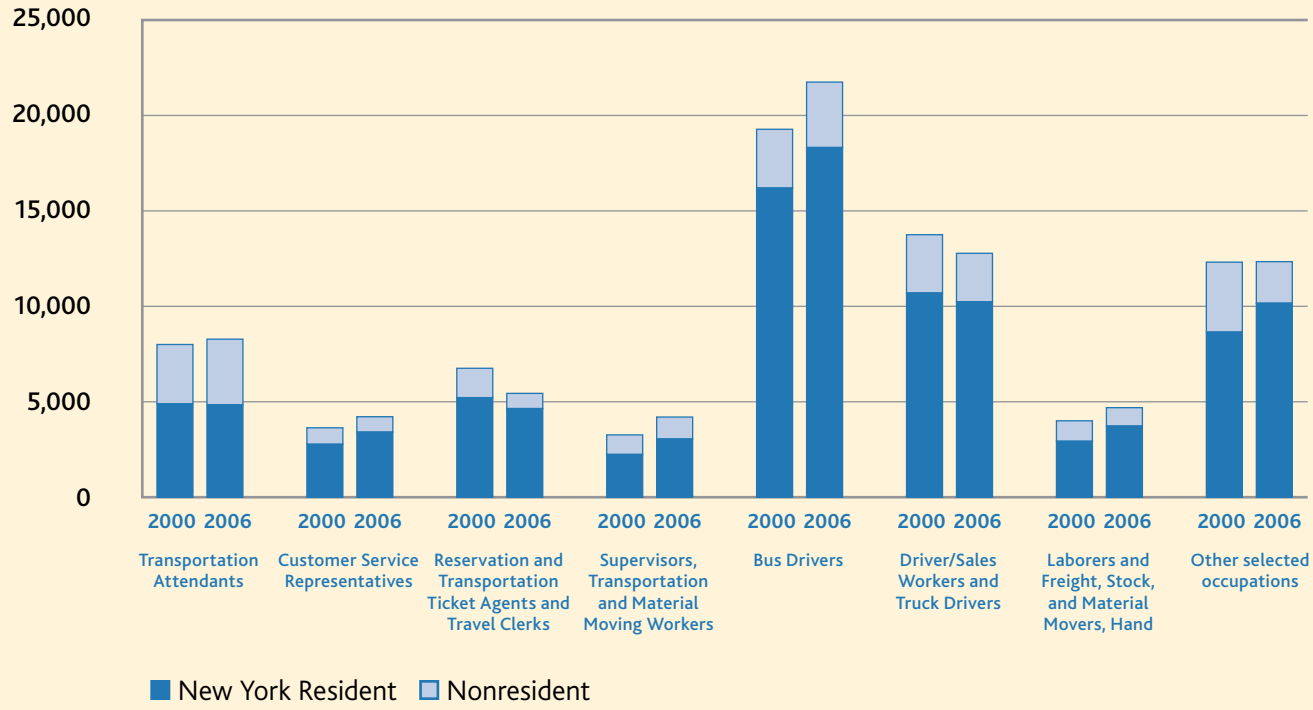
Figure 6a shows the estimated number of workers in each occupation and the distribution of New York City residents across the top 10 occupations (bus mechanics, cargo and freight agents, dispatchers and supervisors are aggregated in "Other Occupations" because the Census sample size was insufficient to include each separately).

National data suggest that more people work as bus drivers than any other occupation in the transportation sector.[1] In New York City, indeed, the largest proportion work as bus drivers followed by truck drivers and transportation attendants. The number of persons employed as reservation and ticket agents and truck drivers has decreased somewhat from 2000 to 2006. Numbers in all other occupations held steady or increased. A majority of individuals employed in the top transportation occupations are New York City residents and the share of New Yorkers has remained

Top Occupations in the Transportation Sector

Bus drivers
Bus and truck mechanics
Cargo/freight agents
Customer service representatives
Dispatchers
Light truck drivers/sales drivers
Laborers/material movers
Supervisors of laborers
Reservation and ticket agents
Transportation attendants

FIGURE 6a Workers Employed in Top Transportation Occupations by Place of Residence, 2000 and 2006



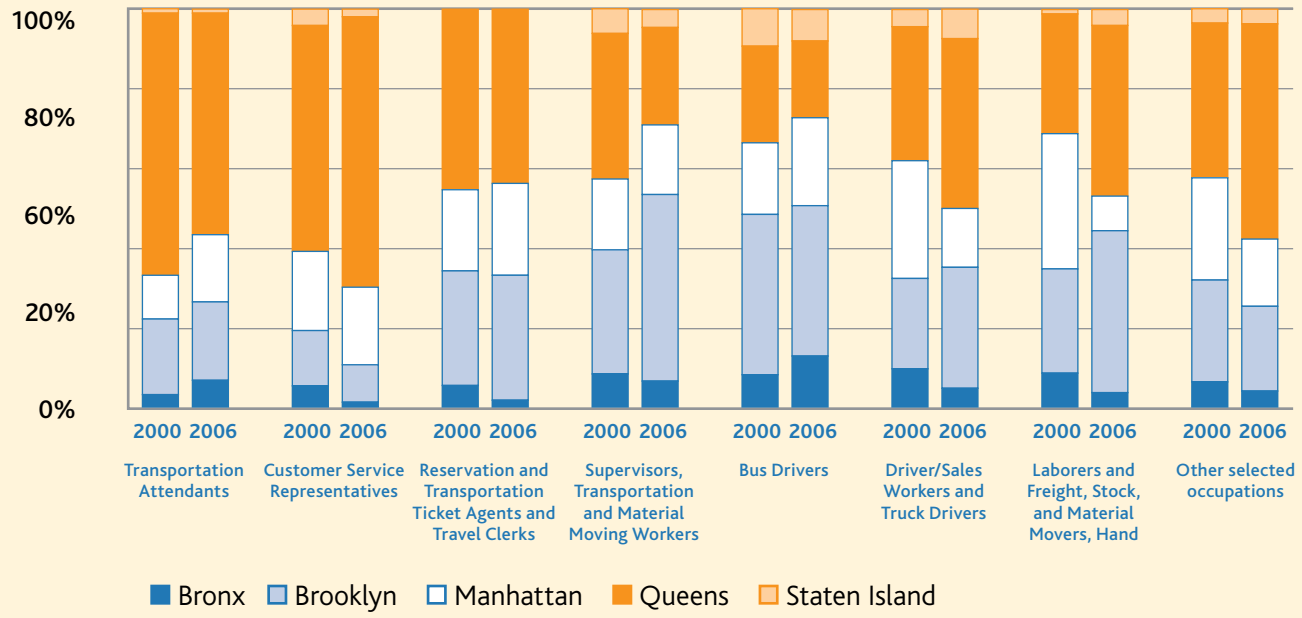
SOURCE U.S. Bureau of the Census: 2000 Decennial Census and 2005 and 2006 American Community Survey Public Use Microdata Files (*weighted sample of individuals whose place of work is New York City*).

the same or increased from 2000 to 2006 in all of the top occupations shown except for a slight decrease among transportation attendants (from 62% to 59%).

Figure 6b shows the share of New Yorkers employed in each of the top occupations by borough. Not surprisingly, a large percentage was employed in either Queens or Brooklyn. The share of those employed in Queens is related to whether an occupation is within the aviation subsector, which is heavily concentrated in that borough. For example, in 2006, 56 percent of the transportation attendants worked in Queens and another 20 percent in Brooklyn, whereas only 19 percent of the bus drivers worked in Queens. In all occupations except customer services representatives, the share of workers in Brooklyn grew between 2000 and 2006.

Males predominate in all of the top transportation occupations in New York City, with the exception of transportation attendants and customer service representatives (Figure 6c). The share of males in each occupation has remained steady or increased between 2000 and 2006, except among bus drivers and "other occupations."

FIGURE 6b Borough of Employment in Top Transportation Occupations, 2000 and 2006

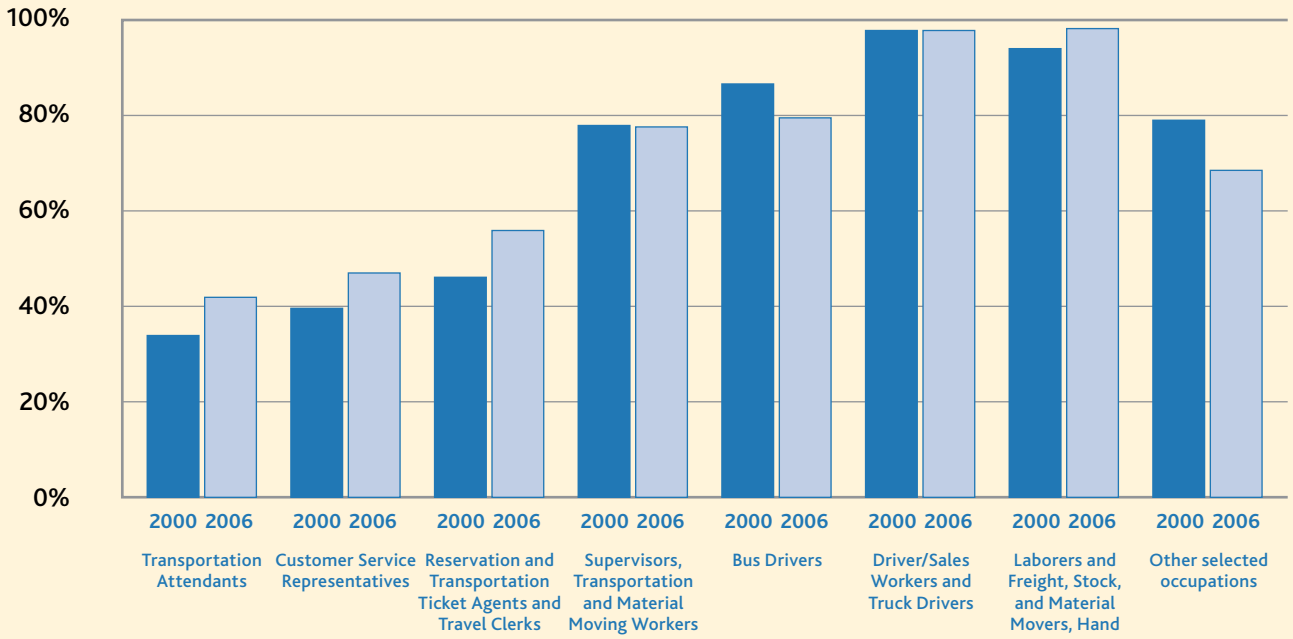


SOURCE U.S. Bureau of the Census: 2000 Decennial Census and 2005 and 2006 American Community Survey Public Use Microdata Files (*weighted sample of individuals whose place of work and place of residence is New York City*).

With respect to race and ethnicity, New York City's transportation workforce in these occupations is fairly diverse as shown in Figure 6d. The share of white employees increased among customer service representatives, supervisors, truck drivers, and laborers. A larger share of bus drivers are Black when compared to the other occupations (47% in 2006). Although the absolute number of reservation and ticket agents increased between 2000 and 2006 (Figure 6a), the share who are Hispanic grew from 26 percent to 34 percent during the same time period (Figure 6d).

National data also suggest that the transportation sector is undergoing an aging out process, as its workforce nears retirement and the sector faces shortages of younger replacement workers[3] (Figure 6e). The New York City picture reflects this national trend with fewer people between the ages of 18 and 34 in all occupations except among laborers and material movers. At the same time, the percentage of the workforce in the 55 and over age bracket has increased somewhat from 9 to 12 percent.

FIGURE 6c Percent Male among New Yorkers in Top Transportation Occupations, 2000 and 2006

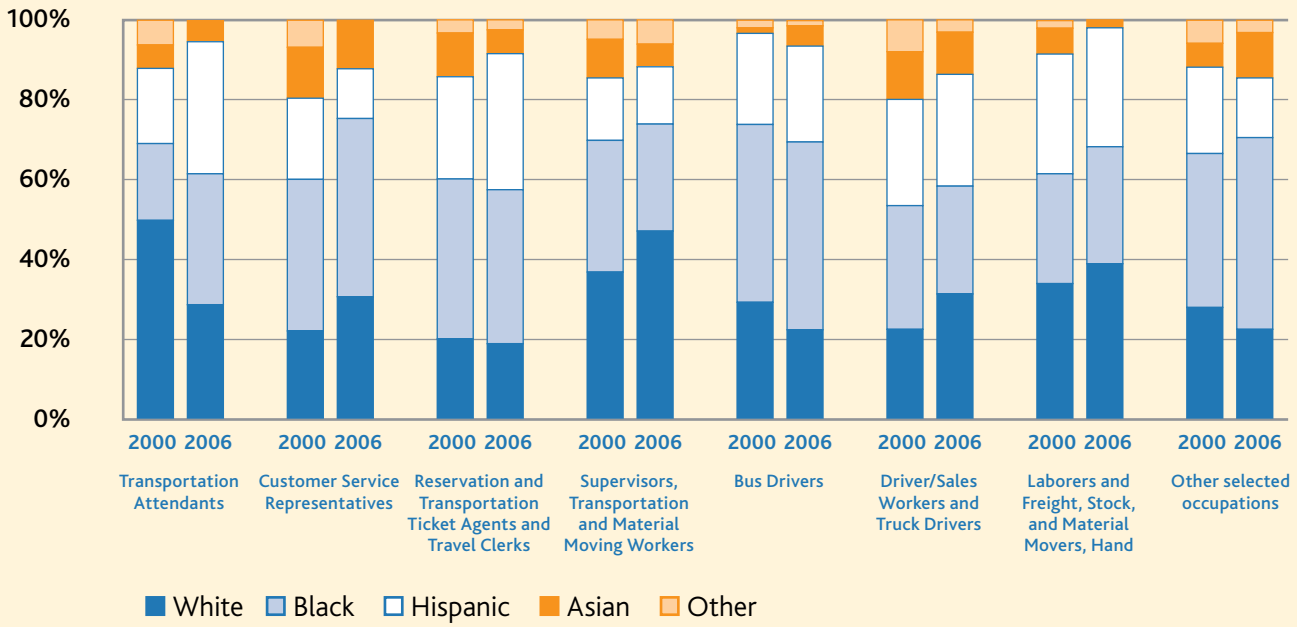


SOURCE U.S. Bureau of the Census: 2000 Decennial Census and 2005 and 2006 American Community Survey Public Use Microdata Files (*weighted sample of individuals whose place of work is New York City*).

The transportation sector is known for the variety of entry level work available to people who have not gone beyond a high school diploma or GED in their educational careers. The data partially support this assumption. A large majority of bus drivers, truck drivers, and laborers and material movers have not attended college (those percentages have not changed markedly between 2000 and 2006). However, half or more transportation attendants, customer service representatives, reservation agents, and supervisors of materials movers have attended college. A notable trend shown in Figure 6f is the declining percentage of the workforce that has not earned a high school diploma or GED.

Finally, we look at the average annual salary of full time workers from New York City who work in the top transportation occupations (Figure 6g). By a wide margin, supervisors earn the most at just over $55,000 per year on average. Given the somewhat higher educational attainment of the transportation attendant and customer service workforce (Figure 6f), persons working in these occupations earn comparatively little (for example, customer service repre-

FIGURE 6d Race/Ethnicity of New Yorkers Employed in Top Transportation Occupations, 2000 and 2006

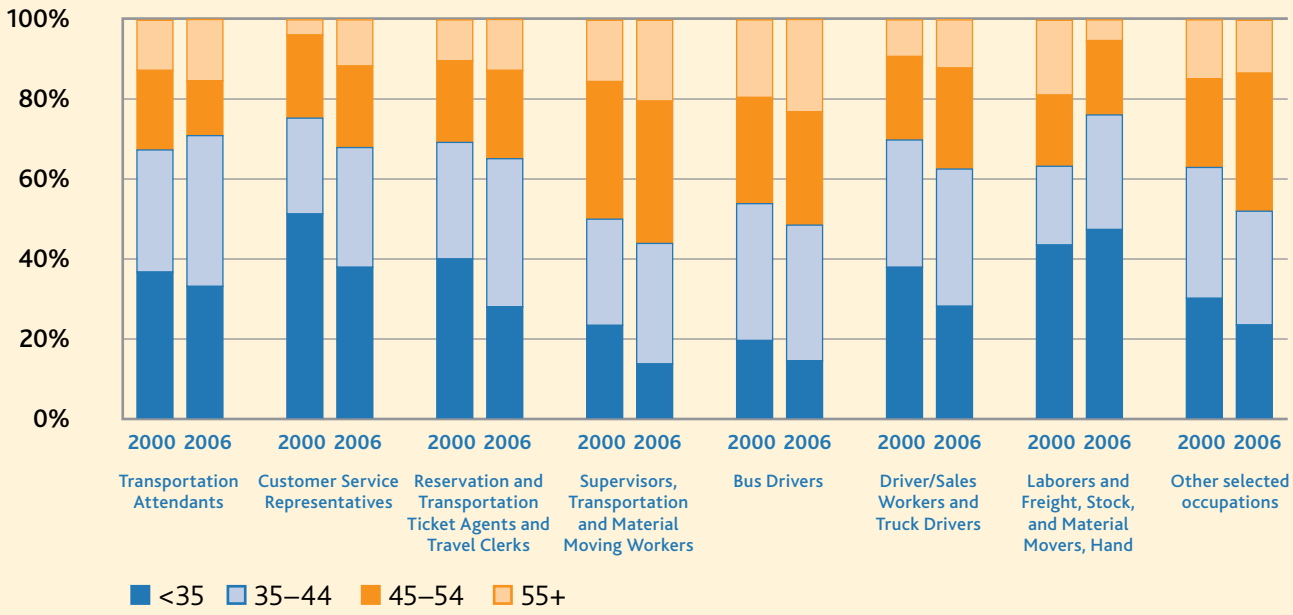


SOURCE U.S. Bureau of the Census: 2000 Decennial Census and 2005 and 2006 American Community Survey Public Use Microdata Files (*weighted sample of individuals whose place of work is New York City*).

sentatives earned about $27,000 per year in 2006). Across the board, salaries in the top occupations appear to be holding steady or declining. For example, bus drivers earned about $45,000 per year in 2000 and about $40,000 per year in 2006.

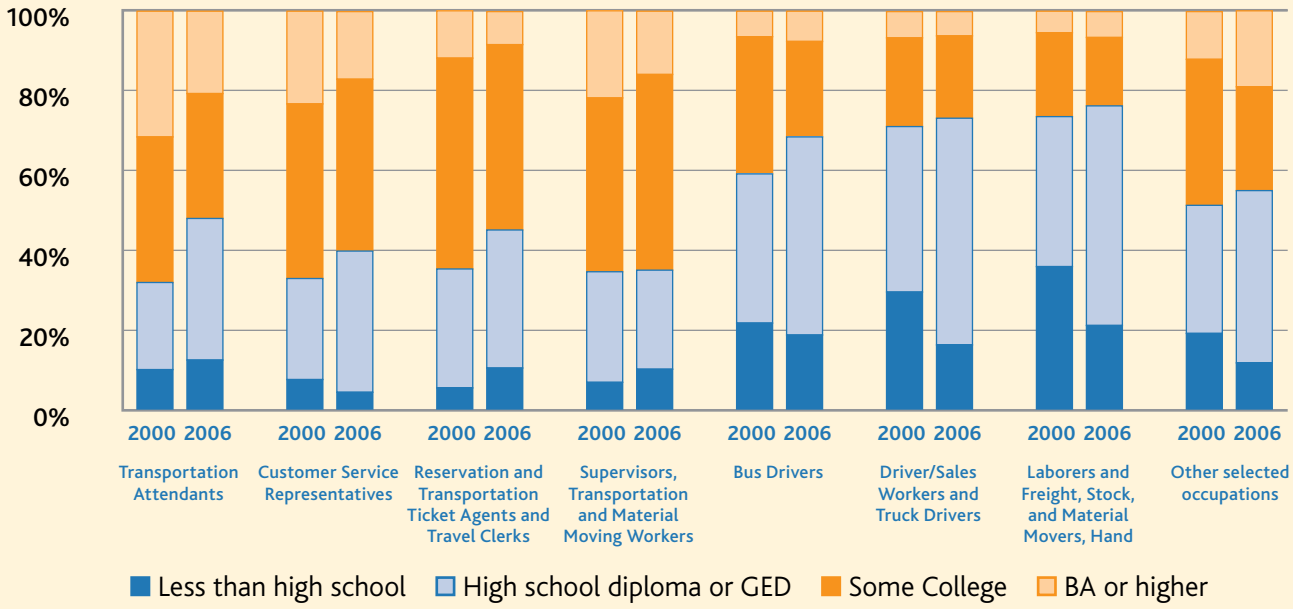
Transportation employers emphasize the need for work readiness, communication and technological skills in their workforce.

FIGURE 6e Age of New Yorkers Employed in Top Transportation Occupations, 2000 and 2006



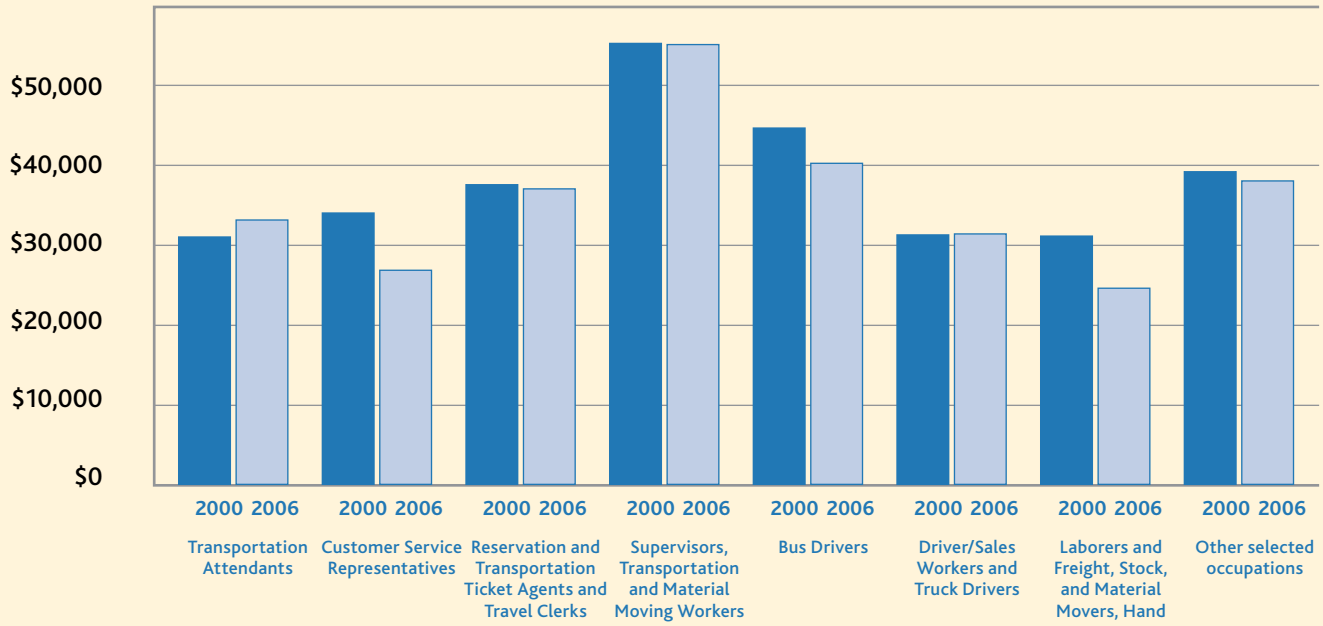
SOURCE U.S. Bureau of the Census: 2000 Decennial Census and 2005 and 2006 American Community Survey Public Use Microdata Files (*weighted sample of individuals whose place of work is New York City*).

FIGURE 6f Educational Attainment of New Yorkers Employed in Top Transportation Occupations, 2000 and 2006



SOURCE U.S. Bureau of the Census: 2000 Decennial Census and 2005 and 2006 American Community Survey Public Use Microdata Files (*weighted sample of individuals whose place of work is New York City*).

FIGURE 6g Average Salary of New Yorkers Employed in Top Transportation Occupations, 2000 and 2006



SOURCE U.S. Bureau of the Census: 2000 Decennial Census and 2005 and 2006 American Community Survey Public Use Microdata Files (*weighted sample of individuals whose place of work is New York City*).

B. Detailed Occupational Profiles

Considering a number of criteria including number of jobs, high rate of growth, comparatively low educational requirements, and good wage levels, the top occupations in the selected transportation subsectors are:

- Bus drivers
- Bus and truck mechanics
- Cargo and freight agents
- Customer service representatives
- Dispatchers
- Light truck drivers/sales drivers
- Laborers/material movers
- Supervisors of laborers
- Reservation and ticket agents
- Transportation attendants

This section of the report includes a detailed occupational profile for each of these top 10 occupations.

The occupational profiles can be used by workforce professionals to inform and refine their career advising and job-matching activities. In addition, jobseekers themselves can use these profiles to better understand the nature of the occupations in the transportation sector and determine their own interest and compatibility.

Each profile includes information about:

- Wages and Employment Trends
- Job Characteristics
- Employee Characteristics and Qualifications — including required education, training and/or licensing, as well as the abilities (mental and physical) and skills (traits that can be learned) necessary to be successful in the occupation
- Related Occupations

KEY FACTS ABOUT OCCUPATIONS IN THE SECTOR

- Entry-level educational and experience requirements for these jobs generally do not exceed high school or GED level attainment and one or two years of work experience. Some employers may be open to hiring jobseekers without a high school diploma or GED, depending on the applicants' skills and experience.
- Employers typically promote workers into supervisory positions after they have several years of experience and most often a two-year college degree. Specialized training programs — such as computer skills training and advanced training in the skilled trades — are also promising avenues for career advancement within the respective subsectors.
- For the most part, the transportation workforce is racially and ethnically diverse. Gender diversity represents a continuing challenge with men being typically predominant.
- Increasing licensing and security regulations represent potential barriers to entry for jobseekers in the transportation subsectors with criminal backgrounds or imperfect driving records. For example, background checks are likely for jobseekers interested in occupations in the Air Transportation subsector.
- Transportation employers report difficulties recruiting a skilled workforce because of negative perceptions of the sector among jobseekers. The negative perceptions — some of which accurately reflect real conditions — include relatively high skill demands for entry-level work, comparatively low wages, the physical nature of the work activities, and stress associated with public interaction.

- In the private sector, career advancement opportunities are more likely to arise for workers in larger firms, diversifying firms, and firms that interact with a variety of other firms in related areas of business, such as logistics, scheduling, packaging, and airport operations.
- Larger companies are more likely to invest in training and professional development for their employees, and are more likely to provide their staff with access to advanced communications and computer technologies.
- Transportation employers emphasize the need for work readiness, communication and technological skills in their workforce.

Bus Driver

WAGES AND EMPLOYMENT TRENDS

New York City

2006 Entry-level hourly wage	$12.82
2006 Median hourly wage	$21.18

New York State

Job growth outlook 2004–2014 (from 25,590 in 2004)	+8%

JOB CHARACTERISTICS

What do bus drivers *do*?

- Inspect vehicles, and check gas, oil, and water levels prior to departure.
- Drive vehicles over specified routes or to specified destinations according to time schedules in order to transport passengers, complying with traffic regulations.
- Park vehicles at loading areas so that passengers can board.
- Assist passengers with baggage and collect tickets or cash fares.
- Report delays or accidents.
- Advise passengers to be seated and orderly while in vehicles.
- Regulate heating, lighting, and ventilating systems for passenger comfort.
- Load and unload baggage in baggage compartments.
- Record cash receipts and ticket fares.
- Make minor repairs to vehicle and change tires.

In what type of *conditions* do bus drivers work?

- **Contact with others.** Requires contact with others (face-to-face, by telephone, or otherwise).
- **Work in enclosed vehicles.** The job requires working in a closed vehicle or equipment.
- **Decision-making.** Must frequently make decisions that affect other people, the financial resources, and/or the image and reputation of the organization.
- **Impact of decisions.** Decisions made have an impact on co-workers, clients, or the company.
- **Deal with external customers.** Must work with external customers or the public.
- **Distracting or uncomfortable sounds or noise levels.** Requires exposure to sounds and noise levels that may be distracting or uncomfortable.

EMPLOYEE CHARACTERISTICS AND QUALIFICATIONS

How much *education* must a bus driver have?

Usually requires a high school diploma or GED and may requires some vocational training or job-related course work. Optional bus driver training is also available from professional driving schools.

What kind of *licensing* must a bus driver have?

Must have a valid New York State commercial driver's license with a passenger endorsement (CDL-P).

How much *work experience* should a bus driver have?

Some previous work-related skill, knowledge, or experience may be helpful in these occupations, but usually is not needed.

What type of *job training* does a bus driver need?

Employees in these occupations need anywhere from a few months to one year of working with experienced employees.

What are the most important *abilities* a bus driver should have?

- **Near vision.** The ability to see details at close range (within a few feet of the observer).
- **Depth perception.** The ability to judge which of several objects is closer or farther away from you, or to judge the distance between you and an object.
- **Far vision.** The ability to see details at a distance.
- **Reaction time.** The ability to quickly respond (with the hand, finger, or foot) to a signal (sound, light, picture) when it appears.
- **Control precision.** The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.

What are the most important *skills* for a bus driver to have?

- **Active listening.** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Operation monitoring.** Watching gauges, dials, or other indicators to make sure a machine is working properly.
- **Social perceptiveness.** Being aware of others' reactions and understanding why they react as they do.
- **Equipment maintenance.** Performing routine maintenance on equipment and determining type and timing of needed maintenance.
- **Operation and Control.** Controlling operations of equipment or systems.

RELATED OCCUPATIONS

- Cargo and Freight Agents
- Couriers and Messengers
- Truck Drivers, Light or Delivery Services
- Taxi Drivers and Chauffeurs
- Rail Yard Engineers, Dinkey Operators, and Hostlers
- Subway and Streetcar Operators
- Transportation Vehicle, Equipment/ Systems Inspectors, Except Aviation
- Industrial Truck and Tractor Operators

SOURCE O*NET Summary reports and occupational databases. Retrieved May 2008, from http://online.onetcenter.org/.

Bus and Truck Mechanics and Diesel Engine Specialist

WAGES AND EMPLOYMENT TRENDS

New York City

2006 Entry-level hourly wage	$15.65
2006 Median hourly wage	$23.93

New York State

Job growth outlook 2004–2014 (from 15,390 in 2004)	+7%

JOB CHARACTERISTICS

What do bus and truck mechanics and diesel engine specialists *do*?

- Use hand tools such as screwdrivers, pliers, wrenches, pressure gauges, and precision instruments, as well as power tools such as pneumatic wrenches, lathes, welding equipment, and jacks and hoists.
- Inspect brake systems, steering mechanisms, wheel bearings, and other important parts to ensure that they are in proper operating condition.
- Perform routine maintenance such as changing oil, checking batteries, and lubricating equipment and machinery.
- Adjust and reline brakes, align wheels, tighten bolts and screws, and reassemble equipment.
- Raise trucks, buses, and heavy parts or equipment using hydraulic jacks or hoists.
- Test drive trucks and buses to diagnose malfunctions or to ensure that they are working properly.
- Inspect, test, and listen to defective equipment to diagnose malfunctions, using test instruments such as handheld computers, motor analyzers, chassis charts, and pressure gauges.
- Examine and adjust protective guards, loose bolts, and specified safety devices.
- Inspect and verify dimensions and clearances of parts to ensure conformance to factory specifications.
- Specialize in repairing and maintaining parts of the engine, such as fuel injection systems.

In what type of *conditions* do bus and truck mechanics and diesel engine specialists work?

- **Exposed to contaminants.** Requires exposure to contaminants (such as pollutants, gases, dust or odors).
- **Distracting or uncomfortable sounds or noise levels.** Requires exposure to sounds and noise levels that may be distracting or uncomfortable.
- **Using hands to control or feel objects, tools, or controls.** Frequent use of hands to handle or control objects tools or controls.
- **Wear protective or safety equipment.** Requires wearing protective or safety equipment such as safety shoes, glasses, gloves, hard hats or life jackets.
- **Exposed to hazardous equipment.** Requires exposure to hazardous equipment.

EMPLOYEE CHARACTERISTICS AND QUALIFICATIONS

How much *education* must a bus and truck mechanic or diesel engine specialist have?

Usually requires training in vocational schools, related on-the-job experience, or

an associate's degree. May require a bachelor's degree.

What kind of *licensing* must a bus and truck mechanic or diesel engine specialist have?

Commercial driver's license is often required. Certification from National Institute for Automotive Service Excellence (ASE) in one of several areas of truck repair is optional.

How much *work experience* should a bus and truck mechanic or diesel engine specialist have?

Some work-related skill, knowledge, or experience is required for these occupations. Trade school certification is sometimes preferred.

What type of *job training* does a bus and truck mechanic or diesel engine specialist need?

One or two years of a combination of on-the-job and informal training with experienced workers.

What are the most important *abilities* a bus and truck mechanic or diesel engine specialist should have?

- **Problem sensitivity.** The ability to tell when something is wrong or is likely to go wrong.
- **Manual dexterity.** The ability to quickly move your hand or hands to grasp, manipulate, or assemble objects.
- **Multi-limb coordination.** The ability to coordinate limbs while sitting, standing, or lying down.
- **Near vision.** The ability to see details at close range (within a few feet of the observer).
- **Arm-hand steadiness.** The ability to keep your hand and arm steady.

What are the most important skills for a bus and truck mechanic or diesel engine specialist to have?

- **Equipment maintenance.** Performing routine maintenance on equipment and determining type and timing of maintenance needed.
- **Troubleshooting.** Determining causes of operating errors and deciding what to do about it.
- **Repairing.** Repairing machines or systems using the needed tools.
- **Reading comprehension.** Understanding written sentences and paragraphs in work related documents.
- **Installation.** Installing equipment, machines, wiring, or programs to meet specifications.

RELATED OCCUPATIONS

- Electric Motor, Power Tool, and Related Repairers
- Mobile Heavy Equipment Mechanics
- Motorcycle Mechanics
- Outdoor Power Equipment and Other Small Engine Mechanics
- Refrigeration Mechanics and Installers
- Stationary Engineers and Boiler Operators

SOURCE O*NET Summary reports and occupational databases. Retrieved May 2008, from http://online.onetcenter.org/.

Cargo and Freight Agent

WAGES AND EMPLOYMENT TRENDS

New York City

2006 Entry-level hourly wage	$10.82
2006 Median hourly wage	$18.13

New York State

Job growth outlook 2004–2014 (from 7,190 in 2004)	-13%

JOB CHARACTERISTICS

What do cargo and freight agents do?

- Negotiate and arrange transport of goods with shipping or freight companies.
- Notify consignees, passengers, or customers of the arrival of freight or baggage, and arrange for delivery.
- Advise clients on transportation and payment methods.
- Prepare manifests showing baggage, mail, and freight weights, and number of passengers on airplanes, and transmit data to destinations.
- Determine method of shipment and invoices, and other shipping documents.
- Check import/export documentation to determine cargo contents, and classify goods into different fee or tariff groups, using a tariff coding system.
- Estimate freight or postal rates, and record shipment costs and weights.
- Enter shipping information into a computer by hand or by using a hand-held scanner that reads bar codes on goods.
- Retrieve stored items and trace lost shipments as necessary.
- Pack goods for shipping, using tools such as staplers, strapping machines, and hammers.

In what type of *conditions* do cargo and freight agents work?

- **Telephone.** Frequent telephone conversations.
- **Contact with others.** Requires contact with others (face-to-face, by telephone, or otherwise).
- **Sitting.** Requires time sitting.
- **Time pressure.** Requires meeting strict deadlines and remaining on schedule.
- **Duration of typical work week.** May require long hours/work weeks.

EMPLOYEE CHARACTERISTICS AND QUALIFICATIONS

How much *education* must a cargo and freight agent have?

A high school diploma or GED is usually required; some employers may require vocational training or job-related course work too.

What kind of *licensing* must a cargo and freight agent have?

Cargo and freight agents do not require licensing.

How much *work experience* should a cargo and freight agent have?

Some work-related skill, knowledge, or experience is helpful but is usually not required.

What type of *job training* does a cargo and freight agent need?

Anywhere from a few months to one year of working with experienced employees.

What are the most important *abilities* a cargo and freight agent should have?

- **Oral comprehension.** The ability to listen to and understand information and ideas presented through spoken words.
- **Oral expression.** The ability to verbally communicate information and ideas so others will understand.
- **Written comprehension.** The ability to read and understand information and ideas presented in writing.
- **Speech clarity.** The ability to speak clearly so others will understand.
- **Near vision.** The ability to see details at close range (within a few feet of the observer).

What are the most important *skills* for a cargo and freight agent to have?

- **Reading comprehension.** Understanding written sentences and paragraphs in work related documents.
- **Active listening.** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Critical thinking.** Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
- **Speaking.** Talking to others to convey information effectively.
- **Negotiation.** Bringing others together and trying to reconcile differences.

RELATED OCCUPATIONS

- Counter Attendants, Cafeteria, Food Concession, and Coffee Shop
- Food Servers, Nonrestaurant
- Meter Readers, Utilities
- Postal Service Mail Carriers
- Weighers, Measurers, Checkers, and Samplers, Recordkeeping
- Parking Lot Attendants

SOURCE O*NET Summary reports and occupational databases. Retrieved May 2008, from http://online.onetcenter.org/.

Customer Service Representative

WAGES AND EMPLOYMENT TRENDS

New York City

2006 Entry-level hourly wage	$9.96
2006 Median hourly wage	$15.96

New York State

Job growth outlook 2004–2014 (from 124,080 in 2004)	+13%

JOB CHARACTERISTICS

What do customer service representatives do?

- Confer with customers by telephone or in person in order to provide information about products and services, to take orders or cancel accounts, or to obtain details of complaints.
- Keep records of customer interactions and transactions, recording details of inquiries, complaints, and comments, as well as actions taken.
- Resolve customers' service or billing complaints by performing activities such as exchanging merchandise, refunding money, and adjusting bills.
- Check to ensure that appropriate changes were made to resolve customers' problems.
- Contact customers to respond to inquiries or to notify them of claim investigation results and any planned adjustments.
- Refer unresolved customer grievances to designated departments for further investigation.
- Determine charges for services requested, collect deposits or payments, or arrange for billing.
- Complete contract forms, prepare change of address records, and issue service discontinuance orders, using computers.
- Obtain and examine all relevant information to assess validity of complaints and to determine possible causes.
- Solicit sale of new or additional services or products.

In what type of *conditions* do customer service representatives work?

- **Contact with others.** Requires contact with others (face-to-face, by telephone, or otherwise).
- **Telephone.** Frequent telephone conversations.
- **Face-to-face discussions.** Frequent face-to-face discussions with individuals or teams.
- **Indoors, Environmentally Controlled.** Requires working indoors in environmentally controlled conditions.
- **Sitting.** Requires time sitting.

EMPLOYEE CHARACTERISTICS AND QUALIFICATIONS

How much *education* must a customer service representative have?

A high school diploma or GED is usually required; some employers may require vocational training or job-related course work too.

What kind of *licensing* must a customer service representative have?

Customer service representatives do not require licensing.

How much *work experience* should a customer service representative have?

Some work-related skill, knowledge, or experience is helpful but is usually not required.

What type of *job training* does a customer service representative need?

Anywhere from a few months to one year of working with experienced employees.

What are the most important *abilities* a customer service representative should have?

- **Oral comprehension.** The ability to listen to and understand information and ideas presented through spoken words.
- **Oral expression.** The ability to verbally communicate information and ideas so others will understand.
- **Deductive reasoning.** The ability to apply general rules to specific problems to produce answers that make sense.
- **Problem sensitivity.** The ability to tell when something is wrong or is likely to go wrong.
- **Speech clarity.** The ability to speak clearly so others will understand.

What are the most important skills for a customer service representative to have?

- **Active listening.** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Reading comprehension.** Understanding written sentences and paragraphs in work related documents.
- **Monitoring.** Monitoring/assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.
- **Speaking.** Talking to others to convey information effectively.
- **Time management.** Managing one's own time and the time of others.

RELATED OCCUPATIONS

- Counter and Rental Clerks
- Retail Salespersons
- Telephone Operators
- Bill and Account Collectors
- License Clerks
- Eligibility Interviewers, Government Programs
- Interviewers, Except Eligibility and Loan
- Reservation and Transportation Ticket Agents and Travel Clerks
- Insurance Policy Processing Clerks

SOURCE O*NET Summary reports and occupational databases. Retrieved May 2008, from http://online.onetcenter.org/.

Dispatcher, Except Police, Fire, and Ambulance

WAGES AND EMPLOYMENT TRENDS

New York City

2006 Entry-level hourly wage	$10.15
2006 Median hourly wage	$16.70

New York State

Job growth outlook 2004–2014 (from 11,430 in 2004)	+3%

JOB CHARACTERISTICS

What do dispatchers do?

- Schedule and dispatch workers, work crews, equipment, or service vehicles to appropriate locations according to customer requests, specifications, or needs, using radios or telephones.
- Arrange for necessary repairs to restore service and schedules.
- Relay work orders, messages, and information to or from work crews, supervisors, and field inspectors using telephones or two-way radios.
- Confer with customers or supervising personnel to address questions, problems, and requests for service or equipment.
- Prepare daily work and run schedules.
- Receive or prepare work orders.
- Oversee all communications within specifically assigned territories.
- Monitor personnel or equipment locations and utilization to coordinate service and schedules.
- Record and maintain files and records of customer requests, work or services performed, charges, expenses, inventory, and other dispatch information.
- Determine types or amounts of equipment, vehicles, materials, or personnel required according to work orders or specifications.

In what type of *conditions* do dispatchers work?

- **Telephone.** Frequent telephone conversations.
- **Contact with others.** Frequent contact with others (face-to-face, by telephone, or otherwise).
- **Freedom to make decisions.** Offers freedom to make decisions without supervision
- **Importance of repeating same tasks.** Requires repeating the same physical activities (e.g., key entry) or mental activities (e.g., checking entries in a ledger) over and over, without stopping.
- **Structured versus unstructured work.** Highly structured environment.

EMPLOYEE CHARACTERISTICS AND QUALIFICATIONS

How much *education* must a dispatcher have?

A high school diploma or GED is usually required; some employers may require vocational training or job-related course work too.

What kind of *licensing* must a dispatcher have?

- Aircraft dispatchers must pass an FAA knowledge exam, known as the ADX in order to achieve an aircraft dispatcher license (ADL).
- Vehicle dispatchers may be required to hold a valid state driver's license and pass criminal and drug and alcohol background checks.

How much *work experience* should a dispatcher have?

Some work-related skill, knowledge, or experience is helpful but is usually not required.

What type of *job training* does a dispatcher need?

Anywhere from a few months to one year of working with experienced employees.

What are the most important *abilities* a dispatcher should have?

- **Oral expression.** The ability to verbally communicate information and ideas so others will understand.
- **Oral comprehension.** The ability to listen to and understand information and ideas presented through spoken words.
- **Speech clarity.** The ability to speak clearly so others will understand.
- **Information ordering.** The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).
- **Problem sensitivity.** The ability to tell when something is wrong or is likely to go wrong.

What are the most important *skills* for a dispatcher to have?

- **Active listening.** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Judgment and decision-making.** Considering the relative costs and benefits of potential actions to choose the most appropriate one.
- **Reading comprehension.** Understanding written sentences and paragraphs in work related documents.
- **Speaking.** Talking to others to convey information effectively.
- **Time management.** Managing one's own time and the time of others.

RELATED OCCUPATIONS

- Licensing Examiners and Inspectors
- Counter and Rental Clerks
- Procurement Clerks
- Hotel, Motel, and Resort Desk Clerks
- Reservation and Transportation Ticket Agents and Travel Clerks
- Police, Fire, and Ambulance Dispatchers
- Subway and Streetcar Operators

SOURCE O*NET Summary reports and occupational databases. Retrieved May 2008, from http://online.onetcenter.org/.

Driver: Sales Worker and Truck Driver

WAGES AND EMPLOYMENT TRENDS

New York City

2006 Entry-level hourly wage	$7.48
2006 Median hourly wage	$13.45

New York State

Job growth outlook 2004–2014 (from 12,270 in 2004)	+4%

JOB CHARACTERISTICS

What do sales workers and truck drivers do?

- Collect money from customers, make change, and record transactions on customer receipts.
- Listen to and resolve customers' complaints regarding products or services.
- Inform regular customers of new products or services and price changes.
- Write customer orders and sales contracts according to company guidelines.
- Drive trucks in order to deliver such items as food, medical supplies, or newspapers.
- Collect coins from vending machines, refill machines, and remove aged merchandise.
- Call on prospective customers in order to explain company services and to solicit new business.
- Record sales or delivery information on daily sales or delivery record.
- Review lists of dealers, customers, or station drops and load trucks.
- Arrange merchandise and sales promotion displays, or issue sales promotion materials to customers.

In what type of *conditions* do sales workers and truck drivers work?

- **Work in enclosed vehicles.** The job requires working in a closed vehicle or equipment.
- **Telephone.** Frequent telephone conversations.
- **Face-to-face discussions.** Frequent face-to-face discussions.
- **Impact of decisions.** Decisions made have an impact on co-workers, clients, or the company.
- **Deal with external customers.** Must work with external customers or the public.

EMPLOYEE CHARACTERISTICS AND QUALIFICATIONS

How much *education* must a sales worker/truck driver have?

Usually requires a high school diploma or GED.

What kind of *licensing* must a sales worker/truck driver have?

Requires a valid New York State Drivers License with clean record. Depending on the size of the truck driven, sales drivers may need to hold a New York State commercial driver's license (CDL).

How much *work experience* should a sales worker/truck driver have?

No previous work-related skill, knowledge, or experience is needed for these occupations.

What type of *job training* does a sales worker/truck driver need?

From a few days to a few months of on-the-job training usually conducted by a more experienced worker.

What are the most important *abilities* a sales worker/truck should have?

- **Oral comprehension.** The ability to listen to and understand information and ideas presented through spoken words.
- **Near vision.** The ability to see details at close range (within a few feet of the observer).
- **Oral expression.** The ability to verbally communicate information and ideas so others will understand.
- **Speech clarity.** The ability to speak clearly so others can understand you.
- **Number facility.** The ability to add, subtract, multiply, or divide quickly and correctly.

What are the most important skills for a sales worker/truck driver to have?

- **Active listening.** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Speaking.** Talking to others to convey information effectively.
- **Social perceptiveness.** Being aware of others' reactions and understanding why they react as they do.
- **Critical thinking.** Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
- **Coordination.** Adjusting actions in relation to others' actions.
- **Operation monitoring.** Watching gauges, dials, or other indicators to make sure a machine is working properly.
- **Equipment maintenance.** Performing routine maintenance on equipment and determining type and timing of needed maintenance.
- **Operation and Control.** Controlling operations of equipment or systems.

RELATED OCCUPATIONS

- Counter and Rental Clerks
- Retail Salespersons
- Advertising Sales Agents
- Insurance Sales Agents
- Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products
- Real Estate Sales Agents

SOURCE O*NET Summary reports and occupational databases. Retrieved May 2008, from http://online.onetcenter.org/.

First-Line Supervisor/ Manager of Transportation and Material-Moving Machine and Vehicle Operators

WAGES AND EMPLOYMENT TRENDS

New York City

2006 Entry-level hourly wage	$16.41
2006 Median hourly wage	$22.31

New York State

Job growth outlook 2004–2014 (from 13,350 in 2004)	+8%

JOB CHARACTERISTICS

What do transportation supervisors/ managers *do*?

- Enforce safety rules and regulations.
- Plan work assignments and equipment allocations in order to meet transportation, operations, or production goals.
- Confer with customers, supervisors, contractors, and other personnel to exchange information and to resolve problems.
- Direct workers in transportation or related services, such as pumping, moving, storing, and loading/unloading of materials or people.
- Resolve worker problems, or collaborate with employees to assist in problem resolution.
- Review orders, production schedules, blueprints, and shipping/receiving notices to determine work sequences and material shipping dates, types, volumes, and destinations.
- Monitor fieldwork to ensure that it is being performed properly and that materials are being used as they should be.
- Recommend and implement measures to improve worker motivation, equipment performance, work methods, and customer services.
- Maintain or verify records of time, materials, expenditures, and crew activities.
- Interpret transportation and tariff regulations, shipping orders, safety regulations, and company policies and procedures for workers.

In what type of *conditions* do transportation supervisors/managers work?

- **Face-to-face discussions.** Frequent face-to-face discussions with individuals or teams.
- **Contact with others.** Requires contact with others (face-to-face, by telephone, or otherwise).
- **Telephone.** Frequent telephone conversations.
- **Frequency of decision-making.** Required to make decisions that affect other people, the financial resources, and/or the image and reputation of the organization.
- **Work with group or team.** Must work with others in a group or team.

EMPLOYEE CHARACTERISTICS AND QUALIFICATIONS

How much *education* must a transportation supervisor/manager have?

Usually requires training in vocational schools, related on-the-job experience, or an associate's degree. Some employers —

larger, and those that are more prestigious or handle expensive goods — may prefer to hire supervisors with some college or a college degree.

What kind of *licensing* must a transportation supervisor/manager have?

Jobs of this type often require a licensing exam in order to perform the job.

How much *work experience* should a transportation supervisor/manager have?

Some work-related skill, knowledge, or experience is required.

What type of *job training* does a transportation supervisor/manager need?

One or two years of a combination of on-the-job experience and informal training with experienced workers.

What are the most important *abilities* a transportation supervisor/manager should have?

- **Oral comprehension.** The ability to listen to and understand information and ideas presented through spoken words.
- **Oral expression.** The ability to verbally communicate information and ideas so others will understand.
- **Problem sensitivity.** The ability to tell when something is wrong or is likely to go wrong.
- **Written comprehension.** The ability to read and understand information and ideas presented in writing.
- **Deductive reasoning.** The ability to apply general rules to specific problems to produce answers that make sense.

What are the most important *skills* for a transportation supervisors/manager to have?

- **Active listening.** Giving full attention to what other people say, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Speaking.** Talking to others to convey information effectively.
- **Time management.** Managing one's own time and the time of others.
- **Management of personnel resources.** Motivating, developing, and directing people as they work, identifying the best people for the job.
- **Coordination.** Adjusting actions in relation to others' actions.

RELATED OCCUPATIONS

- Industrial Production Managers
- Transportation Managers
- Storage and Distribution Managers
- Postmasters and Mail Superintendents
- Wholesale and Retail Buyers, Except Farm Products
- First-Line Supervisors/Managers of Office and Administrative Support Workers
- First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand
- Mates — Ship, Boat, and Barge
- Transportation Vehicle, Equipment and Systems Inspectors

SOURCE O*NET Summary reports and occupational databases. Retrieved May 2008, from http://online.onetcenter.org/.

Laborer and Freight, Stock, and Material Mover, Hand

WAGES AND EMPLOYMENT TRENDS

New York City

2006 Entry-level hourly wage	$7.55
2006 Median hourly wage	$11.17

New York State

Job growth outlook 2004–2014 (from 102,030 in 2004)	0%

JOB CHARACTERISTICS

What do laborers and movers *do*?

- Attach identifying tags to containers, or mark them with identifying information.
- Read work orders or receive oral instructions to determine work assignments and material and equipment needs.
- Record numbers of units handled and moved, using daily production sheets or work tickets.
- Move freight, stock, and other materials to and from storage and production areas, loading docks, delivery vehicles, ships, and containers, by hand or using trucks, tractors, and other equipment.
- Sort cargo before loading and unloading.
- Assemble product containers and crates, using hand tools and precut lumber.
- Load and unload ship cargo, using winches and other hoisting devices.
- Connect hoses and operate equipment to move liquid materials into and out of storage tanks on vessels.
- Pack containers and re-pack damaged containers.
- Carry needed tools and supplies from storage or trucks, and return them after use.

In what type of *conditions* do laborers and movers work?

- **Contact with others.** Requires contact with others (face-to-face, by telephone, or otherwise).
- **Time pressure.** Requires meeting strict deadlines and remaining on schedule.
- **Face-to-face discussions.** Frequent face-to-face discussions with individuals or teams.
- **Standing.** Spend time standing.
- **Using hands to handle, control, or feel objects, tools, or controls.** Requires using hands to handle, control, or feel objects, tools or controls.

EMPLOYEE CHARACTERISTICS AND QUALIFICATIONS

How much *education* must a laborer or mover have?

A high school diploma or GED is usually required; some employers may require vocational training or job-related course work too.

What kind of *licensing* must a laborer or mover have?

Laborers and freight, stock, or material movers do not require licensing.

How much *work experience* should a laborer or mover have?

Some work-related skill, knowledge, or experience is helpful but is usually not required.

What type of *job training* does a laborer or mover need?

Anywhere from a few months to one year of working with experienced employees.

What are the most important *abilities* a laborer or mover should have?

- **Static strength.** The ability to exert maximum muscle force to lift, push, pull, or carry objects.
- **Extent flexibility.** The ability to bend, stretch, twist, or reach with your body, arms, and/or legs.
- **Trunk strength.** The ability to use your abdominal and lower back muscles to support part of the body repeatedly or continuously over time without 'giving out' or fatiguing.
- **Manual dexterity.** The ability to quickly move your hand or hands to grasp, manipulate, or assemble objects.
- **Visualization.** The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.

What are the most important *skills* for a laborer or mover to have?

- **Active listening.** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Reading comprehension.** Understanding written sentences and paragraphs in work related documents.
- **Instructing.** Teaching others how to do something.
- **Coordination.** Adjusting actions in relation to others' actions.
- **Learning strategies.** Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.

RELATED OCCUPATIONS

- Landscaping and Grounds keeping Workers
- Helpers — Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters
- Cleaners of Vehicles and Equipment
- Packers and Packagers, Hand
- Wellhead Pumpers

SOURCE O*NET Summary reports and occupational databases. Retrieved May 2008, from http://online.onetcenter.org/.

Reservation and Transportation Ticket Agent and Travel Clerk

WAGES AND EMPLOYMENT TRENDS

New York City

2006 Entry-level hourly wage	$9.84
2006 Median hourly wage	$15.90

New York State

Job growth outlook 2004–2014 (from 8,100 in 2004)	-5%

JOB CHARACTERISTICS

What do ticket agents and travel clerks *do*?

- Plan routes, itineraries, and accommodation details, and compute fares and fees, using schedules, rate books, and computers.
- Make and confirm reservations for transportation and accommodations, using telephones, faxes, mail, and computers.
- Prepare customer invoices, and accept payment.
- Answer inquiries regarding such information as schedules, accommodations, procedures, and policies.
- Assemble and issue required documentation such as tickets, travel insurance policies, and itineraries.
- Determine whether space is available on travel dates requested by customers, and assign requested spaces when available.
- Inform clients of essential travel information such as travel times, transportation connections, and medical and visa requirements.
- Maintain computerized inventories of available passenger space, and provide information on space reserved or available.
- Confer with customers to determine their service requirements and travel preferences.
- Examine passenger documentation to determine destinations and to assign boarding passes.

In what type of *conditions* do ticket agents and travel clerks work?

- **Telephone.** Frequent telephone conversations.
- **Contact with others.** Requires contact with others (face-to-face, by telephone, or otherwise).
- **Indoors, environmentally controlled.** Requires working indoors in environmentally controlled conditions.
- **Deal with external customers.** Must work with external customers or the public.
- **Importance of repeating same tasks.** Must repeat same physical activities (e.g., key entry) or mental activities (e.g., checking entries in a ledger) over and over, without stopping.

EMPLOYEE CHARACTERISTICS AND QUALIFICATIONS

How much *education* must a ticket agent and travel clerk have?

A high school diploma or GED is usually required; some employers may require vocational training or job-related course work too.

What kind of *licensing* must a ticket agent and travel clerk have?

Ticket agents and travel clerks do not require licensing; however, may require security background check.

How much *work experience* should a ticket agent or travel clerk have?

Previous work-related skill, knowledge, or experience is helpful but is not usually required.

What type of *job training* does a ticket agent or travel clerk need?

Anywhere from a few months to one year of working with experienced employees.

What are the most important abilities a ticket agent or travel clerk should have?

- **Oral expression.** The ability to verbally communicate information and ideas so others will understand.
- **Oral comprehension.** The ability to listen to and understand information and ideas presented through spoken words.
- **Near vision.** The ability to see details at close range (within a few feet of the observer).
- **Written comprehension.** The ability to read and understand information and ideas presented in writing.
- **Speech clarity.** The ability to speak clearly so others will understand.

What are the most important *skills* for a ticket agent or travel clerk to have?

- **Active listening.** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Speaking.** Talking to others to convey information effectively.
- **Service orientation.** Actively looking for ways to help people.
- **Critical thinking.** Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
- **Reading comprehension.** Understanding written sentences and paragraphs in work related documents.

RELATED OCCUPATIONS

- Flight Attendants
- Counter and Rental Clerks
- Travel Agents
- Customer Service Representatives
- Hotel, Motel, and Resort Desk Clerks
- Dispatchers, Except Police, Fire, and Ambulance

SOURCE O*NET Summary reports and occupational databases. Retrieved May 2008, from http://online.onetcenter.org/.

Transportation Attendant

WAGES AND EMPLOYMENT TRENDS

New York City

2006 Entry-level hourly wage	$7.32
2006 Median hourly wage	$8.71

New York State

Job growth outlook 2004–2014 (from 8,100 in 2004)	N/A

JOB CHARACTERISTICS

What do transportation attendants do?

- Provide boarding assistance to elderly, sick, or injured people.
- Open and close doors for passengers.
- Respond to passengers' questions, requests, or complaints.
- Explain and demonstrate safety procedures and safety equipment use.
- Perform equipment safety checks prior to departure.
- Signal transportation operators to stop or to proceed.
- Count and verify tickets and seat reservations, and record numbers of passengers boarding and disembarking.
- Greet passengers boarding transportation equipment, and announce routes and stops.
- Collect fares from passengers and provide change in return.
- Issue and collect passenger boarding passes and transfers, tearing or punching tickets as necessary to prevent reuse.

In what type of *conditions* do transportation attendants work?

- **Work in enclosed vehicles.** The job often requires working in a closed vehicle or equipment.
- **Contact with others.** Requires contact with others (face-to-face, by telephone, or otherwise).
- **Time pressure.** Requires meeting strict deadlines and remaining on schedule.
- **Sitting.** Requires time sitting.
- **Consequence of error.** Mistakes that are not readily correctable have serious consequences.

EMPLOYEE CHARACTERISTICS AND QUALIFICATIONS

How much *education* must a transportation attendant have?

A high school diploma or GED is usually required; some employers may require vocational training or job-related course work too.

What kind of *licensing* must a transportation attendant have?

Transportation attendants do not need licensing; however, may require security background check.

How much *work experience* should a transportation attendant have?

Some previous work-related skill, knowledge, or experience is helpful, but it is usually not required.

What type of *job training* does a transportation attendant need?

Anywhere from a few months to one year of working with experienced employees.

What are the most important *abilities* a transportation attendant should have?

- **Oral comprehension.** The ability to listen to and understand information and ideas presented through spoken words.
- **Oral expression.** The ability to verbally communicate information and ideas so others will understand.
- **Speech clarity.** The ability to speak clearly so others will understand.
- **Problem sensitivity.** The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
- **Speech recognition.** The ability to identify and understand the speech of another person.

What are the most important *skills* for a transportation attendant to have?

- **Active listening.** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Speaking.** Talking to others to convey information effectively.
- **Service orientation.** Actively looking for ways to help people.
- **Social perceptiveness.** Being aware of others' reactions and understanding why they react as they do.
- **Monitoring.** Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

RELATED OCCUPATIONS

- Combined Food Preparation and Serving Workers, Including Fast Food
- Counter Attendants, Cafeteria, Food Concession, and Coffee Shop
- Locker Room, Coatroom, and Dressing Room Attendants
- Baggage Porters and Bellhops
- Tour Guides and Escorts
- Flight Attendants
- Personal and Home Care Aides
- Counter and Rental Clerks

SOURCE O*NET Summary reports and occupational databases. Retrieved May 2008, from http://online.onetcenter.org/.

C. Occupational Profile Summary Tables

This section contains summaries of information from the preceding detailed occupational profiles (Section 6, Part B). The information that appears in both the profiles and these tables come from O*NET, which relies on a survey of a national sample of employers. The information in the summary tables has been supplemented by input from local workforce professionals who reviewed the report.

Table 6.1 shows the *skills and abilities* needed to perform the tasks and responsibilities of each of the top 10 transportation occupations. Included are the top-ranking skills and abilities according to the O*NET employers' survey. Career advisors can use this information as a guide to check jobseekers' compatibility with job requirements, but should use reliable assessments to determine the extent to which jobseekers have the requisite skills and abilities. As an example, employers say that the most important skills a bus driver must have are: equipment maintenance, operation and control, operation monitoring, active listening, and social perceptiveness. Similarly, a bus driver's most important abilities are: control precision, reaction time, depth perception, and near and far vision.

Table 6.2 is a summary of the basic *educational and training requirements* for each of the top 10 transportation occupations according to O*NET. Workforce professionals with whom we spoke have noted that employers sometimes require less education than is shown here, depending on an applicant's previous experience and skill level. As an example, a bus driver is usually required to have a high school diploma or GED; licensing (in this case a Commercial Driver's License or CDL, with a passenger endorsement); some previous work experience; and can expect to receive several months of on-the-job training.

Table 6.3 provides an overview of the *working conditions* jobseekers can expect to encounter in each of the top 10 occupations. Shown are the five job conditions most frequently cited by employers surveyed by O*NET. This information is useful for career advisors to gauge jobseekers' compatibility with the requirements of a job and provide information to help jobseekers know what to expect on the job. For example, cargo and freight agents can expect to have frequent phone conversations, contact with others, spend a great deal of time seated, and may be required to work under time pressure and put in extra hours.

More in-depth descriptions of the *skills and abilities and work conditions* can be found in the detailed occupational profiles, Section 6, Part B of this report.

Endnotes

1 American Public Transportation Association, *2008 public transportation fact book, 59th edition*, June 2008.

2 See, for example: United States Department of Labor, *Transportation industry: Identifying and addressing workforce challenges in America's transportation industry*, March 2007; and Report of the Interagency Aerospace Revitalization Task Force, Washington, DC: United States Department of Labor, February 2008.

3 United States Department of Labor, *Transportation industry: Identifying and addressing workforce challenges in America's transportation industry*, March 2007.

TABLE 6.1 Summary of Highest Ranking Skills and Abilities Required for Selected Transportation Occupations*

	BUS DRIVER	BUS AND TRUCK MECHANIC	CARGO AND FREIGHT AGENT
Skills			
Physical			
Coordination			
Equipment maintenance	■	■	
Troubleshooting		■	
Repairing		■	
Operation and control	■		
Operation monitoring	■		
Installation		■	
Communication			
Active listening	■		■
Reading comprehension	■	■	■
Negotiation			■
Speaking			■
Cognitive			
Critical thinking			■
Instructing			
Judgment and decision making			
Learning strategies			
Monitoring			
Service orientation			
Social perceptiveness	■		
Management of personnel			
Time management			

SOURCE Derived from O*NET Summary reports and occupational databases (top five scoring items in work context) and feedback from focus groups with account executives. Data retrieved May 2008, from http://online.onetcenter.org/

*See detailed Occupational Profiles — earlier in this section of the report for additional information and explanation of terms.

	CUSTOMER SERVICE REPRESENTATIVE	DISPATCHER	DRIVER: SALES WORKER	FIRST LINE SUPERVISOR, TRANSPORTATION	LABORER, FREIGHT, STOCK AND MATERIAL MOVER	RESERVATION AND TICKET AGENT, TRAVEL CLERK	TRANSPORTATION ATTENDANT
			■	■	■		
			■				
			■				
			■				
	■	■	■	■	■	■	■
	■	■		■	■	■	
	■	■	■	■		■	■
			■			■	
					■		
		■					
					■		
	■						■
						■	■
			■				■
				■			
	■	■		■			

CONTINUED ON NEXT PAGE

TABLE 6.1 Summary of Highest Ranking Skills and Abilities Required for Selected Transportation Occupations* (continued)

	BUS DRIVER	BUS AND TRUCK MECHANIC	CARGO AND FREIGHT AGENT	
Abilities				
Physical				
Arm-hand steadiness				
Control precision	■			
Extent flexibility				
Manual dexterity		■		
Multilimb coordination		■		
Reaction time	■			
Static strength				
Trunk strength				
Communication				
Oral comprehension		■	■	
Oral expression			■	
Speech clarity			■	
Speech recognition				
Written comprehension			■	
Vision				
Depth perception	■			
Far vision	■			
Near vision	■	■		
Cognitive				
Deductive reasoning				
Information ordering				
Number facility				
Problem sensitivity		■		

SOURCE Derived from O*NET Summary reports and occupational databases (top five scoring items in work context) and feedback from focus groups with account executives. Data retrieved May 2008, from http://online.onetcenter.org/

*See detailed Occupational Profiles — earlier in this section of the report for additional information and explanation of terms.

CUSTOMER SERVICE REPRESENTATIVE	DISPATCHER	DRIVER: SALES WORKER	FIRST LINE SUPERVISOR, TRANSPORTATION	LABORER, FREIGHT, STOCK AND MATERIAL MOVER	RESERVATION AND TICKET AGENT, TRAVEL CLERK	TRANSPORTATION ATTENDANT

TABLE 6.2 Summary of Highest Ranking Educational and Training Requirements for Selected Transportation Occupations*

	BUS DRIVER	BUS AND TRUCK MECHANIC	CARGO AND FREIGHT AGENT
Education			
High school diploma or GED usually required. Employers may require vocational/trade school training or job-related course work.	■		■
Vocational/trade school training, related on-the-job experience, or an associate's degree required. Employers may prefer to hire candidates with some college or a college degree.		■	
Licensing			
None needed			■
Some needed	■	■	
Work Experience			
None required, some helpful	■		■
Some required		■	
Job Training			
Less than one month	■		
Several months on the job			■
One to two years on the job		■	

SOURCE Derived from O*NET Summary reports and occupational databases (top five scoring items in work context). Retrieved May 2008, from http://online.onetcenter.org/

*See detailed Occupational Profiles — earlier in this section of the report for additional information and explanation of terms.

	CUSTOMER SERVICE REPRESENTATIVE	DISPATCHER	DRIVER: SALES WORKER	FIRST LINE SUPERVISOR, TRANSPORTATION	LABORER, FREIGHT, STOCK AND MATERIAL MOVER	RESERVATION AND TICKET AGENT, TRAVEL CLERK	TRANSPORTATION ATTENDANT

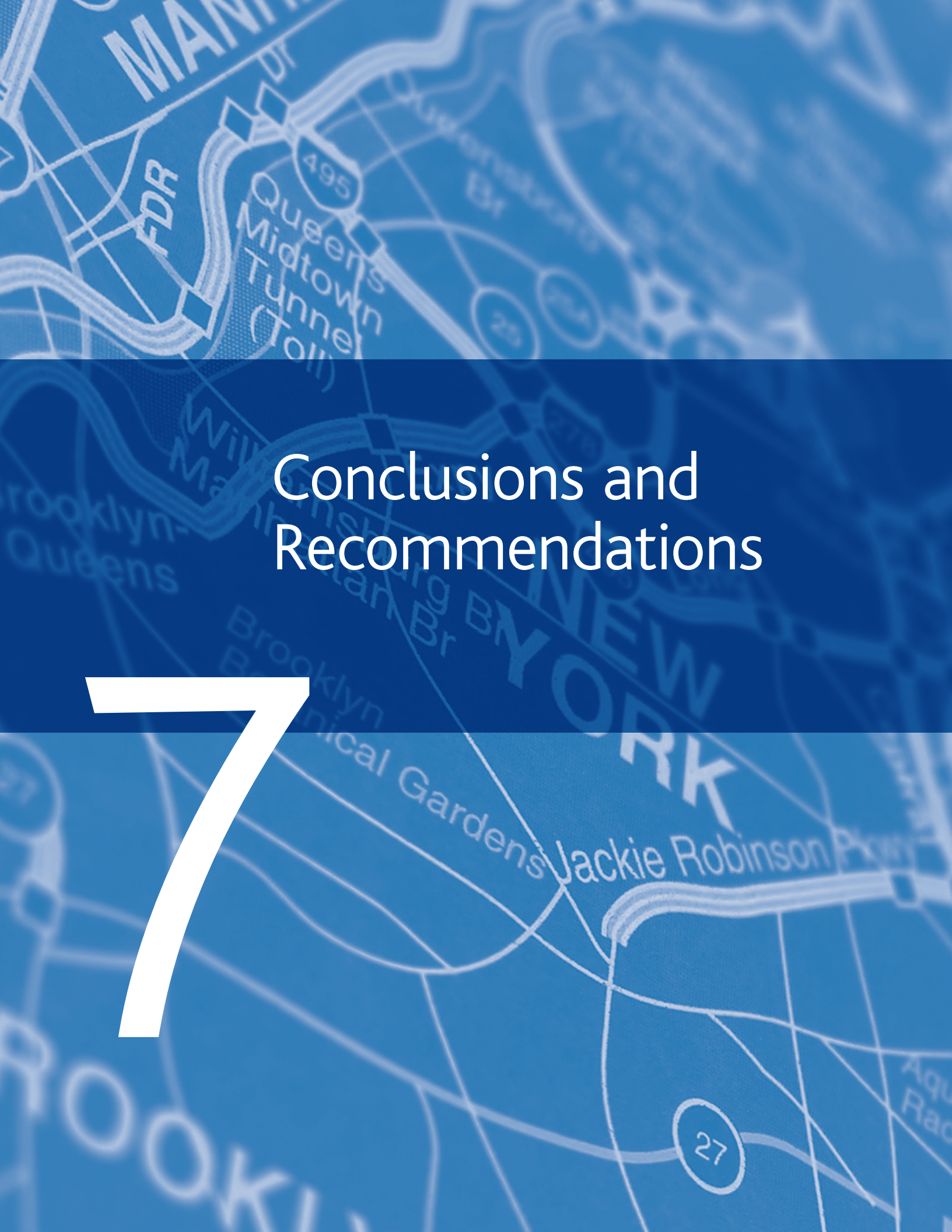
TABLE 6.3 Summary of Highest Ranking Work Conditions for Selected Transportation Occupations*

	BUS DRIVER	BUS AND TRUCK MECHANIC	CARGO AND FREIGHT AGENT
Communication and Interaction			
Frequent telephone conversations			
Contact with others			
Deal with external customers			
Face to face discussions			
Work with groups			
Setting			
Sitting			
Standing			
Enclosed vehicle			
Indoors, controlled atmosphere			
Exposed to contaminants			
Sounds/noise levels			
Hazardous equipment			
Wear protective equipment/gear			
Nature of work			
Extra hours			
Consequences of error			
Time pressure			
Frequent decision making			
High impact decisions			
Repetitive tasks			
Hand use			
Freedom to make decisions			
Structured work			

SOURCE Derived from O*NET Summary reports and occupational databases (top five scoring items in work context). Retrieved May 2008, from http://online.onetcenter.org/

*See detailed Occupational Profiles — earlier in this section of the report for additional information and explanation of terms.

CUSTOMER SERVICE REPRESENTATIVE	DISPATCHER	DRIVER: SALES WORKER	FIRST LINE SUPERVISOR, TRANSPORTATION	LABORER, FREIGHT, STOCK AND MATERIAL MOVER	RESERVATION AND TICKET AGENT, TRAVEL CLERK	TRANSPORTATION ATTENDANT



7 Conclusions and Recommendations

The transportation sector accounts for 2.3 percent of private sector employment in New York City but plays a critically important role to the city's economic vitality. With the exception of public transit, the selected transportation subsectors — air, truck, ground passenger, and support activities for transportation — are all highly intertwined with the region's major economic sectors and are therefore susceptible to economic cycles. The current credit crisis affecting the housing and financial markets, as well as consumer confidence in general, can be expected to have a depressing effect on the sector's general economic outlook in the short term. But because of expected population growth, infrastructure investments being undertaken, and the maturation of the existing workforce (with the exception of support activities), we expect to see the employment prospects cycle upward again.

A. General Conclusions about the Transportation Sector in New York City

- Deregulation has increased competition and led to substantial consolidation within the air and truck subsectors making for a more volatile employment environment for jobseekers. Until some balance is restored to these subsectors, smaller, debt-strapped or less well-capitalized companies may struggle, merge, or go out of business. However, these smaller firms often make a good entry point for new transportation workers before they move on to bigger, more stable firms.
- Fuel is a major input for the air and truck subsectors, as well as for ground passenger transportation. Rising fuel prices cut into operating costs leaving less money to support labor costs.
- Among the subsectors analyzed in this report, public transit is one area likely to continue to grow in both the short- and the long-term.

TABLE 7.1 Average Employment in Selected Transportation Subsectors in New York City by Borough, 2007

	AIR	TRUCK	TRANSIT AND GROUND PASSENGER	SUPPORT ACTIVITIES	TOTAL
Bronx	ND	1,292	2,625	284	4,201
Brooklyn	ND	2,572	11,377	1,142	15,091
Manhattan	897	1,537	1,870	2,738	7,042
Queens	24,351	3,555	10,358	12,388	50,652
Staten Island	ND	418	1,669	1,031	3,118
New York City	25,248	9,374	27,899	17,583	80,104

SOURCE New York State Department of Labor, Quarterly Census of Employment and Wages, 2006.

ND = Not disclosable, due to data suppression rules followed by the New York State Department of Labor.

TABLE 7.2 Average Annual Salary in Selected Transportation Subsectors in New York City by Borough, 2006

	AIR	TRUCK	TRANSIT AND GROUND PASSENGER	SUPPORT ACTIVITIES
Bronx	ND	$38,638	$35,856	$34,199
Brooklyn	ND	$39,464	$30,984	$38,289
Manhattan	$60,052	$41,057	$36,250	$79,392
Queens	$56,289	$41,439	$41,792	$37,173
Staten Island	ND	$33,972	$31,069	$71,991
New York City	$56,402	$40,118	$35,871	$46,085

SOURCE New York State Department of Labor, Quarterly Census of Employment and Wages, 2006.

ND = Not disclosable, due to data suppression rules followed by the New York State Department of Labor.

- Despite the sector's sensitivity to economic cycles, employment levels are not expected to decrease in the long-term and may even increase. For one, the region's numerous trade and transit advantages can be expected to become apparent to larger numbers of people as energy prices continue to rise.
- The federal oversight committee for regional transportation policy is undertaking a study about the feasibility of co-locating cargo, transportation, freight forwarding, logistics and warehousing activities in "freight villages" in or around New York City. If these are undertaken, the resulting developments represent promising locales for jobseekers in the public workforce system.
- With the exception of support activities for transportation, the subsectors examined in this report appear to be undergoing some amount of aging out as a result of shifting demographics and are not recruiting young people in sufficient numbers to replace workers who are approaching retirement age.
- Transportation employers emphasize the need for work readiness, communication and technological skills in their workforce. In particular, all of the subsectors examined in this report are in the process of rapid technological advancement. Employers experience difficulty in finding adequately prepared recruits and providing sufficient training for their existing workforce.

B. Jobs and Wages

- In 2007, there were about 83,000 private sector jobs in the selected subsectors in New York City. Most jobs were in ground passenger and air transportation; and a majority of these jobs were in Queens.
- There are almost as many jobs in public transit (approximately 69,000) as in the private sector portion of the four biggest subsectors of transportation combined.
- Average annual wages were highest for air, followed by public transit, support activities, truck, and private sector ground passenger transportation.

Despite the sector's sensitivity to economic cycles, employment levels are not expected to decrease in the long-term and may even increase. For one, the region's numerous trade and transit advantages can be expected to become apparent to larger numbers of people as energy prices continue to rise.

C. Occupations

- Considering a number of criteria including number of jobs, high rate of growth, comparatively low educational requirements, and good wage levels, the top occupations in the selected transportation subsectors are listed in the text box on this page.
- Entry-level educational and experience requirements for these top 10 jobs (detailed in the sidebar) generally do not exceed high school or GED level attainment and one or two years of work experience. Some employers may be open to hiring jobseekers without a high school diploma, depending on the applicants' skills and experience.
- Employers typically promote workers into supervisory positions after they have several years of experience and most often a two-year college degree. Specialized training programs — such as computer skills training and advanced training in the skilled trades — are also promising avenues for career advancement within the respective subsectors.
- For the most part, the transportation workforce is racially and ethnically diverse. Gender diversity represents a continuing challenge.
- Increasing licensing and security regulations represent potential barriers to entry for jobseekers in the transportation subsectors with criminal backgrounds or imperfect driving records.
- Transportation employers report difficulties recruiting a skilled workforce because of negative perceptions of the sector among jobseekers. The negative perceptions — some of which accurately reflect real conditions — include relatively high skill demands for entry-level work, comparatively low wages, the relentless nature of the work activities, and stress associated with public interaction.
- In the private sector, career advancement opportunities are more likely to arise for workers in larger firms, diversifying firms, and firms that interact with a variety of other firms in related areas of business. *Larger companies* are more likely to invest in training and professional development for their employees, and are more likely to provide their staff with access to advanced communications and computer technologies. Because *diversifying firms* are taking on new services and work processes, they represent opportunities for new work skills and positions. Finally, transportation firms that interact with other *firms that specialize in related areas of business* — such as logistics, scheduling, packaging, and airport operations — provide opportunities for their workforce to move laterally and advance.

Top Occupations in the Transportation Sector

- **Bus drivers**
- **Bus and truck mechanics**
- **Cargo and freight agents**
- **Customer service representatives**
- **Dispatchers**
- **Light truck drivers/sales drivers**
- **Laborers/material movers**
- **Supervisors of laborers**
- **Reservation and ticket agents**
- **Transportation attendants**

D. Recommendations for the Public Workforce System

The recommendations for the public workforce system are divided into four key areas: **Availability of Employment Opportunities**, **Jobseeker Skills Development and Career Advisement**, **Meeting the Needs of Employers**, and **Access to Information and Data**. Many of the recommendations span across the subsectors, while recommendations relating to a specific subsector are specified as such.

AVAILABILITY OF EMPLOYMENT OPPORTUNITIES

- The transportation sector is not expected to go the way of the New York City manufacturing sector given the advantages and needs of the region's transportation infrastructure. However, the current economic outlook in the nation as a whole and for the New York City region lead the NYCLMIS to the conclusion that the selected transportation subsectors will not provide a promising avenue for placing a large number of entry and mid-level jobseekers in the short term. Given the region's advantages and growth, long-term employment prospects in transportation are more positive. Service providers and policy makers should think of ways to work with industry leaders and educational institutions to craft a longer-term solution to their staffing challenges.
- Due to current economic conditions, the short-term employment prospects in the air, truck, private sector ground passenger, and support activities transportation subsectors are not as positive as they are for public transit. However, there clearly is a need for young people to reinvigorate the respective workforce and replace retiring workers in those fields in the years ahead. Youth-serving providers need to assess if the populations they serve are going to be ready to take positions in these fields, and if not, identify what kind of preparation they need. The development of adequate education and training pipelines will require making successful linkages to the education and training institutions of New York City.
- Account executives can most efficiently conduct business outreach in the geographic locations where jobs are clustered within and across subsectors. For example, many transportation and related jobs tend to cluster around marine and air cargo terminals and distribution centers. This is particularly true in Queens and Brooklyn, but also in the Bronx and Staten Island.
- Aside from developing business relationships, the public workforce system could benefit by communicating with the major labor unions in each subsector that could provide insight into job opportunities for adults and entry opportunities for youth.

There is clearly a need for young people to reinvigorate the transportation workforce and replace retiring workers in the years ahead.

Air Transportation

- The workforce system can meet the needs of employers and jobseekers by articulating and developing clear traditional and nontraditional education and training pipelines for entering into and advancing within the subsector. Although jobs may not be expected to surge in the near future, given current economic circumstances, the long-range prospects for jobs in the subsector are good.

Transit and Ground Passenger Transportation

- Despite the sensitivity of public transit to tax revenue cycles, workforce professionals — including youth service providers — should increase their focus on the Metropolitan Transportation Authority in general, and the New York City Transit Authority in particular as an important job source for jobseekers.

Workforce professionals should increase their focus on the Metropolitan Transportation Authority in general, and the New York City Transit Authority in particular as an important job source for jobseekers.

Support Activities

- The best geographic targets for account executives in this subsector are near New York City's distribution and cargo hubs: in and near the airports in Queens, South Brooklyn, Howland Hook in Staten Island, and Hunts Point in the Bronx. Additionally, comparatively well-paying clerical jobs may be available in Manhattan corporate offices in this subsector.

JOBSEEKER SKILLS DEVELOPMENT AND CAREER ADVISEMENT

- The public workforce system should use the occupational profiles that appear in this report (section 6) to inform and refine their career advising and job-matching activities. This report provides the pertinent information required to "sell" an occupation or subsector to a jobseeker by focusing on job growth, labor shortages, typical wages, top occupations, key employers, work environment, skills and training required.
- Career advisors can also use the report's occupational profiles to provide jobseekers with a deeper understanding of the top occupations and the associated requirements. In addition, jobseekers themselves can use these profiles to better understand the nature of the occupations in the transportation sector and determine their own interest and compatibility.
- Career advisors can provide this detailed information to targeted jobseekers, including nontraditional and underrepresented populations for these subsectors such as women, people with disabilities, and veterans.

- Rapid advancements in computers and electronics require a workforce that possesses appropriate technical and technological skills. Such skills are also essential for career advancement and to connect to mid- and professional level jobs in other sectors. While the scope of education and training appears to be beyond the capacity of any single agency to provide, the public workforce system is uniquely positioned to identify the issues and bring together the relevant actors to address these systemic needs.
- Policy makers and service providers should work on developing relationships that connect educational institutions — such as the New York City Department of Education, the City University of New York's community and senior colleges, and large private universities located in the city — to employers so that they can jointly plan formal training and education pipelines that are adequate for the sector's needs. Policy makers and service providers should identify the skills that the primary public education system should address and use existing networks to create introductory work opportunities for youth.

Truck Transportation

- Career advisors and counselors should inform jobseekers about the diversity of opportunities in the truck transportation subsector. Outreach to women should emphasize the variety of occupations (such as office jobs, short haul drivers, and drivers who are not required to lift heavy objects) which may ease their concerns about truck transportation related to physical demands, unusual hours, or being away from home.
- Currently, ex-offenders can find job opportunities in many truck transportation firms. However, workforce professionals should be aware of a trend toward increased demands for licensing, screening, and security requirements.
- Career advisors and job counselors can help jobseekers overcome the barriers that the Commercial Driver's License (CDL) may present to New York City residents who want to become truck drivers. For example, individuals who do not already hold a regular U.S. driver's license will need to obtain one before attempting to acquire a CDL.
- Career advisors should be aware that drivers with more than two points on their records may earn a CDL, but they will likely confront obstacles to obtaining driving jobs.

Transit and Ground Passenger Transportation

- On the private sector side, the public workforce system could help entrants to obtain the needed licensing and identify employers with high demand and higher than average salaries. Smaller private sector employers often provide good entry points to the subsector. After gaining experience in these smaller firms, workers often have a better chance of getting a job in public transit—which typically pays better.
- With regards to public transit, the Metropolitan Transit Authority already coordinates with the New York City Department of Education and the City University of New York to provide training, internships, and apprenticeships in transit-related occupations. Tighter coordination, as well as additional communication and recruitment efforts are needed to attract a younger and gender-diverse workforce in the subsector. Youth service providers can play an important role in connecting teens and young adults to existing programs and to developing new entry points to public transit.

Support Activities

- Career advancement in the support activities subsector relies on experience and the acquisition of skills that are in demand. The experts we interviewed for this study agreed that computer skills are critical to advancement in any transportation subsector, but these skills are acutely needed in this subsector. Workforce professionals should seek qualified community college and training programs to prepare entry-level and incumbent workers with skills in scheduling, modeling, and geographic positioning systems to organize and keep track of a huge volume of shipments.

MEETING THE NEEDS OF EMPLOYERS

- Public workforce account executives who work directly with employers should use different strategies in working with the various transportation subsectors, including differentiating between ground passenger transportation and public transit (as outlined in section 4). This report (and the associated subsector profiles) equips account executives with detailed information required to communicate clearly, knowledgeably, and effectively with employers in the transportation sector on topics such as: structure of the subsectors, local job growth, typical wage ranges, top occupations, largest employers, work environment, skills, and training required.
- Account executives should take into consideration growth trends in each borough and the largest employers in each subsector (detailed in the subsector profiles). Proprietary lists of businesses like Dun and Bradstreet and Reference USA are available to locate employers in key growth areas.
- Account executives, in conjunction with career advisors, can also assist employers with recruitment of underrepresented, nontraditional populations such as women, people with disabilities, and veterans.

Air Transportation

- Account executives should focus on building relationships with regional and discount airlines that are more likely to hire entry-level workers than their larger "legacy" airline cousins. Caution is warranted in that these carriers may also be more vulnerable to economic hardship and layoffs than their larger, national counterparts.

Truck Transportation

- Workforce professionals may look to smaller carriers as a promising entry point into truck driving for less credentialed, less experienced drivers.
- Incumbent worker training in logistics and scheduling could pay off as truck transportation firms increasingly diversify and New York City invests in the "freight village" model for organizing cargo handling.

ACCESS TO INFORMATION AND DATA

- Currently labor market data merely tell us where existing jobs are, not where to find new and replacement jobs, which are jobs that become available due to retirement or turnover. As the transportation workforce ages out, replacement jobs data will allow the workforce system to understand where existing opportunities are in the sector. New data to be released in the coming months by the New York State Department of Labor ("Quarterly Workforce Indicators" http://lehd.did.census.gov/led/datatools/qwiapp.html) will assist workforce system managers and staff to better target new and replacement jobs and understand the nature and extent of job turnover in transportation as well as other sectors.
- The New York City agencies that administer the public workforce system need access to dependable and up-to-date establishment lists that are currently compiled and managed by New York State Department of Labor (NYSDOL). However, these lists are not readily available due to current legislation and policies intended to protect the confidentiality of businesses. Although commercial lists (such as Dun and Bradstreet) are available, none purport to provide complete or near complete coverage. Without the NYSDOL data, the public workforce system's ability to conduct efficient searches for businesses with staffing needs and to monitor local employment dynamics is limited. Access to this data to relevant government agencies would help in tracking important workforce and economic development trends in New York City.
- The national O*NET occupational database is a promising resource for use in multiple sectors (http://online.onetcenter.org/). Yet, since it is based on national data, the information needs to be verified with New York City employers to ensure that it reflects the local employment experience.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Queens
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Jackie Robinson
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Appendix

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B. Bibliography

NAICS 48 — GENERAL TRANSPORTATION

Brown, S., Virmani, R. and R. Alm, Crude awakening: Behind the surge in oil prices, *Economic Letter: Insights from the Federal Reserve Bank of Dallas,* 3:5, May 2008. (http://dallasfed.org/research/eclett/2008/el0805.html)

Habiby, M. Oil rises for first time in four days after U.S. stocks slump, Bloomberg.com, 18 July 2008.

Port Authority of New York and New Jersey, The Port Authority Strategic Plan: Transportation for Regional Prosperity, 2005.

Saliba, G. NJ labor and workforce development conference: Transportation critical to economy, *New Jersey Business*, 1 February 2006.

Troianovski, A. and S. Reddy, Fed confronts spike in inflation, *Wall Street Journal,* 17 July 2008, p.1.

United States Department of Labor, Transportation industry: identifying and addressing workforce challenges in America's transportation industry, March 2007.

NAICS 481 AND 4881 — AIR AND SUPPORT FOR AIR TRANSPORTATION

Associated Press, United to eliminate 950 pilot jobs, *New York Times*, 24 June 2008.

Bailey, J. Fuel costs just part of airlines' list of woes, *New York Times,* 10 April 2008.

Bloomberg News, Low-fare airline files for bankruptcy, *New York Times,* 7 April 2008.

Bond, D., Bankruptcy's revolving door, *Aviation Week,* n.d.

Bowley, G. and K. Bradsher, Frontier Airlines files for bankruptcy, *New York Times,* 12 April 2008.

Kim, A., TSA airport staffing could swing by 20% under new plan, *Aviation Daily*, 361: 3, p. 1, July 6, 2005.

Maynard, M. Big job cuts announced at American, *New York Times,* 3 July 2008.

Maynard, M. Citing fuel costs, Northwest plans to cut 2,500 jobs, *New York Times,* 10 July 2008.

Maynard, M. Continental cuts jobs and grounds jets, *New York Times,* 6 June 2008.

Maynard, M. Deals fade, and airlines look to cut, *New York Times*, 29 May 2008.

McGeehan, P., Rise in wages in Queens is almost highest in U.S., *New York Times,* 3 April 3 2008.

Port Authority of New York and New Jersey 2008 Budget and Updated Capital Investment Plan. (www.panynj.gov/budget_cap_plan/)

Ranson, L. Lufthansa Technik to handle line maintenance for Virgin America. *Aviation Daily*, 368:14, 19 April 2007.

Report of the Interagency Aerospace Revitalization Task Force, Washington, DC: United States Department of Labor, February 2008. (www.doleta.gov/pdf/REPORT_Aerospace_2008.pdf)

Santiago, A. Airline staff levels continue upward trend *Aviation Daily,* 370:41, p. 5, 8 November 2007.

Velocci, A. Say good-bye to the airline industry as we know it, *Aviation Week*, n.d.

Wilson, B. Record fuel prices will force Delta to cut capacity, *Aviation Week,* n.d.

NAICS 484 AND 4885 — TRUCK AND SUPPORT FOR TRUCK TRANSPORTATION

American Transportation Research Institute, Critical issues in the trucking industry: 2007. Report to the American Trucking Association, October 2007.

American Trucking Association, U.S. Trucking Industry Reaches Major Freight Transportation Milestone, January 25, 2008 www.truckline.com/exeres/

Barbaro, M. Retailing chains caught in a wave of bankruptcies, *New York Times,* 15 April 2008.

Belman, D. and K. Monaco, The effects of deregulation, de-unionization, technology, and human capital on the work and work lives of truck drivers, *Industrial and Labor Relations Review,* 54:2A. , March 2001, pp. 502–524.

Bingham, P. Freight, *Transportation Megatrends*, Presented at the Freight Demand Modeling Conference, Washington, DC: 25 September 2006.

Brudie, K. Recording Secretary, International Brotherhood of Teamsters Local 807, Personal communication with the author, August 2008.

Frost & Sullivan, *U.S. trucking industry challenges and emerging multimode network architectures*, 2006. www.telematicsinfo.jp/whitepaper/WP149.pdf

Hughes, J. and J. Seneca, *New Jersey logistical competitiveness: Ominous trend lines,* A 2008 Trend Study by the Rutgers University, Edward J. Bloustein School of Planning and Public Policy, June 2008.

Moss, M. and H. O'Neill, *Tunnel vision: An analysis of the proposed tunnel and deepwater port in Brooklyn*, Taub Urban Research Center, New York University, November 1998.

New York Metropolitan Transportation Council, *The Basics of Freight Transportation in the New York Region,* New York, n.d.

New York Metropolitan Transportation Council, *Freight village feasibility*, Presentation to the American Metropolitan Planning Organization, September 2007. (www.ampo.org/assets/529_howardmannpres.pdf)

New York Metropolitan Transportation Council Regional Freight Planning Project, *NYMTC regional freight plan: An element of the regional transportation plan*, April 2004. (http://webservices.camsys.com/nymtcfreight/documents/nymtc_task8.pdf)

New York Metropolitan Transportation Council, *Review of technologies used in freight transportation*, New York, September 2002.

Reiskan, J. Trucking failures hit highest level since '01 recession, analyst says, *Transport Topics*, April 21, 2008.

Watson, R. ATA, Army Reserve agree to join forces to encourage vets to become truck drivers, *Transport Topics*, April 21, 2008.

NAICS 485 — TRANSIT/GROUND PASSENGER

American Public Transportation Association, *Public transportation fact book 58th edition,* Washington, DC: APTA, June 2008.

Brown, James. Personal communication with the author, April 2008.

Diewald, W. Commentary: Training to meet transportation agency workforce needs, *Public Works Management and Policy,* 9: 1, July 2004.

Economic Snapshot, April 2008, New York City Economic Development Corporation.

Krauss, C. Gas prices send surge of riders to mass transit, *New York Times*, 10 May 2008.

Metropolitan Transportation Authority. *Engaging, recognizing, and developing the MTA workforce: Recommendations to Elliot G. Sander, Executive Director and CEO, November 2007.* www.mta.info/mta/pdf/develop_workforce.pdf

Metropolitan Transportation Authority, *New York City transit: Express to success* (jobs and careers circular), 2008.

Neuman, W., So soon? Fares and tolls rise in M.T.A. plan, *New York Times*, 22 July 2008, p. 1.

Partnership for New York City, 2004. *Transportation choices and the future of the New York City Economy.* (www.nycp.org/publications/2003_11_TransportationStudy.pdf)

Schaller, B. and G. Gilbert, Factors of production in a regulated industry: New York taxi drivers and the price for better service, *Transportation Quarterly*, 49:4, 1995.

Transit Cooperative Research Program, *Closing the Knowledge Gap for Transit Maintenance Employees: A Systems Approach*, Report 29, Washington, DC: Transportation Research Board of the National Academies, 2003. (http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_29.pdf)

Transit Cooperative Research Program, *Managing transit's workforce in the new millennium*, Report 77, Washington, DC: Transportation Research Board of the National Academies, 2003. (http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_77.pdf)

Transit Cooperative Research Program, *Emerging new paradigms: A guide to fundamental change in public transportation agencies,* Report 97, Washington, DC: Transportation Research Board of the National Academies, 2003.

Transit Cooperative Research Program, *The workforce challenge: recruiting, training, and retaining qualified workers for transportation and transit agencies*, Special Report 275, Washington, DC: Transportation Research Board of the National Academies, 2003. (http://onlinepubs.trb.org/onlinepubs/sr/sr275.pdf)

C. North American Industry Classification System (NAICS) Sector 48: Transportation

NAICS allows users to uniformly identify and classify companies. Using the NAICS helps to ensure that we are referring to the same group of firms. Once workforce professionals have identified a sector (2-digit NAICS code), subsector (3-digit code), or industry group (4-digit code) to explore, they should give more thought to what companies are and are not included, and then expand or reduce their NAICS selection as needed.

THE FOUR SUBSECTORS EXAMINED IN THIS REPORT APPEAR IN BLACK

NAICS 481000 Air Transportation

NAICS 481000 Air Transportation
NAICS 481100 Scheduled Air Transportation
NAICS 481200 Nonscheduled Air Transportation

NAICS 482000 Rail Transportation
NAICS 482100 Rail Transportation

NAICS 483000 Water Transportation
NAICS 483100 Deep Sea, Coastal, and Great Lakes Water Transportation
NAICS 483200 Inland Water Transportation

NAICS 484000 Truck Transportation

NAICS 484100 General Freight Trucking
NAICS 484200 Specialized Freight Trucking

NAICS 485000 Transit and Ground Passenger Transportation

NAICS 485100 Urban Transit Systems
NAICS 485200 Interurban and Rural Bus Transportation
NAICS 485300 Taxi and Limousine Service
NAICS 485400 School and Employee Bus Transportation
NAICS 485500 Charter Bus Industry
NAICS 485900 Other Transit and Ground Passenger Transportation

NAICS 486000 Pipeline Transportation
NAICS 486100 Pipeline Transportation of Crude Oil
NAICS 486200 Pipeline Transportation of Natural Gas
NAICS 486900 Other Pipeline Transportation

NAICS 487000 Scenic and Sightseeing Transportation
NAICS 487100 Scenic and Sightseeing Transportation, Land
NAICS 487200 Scenic and Sightseeing Transportation, Water
NAICS 487900 Scenic and Sightseeing Transportation, Other

NAICS 488000 Support Activities for Transportation

NAICS 488100 Support Activities for Air Transportation

NAICS 488400 Support Activities for Road Transportation

NAICS 488500 Freight Transportation Arrangement

NAICS 488900 Other Support Activities for Transportation

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E. List of Acronyms

ADL	Aircraft Dispatcher License
ASE	National Institute for Automotive Service Excellence
ATA	American Trucking Association
ATU	Amalgamated Transit Union
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BTOBA	Bridge and Tunnel Officers Benevolent Association
CDL	Commercial Driver's License
CDL-P	Commercial Driver's License with passenger endorsement
CUR	Center for Urban Research at the CUNY Graduate Center
FAA	Federal Aviation Administration
GDP	Gross Domestic Product
GED	General Educational Development (formerly known as the General Equivalency Diploma)
GPS	Geographic Positioning System
JFK	John F. Kennedy International Airport
MTA	Metropolitan Transportation Authority
NAICS	North American Industry Classification System
NYCLMIS	New York City Labor Market Information Service
NYCT	New York City Transit Authority
NYMTC	New York Metropolitan Transportation Council
OES	Occupation Employment Statistics
PUMS	Public Use Microdata Sample
QWI	Quarterly Workforce Indicators
LED	Longitudinal Employment Dynamics
TBTA	Triborough Bridge and Tunnel Authority
TLC	Taxi and Limousine Commission
TRB	Transportation Research Board
TSO	Transportation Security Officer
TWU	Transport Workers' Union of America
WIB	Workforce Investment Board

Tunnel
(Toll)
Expy
Brooklyn-
Queens
Brooklyn
Botanical Gardens
BROOKLY

NYC WIB
WORKFORCE INVESTMENT BOARD

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