



THE POWER OF PERSPECTIVE

The U.S. Truck Driver Shortage:
Analysis and Forecasts

PREPARED FOR:
American Trucking Associations

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EXECUTIVE SUMMARY

The truck transportation industry in the U.S. is experiencing a national shortage of truck drivers that has become a limiting factor in the operations of many companies. This study takes a systematic look at the long-term structural problem of the availability of truck drivers relative to the future requirements for drivers that will be created by retirements of an aging driver workforce and by economic growth.

We determined that there were 1.3 million long-haul heavy-duty truck drivers in 2004 – the segment of the driver occupation most severely impacted by the driver shortage. All of our projections are for this driver group only.

Principal findings of our analysis of the potential future supply of long-haul heavy-duty truck drivers are:

- There have been some positive developments in demographic trends affecting the growth of the truck driver workforce over the past ten years. In particular, among males over 35 in the labor force, the share of truck drivers has trended upwards. The share of truck drivers in the rapidly growing Hispanic labor force has also risen.
- But demographic trends will turn against the industry over the next 10 years. The size of the white male population of ages 35-54 – a demographic group that currently provides over half of all truck drivers – will decline by over 3 million persons between 2004 and 2014.
- The trucking industry faces some adverse demographic trends, although the labor supply problem the industry confronts will also impact other industries in which the number of jobs available will grow at an above-average rate. A major problem for the trucking industry and the U.S. economy as a whole is that the annual rate of growth of the overall labor force will slow sharply, from 1.4% currently to only 0.5% by 2012.
- Based on our detailed analysis of the labor market participation rates of truck drivers by age, sex, and race/ethnicity, and our forecasts of labor force growth, we project that the supply of new long-haul heavy-duty truck drivers will grow at an average annual rate of 1.6% over the next ten years if present trends in truck driver labor participation in different demographic groups continue.

However, the number of new truck drivers needed will grow at a faster pace:

- Over the next 10 years, economic growth will give rise to a need for a 2.2% average annual increase in the number of long-haul heavy-duty truck drivers, or an additional 320,000 jobs overall.
- At least another 219,000 new truck drivers must be found to replace drivers currently of ages 55 and older who will retire over the next 10 years and to replace those in younger groups who will leave the occupation.
- Combining these two figures gives total expansion and replacement hiring needs of 539,000, or an average of about 54,000 per year. However, this is a net figure. It reflects the hiring of new truck drivers to offset drivers exiting the occupation only on a net basis, and it does not include the substantial amount of hiring that trucking companies must do each year as a result of job switching (“churning”) within the industry.

These separate projections of trend growth in the potential *supply* of and *demand* for long-haul heavy-duty truck drivers imply a widening imbalance:

- There is already a shortage of long-haul heavy-duty truck drivers equal to perhaps 1.5% of the over-the-road driver workforce, or about 20,000 drivers.
- In the absence of substantial market adjustments, this driver shortfall – projected demand less projected supply – would rise to 111,000 in 2014.

Closing this gap implies attracting a higher share of the labor force into the truck driving occupation. And the primary means by which more workers are drawn into long-distance trucking is higher wages.

- The labor market analysis presented in this report shows graphically how the share of truck drivers in the labor force increases sharply with age from the early 20s through the early 30s. The trucking industry gets the long-haul drivers it needs by attracting workers in their late 20s and early 30s from other occupations where they have already reached their earnings potential.
- A critical element in the current truck driver shortage is that *the competitiveness of wages in the truck transportation industry fell sharply with the onset of recession in 2000*, and driver wages have yet to regain their previous position. Average weekly earnings in long-distance trucking were 6-7% above average earnings in construction throughout the 1990s but fell to 9% below construction earnings by 2001 and were still 1% lower in 2004.
- If the trucking industry is to attract the higher share of workers that it needs to achieve the growth projected over the next 10 years, earnings in the industry must, at a minimum, return to the relative position that prevailed during the 1990s.

The current tight job market for drivers – the ready availability of job options for dissatisfied workers – has made it more essential to address non-monetary aspects of the job as well. Although competitive wages are a major factor in attracting workers to the trucking occupation, quality of life issues are more frequently cited as the primary consideration for worker retention in the industry. The major irritants for drivers are extended periods on the road away from home and unpredictable schedules for getting home. Firms impacted the most are those with less flexibility to address this major negative aspect of the long-haul truck driver's job. The marginal loss in productivity that may result from designing schedules to get drivers home more often must be weighed against the high cost of turnover.

Numerical estimates of the driver shortage in terms of the size and projected growth of different demographic groups do not tell the whole story. The industry faces a constant challenge of finding qualified drivers. Despite the severe shortage, many firms continue to reject a very high percentage of driver applicants due to their lack of qualifications. And the challenge of finding qualified drivers has grown in recent years, as heightened concerns with security and safety have resulted in new regulatory requirements for the trucking industry. Nonetheless, driver qualifications and safety remain a dominant concern; the cost of lowering hiring standards can be significant in the long run when accounting for increased insurance premiums and accidents.

Given the current relative wage level, the size of the projected driver shortage and the added labor market pressures caused by regulatory requirements, we expect

wage gains in long-haul trucking over the next three years to average 6-7% per year -- ahead of the 5.1% increase recorded in 2004, and well ahead of the increase in wages economy-wide. This wage increase, in combination with continuing efforts on the part of trucking companies to address quality-of-life issues, should ease the severity of the driver shortage. But because the adverse demographic trends affecting the industry will intensify in the second half of the decade, trucking firms will face a continuing challenge to attract and retain a qualified driver workforce.

1. INTRODUCTION

The truck transportation industry in the U.S. is experiencing a shortage of drivers of long-haul heavy trucks that has become a limiting factor in the operations of many freight companies. The truck driver shortage is not a new issue. The economic boom of the late 1990s resulted in widespread difficulty among trucking firms in attracting and retaining drivers. But the recession of 2000-2001 started a long downturn in the trucking industry that took the pressure off the overheated driver labor market. The combination of depressed demand for trucking services and a weak labor market meant that enough drivers could be found. But with the strengthening of the U.S. economy over the past two years and the strong growth of freight traffic, the driver shortage quickly resurfaced.

In 1997 the ATA Foundation (now called The American Transportation Research Institute) commissioned a study of the driver shortage problem by The Gallup Organization.¹ That study identified the substantial amount of new hiring the truck transportation industry must do annually due to industry growth, driver retirements, drivers shifting to new occupations, and especially to drivers' job switching within the industry. Trucking companies are placing greater emphasis on factors affecting driver job satisfaction to counteract rising turnover rates. But the industry faces even greater pressures on the ability to hire and retain a qualified driver workforce in coming years, because a large fraction of the existing driver population is nearing retirement age and the demographic groups that have been the main source of truck drivers in the past are shrinking.

Global Insight was asked by the American Trucking Associations to take a systematic look at the long-term structural problem of the availability of truck drivers relative to future requirements for drivers that will be created by retirements and new demand stimulated by economic growth. Our study addresses four basic questions:

1. How will the demand for truck drivers grow over the next decade?
2. What factors will affect the future supply of truck drivers?
3. How will the industry adjust to the expected imbalance between the supply of and demand for drivers?
4. How will changing regulatory requirements affect the demand for and supply of truck drivers?

A theme that emerges quickly in discussions about the truck driver shortage is the demands of the job of long-distance driving, which take drivers away from home for extended periods of time. Because it is primarily long-haul trucking that is affected by the driver shortage, our first task is to gather basic data on the size and demographic characteristics of this segment of the truck driver workforce. In Chapter 2, we compare data from various Bureau of Labor Statistics (BLS) and Census Bureau sources that use differing definitions of the truck driver occupation and the Truck Transportation industry. We then use micro-data files from the 2000 Census and the Current Population Survey to analyze how the labor force participation of heavy-duty truck drivers varies by age, sex and race/ethnicity.

¹ *Empty Seats and Musical Chairs: Critical Success Factors in Truck Driver Retention*, report prepared by The Gallup Organization for the ATA Foundation, October 1997.

In Chapter 3, we turn to an analysis of factors that will affect the number of heavy-duty truck drivers needed in the U.S. economy over the next 10 years. The BLS recently issued updated projections of job growth in the U.S. through 2012, which include estimates of the need for heavy-duty truck drivers. BLS projects that the number of truck drivers operating heavy trucks and tractor-trailers will grow by 19.0% between 2002 and 2012, outpacing the 14.8% increase expected in the total number of jobs in the economy over this period. Among the nearly 700 detailed occupations analyzed, the heavy-duty truck driver occupation ranks eleventh in the number of jobs to be added. In this chapter, we prepare our own projections of job growth in the narrower category of heavy-duty truck drivers in long-haul trucking over the period 2004-2014, based on Global Insight's macroeconomic and industry forecasts.

In Chapter 4, we examine the implications of demographic changes that will occur in the U.S. labor force over the next 10 years for the growth of the truck driver workforce. To develop projections of the likely future supply of truck drivers, we analyze trends in the labor force participation of truck drivers in detailed demographic groups defined by age, sex and race/ethnicity over the last 10 years. Drawing on the latest Census Bureau projections of the U.S. population in each of these demographic groups, we develop alternative scenarios for the number of new entrants to (and net change in) the heavy-duty truck driver workforce over the next decade.

In Chapter 5, we compare our projections of job growth in long-haul trucking with alternative projections of the potential supply of truck drivers. The result is a widening imbalance between the demand for heavy-duty truck drivers and the number of net new entrants to the driver workforce. The innovative efforts of many companies to address the negative aspects of the truck driver's job may help to ease the driver shortage. But the shortfall must be resolved largely by market wage adjustments. To analyze the role of wages, we compare trends in earnings in the long-haul truck transportation with wage growth in industries often viewed as alternatives for workers considering long distance trucking. Although higher wages should attract more job applicants, the truck transportation industry faces unique challenges in finding qualified truck drivers. Changes in the regulatory environment in which the industry operates have added to the constraints on companies' ability to attract and retain qualified drivers. In the final section of Chapter 5, we review some of these qualitative factors that could affect the severity of the driver shortage.

In Chapter 6, we lay out a scenario for how the gap between the demand for and supply of over-the-road truck drivers will be closed. Our analysis of the dynamics of truck driver labor force participation shows that the driver work force grows largely through workers shifting to long-distance trucking from other occupations in their mid-20s and early 30s. Given the disamenities of the job, the main factor in these job shifts must be higher pay. Drawing on Global Insight's forecasts of wage growth in other sectors of the economy, we project how truck driver wages must adjust in the next 2-3 years in order for the industry to be able to attract the number of new drivers that will be needed over the next decade.

2. ESTIMATES OF THE SIZE OF THE TRUCK DRIVER WORKFORCE

There are over 3 million truck drivers in the U.S., but the acute labor market pressures that are the focus of this study pertain primarily to drivers of heavy trucks involved in long-haul freight transportation, which is a much smaller number. In this section, we look at how the truck driver population is measured in various government statistical sources and how many drivers are reported by these various measures.

The most detailed compilation of truck driver employment is done by the Office of Occupational Statistics and Employment Projections of the Bureau of Labor Statistics. As a basis for projecting the growth of the number of jobs of all types in the U.S. economy, they develop a comprehensive picture of employment by occupation within each industry. Their current estimates and projections are based on the 2000 Standard Occupation Classification (SOC), which distinguishes three categories of truck drivers:

- Driver/sales workers (SOC 53-3031),
- Truck drivers, heavy and tractor trailer (SOC 53-3032), and
- Truck drivers, light or delivery services (SOC 53-3033).

Table 2.1 shows BLS estimates of the number of drivers in each of these occupations, economy-wide and within the Truck Transportation industry in 2002. We have also included in this table the BLS estimates of the number of self-employed drivers, because – at least in the heavy-duty truck driver occupation – these are likely to be predominantly owner operators involved in long-haul trucking. The economy-wide totals include the number of self-employed.

Table 2.1
Number of Truck Drivers in the U.S. Economy: 2002
(thousands)

Occupation	Economy-wide	Truck Transportation Industry	Self-employed
Total	3,221	785	337
1. Driver/sales workers	431	6	57
2. Truck drivers, heavy and tractor trailer	1,767	701	232
3. Truck drivers, light or delivery services	1,022	78	48

Source: BLS, Office of Occupational Statistics and Employment Projections.
(<http://www.bls.gov/oes/home.htm>)

This report is concerned with drivers in the second category, which we will refer to in brief as heavy-duty truck drivers. However, within this group we must narrow our focus still further, because the truck driver shortage is primarily affecting the Truck Transportation industry, while – as Table 2.1 shows – there are over 800,000 heavy-duty truck drivers in other industries.

Table 2.2 gives additional detail on the employment by industry of the 1.767 million heavy-duty truck drivers identified in Table 2.1. Included in this table are all industries employing at least 10,000 heavy-duty truck drivers. BLS identifies another 20 industries that employ between 5,000 and 10,000 heavy-duty truck drivers and over 50 other industries with at least 1,000 heavy-duty truck drivers.

Table 2.2
Employment of Heavy-duty Truck Drivers by Industry: 2002

	Number	Share
Total, all industries	1,767,093	100.0%
1. General freight trucking	517,845	29.3%
2. Self-employed workers, primary job	220,137	12.5%
3. Specialized freight trucking	182,885	10.3%
4. Cement and concrete product manufacturing	68,426	3.9%
5. Grocery and related product wholesalers	56,056	3.2%
6. Other specialty trade contractors	39,252	2.2%
7. Employment services	34,916	2.0%
8. Waste collection	26,950	1.5%
9. Couriers	25,151	1.4%
10. Highway, street, and bridge construction	25,057	1.4%
11. Local government, excluding education and hospitals	23,037	1.3%
12. Direct selling establishments	21,162	1.2%
13. Petroleum and petroleum products merchant wholesalers	20,971	1.2%
14. Warehousing and storage	20,517	1.2%
15. Building material and supplies dealers	20,480	1.2%
16. Support activities for road transportation	19,361	1.1%
17. Lumber and other const. materials merchant wholesalers	17,803	1.0%
18. Waste treatment and disposal	16,030	0.9%
19. Miscellaneous nondurable goods merchant wholesalers	12,940	0.7%
20. Self-employed workers, secondary job	11,959	0.7%
21. Freight transportation arrangement	11,609	0.7%
22. Beer, wine, and distilled alc bev merchant wholesalers	11,197	0.6%
23. Miscellaneous durable goods merchant wholesalers	10,736	0.6%
24. Nonmetallic mineral mining and quarrying	10,447	0.6%
25. Wholesale electronic markets and agents and brokers	10,408	0.6%
26. All other industries	331,761	18.8%

Source: BLS, Office of Occupational Statistics and Employment Projections.
(<http://www.bls.gov/oes/home.htm>)

The 232,000 heavy-duty truck drivers that are self-employed workers (as either their primary or secondary job) – appear in lines 2 and 20 of the table. Although there are owner operators that work primarily in a single industry, e.g., construction, it appears (based on data from the 2000 Census and the Current Population Survey presented below) that the Census Bureau classifies nearly all owner operators of trucks as part of the Truck Transportation industry.

There are conflicting estimates of the number of owner operators. Truck owners may come into and go out of the business as demand conditions and their own personal situations change. One recent estimate – based on data from the Census Bureau’s 2002 Vehicle Inventory and Use Survey – put the number at 390,000 or more.² Data collected in the 2002 Census of Transportation provide another bit of evidence on this. That source reports that there were 413,100 non-employer establishments in the Truck Transportation industry.³ Most of these non-employer establishments must be independent truck operators, but many of them could be in local, rather than long-distance trucking.

Our tabulations of microdata from the Current Population Survey for 2002 found 300,000 self-employed persons who reported their occupation as truck driver. However, this includes light-duty truck drivers as well as heavy-duty truck drivers. The CPS classifies most of these persons as being in the Truck Transportation industry. This result is consistent with the 232,000 self-employed heavy-duty truck drivers reported in Table 2.2. Adding this number to the number of drivers employed in General Freight Trucking and Specialized Freight Trucking, we get an estimate of the number of heavy-duty truck drivers in the Truck Transportation industry – about 933,000 in 2002.

As our subsequent analysis will show, a critical factor underlying the truck driver shortage is the job requirement to be away from home for extended periods of time. Therefore, ideally we would like to be able to further narrow the definition of the driver population that is the target of analysis to focus on heavy-duty truck drivers in long-distance freight transportation. Data from the 2002 Economic Census show that, among establishments with employment within the Truck Transportation industry (NAICS 484), about 70% of total employment is attributable to long-distance trucking and 30% to local trucking and storage. These figures apply to all employees in the industry, not just truck drivers. But if we apply this 70% fraction to the number of truck drivers employed in the industry, we get about 550,000 long-distance heavy-duty truck drivers. Adding in the owner operators of heavy trucks gives a total of approximately 780,000 heavy-duty truck drivers operating on long-haul routes in 2002.

This estimate of 780,000 long-distance heavy-duty truck drivers does not include the drivers who are employees in other industries that have dedicated long-haul fleets. This number is much more difficult to pin down, because the 800,000+ heavy-duty truck drivers that are employed outside the Truck Transportation industry may be operators of heavy equipment used in production operations (e.g., in construction, manufacturing and waste collection) or drivers involved in local (intra-metropolitan) delivery operations. Among the other industries where a high proportion of the heavy-duty truck drivers could be involved in long-distance freight operations are wholesale trade industries, which employ over 180,000 heavy-duty truck drivers. Thus, there were probably more than 1 million drivers of heavy trucks involved in long-distance freight operations in 2002, but how many more cannot be determined precisely from existing government statistics.

The analysis based on BLS data above relies on data for 2002 because the data for 2002 include estimates of self-employed drivers. BLS has released more current occupational employment data, which do not include owner operators, which show

² *Fleet Owner Magazine Online*, Dec. 13, 2004.

³ <http://www.census.gov/epcd/nonemployer/2002adv/us/TABLE2.HTM>

employment of heavy-duty truck drivers within the Truck Transportation industry in November 2003 up 2.2% compared to 2002 (Table 2.3).

Table 2.3
Heavy-duty Truck Driver Employees in the Truck Transportation Industry

Industry	2002	November 2003	Change (%)
Truck Transportation	700.7	716.3	2.2
General Freight Trucking	517.8	524.6	1.3
Specialized freight Trucking	182.9	191.7	4.8

Source: BLS, Office of Occupational Statistics and Employment Projections.
(<http://www.bls.gov/oes/home.htm>)

We turn now to estimates of the truck driver workforce based on the 2000 Census of Population and Housing. The use of data from the 2000 Census has the great advantage that it permits detailed analysis of the demographic characteristics of the truck driver workforce. But one limitation is that the occupational categories used in collecting the Census data include only a single category for truck drivers – “Driver/Sales Workers and Truck Drivers” – which combines all three detailed occupations listed in Table 2.1. To narrow the focus of our analysis as much as possible to heavy-duty truck drivers, we develop estimates for the subset of drivers that report they are working within the Truck Transportation industry.

Published reports and tables from the 2000 Census have very little data specifically on truck drivers. To get information such as the distribution of truck drivers by age or race/ethnicity, it is necessary to work with Census Bureau files that contain the responses of individual households. The largest file of this sort from the 2000 Census is the Public Use Microdata Sample (PUMS) containing the responses of 5% of all households that received the long form of the census. We extracted from this database a file containing records for all persons reporting truck driver as their occupation. This file contains data on 170,757 persons, of which 62,653 were truck drivers in the Truck Transportation industry. Table 2.4 provides summary estimates of the truck driver workforce based on the 2000 Census.

Table 2.4
Estimates of the Number of Truck Drivers from the 2000 Census
(thousands)

	Economy- wide	Truck Transportation Industry	All Other Industries
Employed Truck Drivers	3,114	1,096	2,018
Employees	2,793	866	1,927
Self-employed	321	230	91

Source: Global Insight tabulations of the 5% Public-Use Micro-data Sample of the 2000 Census.

These data closely parallel the BLS estimates described above. There were a total of 1.1 million truck drivers of all types in the Truck Transportation industry in 2000 and another 2.0 million employed in other industries. In addition to these 3.1 million truck drivers with jobs, there were 176,000 unemployed persons who reported their occupation as truck driver – for a total truck driver workforce of 3.29 million (and a truck driver unemployment rate of 5.4%).

A third source of estimates of the truck driver workforce is the Current Population Survey (CPS). The CPS is the monthly survey conducted by the Census Bureau for the purpose of calculating the nation's unemployment rate. It also serves as a primary source of information on demographic change in the U.S. between decennial censuses. We tabulated estimates of the number of truck drivers and their demographic characteristics from a public-use micro-data file created from the CPS known as the outgoing rotation group file.⁴

We tabulated estimates of truck drivers from CPS files for 1994 through 2004. However, the data for the last two years are not comparable to the earlier years, because beginning in 2003 the CPS began to use new occupational and industry classifications. Since 2003, the CPS has used an occupational classification like that used in the 2000 Census, which reports only a single truck driver occupation, combining heavy-duty truck drivers, light truck drivers and driver/sales workers. Prior to 2003, heavy-duty truck drivers were grouped with the light truck drivers, but driver/sales workers were in a separate occupational category. In this respect, the earlier CPS data give a little cleaner picture of the heavy-duty truck driver workforce that is the focus of this study. However, the industry code for the Truck Transportation industry in the CPS prior to 2003 is broader than we would like it to be. It used the old SIC-based definition of the Truck Transportation industry, which included courier services as well as trucking and warehousing.

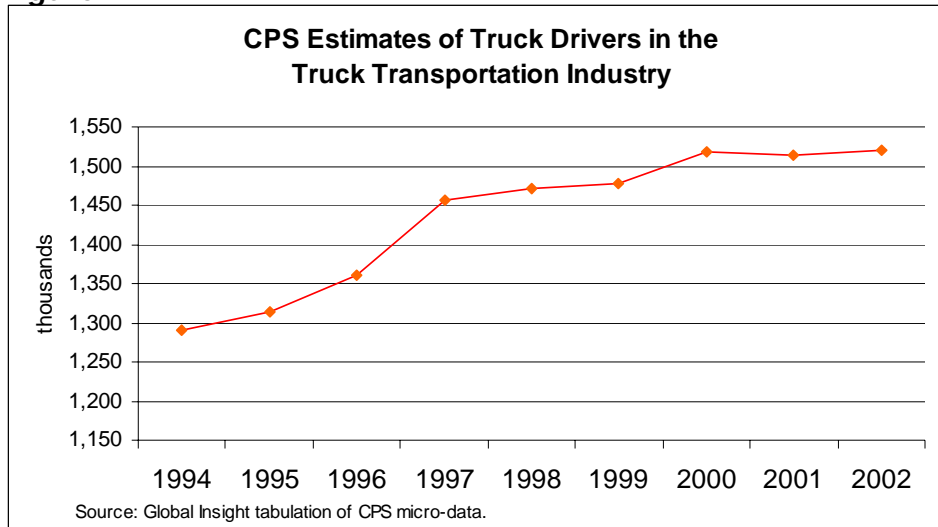
Thus, the demographic data on truck drivers we are able to compile with CPS data prior to 2003 include some drivers who are not “heavy-duty truck drivers in the Truck Transportation industry,” which are the focus of our analysis. But the time series data we construct from the CPS for 1994 through 2002 primarily reflect trends in the labor market participation of heavy-duty truck drivers. To further narrow the focus of our analysis using CPS data, we also limit the sample of observations we draw from the CPS to workers age 21 and over, because anyone reported as a truck driver under age 21 clearly can not be a long-distance heavy-duty truck driver.⁵

The outgoing rotation file of the CPS has an average of nearly 2,000 observations each year for truck drivers in the Truck Transportation industry, age 21 and over. Figure 1 displays CPS employment estimates for truck drivers based on this definition, including the self-employed (owner operators). The total of 1.5 million in 2000 is higher than the estimate tabulated from the Census of Population data largely due to the broader definition of the Truck Transportation industry. By this measure, the number of truck drivers grew steadily between 1994 and 2000, but showed little change over the following two years. Because of the definitional changes described above, we cannot extend this series beyond 2002 on a consistent basis.

⁴ The outgoing rotation group (ORG) file of the CPS contains the labor force responses of persons in one-fourth of all households in the sample each month – those who are asked questions about their current earnings as well as their labor force status.

⁵ To drive interstate freight in the U.S., drivers have to be at least 21 years old.

Figure 1



Demographic Characteristics of the Truck Driver Workforce

Table 2.5 presents summary statistics on selected demographic characteristics of truck drivers, tabulated from the 2000 Census of Population. As noted above, the

**Table 2.5
Demographic Characteristics of Truck Drivers: 2000**

	In the Truck Transportation Industry¹	In All Other Industries
Truck Drivers in the Labor Force (x1,000)	1,150	2,140
Male	1,098	1,997
Female	52	143
% Female	4.6%	6.7%
Average Age	43.1 years	40.6 years
Race:	100.0%	100.0%
White alone	80.6%	77.0%
Black alone	11.7%	12.4%
Other	7.7%	10.6%
Hispanic Origin	9.7%	13.0%
Education:	100.0%	100.0%
Less than high-school diploma	25.7%	24.7%
High-school diploma	47.6%	44.3%
Some college or college degree	26.7%	31.0%

¹Includes owner operators.

Source: Global Insight tabulations of the 5% Public-Use Micro-data Sample of the 2000 Census.

truck driver occupational category in the 2000 Census includes light truck drivers and driver/sales workers as well as heavy-duty truck drivers. The former two occupations are concentrated outside the Truck Transportation industry, and this accounts for some of the differences observed between the two columns of Table 2.5.

The driver workforce in the Truck Transportation Industry has a slightly higher concentration of males and a slightly lower incidence of minority workers. According to these Census data, the African American population is slightly over-represented among truck drivers in the Truck Transportation Industry, and the Hispanic population is slightly under-represented. Each of these two minority groups accounted for 10.7% of the overall labor force at the time of the 2000 Census.

The Public-Use Micro-Sample data from the 2000 Census can also be used to analyze the earnings of truck drivers. Table 2.6 contains tabulations of the average earnings of truck drivers, both within the Truck Transportation Industry and in all other industries. While the labor force status questions asked of persons in the 2000 Census pertained to their current occupation and earnings, the income questions asked pertained to annual earnings in the previous year (1999). We tabulated average weekly earnings because the work schedules of long-distance truck drivers could give rise to different interpretations about how many hours should be reported as work hours.

Table 2.6
Average Weekly Earnings of Truck Drivers: 1999

	In the Truck Transportation Industry		In All Other Industries	
	Share of Drivers (%)	Average Weekly Earnings	Share of Drivers (%)	Average Weekly Earnings
All Truck Drivers	100.0	\$719	100.0	\$567
Reporting Wages Only	83.6	\$694	95.2	\$562
Reporting Self-empl. Income Only	12.9	\$769	2.7	\$604
Reporting Wages & Self-empl. Income	3.5	\$1,142	2.1	\$764

Source: Global Insight tabulations of the 5% PUMS of the 2000 Census.

Owner operator's earnings should be reported as self-employment income. We included both wages and self-employment income in our weekly earnings measure. To distinguish the earnings of owner operators from those of wage earners in the Truck Transportation industry, we show their earnings on separate lines of Table 2.6. A small fraction of drivers (3.5% within the Truck Transportation industry) reported both wages and self-employment income. It is possible that some of the self-

employment income of these dual earners could be from a second job other than truck driving.⁶

These earnings figures are generally consistent with data from other sources such as the BLS occupational employment survey and the CPS, which we will discuss in greater detail below. Truck drivers in the Truck Transportation industry (predominantly long-distance heavy-duty truck drivers) earned about 25% more than truck drivers on average in all other industries. Within the Truck Transportation industry, the average weekly earnings of owner operators were at least 10% greater than employees of trucking firms.

The large number of individual truck drivers that are identified in the 2000 Census 5% PUMS data (over 60,000 observations on truck drivers in the Truck Transportation industry) makes it possible to analyze labor participation patterns in narrowly defined demographic groups of the driver workforce. A major concern in the current tight labor market for truck drivers is the aging of the existing driver workforce and the ability to attract new drivers among younger age groups of workers entering the workforce that are shrinking in size. To examine the age distribution of truck drivers, we tabulated the number of truck drivers in the Truck Transportation industry in 5-year age groups from ages 21 through 34 and 10-year age groups thereafter (Table 2.7).

Table 2.7
Truck Drivers in the Truck Transportation Industry by Age: 2000

Age Category	Number (x1,000)	Share (%)
Total	1,142.2	100.0%
21-24	38.3	3.4%
25-29	102.7	9.0%
30-34	136.8	12.0%
35-44	374.5	32.8%
45-54	300.0	26.3%
55-64	158.5	13.9%
65+	31.6	2.8%

Source: Global Insight tabulations of the 5% PUMS of the 2000 Census.

One in six drivers was 55 or older at the time of the 2000 Census, and the contingent of drivers in the 21-29 age group was small compared to older 10-year age groups. These trends point to a problem with the size of the truck driver workforce in coming years. But to put the extent of the problem in perspective, it is useful to compare the number of truck drivers in each age group with the size of that age group in the labor force as a whole. Because the truck driver occupation is so heavily dominated by males, we do this in two steps. We first compare the age distribution of the overall truck driver workforce to the age distribution of the overall

⁶ We excluded observations with weekly income over \$3,000 from these averages to avoid possible bias from misreporting of weeks worked or earnings and from owner operators reporting their gross receipts rather than net earnings.

labor force (Figure 2) and then compare the age distribution of the male driver workforce to the male labor force (Figure 3).

Figure 2

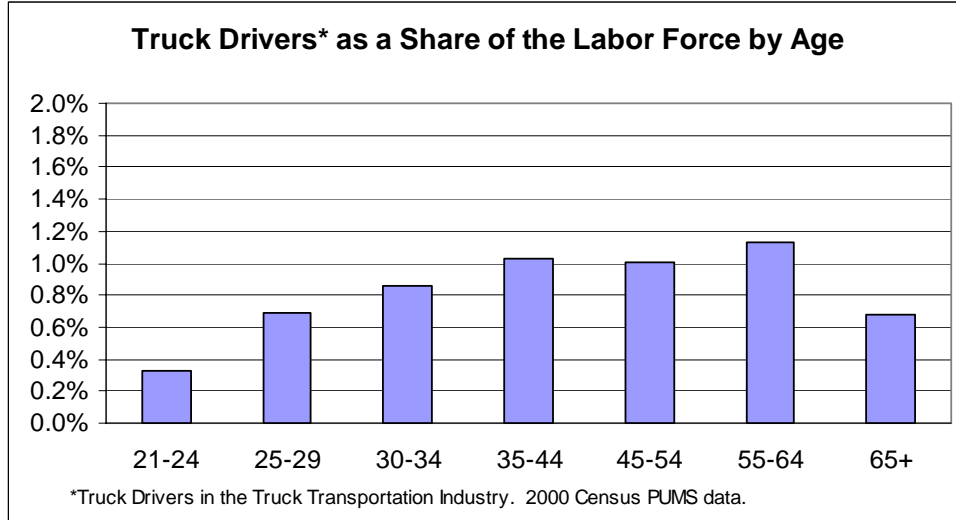
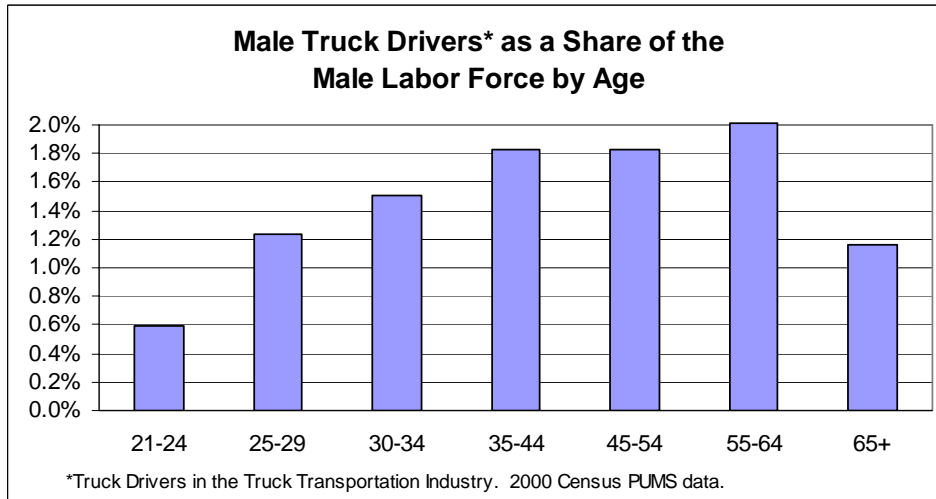


Figure 3



The basic result that flows from these charts – that the incidence of truck drivers is low among the youngest age groups of the labor force and rises gradually until leveling off after the 35-44 age group – is, at least initially, surprising given the industry’s focus on the need to attract and retain young male workers. At first glance, one might conclude from these charts that the industry once attracted a larger share of the work force – the 35-and-above cohorts who became truck drivers 14 or more years ago – but is attracting a smaller share of new entrants to the labor force in more recent years. This is possible but is not a valid conclusion to draw from this snapshot of the workforce at one point in time. We focus more directly on

changes over time in the share of truck drivers in the labor force below using CPS data over a period of years.

The pattern observed in Figures 2 and 3 reflects some general tendencies of workers at different ages to move into (or out of) the truck driving workforce, which are important to understand in evaluating the severity of the current truck driver shortage. To some extent, the different incidence of truck drivers in the labor force by age group is also affected by how much hiring was going on in the trucking industry during the period when each age cohort entered the labor force. We cannot sort out the relative importance of these factors from these charts alone, but we offer some tentative comments on the results by age group:

- The low share of workers in the 21-24 age group in truck driving reflects in part the need to get a commercial driver's license and gain experience driving before becoming a heavy-duty truck driver. Workers in this age group joined the labor force between 1997 and 2000 – a period when employment in truck transportation was growing at about the same pace as total non-farm employment, so slow hiring did not depress their share of the labor force.
- The share of truck drivers in the labor force for the 25-29 age group is double that of the 21-24 group. The point is often made that recruiting truck drivers is made more difficult by the need to wait until they are old enough to drive in interstate commerce, but these charts show the extent to which workers wait even longer to make a shift to truck driving. Indeed, some long-distance trucking companies require their drivers to be 25 years of age.
- The additional gains in the share of truck drivers in the labor force in the 30-34 and 35-44 age groups must be due to further shifting of workers into truck driving from other occupations as they age – possibly attracted by the earnings potential relative to what they were able to achieve in their previous jobs.
- At age 35 and above (through retirement age), we see a leveling off of the share of truck drivers in the workforce that could indicate less shifting into and out of the occupation. The slightly higher share of truck drivers among the 55-64 age groups may be due in part to the fact that this age cohort entered the workforce during a period (1957-1966) when trucking employment was growing faster than overall employment economy-wide, while the 35-44 and 45-54 age groups joined the workforce during periods when the increase in the number of trucking jobs lagged overall employment growth (1977-1986 and 1967-1976).
- Finally, the fall-off in the share of truck drivers in the post-65 labor force is not surprising given the job requirements compared to other occupations where persons may choose to work beyond retirement age.

Time Trends in the Share of Truck Drivers in the Labor Force

Data from the Current Population Survey for the period 1994-2002 confirm that the age differences we have just summarized represent a fairly stable pattern in the timing of when workers become truck drivers in the Truck Transportation industry. Figures 4 and 5 display the share of truck drivers in the male labor force by age group. There are some trends of change in these labor-force shares over the period, but the net changes are small. The overall share of truck drivers in the male labor force (across all age groups) increased slightly from 1.89% in 1994 to 2.10% in 2000 and then retreated to 2.06% in 2002. But at age 21-24 only 1% of the male

labor force is truck drivers. By age 25-29, this share rises to above 1.5%, and by age 30-34 it is above 2.0%, where it stays for all older age groups up to age 65.

Figure 4

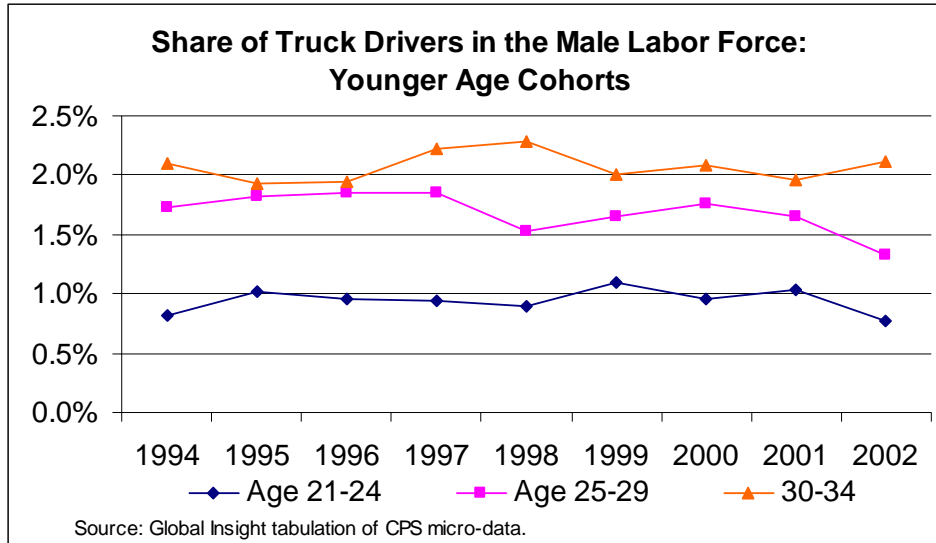
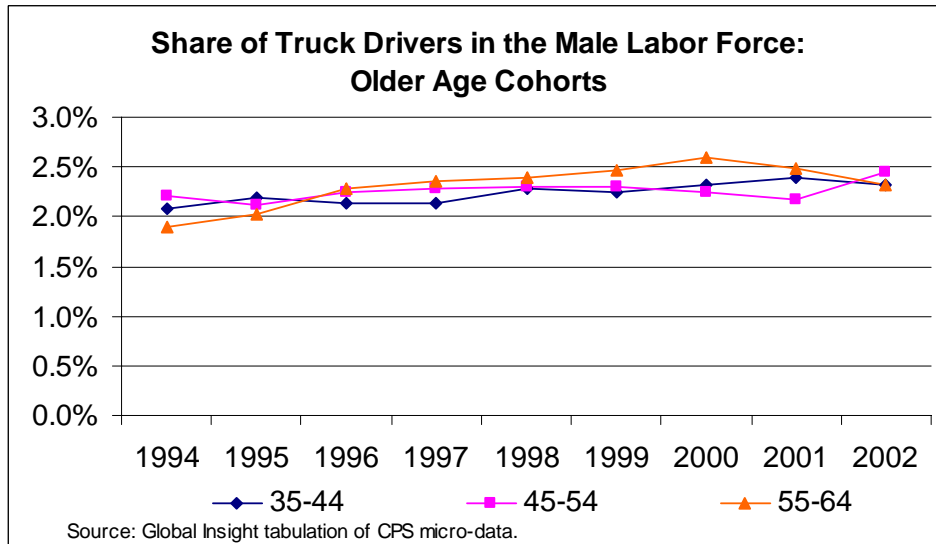


Figure 5



Although the pattern of timing of when workers become truck drivers is quite stable, even small tendencies toward change can have implications for the future severity of the truck driver shortage. There are some troubling trends, but overall the direction of change appears positive for the supply of truck drivers:

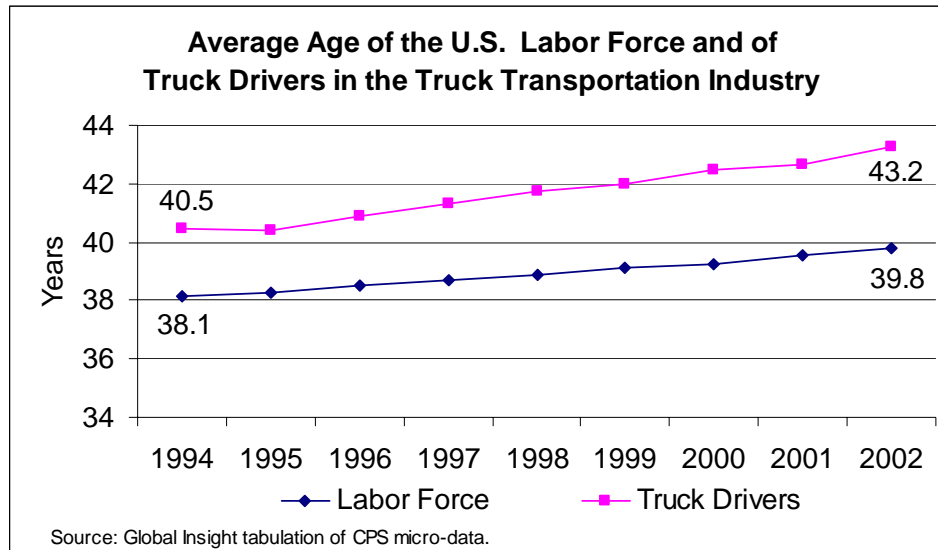
- The share of truck drivers among all workers age 21-24 has been stable. The dip in 2002 in the share of truck drivers in this age group may reflect the disproportionate impact of the economic downturn on young workers in an industry (trucking) that is more cyclical than the economy as a whole. Unfortunately, change in the occupational and industry codes employed in the

CPS after 2002 make it impossible for us to gauge whether this is the case, or whether the propensity to become a truck driver has begun to shift downward among the youngest workers.

- The trend for the group of ages 25-29 shows a slight decline when viewed from the peak share reached in 1997. But here also the drop in 2002 could be exaggerated by the business cycle.
- The share of truck drivers in the 30-34 age group has fluctuated around 2%.
- In all three of the 10-year age groups over age 35, the share of truck drivers has risen by at least two tenths of a percent. This seemingly small shift was in fact a significant development contributing to the increase in the number of truck drivers over this period. If we calculate 2002 employment of truck drivers in these three age groups on the assumption that their labor force shares were still at their 1994 levels, the overall number of truck drivers in 2002 would be 120,000 lower – a figure that represents over half of the growth of truck driver employment during this period.

The fact that truck drivers account for a larger share of the labor force in older age groups means that the average age of truck drivers exceeds the average age in the overall labor force. The trends we have just described – a rise in the share of truck drivers in older age groups, while truck drivers’ shares of younger age groups have been stable or declining – means that the gap in average age between truck drivers and the overall labor force has been widening. Figure 6 depicts this trend. The average age of the labor force increased by 1.7 years between 1994 and 2002, but the average age of truck drivers in the Truck Transportation industry increased by 2.7 years.

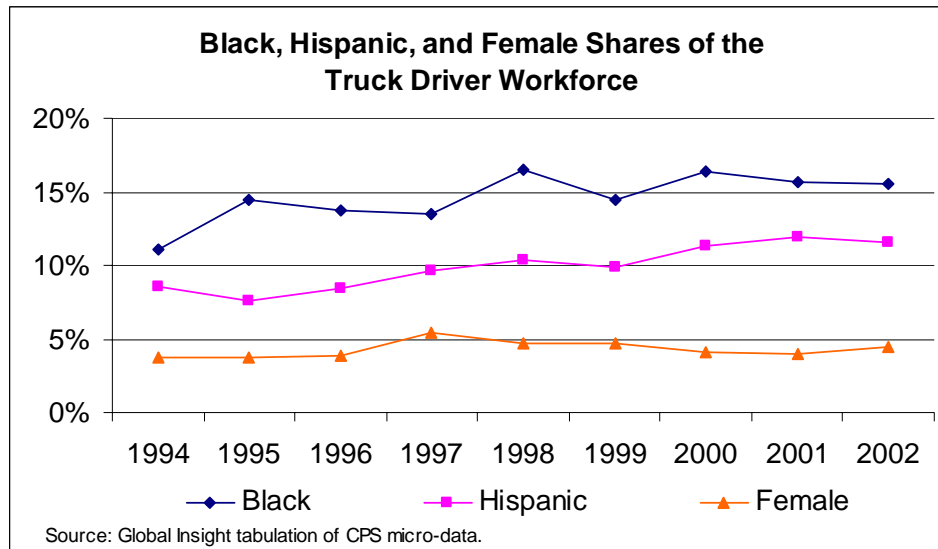
Figure 6



The CPS also permits us to examine changes over time in other dimensions of the demographic characteristics of truck drivers. Figure 7 shows the shares of African American, Hispanic and female drivers among all truck drivers in the Truck Transportation industry over the period 1994-2002, age 21 and over. The share of

female truck drivers has changed little – accounting for only 4-5% of all truck drivers. The shares of both black and Hispanic drivers have shown an upward trend. (The percentage shares for these groups in Figure 7 are higher in 2000 than the Census of Population figures cited in Table 2.1 because this Figure is based on persons of age 21 and older.) The upward trend in the share of truck drivers of Hispanic origin is a positive development for the potential future supply of truck drivers, since this is a demographic group that is projected to show strong growth.

Figure 7



As stated above, the CPS introduced new industry and occupational classifications in 2003, which permit a slight improvement in our ability to measure the heavy-duty truck driver population that is the primary focus of this study. The most recent data for 2004 show a total of 1.3 million truck drivers age 21 and older in the Truck Transportation industry, including owner-operators (Table 2.8).

Table 2.8
Truck Drivers in the Truck Transportation Industry by Age: 2004

	thousands	Share (%)
Total	1,309	100.0
21-24	29	2.2
25-29	103	7.9
30-34	152	11.6
35-44	395	30.2
45-54	356	27.2
55-64	226	17.3
65+	48	3.7

Source: Global Insight tabulations of CPS micro-data files for Jan-Oct, 2004.

3. FUTURE DEMAND FOR TRUCK DRIVERS

The Economic Outlook and Freight Trucking Growth

How many additional heavy-duty truck drivers will be needed to meet the needs of the trucking industry given the expected pace of economic growth over the next 10 years? To address this question, we first examine trends in the growth of output and employment in the Truck Transportation industry over the past 10 years (see Table 3.1). During strong growth years in the 1990s, employment grew at rates of 2-3% or more per year. During the recession and “jobless recovery” of 2001-2003, trucking employment declined each year (note: the employment series in Table 3.1 do not include the number of owner-operators). With the accelerated growth of truck tonnage in 2004, employment growth in the Truck Transportation industry as measured by BLS’s establishment survey increased 2.3% (1.6% in long-distance trucking). Our estimates of the number of truck drivers in the truck transportation industry (including owner operators) tabulated from the CPS show a 2.0% increase between 2003 and 2004.

Table 3.1
Measures of Output and Employment in Truck Transportation

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004 ^P
BLS Index of the Output of General Freight Trucking, Long-distance (NAICS 48412)											
1997=100	89.8	90.7	95.9	100.0	103.5	109.5	114.0	110.2	111.4	na	na
% change	8.7	1.0	5.7	4.3	3.5	5.8	4.1	-3.3	1.1		
ATA For-Hire Truck Tonnage Index											
2000=100	78.8	84.6	82.7	91.4	100.7	105.5	100.0	99.4	103.6	106.7	112.8
% change	10.3	7.5	-2.3	10.6	10.1	4.8	-5.2	-0.6	4.2	3.0	5.7
Employment in Truck Transportation (NAICS 484)											
thousands	1206.2	1,249	1,282	1,308	1,354	1,391	1,406	1,387	1,339	1,328	1,359
% change	4.5	3.6	2.7	2.0	3.5	2.7	1.0	-1.4	-3.4	-0.8	2.3
of which, General and Specialized Trucking - Long-distance (NAICS 48412001 and 48423001)											
thousands	744.9	777	795	809	840	863	875	858	821	808	821
% change	4.5	4.4	2.3	1.7	3.8	2.8	1.3	-1.9	-4.2	-1.6	1.6

^P2004 figures are preliminary averages based upon data through November.

Source: BLS employment – <http://data.bls.gov/cgi-bin/srgate>;
output – <http://www.bls.gov/lpc/home.htm>.

In simple terms, we can break down the problem of projecting future requirements for heavy-duty truck drivers into the following three questions:

- How fast will the economy grow over the next 10 years?
- How will the demand for freight trucking services grow in relation to overall economic growth? and

- What is the rate of employment growth in truck transportation required to achieve the output growth projected for the industry?

The Office of Occupational Statistics and Employment Projections of the Bureau of Labor Statistics addresses each of these questions in a systematic way – not just for truck drivers but for all occupations – in preparing their long-term projections of employment in the U.S. economy. Their most recent set of projections, published in early 2004, take as a base-year 2002 and project employment by occupation in 2012. Here are some of the results of these BLS projections that relate to growth of demand for heavy-duty truck drivers:⁷

- Overall economic growth, as measured by real Gross Domestic Product, is expected to increase at an average annual rate of 3.0% over this 10-year period.
- Gross output of the Truck Transportation and Couriers industry is projected to grow at an annual average rate of 3.8% and employment in this industry will grow at a 2.4% annual rate.
- Employment in the occupation “Truck drivers, heavy & tractor trailer” (including owner operators) will increase from 1.767 million in 2002 to 2.104 million in 2012 – an increase of 1.8% per year.
- Employment in this heavy-duty truck driver occupation within the Truck Transportation industry, excluding owner operators, will increase from 701,000 to 871,000 – a 2.2% average annual increase.

The macroeconomic projections underlying these employment growth results are generally consistent with Global Insight’s long-term forecast of the U.S. economy, which shows 3.3% average annual growth of real GDP over the period 2002-2012 (and 3.2% over the 10-year period beginning in 2004).

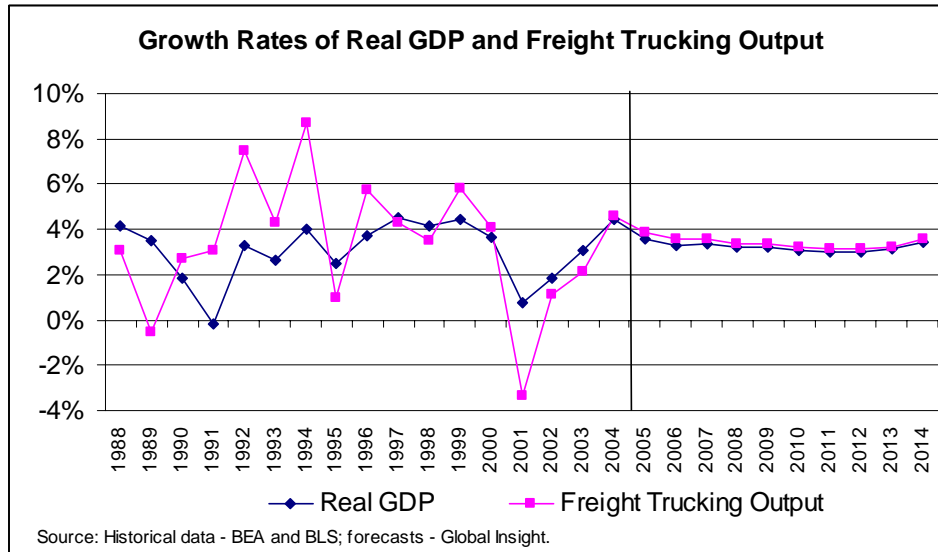
We carried out a similar forecasting exercise to develop a forecast of the annual increase in the number of net new jobs for drivers of heavy trucks in long-haul freight transportation over the period 2004-2014. We linked our employment growth projections to the BLS Index of General Long-Distance Freight Trucking shown in Table 3.1. A simple model relating the annual growth rate of this index to real GDP growth indicates that historically long-distance freight trucking output has increased at a slightly faster pace than overall economic growth, although there is a slight trend toward narrowing of the gap between these two growth rates. Over the period 1987-2002 for which this BLS index is available, long-distance freight trucking output increased at an average annual rate of 3.4% (compared to real GDP growth of 3.0%). Our forecast shows 3.4% average annual growth of trucking output over the next ten years – based on Global Insight’s 3.2% real GDP forecast (Figure 8).

Job Growth

BLS also publishes a growth index for employment in the General Long-Distance Freight Trucking industry. We developed a model relating this employment index to the industry’s output index to use in projecting growth of the demand for drivers of heavy trucks in long-haul freight transportation over the period 2004-2014. We applied this growth index to our estimate of the number of jobs in long-haul trucking

⁷ Daniel E. Hecker, “Occupational Employment Projections to 2012,” *Monthly Labor Review*, February 2004, pp. 80-105; Jay M. Berman, “Industry Output and Employment Projections to 2012,” *Monthly Labor Review*, February 2004, pp. 58-79; and <http://www.bls.gov/oes/home.htm>.

Figure 8



in 2004. As our review in Chapter 2 of all the data sources that measure trucking employment in various ways showed, this is a hard number to pin down. Not all of the truck drivers in the Truck Transportation industry are heavy-duty truck drivers, and only a fraction of the heavy-duty truck drivers outside the Truck Transportation industry are long-haul freight carriers. The employment estimate for 2004 that we developed from the CPS – defined as truck drivers in the Truck Transportation industry age 21 and over, including owner operators – includes some light truck drivers we would like to exclude and misses some long-haul drivers in private fleets who are classified in other industries. We cannot reliably estimate these offsetting effects, so we accept this CPS figure – 1.31 million – as our 2004 estimate of the number of long-haul heavy-duty truck drivers.

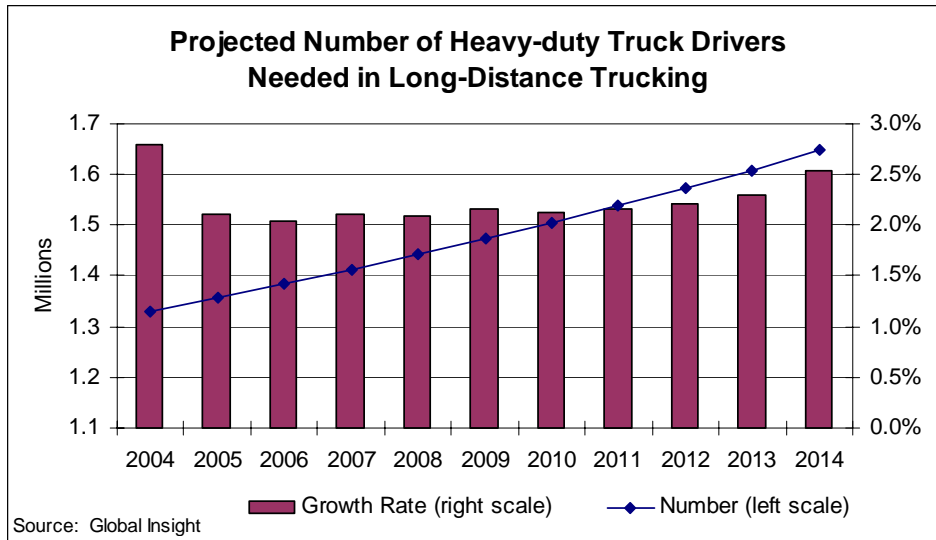
Widespread anecdotal evidence indicates that the number of truck driver jobs already exceeds the number of employed truck drivers. Numerous trucking companies report having job openings that they cannot fill, which is leaving trucks idle and forcing them to turn away business. One indication of the size of the shortfall in the supply of heavy-duty truck drivers that has already developed is the weak growth of employment of heavy-duty truck drivers in 2004 – about 2% – compared with the strong growth in truck tonnage – 5.7% as measured by the ATA for-hire truck tonnage index. Historically, a volume increase of this magnitude would have been accompanied by employment growth of 3% or more. Moreover, output growth has already been constrained by the driver shortage. Therefore, in establishing our baseline figure for the number of truck driver jobs in 2004, we boost the 1.31 million employment figure by 1.5%, adding an estimated 20,000 current job vacancies.

We project an increase of 320,000 in the number of heavy-duty truck drivers needed between 2004 and 2014. This growth in the number of jobs is lower than the BLS 10-year increase cited above because we are focusing on a narrower subset of heavy-duty truck drivers (i.e., long-haul in the for-hire industry). However, the average annual rate of job growth that we project – 2.2% -- is generally consistent with the BLS projections. Figure 9 shows the annual percent increases between

2004 and 2014 and the rise in the overall number of jobs over his period from 1.33 million to 1.65 million.

This increase of 320,000 jobs represents only the net increase in employment required to support growth of truck freight transportation over the period. It does not include the hiring needed to replace drivers who will retire or leave the occupation for other reasons, and it does not reflect the substantial amount of hiring that trucking companies must do each year as a result of job switching (“churning”) within the industry. We address these additional hiring demands in the following chapter, where we discuss the impact of demographic trends on the industry’s ability to accomplish these hiring needs.

Figure 9



4. THE POTENTIAL SUPPLY OF TRUCK DRIVERS

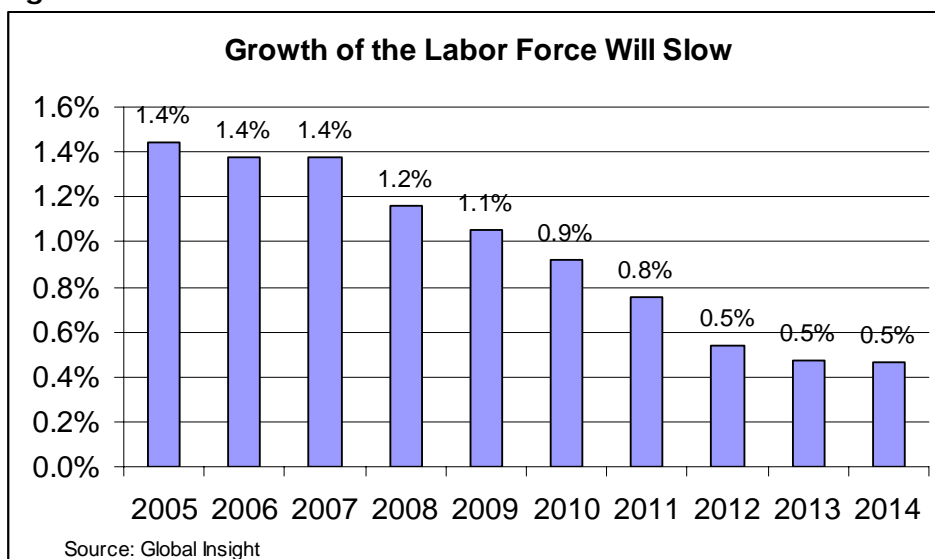
Future Demographic Trends

As noted above, the strong growth in truck shipping requirements that has accompanied the economic recovery of the last two years has already resulted in a shortage of qualified heavy-duty truck drivers. The concern is that the situation will only get worse in coming years as adverse demographic trends severely limit the size of the pool of workers that traditionally have filled trucking jobs:

- The first great demographic challenge is that over one-fifth of all heavy-duty truck drivers are 55 or older, and replacements must be found for nearly all of these drivers over the next 10 years, since only a small fraction of heavy-duty truck drivers continue to work past age 65.
- The ability to replace these drivers will be constrained in part by insufficient growth of new entrants into the labor force to offset retirements. Global Insight's projections show that overall growth of the labor force will steadily decelerate after 2007 from a 1.4% annual pace to only 0.5% growth in 2014 (Figure 10).
- But an even greater challenge for the trucking industry, given the tendency of a rising share of the male labor force to go into truck driving with age through the late 30s, is that growth of the middle-age groups that are critically important to truck driver employment (35-44 and 45-54) will be flat or declining over the next 10 years.

The demographic threats to the future growth of truck driver employment are evident from Census Bureau population projections released in the spring of 2004. Because the female population contributes only a small share of truck driver employment, and the historical data summarized above do not give evidence of an increasing trend in the share of female drivers, we focus on projections of the male population. Table 4.1 presents the Census Bureau's projections for male population growth over the next 10 years in the age groups used in the analysis of truck driver labor participation above.

Figure 10



As an aid in interpreting the significance of these demographic shifts, the far right column of this table shows the share of each age group in total truck driver employment. Thus, the 95.9% in the 'Total' row indicates that the male population comprises all but 4.1% of total truck driver employment, and the percentages for the seven age groups sum to 95.9% (except for rounding).

Table 4.1
Census Bureau Projections of the Male Population, Age 21 and Older
(thousands)

	2004	2014	Change, 2004-14	Growth, 2004-14	Reference: Share of Total Truck Driver Employment in 2003
Total, 21+	99.839	111.714	11.875	11.9%	95.9%
21-24	8.500	9.102	0.602	7.1%	2.1%
25-29	9.790	11.109	1.320	13.5%	7.8%
30-34	10.202	11.031	0.829	8.1%	11.2%
35-44	21.859	20.437	-1.421	-6.5%	28.8%
45-54	20.415	21.498	1.083	5.3%	26.0%
55-64	13.996	19.104	5.109	36.5%	16.4%
65+	15.078	19.432	4.354	28.9%	3.5%

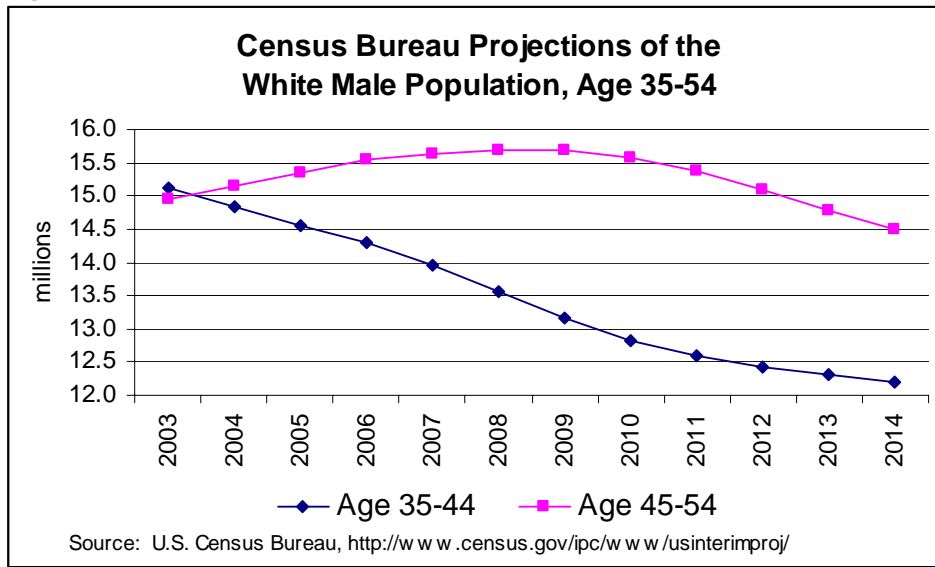
Source: U.S. Census Bureau, <http://www.census.gov/ipc/www/usinterimproj/>

The total population of age 21 and older will grow by 1.2% per year. The number of males age 55-64 shows the strongest growth – increasing by over one-third. As noted above, the large number of truck drivers who are currently age 55-64 and headed for retirement over the next 10 years poses a threat to the supply of truck drivers. But the increase in the size of the 55-64 age group can actually be a positive development for truck driver supply within this time frame – as long as the very high current incidence of truck drivers in the labor force continues to be maintained among those moving into this age group.

The big threat to the potential supply of truck drivers over the next 10 years is that the number of males age 35-44 will fall by 6.5% over this period. This age group currently accounts for 29% of all truck drivers. The situation in the age 45-54 male population group – which accounts for another 26% of all truck drivers – is little better. The size of this group will increase by only 5.3%.

When we narrow the focus to white males in these age groups, the demographic trends are found to be even more adverse. Much of the population growth that is projected to occur among middle-aged males will be in the Hispanic and other minority populations. The number of white males of age 35-44 will decline by 17.7% over the next 10 years. The number of white males of age 45-54 will rise slightly over the next five years but by 2014 will be 4% below the 2004 level (see Figure 11).

Figure 11



Projections of the Supply of Truck Drivers

What will be the impact of these demographic developments on the number of U.S. workers who opt to become heavy-duty truck drivers over the next 10 years? We have seen above that: 1) there are sharp, yet systematic, differences in the propensity of workers in different demographic groups to become truck drivers, and 2) there are widely divergent trends in expected population growth by age, race, and ethnicity. In order to capture the impact of both sets of factors, we developed projections of the U.S. labor force on a disaggregated basis by age, sex and race/ethnicity and examined the impact of alternative assumptions about future change in the propensity of workers in each demographic group to become truck drivers.

The disaggregation of the labor force that we chose for this analysis first divided the overall population along the following lines:

- White males, nonhispanic
- Hispanic males
- All other males
- All females

This categorization permits us to take into account the divergent population growth trends across these groups and to examine the impact on the total supply of truck drivers of alternative assumptions about increases in the number of women and minorities who chose to become truck drivers. We further divided each of these four groups into the seven age categories employed in the analysis presented in Chapter 2 (21-24, 25-29, 30-34, 35-44, 45-54, 55-64, and 65+). This creates a total of 28 demographic cells.

Using data from the CPS for 2004 as a base year, we compiled estimates of the number of people in the labor force in each of these 28 demographic cells. Our projections of the growth of the labor force in each of these cells were based on the simplifying assumption that labor force participation by workers in each cell would be constant. That is, we applied the growth trend from the Census Bureau's population projection for each demographic group to the base-year 2004 estimate of the size of the labor force in the group. (Published data from the Census Bureau's latest population projections can readily be aggregated into these 28 categories.)

This set of detailed labor force projections provided a basis for examining the impact of alternative assumptions about change over time in the share of truck drivers among all workers in each demographic group – ratios that we will refer to as truck driver participation rates. These ratios were developed from the time series analysis of truck driver labor force behavior using the CPS in Chapter 2. Because this categorization into 28 demographic cells creates some small population groups, with associated small sample sizes in the CPS, we analyzed trends in these truck driver participation rates based on a moving average of the annual time series for each population group.

Initially, we developed two scenarios of future growth of the supply of truck drivers using this approach:

Baseline. In this scenario, we hold the truck driver participation rate in each of our 28 demographic cells constant over the next 10 years. Thus, for example, we know that currently 1.9% of the white male labor force of ages 45-54 are truck drivers; we assume that share will remain constant. The same assumption is made for each of our 28 demographic cells. This scenario reveals the pure impact of the change in the demographic mix of the labor force over the next 10 years due to differing rates of growth by age, sex and race/ethnicity.

Trend. To develop this scenario, we examined the trend since 1994 in the truck driver participation rate in each demographic cell and judgmentally extrapolated this trend to 2014 in a linear fashion. For example, the share of truck drivers in the Hispanic male labor force of ages 25-29 rose by about 0.2 percentage points between the mid-1990s and 2002; we projected a further increase, but of a slightly smaller magnitude. Where the share of truck drivers in the labor force in a demographic group showed a declining trend, we projected a further decline but at a reduced pace. Truck driver participation rates that showed no trend over the historical period were held constant in the forecast. This scenario provides an insight into the growth of the supply of truck drivers if recent trends in the propensity to choose the occupation persist.

The results of this forecasting exercise are displayed in Figure 12. Under the Baseline scenario, i.e., assuming no change in the propensity of persons in individual demographic groups of the labor force to become truck drivers, the supply of truck drivers is projected to grow by 11.2% from 1.31 million in 2004 to 1.46 million in 2014. This increase of only 150,000 drivers is far short of the projected requirements for heavy-duty truck drivers in long-distance trucking over the next 10 years. However, a significant finding from this simple exercise is that the adverse demographic trends that will affect the trucking industry are no worse than the trends affecting growth of the overall labor force. The increase in the total size of

the labor force in this Baseline scenario is projected to be only 10.0% – 1.2% slower growth than that projected for the supply of truck drivers. What this means is that the cumulative impact of shifts in the demographic mix of the labor force over the next 10 years will have about the same adverse impact of the supply of truck drivers as on labor supply in the economy at large. The problem the trucking industry faces is one that will be faced by many other industries in which output and employment are expected to increase at a pace that equals or exceeds the overall rate of economic growth.

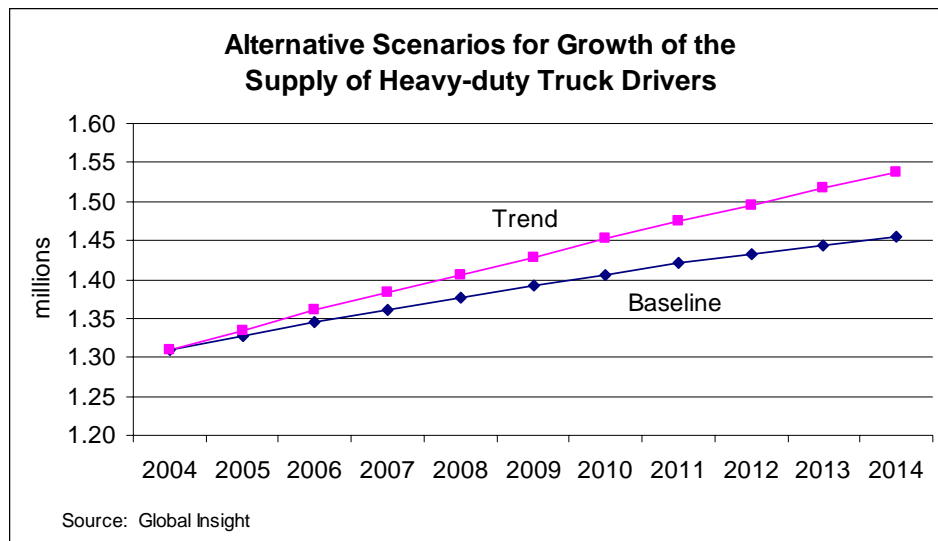
If we break the results of the Baseline scenario down into the 28 demographic cells of our forecasting model, the most adverse impacts on the future supply of heavy-duty truck drivers come from:

- The declines in the white male labor force in the 35-44 and 45-54 age groups, and
- Below average growth of white males age 30-34 and in the ‘other minority’ male group of age 35-44.

But the potential supply of truck drivers gets a boost from:

- A big increase in the white male age 55-64 group, which currently accounts for 13% of all heavy-duty truck drivers, and
- Strong growth in all of the Hispanic male age groups from age 30 to 64; in each of these age groups, Hispanic males account for a higher percentage of truck drivers than they do of the overall labor force.

Figure 12



While the Baseline scenario reflects the impact on the supply of truck drivers of changes in the demographic mix of the labor force, the Trend scenario indicates whether the changes that have been taking place over the past 10 years in the propensity of workers in different demographic groups to become truck drivers are favorable or unfavorable to the supply of truck drivers. In this scenario, the potential supply of truck drivers rises from 1.31 million in 2004 to 1.54 million in

2014 – a 17.5% increase. The fact that the job gain is projected to be higher under the Trend scenario means that on balance current trends in the propensity of workers in individual demographic groups are positive. Among the negative trends projected to continue in this scenario are further declines in the share of white males age 21-24 and age 25-29 who become truck drivers. Among the positive trends that outweigh these negative developments are:

- Small increases in the share of white males who become truck drivers in the 35-44 and 55-64 age groups;
- Further increases in the share of Hispanic males who become truck drivers in all age groups except 21-24, and
- Small increases among some age groups of other minority males.

The increase in the potential supply of heavy-duty truck drivers over a 10-year period calculated in these two scenarios represents a net increase in the number of truck drivers, with new entrants into the occupation replacing retirees (and those who leave for other reasons) as well as filling new job openings. We can get an indication of the magnitude of the need to replace retiring truck drivers by following each age cohort of drivers in 2004 as it ages 10 years by 2014.

Table 4.2 presents underlying data from the Trend scenario described above. The net increase in employment over the 10 years is 229,000 (the total in column 5). The age structure of the truck driver workforce in 2004 is shown in column 2. Drivers in these age cohorts are all ten years older in 2014; the rows in columns 3-4 are staggered to show this.

Table 4.2
Cohort Analysis of the “Trend” Scenario
(thousands)

Age Groups in 2004 (1)	2004 Employment (2)	Age Groups in 2014 (3)	2014 Employment (4)	10-Year Change (5)
Total	1,309	Total	1,538	229
21-24	29	21-29	147	147
25-34	255	30-34	165	136
35-44	395	35-44	420	165
45-54	356	45-54	389	-6
55-64	226	55-64	339	-18
65+	48	65+	79	-147
				-48
				Driver attrition in four oldest age categories: -219
				Increase in drivers in three youngest age categories: 448

Changes that take place over the 10-year period described by Table 4.2 can be summarized as follows:

- The 147,000 drivers of age 21-29 in 2014 are new entrants; they were not in the labor force (or at least not eligible to become interstate truck drivers) in 2004.
- Workers in the 21-24 age group in 2004 are (approximately) in the 30-34 year old age group in 2014. Table 4.2 shows an increase of 136,000 drivers in this cohort. This reflects the basic finding of our analysis of truck driver labor force participation in Chapter 2. As the young male labor force ages from early 20s to early 30s, the share of the age cohort that chooses truck driving as an occupation rises substantially.
- The increase of 165,000 in the number of workers who are truck drivers in the cohort that is age 35-44 in 2004 and 35-44 in 2014 reflects a continuation of this shifting into the truck driver occupation in this age range.
- After age 45 until retirement age, the share of truck drivers in the labor force stabilizes; there are small net losses in the truck driver workforce in these age cohorts.
- The net losses of 147,000 and 47,000 truck drivers in the last two rows of Table 4.2 must be interpreted as primarily retirements.

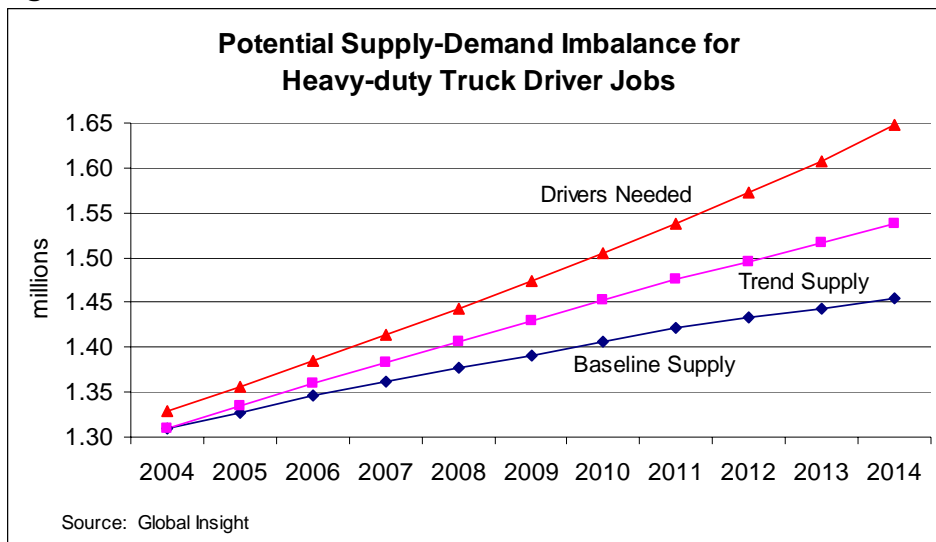
Overall, a total of 219,000 truck drivers that are currently in the older age groups must be replaced by new entrants to the occupation. This means that the gross number of new truck drivers required is 448,000. Only one-third of these will come from persons who have not yet entered the workforce. Two-thirds will be attracted to long distance trucking from another occupation.

Although we have referred to this higher number of 448,000 new truck drivers needed – or nearly 45,000 per year – as the “gross” requirement, because it takes into account absolute growth in certain age categories in addition to replacing retirees, it represents gross hiring needs only in this limited sense. Since drivers are constantly leaving the occupation in all age groups, the number of new drivers that must be recruited and trained is even larger. We do not have an estimate of the number of drivers who leave the occupation permanently each year. Finally, all of this hiring of drivers that are new to long-haul truck driving will take place within the context of the substantial amount of job switching between companies that characterizes the industry.

5. THE IMBALANCE IN THE TRUCK DRIVER LABOR MARKET

The “Trend” scenario of the future supply of truck drivers in the previous chapter reflects some encouraging aspects of demographic trends and shifts in the incidence at which workers chose truck driving as an occupation. The assumptions underlying this scenario make it an entirely achievable outcome; we can disregard the more pessimistic Baseline scenario. Yet this Trend scenario still falls far short of meeting the demand for heavy-duty truck drivers over the next 10 years that was projected in Chapter 3. The imbalance between the demand for and potential supply of truck drivers widens from 20,000 in 2004 to 45,000 in 2009 and then accelerates to 111,000 by 2014.

Figure 13



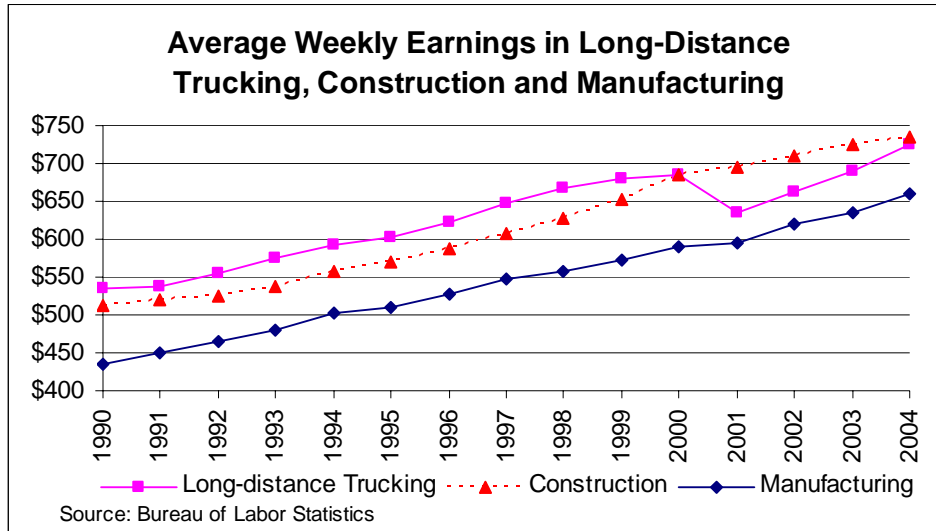
Although productivity improvements (or longer work-hours per driver) could make it possible to achieve output growth with a smaller increase in the number of drivers, it is unlikely that an employment gap of this magnitude can be offset by these factors. The macroeconomic forecast underlying these projections already includes fairly optimistic assumptions about labor force growth. Therefore, closing the gap implies attracting a higher share of the labor force into the truck driving occupation. And the primary means by which more workers are drawn into long-distance trucking is likely to be higher wages.

Wage Trends

Indeed, a change in the competitive position of wages in the freight trucking industry may be responsible for some of the increased difficulty that trucking companies have experienced in attracting and retaining qualified drivers in the past year. An industry that is often identified as a competitor for labor is the construction industry, which is relatively comparable to trucking in terms of pay and educational requirements. Manufacturing might also be cited as an alternative occupation, but declining employment levels for many years make getting a manufacturing job a less viable option. Average weekly earnings of production workers since 1990 in the General

Long-distance Freight Trucking industry and these two competitors in the labor market are displayed in Figure 14.

Figure 14



Throughout the 1990s, average earnings in long-distance trucking were above those in construction, generally maintaining a 6-7% edge. Construction earnings, in turn, were on average about 13% higher than weekly earnings in manufacturing. With the onset of recession and the sharp downturn in trucking that began in early 2000, earnings in long-distance trucking slowed to only 0.5% growth in 2000 and then contracted sharply – down 7.1% in 2001. Earnings growth slowed in construction and manufacturing during the recession but remained positive.

Since the end of the recession, weekly earnings in long-distance trucking have made up some lost ground, increasing by about 4% each year in 2002 and 2003 and 5.1% in 2004, while earnings growth in construction averaged just 2%. However, average weekly earnings in long-distance trucking – at \$725 in 2004 – still remain below the \$736 per week figure in construction. Construction jobs have provided a viable alternative to truck driving over the past four years since housing construction remained one of the steadying forces of the economy during the recession and the “jobless” recovery of 2002-2003.

If the trucking industry is to attract the higher share of workers that it needs to achieve the growth projected over the next 10 years, it will be necessary for earnings in the industry to, at a minimum, return to the relative wage position that prevailed during the 1990s. At present, weekly earnings in long-distance trucking are 1.5% below the average in construction, and the wage advantage of long-distance trucking over the construction industry during the 1990s was 6-7%. Thus, average earnings in long-distance trucking will have to increase by at least 8 percentage points more than earnings growth in construction in the near future in order for the industry to regain the relative wage position it maintained during the 1990s. However, given the need to capture an even higher share of the labor force than truck drivers represented during the 1990s and the increasing constraints

placed on the trucking industry by regulatory requirements discussed below, the size of the wage increase needed will be even larger.

Non-monetary Factors

Although wages clearly must rise substantially to resolve the imbalance in the demand for and supply of long-haul truck drivers, the current tight job market for drivers – the ready availability of job options for dissatisfied workers – has made it more essential to address non-monetary aspects of the job as well. That wages have gone up much more sharply than the 5.1% average at some major carriers is evidence of the fact that the driver shortage is affecting different segments of the trucking industry to different degrees. Firms impacted the most are the companies with less flexibility to address the major negative aspect of the long-haul truck driver's job – extended periods on the road away from home. The companies that are experiencing lower turnover rates are those that are more able to give drivers predictable schedules and also to be more flexible in scheduling to accommodate drivers' family obligations. Large and small companies alike are realizing that the marginal loss in productivity that may result from designing schedules to get drivers home more often must be weighed against the high cost of turnover.

The analysis of the extent of the driver shortage in terms of the size and projected growth of different demographic groups above abstracts from an important dimension of the driver shortage – the need to find qualified drivers. Despite the severe shortage, many firms continue to reject a very high percentage of driver applicants. Background checks filter out some applicants, as felony and drug convictions limits the pool of potential drivers. Although the statutory minimum age to become a long-haul truck driver is 21, many companies set a minimum hiring age of 25, and some major firms hire only experienced drivers. Driver safety remains a dominant concern; the cost of lowering hiring standards can be higher costs in the long run when accidents result in increased insurance premiums.

The Regulatory Environment

The challenge of finding qualified drivers has grown in recent years, as heightened concerns with security and safety have resulted in new regulatory requirements for the freight trucking industry. Some of these regulatory measures – implemented for public and driver safety purposes – impact the industry's ability to hire and retain qualified truck drivers. Compliance with standards may increase the cost of hiring and employing truck drivers, as well as other operational costs of running a motor freight business. Moreover, by raising the bar on becoming a truck driver, some policies may have the effect of making alternative occupations more appealing to potential truck driver candidates. For example, entering the construction industry as a laborer or a semi-skilled worker does not entail the level of certification, licensing, and checks, required for the trucking industry. Some examples of recent regulatory actions that may make solving the driver shortage more difficult are listed below.

Background Checks for HazMat Endorsement

The Transportation Security Administration (TSA) has issued rules requiring fingerprint-based Criminal History Background Checks for commercial drivers seeking, renewing or transferring a Hazardous Materials Endorsement (HME). Since almost any driver might be required to carry a HazMat load at some time,

the endorsement creates a de facto requirement for about 2.7 million drivers, according to TSA. TSA has estimated that in its first year of implementation, this regulation could result in a 20% reduction in the pool of qualified HME drivers.

The English Language Requirement

This provision requires that drivers of commercial motor vehicles (CMVs) operating in interstate commerce be able to "read and speak the English language sufficiently to converse with the general public, understand highway traffic signs and signals, respond to official inquiries, and make entries on reports and records." This may limit the ability to attract more drivers among the recent immigrant population.

Health Standards of the Federal Motor Carrier Safety Administration

The Federal Motor Carrier Safety Administration recently revised its medical standards and the wording of medical forms used to evaluate truck drivers regarding the recommended blood pressure threshold. With the threat of malpractice should a physician exercise judgment that goes outside the instructions, medical liability issues are almost always going to disqualify the driver if they do not meet these guidelines.

Mandatory Training Requirements

The Federal Motor Carrier Safety Administration issued a new regulation in May 2004 setting mandatory training requirements for entry-level CDL drivers. Newly hired entry-level drivers cannot operate a commercial vehicle in interstate commerce without the required training.

Hours of Service

New hours-of-service (HOS) regulations allow drivers to have more regular on-duty hours and increase the potential for quality sleep to reduce fatigue and increase driver alertness. Many drivers apparently favor the new regulations because they have resulted in reduced turnaround time at docks. Since waiting time at customer sites is now charged against duty time, in the current capacity-constrained environment, trucking companies are succeeding in imposing holding charges on shippers for delays in loading and unloading. The main impact of the new regulations on long-haul trucking companies, however, has been to reduce driver productivity by an estimated 3%, which in itself has exacerbated the driver shortage.

Insurance Company Limitations on the Hiring of Truck Drivers

Insurance premiums for trucking companies have increased substantially in the last four years. A higher level of litigation and increased size of claim awards have contributed to this trend. In response, insurance deductibles and self-insurance retention (SIR) figures have gone up, especially for bodily injury and physical damage (BIPD). Along with the risk of greater loss from claims has come increased oversight of trucking companies' operations by insurance companies. This may include review of hiring practices and restrictions of driver qualifications. Hiring below-average drivers, in terms of safety, is too risky and costly.

Driver Safety History Screening

The Federal Motor Carrier Safety Administration recently revised its regulations concerning safety screening of drivers during the hiring process. As a result of this regulation, trucking companies must seek additional information from a driver's previous employers, including more detailed accident and drug and alcohol testing history. This revised regulation also requires a driver's previous employer to provide this information – closing a loophole that existed in the safety regulations for years. With the closing of this loophole, and the enhanced information sharing, drivers are being screened much more tightly, which is likely to result in some drivers not being hired as easily, forcing some to depart the industry.

Immigration Law

The H2-B nonimmigrant visa program permits employers to hire foreign workers to come to the U.S. and perform seasonal temporary nonagricultural work. However, there is a ceiling limit of 66,000 H2-B visas per year, which is reached in a rather short period of time due to demands in various sectors of the economy for such workers. There are discussions for increasing the ceiling-number of visas, but it is not likely to move much higher.

Another immigration initiative under discussion would seek to allow illegal immigrants already working in the country to work legally for a specific period of time (two years) after which time they would have to return to their home country before being able to re-apply to return to the U.S. to work.

Implementing NAFTA's Trucking Provisions

In November of 2002, President George W. Bush lifted the moratorium on operations by Mexican trucks to transport international cargo to and from the U.S. and Mexico. After a legal challenge to the U.S. Department of Transportation rules establishing the application process for Mexican carriers, the Supreme Court ruled that DOT could move forward with the processing of applications. The access provisions of NAFTA provide Mexican carriers the same access that Canadians already have. However, the FMCSA is still working with Mexican authorities on how to conduct safety inspections for Mexican carriers in Mexican territory, as required by statute, of a certain percentage of Mexican trucking companies applying. All Mexican motor carriers transporting international cargo to and from the U.S. must comply with all regulations that U.S. motor carriers have to comply with, including environmental, safety, fiscal, insurance, etc. A few U.S. truckload carriers are experimenting with Mexican drivers journeying beyond the border-hugging commercial zone, where Mexican truckers have long been allowed to operate. However, this is unlikely to solve the driver shortage any time soon, despite the significantly lower wages Mexican drivers would be paid. The cost of insuring Mexican drivers is still daunting and, together with the cultural and linguistic challenges, could nullify savings from lower wage pay.

6. RESOLVING THE IMBALANCE

As stated in the previous chapter, the assumptions underlying our Trend scenario of the future supply of long-haul truck drivers require the continuation of some favorable trends in truck driver labor force participation. In particular, the industry must retain the substantial number of drivers currently in the age 45-54 cohort as they become the age 55-64 group of 2014. And the industry must absorb a higher share of drivers in fast-growing minority groups. Figures 15 and 16 show how the composition of the driver workforce will change under these assumptions.

Figure 15

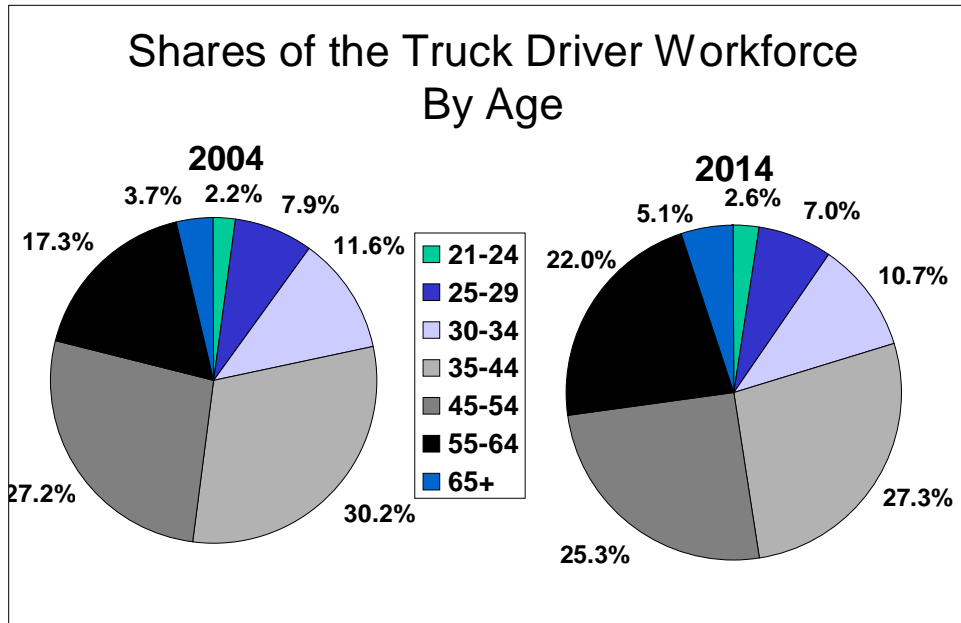
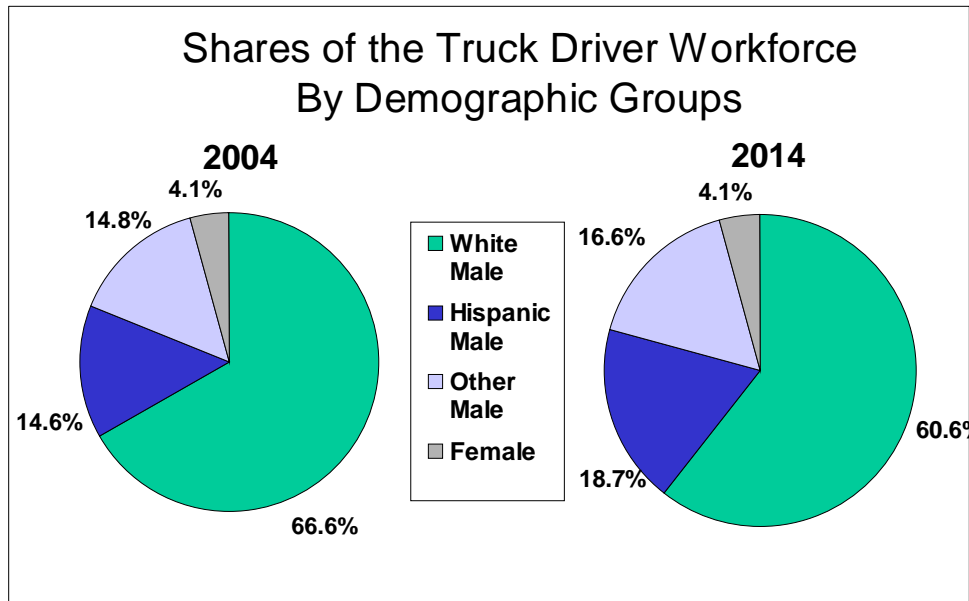


Figure 16



Although the Trend scenario of truck driver supply is an entirely achievable outcome, even this favorable scenario falls short of meeting the projected demand for heavy-duty truck drivers over the next 10 years. The imbalance between the demand for and potential supply of drivers widens from 20,000 in 2004 to 111,000 by 2014.

While this gap is large in absolute terms, closing it would require increasing the share of truck drivers in the labor force by only about the amount that this ratio rose during the strong growth years of the 1990s (111,000 jobs is less than 0.1% of the total labor force). To achieve the increase in the number of truck drivers projected in the Trend scenario, long-haul trucking wages must, at a minimum, return to the relative wage position that prevailed during the 1990s. However, given the need to capture an even higher share of the labor force, and to do this in a new regulatory environment that places greater constraints on the pool of qualified applicants for truck driver jobs, the size of the wage increase needed will be even larger.

The ability of the Truck Transportation industry to implement sizable wage increases is limited by the highly competitive nature of the industry. Wages cannot go up without the ability to recoup these costs through higher freight rates. The trucking industry is a highly fragmented industry with a few large carriers that are publicly listed companies and many small firms. In 2004, there were more than 573,000 U.S. carriers on file with the U.S. Department of Transportation, including for-hire, private fleets, and owner-operators. Approximately 96% operated 20 or fewer trucks, and more than 87% operated six trucks or less. Operating in such keen competition, most carriers have very little pricing power as long as there is any excess capacity.

Over the past year, however, the expanding economy and the driver shortage have created a capacity shortfall that made it possible for firms to begin to pass along the costs of higher wages (as well as sharply higher fuel costs). The 5.1% increase in long-haul trucking industry weekly earnings in 2004 reported in government statistics is an average that masks much larger increases in some segments of the industry. Some major carriers increased driver wages by 10% or more in 2004. Others plan such increases in 2005. In some cases driver pay will see an increase for two years in a row, which has not occurred for several years. It has become common for industry analysts to comment that wages must go from the current \$40,000+ a year to \$65,000 to solve the driver shortage problem.

The need to attract workers who will accept the disamenities of the long-haul truck driving job and can satisfy the additional qualification standards summarized above accounts for the premium long-haul truck drivers have been paid in the past over comparable workers in other occupations. In Chapter 5, we adopted the difference between weekly earnings in long-distance trucking and the construction industry as a measure of the wage differential that prevailed during a period of strong growth in truck driver employment. Global Insight's Cost Planning Service expects future wage growth in the construction industry to be modest – averaging 2.2% annually over the next three years – as a slowdown in the housing market cools the pace of total construction employment growth.

In 2004, average earnings in long-distance trucking were still 1.5% below those in construction. Thus, to return to the relative wage position of the 1990s, truck driver wages will have to exceed the growth of construction wages by at least 7-8% over some period of time. Moreover, we have argued that the premium that long-haul trucking companies must pay to attract the drivers needed over the next 10 years

will be higher than the wage differential that prevailed during the 1990s. However, since we have no empirical evidence on the elasticity of truck driver labor supply with respect to wages, we can only guess at how much higher wages must go.

Based on Global Insight's forecast of construction wages, if annual wage increases in long-distance trucking continue at the 5.1% pace recorded in 2004, it would take three years to regain the relative wage position the industry experienced in the 1990s and at least four years to achieve a larger differential that might support attracting an increasing share of the labor force into long-distance trucking. This is unlikely to be an workable time frame for reducing the truck driver shortage. We expect wage growth to accelerate in 2005 and sustain higher rates of growth over the next 2-3 years. The fact that not all segments of the long-haul trucking industry are affected as severely by the shortage should preclude any immediate spike in wages industry-wide. A more likely scenario is that wage growth will average 6-7% per year over the next three years.

These larger wage increases will move over-the-road truck driver wages back to and above the competitive position in the labor market that they held during the 1990s. This wage differential, in combination with continuing efforts on the part of trucking companies to address quality-of-life issues, should be sufficient to reduce the severity of the driver shortage. But because the adverse demographic trends affecting the industry will intensify in the second half of the decade, trucking firms will face a continuing challenge to attract and retain a qualified driver workforce.