





The Truck Driver Supply and Demand Gap

Final Report

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Canadian Trucking Alliance

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CPCS

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The Canadian Trucking Alliance is the federation of provincial trucking associations in Canada, representing over 4,500 for-hire and private trucking companies of all sizes, regions and commodity focus.

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Acronyms / Abbreviations

Compound Annual Growth Rate
Canadian Industry Statistics
Canadian Occupational Projection System
Canadian Trucking Alliance
Electronic Logging Device
Gross Domestic Product
Hours of Services
High-Occupancy Toll
Human Resources
Input-Output
Labour Force Survey
North American Industry Classification System
National Household Survey
Social, Technical, Environmental, Economic, Political
Temporary Foreign Worker Program
United States
Weigh-in-Motion





Executive Summary

Introduction

The for-hire trucking industry produced more than \$19 billion in GDP in 2014, which is more than the air and rail transportation industries combined. The large size of the industry necessitates a large number of truck drivers. This report assesses the extent to which the combination of industry growth and difficulties in finding new sources of labour supply will contribute to a gap in the supply and demand for truck drivers in Canada in the coming decade.

The Truck Driver Supply and Demand Gap

As a result of growing industry demand and a stagnant supply of drivers, the estimated driver supply and demand gap for 2024 is approximately 34,000 drivers, which could increase to 48,000 based on plausible combinations of different trends that can affect industry demand, occupational attractiveness and labour productivity.

By province, the expected gap is nearly 14,000 drivers in Ontario by 2024. In absolute terms, Quebec follows with an expected gap of nearly 7,000 drivers (see Figure ES-1). This baseline projection is largely based on an analysis of the historical relationship between industry demand and their resulting demand for trucking services. However, the relationship between industry demand and trucking industry demand can change significantly in the future for a variety of reasons.

Social, technical, environmental, economic and political trends can affect the demand for, and supply of, truck drivers in Canada. Based on plausible combinations of different trends that can affect industry demand, occupational attractiveness and labour productivity, we estimate that this expected gap can increase to 48,000 drivers.



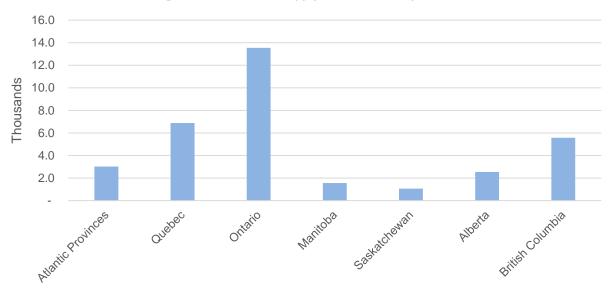


Figure ES-1: Provincial Supply and Demand Gap, 2024

Source: CPCS

Demographics and Other Notable Trends

Official statistics tend to lump all truck drivers into a single occupation, but the fact of the matter is that the specifics of different truck driving jobs, and the attractiveness of those jobs as a result, are not homogeneous. Local and long-haul truck driving, for example, are very different occupations that have very different associated lifestyles.

According to 2011 National Household Survey data, approximately 160,000 truck drivers were employed in the for-hire trucking industry (using data from the Labour Force Survey we estimate that this employment has increased to nearly 169,000 in 2014). Meanwhile, the average age of these truck drivers continues to increase. We estimate that the average age of truck drivers was 47.1 years in 2014 (up from 46.2 years in 2011 and 44.1 years in 2006).

Figure ES-2 provides some insight into why the truck driver population is older and aging more rapidly than the rest of the labour force. Both the driver population and the labour force in general have a glut of workers in the 45 to 54 year old age cohort, reflecting the impact of the boomer generation. The labour force as a whole also has a glut of workers in the 25 to 34 year old cohort that is almost as large. This is the result of the echo generation (who are the children of the boomers). However, there is no similar glut of the echo generation among the truck driver population. The occupation has been unsuccessful in attracting anywhere near a proportionate share of workers from the echo generation.



35.0% 30.0% 25.0% 20.0% 15.0% 10.0% 5.0% 0.0% 15 to 24 years 25 to 34 years 35 to 44 years 45 to 54 years 55 to 64 years 65 years and over Truck Drivers 2011 All Occupations 2011

Figure ES-2: Population by Age Cohort: Truck Drivers versus All Occuptations

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada

Furthermore, the share of young drivers in the occupation has been decreasing over time. Between 2006 and 2011 the share of drivers in the 25 to 34 year old cohort dropped from 18% to below 15%, while the share of drivers in the 55 to 64 year old cohort (most of whom will retire over the next decade) increased from 17% to 22%. As the ratio of younger to older workers continues to increase for the labour force as a whole, it is clear that the trucking industry will have to reverse this trend, and fast.

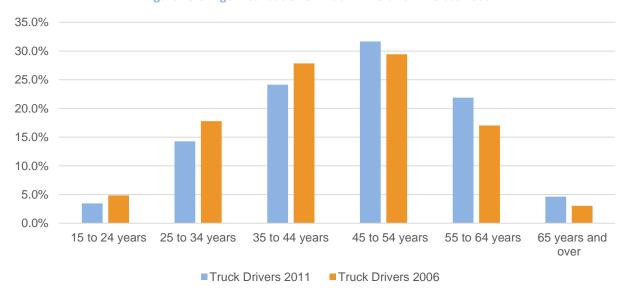


Figure ES-3: Age Distribution of Truck Drivers 2011 versus 2006

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada



Truck driving, and particularly long-haul truck driving, is a reasonably well-paying occupation. For example, according to a survey of carriers by the CTA, the average hourly wage rate for tractor-trailer drivers in Canada was nearly \$23 in 2014. However, long-haul truck drivers are required to work long hours, unpredictable hours and spend a lot of time away from home in order to earn their wages.

Owner-operator drivers are an important part of the truck driving workforce. Owner-operators can earn more income by maintaining their equipment and taking time to manage their finances. But growing equipment costs are putting pressure on the owner-operator model.

Industry and Driver Forecasts

Based on forecasts by the Conference Board of Canada, for-hire trucking industry GDP is expected to grow from \$19.2 billion in 2014 to \$24.1 billion in 2024, for a compound annual growth rate of 2.2%. Taking into consideration expected labour productivity growth, this industry growth implies the need for 25,000 additional truck drivers by 2024. Meanwhile, due to the aging driver workforce, the supply of drivers available is expected to decrease by approximately 9,000 drivers over the same period of time. By province, the demand for drivers is expected to grow the most (in absolute terms) in Ontario, followed by British Columbia.

Conclusions and Observations

The implementation of successful recruitment and retention strategies will become even more important to reduce the driver supply and demand gap for the industry as a whole. Carriers have taken different approaches to sourcing new drivers. Some have focussed on mid-career recruits while others have placed renewed emphasis on recruitment programs for younger, entry-level drivers.

Driver retention strategies have increased in importance. These retention strategies can begin at the recruitment stage. Carriers have a good understanding of why long-haul drivers leave for other occupations, but generally have less information on what occupation they have left for. Having this information may help to identify trends and identify the characteristics of those occupations that make them more attractive than truck driving.

The trucking industry, and the companies that make up the trucking industry, are not the only stakeholders that have an interest in maintaining the sustainability of the long-haul trucking model. The industry's customers (shippers) and their customers' customers (the general public), will also be directly affected, negatively or positively by the trucking industry's ability to rise to the challenge.





Introduction

Key Messages

- The for-hire trucking industry is a major Canadian industry. The industry produced more than \$19 billion in GDP in 2014 (2007 \$ Constant), which is more than the air and rail transportation industries combined.
- This industry GDP does not included private trucking activity. Companies in many other industries (such as wholesale and retail) operate their own fleets of trucks and hire their own drivers. This private trucking activity is not captured in the forhire trucking statistics.
- The large size of the industry necessitates a large number of truck drivers. This report assesses the extent to which the combination of industry growth and difficulties in finding new sources of labour supply will contribute to a gap in the supply of and demand for truck drivers in Canada in the coming decade.



1.1 Background

The for-hire trucking industry ("the industry") is a major Canadian industry. The industry produced more than \$19 billion in GDP in 2014 (2007 \$ Constant), which is more than the air and rail transportation industries combined. However, this figure does not capture the full picture of trucking activity in Canada. In addition to for-hire trucking activity, there is significant

"in-house" or private trucking activity. Companies in many other industries (such as wholesale and retail) operate their own fleets of trucks and hire their own drivers. This private trucking activity is not captured in the for-hire trucking statistics.

The for-hire trucking industry produced more than \$19 billion in GDP in 2014, which is more than the air and rail transportation industries combined.

1.2 Objectives

The objective of this report, is to assess the extent to which the combination of industry growth and difficulties in finding new sources of labour supply will contribute to a gap in the supply of and demand for truck drivers in Canada. In particular, the objectives of the research are to investigate:

- 1. Future demand (approximately 10 years) for truck drivers in Canada, based on a forecast of for-hire trucking industry growth
- 2. Future supply of truck drivers (total of company and owner-operator) in Canada
- 3. Plausible future scenarios and their related implications for the supply of, and demand for, truck drivers in Canada
- 4. The resulting potential gaps between driver supply and demand in each of the scenarios

In addition, the secondary objectives of this report are to investigate:

- 5. Trends in driver turnover, to the extent possible
- 6. Differences in driver wage data from Statistics Canada surveys and the CTA's own survey efforts.

The key outcome of the research will be to identify the extent to which the recruitment of truck drivers into the trucking industry will become more or less difficult into the future under baseline and alternate scenarios.



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¹ Statistics Canada, CANSIM Table 379-0031.

1.3 Methodology

For-hire carriers are more likely to employ long-haul drivers, where the gap between supply and demand is generally considered to be the largest. Therefore, we focus our discussion and analysis on the supply and demand of long-haul truck drivers in the for-hire industry. To develop our driver supply and demand forecasts, we analyze industry account, demographic and productivity data. Further details on the methodology to develop the driver supply and demand forecasts are provided in chapter 3.

In addition to relying on statistical analysis for our driver supply and demand forecasts, we conducted a literature review to uncover important industry trends and business strategies. We also consulted eight large trucking companies located across the country for their views on recruitment and retention challenges. This information contributed to our supply and demand scenario analysis.

1.4 Organization of this Working Paper

The remainder of this report is organized in five chapters as follows:

- Chapter 2: Driver Demographics, Wages and Notable Trends
- Chapter 3: Industry and Driver Forecasts
- Chapter 4: The Driver Gap, Baseline and Alternate Scenarios
- Chapter 5: Conclusions and Observations



Driver Demographics, Wages and Notable Trends

Key Messages

- Official statistics tend to lump all truck drivers into a single occupation, but the fact of the matter is that the specifics of different truck driving jobs, and the attractiveness of those jobs as a result, are not homogeneous.
- Truck driving, and particularly long-haul truck driving, is a reasonably well-paying
 occupation. However, long-haul truck drivers are required to work long hours,
 unpredictable hours and spend a lot of time away from home in order to earn
 their wages.
- Owner-operator drivers are an important part of the truck driving workforce.
 Owner-operators can earn more income by maintaining their equipment and taking time to manage their finances. But growing equipment costs are putting pressure on the owner-operator model.



This chapter provides a brief summary of the truck driver occupation and reviews current data sources regarding truck driver population, demographics and wages in Canada. This includes trends regarding the age, education levels, and distribution of company and owner-operator drivers. Although the focus of the study is on the for-hire industry, we also provide some analysis of the total truck driver population (including in-house drivers). This chapter also explores some of the recent trends affecting the trucking industry.

2.1 The Truck Driver Occupation

Obviously, truck drivers drive trucks to pick up and deliver goods from various locations. But the type of work, and the associated lifestyle of truck drivers, varies considerably depending on the specific service that is provided. While official statistics tend to lump all truck drivers into a single occupation, the fact of the matter is that the specifics of different truck driving jobs, and the attractiveness of those jobs as a result, are certainly not homogeneous.

2.1.1 Local Drivers

For example, local pickup and delivery (P&D) drivers are often on a fixed, daily schedule and are home every night. They spend most of their time within, or close to, a single urban area. They may drive a tractor-trailer or a smaller truck. Much of their shift is often spent outside of the truck assisting with pickups and deliveries, breaking down pallets, waiting for loads and/or waiting for delivery dock space to open up. In fact, for many local drivers, perhaps only 25% of their time is spent in the truck. Because they do often work fixed shifts and because they are often required to drive during peak hours in dense urban areas (making the time it takes to cover a given distance highly variable), they are often paid an hourly wage rather than by-themile.

2.1.2 Long-Haul Drivers

The nature of work and lifestyle of a long-haul or "over the road" driver is much different. They are less likely to assist in pickup and delivery activity, but they also might spend weeks at a time on the road with a highly variable schedule. Some drivers may be on a relatively fixed schedule so they can minimize their time away from home, or at least predict when their home time will be. Unlike P&D drivers, they are likely to be paid by-the-mile rather than an hourly wage. This means that their hourly compensation varies with traffic conditions and their customers' ability to efficiently provide loads or accept deliveries.

2.1.3 Other Drivers

There are also other jobs that are in-between the two extremes above, or are some variation of one or the other. For example, short-haul drivers may drive to locations up to a half day away from their area of domicile but still be on a relatively-fixed schedule and home on most nights. Some trucking companies may provide a mix of hourly and by-the-mile compensation for these



drivers. Drivers may also be paid for loading and unloading activity and hourly rates for other authorized work time (such as administration).

Companies that do pay-by-mile also vary how they determine mileage to begin with, an important distinction for prospective employees. For example, some companies pay edge-to-edge, or the shortest possible distance between two points, while others pay according to the odometer, which effectively compensates drivers for taking detours to avoid traffic (and therefore saving time).

Meanwhile, shunt drivers work at specific facilities, such as ports and terminals, and are responsible for moving empty and loaded trailers to and from docks and yards.² Jobs can also vary by the product that is handled (dry goods, fresh & frozen, hazardous, etc.), each of which may have different requirements and resulting responsibility for drivers. Some of these products require drivers to operate specialized equipment such as refrigerated trailers, motor vehicle haulers and bulk tankers.

2.1.4 Owner-Operator and Company Drivers

Drivers are not only distinguished by the type of work that they do. They are also distinguished by the contractual relationship that they have with carriers, particularly whether they are company or owner-operator drivers. Owner-operators are truck drivers who own and operate their own equipment (tractors and sometimes trailers as well). As opposed to company drivers – who are employees of trucking companies who pay their wages directly – owner-operators are independent businesses who hire out their services (including the use of their equipment) to trucking companies.

The trucking industry is somewhat unique (relative to other transportation industries) in its use of owner-operators. In the rail freight, air transportation and urban transit industries, drivers or operators are exclusively company employees. In the taxi and limousine industry, most drivers are owner-operators. The trucking industry falls somewhere in-between. The share of owner-operators as a share of all truck drivers in Canada (include private trucking activity) is approximately 20%.³ For the for-hire trucking industry this share is likely much higher (in the range of 30%) where the owner-operator model is much more common.

Further, there are various owner-operator models in the trucking industry, with varying degrees of independence from the carriers that they work with. For example, most owner-operators lease their trucks to a carrier and operate under the carrier's operating registration. Other owner-operators operate under their own operating registration.



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² TruckingHR Canada, Work With Cargo, http://www.truckingcareers.ca/en/content/shunt-driver-1.

³ Estimate based on data from the Labour Force Survey.

2.2 Current Driver Population

According to the 2011 National Household Survey (NHS), there were 283,185 truck drivers employed in Canada, making up 1.57% of all employment in the country. Approximately 158,000 of these drivers were employed in the for-hire trucking industry. The rest (approximately 125,000 drivers) were employed by other companies whose primary business was not trucking (see Figure 2-1). Of the for-hire industry drivers, approximately one-third were engaged in specialized trucking activity, where the products that they carry require the use of specialized equipment such as bulk tankers and refrigerated trailers.

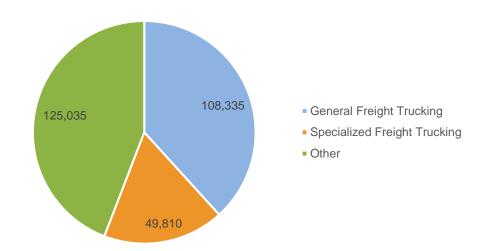


Figure 2-1: Number of Truck Drivers Employed in the For-Hire and Private Trucking Industries

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada

The fact that the labour force in Canada is aging is well known. However, the truck driver population is aging at a faster pace. According to our analysis of NHS data, the average age of truck drivers employed in the for-hire trucking industry increased from 44.1 years in 2006 to 46.2 years in 2011, an increase of 2.1 years. Meanwhile, the average age of workers in all occupations increased from 40.1 years in 2006 to 41.5 in 2011, an increase in 1.4 years (see Figure 2-2).



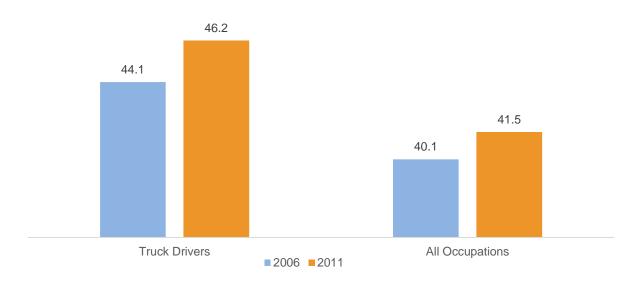


Figure 2-2: Average age (years) of Truck Drivers versus All Occupations 2006 to 2011

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada

The NHS data are the most robust set of demographic data available. However, because the NHS is only conducted once every five years (corresponding to Census years), they are not the most current data. Labour Force Survey (LFS) data are collected more frequently, however, the LFS sample size is much smaller. To provide a more recent estimate of the average age of drivers in the for-hire industry, we used LFS data to analyze the trend of driver ages from 2011

to 2014, then applied that trend to our estimate of the average truck driver age from the NHS in 2011. This allows for an estimate of the average age, which is still anchored in the more robust NHS data set, but takes advantage of the more frequent LFS

By combining the more robust National Household Survey data with the more frequent Labour Force Survey data, we estimate that the average for-hire truck driver age has increased to 47.1 years in 2014.

data. Using this method, we estimate that the average for-hire truck driver age had increased to 47.1 years in 2014.

Figure 2-3 provides some insight into why the truck driver population is older and aging more rapidly than the rest of the labour force. Both the driver population and the labour force in general, have a glut of workers in the 45 to 54 year old age cohort, reflecting the impact of the boomer generation. The labour force as a whole also has a glut of workers in the 25 to 34 year old cohort that is almost as large. This is the result of the echo generation (who are the children of the boomers). However, there is no similar glut of the echo generation among the truck



driver population. The occupation has been unsuccessful in attracting anywhere near a proportionate share of workers from the echo generation.

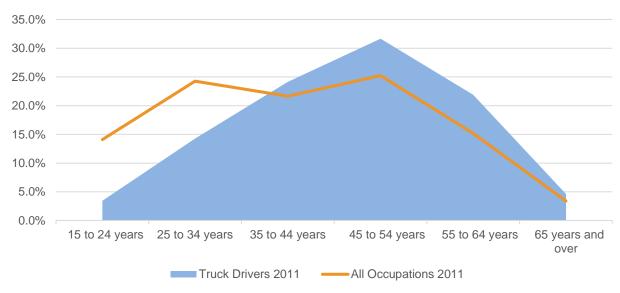


Figure 2-3: Population by Age Cohort: Truck Drivers versus All Occuptations, 2011

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada

Figure 2-4 provides more detail on how the truck driver population has aged since 2006. Between 2006 and 2011 the share of drivers in the 25 to 34 year old cohort dropped from 18% to below 15%, while the share of drivers in the 55 to 64 year old cohort (most of whom will retire over the next decade) increased from 17% to 22%. As the ratio of younger to older workers continues to increase for the labour force as a whole, it is clear that the trucking industry will have to reverse this trend, and fast.

While the echo generation is mostly absent from the driver population, women are almost entirely absent. 97% of all truck drivers are male, compared to 52% of all employees in all occupations.⁴ Figure 2-5 shows the gender distribution for truck drivers and other selected occupations.



⁴ 2011 National Household Survey, Statistics Canada

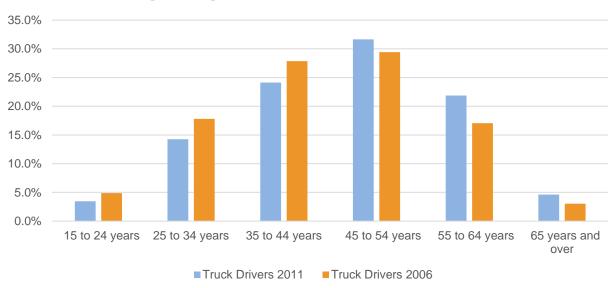


Figure 2-4: Age Distribution of Truck Drivers 2011 versus 2006

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada

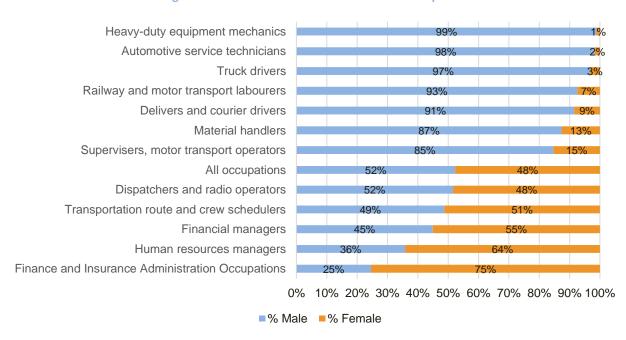


Figure 2-5: Gender Breakdown for Selected Occupations

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada

By province, the largest concentration of drivers are found in Ontario, followed by Quebec, which is no surprise given that they are the most populous provinces (see Figure 2-6). However,



relative to their respective labour forces, truck drivers are more heavily concentrated in New Brunswick, Alberta, Manitoba and Saskatchewan (see Figure 2-7).

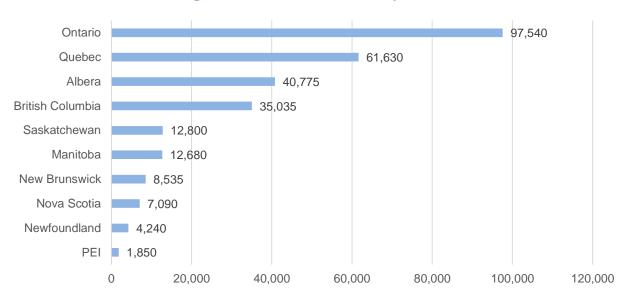


Figure 2-6: Number of Truck Drivers by Province

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada

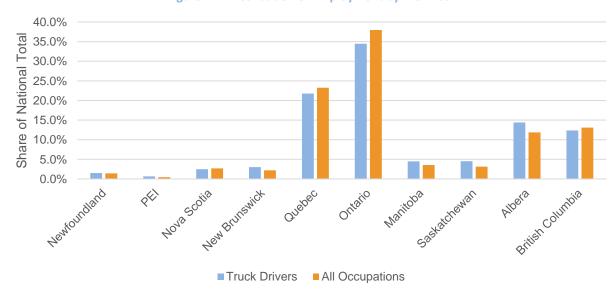


Figure 2-7: Distribution of Employment by Province

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada



Immigrants make up about 20% (57,000 drivers) of the truck driver population (see Figure 2-8). However, this percentage is smaller than it is for the Canadian workforce. Non-permanent residents make up a very small share of the driver population, at 0.5%, compared to the workforce as a whole at 1.1%.

Non-immigrants
Immigrants
Non-permanent
residents

Truck Drivers
79.5%
20.0%
0.5%
All Occupations
77.1%
21.9%
1.1%

Figure 2-8: Immigrant Contribution to Employment

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada

Truck drivers tend to be over-represented, as compared to the total labour force, in terms of the percentage of those employed having an apprenticeship of trade certificates/diplomas, high school diplomas, or no diploma or certificate. Meanwhile, truck drivers are under-represented, as compared to the total labour force, in terms of the percentage of people with college, CEGEP or university degrees.

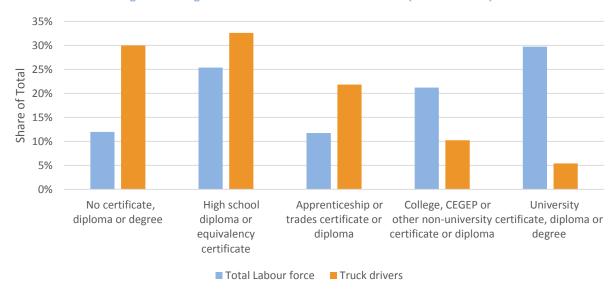


Figure 2-9: Highest Level of Educational Attainment (Share of Total)

Source: CPCS analysis of 2011 National Household Survey, Statistics Canada

2.3 Trends in Driver Employment and Wages

Generally, LFS is the most comprehensive source of wage data by occupation. However, in 2014 the CTA carried out an industry survey asking carriers to report driver wage data. This section compares wage data from the two sources.



2.3.1 Comparison of CTA and LFS wage data

The CTA survey was administered to 305 Canadian trucking companies, covering 20,697 tractor-trailer drivers and 1,819 straight truck drivers. All provinces were represented, and respondent carriers reported minimum, median, average, and maximum hourly wages before benefits. Owner-operators and temporary foreign workers were explicitly excluded from consideration.

These data can be compared to the LFS data on hourly wages reported for workers qualifying as truck driver by occupation, and as belonging to North American Industry Classification System (NAICS) Industries 4841 (Generalized Freight Trucking) or 4842 (Specialized Freight Trucking). Thus, truck drivers for private fleets are excluded.

The CTA survey concluded that the average hourly wage rate for tractor-trailer drivers in Canada was \$22.88. This is higher than the average for-hire truck driver wage according to the LFS (\$21.15). The average wage calculated by the CTA, however, was the straight average across companies. It did not appear to account for the number of employees by company. In other words, all companies were weighted equally, rather than weighted by number of employees.

In order to address this, we calculated a weighted average wage by province from the CTA data. After this adjustment, the average wage according to the CTA data decreases from \$22.88 to \$22.67. However, this wage is still 7% higher than the average wage reported from the LFS. The average wage from the CTA data also remains higher than the LFS average across all provinces (see Figure 2-10). The discrepancy is smallest in Ontario and British Columbia, and largest in Quebec, Nova Scotia, and Manitoba. Relevant data were not available for Newfoundland and P.E.I.

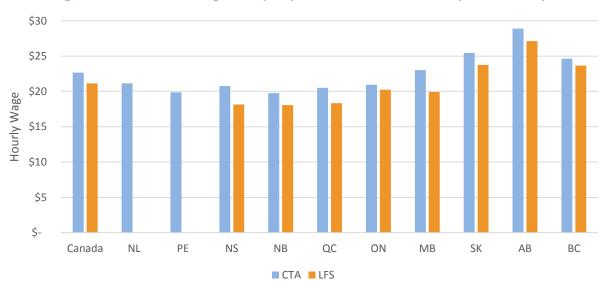
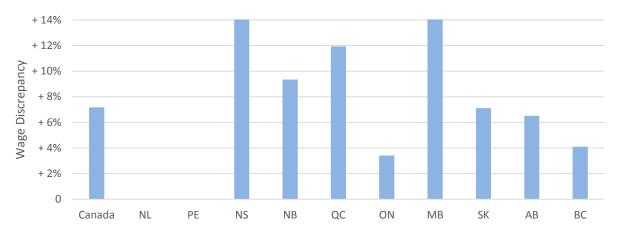


Figure 2-10: Truck Driver Wage Discrepancy between Labour Force Survey and CTA Study





Source: Statistics Canada Labour Force Survey for 2013-14; Canadian Trucking Alliance for 2014

Note that the average shown for the CTA is the weighted average, as described in Section 2.3.1.

2.3.2 Wages for Truck Drivers Compared to All Occupations

The LFS and CTA wage rates can also be compared to provincial median wages. Figure 2-11 shows the median hourly wage for all occupations as a line, and average wages for the trucking industry as columns (these are the same as for Figure 2-10).

Truck driver wages meet or exceed the provincial median for most provinces, especially in Western Canada. In Eastern provinces they are broadly in line with median wages for all occupations. The situation is most ambiguous in Quebec, where the CTA and LFS data sources generate different conclusions.

Comparing median and average wages is not ideal, since average wages tend to be inflated by outliers (extremely high values). Notably, the average wage rate for all occupations is significantly higher than the median for all occupations.

However, there is reason to believe that truck driver wages are much less prone to this issue than other occupations, as wages are more uniform across the industry. The CTA collected both average and median data at the company level in its survey; although the medians cannot be scaled to the level of the entire industry, the median and average can be compared for individual companies. Such an analysis reveals that at the company level, average wages exceed median wages by on average 1%. In other words, an average truck driver wage of \$20/hr corresponds to a median truck driver wage of \$19.79/hr, roughly a 20¢ difference. This is insufficient in explaining the high wage rate for trucking compared to all occupations shown in Figure 2-11, but demonstrates that the gap between average and median driver wages is relatively small.



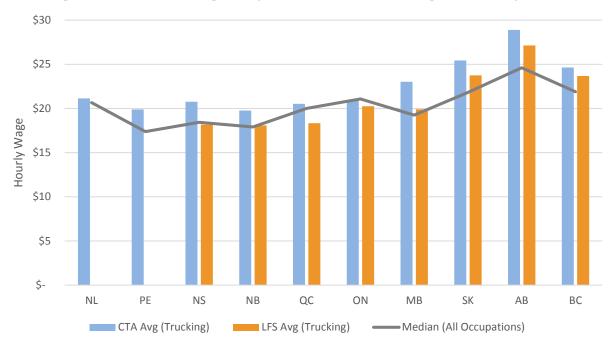


Figure 2-11: Truck Driver Wages Compared to Provincial Median Wages for All Occupations

Sources: Canadian Trucking Alliance average for tractor-trailer drivers, 2014; Statistics Canada Labour Force Survey average for Occupation category Truck Drivers and industry categories General and Specialized Freight, 2013-14; LFS median hourly wages by province/territory as reported by Employment and Social Development Canada, 2013-14

2.3.3 Potential Causes of Wage Discrepancies

The table below outlines some of the potential sources of wage discrepancies, aside from the question of medians vs. averages discussed previously.

Cause Description Conclusion Long Haul vs. Local The CTA data are for long-haul tractor-trailer Long-haul drivers generally have a drivers, whereas the LFS data are not available at higher average wage rate than such a level of detail (Specialized and General local drivers. This likely explains freight both include local and long distance much of the difference between components).5 Although not its main focus, the the CTA and LFS wages. CTA survey also collected wage data for straight truck drivers, for carriers that had such operations. The data shows an average 15% wage increment for tractor-trailer drivers compared to straight truck drivers.

Figure 2-12: Potential Causes of Wage Discrepancies between LFS and CTA Wage Data

The LFS data are for both Specialized and General



Specialized vs.

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Specialized Freight (bulk tankers,

⁵ Statistics Canada, North American Industry Classification System (NAICS) Canada 2012, 484 Truck Transportation

Cause	Description	Conclusion
General Freight	Freight trucking. Notably, the Specialized Freight category includes certain tractor-trailer drivers since it includes refrigerated vehicles. These are part of the Other Specialized Freight Trucking NAICS codes, which represent over one quarter of employment in Specialized Freight. ⁶ Overall, the LFS wage rate for Specialized Freight is \$22.57 nationally, compared to \$20.52 for General Freight (approximately 10% higher).	refrigerated, motor vehicle carriers, etc.) drivers have a higher wage rate than General Freight drivers. However, tractor-trailer drivers from the CTA study also fall within both categories, so we would not expect this to impact the results.
Private vs. For-hire Trucking	Private trucking is not included in the LFS data, since the data are segmented by both occupation and industry. Private wages may be somewhat lower than for-hire wages but this dynamic does not affect the results here.	Analysis is of for-hire trucking – no impact on results.
Truck Drivers vs. Other Employees	The LFS data are segmented by both occupation and industry. Thus both studies compare driver wages.	Analysis is of truck drivers specifically – no impact on results.
Reporting of Wages	The CTA survey respondents were asked for hourly wages before benefits. It is thus up to individual companies to convert per mile pay rates to perhour rates, using the number of paid hours. The LFS is a household survey and requires self-reporting of hours and wage rates. To counter non-response bias, the LFS imputes wages for certain respondents based on other respondents with similar characteristics (e.g. occupation). ⁷	Neither method should include benefits but it is difficult to systematically assess the impacts of differences in reporting. Both methods likely encounter issues when converting per mile rates to hourly rates.

If the LFS wage rate is restricted to general freight only, the national wage rate decreases by 3%. On the other hand, if the wage premium for tractor-trailer drivers over straight truck drivers is assumed to be similar to the wage premium for long-distance over local trucking, the LFS wage rate increases by 6%. The combined effect of these adjustments would be an increase in the LFS average wage rate from \$21.15 to \$21.68. This leaves approximately 4.5% of the difference relative to the CTA national average wage rate that is the result of other factors.



⁶ Employment can be approximated from Canadian Business Patterns data, using establishment counts tabulated by employment size category. These are available for 6-digit NAICS industries in Industry Canada's Canadian Industry Statistics (CIS) for 2013

⁷ Statistics Canada, Labour Force Survey: Data Quality Statements (Reference Number 3701)

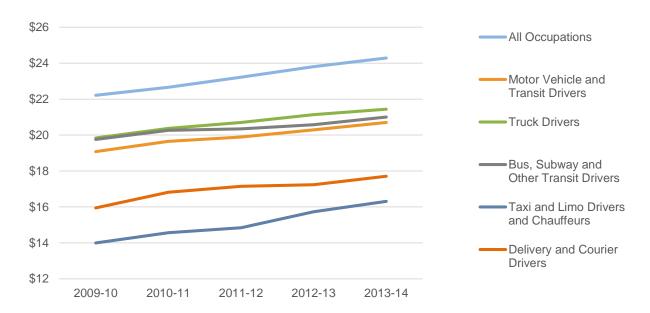


Figure 2-13: Average Hourly Wages for Truck Drivers and Comparable Occupations

Source: CPCS Analysis of Statistics Canada Labour Force Survey Note: Two year moving averages reported

While the LFS and other sources report driver wages as an hourly rate, actual compensation of drivers may not actually be based on number of hours worked. Depending on their circumstances and types of deliveries, some drivers are paid hourly wages, distance-based salaries (a certain number of cents per kilometer driven) or by the trip. Other factors can at times also be taken into account such as the number of deliveries made (amount drivers are paid being dependent on the number of deliveries made). Additionally, in some cases, drivers are paid based on a hybrid of the above mechanisms, such as a driver being paid a base amount per hour and another amount per kilometer driven. Distance-based and per-trip payment structures encourage efficient driving and transfer some risk away from companies and on to drivers themselves, who are paid based on performance. In such instances, drivers will therefore have an incentive to avoid travelling during peak traffic periods, since their effective hourly rate is lower.

Typically, truck drivers operating in urban routes, such as serving from a distribution centre to a number of delivery points in an urban centre, are often paid an hourly wage. Drivers generally have less choice as to when they can drive and aren't able to avoid congested peak travel hours when serving urban routes (operating on fixed schedules and short routes). Long-haul truck drivers are much more commonly paid based on distance travelled. Such drivers often have more choice as to which hours they drive and can plan out to avoid urban centres during peak periods. Overall, long-haul drivers are often paid more than local drivers. As noted in the next section and in chapter 5, drivers generally prefer to be home regularly and work consistent schedules. Local trucking is better able to offer such schedules. As a consequence, long-haul



drivers often require a wage premium relative to local drivers. Failing to distinguish between the two likely contributions to an underestimation of long-haul driver wages.

2.4 General Trucking Industry Trends

2.4.1 The Importance of Labour and Labour Costs

Trucking is a labour-intensive business. In fact, for both local and long-haul trucking, labour costs are the largest component of total costs. At 30% of total long-haul trucking costs, labour costs are a larger component than fuel costs (21%), capital costs (11%) and maintenance costs (9%).

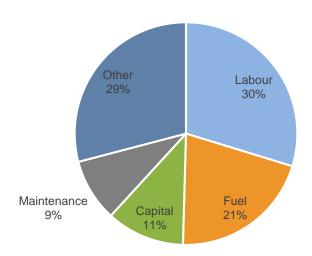


Figure 2-14: Long-Haul Trucking Industry Cost Structure (2010)

Source: CPCS Analysis of CANSIM Table 403-0009.

Note: 2010 data are the most recent available. Other costs include insurance, utilities, telecommunications, other purchased services and other overhead costs.

Labour costs include the cost of both driver and non-driver positions. As drivers makeup approximately two-thirds of the trucking industry labour force, we estimate that driver labour costs account for roughly 20% of long-haul trucking cost structure.

2.4.2 Market Trends

Naturally, growth in truck transportation demand tends to track overall growth in the wider economy. The industry therefore experienced decline during the recession of 2008/2009 before recovering quickly as the general economy recovered. International trade, particularly with the US, is also a large factor impacting Canadian trucking industry demand. Rising import and export trade with the U.S. increases demand for long-haul trucking in particular.



Recently, crude oil prices, and by extension fuel costs, have declined precipitously due to oversupply. The ever-competitive for-hire trucking industry has passed on much of these fuel cost savings through reductions in fuel surcharges. In November 2015, it was estimated that general freight fuel charges had fallen to below 13% of base freight costs. This is down from over 22% in early 2014. Meanwhile, total freight costs (including fuel surcharges) have been on an overall declining trend since early 2015. This may reflect not just the decline in the price of fuel, but also the softening of demand from the energy sector and a general softening in economic conditions in Western Canada.

2.4.3 Labour Market

Unlike jobs in some other industries, such as manufacturing and information technology, truck driving is an occupation that cannot be offshored or shipped overseas. Jobs need to be filled by labour locally. While educational requirements may be less common for truck drivers than other occupations, employers tend to experience difficulty in finding sufficient qualified applicants. Many carriers are hesitant to hire applicants under the age of 25 years due to higher insurance premiums. And naturally, they tend to look for candidates with some experience driving vehicles professionally. Candidates may also not be willing to be away from home for longer periods of times, as required by long distance trucking. According to one study, it was found that as distance covered becomes greater, hiring drivers becomes more difficult.⁹

Turnover Rates

Carriers noted (through interviews conducted for this report) that turnover rates have held relatively steady over the past year, with turnover rates generally in the 20 to 30% range. According to TruckingHR Canada, 41% (9 out of 22) in their Top Fleet Employer program saw turnover rates of between 0% and 15% in 2015 and the majority (15 out of 22) had a turnover rate below 30%.

As expected, carriers have seen the highest turnover rates for long-haul positions, although shunting positions were also noted to be prone to higher turnover than average as well. Some carriers noted temporary surges in turnover rates when changing over to electronic logs and introducing more accountability concepts in general. However, carriers believe that these initiatives will help, rather than hinder recruitment and retention in the long-term.

Driver Supply Studies in Canada and the United States

Many reports and industry observers south of the border have also noted an increasing apparent shortage in truck drivers. The American Trucking Association reported that there



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⁸ NULOGX, Canadian General Freight Index (January 27, 2016)

⁹ CAMO-Route, Diagnostic de la main-d'œuvre dans le secteur du transport routier de marchandises au Québec (January 2012).

would be an expected shortage in the United States of 50,000 drivers by the end of 2015.¹⁰ They also noted compensation increasing between 8-12% a year for truck drivers, in part to attract the necessary labour to fill positions. Such a shortage is expected to worsen in the coming years.

Job outlooks for truck drivers in Canada are generally above average.¹¹ Additionally, many labour market analyses have noted that truck drivers are an aging labour force that hasn't attracted as many new entrants as other occupations. Statistics Canada expects the majority of labour demand to come from replacing retired workers.¹²

Meanwhile, recent labour supply and demand forecasts were produced for the trucking sector in B.C.¹³ According to these forecasts, the labour market for truck drivers for B.C. will be nearing a tight market in 2016. From 2017 through 2024 the forecasts are for a tight market. Much of the tightness is expected to be a result of attrition in the industry. As an outcome, B.C. employers can expect to face recruitment challenges from 2017 onwards.

Another recent study profiled the driver workforce serving Atlantic ports. That study found that the drivers serving these ports were older than the national average, with 42% being 55 and older. As a result, a significant number of retirements are expected over the next 10 years, which in turn will create serious recruitment challenges for the industry.

2.4.4 Regulation

In 2002, the ministers of transport in all provinces agreed to adopt identical regulation for the maximum daily number of driving hours a driver can operate a heavy vehicle. These standards were aimed at reducing total driving hours to increase safety and naturally led to an increased need for more drivers in the sector.

In Ontario and Quebec, trucks are now electronically limited to a maximum speed of 105km/h.¹⁵ This may have led to some small increases in total number of drivers needed where productivity may have suffered due to this restriction, though likely this impact was minor since it is estimated that few trucks traveled at speeds higher than this, on average, prior to the implementation of limiters.



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¹⁰ Patrick Gillespie, CNN Money. *Truck Drivers wanted. Pay: \$73,000* (October 9, 2015).

¹¹ For example, government of Ontario's outlook for truck drivers' employment prospects is listed as "above average". See: https://www.app.tcu.gov.on.ca/eng/labourmarket/ojf/profile.asp?NOC_CD=7411

¹² Statistics Canada, Job Futures Quebec, Truck Drivers (Unit Group 7411). Accessed December 29, 2015.

¹³ Asia Pacific Gateway Skills Table, *The British Columbia Asia Pacific Gateway: Trucking Sector Outlook 2015 – 2024.*

¹⁴ Asia Pacific Gateway Skills Table, *Labour Force Profile of Professional Drivers Working at Ports in Atlantic Canada.*

¹⁵ Transport Canada, Summary Report- Assessment of a Heavy Truck Speed Limiter Requirement in Canada. Date Modified: 2013-12-10.

There has also been some debate on weight restrictions in the United States, ¹⁶ which could have implications for Canadian companies that operate on transborder routes. Currently, Federal weight restrictions are much more stringent in the U.S., as they limit total gross vehicle weight to 80,000 lbs. on the interstate highway system. This is opposed to limits in excess of 100,000 lbs. ¹⁷ for tractor semi-trailers in Canada. Some observers have proposed increasing the interstate highway limit to 91,000 lbs. Many industry stakeholders argue that higher weight limits would allow for more efficient and productive transportation, as well as the removal of trucks from the roads as more goods can move in less vehicles. For example, the U.S. Department of Transportation estimated that increasing truck weights could reduce logistics costs by 1.4% per year and produce a cost savings of \$5.6 billion. ¹⁸

2.4.5 Technology

Technological improvements have also impacted how truck drivers operate, mostly helping to improve overall productivity. The use of global positioning systems, as well as on board diagnostics, have allowed trucking companies to better locate trucks and monitor how trucks are used, fuel consumption, and other factors. The widespread use of cell phones have also allowed for easy communication between drivers and also for coordination with receivers.

Electronic Logging Devices

A specific technology that will become ubiquitous in the near future is the electronic logging device (ELD). ELDs synchronize with vehicle engines to automatically record driving time, making hours of service recording easier and more accurate. In the U.S. ELDs have become mandatory and are being phased-in from 2017 to 2019.¹⁹ A similar commitment to ELDs has been made by Transport Canada, with the timing of implementation yet to be announced. Nevertheless, many Canadian carriers have already begun, or even completed, a full transition to ELDs. For example, Shaw Tracking supports over 700 customers using a total of more than 50,000 ELD units in Canada.²⁰



¹⁶ Berman, Call for increased truck size and weight struck down by House.

¹⁷ For example the according to the MOU on Interprovincial Weights and Dimensions the maximum gross vehicle weight for a six tractor semitrailer is 46,500 kg., or approximately 102,500 lbs.

¹⁸ The Journal of Commerce, Regulation and Policy, Legislation Aims to Find Middle Road in US Truck Weight Debate. Accessed December 31, 2015.

¹⁹ The Federal Motor Carrier Safety Administration, *Electronic Logging Devices* (December 21, 2015). https://www.fmcsa.dot.gov/hours-service/elds/electronic-logging-devices.

²⁰ Shaw Tracking, *Ministry of Transport announce Transport Canada's support on Electronic Logging Device*. http://www.shawtracking.ca/minister-of-transport-announce-transport-canadas-support-on-electronic-logging-device-eld.

Automated Vehicles

Increasing automation in driving technologies may also allow for more productive use of drivers' time in the future. Full automation of driving actively is likely very far off into the future, well-beyond the ten year outlook that this report takes. Partial automation may be able to save some driver time in the less-distant future. These trends are briefly touched upon later in section 4.2.

Hours of Service Regulations

Hours of Service regulations impose rest requirements on drivers of commercial vehicles. For example, in the Province of Ontario, HOS are governed by Ontario Regulation 555/06 of the *Highway Traffic Act*, the key components of which include:

- maximum 13 hours of driving time per day
- no driving after engaging in 14 hours on-duty time (including other work activities) per day
- mandatory breaks from driving: at least eight consecutive hours off-duty time per every
 13 hours of driving time or 14 hours of on-duty time
- various cycle requirements, such as at least 24 consecutive hours of off-duty time every 14 days.

Source: Government of Ontario, http://www.ontario.ca/laws/regulation/060555Ontario

2.4.6 Owner-Operators

As noted in section 2.1.4, owner-operators are an important part of the truck driver labour force. Factors that influence attractiveness of the owner-operator model will have an impact on the total driver supply. Therefore, it is useful to review the benefits, challenges and trends related to owner-operator models in Canada.

Keys to Owner-Operator Success

The ability of owner-operators to be successful and remain in the business is based on several factors. To a greater extent than company drivers, owner-operators must be good financial planners. This means planning their expenditures and revenues over the life-cycle of their equipment, rather than just year-to-year. For example, owners of new trucks will find that in the first few years of operation, their maintenance costs may be very low. However, prudent owner-operators recognize that maintenance costs will increase as their tractor ages and treat these expected maintenance costs as a liability in the early years. Failing to do so means that



the owner-operator is overestimating his net income in early years and is in for a surprise in later years. ²¹

On the other hand, owner-operators can benefit from maintaining their truck in good condition and keeping it in operation beyond the financing term. As noted in section 2.4.1, capital costs makeup approximately 11% of the total long-haul trucking cost structure. Because owner-operators likely have much lower overhead and administrative costs, this capital cost share for owner operators is likely much larger (perhaps in the range of 15 - 20%). Shedding the associated financing and repayment costs in later years of operation can result in a significant boost in net earnings as a result. For owner-operators then, being able to do some of their own maintenance, being vigilant about identifying potential issues and driving their tractors with care can not only reduce their maintenance costs, but decrease their capital costs as well.

Owner-Operator Programs

As noted in section 2.1.4, various owner-operator models exist with respect to their level of integration with, and independence from, carriers, with most owner-operators in Canada being contracted to a single carrier. From their perspectives, carriers vary considerably with respect to the degree to which they contract with owner-operators. Some carriers rely entirely, or almost entirely, on company drivers, while others maintain a split of 50% or more owner-operator drivers. Those carriers have active owner-operator programs, designed to provide incentives to current and prospective owner-operators.

For example, some carriers offer to pay for loading and unloading activity, plates, insurance, etc. Others will also provide a fuel-subsidy program to offset the risks of variable fuel costs. In some cases, companies will also provide group health plans. To the extent that companies provide these incentives (as opposed to

Financing the purchase of a truck is one of the biggest obstacles to becoming an owner-operator. A new truck tractor costs between USD\$110,000 and \$125,000. With the weakened Canadian dollar today this amounts to between CAD\$155,000 and \$180,000.

making a single, all-in payment for all services rendered), the owner-operator can take on characteristics of a company driver which clouds their independent status.

Naturally, financing the purchase of a truck is one of the biggest obstacles to becoming an owner-operator. A new truck tractor costs between USD\$110,000 and \$125,000.²² With the weakened Canadian dollar today this amounts to between CAD\$155,000 and \$180,000.

²² Kilcarr, *Big Rigs, Big Costs* (November 2014). http://fleetowner.com/blog/big-rigs-big-costs.





²¹ Rudolfs, On-*Road Editor: Becoming a Successful Owner/Operator* (October 2004). http://www.trucknews.com/features/on-road-editor-becoming-a-successful-owner-operator/.

Purchasing trucks on the secondary market is often the route of choice of owner-operators, but even in that case the weak Canadian dollar is pushing up purchase costs. In recognition of the general challenge of equipment financing, some carriers offer owner-operator lease programs, where they take advantage of their own volume discounts to make the initial purchase before leasing trucks to owner-operators.²³

Recent Trends and Pros and Cost of Owner-Operator Models

Consultations with industry stakeholders revealed different trends related to owner-operators. Some carriers noted that with the recent softness in the general economy, they were more likely to reduce their share of owner-operators in the near-term to ensure full utilization of their own fleet. Other carriers remain indifferent to owner-operator or company drivers — their main concern is with the quality of the driver. Yet, others have explicit targets for increasing the owner-operator share of their driver workforce.

There are several reasons why companies may or may not prefer owner-operators to company drivers, or prefer a healthy mix of both. With ownership of their trucks, owner-operators are generally seen to be more committed to the industry and more likely to care for and maintain their vehicle. Although owner-operators see the direct benefits of caring for their vehicle, carriers benefit as well, as the portion of their payments to owner-operators that implicitly cover maintenance can be lower than what their maintenance costs would have been on their own truck using a company driver. Furthermore, some carriers noted that owner-operators are more likely to drive more efficiently (since they are usually directly on the hook for the fuel bill), further reducing their cost of operation. A recent study also found that owner-operators in the U.S. also have better safety records than company drivers.²⁴ They are also perceived to be less likely to take "sick days" (the kind that are taken for reasons other than being sick), as they are paid only for the time that they work. Perhaps most important, contracting with owner-operators reduces a carrier's capital costs (along with the associated debt and risk levels), albeit in exchange for larger ongoing operating costs (owner-operators of course need to earn a return on capital as well).

As a consequence of the high upfront cost of truck tractors mentioned above, however, some owner-operators are more likely to operate older or poorly-specified trucks. Some carriers note that due to this, combined with the fact that they provide fuel efficiency incentives and training to company drivers, their owner-operator fleet actually performs worse on average in terms of fuel efficiency.



²³ Transx, Owner-Operator Program. http://www.transx.com/drivers/owneroperators.cfm.

²⁴ Cantor, *Owner-Operator versus Company Driver Safety Performance Analysis* (January 2016). http://www.intrans.iastate.edu/research/documents/research-reports/owner-operator vs company-driver safety w cvr.pdf



Industry and Driver Forecasts

Key Messages

- For-hire trucking industry GDP is forecasted to grow from \$19.2 billion in 2014 to \$24.1 billion in 2024, for a compound annual growth rate of 2.2%.
- Taking into consideration expected labour productivity growth, this industry growth implies the need for 25,000 additional truck drivers by 2024.
- Meanwhile, due to the aging driver workforce, the supply of drivers available is expected to decrease by approximately 9,000 drivers over the same period of time.
- By province, demand is expected to grow the most (in absolute terms) in Ontario, followed by British Columbia.



This chapter provides the baseline forecast for for-hire trucking industry demand and the resulting forecast for driver demand, as well as the baseline forecasts for for-hire trucking driver supply.

3.1 For-Hire Trucking Industry Outlook

As noted in section 1.3, although a large number of drivers are employed by in-house carriers, we focus our analysis on the for-hire trucking industry. The gap between the supply and demand of drivers is expected to be larger in the for-hire industry, as for-hire carriers are more likely to employ long-haul drivers. That said, in-house carriers certainly face pressure when hiring drivers as well. An analysis that is constrained to the for-hire industry can then be thought of as a minimum case. If demand for drivers is expected to outpace the supply of drivers available to the for-hire industry, it is likely that the in-house industry would be facing increasing pressures as well.

3.1.1 Summary of Driver Demand Methodology

The methodology for the baseline forecast of driver demand was developed as follows:

- Development of GDP forecasts for the for-hire trucking industry (NAICS 484) for Canada
- Development of GDP forecasts for the transportation and warehousing industry (NAICS 48-49) by province
 - Development of provincial GDP forecasts for the for-hire trucking industry by using the current NAICS 484 share of NAICS 48-49 by province, applying that share to the NAICS 48-49 forecasts by province, then aligning those forecasts with the national NAICS 484 forecast
- Development of driver demand forecast by province by applying current labour productivity rates (specific to truck drivers) and projected labour productivity growth to macroeconomic forecasts.

The baseline macroeconomic forecasts for NAICS 484 at the national level and NAICS 48-49 at the provincial level were prepared by the Conference Board of Canada. Provincial level forecasts for NAICS 484 were then developed from the above forecasts. Labour productivity rates were estimated from current labour force data, while labour productivity growth rates were based on past growth rates and feedback from industry consultations on prospects for labour productivity growth in the future.

3.1.2 Traditional Demand Drivers for For-Hire Trucking

Demand for trucking services closely related to general economic activity. Intuitively, one might think that it is more closely linked with output of goods-producing service-producing industries.



However, service-producing industries such as retail and wholesale trade are important drivers of demand for trucking services. Over the past two decades, for-hire trucking GDP growth has actually been linked more closely with service-producing GDP growth (98.6% correlation) than it has been with goods-producing GDP growth (92.6% correlation). With that said, the impact of events such as the contraction of goods-producing industries during the recession of 2009 is apparent when examining trends in trucking industry GDP. Figure 3-1 shows the growth in trucking and total industry GDP since 1997.

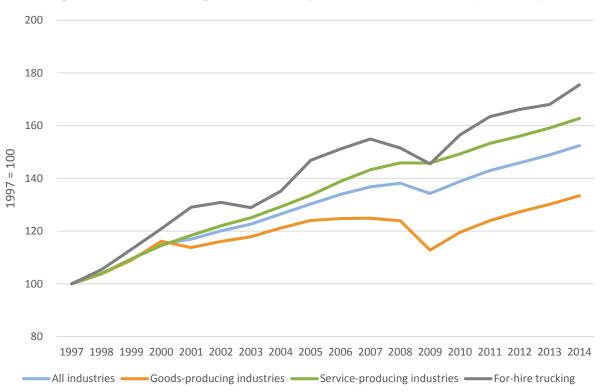


Figure 3-1: For-Hire Trucking and Total Industry Real GDP Growth in Canada (1997 = 100)

Source: CPCS Analysis of Cansim Table 379-0030

An analysis of input-output (IO) accounts unsurprisingly shows that a diverse set of industries use trucking services as part of their production process. The IO accounts provide a detailed view of the inputs and outputs that are used and produced by different industries. In other words, for each industry the IO accounts provide the "recipe" that the industry uses in order to produce the goods or services that it then sells to other businesses or consumers. These accounts can be used to some extent to show which industries rely most heavily on trucking services as a part of their recipe.

However, there are some challenges associated with identifying the key users of trucking services in this way. This is due to the fact that according to the IO accounts, a large portion of trucking services are purchased by a fictive "transportation margins" industry. This fictive



industry in turn produces the fictive "transportation margins" commodity. These fictive industries and commodities have been created in part to reconcile producer and wholesale prices. Wholesale prices include the cost of transportation to the buyer, whereas producer prices do not. As a result, we will often see industries that do not purchase a great deal of trucking services, but do purchase a larger portion of "transportation margins." In most cases, behind these transportation margins are trucking services. This is confirmed by the fact that by far, the greatest input into transportation margins industry are freight truck transportation services. ²⁵

With that in mind, Figure 3-2 identifies some of the key users of for-hire trucking services²⁶ in Canada according to the IO accounts.

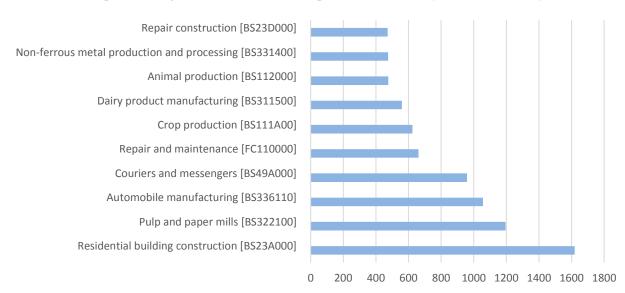


Figure 3-2: Key Users of For-Hire Trucking Services in Canada (dollars x 1,000,000)

Source: CPCS Analysis of Statistics Canada 2011 Input-Output Accounts

Notes: Trucking services include general trucking, specialized trucking and transportation margins. Private (in-house) trucking is not included. The transportation margins, truck transportation and support activities for transportation industries are excluded from the analysis. Industries are generally shown at either the three or four digit level of aggregation.



²⁵ To complicate things further, according to the data, the for-hire trucking industry also purchases a large portion of its own services (indicating that companies within the industry are purchasing services from each other). We ignore this for the purpose of identifying the key industries that use trucking services.

²⁶ Transportation margins are included here with for-hire trucking services. As a portion of transportation margins relate to rail and other transportation services, for-hire trucking service usage may be over or understated in some cases.

The residential building construction industry appears as the heaviest user of trucking services. However, it should be kept in mind that due to the choice of industry aggregations within the IO accounts, industries are shown at the two, three, four or five digit levels. For example, the residential construction industry is at the two-digit level of aggregation, while the automobile and light-duty motor vehicle manufacturing industry is at the five-digit level of aggregation. If data were available for all industries at the five-digit level, the latter industry would be by far the largest user of trucking services.

The analysis regarding the key users of trucking services will be revisited for the purpose of creating alternative plausible scenarios for trucking industry and truck driver demand.

Derived demand versus industry enabler

We generally think of demand for trucking services to be derived from the demand for goods and services from their customers' industries. For example, consumer demand for retail goods subsequently triggers the retail trade industry's demand for trucking services. Indeed, we do make this assumption in our macroeconomic forecasts. However, there is at least some feedback mechanism at work. Lower cost and more efficient trucking services will help to enable growth in those other industries while higher cost and less efficient trucking services can stifle growth in those industries. Using the retail trade example, lower trucking costs will help to lower the price of retail goods that consumers see, thereby stimulating consumer demand for those goods.

This feedback mechanism is important to note in the context of the truck driver supply and demand gap. If the supply of drivers is projected to be considerably lower than the demand for drivers as determined by macroeconomic forecasts, one possible "solution" or outcome is that those macroeconomic forecasts may simply not materialize (economic growth would be lower than forecasted). This can occur both in terms of overall economic growth as well as the distribution of growth among industries, where those industries that are more dependent on trucking services are more likely to suffer in the situation where drivers are particularly hard to find.

With that in mind, we turn to our baseline forecast of GDP growth of the for-hire trucking industry.

3.1.3 For-Hire Trucking National Forecast

The national forecast for the for-hire trucking industry was generated by the Conference Board of Canada's National Economic Model. For-hire trucking industry GDP was \$19.2 billion (2007 \$ Constant) in 2014. Industry GDP is expected to grow to \$24.1 billion in 2024 (see Figure 3-3) for a compound annual growth rate of 2.2%.



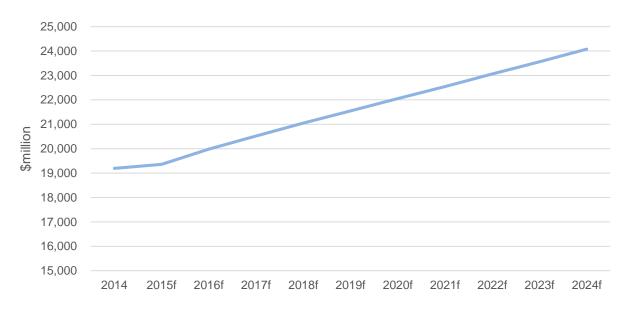


Figure 3-3: For-Hire Trucking Industry National GDP Forecast (2007 \$ Constant)

Source: The Conference Board of Canada

3.2 Implications for Truck Driver Demand

3.2.1 Productivity in the Trucking Industry

An increase in demand for trucking services will mean an increase in demand for truck drivers. However, this is not a 1:1 relationship. Increases in labour productivity allow for greater output relative to a given amount of labour input. For the trucking industry, increasing labour productivity means more tonnes or cubic metres of freight hauled per employee or more specifically, per truck driver.

Over the past few decades, labour productivity in the trucking industry has increased due to a number of factors. One reason is that trucking companies have become more efficient in managing their backhauls, resulting in fewer empty, non-revenue generating miles. This was especially the case after the industry was deregulated during the 1980s. Before then, limited numbers of operating certificates were allocated on specific routes by provincial governments, limiting competition and potential routing combinations for individual companies. More efficient routing has helped to ensure that greater amounts of driver time is being utilized for productive purposes.

Size and weight regulations have been significant contributors to productivity gains. Longer trailers and long-combination vehicles (tractors hauling multiple trailers) have allowed trucking companies to haul more product per truck and driver. For example, the maximum trailer length



increased from 40 feet to 53 feet by the mid-1990s in all provinces. Maximum lengths are especially useful when carrying products that "cube out" (use up all of the available volume in a trailer) before they "weigh out" (hit the maximum allowed gross vehicle weight).

These and other factors have helped the industry to achieve productivity gains that exceed gains in the economy as a whole. The compound annual growth rate (CAGR) of labour productivity in the trucking industry over the period from 1990 to 2010 was 1.62%, against 1.34% for the total economy (see Figure 3-4).

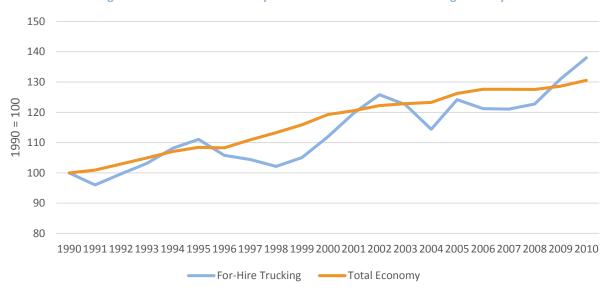


Figure 3-4: Labour Productivity in the Canadian For-Hire Trucking Industry

Source: CPCS Analysis of Cansim Tables 383-0032 and 383-0012

3.2.2 Productivity and Driver Demand

An annual growth rate of 1.62% may seem somewhat trivial. However, its implications for driver demand and economic growth in general are significant. If the industry experienced no productivity gains over the same period, in order to move the same volume of goods that it does today it would need more than 30% more, or more than 50,000 drivers than it currently employs.²⁷ This is entirely a hypothetical situation. In reality, without those productivity gains industry output (along with its customers' output) would not have grown at the same pace. Nevertheless, it illustrates the importance of labour productivity growth. Outside of that growth the industry would have seen some combination of higher costs and lower growth.



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²⁷ This assumes that labour productivity has been spread equally among different occupations within the industry. Given that truck drivers make up approximately two-thirds of the industry's workforce this is a reasonable assumption, at least for the purpose of illustrating the rough impact on driver requirements.

Any forecast of driver demand must then make some assumption about labour productivity growth in the future. If an assumption is not made explicitly, then implicitly we would be assuming no productivity growth. A no productivity growth scenario beyond the very near term is unlikely. But, productivity may be expected to grow at a slower rate than we have seen over the past 30 years. For one, labour productivity growth in the industry has slowed in recent years, down to a CAGR of 0.9% over the past ten years and 0.7% over the past five years.

The deterioration in the growth rate reflects, in large part, the absence of major size and weight increases in recent years as well as the fact that the effects of economic deregulation in the 1980s have already been fully absorbed. In fact, the industry may be facing more regulatory headwinds that have, or will have, dampening effects on labour productivity, such as driver hours of service regulations in the US.

Other external factors could create further barriers for future productivity gains. For example, growing congestion in urban areas increases the amount of time required for drivers to make deliveries. How urban areas respond to growing congestion is uncertain. In Canada, there has been a notable increase in investment in urban transit services. These investments have targeted modal shift in order to help alleviate congestion for remaining road users. Whether these investments are successful in helping to alleviate congestion remains to be seen. Even if they are, they may only be successful in helping to slow the rate of growth in congestion itself, rather than in reducing congestion in absolute terms.

Given these factors, we assume that labour productivity growth in the industry to follow the trend over the past ten years (a CAGR of 0.9% as noted above), while noting that the actual rate of productivity growth could be much higher or lower. Potential drivers of productivity growth and their corresponding impacts on labour demand will be explored further in our scenario analysis.

3.3 Baseline Truck Driver Demand Forecasts

With our baseline forecast of for-hire trucking GDP growth and baseline assumption of labour productivity growth, we produce our forecast for truck driver demand over the next ten years.

3.3.1 National Truck Driver Demand Forecast

The outlook for driver demand at the national level naturally follows a similar trend as the GDP outlook. However, as a result of the productivity growth assumption, truck driver demand is expected to grow at a slower pace. Nevertheless, it is estimated that driver demand will grow by nearly 25,000 by 2024, up to a total of 194,000 drivers (see Figure 3-5).



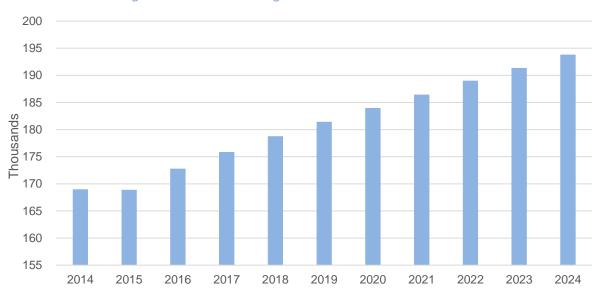


Figure 3-5: For-Hire Trucking National Driver Demand Forecast

Source: CPCS; The Conference Board of Canada

3.3.2 Regional Truck Driver Demand Forecast

At the provincial/regional level, for-hire trucking industry GDP is expected to grow in all provinces and regions. In percentage terms, GDP is expected to grow the fastest in Ontario and Manitoba. (See Figure 3-6).

In order to estimate truck driver demand at the provincial/regional level, the same productivity growth rate assumption from the national forecast is applied. As a result of the forecast, an additional 10,000 drivers will be required in Ontario. In absolute terms, this is followed by B.C. where more than 5,000 additional drivers will be required (see Figure 3-7).



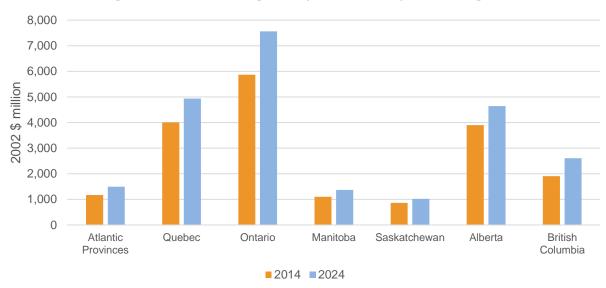


Figure 3-6: For-Hire Trucking Industry GDP Forecast by Province/Region

Source: CPCS; The Conference Board of Canada

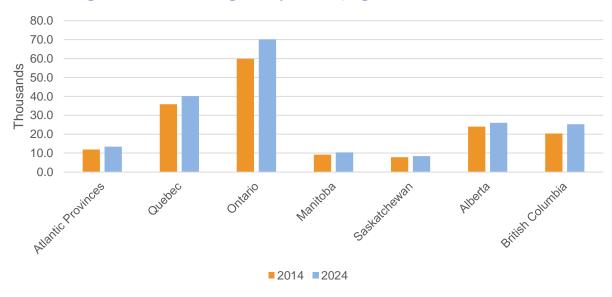


Figure 3-7: For-Hire Trucking Industry Provincial/Regional Driver Demand Forecast

Source: CPCS; The Conference Board of Canada $\,$

3.4 National Outlook for Driver Supply

3.4.1 Driver Supply Methodology

The baseline driver supply forecast was developed as follows:



- Obtain data regarding the distribution of truck drivers in the for-hire trucking industry by 5 or 10 year age cohorts from the NHS.
- Estimate the distribution of drivers within each age cohort using a moving average method. This provides a more precise estimate of the age profile (by age rather than age cohort).
- Age existing driver population by year, to the year 2024. Each year, new drivers were
 added to the driver population through additions from the school leaver population and
 immigrant entry, the two key additions to the total labour force in Canada.
 - The total school leaver population over the forecast period was based on forecasts from the Canadian Occupational Projection System (COPS).²⁸ The share of school leavers that the truck driver occupation attracts was based on the occupation's current and recent rate of attraction of school leavers. In other words, we assume that the occupation will continue to have the same success (or lack of success) in attracting school leavers into the future. The school leaver entrants were assumed to be between 20 and 29 years old.
 - The total immigrant population was obtained through COPS.²⁹ As above, the share of immigrants that the truck driver occupation attracts was based on recent trends. Immigrant entrants were distributed equally across the 25 to 45 year age range.
- Each year, drivers were retired from the labour force as they started to hit retirement age. The average retirement age in Canada is approximately 63 years. A direct estimate of the average for-hire truck driver retirement age was not available. However, given that the share of drivers that are 65 and older is higher than the share of the total labour force that is 65 and older (see section 2.2), we assumed that the average truck driver retirement age was approximately 65 years. For the model, driver retirements were distributed from age 61 through age 74.
- Net entry from other occupations was assumed to be zero. Naturally, the occupation
 may attract workers from other occupations as well as lose workers to other
 occupations. This assumption, in combination with the others, effectively provided us
 with a "pure" increase in the driver supply based on current rates of school leaver and
 immigrant population attractiveness and demographics.



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²⁸ The COPS projections extend to the year 2022. The projections were extended to 2024 using a linear trend line.

²⁹ As above, COPS projections were extended to 2024 using a linear trend line.

• The NHS and LFS provide different estimates for the total for-hire truck driver population. As the sample size for the NHS is higher, we anchored the supply estimate on the NHS figure from 2011, extended to 2013 using the trend from the LFS data.

3.4.2 Outlook for Driver Supply

Chapter 2 established that the driver population continues to age at a faster rate than the labour force as a whole. Notably, the occupation has been unable to attract a significant share of young workers. The forecast for truck driver supply provided here effectively extends recent trends with respect to the occupation's attractiveness to younger workers (school leavers) and new immigrants.

As noted in the methodology, the forecasts assumes no net increase or decrease in the number of workers attracted from other occupations. This is not to say that some movement of workers to and from the occupation will not occur. Rather, the supply forecast (combined with the demand forecast) will provide some indication of just how much that will have to occur in order to meet the expected demand growth of the industry. In other words, the larger the gap between the supply and demand forecasts, the more pressure there will be on the industry to draw workers from new sources.

The supply forecast is specific to the for-hire industry. We might expect that the growth rate in driver supply that is available to all industries is similar to the growth rate in supply for the for-hire industry. On the other hand, we might expect that the supply that is available to the for-hire industry will become more constrained due to the fact that the for-hire industry handles a disproportionate share of long-haul, and particularly unscheduled long-haul, activity. This fact is notable as drivers would generally prefer to handle local deliveries on a regular schedule. Nevertheless, we assume that the supply will grow at a similar rate for both the for-hire and private trucking industries, but focus on the former in order to matchup with our for-hire industry demand growth. In other words, because we focus on for-hire trucking for the demand side, we also focus on for-hire trucking for the supply side.

Figure 3-8 provides the base forecasts for the truck driver supply to 2024. The decrease in truck drivers, from approximately 169,000 in 2014 to just under 160,000 in 2024, largely reflects the oncoming of retirements over the next few years.



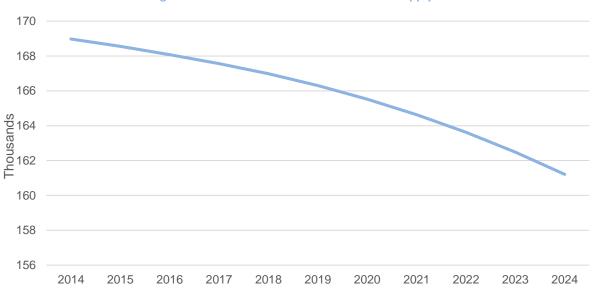


Figure 3-8: Forecast of For-Hire Truck Driver Supply

Source: CPCS Analysis

While the average driver age is estimated to be approximately 47 years, there are a large number of drivers in their 50s and 60s. For example, there are approximately 17,000 drivers who are between the ages of 60 and 65. We would expect virtually all of these drivers to retire over the next decade. Coupled with a relative lack of entrants from school leavers and new immigrants, the age profile of truck drivers will continue to skew to the right (see Figure 3-9).

The extent of the demographic cliff is evident from the figure. While the peak can continue to shift to the right, the tail simply cannot as drivers will inevitably have to retire. This shift serves to steepen the cliff. The average truck driver age is expected to increase from 47 years to 49 years over the forecast period. It is clear that as the current glut of the driver population nears retirement age, the pressure to draw drivers from new sources will continue to mount.





Figure 3-9: Current and Forecasted Truck Driver Age Profile

Source: CPCS

3.4.3 Regional Outlooks

Labour supply between provinces is particularly fluid in the long-run. Workers will likely migrate to high demand provinces (at least in the medium to long run) as there are few barriers preventing them from doing so. Our baseline forecast assumes that supply is only fluid to the extent that this is reflected in the baseline forecast of total labour supply by province, not because we expect that the supply will not be fluid. Rather, a baseline forecast that assumes a lack of fluidity between provinces will show which provinces can expect to experience more labour market pressures than others, after matching the supply forecast up with provincial demand forecasts.

The baseline total labour force forecast was generated by the Conference Board of Canada. The labour force forecasts are predominately the result of current demographics and expected levels of immigration. In general, the Western Canada demographics are skewed younger than Eastern Canada demographics and as a result, the labour pool is expected to grow more quickly in the West. The labour pool in Alberta, B.C. and Manitoba, in particular, is expected to grow



faster than the national average, while labour supply growth in the Atlantic Provinces is expected to be relatively stagnant due to the older than average labour force. Taking these factors into consideration, the driver supply forecasts by province/region are shown in Figure 3-10.

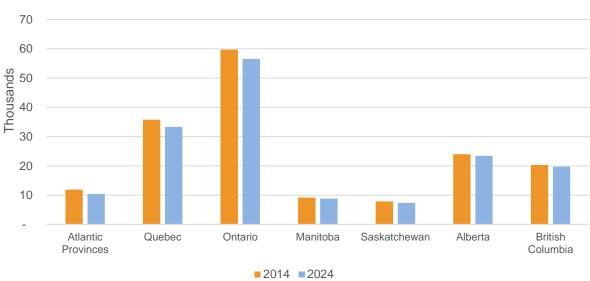


Figure 3-10: Forcast for For-Hire Truck Driver Supply by Region

Source: CPCS

As the national forecast shows a decline in driver supply by 2024, so do each of the individual provincial or regional forecasts. In percentage terms, the decrease in supply is largest in the Atlantic Provinces and smallest in Alberta and B.C., again due to the more favourable current labour supply demographics out west. The percentage decrease in the supply for Quebec and Ontario are roughly in line with the national average.



The Driver Gap, Baseline and Alternate Scenarios

Key Messages

- As a result of growing industry demand and a stagnant supply of drivers, the estimated driver supply and demand gap for 2024 is approximately 34,000 drivers.
- This baseline projection is largely based on an analysis of the historical relationship between industry demand and their resulting demand for trucking services. However, the relationship between industry demand and trucking industry demand can change significantly in the future for a variety of reasons.
- Based on plausible combinations of different trends that can affect industry demand, occupational attractiveness and labour productivity, we estimate that this expected gap can decrease to 15,000 or increase to 48,000 drivers.



This chapter defines the expected baseline truck driver supply and demand gap based on the industry demand and driver supply forecasts from chapter 3. In addition to a baseline projection, alternate scenarios are defined based on plausible alternatives for some of the key drivers of industry demand and driver supply.

4.1 Assessing the Supply and Demand Gap

4.1.1 Determining the Starting Point

Combining the supply and demand forecasts at the national level allows for an estimate of the supply and demand gap by 2024. Before doing so, we must make an assumption about whether driver supply is currently in balance, over supplied, or under supplied. The Statistics Canada Job Vacancy and Wage Survey (2015) found that there were an estimated 13,115 job vacancies for truck drivers in Canada, representing 3.3% of the total 399,855 job vacancies for all occupations. On a percentage basis, job vacancies represented 4.6% of those employed as truck drivers in Canada compared to the average for all occupations of only 2.2%.

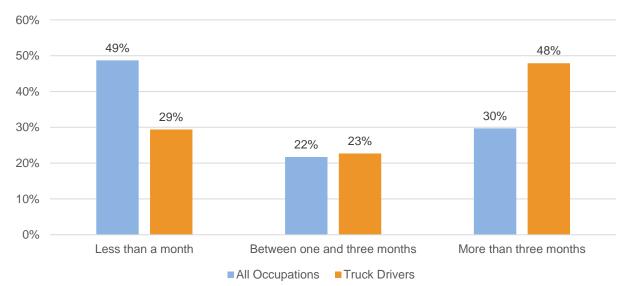


Figure 4-1: Duration of Job Openings Truck Drivers Versus Average for All Occupations in Canada

Source: CPCS Analysis of Job Vacancy and Wage Survey (Quarter 1 of 2015)

However, economic conditions, particularly in Western Canada, are changing rapidly. This is due in part to the difficulty that the energy sector has had in getting its product to international markets. As a result, we estimate that the current labour market is in balance. This is reflected in the starting point for Figure 4-2, which provides the combined baseline supply and demand results.



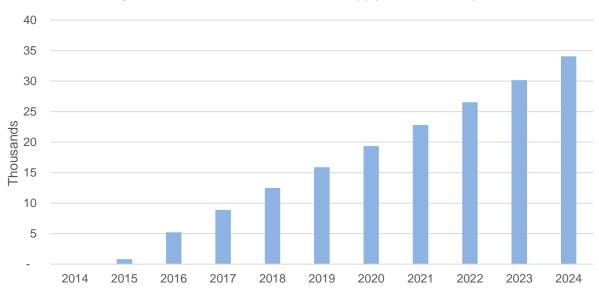


Figure 4-2: National For-Hire Truck Driver Supply and Demand Gap

Source: CPCS

The estimated driver supply and demand gap for 2024 is approximately 34,000 drivers. The estimated gap is larger than previous estimates by the Conference Board of Canada because:

- The period of analysis is longer than the previous period of analysis
- The demand forecast for trucking industry GDP growth is stronger than the previous forecast
- As drivers continue to age, a greater portion of drivers are expected to retire over the 2021 to 2024 period
- The previous forecast assumed a small initial oversupply of drivers whereas the current forecast assumes that the supply is currently in balance.

The expected gap by provinces is distributed across the country roughly as expected, given the relative sizes of the provincial economies and labour forces. That said, the expected gap in B.C. is significantly larger than the expected gap in Alberta, in part due to the weakening economic prospects in the latter. Meanwhile, the expected pickup in the growth of Ontario's economy is expected to generate industry and therefore driver demand that will significantly outpace the expected growth in the supply of drivers. The resulting expected gap is nearly 14,000 drivers by 2024. In absolute terms, Quebec follows with an expected gap of nearly 7,000 drivers (see Figure 4-3).



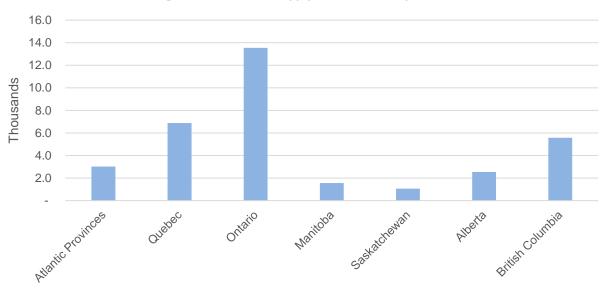


Figure 4-3: Provincial Supply and Demand Gap, 2024

Source: CPCS

4.2 Alternate Scenarios

The baseline projections in section 4.1 are largely based on an analysis of the historical relationship between industry demand and their resulting demand for trucking services. However, the relationship between industry demand and trucking industry demand can change significantly in the future for a variety of reasons. We identify some of the key drivers for these relationships, and how those drivers could change in the future. Ultimately, three alternate scenarios are developed based on plausible changes in these drivers and the resulting effects on truck driver demand and supply.

4.2.1 Key Drivers and Plausible Outcomes

As standard approach to scenario planning, key drivers are often identified according to five groups of external factors: social, technical, environmental, economic and political (see Figure 4-4). This "STEEP" framework is useful for scenario analysis and planning as it helps to generate thinking about what the key external factors that might affect a business are and how those factors may or may not relate to one another.



Figure 4-4: The STEEP Framework

Driver	Description		
Social	Broad societal factors including demographic, lifestyle, religious and education factors, among others.		
Technical	Technological factors that may generate new (alternative) products or services, increase the availability/lower the cost of current products or services, etc.		
Environmental	Prevailing environmental factors may influence the demand for or the production of goods and services, either positively or negatively.		
Economic	Economic factors that influence the ability of individuals' or businesses' capacity to purchase the goods or services under consideration (such as overall economic growth or the distribution of that growth).		
Political	Political or legal frameworks of countries or regions such as trade barriers or domestic policies may influence the demand for or production of certain goods and services.		

Source: Kyler; Competia.com; CPCS

These key drivers have various potential *effects* or outcomes. For the purpose of identifying transportation or commodity flow impacts, these effects can further be distinguished into five groups: sourcing, flow, routing, volume and value density.

Figure 4-5: Translating Drivers into Effects

Effect	Description	
Sourcing	Where are the products sourced from?	
Flow	Where is the demand located?	
Routing	How are the products routed from source to destination?	
Volume	How will the total volume of goods shipped change?	
Value Density	How will the product characteristics and related value density change?	

Source: MIT Center for Transportation & Logistics; CPCS

For the Canadian trucking industry, variations in any of these effects can mean changes in demand and as a result, changes to the demand for truck drivers. For example, if the global demand for a given product remains the same, but sourcing changes from locations in other countries to locations in Canada, the impact on Canadian trucking industry demand will likely be positive. On the other hand, if products become more compact (more value dense) the demand for transportation services, all things being equal, will decrease.

The above five effects implicate only the demand side of the equation, or the **output** of the trucking industry. In addition to these effects, the key drivers could impact **occupational attractiveness** and therefore the total supply of truck drivers. The key drivers could also impact **labour productivity**, and therefore the total demand for drivers relative to overall trucking industry demand.

Key drivers according to the STEEP framework and their associated potential effects are identified and are presented in Figure 4-6.



Figure 4-6: Key Drivers and their Potential Effects on the Trucking Industry

STEEP Drivers		Potential Effects
Social	Income distribution	More balanced income distribution may lead to an increase in consumption relative to income, and therefore an increase in trucking demand (volume).
	Consumer preferences	Consumer preferences for services or digital products may lead to lower trucking industry demand (volume).
	Labour preferences	Increasing level of connectivity through technology may make it more palatable for truck drivers to be away from home for longer periods of time (occupational attractiveness).
	Pensions and savings	Middle class pensions and savings levels alter the propensity to work longer into retirement age (occupational attractiveness). (Pensions and savings are also driven by political factors).
Technical	New product technologies	Smaller, more valuable products could decrease demand for trucking services (value density). Technologies such as 3D printing could shift the last leg of production to households for some products (volume).
	Technological change in trucking	More advanced fleet management systems may allow carriers to better schedule shifts, increasing predictability for truck drivers and making better use of their time (labour productivity and occupational attractiveness). Automated technologies could increase labour productivity.
	Technological change or investments in other modes	Investments in rail intermodal services in particular could affect longhaul trucking demand (routing).
Environmental	Climate change concerns	Increasing concerns about climate change and associated solutions could negatively impact the costs of trucking and therefore overall demand relative to other modes (routing).
	Urban congestion	Failure to halt the growth of urban congestion can increase truck travel times (labour productivity).
Economic	Overall goods production	Higher overall goods production likely means higher trucking industry demand (volume).
	Mix in goods production	A shift in the economy from bulk resources to manufactured goods could increase overall demand for trucking, as bulk commodities are more likely to be carried by rail (volume, routing).
Political	Trade barriers	Higher trade barriers, implicit or explicit, likely means lower commodity flows and lower trucking demand as a result (volume).
	Regulations	Certain regulations can increase or decrease the cost of trucking relative to other modes (routing). Others (hours of service, weight and dimension) can affect labour productivity.
	Military personnel	Many carriers have explicit recruitment programs for former military personnel. Reductions or increases in the pool of former military personnel can affect the available pool of drivers (occupational attractiveness).
	Skilled occupations	Recognizing truck driving as a skilled occupation increases access to immigration as a source of supply (occupational attractiveness).

Source: CPCS



4.2.2 Summary of Output, Occupational and Productivity Effects

As noted, the various drivers can result in effects that change trucking industry output, occupational attractiveness (and therefore driver supply), or labour productivity (and therefore truck driver demand, relative to trucking industry output). The potential effects under these three categories, according to different plausible combinations of the key drivers, are explored further.

Trucking Industry Output

There are many plausible combinations of key drivers, but combinations that include higher or lower levels of Canadian economic growth as a whole will likely have the greatest impacts on trucking industry output. With tepid demand in the global energy markets and perhaps more important, the lack of new capacity for Canadian energy projects to reach international markets, it is anticipated that Canada's growth will come largely from non-energy exports, such as manufactured, agricultural, and forestry products.³⁰ It is likely that manufacturing export-led growth would result in greater demand for truck transportation compared to energy-led growth. Further, demand for residential construction services is typically linked to strong growth in trucking services.

Other key drivers are likely to be circularly impacted by the truck driver gap. For example, as the gap increases, some freight will shift to other modes, such as intermodal. Further, dimensional weight pricing has encouraged shippers to use less packaging, increasing not only productivity but also product value density. Hence, while there are external forces behind these key drivers, there are also natural market feedback mechanisms which serve to moderate the impact on truck driver demand. With regard specifically to urban trucking, delivery drones have been in the news as a possible last-mile replacement for trucks; however, for the moment at least shippers are restrained in their expectations of this mode's potential. Similarly, other disruptive technologies, such as 3D printing, are also perceived to be more distant in their large-scale rollout, as there are a number of important issues yet to be ironed out. 32

We simplify these various drivers and trends into two plausible combinations:

- An export-driven recovery, with continued moderate-strong economic growth and continued demand for residential housing
- A stagnant economy with associated stagnant production and demand.

http://www.tradecommissioner.gc.ca/eng/canadexport/document.jsp?did=148543



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³⁰ The Canadian Trade Commissioner Service, 2015:

³¹ Auburn University, *The State of the Retail Supply Chain*, 2015. Interviews with over 50 leading supply chain professionals in the retail sector.

³² Supply Chain MIT, 4 Reasons Why 3D Printing is Still a Niche Application, 2015.

Other factors are also woven into the scenarios, but overall economic growth is considered to be the single biggest demand-side driver and thus the two outcomes contrast two distinct futures with respect to growth.

Occupational Attractiveness

Supply is a product of the attractiveness of trucking compared to other similar occupations, and the demand for labour in those competing fields. For example, if employment in manufacturing or construction picks up, the trucking industry may need to work harder to attract workers. On the other hand, if these industries are stagnant, trucking may be relatively more appealing as workers are happy to simply make a steady income.

Truck driving is not an easy job and some of the factors that limit its attractiveness include long hours, substantial time away from home, uncertain and irregular hours, stressful work, sedentary conditions, lack of healthy food options on the road, and long waits at shipper/receiver docks. Some of these are simply the "nature of the game," but other factors may evolve as technology improves and cultures within the industry evolve. Others can be improved by policies and initiatives: one small example is of a shipper making it a priority to upgrade rest areas and restrooms at its distribution centres to better serve truckers and make the company more attractive to carriers.³³ Other factors include efforts by carriers to enhance truck-sharing and enable more predictable scheduling through improved fleet management systems.

Pay is the great equalizer for other factors that make jobs dangerous or unattractive, and indeed higher wages are also a factor that would increase the attractiveness of trucking. At the same time, carriers are hesitant to approach shippers about increased rates unless they can demonstrate an accompanying increase in service. Overall, the more attractive the truck driver occupation becomes, in terms of either wages or conditions, the more trucking labour supply increases.

In addition, government policy can affect occupational attractiveness. For example, the trucking industry believes that designating truck driving as a skilled occupation would more accurately describe the occupation as well as improve its attractiveness. For example, doing so would improve access to funding for training and potentially impact the type of information career counsellors get on the occupation in the longer term. The industry is currently working with provincial governments on initiatives like mandatory entry-level training to lay the foundation for this designation.

The supply-side drivers are narrowed down to three plausible combinations:



³³ Wall Street Journal, *Kimberly-Clark Woos Truckers with Promise of Clean Bathrooms*, (2015).

- Truck driving continues to be perceived as an unattractive occupation compared to similar occupations
- Truck driving halts its slide in terms of occupational attractiveness and at least holds its relative occupational attractiveness steady
- Truck driving reverses its trend as scheduling becomes more predictable and the truck driving occupation is recognized as skilled.

Labour Productivity

Technological change is likely to continue to drive increases in productivity. Currently a lot of media focus is on automated vehicles. Fully automated trucks are not likely to be operational within our forecast period, except on private property (e.g. mines) where they are already being deployed. As such, the trucking industry does not see automated vehicles as a means to resolve labour shortages.

Automation will likely introduce itself piecemeal, starting with driver assist technologies. The next step up is a self-driving truck but with a human still in the cab ready to take over at a moment's notice. Such trials are being pioneered in Nevada and the technology is likely to continue to improve to the point that there will be, for example, 3,000 semi-automated trucks in the US by 2025.³⁴ This would allow the driver to engage in other activities while seated behind the wheel.

Aside from automation, there are other technological improvements involving, for example routing and route assignments, which can continue to drive labour productivity. Congestion mitigation measures in dense urban areas, such as toll lanes or high-occupancy toll (HOT) lanes, could also have a positive impact. Technological improvements in safety improvements can also help to increase labour productivity. For example, commercial vehicle inspection stations require trucks to pull over for inspections, increasing the time required to make deliveries. Technologies such as weigh-in-motion (WIM) stations that record vehicle weights and dimensions while in motion can help to pre-screen and reduce the number vehicles that are required to pull over for manual inspection. Other technologies such as licence plate readers and infrared mechanical inspection can also be used for pre-screening purposes. Using technology to implement such pre-screening would reduce average trip times and therefore increase driver productivity, while making better use of manual inspection time as well.



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³⁴ Frost and Sullivan study referenced in Fleet Owner, *Path to autonomous trucks will be a smooth road for drivers* (2015).

Legislation, however, could act in both directions. Whereas size and weight increases and increased off-peak delivery windows would support increased productivity, restrictions of hours-of-service regulations would reduce productivity.

These drivers are narrowed down into a set of three plausible combinations:

- Modest technological advances are offset by legislative effects and increasing gridlock, resulting in stagnate productivity growth
- Modest technological advances are accompanied by supportive or at least neutral legislative effects, resulting in moderate productivity growth
- Substantial technological advances in fleet management systems, predictive scheduling and to a lesser extent, partial-automation, are accompanied by supportive policy, resulting in an acceleration of productivity gains.

4.2.3 Development of Scenarios

The outcomes presented in the previous section are, for the most part, independent of one another (e.g. supply-side outcomes are independent of demand-side outcomes). The combinations of these plausible outcomes produces a set of 24 possible scenarios. While each of these scenarios are reasonably plausible, there are several linkages between underlying drivers that make certain combinations more plausible than others.

Some of these linkages are:

The faster the economy grows, the greater the demand for labour, not just in transportation but also in other industries like manufacturing and construction. This will have a double-sided effect on the trucking industry — on the one hand, an increase in the demand for truck transportation and on the other, greater difficulty in attracting and retaining labour (all else equal).

The greater the labour productivity growth in trucking, the more the attractiveness of trucking is expected to increase. For one thing, carriers may be more amenable to offering higher wages since doing so does not necessitate reducing service quality.

In a slow-growth economy, policymakers may be more likely persuaded to undertake initiatives that are supportive rather than detrimental to productivity. Policy, however, is often difficult to predict so it is also possible the linkage will not take hold.

Three combinations are selected from among the 24 possible combinations on the basis of:

 Plausibility. There should be internal consistency among the various outcomes and it should be possible to weave these outcomes into a clear "story" depicting the scenario.



- Diversity of impact. Two scenarios should not have a similar impact on the driver gap, even if the underlying mechanisms are different.
- Boldness and uniqueness. The scenarios should reflect one or two key underlying forces or phenomena and should favour boldness over predictability.

The three selected scenarios are presented in the following section.

4.3 Alternate Scenarios

The purpose of scenario planning is not to enumerate every possible scenario, nor is it to quantify the impact of every possible change to the baseline. Rather, the objective is to present alternative futures and map out how key variables, in this case truck driver supply and demand, stand to be affected. It is important to note that no single scenario is "preferred", they simply represent distinct plausible futures. Moreover, the focus is on coherence rather than precision. The future may end up resembling one scenario or a combination of scenarios. The scenario planning exercise helps to illuminate the key drivers and to provide a better, more intuitive understanding of the most important ways in which the future may deviate from the baseline forecast.

4.3.1 Description of the Scenarios

The four scenarios, including the baseline scenario, are as follows:

Scenario 1: Baseline

There is a general economic recovery, with a corresponding increase in demand for trucking. Trucking productivity continues to increase at historical (modest) rates and legislation is moderately supportive or neutral towards productivity. Trucking remains somewhat unattractive as an occupation, particularly for younger workers. Net result: despite modest gains in productivity, the driver supply and demand gap increases, as projected in the baseline scenario provided in section 4.1.

Scenario 2: Strong Economy and Heavy Regulation

Canada undergoes an export-led economic recovery, leading to higher demand for trucking but also driving job growth in sectors like manufacturing and construction. Meanwhile, modest technological innovation is offset by growing congestion as trucking productivity stagnates. To add to the challenges, legislative initiatives aimed at supporting safety and the environment are applied bluntly and have a negative impact on productivity. With productivity growth low, carriers raise rates to the extent that they can to increase wages or improve driver amenities, though not enough to substantially enhance occupational attractiveness. Young people continue to eschew trucking for available jobs in other sectors.



Scenario 3: Sluggish Economy, Light Regulation

The economy struggles to grow, but policymakers understand the importance of finding new sources of productivity and legislation generally supports increased productivity in the trucking industry. Developments, such as improved routing and better driver amenities, make trucking somewhat more attractive as an occupation. Although wages do not increase substantially, carriers are able to find some new sources of driver supply, driven partly by improving conditions and partly by limited job prospects in sectors such as manufacturing and construction.

Scenario 4: Major Technological Change

Policymakers wholeheartedly embrace automated vehicles, which offer the allure of substantial productivity benefits through partial automation by 2024. Drivers are still required behind the wheel, but there are designated long-haul routes in which trucks can use driverless technology safely, allowing the driver to fulfill some of their rest requirements while doing paperwork or engaging in other activities. Active driving will still be necessary in urban areas, during poor weather, on non-designated roads, and in other situations.

Advances in fleet management systems will also add predictability in scheduling and minimize time away from home. Young drivers, in particular, like the enhanced possibility of using social media to interact with family and friends. Productivity improves and driver supply increases. The economy as a whole experiences the benefits of strong technological advancements, which in turn increases the demand for trucking services (though to a lesser degree than in Scenario 2).

4.3.2 Summary of Scenarios

We estimate the impacts of each the above scenarios by increasing or decreasing trucking industry demand, labour productivity and labour supply relative to the baseline scenario. Specifically, by considering the combined influences of the above factors, we apply the below percentage increases or decreases for each scenario, relative to the baseline:

Figure 4-7: Demand, Productivity and Supply Effects of Altnerate Scenarios (per cent relative to baseline)

Alternate Scenario	Demand Effect	Productivity Effect	Supply Effect
2: Strong Economy, Heavy Regulation	3.0	-3.0	-1.5
3: Sluggish Economy, Light Regulation	-3.0	1.5	1.0
4: Major Technological Change	1.0	10	1.0

The resulting national supply and demand gap for each scenario is shown in Figure 4-8.



Figure 4-8: National For-Hire Truck Driver Supply and Demand Gap (thousands of drivers), Baseline and Alternate Scenarios, 2024

Scenario	Demand	Supply	Gap
1: Baseline	194	160	34
2: Strong Economy, Heavy Regulation	206	157	48
3: Sluggish Economy, Light Regulation	185	161	24
4: Major Technological Change	176	161	15

Source: CPCS

Under the strong economy, heavy regulation scenario, the supply and demand gap increases to 48,000 drivers. The increase in the gap relative to the baseline is a function of higher demand for trucking services as the economy grows at a faster pace. Meanwhile, (as described in section 4.3.1) the regulatory environment is not favourable to trucking industry productivity growth, increasing the number of truck drivers required relative to trucking industry output.

On the other hand, the major technological change scenario gap decreases (relative to the baseline scenario) to 15,000 drivers. While economic growth also increases the demand for trucking services in this scenario, technological advances help to boost trucking industry productivity, reducing the number of truck drivers needed relative to total industry output. A small bump in driver supply, due to the improved driver quality of life (as described in section 4.3.1), also helps to slightly decrease the gap. Of note in this scenario is that partial automation only begins to take hold towards the end of the period of analysis (2024), meaning that it only has a small impact on reducing the need for truck drivers at that point. Presumably, those impacts would continue to grow (along with labour productivity) further into the future.

In general, the scenarios were selected so as to ensure a range of impacts are represented. It may be that the economy grows quickly and, separately, the truck driving occupation also becomes more attractive. In such cases, some of the effects will "cancel out" and the supply-demand gap will be somewhere between the levels predicted by the scenarios. Smaller gaps between supply and demand would require dramatically-improved levels of productivity combined significantly with higher levels of occupational attractiveness (perhaps as a result of even greater automation of other competing occupations). Or, a persistently very sluggish economy would also presumably eliminate the gap, though such a "solution" is one that no one would hope for.



Conclusion and Observations

Key Messages

- The implementation of successful recruitment and retention strategies will become even more important to reduce the driver supply and demand gap for the industry as a whole.
- Carriers have taken different approaches to sourcing new drivers. Some have focussed on mid-career recruits while others have placed renewed emphasis on recruitment programs for younger, entry-level drivers.
- Driver retention strategies have increased in importance. These retention strategies can begin at the recruitment stage.
- Carriers have a good understanding of why long-haul drivers leave for other occupations, but generally have less information on what occupation they have left for. Having this information may help to identify trends and identify the characteristics of those occupations that make them more attractive than truck driving.



5.1 Avoiding the Driver Supply and Demand Gap

Recruiting and retaining truck drivers, particularly long-haul drivers, is a challenge that will only become more difficult in the future. The implementation of successful recruitment and retention strategies will become even more important for individual carriers to maintain an edge over competitors, but they will also help to reduce the driver supply and demand gap for the industry as a whole. Some general observations regarding driver recruitment and retention follow, most of which were informed by industry stakeholder interviews.

5.2 Turnover Costs

The cost of high turnover is very significant for the trucking industry. The precise cost of turnover is difficult to calculate due to the fact that carriers employ different recruitment and training strategies and because some of the costs of turnover are hidden, or not directly out-of-pocket.

At the very least, turnover costs companies the salary of new drivers while they are in the process of training. When recruiting seasoned drivers, the training costs may be virtually zero. However, when recruiting relatively inexperienced or entry level drivers, the costs are much higher. In these cases, direct costs will be at least \$2500 to \$3000 in order to cover salaries while recruits undergo training for a couple of weeks. Some companies may provide up to 13 weeks of training, in which case the cost of covering salaries as well as providing training could add up to much more.

Hidden costs of turnover include having a truck sitting idle rather than earning revenue as the company looks for a new driver. In some cases, this can be mitigated by increasing part time hours for drivers who were on a truck share. Nevertheless, there will usually be some idle time as a result of turnover. All-in-all, total salary, training and hidden costs associated with replacing one driver with a new entry level driver could cost in the vicinity of \$20,000.

5.3 Sources of New Drivers

5.3.1 Mid-Career Recruits

Carriers have taken different approaches to sourcing new drivers. For many carriers, key sources for new drivers have been mid-career workers from other industries, such as construction or manufacturing, who are seeking similar salary levels (in the range of \$60,000 per year). For many of these workers, long-haul truck driving is one of the few occupations that can replace such a salary level. Carriers are more likely to trust that these workers, being mid-career, will buy into the occupation long-term.



Some carriers have also found limited success recruiting former military personnel who are on a partial pension. The fit is often seen to be good for these workers as they are already used to being away from home as well as being accustomed to undertaking strenuous physical activity.

5.3.2 Immigrant Candidates

Carriers have had varying levels of success in tapping into foreign workers or immigrant populations for their driver workforce. On the whole, the trucking industry was not a major user of the Temporary Foreign Worker Program (TFWP), but many carriers that did use the program have moved away from it since the Federal Government has implemented changes that have increased the cost of using the program in 2014.

In addition, not all provinces include truck drivers in their provincial nominee programs, which in some cases enabled drivers entering Canada under the TFWP to eventually become permanent residents. The designation of the occupation as low-skilled under the National Occupational Classification also stymies the industry's ability to attract truck drivers through immigration channels. ³⁵

5.3.3 Recruiting Younger Drivers

A challenge associated with recruiting mid-career workers, is that they will unlikely be able to provide 25 or 30 years or more of service since they are already in their 40s or even 50s. Moreover, there is only a limited supply of workers of this age who are looking to switch careers.

In response to the need to find new sources of labour supply, some carriers are looking more and more at recruiting younger drivers who are new to the labour force. As noted in section 3.4, the industry has largely been unsuccessful in recruiting drivers from this demographic. This is a result of the changing preferences of younger workers, as well as the perception of the trucking industry and the occupation. But it also comes as a result of many years of hesitation within the industry to put effort and resources in recruiting younger drivers. Younger recruits have shown a penchant for leaving the occupation not long after undergoing training and coming to the realization that being on the road for many days or weeks at a time takes its toll. Furthermore, obtaining insurance for drivers under 25 with little or no experience has at times posed challenges as well.

Carriers have tried to address these issues by increasing their investment in entry level drivers (as noted in section 5.2, in some cases up to 13 weeks of training) while taking some steps to



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³⁵ As noted in section 4.2.2, the trucking industry is working with provincial governments on initiatives like mandatory entry-level training to lay the foundation for recognizing truck driving as a skilled occupation. Furthermore, TruckingHR Canada has published an extensive National Occupational Standard (NOS) for truck drivers that provides in-depth descriptions of the various tasks and competencies required for the occupation.

protect that investment. For example, entry level drivers may be required to pay back a small portion (perhaps \$2000) of the training costs if they leave the company within a specified period of time (e.g. two years). While this policy helps to reduce the risk of recruiting any entry level driver, regardless of age, it helps to assuage the reluctance to recruit younger drivers in particular, as recruits who are willing to accept these terms are more likely to be in for the long haul (pun not intended).

Some carriers have also found that concerns from insurance companies regarding inexperienced drivers under the age of 25 can also be addressed by demonstrating proper due diligence in training and mentorship programs. This includes starting young drivers on local routes and gradually moving them to long-haul routes. When possible, recruiting younger drivers who have some experience driving light and medium duty trucks also helps to provide confidence for insurance companies (and ease the transition to heavy duty long-haul trucking in general). The industry hopes that the introduction of mandatory entry level training, in some provinces at least, will help in this regard.

5.3.4 Aboriginal and Women Candidates

Aboriginals and women are currently underrepresented among the truck driver pool in Canada. As such, they represent a large potential pool of driver candidates. Some industry efforts are underway in order to increase the level of participation among these groups in the trucking industry. For example, TruckingHR Canada's "Women with Drive" project aims to raise awareness among women of career opportunities and raise awareness among employers of recruitment and retention practices that support the integration of women in the workforce. 36

5.4 Driver Retention

Providing stable and above-average income is obviously one factor that can help retain drivers. But other strategies can also contribute to driver retention. For a growing number of carriers, these driver retention strategies begin at the recruitment stage. By identifying good candidates, providing effective training and doing as much as possible to demonstrate the rigours and lifestyle of long-haul trucking to new recruits (in some cases inviting spouses to interviews), there are less likely to be unpleasant surprises for drivers later on.

After recruitment, retention efforts are an ongoing processes. Some carriers are experimenting with different incentives, such as providing bonuses to drivers who are away from home for particularly long periods of times (such as 15 days or more). Others have tried providing safedriving incentives (such as bonuses for clean safety records). These incentives have been met



³⁶ TruckingHR Canada, Women with Drive. https://www.truckinghr.com/en/content/women-drive.

with mixed results at best, as it is not clear that they are actually useful for encouraging safer behaviour and they come at the risk of agitating drivers.

Some carriers have found that tenured drivers would quit with little or no notice, and no previous indication of being dissatisfied with the job. In response, carriers have initiated more regular check-ins with drivers to ensure satisfaction or to address concerns before they grow. Having various staff (HR staff, supervisors, fleet managers, etc.) perform check ins at different times also helps increase the likelihood that drivers would find someone that they are more comfortable being open with in regards to any on the job issues.

A greater trend towards truck sharing, where two drivers share one truck, has helped to provide more flexibility in scheduling. For example, this allows one driver to be off for a month while the other is on for the month. Truck sharing can theoretically be applied in different ratios, such as three drivers sharing two trucks, in order to provide different ratios and portions of predictable home time. Geographic dispersion of the driver pool is another continuing trend. This dispersion allows drivers to stay closer to home, thereby maximizing their home time.

More carriers are beginning to recognize the need for enhanced health and wellness strategies. This comes as a result of the number of drivers who are lost due to medical issues, or who are screened out due to medical issues to begin with. For example, by one estimate the U.S. trucking industry lost more than 150,000 drivers from May 2014 through the end of 2015 due to elevated blood pressure and blood sugar levels. Taking active steps to promote health and wellness, starting at driver orientation, has been suggested as a strategy to reduce the number of drivers who are lost due to these medical issues.³⁷

5.5 Identifying Destinations for Former Employees

For the most part, the reasons for driver dissatisfaction are well-established. Where former employees ultimately windup is not as well-established. Some carriers report that long-haul drivers often leave to take a local trucking position out of preference for the regular work hours and schedule. For drivers who leave the occupation altogether, carriers generally have less information on what occupation they have left for.

Trying to obtain this information more systematically (such as through exit surveys) may help to identify trends and identify the characteristics of those occupations that make them more attractive than truck driving. This may be easier said than done, however, as carriers who already conduct exit surveys at times find it difficult to get responses from their former



³⁷ Commentadore, *Ditching Old-School Methods to Retain Drivers* (January 25, 2016). http://fleetowner.com/driver-management-resource-center/ditching-old-school-methods-retain-drivers.

employees. A wider survey effort conducted by an organization such as the CTA or TruckingHR Canada could help to identify these occupations and their related characteristics.

5.6 Conclusion

The extent to which the trucking industry will face growing challenges in recruiting the necessary number of truck drivers depends not only on demographics. The industry will need to employ new recruitment and retention strategies to ensure the sustainability of the current business model, particularly the long-haul trucking business model.

That said, there will need to be further changes to the business model itself, primarily changes that manage to move products across the country and continent while minimizing – to the extent possible – the amount of time that drivers spend away from home.

The trucking industry, and the companies that make up the trucking industry, are not the only stakeholders that have an interest in maintaining the sustainability of the long-haul trucking model. The industry's customers (shippers) and their customers' customers (the general public), will also be directly affected, negatively or positively, by the trucking industry's ability to rise to the challenge.



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