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Labour Shortages in the Canadian Transportation Sector: New Evidence from Microdata

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Executive Summary

This report investigates concerns over perceived labour shortages in Canadian Transportation industries and occupations with individual-level data from the 2010-2020 Labour Force Surveys and the 2006 and 2016 Canadian Census cycles. Using confidential microdata available in the Statistics Canada Research Data Centre allowed us to analyze Transportation industries and occupations in more detail than is currently possible with publicly available data.

Findings

Workforce Characteristics

- In this study, we show that the characteristics and demographics of the Transportation workforce in Canada have remained stable and distinct from the non-Transportation workforce since 2006, with two exceptions:
    - The Transportation workforce is older.
    - More immigrants are represented in the Transportation workforce in 2016 than in 2006.

- Industries and occupations in the Transportation sector remain disproportionately male-dominated and have a high representation of workers without post-secondary education.

Regional Labour Supply Challenges

- Labour supply challenges differ by industry and by region across Canada. For instance, the aging Transportation workforce is more pronounced in the Atlantic provinces, where population growth is slow and immigration levels are low.

- Transportation industries and occupations across the country have low unemployment rates but generally remain above the 3.5% threshold defining a tight labour market. Yet, in Nova Scotia and New Brunswick, a reliance on older workers with longer job tenure in Transportation suggests there is an absence of younger labour market entrants in the sector. This poses future risks of labour shortages as older workers retire.

- Meanwhile, Western Canada sees a net gain of Transportation workers from inter-provincial migration, meaning Canadian-born Transportation workers are leaving other regions. Quebec and the western provinces have benefited from immigration to backfill, and in Ontario's case grow, the Transportation workforce.

Earnings Growth

- Transportation workers' earnings growth, which is considered a key indicator for labour shortages, is generally in line with that of non-Transportation workers, suggesting that whatever pressures employers in Transportation face finding workers are shared by employers in non-Transportation industries.

- In Truck Transportation, other than in the Atlantic region, earnings growth has been weaker than for non-Transportation industries and workers, which suggests improving labour supply conditions.

- Some occupations in Transportation show high earnings growth compared to other Transportation occupations, as well as compared to the non-Transportation workforce, but they are high-skill occupations with lower employment size, like railway engineers, air pilots, and engineer officers for water transport.

Transportation Industries and Occupations

- Of the Transportation industries and occupations, Truck Transportation and Transport Truck Drivers represent a large share of employment. Other industries' subsectors and occupations account for smaller counts and shares of the sector's employment.

- Concerns over labour shortages have been associated with Truck Transportation and Truck Drivers. Yet, the Trucking Industry and Truck Drivers show the least evidence of a national labour shortage among Transportation industries – if anything, they show loosening labour markets.

- Water and Rail Transportation industries show more evidence of labour shortages, but the numbers employed are low enough that it should be feasible to grow the necessary labour supply through education and training and other strategies.

Discussion

From the results, it is not obvious that there are national labour shortages in Transportation industries and occupations at this time, though there are signs of a tightening labour supply and risks of future shortages.

Overall, pressures on Transportation industries appear to have been related to the strong economic growth of Western Canada and labour supply trends affecting the overall economy. The slowing economic growth in Western Canada since 2016 should alleviate some of the labour supply pressures on other regions of Canada arising through inter-provincial migration.

Immigration has been an important source of workforce supply to reduce the pressure on employers, particularly in Ontario. For Atlantic Canada, Transportation workforce challenges can be addressed with immigration and improved immigrant retention.

An intriguing policy direction for growing the Transportation workforce is to encourage greater female participation in the sector. The relative absence of females in Transportation industries and occupations, combined with a sizeable earnings premium of Transportation occupations over female-dominated occupations in the service sector, suggests that strategies for growing the workforce with female employment in Transportation could come from addressing non-wage aspects of the jobs and, likely, the social norms which may lead to excessive gendering of the Transportation workforce.

Introduction

Overview of the Issue

Recent trends in the Canadian Transportation sector have raised concerns that labour shortages exist and are likely to become more severe.[1, 2] In 2001, the Canadian Labour Congress identified a "looming shortage of skilled workers" in Utilities, Transportation, Education, Health and Social Services, and Public Administration. Unsurprisingly, Transportation sub-sectors in Canada have since experienced low unemployment rates,[3] low rates of employment growth,[4] increased wages,[5] and an increased reliance on immigration for meeting workforce needs.[6]

Back in 2013, The Conference Board of Canada projected shortages for Truck Drivers in Canada in 2020 would be between 25,000 and 33,000 drivers.[7] Between 2015 and 2018, not long after these projections were made, the average number of job vacancies for Truck Drivers in Canada rose from 48,000 to 81,000.[8]

The Canadian Occupational Projection System (COPS) also projected future shortages in two Transportation occupations:

- NOC7312 – Heavy-Duty Equipment Mechanics
- NOC7511 – Transport Truck Drivers.[8]

These projections identified that labour shortages in long-haul trucking have been particularly acute and have acted as the main constraint on employment growth in the industry. Meanwhile, lower fertility and the aging out/retirement of the baby boomer generation are expected to slow the growth of the Canadian labor force in coming years, and there are concerns that the growth in labour supply for the Transportation sector will slow as part of this general labour market trend.

Other changes in the Canadian economy may also be worsening the labour supply conditions for particular sectors, including Transportation. The shift away from primarily resource-based economies to knowledge-based economies has changed the skills required of the Canadian workforce. This, coupled with demographic changes as a result of an aging workforce, has led to concerns that an older and smaller labour force may lead to a shortage of workers in the Transportation sector.[9]

Labour shortages in a market economy arise when the demand for workers in an occupation at a given wage exceeds the supply of workers who are qualified, willing, and available to do that job at a given wage.[10, 11] If employers and workers respond to wages, excess demand for an occupation should result in an increase in the competitive market wage, alleviating the shortage by reducing demand for labour and inducing more workers to acquire skills and credentials and be available to work.

Persistent labour demand in excess of labour supply would result if wages do not respond to excess labour demand pressure, or if barriers to entry to the occupation experiencing shortages exist.

For economists, labour shortages are a concern in cases where markets fail to adjust to the shortage conditions due to barriers to supply or rigidities in wage setting. However, labour shortages are a source of concern for governments and industry stakeholders for reasons other than market efficiency. Higher wages are associated with lower employment, which, if resulting from marginal firms exiting the industry, is part of an economic contraction.

Higher Transportation costs arising from higher labour costs compound the impact of labour shortage on producer competitiveness, which can discourage investment. Governments may choose to intervene to address emerging labour shortages or supply-related wage inflation to maintain competitiveness of trade-exposed producers and to support economic growth. This concern can carry over to policies related to addressing regional economic disparities.

Since Confederation until the 1990s, subsidies for Transportation to support producers in the Maritime provinces have been applied to maintain the region's industrial base. If labour shortages are more pronounced in some provinces and not generally for the national labour market, then government intervention to address a regional labour shortage would depend on whether the national interest is served by alleviating the regional shortage, or whether the shortage is interpreted as part of an economic adjustment that itself is in the national interest.

Study Objective

The objective of this study is to provide quantitative evidence with which we can assess the concerns of stakeholders in the Transportation sector regarding the availability and affordability of qualified labour and to determine policy options for addressing those concerns.

As concerns surrounding labour shortages have been persistent, there is a need to understand the operation and adjustment of the labour market with respect to the Transportation sector.

- If labour supply and demand respond to higher wages, market mechanisms may be a solution for drawing more labour into the sector and reducing rates of turnover.

- If labour supply and demand do not respond to higher wages, it could mean other market barriers and distortions are at play, such as regulations, skills mismatch, working conditions, and related factors.

We also consider whether any observed labour shortages are specific to provinces or regions within Canada or are a national phenomenon.

This report presents our statistical work on detailed occupational information on Transportation industries using confidential microdata from the Labour Force Survey and Census of Canada, available in the Statistics Canada Research Data Centre. We investigate indicators of labour market balances by Transportation industry, Transportation occupations, regions, and provinces to assess if there is evidence supporting an interpretation of labour shortages or risks of future shortages.

Summary of Findings

We do not find evidence of national labour shortages in the Transportation sector, though there are signs of a tightening labour supply and risks of future shortages.

The Transportation workforce is aging, and there are pressures on labour supply coming from the decreased entry of younger Canadian-born workers and strong labour demand drawing Transportation workers to the west. However, the tight labour market conditions in Transportation appear to be part of the same labour force trends and challenges facing all sectors and are not specific to Transportation.

Some occupations that are characterized by more specialized, advanced skills may be facing a labour shortage, but the size of these occupations in terms of employment are small enough that solutions can be found through training, education, and more efforts directed at recruitment.

Immigration is growing the Transportation workforce, particularly in Trucking, which is alleviating labour shortages, and immigration can continue to be an important source of Transportation labour supply.

Given the relative absence of females in the Transportation workforce and the lower earnings of females in non-transportation industries, there is also potential to grow the Transportation workforce through attraction of females to Transportation occupations. Over the past 60 years, rising female participation in the labour force has been the major driver of labour supply growth in Canada. There should at least be recognition that employers in the Transportation sector have not succeeded in tapping into that enormous pool of labour.

Background and Literature Review

Observed and projected labour shortages within the Transportation sector in Canada have led to a growing body of research aimed at investigating and quantifying these shortages to determine policy options that address these concerns.

Labour Shortage Definitions

While there is no universally accepted definition for a labour shortage, researchers generally view a labour shortage as

> *a situation where the demand for labour exceeds the supply of labour at the existing wage for a sustained period of time*.

Blank and Stigler[12] argue that shortages exist when the supply of workers increases less rapidly than the number demanded at the compensation/wages paid in the recent past. In a

competitive labour market, this imbalance should lead to increased wages to encourage more supply (and/or dampened labour demand) and/or activities which were once performed by qualified workers to be performed by workers who are less trained and less expensive. Using a comparison of earnings of engineers and other professional groups to test the hypothesis of a shortage of engineers, they proposed that a shortage exists if the earnings of engineers relative to other occupations have risen.

Arrow and Capron[13] expand on this, explaining that dynamic shortages are brought on by a rapid and persistent rise in demand, a low elasticity of supply, and a slow market reaction to the changes in demand. In other words, shortage conditions arise from the failure of demand to increase the wage as rapidly and/or by as large an amount as needed to induce a sufficient increase in labour supply.

Franke and Sobel[14] agree that demand exceeding supply at the going wages is the reason behind shortages, adding that institutional constraints are responsible for the lagged response of wage and supply. Where wages do not rise sufficiently, labour shortages can be characterized by persistent job vacancies – employers who have positions unfilled at the going wage rate.

Shah and Burke[15] believe a shortage occurs when the demand for workers exceeds the supply of workers available and willing to work under existing market conditions in an occupation. In this case, employers report a labour shortage when they have trouble hiring despite the availability of qualified workers (quantity) or when the available workers do not fit their definition of 'ideal' (quality).

Using a similar definition, Veneri[10] discusses distinguishing between shortages due to quantity and shortages due to quality, stating that under conditions of a tightened market, employers are faced with a reduction in applications as a whole or a decrease in their preferred caliber of applicants. Both papers signal the importance of distinguishing between a labour shortage and a skill shortage:

> *Labour shortages occur when there is lack of candidates for a job, while skill shortages describe a situation where there is a sufficient number of candidates, but not all of them meet the employer-required skills to do that job.*

Labour Shortage Indicators

There is, however, more to the concept of shortages than defining them. Knowing the indicators to measure and identify them is also a challenge.

Franke and Sobel[14] state that relative wages as an indicator of labour shortages should be the only focus. Rather, the entire labour market process, from trends in employment to hiring practices, should be examined. While they highlight the basic premise behind a labour shortage – demand being greater than supply at the going wage – they acknowledge the multifaceted nature of labour shortages, agreeing that there are numerous reasons why a market does not clear.

The indicators or measures of a labour shortage are where the majority of discourse on this subject matter comes in. These indicators are market reactions to, or signals of, a shortage of labour.

Some researchers investigate the existence of labour shortages by conducting surveys among stakeholders in a sector or industry. Others use labour market indicators from available data.

Some of these signals include the following:

- Increase in wage and benefits[10, 13, 16, 17]
- Lower unemployment rate / increased employment rate[2, 10, 17, 18]
- Increase in rates of turnover or churn decreasing job tenures
- Increased switches to similar industries[2, 16-18]
- Hiring bonuses[2]
- Improved working environment / conditions[9, 16]
- Shifting age and gender distributions[2, 9]
- Increase in labour and/or capital productivity[17, 19, 20]
- Increase in overtime/hours worked[16, 18-20]
- Increase in job vacancies[2, 18, 21]
- Reduced barriers to entry / increase in underqualified workers[16, 17]
- Increased geographic mobility[9]
- Decline in post-secondary enrollments or graduations[22]
- Internal reassignment of responsibilities[16]
- Outsourced work (i.e., contracts, foreign workers/immigrants)[16, 19]
- Increased training[9, 16, 19, 22]
- Increased use of labour-saving technology.[16, 20]

Veneri proposes a combination of indicators to identify a shortage as best: "Different types of shortages resulting from various labor market situations may require different responses from employers and workers."[10] For instance, while some employers respond to a shortage by increasing wages, others provide longer hours for existing workers or contract out positions.

Another aspect to labour shortages is the dimension in which they occur. Barnow et al.[16] suggest researchers note four dimensions before turning to the cause and consequence of a shortage:

1) The geographic scope of a shortage (national or confined to a region)

2) The longevity of the shortage (weeks, months, or years)

3) The severity of the shortage

4) The occurrence of a shortage within sub-specialties (e.g., Truck Drivers within the Transportation industry by years of work experience, or by specialized training).

In short, labour shortages are often specific and delimited by geographic location, length, severity, or occupational category.

The Canadian Transportation Sector

The Canadian Transportation and Warehousing sector (referred herein as the Transportation sector) supports the activities of other industries, particularly manufacturing, in the delivery of goods to markets and inputs from the supply chain to producers.

In 2019, the Transportation sector represented 4.5% of Canada's gross domestic product (GDP),[i] and the sector's GDP increased 3.2%, faster than GDP growth in Canada (2%). In the same year, employment in the Transportation sector accounted for 5% of total employment in Canada, employing close to a million people – up 5.7% from the previous year.[23]

Productivity growth in the Transportation sector, however, has not been strong. Between 2010 and 2019, multifactor productivity for the sector decreased by around 0.9% per year, compared to a 0.6% increase for the business sector as a whole.[1]

The Canadian Transportation and Warehousing sector contains nine sub-sectors/industries:

- Air Transportation
- Rail Transportation
- Water Transportation
- Truck Transportation
- Transit / Ground Passenger / Scenic / Sightseeing Transportation
- Pipeline Transportation
- Support Activities for Transportation
- Postal Service / Couriers / Messengers
- Warehousing and Storage.

The Transportation industries are all concentrated in provinces with larger populations: specifically, Ontario, Alberta, Quebec, and British Columbia, with Ontario often having the largest share of employment.[24]

Each industry serves a unique purpose. For instance, 70% of domestic freight is moved by truck, while the other 30% is moved mostly by rail. International freight is also handled by air and marine modes of Transportation.

The Truck Transportation industry represents the largest share of GDP within the sector – accounting for 25% to 26% of the sector's GDP for the last five years (2014-2019). Often referred to as 'trucking,' Truck Transportation also comprises a significant amount of the services provided by small, for-hire carriers and owner-operators, as well as medium- to large-size companies that offer comprehensive logistic services in addition to the truck fleets they operate.

[i] Based on chained (2012) dollars, seasonally adjusted

The two main railways in Canada – the Canadian National Railway and the Canadian Pacific Railway – offer intermodal transportation, logistics, and brokerage services.

Air Transportation is used in goods shipment for moving high-value goods, perishable goods, or short notice orders.

Postal, Courier, Warehousing, and Storage service industries engage mostly in postal services, from courier and delivery services to operating warehousing and storage facilities.

For the Marine sector, Canadian ports are the main points of exit and entry of Canadian bulk commodities and imported products to and from overseas markets.[25] There are two categories of ports: 17 ports independently managed by Canada Port Authorities and 35 port facilities currently owned and operated by Transport Canada. The main activity of Canadian registered vessels is transporting domestic bulk cargo and facilitating trade between Canada and the US. This sector is also critical for northern resupply and offshore resource development. Canada's commercial registered fleet has 727 vessels, with a total of 3.7 million gross tonnes. Ferries in Canada provide an important role as a Transportation link for coastal and island communities, as well as for those separated by river or lake crossings. Major ferry companies in Canada carry yearly on average more than 53 million passengers and more than 21 million vehicles.

In 2019, the Canadian economy – and trade – experienced slower growth, which in turn affected demand within the Transportation sector. Air cargo traffic declined, the growth of rail traffic slowed, and there were reportedly 3% fewer trucks crossing the Canadian-US border compared to 2018.

The sector also experienced major disruptions in 2019 and 2020. The Canadian National Railway strike in 2019 affected the flow of goods from Canada, and challenging weather conditions affected port and railway line operation.

However, the impacts of these disruptions pale in comparison to the ones caused by the ongoing COVID-19 pandemic. With the pandemic significantly impacting the US and China as two of its top trading partners, Canada saw significant declines in its supply chains, the inbound flow of goods, and overall production and productivity.

The Transportation sector was one of the industries most affected by the COVID-19 crisis, experiencing a 5.2% decrease in output, a 6.7% decline in hours worked, and a total loss of 11.7million hours in the first quarter of 2020. While the full economic effect of the social and physical distancing mandates remains to be seen, the main modes of Transportation – air, marine, road and rail – have seen significant declines in activity and, in turn, revenue.

Labour Shortages in Transportation

Labour shortages in the Transportation sector may be the outcome of structural trends affecting the supply and demand of labour, such as the demographic trends of an aging Canadian population and the shifting of labour supply requirements to those of a knowledge-based economy. Labour shortages can be the product of regulation, collective agreements, and other

barriers that limit the flexibility and expansion of labour supply. Cyclical influences can also create strong short-lived pressures on employers.

Regarding Truck Transportation, Canada's most relied upon mode of freight transportation, it is believed that economic activity could stall if the industry is unable to keep supply chains flowing.[26] This is of particular concern, as the industry plays a significant economic role in national and international supply chains.[2, 27]

In 2017, the World Bank identified Transportation and Warehousing as having a "serious and worsening" shortage of workers at all employee levels, across regions and between countries within the same region.[28] In the report by Mackinnon et al.,[28] the shortage of workers in developed countries like Canada appeared most acute among staff at the operational level (e.g., Truck Drivers, Forklift Drivers, Warehouse Pickers).

The shortage problem in this industry is described as two-fold:

- a lack of staff with the right skills and qualifications
- a skill deficiency among existing staff, most of whom lack the attitude or discipline needed to perform at their jobs.

According to the World Bank report, this recruitment shortfall will result in longer hours, which leads to losses in service quality, high turnover, or an overreliance on temporary staff, which affects productivity and quality and less investment in training by employers.

Reasons behind shortages at the operational level were said to be linked to the low social status and poor wages often associated with positions in this level. The nature of the tasks (e.g., long hours, night shifts, and long periods away from home) made jobs at this level unattractive for large sections of the population. Another reason cited was the clustering of logistics activity in major hubs, which intensified the competition for labour in small areas. When employers were located in more remote areas, finding workers was identified as a challenge.

For the Transportation sector, declining unemployment rates and increasing job vacancies are interpreted as signs of a labour shortage. Transport Canada[24] reported that the 2019 unemployment rate for the sector (3.2%) has remained below the national average of 5.7%, and its unemployment-to-job vacancy ratio (1.9) has declined in recent years, staying below the national average of 3.4 in 2018. The declining value of the unemployment-to-job vacancy ratio means that there are fewer unemployed people for each job opening. The tight labour market, however, did not cause an earnings growth, with average hourly wages increasing at a lower rate (1.9%) than the overall industrial average in 2019 (3.4%).

The demographics of the Transportation workforce are also interpreted as signals of a labour shortage within the sector. In 2016, women comprised less than 25% of the sector's workforce, and immigrants and Indigenous peoples were under-represented. As well, 50% of the sector's labour force was between 45 and 64 years old, compared to 40% nationally; and 7% of workers were under 25 years old, compared to 14% nationally.

As mentioned earlier, shortages can occur within specific occupations and businesses in a sector, and Transportation is not an exception. Truck driving in particular is seen as undergoing a long-term, chronic shortage of qualified drivers in certain regions of the country and certain sectors of the sub-industry.[26]

Truck Drivers represent 46% of the sector's workforce, while their activities are said to support the remaining 54% in activities from shipping and receiving to administrative tasks. However, despite their importance, they accounted for 63% of the sector's job vacancies in 2019, climbing from 8,600 vacancies in 2016 to 20,500 vacancies in the first three quarters of 2019. The occupation's historically low unemployment rate – 6.6% to 3.8% between 2016 and 2018 – was interpreted as further evidence of a shortage.[2] Key factors behind this shortage were said to be the aging workforce, difficulties attracting women and younger workers, a high rate of voluntary turnover, quality of life, qualifications, and public perceptions of the industry and the truck driving job, among others.[26] Trucking HR Canada[2] identifies smaller firms as disproportionately impacted by a shortage of labour for driving trucks.

Millennials form the largest birth cohort in Canada's workforce at 37%, followed by the baby boomer generation at 31%. With the latter comprising an increasingly smaller percentage of the workforce due to aging and retirement, more opportunities are opening up for younger employees across all sectors, including the Transportation industry. However, the Truck Transportation industry has a relatively lower percentage of young employees than the average across other industries.[29]

Despite the increase in the number of opportunities for individuals entering the workforce as the older generation approaches retirement, there is a lack of interest from younger generations in taking up these opportunities. The small percentage of younger workers (under age 25) within these occupations was attributed to the strict qualifications required for hiring – chief of which was the combination of the minimum age to obtain a Truck Driver's license (18/19 years) and the years of experience required for hire (average of 3 years). In 2018, the shortage of Truck Drivers in Canada caused a 5% reduction in revenues in the Truck Transportation industry. Small businesses were said to be more vulnerable to the effects of this shortage, which cost them an average of 25% of sales compared to 7% for larger firms.[27]

The problem of labour shortage in Transportation is more acute for the Atlantic provinces. The region has been identified as high risk in comparison to other provinces, as the labour shortage in Truck Transportation is most prominent in this region.[30, 31] Historically, the Atlantic provinces have been considered labour abundant, with high unemployment and low wages compared to other regions of Canada.[32] In recent years, however, the Transportation labour market in the Atlantic region has been characterized by high vacancy rates, a decline in the number of active employer businesses, and weak employment growth in comparison to other regions. In the Atlantic regions, Transportation comprises a larger share of the economy than in other provinces due to the prominence of the Truck Transportation subsector and the provinces' locations as regional crossroads.[31] The prevailing shortages are projected to persist for the foreseeable future, given the aging workforce approaching retirement and the lack of uptake by younger potential employees.

Despite there being a lack of female representation within the industry, recruiting female millennials may be a pervasive challenge. Perceptions of the safety and well-being of the occupation is low among young women. with only 29% of surveyed women considering long-haul luck driving safe, compared to 46% of men.[27] These concerns are focused primarily on personal safety.

Hiring immigrant workers may be viewed as part of the solution to the looming driver shortage. While Canada needs immigration to grow its workforce over the long term, there appears to be a perceived focus on attracting immigrants with "higher levels of education."[26] The Truck Transportation sector need not be seen as any different from other sectors, as carriers are already competing with all other industries to attract individuals from a shrinking domestic labour pool.[26] However, this remains a challenge, as Truck Drivers are not candidates for immigration to Canada under the federal economic streams because the job does not qualify as a skilled occupation under the National Occupational Classification (NOC). Truck Drivers are eligible for immigration to Canada under the Provincial Nominee Programs of several provinces. However, the employment of Temporary Foreign Workers in the Transportation sector does not appear to be significant.[33]

Like perceptions of Canada, the US is perceived to be suffering from a Truck Driver shortage as well. In a report by Costello and Karickhoff[34] for the American Trucking Alliance, the Trucking industry in the US is projected to be short 160,000 drivers by 2028. Published figures suggested the issue was due to issues of quality rather than quantity, with 88% of fleets reporting enough job applicants but not enough qualified ones.

In a paper for the US Bureau for Labor Statistics (BLS), Burks and Monaco[18] stated that the labour market for Truck Drivers, specifically Heavy and Tractor Trailer Truck Drivers, has shown indications of a tightened labour market. Higher wages, increased employment rates, and lower unemployment rates relative to other blue-collar jobs with similar job requirements are some of the indicators used to identify this. Occupational mobility data used in the study also showed that majority entry and exit occupations were within Transportation or similar blue-collar sectors. Econometric modeling revealed that Heavy Truck Drivers were less likely to leave than light and delivery service drivers or driver sales workers. Increased initial pay reduced the likelihood of entry, whereas increased hours had the opposite effect, showing that those entering the occupation may have seen it as an avenue to increased earnings and therefore worked more hours. Overall, Burks and Monaco assess that the market for Truck Drivers in the US is adjusting as required to address labour market imbalances.

For Canada, there are concerns that Transportation labour shortages may be emerging and chronic. In 2018, the Employment and Social Development Canada COPS projections indicate emerging shortages in some Transportation occupations within the next nine to ten years (2019 to 2028).[35] Persisting labour shortages are projected for Truck Drivers even though productivity-enhancing technologies (e.g., driverless trucks, Uber, Lyft) are expected to augment labour supply within these industries.

Shortages are expected to be higher among Long-haul Truck Drivers, who are especially difficult to attract due to specific licensing requirements and demanding working conditions. These

shortages are projected to worsen due to the large number of Truck Drivers of retirement age. Broad economic conditions for other industries in the sector are more positive, however.

For the Postal, Courier, Warehousing, and Storage industries, modest growth in industry (1.1%) and employment (0.4%) is expected in the next nine to ten years, albeit below the projected growth for the entire economy. This growth is projected to be driven by increased utilization of e-commerce methods and the consequent increased demand in parcel delivery and warehousing services. Increased reliance of retailers on warehousing services is expected to benefit these industries as well.

Long-term growth opportunities are expected to be slowed by decreased growth in disposable income due to a shrinking workforce and the mass retirement of baby boomers. This decreased growth in disposable income is expected to affect the Air, Rail, Water, and Pipeline Transportation industries as well, for the same reasons. Increased climate change activism, consumer debt levels, and oil prices are also expected to affect some of these industries. Overall, real GDP for these industries is expected to grow by 1.8% over the projection period.

In summary, certain Transportation occupations in Canada (and the US) are believed to be experiencing labour shortages which are expected to worsen in coming years. These shortages are mostly attributed to the unbalanced demographics of Transportation sector workers (older and male) and the retirement of experienced workers, combined with the specific entry requirements of some occupations in the sector and unattractive working conditions, both of which were said discourage entry into the sector. Market signals most often used to indicate shortages in the sector were increasing wages, declining unemployment rate, and increased employment and vacancy rates.

Other studies looking at shortages in general, however, suggest the use of other indicators based on the objectives in their studies. Due to data availability and differing research objectives, only some of those indicators are used in this study.

Data and Methodology

This report uses data from the Canadian Labour Force Survey from the years 2010 to 2020, and the 2006 and 2016 Canadian Census cycles. The datasets used in this report are useful for investigating labour market characteristics related to employment, income, and mobility, as well as the changing demographic composition of sectors and occupations. This is of principal concern since trends in aging, replacement, and retention of younger workers and minorities (women and immigrants) are central to understanding the likelihood of future labour shortages.

The **Labour Force Survey (LFS)** is a monthly cross-sectional survey with detailed self-reported information on industry and occupation, in addition to demographic and socioeconomic characteristics for individuals aged 15 and over in Canada. Information on detailed labour force activities is available on a monthly frequency. The LFS provides us with information on

- Actual hours of work in a reference week
- Hourly and weekly wages
- Age
- Employment status (including unemployment)
- Immigrant status

Due to relatively small samples and restrictions on disclosure of disaggregated data, certain occupations and sectors in some provinces do not have statistics reported. We use this survey to establish trends in labour supply indicators and labour shortage indicators. We also use this survey to determine which provinces have an increased likelihood of labour shortage indicators.

The **Canadian Census** provides detailed information on

- Labour force status
- Industry
- Occupation
- Immigrant characteristics
- Personal demographics
- Socioeconomic characteristics
- Region of residence

and some information on the geographic mobility of Canadian residents. The 2006 Census is based on a 20% sample of the population while the 2016 Census is based on a 25% sample.

In this report, Census data is used to examine the characteristics and employment earnings of individuals who self-reported that they were employed in Transportation occupations and industries. We compare them to individuals who self-reported employment in non-Transportation occupations and industries. We do not use Census data from the two cycles to infer employment trends.

We restrict ourselves to using the Census to describe characteristics and earnings of the Transportation (North American Industry Classification System [NAICS] 48) and non-Transportation workforces as well as select Transportation occupations (see Tables 1 and 2).

Analysis for both the Census and LFS includes Air (NAICS 481), Rail (NAICS 482), Water (NAICS 483), and Truck (NAICS 484) Transportation industries.[36]

- **Air Transportation** is comprised of establishments primarily engaged in for-hire, common-carrier transportation of people and/or goods using aircraft, such as airplanes and helicopters.

- **Rail Transportation** is comprised of establishments primarily engaged in operating railways. Establishments primarily engaged in the operation of long-haul or mainline railways, short-haul railways and passenger railways are included.

- **Water Transportation** is comprised of establishments primarily engaged in the water transportation of passengers and goods, using equipment designed for those purposes (Port and harbor operations are not part of Water transport. They are NAICS 48831, part of NAICS 488 Support Activities for Transportation).

- **Truck Transportation** is comprised of establishments primarily engaged in the truck transportation of goods. These establishments may carry general freight or specialized freight. Specialized freight comprises goods that, because of size, weight, shape or other inherent characteristics, require specialized equipment for transportation. Establishments may operate locally, that is within a metropolitan area and its hinterland, or over long distances, that is between metropolitan areas.

With the LFS, the Prairie provinces are excluded from the Water Transportation sample, while Newfoundland and Labrador and Prince Edward Island are excluded from Rail Transportation sample. The geographic structure of these provinces means a small sample size in the respective sectors, and they are excluded due to regulations on the disclosure of small sample statistics when using Statistics Canada microdata.

The final sample is restricted to respondents aged 18 to 64 at the time of the survey. We impose the lower bound age of 18, as this is the minimum age to obtain a commercial driver's license in Canada.

Results using Census data are based on the job held in the reference week,[ii, 21] while results using LFS data are based on respondents' current jobs, or the last job worked in the last 12 months. Occupation projection summaries by COPS,[8] as well as occupations of interest shared by Transport Canada, are used to determine the Transportation occupations analyzed in this report. Results using Census data are available for a larger number of occupations than for the LFS.

Due to sample size concerns in the LFS and Census samples, we grouped Transportation occupations of interest into five groups for the LFS and 21 groups for the Census. Our groupings are based on NOC codes and are not easily categorized by NAICS Transportation industries.

Two classifications of interest based on previous studies of labour shortages – Transport Truck Drivers (NOC 7511) and Transportation Officers/Controllers (NOC 2270) – are projected by COPS to be in shortage, while the rest are grouped occupations which were declared to either be recently in balance or have always had openings be similar to job seekers. The occupations and our grouping of them for the LFS are listed in Table 1:

[ii] The variable is reported for the "Population aged 15 years and over, in private households, who worked since January 1, 2015." The variable usually relates to the individual's job held during the week of Sunday, May 1 to Saturday, May 7, 2016. However, if the person did not work during that week but had worked at some time since January 1, 2015, the information relates to the job held the longest during that period."

Table 1: Occupational Groups for Labour Force Survey Analysis

Group	Occupations	NOC Codes
Transport Truck Drivers	Transport Truck Drivers	7511
Transport Officers/Controllers	Transport Officers and Controllers *(This includes the following)*	2270
	Air Pilots, Flight Engineers and Flying Instructors	2271
	Air Traffic Control and Related Occupations	2272
	Deck Officers	2273
	Engineer Officers – Water Transport	2274
	Railway Traffic Controllers and Marine Traffic Regulators	2275
Other Drivers *(Excludes Delivery & Courier Drivers)*	Bus Drivers, Subway Operators and Other Transit Operators	7512
	Taxi and Limousine Drivers and Chauffeurs	7513
Transportation-related administrative positions	Supervisors, Recording, Distributing and Scheduling Occupations	1215
	Customs, Ship and Other Brokers	1315
	Shippers and Receivers	1521
	Production Logistics Coordinators	1523
	Dispatchers and Radio Operators	1525
	Rail Supervisors	7304
	Supervisors/Motor Transport/Other Ground Transit Operators	7305
Other (Equipment Operators)	Railway Carmen and Carwomen	7314
	Automotive Service Technicians, Truck and Bus Mechanics and Mechanical Repairers	7321
	Railway and Yard Locomotive Engineers	7361
	Longshore Workers	7451
	Railway Track Maintenance Workers	7531
	Crew & Engine Room Crew – Water Transportation	7532
	Boat and Cable Ferry Operators and Related Occupations	7533

Table 2: Occupations Used in Census Data Analysis

Occupations	NOC Codes
Supervisors/Supply-Chain/Tracking/Scheduling	1215
Customs, Ship and Other Brokers	1315
Dispatchers and Radio Operators	1525
Air Pilots, Flight Engineers and Flying Instructors	2271
Air Traffic Control and Related Occupations	2272
Deck Officers (Water Transportation)	2273
Engineer Officers (Water Transportation)	2274
Railway Traffic Controllers and Marine Traffic Regulators	2275
Airline Ticket/Service Agents	6523
Rail Supervisors	7304
Supervisors/Motor Transport/Other Ground Transit Operators	7305
Railway Carmen and Carwomen	7314
Railway Engineers	7361
Longshore Workers	7451
Transport Truck Drivers	7511
Bus Drivers, Subway Operators and Other Transit Operators	7512
Taxi and Limousine Drivers and Chauffeurs	7513
Railway Track/Yard Maintenance	7531
Boat/Cable Ferry Operators	7533
Other Transportation	

Data for the LFS and Census can be used for constructing several statistical indicators that have been used to measure or determine labour shortages. For this study, the available data limit us to indicators that are based on the demographics, employment status, and earnings of the Transportation workforce (Table 3).

Table 3: Labour Shortage Indicators

LABOUR FORCE SURVEY – Supply-Side Indicators	
Indicators	**Benefit/Rationale**
Demographic distribution: Ratio of men to women, reliance on older workers	Shortage sectors or occupations usually have a demographic make-up that is vastly different from the overall labour supply. These shortage sectors or occupations are characterised as having an older demographic or a gender imbalance.
Job tenure	High voluntary turnover or high rates of 'churn' have been empirically linked to shortages. Low turnover or longer tenure on the job can also signal a lack of entry to the occupation, which contributes to perceived labour shortages.
Presence of immigrants in the workforce	Immigration is a source of labour supply that can offset or replace a scarcity of Canadian-born workers for an industry or occupation. Therefore, within shortage sectors or occupations, we expect to see a relatively low utilization of immigrants relative to the size of the immigrant pool of labour.
LABOUR FORCE SURVEY – Demand-Side Indicators	
Indicators	**Benefit/Rationale**
Unemployment rate by sector and occupation	A low unemployment rate may be a signal of a shrinking pool of applicants and a high utilization of qualified workers.
Average hourly and weekly wage	Some employers undergoing a shortage may increase wages to attract labour.

CENSUS – Supply-Side Indicators	
Indicators	**Benefit/Rationale**
Demographic distribution: Age, gender, employment share, and employment share of immigrants	Shortage sectors or occupations usually have a demographic make-up that is vastly different from the overall labour supply. These shortage sectors or occupations are characterised as having an older demographic or a gender imbalance.
CENSUS – Demand-Side Indicators	
Indicators	**Benefit/Rationale**
Annual earnings (2006 & 2016)	Same rationale as above with wages.
Geographic mobility	As mobility is directly linked to labour supply, increased outmigration of workers within an occupation or sector can lead to a shortage of available workers within that occupation or sector.

Labour Force Survey Data: 2010 to 2020

Description of the Transportation Workforce

Demographic characteristics of the Transportation sector workforce are distinct from non-Transportation sectors. Within the Transportation sector, there are three times as many men as women and an increasing reliance on workers between the ages of 55 and 64. Additionally, although the share of immigrants in the sector has increased slightly over the years, it varies by province, with the Atlantic provinces – particularly New Brunswick – lagging.

Overall, LFS data suggests the challenge for the Transportation sector is one of greater general competition for labour in Canada, with its aging population along with low appeal for young workers and female workers. Transportation sector employers have leveraged a growing male immigrant labour pool, but the large pool of female labour supply remains untapped.

Ratio of Men to Women

While service sector employment overall, and the aggregate of all non-Transportation sectors, shows a balance of males and females in the workforce, Transportation industries and occupations are extremely male-dominated workforces.

Analysis by sector shows that this imbalance is most pronounced in Truck and Rail Transportation, though clearly also present in Water and Air Transportation (Table 4). In both sectors (Truck and Rail), there are over five men for every woman in the labour force for most provinces. In non-Transportation industries, the ratio of men to women employed is around 1 to 1.

Transport Truck Drivers have at least a 20 to 1 ratio of men to women (Table 5). Air Transportation and Transportation-related administrative positions have a 2 to 1 ratio of males to females in most provinces. Transportation-related administrative positions consist of occupations declared by the COPS to be recently in balance, with openings being similar to job seekers (Table 4).

Table 4: Average Ratio of Men to Women, Transportation Industries 2010 to 2020

	Transportation & Warehousing	Air	Rail	Water	Truck
Newfoundland and Labrador	3.4	3	-	6	7
Prince Edward Island	3.7	-	-	-	11
Nova Scotia	3.5	3	-	4	9
New Brunswick	3.0	2	-	-	5
Quebec	3.4	2	7	3	8
Ontario	3.0	2	10	-	6
Manitoba	4.0	2	8	-	6
Saskatchewan	3.7	3	-	-	5
Alberta	3.0	2	6	-	5
British Columbia	3.2	2	16	5	6

Source: Labour Force Survey. "-"means small sample size or an excluded province.

Table 5: Average Ratio of Men to Women by Occupation, 2010 to 2020

	Transport Truck Drivers	Transport Officers	Other Drivers (Except Delivery/Courier Drivers)	Transportation-Related Administrative Positions	Other
Newfoundland and Labrador	-	-	5	3	-
Prince Edward Island	-	-	6	3	-
Nova Scotia	-	-	7	2	-
New Brunswick	-	-	3	3	-
Quebec	46	-	5	3	-
Ontario	33	-	4	2	-
Manitoba	29	-	5	3	-
Saskatchewan	27	-	3	2	-
Alberta	21	-	-	3	-
British Columbia	28	-	6	2	-

Source: Labour Force Survey. "- "means small sample size or an excluded province.

Reliance on Older Workers

Going by age distribution, the percentage of older workers (between 55 and 64) is higher within Water and Truck Transportation compared to Air or Rail (Table 6). For the Transportation sector overall, older workers generally make up over 20% of the workforce. Nationally, workers aged 55 to 64 comprised 18% of the working-age sample in 2018, up from 15% in 2010.[37]

Air and Rail Transportation have workforces that are younger than the overall Canadian workforce, while Water and Truck Transportation have older workforces in the Atlantic provinces. Truck Transportation workers are older in Manitoba and Saskatchewan as well (Table 6). This suggests that the Transportation workforce reflects the age distribution problem of the province's pool of labour.

Population aging and an aging workforce has been most prominent in provinces with slower population growth. Figure 1 below shows that, with the exception of 2018, the overrepresentation of older workers has been increasing in Truck Transportation. Water Transportation has a large share of its workforce aged 55 to 64, but that share does not appear to be increasing.[iii]

Narrowing Truck Transportation down to just Transport Truck Drivers, over one-quarter of Truck Drivers in three out of four Atlantic provinces are between ages 55 and 64. New Brunswick and Nova Scotia have the highest percentages of older workers in the Truck Driving workforce (28%). Additionally, 27% of the Truck Drivers in Saskatchewan are between ages 55 and 64 (Table 6). Other Drivers have the highest percentage of workers between ages 55 and 64. In the Atlantic provinces, close to 40% of drivers are between 55 and 64. While the COPS projections show occupations within this category to be in balance, the age distribution of workers in the

[iii] The increase in 2018 is driven by a large increase in Quebec water transport employment coinciding with a drop in total employment in the LFS data.

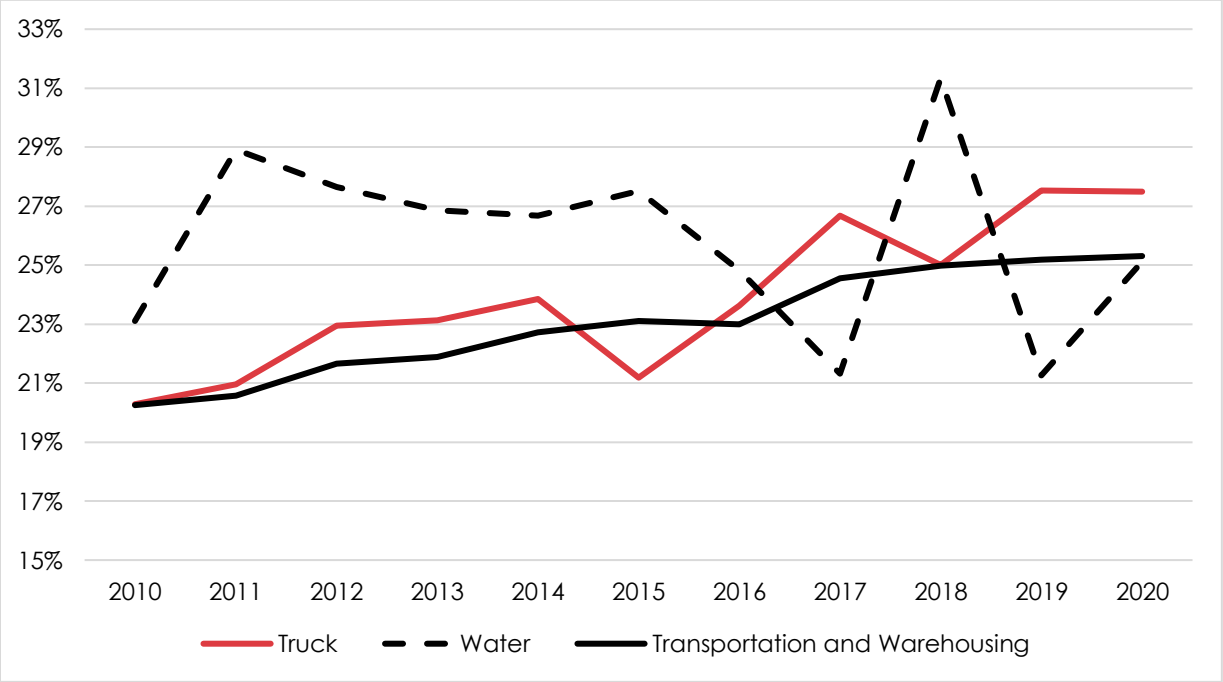
category could be sign of a looming shortage if there is a lack of labour market entrants into the Transportation sector's industries and occupations.

Table 6: Percentage of Labour Force Aged 55-64 by Sub-Sector, 2010 to 2020 Average

	Total Labour Force	Transportation & Warehousing	Air	Rail	Water	Truck
Newfoundland and Labrador	18%	24%	11%	-	20%	26%
Prince Edward Island	19%	30%	-	-	34%	27%
Nova Scotia	18%	27%	-	-	29%	29%
New Brunswick	18%	24%	10%	-	31%	25%
Quebec	16%	22%	16%	18%	24%	23%
Ontario	16%	21%	16%	16%	18%	21%
Manitoba	16%	19%	13%	15%	-	23%
Saskatchewan	17%	22%	-	-	-	24%
Alberta	15%	21%	12%	13%	-	20%
British Columbia	17%	21%	19%	14%	-	21%

Source: Labour Force Survey. "-"means small sample size or an excluded province.

Figure 1: Percentage of Workers in Truck and Water Transportation Labour Force Aged 55-64, 2010 to 2020



Source: Labour Force Survey. Note: Water Transportation averages exclude Prairie provinces.

Table 7: Share of Labour Force Aged 55-64 by Occupation, 2010 to 2020

	Transport Truck Drivers	Transport Officers	Other Drivers (Except Delivery/Courier Drivers)	Transportation-related administrative positions	Other
Newfoundland and Labrador	25%	-	39%	22%	19%
Prince Edward Island	26%	-	38%	21%	18%
Nova Scotia	28%	20%	37%	25%	20%
New Brunswick	28%	-	36%	20%	20%
Quebec	25%	-	32%	19%	16%
Ontario	25%	14%	29%	17%	17%
Manitoba	25%	-	28%	17%	15%
Saskatchewan	27%	-	31%	19%	13%
Alberta	22%	-	26%	15%	12%
British Columbia	23%	24%	29%	18%	17%

Source: Labour Force Survey. "- "means small sample size.

Average Job Tenure

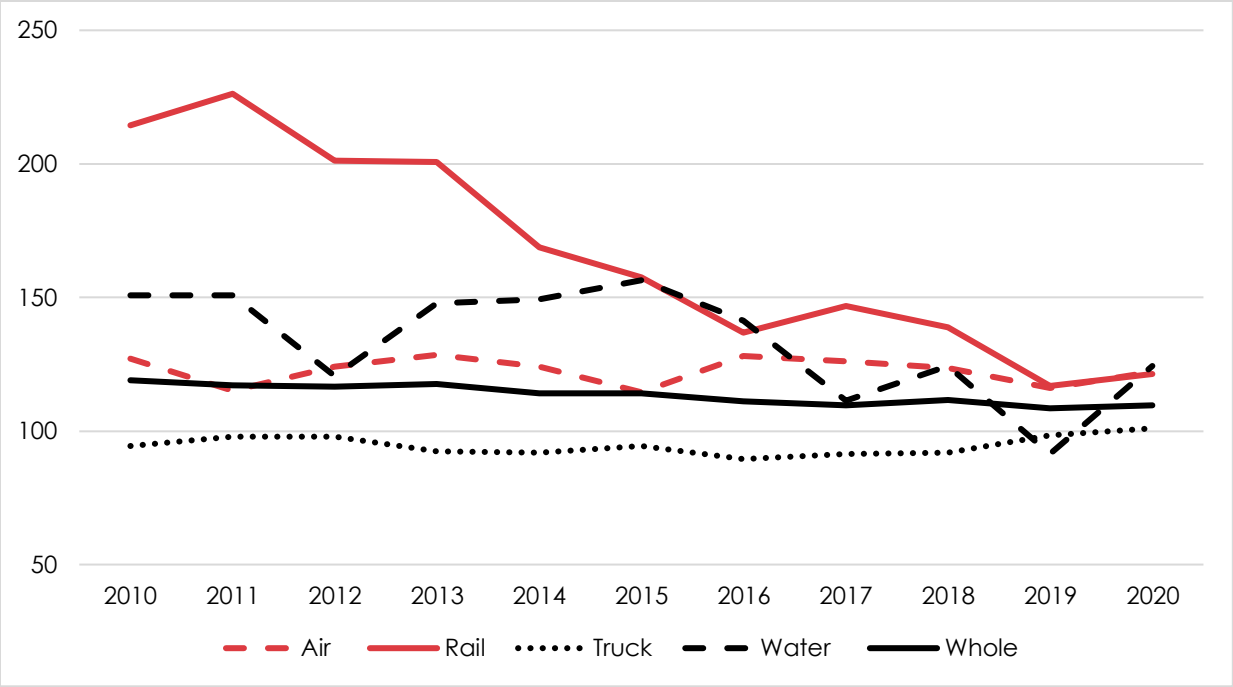
Low or falling job tenure can be a sign of high job turnover, which can either be a challenge for employers or evidence that recent hires make up a larger share of the workforce. Long job tenure is often associated with labour and skill shortages, as it suggests a lack of entry into the occupations. Considering the aging of the workforce, increasing job tenure would reflect a lack of attraction of younger workers to the industry.

Although Rail and Water Transportation are often characterized as having the longest tenures (see Figure 2 below), the decreases shown over time in the average number of months spent at a job in these sub-sectors could be a signal of increased entry of new workers and/or the retirement of older workers.

Meanwhile, Truck Transportation has often had the shortest average tenure by province and shows no upward trend in tenure at the national level. On the one hand, if high turnover in the industry was a problem, we could expect to see falling average tenure on the current job. On the other hand, if a lack of entry of new workers was an issue for the industry, we would expect to see rising average job tenure. Stability of average tenure in current jobs could suggest success in attracting and retaining new workers to the industry.

This stability in average job tenure appears to be related to the rising proportion of immigrants in the Truck Transportation workforce. Where young Canadian-born workers are not pursuing Truck Driving occupations, newcomers are.

Figure 2: Average Job Tenure by Sector in Months



Source: Labour Force Survey. Note: Water and Rail Transportation averages exclude some provinces. Prairies are excluded for Water Transportation while Newfoundland and Prince Edward Island are excluded for Rail Transportation.

Within the Transportation and Warehousing sector, Nova Scotia and New Brunswick stand out as having the longest average job tenures – a trend common in other sectors as well (Table 8). An aging workforce with longer job tenure in these two Atlantic provinces could signal a labour shortage looming due to retirements and low entry rates of younger workers.

Table 8: Average Job Tenure by Sector in Months

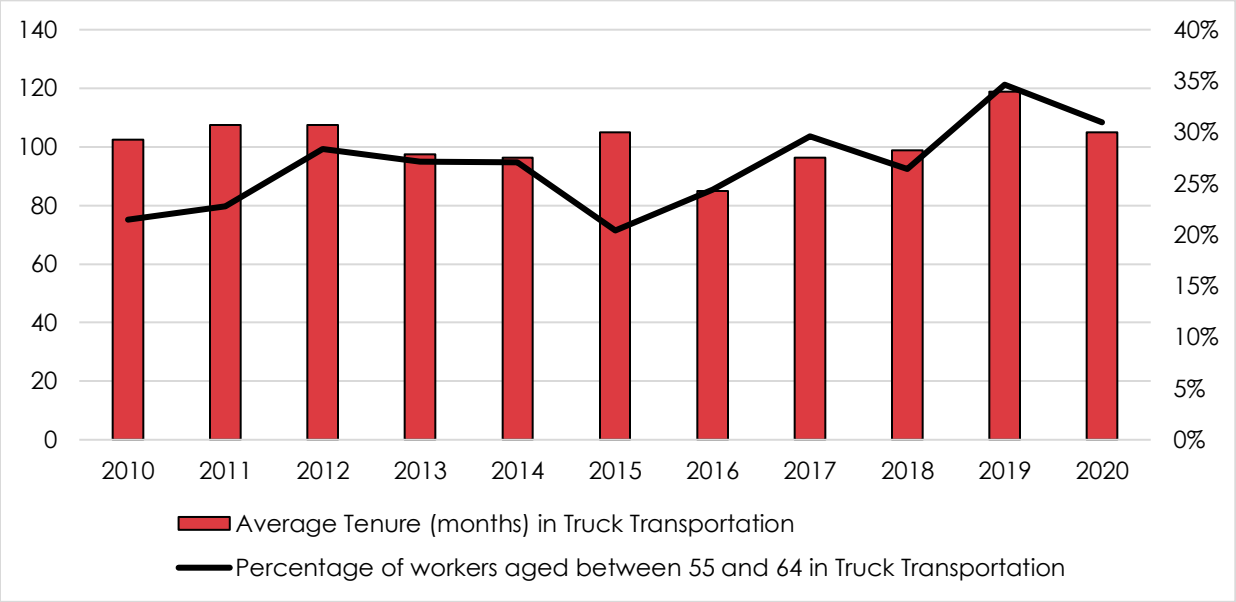
	Transportation & Warehousing	Air	Rail	Water	Truck
Newfoundland and Labrador	122	114	-	111	98
Prince Edward Island	114	122	-	133	94
Nova Scotia	126	137	177	143	103
New Brunswick	126	149	177	151	112
Quebec	113	121	167	127	95
Ontario	109	125	157	125	96
Manitoba	114	122	172	-	90
Saskatchewan	103	100	160	-	89
Alberta	93	99	165	-	79
British Columbia	115	136	155	145	91

Source: Labour Force Survey. Prairies are excluded for Water Transportation while Newfoundland and Labrador and Prince Edward Island are excluded for Rail Transportation.

Limiting the sample to the Atlantic Canadian provinces only, we see declines in job tenure for workers in Rail and Water Transportation, and more fluctuation in the job tenure of workers in Truck Transportation over time (Figure 3).

Within the last five years, however, we see increases in job tenure for workers in Truck Transportation, which, when compared to the percentage of older workers in the sector, shows an almost direct correlation.

Figure 3: Correlation Between Average Tenure and Age in the Atlantic Canadian Truck Transportation Sector



Source: Labour Force Survey.

At the occupational level, Transport Truck Drivers display a similar tenure pattern to the Truck Transportation industry. Both have average tenures that are often the shortest and appear to have slightly risen in recent years (Table 9 and Figure 4). The other occupation with a projected labour shortage – Transport Officers – displays a similar pattern to Rail and Water Transportation. All three often have the highest average tenures but have shown declines in recent years.

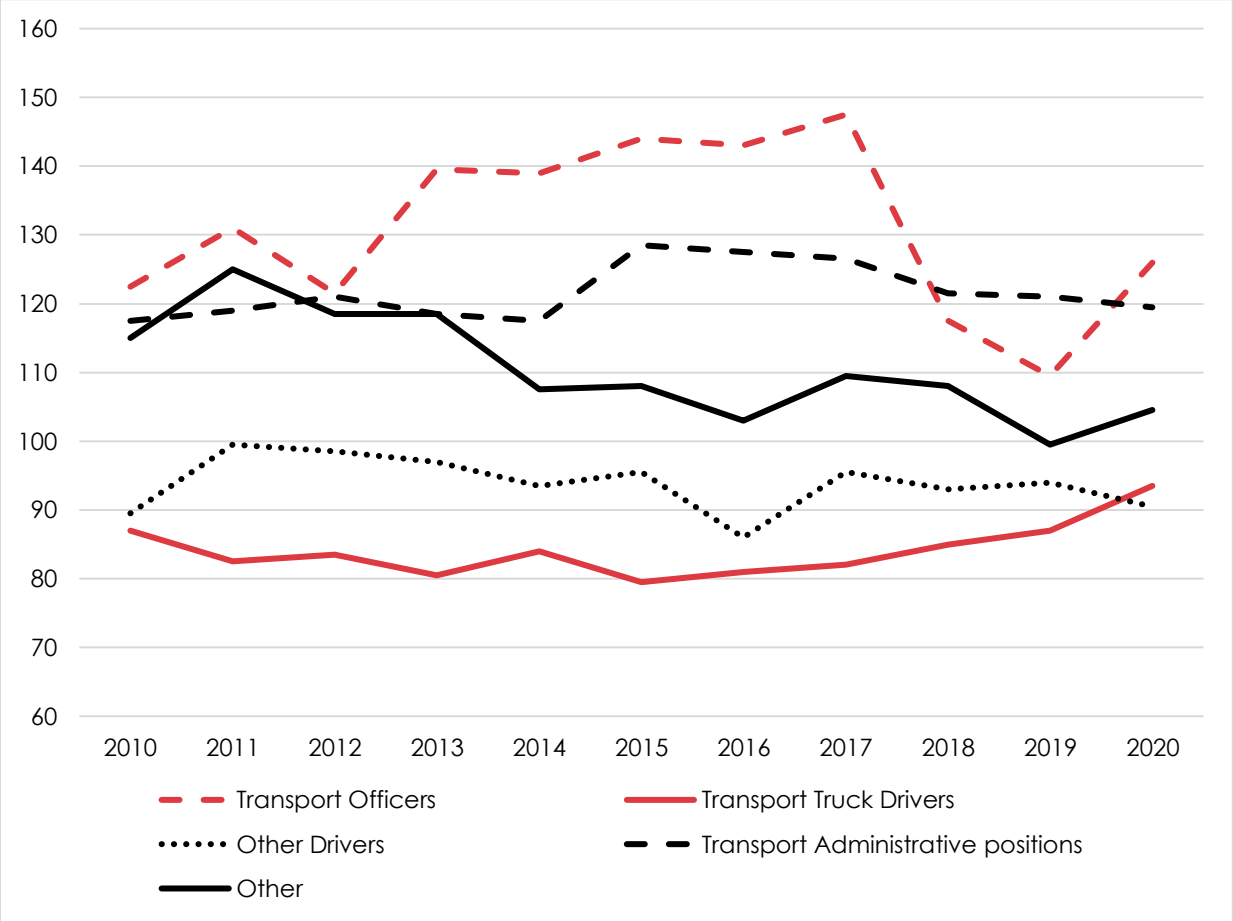
An interesting trend to point out is that of Other Drivers. Between 2019 and 2020, the average job tenure of Other Drivers drops below Transport Truck Drivers, despite the former having a slightly higher average job tenure since 2010. The COVID-19 crisis likely led to a reduced need for Other Drivers (i.e., bus and taxi drivers), which in turn might explain the reduced average tenure among Other Drivers in 2020 (Figure 6).

Table 9: Average Job Tenure by Occupation in Months (2010 to 2020)

	Transport Truck Drivers	Transport Officers	Other Drivers (Except Delivery/Courier Drivers)	Transportation-Related Administrative Positions	Other
Newfoundland and Labrador	66	130	103	132	111
Prince Edward Island	84	168	97	132	107
Nova Scotia	97	145	99	139	125
New Brunswick	95	146	109	137	114
Quebec	94	134	97	115	119
Ontario	95	124	92	117	104
Manitoba	82	105	86	121	109
Saskatchewan	75	96	80	113	110
Alberta	70	110	82	95	93
British Columbia	84	152	94	114	115

Source: Labour Force Survey.

Figure 4: Average Job Tenure by Occupation in Months

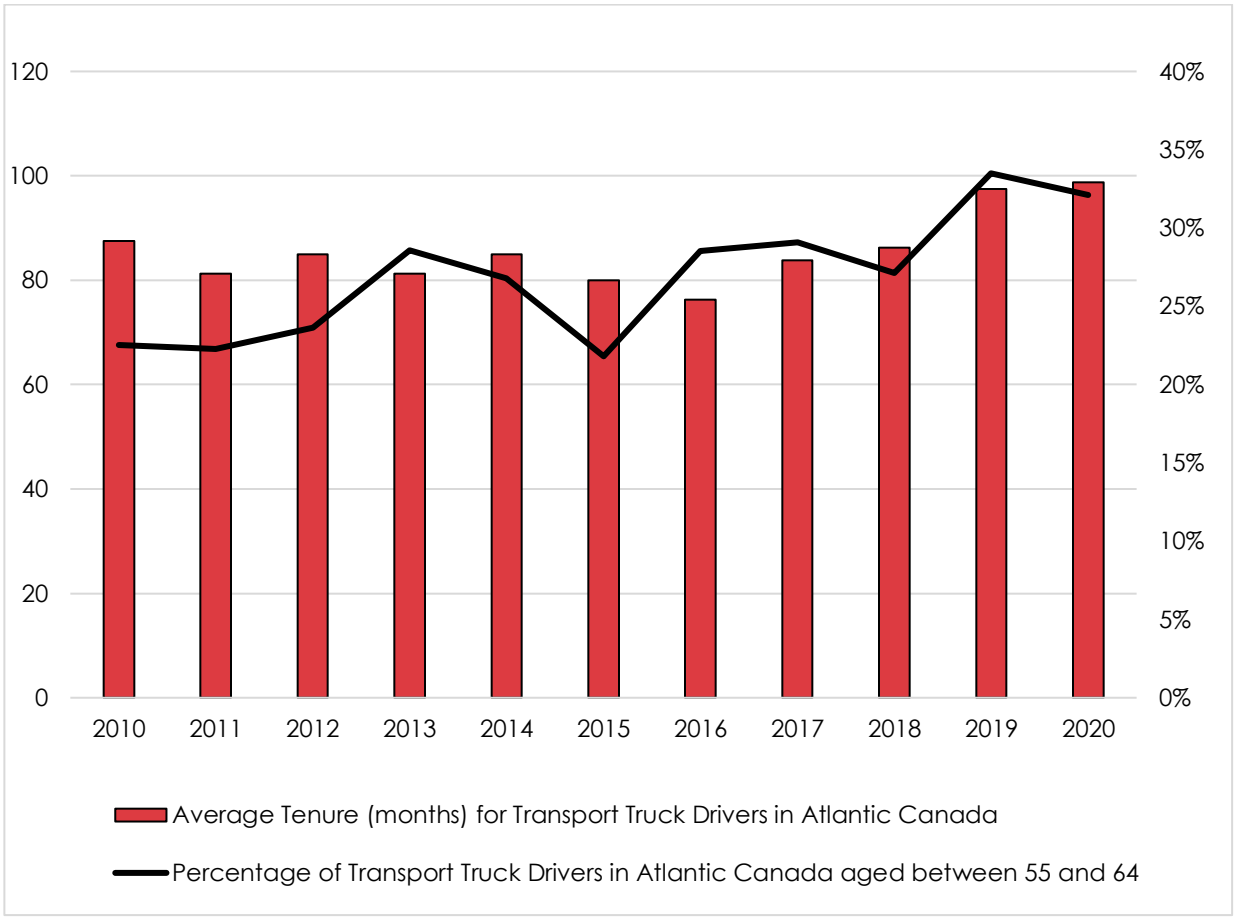


Source: Labour Force Survey.

There is also a correlation between the increases in older workers and the increases in tenure at the occupational level[iv] among Transport Truck Drivers in the Atlantic provinces (Figure 5).

In the Atlantic region, increases in the average age of Transport Truck Drivers are correlated with increases in the average tenure within the occupation, most likely indicating that the problem for this industry is a lack of labour market entrants. Although this correlation is less obvious among other Transportation occupations in other regions or in Canada as a whole, this trend is still the case. Take, for example, Other Drivers in Canada (Figure 6).

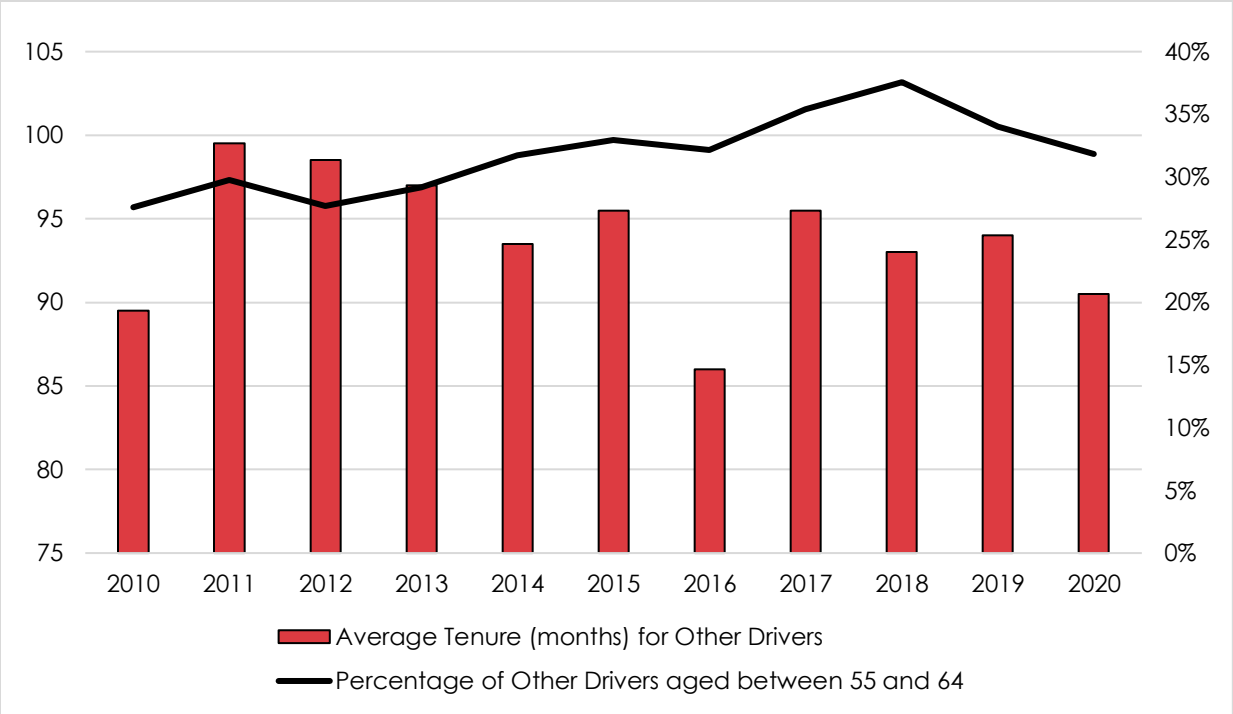
Figure 5: Job Tenure and Workforce Aging among Atlantic Canadian Transport Truck Drivers



Source: Labour Force Survey.

[iv] Sample size concerns in Atlantic provinces prevented the comparison of increases in older workers to increases in tenure for Transport Officers.

Figure 6: Job Tenure and Workforce Aging Among Other Drivers



Source: Labour Force Survey.

Presence of Immigrants in the Workforce

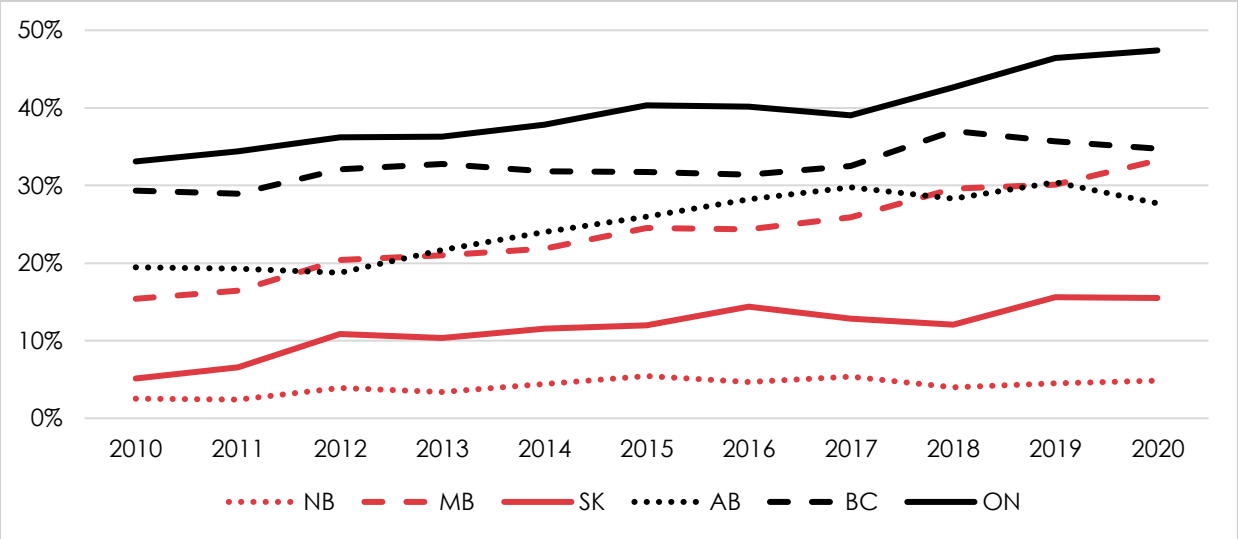
Immigration is a source of labour supply that can offset or replace a scarcity of Canadian-born workers for an industry or occupation. Often, incentivized programs geared toward immigrants or changes in hiring practices are ways in which regions, sectors, and occupations can make up for a lack of domestic workers.

With immigration, two key issues with respect to the Transportation workforce are the number of immigrants available to the labour market and the attraction of landed immigrants jobs in Transportation. For example, complaints have been raised about Canada's immigration system prioritizing higher levels of education for immigrant selection, which does not align well with the skill requirements of jobs like Transportation Truck Driving.

Most provinces have increased their immigrant labour force in the Transportation sector over the last decade (Figure 7).[v] New Brunswick, however, has done so to a much lesser degree, increasing its share of immigrants in the whole sector by only 2 percentage points. This is despite a nearly 50% increase in the number of immigrants[38] landing in the province between 2010 and 2017. Despite increases in immigrants attracted to the region since 2015, New Brunswick and the Atlantic provinces more generally have struggled to attract a larger share of total immigration to Canada[39] and to retain the immigrants who land there.[38, 40]

[v] Due to disclosure regulations surrounding small sample sizes, results could only be released for some provinces and some occupations/sectors.

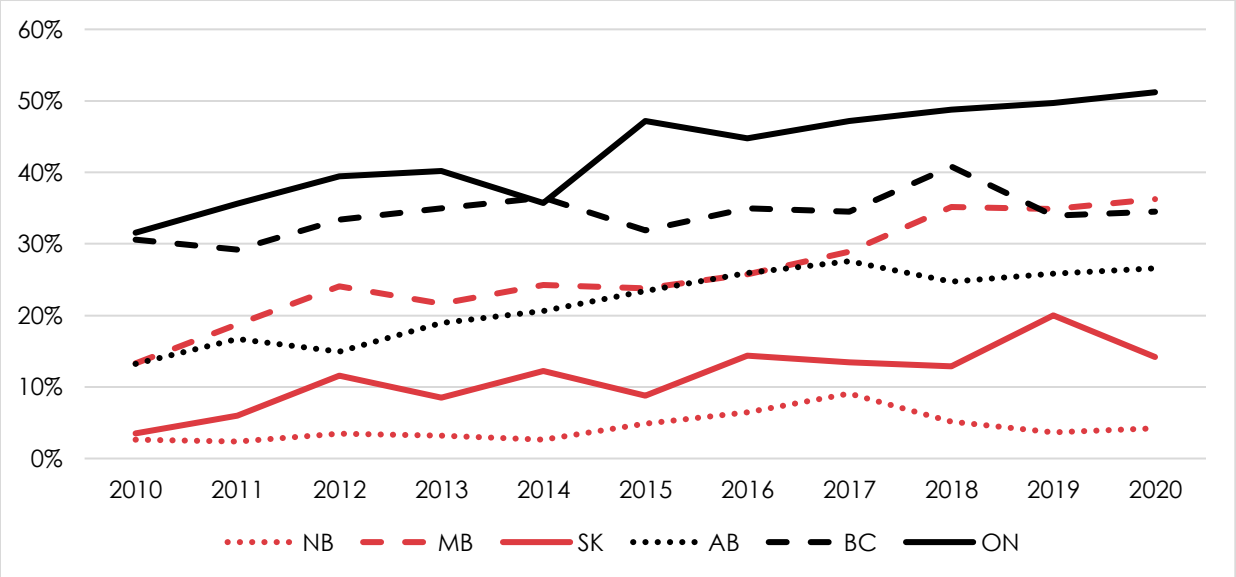
Figure 7: Share of the Transportation Labour Force Who are Immigrants, 2010 to 2020



Source: Labour Force Survey. Quebec, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island have sample counts too small for release by disclosure rules and regulations for the Statistics Canada Research Data Centre.

Each province has a higher percentage of immigrants in the Truck Transportation workforce relative to ten years ago, with Ontario seeing the largest increase. However, within the last one to three years, some provinces, most notably New Brunswick, saw decreased proportion of immigrants in the trucking workforce. As immigrants are seen as a remedy to labour shortcomings, the decreased portion of immigrants in Truck Transportation in NB in recent years is a clear indicator of the challenge of recruiting workers that is related to the province – likely, the work and income opportunities are not competitive with those in other provinces.

Figure 8: Share of the Truck Transportation Labour Force Who are Immigrants, 2010 to 2020



Source: Labour Force Survey. Quebec, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island have sample counts too small for release by disclosure rules and regulations for the Statistics Canada Research Data Centre.

Labour Shortage Indicators

Unemployment Rate

Lower unemployment rates are a sign of a tightening labour market. They signal a high utilization of qualified workers, which means a shrinking pool of available workers. The consensus in labour market research is that unemployment rates at or below 3.5% are an indicator of a tight labour market. For the Transportation industry and Truck Transportation industry, Manitoba is the only province with an average unemployment rate below the threshold (Table 10).

Of the provinces included in our analysis of the Water Transportation sector,[vi] British Columbia has the lowest average unemployment rate, below the 3.5% threshold – particularly in Water Transportation.

The averages in Table 10 for the 2010 to 2020 period mask the cyclical variability in unemployment which could discourage workers from entering Transportation employment. For example, Figure 9 shows that where British Columbia has generally had low unemployment rates in Transportation industries, unemployment increased sharply with the 2010 financial crisis and the 2020 COVID-19 pandemic.

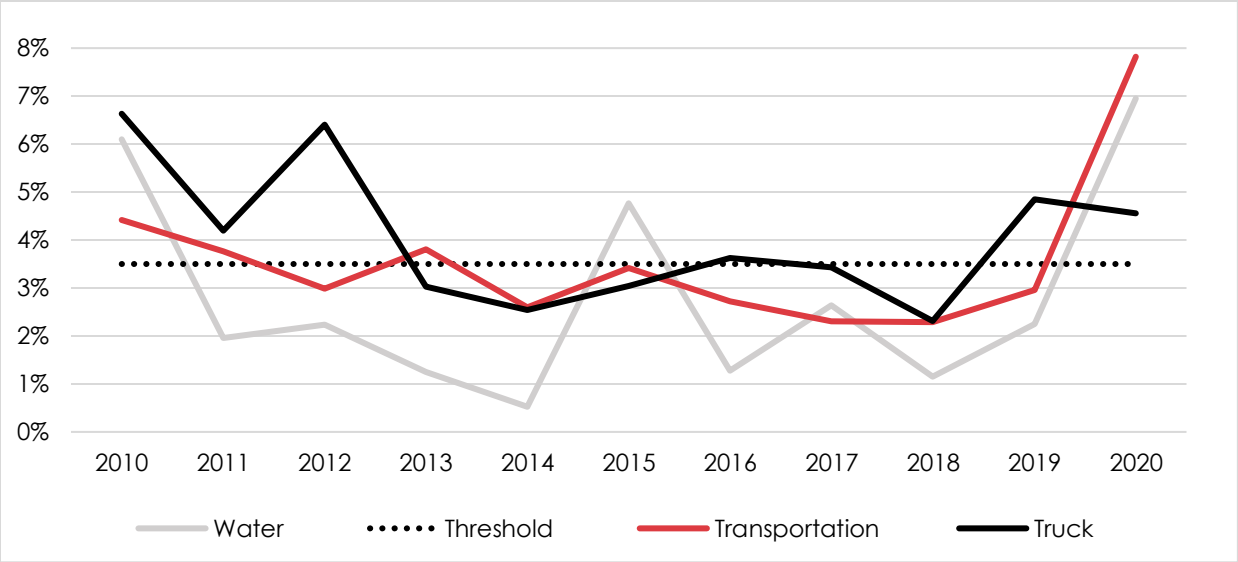
Table 10: Average Annual Unemployment Rate by Sector, 2010 to 2020

	Transportation & Warehousing	Air	Rail	Water	Truck
Newfoundland and Labrador	9.5%	-	-	8.7%	16.3%
Prince Edward Island	10.8%	-	-	23.7%	7.7%
Nova Scotia	5.1%	-	-	-	6.4%
New Brunswick	5.8%	-	-		6.5%
Quebec	4.2%	-	-	7.1%	4.8%
Ontario	4.0%	-	-	-	3.7%
Manitoba	3.4%	4.0%	5.2%	-	3.1%
Saskatchewan	3.5%	-	-	-	4.3%
Alberta	3.9%	-	-	-	4.7%
British Columbia	3.6%	-	-	2.8%	4.1%

Source: Labour Force Survey.

[vi] Air and Rail Transportation are excluded due to residual disclosure concerns. Prairies are excluded from Water Transportation analysis. All other excluded provinces under Water Transportation are excluded due to residual disclosure concerns.

Figure 9: Unemployment Rate in British Columbia, 2010 to 2020



Source: Labour Force Survey.

Transport Administrative Positions were projected by the COPS to be in balance, but the occupations have low unemployment rates, which might indicate a tight labour market. This is found among Western provinces and some Eastern ones (Table 11).

It should, come as no surprise that these provinces suffer from low unemployment rates within these occupations. Entry-level positions such as the ones found among Other Drivers and Transport Administrative Positions are often occupied by younger workers, as they require little to no experience. The provinces with lower average unemployment rates (below 3.5) in these occupation groups often have the lowest percentage of workers aged 55 and over.

Table 11: Average Annual Unemployment Rates by Occupation, 2010 to 2020.

	Transport Truck Drivers	Transport Officers	Other Drivers	Transport Administrative Positions	Other
Newfoundland and Labrador	19%	-	10%	-	9%
Prince Edward Island	14.6%	-	7.5%	-	-
Nova Scotia	7.9%	-	5.7%	4.2%	4.9%
New Brunswick	10.0%	-	7.5%	-	5.7%
Quebec	5.8%	-	4.2%	3.3%	3.3%
Ontario	4.2%	-	4.7%	3.6%	3.3%
Manitoba	4.7%	-	4.5%	2.6%	2.1%
Saskatchewan	6.4%	-	5.9%	2.1%	-
Alberta	6.2%	-	5.2%	3.2%	2.9%
British Columbia	4.9%	-	4.0%	3.0%	2.6%

Source: Labour Force Survey.

Hourly and Weekly Wage Growth

There is no evidence of a labour shortage in terms of excess weekly wage growth for the overall Transportation industry. Industry-level analysis reveals slight growth among provinces. Sub-sectors showing the most consistent growth are Rail and Water Transportation, as each province reports weekly wage increases in the last decade (Table 12).

At the occupational level, wage growth is most consistent in Transport Administrative Positions – between 2.1% and 3.9% average growth in the last decade. Among occupations with projected shortages, growth in hourly wages is often highest in an Atlantic province. Hourly wage growth for Transport Truck Drivers in the last decade was highest in Nova Scotia, while wage growth for Transport Officers was highest in Newfoundland and Labrador and Manitoba.

Table 12: Average Annual Growth of Real Weekly Wages by Sector, 2010 to 2020

	All Sectors	Transportation & Warehousing	Air	Rail	Water	Truck
Newfoundland and Labrador	1.3%	1.8%	1.7%	-	3.0%	0.5%
Prince Edward Island	1.0%	0.8%	4.4%	-	1.3%	0.6%
Nova Scotia	0.9%	0.9%	0.3%	5.3%	0.2%	1.4%
New Brunswick	0.9%	0.9%	0.1%	0.4%	5.9%	0.7%
Quebec	1.3%	0.8%	0.1%	1.7%	1.6%	1.1%
Ontario	1.1%	0.1%	-0.4%	2.5%	5.6%	1.0%
Manitoba	0.9%	0.0%	1.9%	2.6%	-	-0.2%
Saskatchewan	1.1%	0.5%	6.7%	1.0%	-	-0.3%
Alberta	1.1%	1.2%	1.2%	1.8%	-	1.2%
British Columbia	1.1%	0.8%	0.9%	1.6%	1.0%	1.0%

Source: Labour Force Survey & Statistics Canada, Table 14-10-0064. Based on 2020 constant dollars. Note: 'All sectors' is based on ages 15 and over.

Table 13: Average Real Weekly Wage Growth by Occupation, 2010 to 2020

	Transport Truck Drivers	Transport Officers	Other Drivers	Transport Administrative Positions	Other
Newfoundland and Labrador	0.3%	3.2%	1.6%	2.6%	-0.1%
Prince Edward Island	0.2%	-1.9%	1.9%	2.1%	1.4%
Nova Scotia	1.7%	2.0%	1.1%	2.9%	-0.4%
New Brunswick	1.2%	2.8%	-0.7%	2.6%	0.7%
Quebec	0.7%	3.1%	0.5%	3.3%	1.3%
Ontario	0.4%	-1.5%	0.3%	2.3%	1.4%
Manitoba	0.3%	3.2%	0.3%	3.9%	0.4%
Saskatchewan	-0.7%	1.3%	-1.0%	2.4%	1.3%
Alberta	0.3%	0.5%	0.9%	3.2%	1.2%
British Columbia	0.5%	0.4%	-0.3%	2.1%	1.6%

Source: Labour Force Survey. Based on 2020 constant dollars.

Census Data: 2006 and 2016 Cycles

The Transportation Workforce – Age, Gender, Employment Share, and Percentage of Immigrants

Results using the Canadian Census agree with the findings from the LFS. Table 14 shows that the majority workers in Transportation are male, above 35, and non-immigrants, with a high school education or less. Between 2006 and 2016, little changed regarding this demographic profile.

For the non-Transportation sector, there is more of an even gender split and a higher percentage of workers below the age of 35. Workers outside of Transportation also have higher education levels. In 2006, immigrants made up a higher share of non-Transportation employment than Transportation employment; but in 2016, other than in Ontario, immigrants were equally represented in both Transportation and non-Transportation employment. (In 2016 in Ontario, immigrants comprised a larger share of Transportation employment).

The rising share of immigrant workers in Transportation coincides with the inclusion of transportation occupations in Provincial Nominee Programs, and with transportation industry associations and employers working to reduce barriers to entry to employment for newcomers.[41]

In the Transportation sector, the Atlantic region has the smallest share of workers who are women, under age 35, with a post-secondary education, and immigrants. This is the case for Transportation and non-Transportation industries in the region, which indicates a region-wide demographic challenge. In both sector groups, all regions have been able to either increase or retain the same share of workers who are female, younger, post-secondary educated, and immigrants for years. However, the Atlantic region has done so to a lesser degree.

This is even more pronounced in the Transportation sector. The Atlantic region's Transportation sector has not – to the same degree as the western provinces and Ontario – been able to grow its share of younger workers, post-secondary educated workers, and immigrant workers.

Table 14: Demographic Summary of Transportation and Non-Transportation Workers, 2006 and 2016 Census Cycles

		Transportation				Non-Transportation			
		Atlantic	**Quebec**	**Ontario**	**West**	**Atlantic**	**Quebec**	**Ontario**	**West**
Female	**2006**	18%	18%	18%	20%	52%	51%	52%	52%
	2016	19%	20%	20%	20%	52%	51%	52%	52%
< 35 years	**2006**	25%	27%	26%	27%	32%	33%	35%	36%
	2016	21%	25%	24%	27%	31%	34%	35%	37%
55-64 years	**2006**	17%	15%	15%	16%	20%	19%	17%	17%
	2016	25%	22%	23%	22%	26%	23%	21%	21%
High school or less	**2006**	50%	47%	55%	57%	47%	40%	42%	45%
	2016	46%	40%	52%	56%	42%	34%	39%	42%
Immigrant	**2006**	3%	10%	31%	18%	4%	14%	33%	23%
	2016	5%	16%	40%	27%	6%	17%	34%	28%

Source: Canadian Census 2006 and 2016.

Gender and Employment Share

In Table 15 the gap between male and female employment in Air Transportation is relatively small, whereas three males employed for each female in Water Transportation, and nearly six males are employed for each female in Truck and Rail Transportation.

Table 15: Female and Male Shares of Self-Reported Employment by Transportation Industry, 2016 Census

NAICS Industry	Female	Male	Total Employment
Air	0.43	0.57	60,330
Rail	0.13	0.87	29,460
Water	0.26	0.74	13,470
Truck	0.15	0.85	236,730

Source: Canadian Census 2016.

Table 16 shows that the relative gender distribution of employment across the Transportation sector did not change between the 2006 and 2016 Census cycles. As seen in the LFS, a larger percentage of men than women in Transportation choose to work in Truck Transportation. Notably, two-thirds or more of the total employed work in the Truck Transportation sector.

Table 16: Male and Female Shares of (NAICS) Transportation Industry Employment, 2006 and 2016 Census

Transportation Sector	2006			2016		
	Female	Male	Total	Female	Male	Total
Total Transportation Employment	68,295	292,050	360,345	68,445	271,555	340,000
Air	35%	12%	16%	38%	13%	18%
Rail	6%	10%	10%	6%	10%	9%
Water	4%	3%	4%	5%	3%	4%
Truck	55%	74%	71%	52%	74%	70%

Atlantic	2006			2016		
	Female	Male	Total	Female	Male	Total
Total Transportation Employment	4,520	21,210	25,735	4,140	17,445	21,585
Air	33%	10%	14%	32%	12%	16%
Rail	4%	6%	6%	3%	4%	4%
Water	10%	13%	13%	15%	14%	15%
Truck	53%	71%	68%	50%	69%	66%
Transportation Employment as Share of Non-Transportation Employment	1%	3%	2%	1%	3%	2%

Quebec	2006			2016		
	Female	Male	Total	Female	Male	Total
Total Transportation Employment	14,590	64,640	79,225	14,480	58,355	72,835
Air	33%	11%	15%	36%	11%	16%
Rail	7%	9%	9%	9%	9%	9%
Water	3%	2%	2%	4%	3%	3%
Truck	57%	77%	74%	51%	77%	72%
Transportation Employment as Share of Non-Transportation Employment	1%	3%	2%	1%	3%	2%

Ontario	2006			2016		
	Female	Male	Total	Female	Male	Total
Total Transportation Employment	21,960	99,110	121,070	22,715	90,380	113,095
Air	34%	11%	15%	38%	13%	18%
Rail	5%	8%	8%	4%	8%	7%
Water	1%	1%	1%	2%	1%	1%
Truck	60%	80%	76%	56%	78%	74%
Transportation Employment as Share of Non-Transportation Employment	1%	3%	2%	1%	3%	2%

West	2006			2016		
	Female	Male	Total	Female	Male	Total
Total Transportation Employment	27,225	107,090	134,315	27,110	105,375	132,485
Air	36%	14%	18%	39%	13%	19%
Rail	6%	14%	13%	6%	12%	11%
Water	7%	4%	5%	7%	4%	5%
Truck	51%	68%	64%	49%	70%	66%
Transportation Employment as Share of Non-Transportation Employment	1%	4%	3%	1%	4%	2%

Source: Canadian Census 2006 and 2016. Notes: For the 2006 Census, more detailed industries were available than in the 2016 Census. For 2006, Air combines Scheduled Air Transportation and Non-Scheduled Air Transportation; Water combines Deep-Sea, Coastal and Great Lakes Water Transportation and Inland Water Transportation; and Truck combines General Freight Trucking and Specialized Freight Trucking. Table 17 provides a more detailed breakdown.

Table 17 shows that, for 2006, when Transportation is broken down into more detailed sub-sectors, most employment in Air Transportation is with Scheduled Air Transportation. In Water Transportation, it is within Deep-Sea, Coastal and Great Lakes Transportation. In Truck Transportation, it is within General Freight Trucking.

Table 17: Distributions of Female and Male Employment by Transportation Industry, 2006 Census

	Atlantic			Quebec			Ontario			West		
Sub-sector	**Female**	**Male**	**Total**	**Female**	**Male**	**Total**	**Female**	**Male**	**Total**	**Female**	**Male**	**Total**
Scheduled Air Transportation	31%	8%	12%	31%	10%	14%	32%	10%	14%	33%	11%	16%
Non-Scheduled Air Transportation	2%	1%	1%	2%	1%	2%	2%	1%	2%	3%	3%	3%
Rail Transportation	4%	6%	6%	7%	9%	9%	5%	8%	8%	6%	14%	13%
Deep-Sea, Coastal and Great Lakes Water Transportation	9%	12%	12%	3%	2%	2%	1%	1%	1%	6%	4%	4%
Inland Water Transportation	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%	1%	1%
General Freight Trucking	38%	47%	45%	42%	54%	52%	46%	60%	57%	31%	41%	39%
Specialized Freight Trucking	15%	24%	22%	16%	23%	22%	14%	20%	19%	20%	26%	25%
Transportation Employment as Share of Non-Transportation employment	**1%**	**3%**	**2%**	**1%**	**3%**	**2%**	**1%**	**3%**	**2%**	**1%**	**4%**	**3%**

Source: Canadian Census 2006.

Table 18 below shows shares of employment in the Transportation sector by self-reported occupations. Transport Truck Drivers accounted for over 40% of self-reported sector employment across regions. Occupations in the Other category collectively accounted for a similar proportion to Transport Truck Drivers.

The Other category includes

- Railway Carmen and Carwomen (NOC 7314)
- Automotive Service Technicians, Truck and Bus Mechanics and Mechanical Repairers (NOC 7321)
- Railway Track Maintenance Workers (NOC 7531)
- Railway and Yard Locomotive Engineers (NOC 7361)
- Boat Operators/Lock and Cane Ferry Operators and Related Occupations (NOC 7533)
- Deck Crew & Engine Room Crew – Water Transportation (NOC 7532)
- Longshore Workers (NOC 7451).

As there are up to seven occupations within the Other category, this table suggests that Transportation occupations outside of Transport Truck Drivers account for relatively small shares of employment in the sector.[vii]

[vii] Occupations with small shares had several implications for this analysis. First, we were not able to release statistics by occupation stratified by sex due to the small number of observations for female workers. Second, for a similar reason, we were not able to study mobility between occupations or sectors by region. Third, when interpreting our statistics on labour shortages and earnings changes, outside of Transport Truck Drivers and the Other category, we found the sizes of the occupational workforces are relatively small.

Table 18: Share of Transportation Employment by Occupations, 2016 Census

	Share of Total Transportation Employment				
Occupation	**Atlantic**	**Quebec**	**Ontario**	**West**	**Canada**
Supervisors/Supply-Chain/ Tracking/Scheduling	0.9%	1.0%	1.1%	0.8%	0.9%
Custom and Ship and Other Brokers					
Dispatchers and Radio Operators	1.5%	2.2%	2.8%	1.9%	2.2%
Air Pilots/Flight Engineers/Flying Instructors	3.1%	2.7%	3.6%	4.1%	3.6%
Air Traffic Controllers	0.4%	0.2%	0.2%	0.2%	0.3%
Deck Officers (Water Transport)	3.7%	0.4%	0.2%	0.9%	0.7%
Engineer Officers (Water Transport)	1.0%	0.1%	0.1%	0.3%	0.2%
Railway/Marine Traffic Controllers					
Airline Ticket/Service Agents	3.4%	1.9%	2.6%	3.0%	2.6%
Rail Supervisors	0.1%	0.3%	0.2%	0.4%	0.3%
Supervisors/Motor Transport/Other Ground Transit Operators	0.7%	0.4%	0.9%	1.0%	0.8%
Railway Carmen/Women	0.1%	0.3%	0.3%	0.5%	0.4%
Railway Engineers	0.4%	0.7%	0.9%	1.4%	1.0%
Longshore Workers					
Transport Truck Drivers	41.3%	43.3%	46.9%	41.2%	43.6%
Bus Drivers/Subway Operators/Other Transit Operators	0.1%	0.1%	0.1%	0.1%	0.1%
Taxi/Limousine Drivers/Chauffeurs	0.1%	0.2%	0.1%	0.1%	0.1%
Railway Track/Yard Maintenance	0.5%	0.8%	1.1%	1.4%	1.1%
Boat/Cable Ferry Operators	0.3%	0.2%	0.0%	0.5%	0.3%
Other	42.3%	45.1%	38.7%	42.1%	41.6%
Total Transportation	100%	100%	100%	100%	100%
Total Workforce in Transportation	**21,585**	**113,095**	**113,095**	**113,095**	**360,870**

Source: Canadian Census, 2016.

Labour Shortage Indicators

Annual Earnings Growth

Table 19 reports the average annual employment earnings for the Transportation sector and its industries in 2006 and 2016. Truck Transportation, the largest employment Transportation sector, has the lowest average earnings among the Transportation sub-sectors.

Table 19 also highlights the challenges of studying labour shortages at the national level given the sizeable differences in earnings across regions.

Table 19: Average Annual Earnings in Transportation Sectors, 2006 and 2016 Census Cycles

	Atlantic		Quebec		Ontario		West	
	2006	**2016**	**2006**	**2016**	**2006**	**2016**	**2006**	**2016**
Air	$46,613	$67,600	$44,325	$69,060	$45,865	$66,235	$54,495	$70,965
Rail	$50,765	$68,960	$63,965	$89,420	$64,195	$80,325	$65,640	$91,990
Water	$39,798	$80,560	$37,670	$67,035	$43,500	$65,605	$47,540	$67,935
Truck	$29,628	$43,650	$30,190	$36,750	$36,178	$38,705	$37,845	$50,190
Transportation	$35,305	$53,775	$36,000	$47,525	$40,155	$46,980	$44,150	$59,450
Non-Transportation	$23,780	$34,945	$27,270	$35,235	$34,330	$42,520	$32,720	$44,220

Source: Canadian Census 2006 and 2016. Based on Current Dollars.

Table 20 presents the growth in average annual earnings in Transportation sectors between the 2006 and 2016 Census cycles. Here, the wages presented in Table 19 are converted to 2020 constant dollars, and the growth rate is calculated.

Growth in Transportation sector earnings surpassing that of other sectors could suggest labour shortages in Transportation. In the Atlantic region, Water Transportation stands out, as it shows signs of increasing labour shortages. Earnings in the other Transportation industries in the Atlantic region are growing at around the same rate as non-Transportation sectors. In Quebec and Ontario, all sub-sectors other than Truck Transportation show signs of growing labour shortages. In the West, only Rail and Water Transportation have growth rates that are substantially higher than the growth rates of other sectors.

Table 20: Growth in Average Annual Earnings in Transportation Sectors Between 2006 and 2016, by Region

	Atlantic	Quebec	Ontario	West
Air	23%	32%	23%	11%
Rail	15%	19%	6%	19%
Water	72%	51%	28%	21%
Truck	25%	3%	-9%	13%
Transportation	29%	12%	-1%	14%
Non-Transportation	25%	10%	5%	15%

Source: Canadian Census. Based on 2020 Constant Dollars.

Table 21 reports the ratio of average earnings in Transportation to average earnings in non-Transportation industries. If Transportation industries are facing labour shortages, there should be

an increase in earnings ratios from 2006 to 2016. Earnings increases in Transportation exceeding gains in non-Transportation sub-sectors would signal greater increase in demand for labour relative to supply.

As seen with results from the LFS, Water Transportation earnings growth has been stronger than for non-Transportation industries in all regions, while Rail Transportation has had stronger earnings growth in all regions except the Atlantic. Air Transportation shows high earnings growth in Quebec and Ontario. Truck Transportation, the largest employment industry in Transportation, shows no signs of worsening labour shortages under this indicator, and earnings ratios to non-Transportation industries have been unchanged in the Atlantic region and the West. Ontario and Quebec show labour shortages in Truck Transportation are improving between 2006 and 2016.

In 2020, there were a total of 357 businesses within Rail Transportation and a total of 608 businesses in Water Transportation, compared to a total of 125,304 businesses within Truck Transportation.[42] The presence of more businesses – and, therefore, more workers available – in the Truck Transportation sub-sector creates a relatively more saturated workforce and therefore a disincentive to increase wages to attract workers.

Rail and Water Transportation, on the other hand, have fewer businesses and are more likely to use increased wages as an incentive for potential workers. This is the likely reason behind earnings growth being substantially higher in these sub-sectors relative to Truck Transportation. However, Truck Transportation may be an occupation that has lower barriers to entry than occupations in Rail and Water Transportation, like training and collective agreements that allow for more entry and wage competition.

Table 21: Average Earnings in Transportation Sectors Relative to Non-Transportation Average Earnings, 2006 and 2016 Census Cycles, by Region

Sub-sector	Atlantic		Quebec		Ontario		West	
	2006	2016	2006	2016	2006	2016	2006	2016
Air	1.96	1.93	1.63	1.96	1.34	1.56	1.67	1.60
Rail	2.13	1.97	2.35	2.54	1.87	1.89	2.01	2.08
Water	1.67	2.31	1.38	1.90	1.27	1.54	1.45	1.54
Truck	1.25	1.25	1.11	1.04	1.05	0.91	1.16	1.14
Transportation	1.48	1.54	1.32	1.35	1.17	1.10	1.35	1.34

Source: Canadian Census 2006 and 2016.

Table 22 and Figure 10 present the average earnings increase by Transportation industry between 2006 and 2016 divided by the increase in non-Transportation earnings over the same decade.

A ratio greater than 1 indicates a stronger earnings increase in Transportation consistent with a labour shortage or tight labour market. While Water, Rail, and Air Transportation have ratios greater than 1 for at least two regions, Truck Transportation has ratios of 1 or less for all regions.

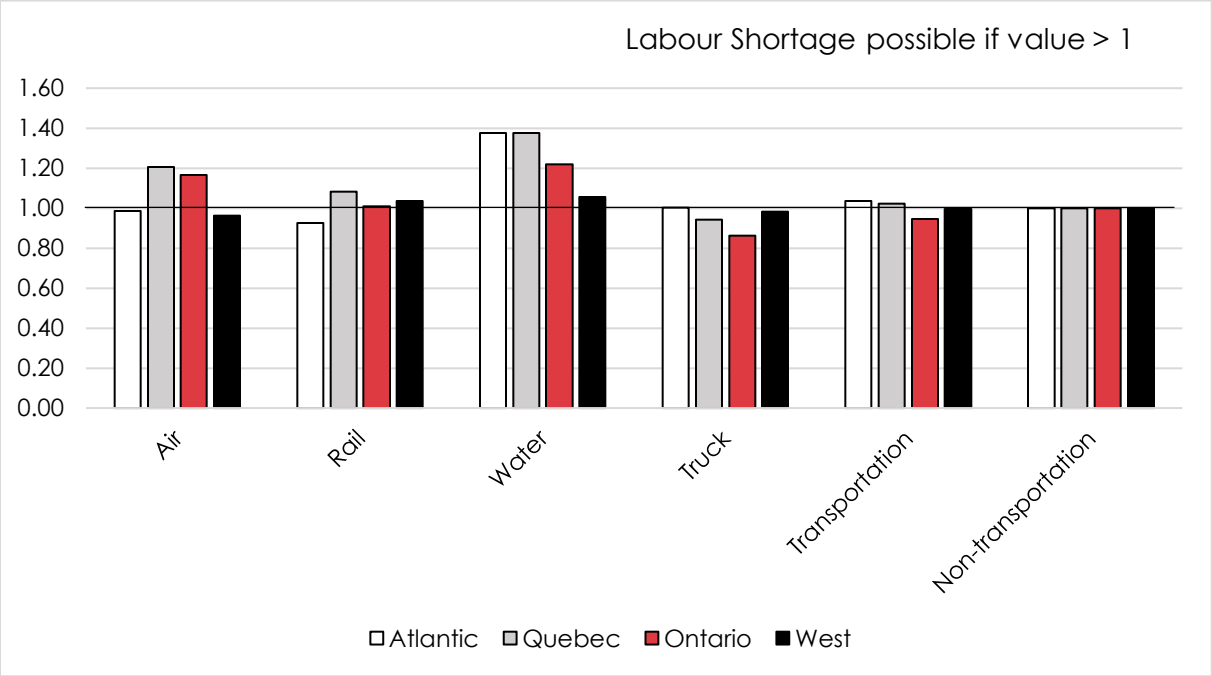
Table 22: Increase of Earnings in Transportation, 2006 to 2016, Relative to Increase in Non-Transportation Earnings

	Atlantic	Quebec	Ontario	West
Air	0.99	1.21	1.17	0.96
Rail	0.92	1.08	1.01	1.04
Water	1.38	1.38	1.22	1.06
Truck	1.00	0.94	0.86	0.98
Transportation	1.04	1.02	0.94	1.00
Non-Transportation	1.00	1.00	1.00	1.00

Source: Canadian Census 2006 and 2016.
Notes: This table shows 2016 earnings divided by 2006 earnings for the occupation relative to the same ratio for non-Transportation occupations. The reported value is earnings change in excess of non-Transportation earnings growth. Ratios greater than 1 indicate above average earnings increase.

As mentioned earlier, wage growth is usually strongest in Water Transportation (Figure 10), particularly for the Atlantic provinces, Quebec, and Ontario.

Figure 10: Earnings Change, 2006 to 2016, for Transportation Relative to Non-Transportation Industries



Source: 2006 and 2016 Canadian Census Cycles. Based on current dollars.

Table 23 shows that Transportation occupations have higher average earnings than the average earnings for non-Transportation occupations. For the largest Transportation occupation, Transport Truck Drivers, the earnings premium over non-Transportation earnings are not as large as for many of the other Transportation occupations.

Table 24 shows the 2016 to 2006 earnings ratios for occupations. Table 25 divides the occupation earnings ratio by the non-transportation earnings ratio. For Table 25, a value greater than 1

indicates larger earnings increases in the Transportation occupation and can be interpreted as a sign of greater labour scarcity.

For all Transportation occupations, the ratios for all four regions are close to 1, suggesting that whatever increases are experienced are general to the labour market. For Transport Truck Drivers, other than in Atlantic Canada, the ratio is below 1, indicating rising labour abundance. In Atlantic Canada, the greater earnings increase is suggestive of a labour shortage.

There are no indications of general labour shortages in Transportation or across the country. Where labour shortages are suggested, they are for occupations with smaller total employment (Table 18). Some occupations, notably in Rail, Air Pilots and Water Transport Officers have earnings increase ratios of 2 and higher, indicating labour scarcity. It is worth noting, however, that these are occupations with high skill levels and relatively small employment sizes.

Table 23: Average Earnings Transportation Occupations by Region, 2006 and 2016 Census Cycles (Current Dollars)

Occupation	Atlantic		Quebec		Ontario		West	
	2006	2016	2006	2016	2006	2016	2006	2016
Supervisors/ Supply-Chain/ Tracking/ Scheduling	$31,535	$61,825	$32,865	$49,530	$36,070	$54,030	$37,985	$61,695
Custom and Ship and Other Brokers	--	--	$46,200	$52,230	$39,830	$28,170	$42,600	$51,905
Dispatchers and Radio Operators	$32,490	$51,915	$36,855	$44,620	$36,800	$39,135	$41,315	$54,995
Air Pilots/Flight Engineers/ Flying Instructors	$76,280	$114,555	$80,795	$106,155	$86,055	$120,655	$80,675	$114,455
Air Traffic Controllers	$67,040	$73,925	$40,195	$54,500	$55,220	$64,645	$37,465	$53,485
Deck Officers (Water Transport)	$56,365	$111,130	$52,015	$91,725	$51,470	$86,060	$62,830	$88,545
Engineer Officers (Water Transport)	$54,235	--	$53,520	$65,445	$79,485	$94,020	$70,125	$95,355
Railway/Marine Traffic Controllers	--	--	$71,140	$92,880	$55,970	$76,925	$59,580	$103,405
Airline Ticket/ Service Agents	$28,735	$36,780	$31,675	$37,595	$33,105	$40,880	$32,760	$40,505
Rail Supervisors	$73,235	$89,545	$72,620	$103,935	$75,900	$96,475	$74,245	$102,035
Supervisors/ Motor Transport/Other Ground Transit Operators	$36,215	$56,820	$37,505	$53,575	$48,610	$52,805	$54,885	$72,600
Railway Carmen/	$49,005	$65,845	$54,495	$79,295	$54,250	$67,725	$54,360	$72,815

Women								
Railway Engineers	$63,880	$94,755	$70,410	$94,960	$83,000	$109,175	$85,045	$104,610
Transport Truck Drivers	$29,965	$44,995	$30,075	$36,865	$34,870	$36,770	$37,895	$48,720
Bus Drivers/ Subway Operators/ Other Transit Operators	$31,275	$38,775	$31,910	$36,645	$23,230	$49,720	$33,005	$46,800
Taxi/Limousine Drivers/ Chauffeurs	--	--	$26,420	$34,315	$27,550	$18,190	$24,725	$21,690
Railway Track/Yard Maintenance	$45,815	$60,915	$47,300	$67,875	$51,480	$71,580	$51,465	$73,125
Boat/Cable Ferry Operators	$30,145	$55,805	$25,060	$59,830	$21,370	$33,055	$38,370	$42,590
Longshore Workers	$36,740	$73,760	$32,240	--	$18,405	--	$51,955	--
Other	$36,425	$52,400	$39,195	$52,445	$42,855	$50,070	$45,135	$62,455
All Transportation	$35,305	$53,775	$36,000	$47,525	$40,155	$46,980	$44,150	$59,450
Non-Transportation	$23,780	$34,945	$27,270	$35,235	$34,330	$42,520	$32,720	$44,220

Source: Canadian Census.
Notes: "—" means not reported or counts too low to release.

Table 24: Average Earnings Transportation Occupations Relative to Non-Transportation Earnings, 2006 and 2016 Census Cycles

Occupation	Atlantic		Quebec		Ontario		West	
	2006	2016	2006	2016	2006	2016	2006	2016
Supervisors/Supply-Chain/Tracking/ Scheduling	1.33	1.77	1.21	1.41	1.05	1.27	1.16	1.40
Custom and Ship and Other Brokers	--	--	1.69	1.48	1.16	0.66	1.30	1.17
Dispatchers and Radio Operators	1.37	1.49	1.35	1.27	1.07	0.92	1.26	1.24
Air Pilots/Flight Engineers/Flying instructors	3.21	3.28	2.96	3.01	2.51	2.84	2.47	2.59
Air Traffic Controllers	2.82	2.12	1.47	1.55	1.61	1.52	1.15	1.21
Deck Officers (Water Transport)	2.37	3.18	1.91	2.60	1.50	2.02	1.92	2.00
Engineer Officers (Water Transport)	2.28	--	1.96	1.86	2.32	2.21	2.14	2.16
Railway/Marine Traffic Controllers	--	--	2.61	2.64	1.63	1.81	1.82	2.34
Airline Ticket/Service Agents	1.21	1.05	1.16	1.07	0.96	0.96	1.00	0.92
Rail Supervisors	3.08	2.56	2.66	2.95	2.21	2.27	2.27	2.31

Supervisors/Motor Transport/Other Ground Transit Operators	1.52	1.63	1.38	1.52	1.42	1.24	1.68	1.64
Railway Carmen/Women	2.06	1.88	2.00	2.25	1.58	1.59	1.66	1.65
Railway Engineers	2.69	2.71	2.58	2.70	2.42	2.57	2.60	2.37
Transport Truck Drivers	1.26	1.29	1.10	1.05	1.02	0.86	1.16	1.10
Bus Drivers/Subway Operators/Other Transit Operators	1.32	1.11	1.17	1.04	0.68	1.17	1.01	1.06
Taxi/Limousine Drivers/Chauffeurs	--	--	0.97	0.97	0.80	0.43	0.76	0.49
Railway Track/Yard Maintenance	1.93	1.74	1.73	1.93	1.50	1.68	1.57	1.65
Boat/Cable Ferry Operators	1.27	1.60	0.92	1.70	0.62	0.78	1.17	0.96
Longshore Workers	1.54	2.11	1.18	--	0.54	--	1.59	--
Other	1.53	1.50	1.44	1.49	1.25	1.18	1.38	1.41
All Transportation	1.48	1.54	1.32	1.35	1.17	1.10	1.35	1.34

Source: Canadian Census.
Notes: Annual earnings, current dollars by reported occupation.

Table 25: Change in Earnings, 2006 to 2016, for Transportation Occupations Relative to Average Change in Earnings for Non-Transportation Occupations

Occupation	Atlantic	Ontario	Quebec	West	2016 Employment All Regions
Transport Truck Drivers	**1.02**	0.85	0.95	0.95	147,880
Other	0.98	0.94	**1.04**	**1.02**	141,190
Air Pilots/Flight Engineers/Flying Instructors	**1.02**	**1.13**	**1.02**	**1.05**	12,165
Airline Ticket/Service Agents	0.87	1.00	0.92	0.91	8,935
Dispatchers and Radio Operators	**1.09**	0.86	0.94	0.98	7,540
Railway Track/Yard Maintenance	0.90	**1.12**	**1.11**	**1.05**	3,795
Railway Engineers	**1.01**	**1.06**	**1.04**	0.91	3,495
Supervisors/Supply-Chain/Tracking/ Scheduling	**1.33**	**1.21**	**1.17**	**1.20**	3,205
Supervisors/Motor Transport/Other Ground Transit Operators	**1.07**	0.88	**1.11**	0.98	2,785
Deck Officers (Water Transport)	**1.34**	**1.35**	**1.36**	**1.04**	2,490
Railway Carmen/Women	0.91	**1.01**	**1.13**	0.99	1,340
Rail Supervisors	0.83	**1.03**	**1.11**	**1.02**	1,065
Boat/Cable Ferry Operators	**1.26**	**1.25**	**1.85**	0.82	915
Air Traffic Controllers	0.75	0.95	**1.05**	**1.06**	850
Engineer Officers (Water Transport)	--	0.96	0.95	**1.01**	750
Bus Drivers/Subway Operators/Other Transit Operators	0.84	**1.73**	0.89	**1.05**	435
Taxi/Limousine Drivers/Chauffeurs	--	0.53	**1.01**	0.65	420
Custom and Ship and Other Brokers	--	0.57	0.87	0.90	--
Railway/Marine Traffic Controllers	--	**1.11**	**1.01**	**1.28**	--

All Transportation	**1.04**	0.94	**1.02**	1.00	360,870
Non-Transportation	1.00	1.00	1.00	1.00	22,680,725

Source: Canadian Census.
Notes: This table shows 2016 earnings divided by 2006 earnings for the occupation relative to the same ratio for non-Transportation occupations. The reported value is earnings change in excess of non-Transportation earnings growth. Ratios greater than 1 indicate above average earnings increase.

Mobility

Over the five years prior to the Census years in question, around 6% of workers employed in Transportation changed their province of residence. For the Atlantic region, Quebec, and Ontario, net out-migration reduced Transportation labour supply by around 1% over the five years, while in-migration over the same five years added 2% more workers to the western Transportation labour supply.

Tables 26 and 27 report counts of persons employed in Transportation and Truck Transportation in the Census year by self-reported region of residence five years prior. These tables allow us to infer mobility of Transportation workers across regions and to evaluate net gains to the Transportation workforce through inter-regional migration. Ontario and the West take in the largest number of inter-regional migrants who work in Transportation; but Ontario, like the Atlantic region, also sees a large number of Transportation workers migrate west.

Table 26: Counts of Transportation and Truck in 2006 by Region of Residence Five Years Previous

2006 All Transportation		**Residence in Census Year**				
		Atlantic	**Quebec**	**Ontario**	**West**	**Total Out**
Residence five years previous	**Atlantic**	24,480	200	570	835	**1,605**
	Quebec	45	76,770	830	445	**1,320**
	Ontario	585	750	113,660	2,075	**3,410**
	West	370	310	1,395	127,630	**2,075**
	Total In	**1,000**	**1,260**	**2,795**	**3,355**	**8,410**

2006 Truck		**Residence in Census Year**				
		Atlantic	**Quebec**	**Ontario**	**West**	**Total Out**
Residence five years previous	**Atlantic**	16,720	90	290	575	**955**
	Quebec	25	57,070	470	240	**735**
	Ontario	335	340	86,800	1,015	**1,690**
	West	170	115	670	82,090	**955**
	Total In	**530**	**545**	**1,430**	**1,830**	**4,335**

Source: Canadian Census

Table 27: Counts of Transportation and Truck in 2016 by Region of Residence Five Years Previous

2016 All Transportation		Residence in Census Year				
		Atlantic	Quebec	Ontario	West	Total Out
Residence five years previous	Atlantic	20,290	70	365	670	**1,105**
	Quebec	95	70,425	760	725	**1,580**
	Ontario	385	375	106,950	2,665	**3,425**
	West	385	250	1,290	122,560	**1,925**
	Total In	**865**	**695**	**2,415**	**4,060**	**8,035**

2016 Truck		Residence in Census year				
		Atlantic	Quebec	Ontario	West	Total Out
Residence five years previous	Atlantic	13,345	30	180	475	**685**
	Quebec	35	50,955	290	320	**645**
	Ontario	215	165	79,230	1,610	**1,990**
	West	275	115	615	79,855	**1,005**
	Total In	**525**	**310**	**1,085**	**2,405**	**4,325**

Source: Canadian Census

Table 28 evaluates the net change in Transportation and Truck employment through inter-regional migration for each region. In both 2006 and 2016, the West gained an increase in its Transportation and Truck Transportation workforce through inter-regional migration. The impact of these migration patterns in the workforce highlights that competition for Transportation workers coming from the West creates labour market tightness in other regions.

The labour supply challenges for employers can be solved/offset by immigration. Ontario's losses through inter-regional migration appear to have been more than offset by immigration, whereas Atlantic Canada's smaller immigrant intake has caused a steadily tightening labour supply in Transportation. Although the Atlantic region has increased its number of immigrants since 2016, it has not been enough to offset the net losses of Transportation workers in the region (300 per year from 2001 to 2006, and 220 per year from 2011 to 2016).

The general pattern of inter-regional migration in both Census cycles is a loss of labour supply to the West. In 2006, the out-migration of Transportation workers in the Atlantic region was disproportionately large, with the greatest imbalance in migration being between the Atlantic region and the West. In 2016, Western Canada gained Transportation workers through inter-regional migration, while Ontario and Quebec were sources of the migrating workers.

Table 28: Net Gain/Loss in Transportation and Truck Employees by Region Through Inter-Regional Migration

All Transportation		
	Net Gain / Loss 2006	**Net Gain / Loss 2016**
Atlantic	-605	-240
Quebec	-60	-885
Ontario	-615	-1010
West	**1,280**	**2,135**

Truck		
	Net Gain / Loss 2006	**Net Gain / Loss 2016**
Atlantic	-425	-160
Quebec	-190	-335
Ontario	-260	-905
West	**8,75**	**1,400**

Source: Canadian Census.

Discussion of Findings

This report investigates the existence and extent of a possible labour shortage within the Canadian Transportation sector, its sub-sectors, and selected occupations.

The demographic makeup of the Transportation workforce sector is different from that of the non-Transportation workforce. In Transportation, there are more men than women, an increasing number of workers over the age of 55, and a falling share of workers under age 35.

Analysis of labour supply and labour shortage indicators suggests that the labour challenges in Transportation are part of the same challenges faced in the labour market generally.

In regions with a relatively healthy supply of labour, labour market imbalances are not as dire. These regions are characterized as having more women, younger workers, and a higher percentage of immigrants (and in-migration in general). Ontario and the Western provinces (particularly Alberta) have enjoyed the largest influx of labour from all parts of Canada, which has enabled them avoid shortages relative to other regions. As workers in shortage sectors and occupations continue to leave the Atlantic region and locate either in Ontario or one of the Western provinces, Atlantic Canadian provinces will continue to see an imbalance in their workforce.

One possible solution to the tight Transportation labour market is immigration. In provinces that have the least evidence for labour shortages, the percentage of immigrants in the

Transportation workforce is often higher and increasing. This is not the case with the Atlantic region.

The overall Atlantic Canadian labour market is tight. When limited to Transportation alone, particularly Truck Transportation, the situation is more severe. This makes immigration a necessary and desirable solution that could enable the region to fill its job openings at a steady pace. Immigrants can play a critical role in ensuring the labour needs of the Atlantic region are met. If the region focuses on not only attracting more immigrants but also ensuring those immigrants are retained for the long term, its demographic challenges could be remedied.

Finally, the low representation of females in the workforce suggests that strategies to encourage more women into Transportation employment could be an important source of labour supply. Women work in many sectors that pay less than Transportation, so strategies for encouraging more females into Transportation employment may need to address non-wage, non-pecuniary features of the jobs.

References

1. Transport Canada. Transportation in Canada 2020 - overview report: transportation enabling economy growth. Government of Canada; 2020a, Jun 30. https://tc.canada.ca/en/corporate-services/transparency/corporate-management-reporting/Transportation-canada-annual-reports/Transportation-enabling-economy-growth
2. Trucking HR Canada. The road ahead: addressing Canada's trucking and logistics labour shortages. Ottawa, ON: Trucking HR Canada; 2020. https://truckinghr.com/wp-content/uploads/2020/03/THRC-Labour-Market-Information-Report_English-version.pdf
3. Statistics Canada. Table 14-10-0023-01 Labour force characteristics by industry, annual (x 1,000). 2021c, Aug 26. https://www150.statcan.gc.ca/n1/pub/11-402-x/2011000/chap/trans/trans-eng.htm
4. Statistics Canada. Transportation. 2018. https://www150.statcan.gc.ca/n1/pub/11-402-x/2011000/chap/trans/trans-eng.htm
5. Statistics Canada. Table 14-10-0064-01 Employee wages by industry, annual. 2021d, Aug 26. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410006401
6. Falconer R. Grown locally, harvested globally: temporary foreign workers are essential to our ag sectors. RealAgriculture; 2020. https://www.realagriculture.com/2020/07/grown-locally-harvested-globally-temporary-foreign-workers-are-essential-to-our-ag-sectors/
7. Gill V, Macdonald A. Understanding the truck driver supply and demand gap and its implications for the Canadian economy. The Conference Board of Canada; 2013. https://www.conferenceboard.ca/e-library/abstract.aspx?did=5345
8. Canadian Occupational Projection System (COPS). Imbalances between labor demand and supply (2019-2028). Government of Canada; 2019. http://occupations.esdc.gc.ca/sppc-cops/l.3bd.2t.1.3lshtml@-eng.jsp?fid=1&lid=29
9. McMullin JA, Cooke M, Downie R. Labour force ageing and skill shortages in Canada and Ontario. Research Report W | 24 Work Network. Canadian Policy Research Networks, Inc.; 2004. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.496.43&rep=rep1&type=pdf
10. Veneri CM. Can occupational labor shortages be identified using available data? Monthly Labor Review. 1999;122(3).
11. Emery JCH. Labour shortages in Saskatchewan. The School of Public Policy SPP Research Papers. 2013;6(4). https://www.policyschool.ca/wp-content/uploads/2016/03/emerysasklabour-online.pdf
12. Blank DM, Stiegler JG. The demand and supply of scientific personnel. New York: National Bureau of Economic Research, Inc; 1957.
13. Arrow KJ, Capron WM. Dynamic shortages and price rises: the engineer-scientist case. Quarterly Journal of Economics. 1959;292.
14. Franke W, Sobel I. The shortage of skilled technical workers. Lexington, MA: Heath-Lexington Books; 1970.
15. Shah C, Burke G. Skills shortages: concepts, measurement and implications. Centre for the Economics of Education and Training Working Paper No. 52. Victoria, Australia: Monash University; 2003.
16. Barnow B, Trutko J, Piatak J. Occupational labor shortages: concepts, causes, consequences, and cures. Kalamazoo, MI: Upjohn; 2013.
17. Min H, Lambert T. Truck driver shortage revisited. Transportation Journal. 2002;42:5-16.
18. Burks VS, Monaco K. Is the U.S. labor market for truck drivers broken? U.S. Bureau of Labor Statistics Working Paper No. 504. 2018. https://www.bls.gov/osmr/research-papers/2018/pdf/ec180040.pdf
19. Sloane P, Healy J, Mavromaras K. Adjusting to skill shortages in Australian SMEs. Applied Economics. 2015;47:2470-87.
20. Mittal N, Udayakumar PD, Raghuram G, Bajaj N. The endemic issue of truck driver shortage - a comparative study between India and the United States. Research in Transportation Economics, Elsevier. 2018;71(C):76-84.

21. Statistics Canada. Dictionary, Census of Population, 2016: occupation (based on the National Occupation Classification [NOC] 2016). 2019. https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/pop157-eng.cfm
22. Finnie R, Mueller RE, Sweetman A. Information and communication technology talent: the skills we need—framing the issues. Canadian Public Policy. 2018;44(S1):Siii-Six.
23. Government of British Columbia. British Columbia labour market outlook: 2019 edition. 2019. https://www.workbc.ca/getmedia/18214b5d-b338-4bbd-80bf-b04e48a11386/BC_Labour_Market_Outlook_2019.pdf.aspx
24. Transport Canada. Transportation in Canada 2019. Government of Canada; 2019. https://tc.canada.ca/en/corporate-services/transparency/corporate-management-reporting/Transportation-canada-annual-reports/Transportation-canada-2019#toc_4
25. Transport Canada. Transportation and the economy. Government of Canada; 2020b, Sep 29. https://tc.canada.ca/en/corporate-services/policies/Transportation-economy-0.
26. Canadian Trucking Alliance. Report of the CTA Blue Ribbon Task Force on the driver shortae in trucking. Ottawa; 2012. www.drivershortage.ca/wp-content/uploads/2013/03/120402-Report-of-CTA-Blue-Ribbon-Task-Force-on-Driver-Shortage-in-Trucking-Final.pdf
27. Trucking HR Canada. Millennials have drive 2. 2019. https://truckinghr.com/wp-content/uploads/2019/09/Millennials-Have-Drive-2.pdf
28. McKinnon A, Flöthmann C, Hoberg K, Busch C. Logistics competencies, skills, and training: a global overview. World Bank Group; 2017. http://dx.doi.org/10.1596/978-1-4648-1140-1
29. Trucking HR Canada. Millennials have drive: a roadmap for Canada's trucking employers to recruit and retain millennials. 2017. https://truckinghr.com/wp-content/uploads/2019/09/Millennials-Have-Drive.pdf
30. Chaundy D, Mangwengwende T. Labour skills shortages in Atlantic Canada: an assessment and discussion of how to move forward. Council APE; 2020. https://www.apec-econ.ca/publications/view/?do-load=1&publication.id=393&site.page.id=2000
31. Labour Market Analysis Directorate. Sectoral profile: transportation and warehousing: Atlantic region 2018. Atlantic Region: Service Canada; 2018. http://www.edsc-esdc.gc.ca/img/edsc-esdc/jobbank/SectoralProfiles/ATL/2018/SP-PS-ATL-2018-48-49-Eng.pdf
32. Amachree J. From abundance to scarcity: labour supply in New Brunswick pre- and post-2008. JDI Roundtable on Manufacturing Competitiveness in New Brunswick Forum; 2019. https://www.unb.ca/roundtable/_assets/documents/unb-jdi-round-table-wp-labour-final.pdf
33. Hall PV, Farahani A, Johnston K, Yeak C-M. Pathways to immigrant employment in the port-logistics sector. Metropolis British Columbia Working Paper No. 13-02. 2013. http://www.sfu.ca/~pvhall/pdfs/WP13-02.pdf
34. Costello B, Karickhoff A. Truck driver shortage analysis: 2019. American Trucking Associations; 2019. https://www.trucking.org/sites/default/files/2020-01/ATAs%20Driver%20Shortage%20Report%202019%20with%20cover.pdf
35. Canadian Occupational Projection System (COPS). Industrial summary: truck and ground passenger transportation services. Government of Canada; 2017. http://occupations.esdc.gc.ca/sppc-cops/l.3bd.2t.1ils@-eng.jsp?lid=48&wbdisable=true
36. Statistics Canada. North American Industry Classification System (NAICS) Canada 2017: Version 3.0. 2021b, Mar 18. https://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=1181553&CVD=1181554&CPV=48-49&CST=01012017&CLV=1&MLV=5
37. Statistics Canada. Table: 14-10-0018-01 Labour force characteristics by sex and detailed age group, annual, inactive (x 1,000). 2021a, Aug 26. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410001801
38. Leonard P, McDonald T, Miah P. Immigrant retention in New Brunswick: results from BizNet and Citizen Database. Fredericton, NB: New Brunswick Institute for Research, Data and Training; 2019. https://www.unb.ca/nbirdt/research/publications/_resources/pdf/nb-irdt-2019_09_immigrant_retention-nb-colour.pdf
39. BoostNB. Goal 2: international migration [Web]. [updated 2021; cited 2021 Sept 14]. Available from: http://www.boostnb.com/uploads/1/2/6/8/126864015/goal_2_2021.pdf.

40. Public Policy Forum. The people imperative: come from away and stay: strategies to grow population and prosperity in Atlantic Canada. 2018. https://ppforum.ca/wp-content/uploads/2018/03/PPF-The-People-Imperative-Vol1-Digital.pdf
41. Government of Canada. Evaluation of the Provincial Nominee Program. Ottawa, ON: Immigration, Refugees and Citizenship Canada; 2017. canada.ca/content/dam/ircc/documents/pdf/english/evaluation/e1-2015-pnp-en.pdf
42. Government of Canada. Industry summaries - Canadian industry statistics - innovation, science and economic development Canada. 2019. https://www.ic.gc.ca/app/scr/app/cis/summary-sommaire/482