PEEL-HALTON SUPPLY CHAIN REPORT

LEPC PEEL-HALTON LOCAL EMPLOYMENT PLANNING COUNCIL

PEEL HALTON WORKFORCE DEVELOPMENT GROUP

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Ontario

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Introduction

The supply chain industry research is a part of the *Local Employment Planning Council (LEPC)* project which is funded by the Ministry of Advanced Education and Skills Development. The *Peel Halton Workforce Development Group* was awarded the LEPC project to improve local labour market conditions in the Peel and Halton regions. To elaborate, the purpose of the LEPC project is to address local labour market needs through research, education and an integrated network of the following four stakeholder groups:

- The Peel and Halton communities
- Employers
- Employment and training service providers
- Government

As a result, several research studies have been conducted to identify the labour market gaps and challenges in local industries. This research is focused on the supply chain industry which is one of the dominant industry sectors in Peel and Halton. The report aims to investigate the trends, gaps, needs and issues in the local supply chain labour market and provide appropriate and actionable recommendations for further improvements.

For the purpose of this research, a working group comprised of local supply chain professionals was formed. Various criteria were considered in sourcing the working group members to represent the diversity of the Peel and Halton regions such as business size, business location, industry category (e.g., transportation, warehousing, and wholesale trade) and industry association. Over the three consultative meetings held with the working group members, the scope of the research was shaped and the research recommendations were discussed and finalized. Additionally, the survey questions were designed according to the discussions with the working group and the group members' feedback on the survey questions was collected through electronic correspondence. The inputs from the working group members helped to improve the research recommendations to make them more applicable and actionable for community stakeholders, policy makers and government bodies.

In terms of research methodology, a combination of quantitative research (e.g., data analysis, survey) and qualitative research (e.g., key informant interviews) were used to gather, analyze and interpret data. For the data analysis, several data sources such as Census Profile, National Household Survey (NHS), Labour Force Survey (LFS), Job Vacancy and Wage Survey (JVWS)[1] and

[1] All of these data sources are presented by Statistics Canada.

the Peel Halton Supply Chain Survey[2] were used to draw the supply chain labour market trends and identify issues.

In regard to data limitation for this report, it is important to note that since the 2016 census data has not been released and the latest Census Profile and National Household Survey (NHS) provides data related to 2011, there is a lack of local (Peel and Halton) data for the recent years after 2011. Additionally, the rest of the aforementioned surveys by Statistics Canada are not reported at the local level. As a result, depending on the availability of data, most of the analysis is based on provincial level or Toronto CMA excluding the City of Toronto data. The reason for this exclusion is to shrink the CMA area and find a better approximation for Peel and Halton. Additionally, it helps to avoid analysis bias since the economy and population of the City of Toronto are way different from the rest of the CMA area; the number of job opportunities, dynamics of workforce and businesses, demographics of labour force and industries growth rates are very different in the City of Toronto compared to the rest of the CMA area. As a result, given the fact that Peel and Halton regions form almost 40% of the Toronto CMA excluding the City of Toronto[3], it is more likely that the analysis results will be very close to those based on local level data. The Toronto CMA excluding the City of Toronto is shown as color shaded areas in Figure 1.

Figure 1: *Toronto CMA Excluding the City of Toronto Area*

Whereas Peel and Halton regions form almost 40% of the Toronto CMA excluding the City of Toronto, it is more likely that the analysis results will be close to those based on local level data.

This report has two major sections: The first section presents an overview of the supply chain industry and provides relevant information and statistics at the regional or provincial level. The second section is focused on the analysis of survey results from local supply chain employers and employees.

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[2] This survey is designed by the Peel Halton Workforce Development Group for the purpose of supply chain labour market research.

[3] 2011 Census Profile

History

The history of supply chain dates back to over 100 years ago when it was a simple but labour intensive shipping and receiving activity. The concept and utilization of supply chain terminology started in 1905 in a newspaper article about wartime situations[4]. It was considered more seriously in operations research on military logistics problems during World War II in the 1940s[5]. After World War II, American industries planned for expansion and invested in mass production. However, the mass production process was very costly and they had serious issues with the efficient and timely distribution of products. As a result, industries (especially textile and grocery industries) sought a solution[6]. Several initiatives took place in both industries to find ways to shorten the supply chain process[6] as well as design a uniform product code. The purpose of the product code was to facilitate effective communication between suppliers and retailers[6] and to manage the inventory of products more efficiently[8]. In October 1952, Norman Joseph Woodland and Bernard Silver from Drexel Institute of Technology patented the first barcode technology[8]. Years after the invention of the barcode, there was still no way to read the codes. With the invention of the laser in 1960[7], new ideas were generated. Finally, on October 1973, IBM developed the Universal Product Code (UPC), a point-of-sale (POS) terminal and a checkout scanner with the capability of reading UPC[8].

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[4] History of logistics and supply chain version 2 (http://i0.wp.com/cerasis.com/wp-content/uploads/2013/07/Supply-Chain-and-Logistics-Management1.png)

[5] Georgia Tech, Supply Chain & Logistics Institute, The evolution of SCL (https://www.scl.gatech.edu/about/scl/history)

[6] Rhonda R. Lummus and Robert J. Vokurka, "Defining supply chain management: a historical perspective and practical guidelines", Industrial Management & Data Systems, Vol. 99 Iss: 1, pp.11 - 17, 1999.

[7] Laser Fest, Early History (http://laserfest.org/lasers/history/early.cfm)

[8] IBM, UPC, the transformation of retail (http://www-03.ibm.com/ibm/history/ibm100/us/en/icons/upc/)

In June 1974, the first product, a pack of Wrigley's Juicy Fruit chewing gum, was sold in Ohio through the IBM scanning system. This innovation revolutionized the inventory tracking system and transaction accuracy and accelerated the checkout process by 40%[8].

Another serious problem related to the distribution of products during the 1940s and 1950s was the movement of giant stacked (palletized) goods. The warehouse design was changed in order to better use space and provide wider accessibility. In the shipment side, the movement model evolved from a very simple and labour intensive model to a more complex and developed model with usage of various means of transportation (ships, trucks, trains, etc.). This became a pathway from a local and domestic supply chain model to globalization. During the1970s, the emergence of computers moved the industry several steps ahead and had a great impact on logistics planning, inventory management and route planning[9].

During the 1980s, a growing demand caused businesses to recognize the lack of an integrated network of suppliers, producers and distributers. They found that in order to achieve better outcomes in terms of sourcing materials, fulfillment and delivery of orders they needed to work collaboratively[10]. Two industry initiatives named "Quick Response" and "Efficient Consumer Response"[11] were launched in the textile and grocery industries, respectively. The results of these initiatives led to billions of dollars of saving in these industries and maximized profitability[6]. Additionally, the results helped these industries to shrink the duration of the supply chain process and deliver products in various locations quickly which resulted in higher consumer satisfaction.

During the 1990s, the analysis of POS data empowered retailers and manufacturers with real-time, accurate and reliable sales data. This data enabled them to forecast the demand for different products and plan for just-in-time replenishment[6].

Nowadays, supply chain is a very complex industry. The real-time and precise data from checkout systems, warehouses, suppliers and transportation systems enable the fast and reliable transfer of numerous products with billions of dollars of value to domestic and international destinations.

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[9] Georgia Tech, Supply Chain & Logistics Institute, The evolution of SCL (https://www.scl.gatech.edu/about/scl/history)

[10] James R. Stock, "Supply chain management: A look back, a look ahead", CSCMP's supply chain quarterly, 2013

[11] Kurt Salmon Associates, Inc., "Efficient consumer response", January 1993

Introduction to Supply Chain Industry

Supply chain is a sequence of various steps in order to deliver goods and services from suppliers to end user customers. In a broader view, the supply chain process is a network of different companies such as suppliers, transporters, manufacturers, distributers and retailers working seamlessly to facilitate all the steps taken to produce and convey commodities and services to the final customer.

On a smaller scale, in a single company, the supply chain process includes three steps: (1) sourcing and procurement of input materials, (2) logistics of raw material or work-in-progress goods within various sections of the company, and (3) the process of delivering final goods to retailers and distributers (See Figure 2). To execute each step, a strong interaction among several departments and sections within a company (e.g., finance, marketing, human resources, manufacturing, buying, shipping, etc.) is required. Hence, to have an integrated supply chain system, a very well connected network of various departments and sectors is essential.

Supply chain is a sequence of various steps in order to deliver goods and services from suppliers to end user customers.

Figure 2: *Supply Chain Process Flow*

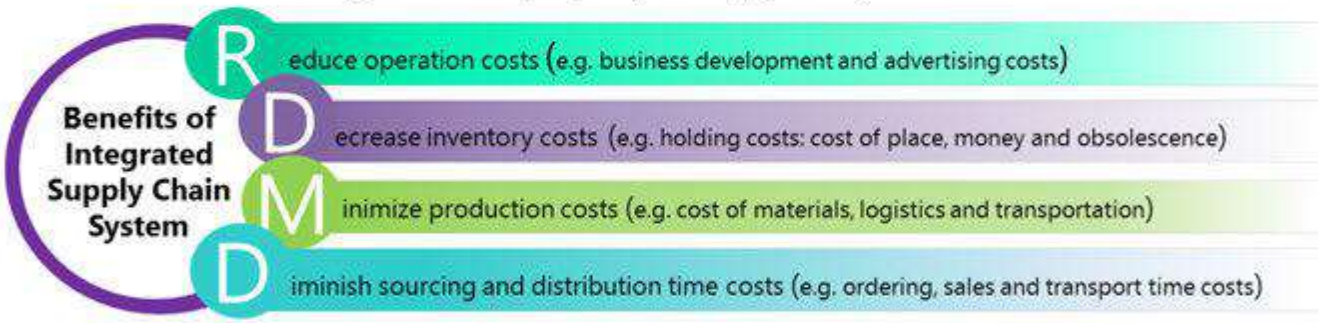
As mentioned, Sourcing & Procurement, Logistics and Warehousing & Distribution are the main steps of a supply chain process. A brief description of each step is provided in the following:

- Procurement is the process of identifying the right suppliers or service providers, with cost effective and good quality products and services, and purchasing materials and/or services that a company needs to continue its operation.
- Logistics refers to all the steps that are taken to secure the flow of goods and services to the final consumers. These steps include, but are not limited to, planning, cost analysis, forecasting, transportation, inventory analysis and route planning. Logistics activities start from transferring raw materials from suppliers to manufacturers or producers, and it continues all the way to the delivery of products and services to retailers and end users. Apparently, all the steps of the supply chain process are dependent on logistics services to coordinate, ship, move and deliver orders in a timely manner.
- Warehousing & Distribution is the process of storing and delivering final goods and services to end users. There are several steps such as planning, inventory control, cost analysis, transportation, business development, sales and marketing that have to be taken in order to efficiently and effectively transfer products into the marketplace.

Each step mentioned in Figure 2 has its own series of planning and operations. Some of these activities are common across various steps of the supply chain process, such as planning, cost analysis and transportation. Although these activities look similar, they are unique and distinctive in terms of functionalities for each step. For instance, planning in logistics is detailed scheduling of the movement process (e.g., means of transportation, route planning, time scheduling, etc.) from shipment to delivery, whereas planning in warehousing and distribution is inventory management, stock level control and effective demand planning for future orders.

In Figure 3, the advantages of an integrated and well connected supply chain system are listed.

Figure 3: *Advantages of Integrated Supply Chain System*



A well connected supply chain system saves costs in different ways and accelerates the movement process from sourcing materials to delivery. Building long term relationships with business partners and being a loyal customer of certain vendors and suppliers helps to save time for sourcing materials with better prices. Additionally, a strong relationship in such a network

facilitates the timely shipment of products with reasonable costs and also reduces the inventory turnover.

There are several parties involved in an end-to-end supply chain process such as suppliers, manufacturers, distributers, retailers and consumers. Each of them has a specific role in the supply chain process. Suppliers and vendors provide raw materials to producers/manufacturers and deliver them by transporters. The raw materials are converted to work-in-progress and transferred to other production lines within a company or other manufacturers for the completion of production process. Transporters carry final goods to warehouses where the products are stored and prepared for shipment to marketplace. At the end of this chain, the final products that are sold in retail stores or online websites will be shipped and delivered to end users. This whole process illustrates the journey of raw materials from suppliers to end customers as final products through an integrated and well connected supply chain system.

Overall, the role of supply chain system is to facilitate, coordinate and implement the movement of goods and services in a timely manner, and in collaboration with external business partners (e.g., vendors, suppliers and retailers) and internal departments or sections within a company (e.g., accounting, marketing, procurement, manufacturing, etc.). In order for this system to work effectively, a perfectly connected network of internal divisions and external links along with real-time data from all steps of this process is required.

Supply chain industry is comprised of two main industry sectors: "Wholesale Trade[12]" and "Transportation & Warehousing" (see Figure 4).

Figure 4: *Supply Chain Industry Sector and Subsectors*

Transportation & warehousing and wholesale trade industries have several subsectors. Each subsector represents a group of businesses and activities as illustrated in Figure 5.

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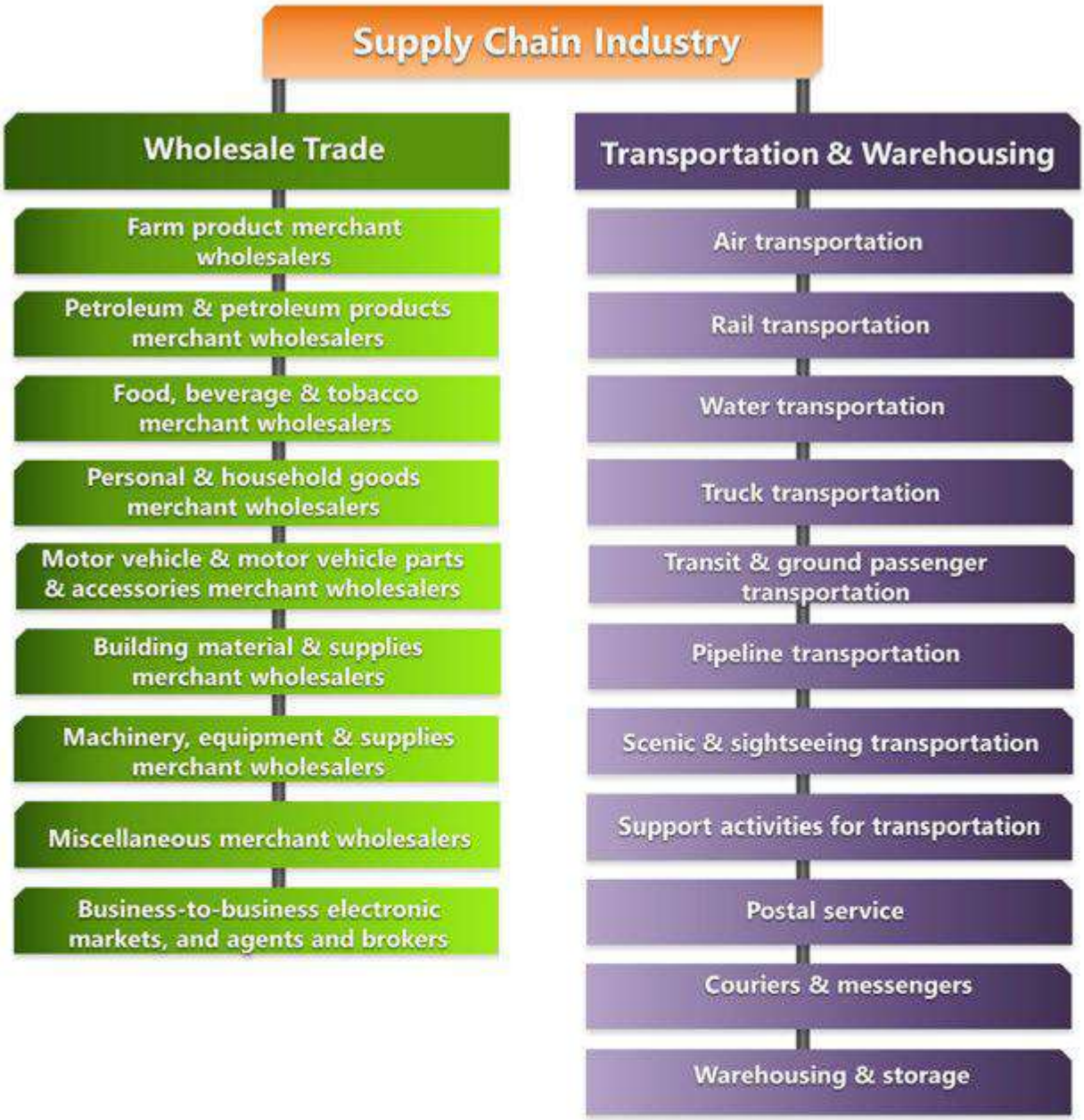
12 Wholesale trade is a form of trade in which goods are purchased and stored in large quantities and sold, in batches of a designated quantity, to resellers, professional users or groups, but not to final consumers. (Glossary of statistical terms, The Organization for Economic Co-operation and Development (OECD)

Figure 5: *Supply Chain Sectors and Subsectors*



Source: *Statistics Canada, North American Industry Classification System (NAICS) Canada, 2012*

In order to study the supply chain industry in detail and identify its gaps and needs, it is required to review and study the major subsectors of this industry and analyze how they work together and how they are affected by economic situations.

Local Supply Chain Potentials

In Ontario, the supply chain industry is one of the key industry sectors that has had a great impact on economic prosperity. Peel and Halton regions are the provincial hubs for supply chain businesses and facilities. While these regions are prime locations for the supply chain industry, their importance is not constrained only to the Province of Ontario. Peel and Halton are located in the Greater Toronto and Hamilton Area (GTHA) which is the most populated area in Canada with close to 7 million residents[13]. Moreover, the advantage of hosting Canada's largest airport creates a unique opportunity for supply chain companies to establish and expand their businesses in these regions[14]. Additionally, a number of major highways in Ontario pass through Peel and Halton regions (e.g., 401, 403, 407, 409, 410, 427, QEW, etc.)[14]. These highways are the vital channels for the distribution of products and services within the province and across the Canada-US border. The Annual Average Daily Traffic (AADT) of commercial vehicles (e.g., trucks) on these highways is the highest traffic volume in Ontario[15].

In addition to road transportation, Canada's major freight railways, i.e., Canadian National (CN) railway and Canadian Pacific Railway (CPR), pass through these regions.

Another advantage of Peel and Halton regions is proximity to the United States border. Canada and United States have the world's largest bilateral trade relationship[16]. In 2015, the value of total export from the Province of Ontario was $235 billion CND and the value of all imported products and services to Ontario was $325 billion CND[17]. From the total provincial trade, 82.5% of export and 56% of import was with the United States.

International trade (import and export) requires a coherent network of supply chain facilities and services for the transportation and distribution of products and goods. The strategic location of Peel and Halton in terms of proximity to the US border and having supply chain facilities such as the airport, railways and roads along with being a hub for supply chain businesses, make these regions prominent for the provincial economic prosperity.

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[13] Statistics Canada, CANSIM table 051-0056

[14] Region of Peel goods movement economic impact analysis, WSP Canada Inc., November 12, 2015.

[15] Commercial vehicle flows by road network, Data Catalogue, Government of Ontario, and Provincial Highways Traffic Volumes 2012 AADT, Ministry of Transportation

[16] United States-Canada Trade and Economic Relationship: Prospects and Challenges, CRS Report for Congress, 2008

[17] Trade Data Online (https://www.ic.gc.ca/app/scr/tdst/tdo/crtr.html?&productType=NAICS&lang=eng)

Overall, the Peel and Halton geographic location within Canada's greatest consumer market, combined with the privilege of having facilities for road, rail and air transportation, has made these regions very attractive for supply chain businesses[18].

[18] Region of Peel goods movement strategic plan, Region of Peel, November 2015

Economic Overview

The Supply chain industry connects businesses to consumers and the demand for supply chain services is created from almost all industries. Consequently, the growth or slow-down in economic activities of other industries, can impact the demand for supply chain services. Moreover, similar to other industries, there are several macroeconomic variables such as exchange rate or interest rate that can impact the business activities in the supply chain industry. Therefore, an in-depth study of past, current and future economic situations is critical in order to analyze the performance of the supply chain industry.

Gross Domestic Product (GDP) is one of the most important indicators of economic health and growth in any given geographical area. In brief, GDP is the monetary value of all economic outputs (final goods and services) produced within a region, province or country in a given year.

In 2015, the supply chain industry accounted for 10.1% of Canada's total GDP. [19] The provincial contributions to the national GDP were not uniform. Figure 6 illustrates the provincial shares in the national GDP.

Figure 6: *Provincial GDP Contribution to the National Supply Chain GDP, 2015*

Ontario and Quebec supply chain industries made the largest contributions (40% and 19%, respectively) to the entire nationwide supply chain GDP.

Source: *Statistics Canada, Table 379-0030 and Table 379-0031 Gross domestic product (GDP) at basic prices by NAICS, Values in Chained 2007 dollars*

[19] Statistics Canada, Table 379-0031 Gross domestic product (GDP) at basic prices by NAICS

Figure 7 illustrates the Gross Domestic Product (GDP) for the supply chain industry in Ontario. According to the graph, over the period of 2011 to 2015, there was a positive trend in the GDP growth for wholesale trade and transportation & warehousing industries (14.4% and 7.1% respectively). As seen, the value of wholesale trade GDP is much higher than transportation & warehousing GDP. The reason is that wholesale trade is a capital intensive industry while transportation & warehousing is more labour intensive. Therefore, the value of services delivered by transportation & warehousing is lower than the value of wholesale trade transactions.

Figure 7: *Real Gross Domestic Product (GDP) in Supply Chain Industry sector and subsectors, Ontario, 2011 to 2015, (Value in Millions of Canadian Chained Dollars (2007))*

Source: *Statistics Canada, Table 379-0030 Gross domestic product (GDP) at basic prices by NAICS*

Moreover, the GDP growth in the transportation & warehousing industry was almost half of the wholesale trade industry. One reason could be the slow-down in economic activities in some industries such as manufacturing between 2011 and 2015[20]. Since a big portion of demand for transportation & warehousing services is created by manufacturers and suppliers, the slow-down in manufacturing industry indirectly impacted the demand for transportation & warehousing services. Another reason is the CND-to-USD exchange rate. The appreciation of Canadian dollar between 2011 to 2013[21] negatively affected the export rate between Canada and the United States[22]. Moreover, the higher value of the domestic currency could not promote the import rate very significantly.[22] Due to the lack of financial stability over the five years after the 2008 financial crisis in the US, and the existence of some level of uncertainty about the

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[20] Table 304-0015 Manufacturing sales, by North American Industry Classification System (NAICS) and province

[21] CanadianForex (http://www.canadianforex.ca/forex-tools/historical-rate-tools/yearly-average-rates)

[22] Trade Data Online (https://www.ic.gc.ca/app/scr/tdst/tdo/crtr.html?&productType=NAICS&lang=eng)

future of the economy, businesses were not leaning toward investment in new business expansions.

Within transportation & warehousing and wholesale trade industries, each subsector has a unique contribution to the total GDP generated by each industry. As seen in Figure 8 in wholesale trade, "Machinery, equipment and supplies wholesaler-distributors" contributed the most and accounted for 27.4% of the entire provincial GDP generated by this industry in 2015. Additionally, "Truck transportation" is the biggest segment in the transportation & warehousing industry and accounted for 26.4% of the GDP produced by this industry in Ontario.

Figure 8: *Major Supply Chain Subsectors in Ontario, 2015*

Source: *Table 379-0030 Gross domestic product (GDP) at basic prices by NAICS*

Figure 9 indicates the GDP share of transportation & warehousing, wholesale trade and the entire supply chain industry in Ontario's GDP. As seen, the GDP share of "Wholesale trade" is about two times higher than the GDP share of the "Transportation and warehousing" industry. Even though the supply chain industry has had 11.7% GDP growth during 2011 to 2015, its share in the provincial GDP remained unchanged. This indicates that the industry growth pace is aligned with the growth rate of other sectors in the Ontario's economy.

Figure 9: *GDP Share of the Supply Chain Industry in Ontario's GDP, 2011 to 2015*

Source: *Statistics Canada, Table 379-0028 Gross domestic product (GDP) at basic prices, by NAICS, annual*

In the past five years (2011 to 2015), the national supply chain GDP growth exceeded the national GDP growth for all industries by 3.5%. The industry projection data shows that the national supply chain GDP will grow by 9.3% over the next five years (2017 to 2021) which is 0.8% above the national GDP growth by all industries[23]. The fact that supply chain GDP growth is converging on the national GDP growth for all industries implies that over the next few years, this industry will face more competition to maintain its 10% share in national GDP. Although this projection is provided only at the national level, considering the fact that Ontario's supply chain industry has the biggest share of the national GDP generated by this industry sector (about 40%), this projection can be applied to Ontario supply chain to a large extent.

GDP is one of the macroeconomic variables that shows the performance and economic health of an industry sector. There is a wide range of macroeconomic variables that impact the supply chain industry such as interest rate, exchange rate, inflation rate, and household and business expenditures. In the following, some examples are provided to shed light on how the supply chain sector has been impacted and will be potentially affected by economic situations in the near future.

The first variable that has a strong impact on supply chain activities is the exchange rate. The supply chain industry has benefited from the decline in Canadian dollar value in the past two years (late 2014 to 2016). The reason is the increase in the competitiveness of the Canadian economy in the international market due to the lower value of the domestic currency. The depreciation in the Canadian dollar and boost in the US economy in recent years have increased

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[23] Canadian Occupational Projection System (COPS), industry data

(http://occupations.esdc.gc.ca/sppc-cops/content.jsp?cid=industrydatasearch&lang=en)

the competitiveness of the Canadian economy and have made foreign markets (especially the US market) more attractive for domestic products.

In 2015, more than 82% of Ontario's total export and 56% of Ontario's total import was with the US[24]. Hence, the high volume of international trade with the US along with the high exchange rate positively impacted Ontario's economy. Import and export activities are entirely dependent on the supply chain industry to transport products all over the world.

It is anticipated that the supply chain industry will benefit from the lower Canadian dollar for a while, since the Canadian government tends to maintain the exchange rate at the current range (0.73-0.76) to boost economic activities[25].

The next macroeconomic variable is the interest rate. Since 2014, the Bank of Canada has cut the interest rate by 0.25% twice which brought it down to 0.5%.[26] That is a significantly low interest rate for borrowing capital.

The low interest rate speeds up economic activities in all industries and consequently in the supply chain industry. A lower interest rate empowers businesses to access low cost financing for operations and hiring new employees. Since the demand for supply chain services derives from all industries, a more stable economic situation (e.g., lower interest rate) in other industries will benefit the supply chain industry as well.

Additionally, a low interest rate enhances the purchasing power[27] of consumers. For instance, a lower interest rate will enable mortgage applicants to become approved for higher mortgage amounts. Hence, the demand for buying properties will increase which results in a positive shift

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[24] Trade Data Online

[25] National Bank, Financial Market (https://www.nbc.ca/content/dam/bnc/en/rates-and-analysis/economic-analysis/forex.pdf), Trading Economics (http://www.tradingeconomics.com/canada/currency/forecast) and RBC economics research: Financial market forecasts (http://www.rbc.com/economics/economic-reports/pdf/financial-markets/rates.pdf), September 2016

[26] Trading Economics (http://www.tradingeconomics.com/canada/interest-rate)

[27] Purchasing power is the amount of goods and services that one unit of currency can buy.

in the demand curve for "Building material and supplies wholesaler-distributors" and "Truck transportation"[28]. Moreover, a lower interest rate affects other types of loans such as car loans, business expansion and capital loans. The requests for these loans increases the demand for "Motor vehicle and parts wholesaler-distributors", "Machinery, equipment and supplies wholesaler-distributors" and "Wholesale electronic markets, and agents and brokers"[29]. Since the interest rate is expected to remain low in 2017[30], the supply chain industry will have the advantage of a low interest economy for a longer period.

Overall, similar to other industries, supply chain has been affected and will also be impacted by numerous internal and external economic factors. It is difficult to come to a strong and robust conclusion about the future of the industry. However, according to the forecasts and future economic expectations determined by the Bank of Canada, a continuous growth for this industry is anticipated for the near future.

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[28] "Building material and supplies wholesaler-distributors" is the second largest subsectors of wholesale trade and "Truck transportation" is the greatest subsector of transportation & warehousing industry. See Figure 5.

[29] These are the subsectors of the wholesale trade industry. See Figure 5.

[30] RBC economics research: Financial market forecasts (http://www.rbc.com/economics/economic-reports/pdf/financial-markets/rates.pdf), September 2016

Labour Force

The labour force is defined as the people who are either employed or unemployed but looking for an employment opportunity. In 2011, 14.3% of the Peel and Halton residents worked in the supply chain industry which was 5.3% higher than the proportion of supply chain labour force in Ontario and 4% higher than Toronto CMA[31]. Since the 2016 census data has not been released, there is a lack of regional and municipal data for the years after 2011. As a result, in this section, the closest geographical area, which is the Toronto CMA excluding the City of Toronto, is selected for the analysis. Figure 10 indicates the labour force population in this geographical area. Over the period of 2011 to 2015, the size of the labour forces in transportation & warehousing and wholesale trade increased by 10.2% and 49.8%, respectively. The higher increase in the wholesale trade labour force is not limited to the Toronto CMA excluding the City of Toronto area. In the entire CMA area (including the City of Toronto) and Ontario, there is a similar pattern in labour force growth rate in both industries. More specifically, in Ontario, wholesale trade labour force increased by 21.5% between 2011 and 2015, while transportation & warehousing labour force declined by 0.9%. This difference in growth rates can be explained through two main reasons:

- In the warehousing subsector, business operations have been optimized over time by using state-of-the-art technologies which has reduced the growth of labour force in this industry. Additionally, the transportation subsector has been facing labour shortages in some occupations such as truck drivers due to the declining interest in these positions among young generation.
- The growth of the wholesale trade subsector is tied to regional, national, and international economic situations (e.g., import and export rates). Over 2011 and 2015, the economic situation improved which resulted in a higher level of growth in the wholesale trade.

Overall, the labour force growth in both industries in Toronto CMA excluding the City of Toronto, implies that these industries are stable and have successfully invested in expansion and

[31] Statistics Canada, 2011 National Household Survey (NHS)

hiring. Given the fact that Peel and Halton regions are the hub for transportation & warehousing and wholesale trade industries, this growth will positively impact the economy of these regions.

Figure 10: *Labour Force population in Supply Chain Industry, Toronto CMA Excluding the City of Toronto, 2011 to 2015*

Source: *Customized Labour Force Survey Data Obtained Through Economic Data Centre, City of Toronto*

Unemployment Rate

This section presents the changes in unemployment. Due to the lack of data for the Toronto CMA, the Ontario level data has been used for this analysis. Figure 11 illustrates the unemployment rate in Ontario's supply chain industry and the overall unemployment rate in all industries between 2011 and 2015. As seen, the unemployment rates in supply chain subsectors were much lower than the unemployment rate associated with all industries in Ontario.

The unemployment rate in both transportation & warehousing and wholesale trade reached its highest level over the last five years in 2013. One reason is related to the fact that prior to 2013, the North American economy was still in the first 5 years of recovery from the 2008 financial crisis and some industries, such as manufacturing, were still facing a slow-down in business activities. Given the fact that the demand for supply chain services derives from other industries, a slow-down in business activities could negatively impact the supply chain sector. The other reason can be attributed to the exchange rate. From 2011 to 2013, the average Canadian to US dollar exchange rate was around 1 which was the highest in the past 10 years[32]. As a result of that, Canadian products became more expensive for US consumers, which led to a shrinking market share for Canadian products in the US. While over 82% of Ontario's export was to the US market, Canada's economy was affected by the increase in exchange rate; especially industries that were highly dependent on import and export such as transportation & warehousing. Subsequently, provincial and local labour markets were also impacted and local employers either reduced their headcount or froze new hiring for quite a long time.

After 2013, due to the drop in the exchange rate, Canadian products regained their competitive advantage in the US market. Additionally, most of the industries recovered from the financial crisis. Hence, the demand for supply chain services increased in order to support the export growth to the US market.

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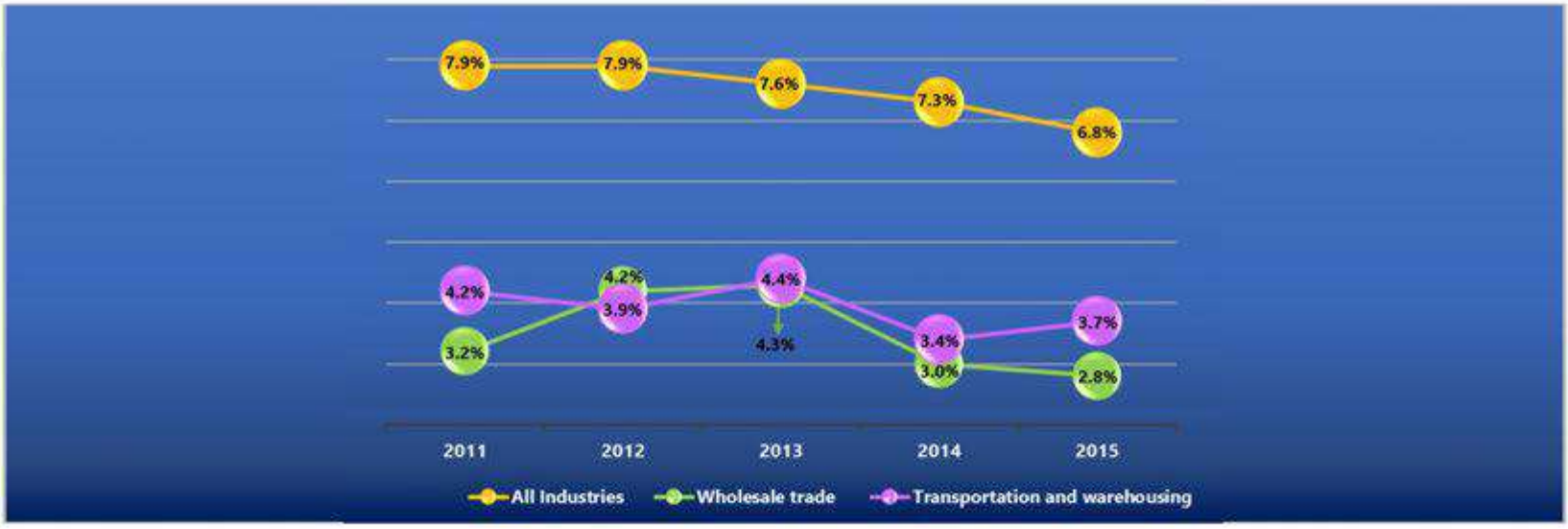
[32] Canadian Forex

Figure 11: *Unemployment Rate in All Industries, Transportation & Warehousing and Wholesale Trade, Ontario, 2011 to 2015*



Source: *Statistics Canada, Table 282-0008 Labour Force Survey Estimates (LFS)*

The unemployment rate varies across different occupations within an industry. There is limited data available about the unemployment rate by each occupational category and subcategory in the supply chain sector. Table 1 illustrates some of the supply chain occupations and their associated unemployment rates for 2013 and 2015. The unemployment rate is to some extent correlated with the level of formal education required for each job category, which means the higher the level of formal education is, the lower the unemployment rate will be; as an example, operational positions[33] such as material handler have the highest unemployment rates among supply chain occupations. Likewise, some of the tactical positions[33] (e.g., dispatchers) have higher unemployment rates compared to managerial occupations. One reason might be the higher number of applicants; several groups of people (e.g., immigrants and youth) consider these positions as the first step to enter the job market. As a result, the demand for these occupations is higher than the supply.

[33] For more information about the operational and tactical positions please see page 35

Table 1: *Unemployment Rate in Supply Chain Occupations, Ontario, 2013 and 2015*

	2013	2015
Specialized Middle Management • Purchasing Managers • Other Administrative Services Managers (e.g., inventory control manager) • Postal and Courier Services Manager • Computer and Information Systems Managers	2.7%	2.0%
Middle Management in Retail and Wholesale Trade and Customer Services • Corporate Sales Managers	2.0%	2.2%
Middle Management in Trades, Transportation, Production, and Utilities • Facility Operation and Maintenance Managers • Transportation Managers	1.8%	1.3%
Administrative and Financial Supervisors and Administrative Occupations • Supervisors, Mail, and Message Distribution Occupations • Supervisors, Supply Chain, Tracking, and Scheduling Coordination Occupations • Purchasing Agents and Officers	4.0%	2.8%
Distribution, Tracking, and Scheduling Coordination Occupations • Shippers and Receivers • Storekeepers and Partspersons • Production Logistics Coordinators • Purchasing and Inventory Control Workers (e.g., inventory analyst) • Dispatchers • Transportation Route and Crew Schedulers	4.8%	3.1%
Finance, Insurance, and Related Business Administrative Occupations • Customs, Ship, and Other Brokers	1.9%	2.5%
Retail Sales Supervisors and Specialized Sales Occupations • Retail and Wholesale Buyers	2.3%	2.0%
Other Installers, Repairers and Servicers and Material Handlers • Longshore Workers • Material Handlers (e.g., forklift truck operator)	9.1%	7.3%

Source: Statistics Canada, CANSIM Table 282-0142, LFS estimates by National Occupational Classification (NOC)

Employment

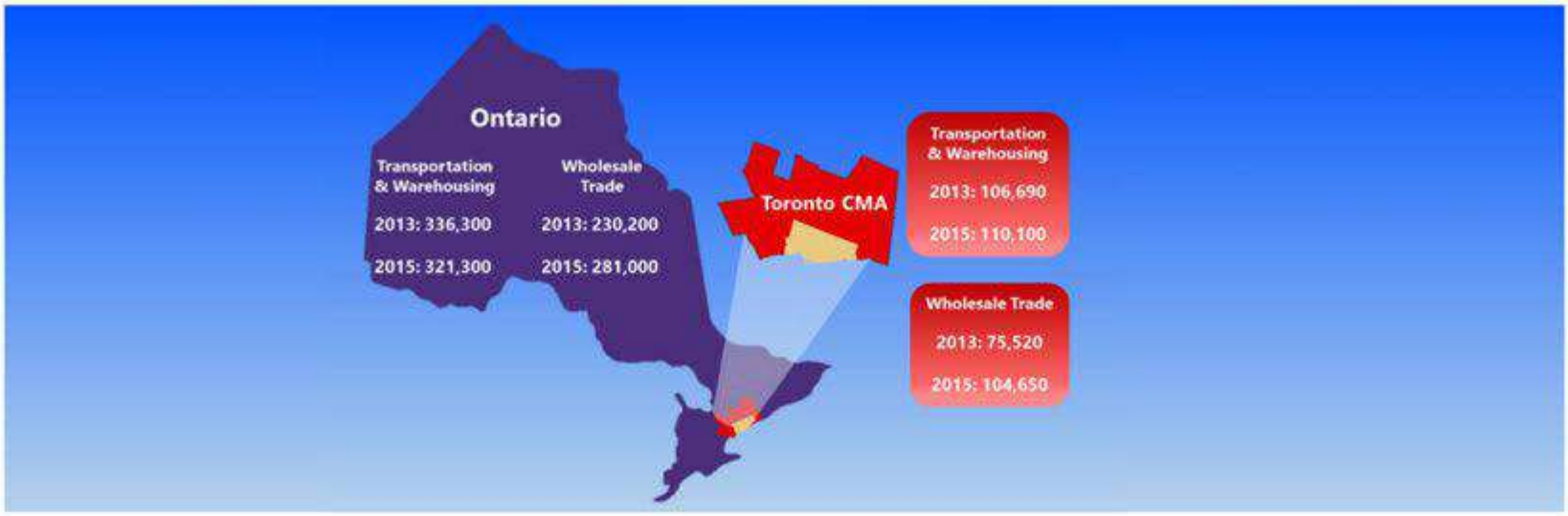
The study of the employment data enables policy makers to plan for educational and skillset development programs in accordance with the future shortages and needs in any occupational category.

Figure 12 illustrates the employment numbers for transportation & warehousing and wholesale trade at the provincial level and Toronto CMA excluding the City of Toronto (which is the smallest population area encompassing the Peel and Halton regions).

In Ontario, employment in transportation & warehousing dropped by 4.5% between 2013 and 2015 and the number of wholesale trade employees increased by 22.1% in the same period. In the Toronto CMA excluding the City of Toronto, employment grew in both transportation & warehousing (3.2%) and wholesale trade (38.6%). As mentioned, transportation & warehousing has grown with a much slower pace than wholesale trade and in Ontario it has even down sized. One reason could be related to the retirement rate that outpaced the hiring rate for new employees[34]. In other words, as stated by employers, transportation & warehousing employees are aging and there is a lack of intention in the younger generation to enter the transportation industry.

[34] For more information, please see Retirement Projection on Page 39

Figure 12: *Employment in Supply Chain Industry, Ontario and Toronto CMA minus the City of Toronto, 2013 and 2015*



Source: *Statistics Canada, Table 282-0008 Labour force survey estimates (LFS), and Customized Labour Force Survey Data Obtained Through Economic Data Centre, City of Toronto*

According to the 2015 Statistics Canada Survey of Employment, Payrolls and Hours (SEPH)[35], in Ontario, the major sources of employment within transportation & warehousing are truck transportation and within wholesale trade are machinery, equipment & supplies merchant wholesalers.

Figure 13 illustrates the major supply chain subsectors in terms of the number of employees in the Toronto CMA, excluding the City of Toronto.

[35] The Survey of Employment, Payrolls and Hours (SEPH) is a survey that gathers information from businesses and provides a monthly portrait of the amount of earnings, the number of jobs and hours worked by detailed industry at the national, provincial and territorial levels (Statistics Canada).

Figure 13: *Employment Breakdown in Major Supply Chain Subsectors, Toronto CMA minus the City of Toronto, 2015*

Source: *Customized Labour Force Survey Data Obtained Through Economic Data Centre, City of Toronto*

As seen, almost 50% of employees in transportation & warehousing and wholesale trade industries worked in the top two industry subsectors. To analyze the growth in the top two industry subsectors (as presented in Figure 13) the 2015 and 2013 data have been compared. Over the course of 2013 to 2015, employment in truck transportation grew by 19.3% and employment in support activities for transportation increased by 44.8%. The employment growth rates in these two industry subsectors outpaced the employment growth rate in the transportation industry itself which was 3.2%. In wholesale trade subsectors, machinery, equipment and supplies merchant wholesalers grew by 44.8% and exceeded the industry employment growth rate of 38.6%. However, employment in miscellaneous merchant wholesalers grew at a slower pace than the industry rate and increased only by 32.3%.

Employment by Age Group

Figure 14 and Figure 15 show the employment by age group in wholesale trade and transportation & warehousing industries. As a general overview, transportation & warehousing has more employees than wholesale trade, which means that this industry sector is more dependent on human capital for expansion and growth.

According to Figure 14, in the wholesale trade industry, employment in all age groups is growing. The majority of employees in the wholesale trade industry are between 25 to 54 years of age and the youth employment is at the lowest level compared to other age groups.

Figure 14: *Employment in Wholesale Trade Industry by Age Groups, Ontario, 2011 to 2015 (Values in Thousand of Employees)*

Source: *Statistics Canada, Table 282-0008 Labour Force Survey Estimates (LFS)*

As shown in Figure 15 during 2011 to 2013, the employment in transportation & warehousing increased for youth (15 to 24 years) and senior groups (55 years and over); however, it decreased in the 25 to 54 years age group. This clearly shows that senior people tend to retain their jobs for a longer time due to the diminishing source of workforce replacement from the middle age group (25 to 54 years). Additionally, the increase in the youth hiring rate cannot offset the decline in the middle age group in the short-term. One reason for the decline in the middle age workforce in the transportation industry is the lack of knowledge and awareness about the industry occupations and career advancement potentials. Some people start their career journeys without knowledge about future jobs and the available career pathways. Considering the skillsets and education required for some occupations in the transportation industry, this industry is one of the first career destinations for a wide range of people including immigrants, non-university graduates and some job seekers who have been unemployed for a long time. As a result, the middle aged workforce, after some years of exploration, leave the industry for their dream jobs.

Figure 15: *Employment in Transportation & Warehousing Industry by Age Groups, Ontario, 2011 to 2015 (Values in Thousand of Employees)*

Source: *Statistics Canada, Table 282-0008 Labour Force Survey Estimates (LFS)*

Employment by Gender

Figure 16 illustrates the population of males and females employed in both part-time and full-time occupations in wholesale trade and transportation & warehousing industries. According to the graph, the male population in transportation & warehousing is more than double the female population. The reason might be related to the nature of some jobs in these industries. For example, some jobs need several days of working away from home (e.g., truck drivers, flight or ship crew) or some jobs require strong physical capabilities. Hence, these types of jobs are not considered by females very often.

Figure 16: *Employment in Wholesale Trade and Transportation & Warehousing by Gender, Ontario, 2011 to 2015*

Source: *Statistics Canada, Table 282-0008 Labour Force Survey Estimates (LFS), Annual*

Figure 17 shows the percentage of full-time and part-time jobs across the wholesale trade and transportation & warehousing industries. Wholesale trade has fewer part-time jobs compared to transportation and warehousing. The reason is related to the higher number of hourly (casual and seasonal) jobs in the transportation & warehousing industry than wholesale trade[36].

Figure 17: *Part-time and Full-time Employment in "Wholesale Trade" and "Transportation and Warehousing" Industries, Ontario, 2015*

Source: *Statistics Canada, Table 282-0008 Labour Force Survey Estimates (LFS)*

The employment projection data for Canada predicts that in the next five years (2017 to 2021) employment in all industries in Canada will grow by 3%. The employment in the wholesale trade industry will grow by 2.9% and in transportation & warehousing it will grow by 2.6%. Overall, the employment in the supply chain industry will increase by 2.7%[37]. The comparison of the employment growth rate for the period of 2011 to 2015 and 2017 to 2021 reveals that in the next five years employment will grow at a much slower pace than in the past five years[38].

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[36] Statistics Canada, Table 282-0080 Labour force survey estimates (LFS)

[37] Canadian Occupational Projection System (COPS), industry data

(http://occupations.esdc.gc.ca/sppc-cops/content.jsp?cid=industrydatasearch&lang=en)

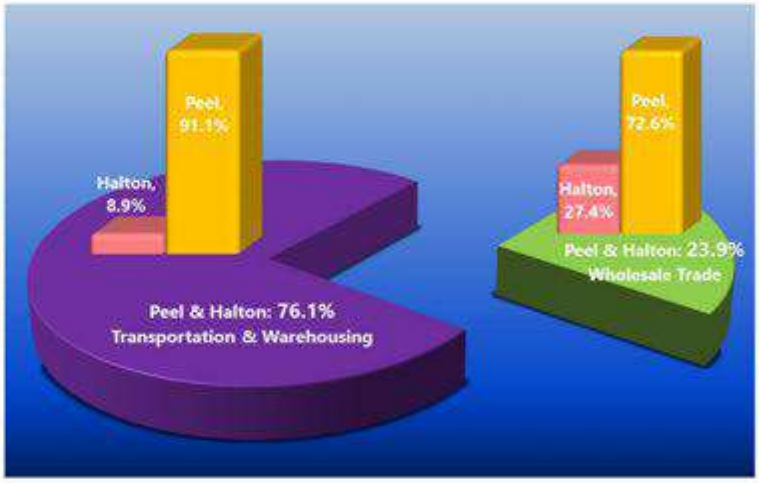
[38] Canadian Occupational Projection System (COPS) and Table 282-0008 Labour force survey estimates (LFS)

Industry

As mentioned earlier, supply chain is one of the dominant sectors in the Peel and Halton regions. In 2015, the number of supply chain businesses in Peel was greater than that in the Halton region. The distribution of wholesale trade and transportation & warehousing businesses across Peel and Halton is presented in Figure 18 (Pie chart). Additionally, the figure illustrates how businesses in each industry are scattered over these two regions. (Bar chart).

Figure 18: *Total Supply Chain Businesses (with and without employees) in Peel and Halton, December 2015*

As seen, the proportion of transportation & warehousing businesses in Peel and Halton was over three times higher than the proportion of wholesale trade businesses. Out of all the supply chain businesses in Peel and Halton, 76.1% operated as transportation & warehousing establishments while 23.9% operated as wholesale trade establishments. The majority of transportation & warehousing companies (91.1%) was located in Peel.



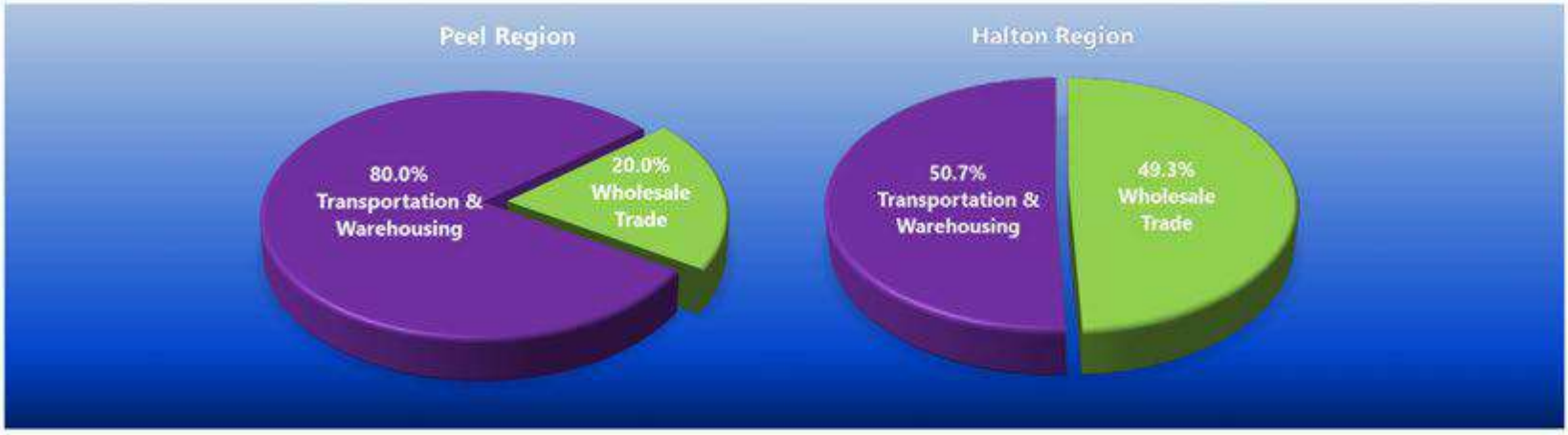
Source: *Statistics Canada, Canadian Business Counts*

Wholesale trade companies formed around 24% of all supply chain businesses in Peel and Halton. Out of all wholesale trade businesses, 72.6% were located in Peel and 27.4% were located in Halton.

Figure 19 illustrates the distribution of supply chain businesses within each region. In Peel, 20% of the supply chain businesses operated in wholesale trade and 80% operated in transportation

& warehousing. In the Halton region, the wholesale trade and transportation & warehousing subsectors were evenly distributed (49.3% and 50.7%, respectively).

Figure 19: *Distribution of the Total Supply Chain Establishments (with and without employees) in the Peel and Halton Regions, December 2015*



Source: *Statistics Canada, Canadian Business Counts*

In addition to the distribution pattern, business size is also one of the important parameters to study. In general, most of the supply chain enterprises were small businesses. The transportation & warehousing industry had more small companies (with and without employees) compared to wholesale trade. When it comes to larger companies with over 100 employees, the number of businesses in wholesale trade exceeded the transportation & warehousing businesses.

Table 2 and Table 3 present the number of supply chain business establishments by company size in the Peel and Halton regions. In Peel, *truck transportation, support activities for transportation* and *machinery, equipment & supplies merchant wholesalers* were the largest subsectors. In Halton, the majority of the supply chain companies belonged to three major subsectors: *truck transportation, machinery, equipment & supplies merchant wholesalers* and *building material & supplies merchant wholesalers.* Table 4 and Table 5 provide similar information at the municipal level. According to these tables, among the Peel and Halton municipalities, Brampton had the highest number of transportation & warehousing businesses while Mississauga had the highest number of wholesale trade companies. In total, there were 36,102 supply chain businesses in Peel and Halton which accounted for 16.7% of all businesses in these regions.

Table 2: *Number of Supply Chain Establishments, Peel Region, December 2015*

	Industry	No employees*	1 - 19	20 - 99	100 - 199	200 +	Total with employees
Wholesale Trade	**Total wholesale trade**	**2,649**	**2,703**	**758**	**102**	**61**	**3,624**
	Farm product merchant wholesalers	38	23	6	3	0	32
	Petroleum and petroleum products merchant wholesalers	10	12	3	1	0	16
	Food, beverage and tobacco merchant wholesalers	326	254	79	15	9	357
	Personal and household goods merchant wholesalers	506	410	103	22	12	547
	Motor vehicle and motor vehicle parts and accessories merchant wholesalers	189	161	63	9	4	237
	Building material and supplies merchant wholesalers	212	424	146	11	5	586
	Machinery, equipment and supplies merchant wholesalers	520	787	243	24	21	1,075
	Miscellaneous merchant wholesalers	451	416	86	13	8	523
	Business-to-business electronic markets, and agents and brokers	397	216	29	4	2	251
Transportation and Warehousing	**Total transportation and warehousing**	**14,390**	**10,242**	**285**	**63**	**44**	**10,634**
	Air transportation	41	32	8	1	5	46
	Rail transportation	7	1	0	0	1	2
	Water transportation	9	5	0	0	0	5
	Truck transportation	9,644	8,766	75	13	6	8,860
	Transit and ground passenger transportation	2,605	109	9	4	5	127
	Pipeline transportation	1	2	1	0	0	3
	Scenic and sightseeing transportation	8	1	0	0	0	1
	Support activities for transportation	1,054	957	95	28	9	1,089
	Postal service	12	11	3	0	2	16
	Couriers and messengers	940	220	14	7	4	245
	Warehousing and storage	69	138	80	10	12	240

Source: *Statistics Canada, Canadian Business Counts*

** "No employees" refers to self employed workforce*

Table 3: *Number of Supply Chain Establishments, Halton Region, December 2015*

	Industry	No employees	1 - 19	20 - 99	100 - 199	200 +	Total with employees
Wholesale Trade	**Total wholesale trade**	**1,074**	**1,048**	**206**	**23**	**16**	**1,293**
	Farm product merchant wholesalers	16	9	2	0	0	11
	Petroleum and petroleum products merchant wholesalers	8	8	0	0	0	8
	Food, beverage and tobacco merchant wholesalers	93	79	18	2	2	101
	Personal and household goods merchant wholesalers	212	106	30	3	6	145
	Motor vehicle and motor vehicle parts and accessories merchant wholesalers	70	51	15	1	3	70
	Building material and supplies merchant wholesalers	109	174	45	6	2	227
	Machinery, equipment and supplies merchant wholesalers	272	319	66	7	1	393
	Miscellaneous merchant wholesalers	159	171	21	3	1	196
	Business-to-business electronic markets, and agents and brokers	135	131	9	1	1	142
Transportation and Warehousing	**Total transportation and warehousing**	**1,592**	**745**	**78**	**19**	**4**	**846**
	Air transportation	16	5	0	0	0	5
	Rail transportation	3	4	0	0	0	4
	Water transportation	3	3	1	0	0	4
	Truck transportation	955	519	33	4	0	556
	Transit and ground passenger transportation	218	23	6	4	3	36
	Pipeline transportation	0	1	0	0	0	1
	Scenic and sightseeing transportation	3	1	0	0	0	1
	Support activities for transportation	193	121	19	4	1	145
	Postal service	10	3	0	0	0	3
	Couriers and messengers	156	40	3	1	0	44
	Warehousing and storage	35	25	16	6	0	47

Source: *Statistics Canada, Canadian Business Counts*

Table 4: *Number of Supply Chain establishments (With Employees), Peel Census Subdivisions, December 2015*

	Industry	Mississauga			Brampton			Caledon		
		Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
Wholesale Trade	**Total wholesale trade**	**2,656**	**131**	**13**	**596**	**28**	**1**	**152**	**1**	**0**
	Farm product merchant wholesalers	24	3	0	3	0	0	2	0	0
	Petroleum and petroleum products merchant wholesalers	12	1	0	0	0	0	3	0	0
	Food, beverage and tobacco merchant wholesalers	255	17	1	59	4	0	14	1	0
	Personal and household goods merchant wholesalers	407	26	2	89	5	1	12	0	0
	Motor vehicle and motor vehicle parts and accessories merchant wholesalers	158	7	0	47	5	0	15	0	0
	Building material and supplies merchant wholesalers	400	19	3	122	3	0	30	0	0
	Machinery, equipment and supplies merchant wholesalers	824	39	6	146	2	0	42	0	0
	Miscellaneous merchant wholesalers	381	16	0	95	6	0	21	0	0
	Business-to-business electronic markets, and agents and brokers	195	3	1	35	3	0	13	0	0
Transportation and Warehousing	**Total transportation and warehousing**	**2,361**	**67**	**14**	**7,782**	**11**	**1**	**316**	**4**	**0**
	Air transportation	25	2	4	13	0	0	1	0	0
	Rail transportation	0	1	0	0	0	0	0	0	0
	Water transportation	4	0	0	1	0	0	0	0	0
	Truck transportation	1,529	14	1	7,044	2	0	258	1	0
	Transit and ground passenger transportation	69	5	1	45	1	0	4	2	0
	Pipeline transportation	1	0	0	2	0	0	0	0	0
	Scenic and sightseeing transportation	0	0	0	1	0	0	0	0	0
	Support activities for transportation	481	23	2	513	3	1	40	1	0
	Postal service	11	0	0	3	0	0	0	0	0
	Couriers and messengers	117	9	2	104	0	0	9	0	0
	Warehousing and storage	124	13	4	56	5	0	4	0	0

Source: *Statistics Canada, Customized Canadian Business Counts Data*

Table 5: *Number of Supply Chain establishments (With Employees), Halton Census Subdivisions, December 2015*

		Milton			Oakville			Halton Hills			Burlington		
		Small	Medium	Large	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
Wholesale Trade	**Total wholesale trade**	**179**	**5**	**1**	**486**	**17**	**0**	**105**	**0**	**0**	**462**	**16**	**1**
	Farm product merchant wholesalers	5	0	0	2	0	0	4	0	0	0	0	0
	Petroleum & petroleum products merchant wholesalers	0	0	0	2	0	0	0	0	0	6	0	0
	Food, beverage and tobacco merchant wholesalers	15	1	1	44	0	0	10	0	0	27	2	0
	Personal and household goods merchant wholesalers	19	0	0	63	5	0	9	0	0	42	3	1
	Motor vehicle and motor vehicle parts and accessories merchant wholesalers	19	0	0	24	2	0	5	0	0	18	2	0
	Building material and supplies merchant wholesalers	30	1	0	70	1	0	19	0	0	91	5	0
	Machinery, equipment and supplies merchant wholesalers	52	1	0	148	6	0	29	0	0	150	2	0
	Miscellaneous merchant wholesalers	23	1	0	72	2	0	15	0	0	80	1	0
	Business-to-business electronic markets, and agents and brokers	16	1	0	61	1	0	14	0	0	48	1	0
Transportation and Warehousing	**Total transportation and warehousing**	**239**	**3**	**0**	**260**	**7**	**0**	**103**	**2**	**0**	**212**	**8**	**1**
	Air transportation	1	0	0	2	0	0	0	0	0	2	0	0
	Rail transportation	1	0	0	0	0	0	0	0	0	1	0	0
	Water transportation	0	0	0	0	0	0	0	0	0	4	0	0
	Truck transportation	178	1	0	169	2	0	73	0	0	131	1	0
	Transit and ground passenger transportation	6	0	0	9	1	0	3	2	0	11	3	1
	Pipeline transportation	0	0	0	0	0	0	0	0	0	1	0	0
	Scenic and sightseeing transportation	0	0	0	0	0	0	1	0	0	0	0	0
	Support activities for transportation	34	0	0	46	2	0	16	0	0	43	0	0
	Postal service	2	0	0	1	0	0	0	0	0	0	0	0
	Couriers and messengers	9	0	0	16	0	0	7	0	0	11	1	0
	Warehousing and storage	8	2	0	17	2	0	3	0	0	8	3	0

Occupations

There are three levels of occupations in the supply chain industry as presented in Figure 20: Managerial, Tactical and Operational. Managerial level occupations deal with strategic planning and long-term decision making about all the steps of a supply chain cycle from procurement to delivery. Each long-term plan is comprised of several short-term decisions at tactical and operational levels. In the supply chain process, tactical occupations make general planning decisions mainly focused on risk control, cost control, production and logistics coordination, and procurement management. Operational occupations make very short-term decisions related to day-to-day activities such as demand forecasting, inventory control, order fulfillment and production control.

Figure 20: *Occupational Levels at Supply Chain Industry*

In order to increase efficiency at the operational level, the accuracy of strategic planning at the tactical level needs to be improved[39]. In brief, the decisions made at the managerial level influence the whole supply chain process and especially the activities at the tactical level. Consequently, the decisions made at the tactical level impact the activities at the operational level.

[39] For more information, please see Procurement Bulletin

Figure 21 illustrates the main occupational categories in the supply chain industry along with a few samples of job titles and skill requirements[40]. In some of the operational and tactical occupations such as drivers and material handlers, there is a lack of career advancement opportunities especially in small and medium sized businesses. As a result, younger generations are less interested in building their career pathways in such occupations.

Figure 21: *Occupation Categories in Supply Chain Industry*

Source: *Statistics Canada, National Occupational Classification (NOC) 2011 and Canadian Logistics Skills Committee, Strategic Human Resources Study of the Supply Chain Sector, Fall 2005*

[40] For more information about supply chain main occupation categories and a brief description of each category, please see Table 13 in Appendix 1.

Occupation by Employment Type

Since there is no specific category of occupations in the National Occupational Classification (NOC) for supply chain jobs, it is difficult to extract accurate employment data for each occupation within the supply chain industry. As a result, due to the overlap of the majority of supply chain occupations with the "Trades, Transport and Equipment Operators and Related Occupations" category in NOC, the data related to this category is used for this analysis. Figure 22 illustrates how the employment type has changed from 2013 to 2015. The employment types are categorized as full-time or part-time, permanent or temporary and within the temporary category, there are seasonal, contract and casual jobs. This figure shows only full positions and it does not include vacant occupations.

Figure 22: *Employment Types in "Trades, Transport and Equipment Operators and Related Occupations", Toronto CMA Excluding City of Toronto, 2013 and 2015*

Source: *Customized Labour Force Survey Data Obtained Through Economic Data Centre, City of Toronto*

Over the period of 2013 to 2015, there was an increase in the number of full-time employment (by 40,160) and a decrease in the number of part-time employment (by 4,600). This implies that the industries affiliated with the "Trades, Transport and Equipment Operators and Related Occupations" category are stable. Overall, over 35,000 jobs were created in this category which was indicative of investment in business expansion and job growth.

The increase in the number of permanent positions compared to temporary jobs is indicative of decreasing employment precarity. Additionally, it is the sign of a sustainable industry as permanent positions require long-term financial commitments from employers. Temporary occupations are divided into seasonal, contract and casual subcategories. The decline in the number of temporary positions can be explained by the decrease in the number of seasonal positions. It should be noted that there was a 53% increase in temp-casual jobs which was a huge growth. However, the number of temp-casual jobs was more than three times less than seasonal and temp-term/contract jobs. As a result, the 53% growth in temp-casual jobs only slightly impacted the overall decline in temporary jobs.

Retirement Projection

Retirement projection is one of the key elements that has to be considered in future planning and long term decision making. Since employers lose experienced workforce due to retirement, they require skilled professionals to fill the position.

Table 6 indicates the employment and retirement changes over the next five years for the supply chain sector in Canada. According to employment projection data, over the next five years, 54,800 new jobs will be created due to demand expansion and 180,500 jobs will become available as a result of retirement. However, the number of new jobs will shrink and the number of replacing jobs will increase over the next five years.

Table 6: *Employment and Retirement Changes, Canada, 2017 to 2021*

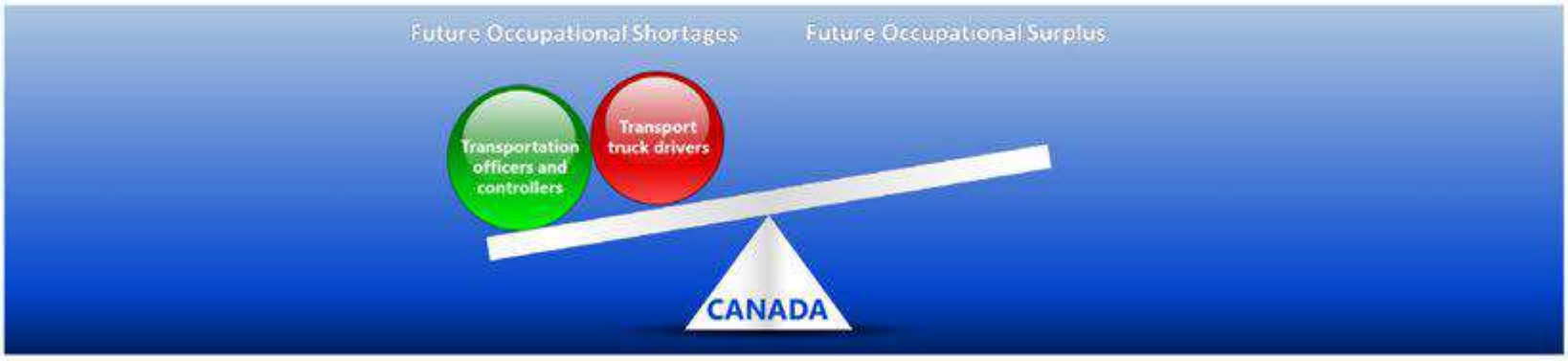
	2017	2018	2019	2020	2021
Employment projection	1,562,300	1,579,700	1,589,300	1,595,900	1,604,500
New Jobs (Demand Expansion)*	12,700	17,300	9,600	6,700	8,500
Retirement	34,200	35,200	36,300	37,100	37,700

Source: *Canadian Occupational Projection System (COPS)*
**New jobs refers to the number of jobs that is created as a result of business expansions or growth and it does not include the number of jobs become vacant as a result of staff retirement.*

Occupational Projection

Canadian Occupational Projection System (COPS) projects the labour force supply and demand for several occupations at the national level. In this projection, COPS assesses occupations facing labour force shortage, balance or surplus. According to this projection, the majority of supply chain occupations are in balance. However, there are two occupations that are projected to face labour force shortages and none expected to face surplus (Figure 23).

Figure 23: *Supply Chain Occupations projection, Canada, 2015-2024*



Sources: *Employment and Social Development Canada - COPS 2015 Projections; and; adapted from Statistics Canada, unpublished data, Labour Force Survey, 2015*

Table 7 lists employment changes in some of the occupations related to the supply chain industry in 2017, 2020 and 2024. This table presents the growth or decline in the number of job openings as a result of new job creation (note: replacement jobs as a result of retirement have not been counted in this table.).

Table 7: *Supply Chain Employment Change Projections (Expansion Demand), Canada, 2014-2024*

Occupations (Expansion Demand)	2017	2020	2024
Trades, transport and equipment operators and related occup	29000	22700	24100
Retail and wholesale trade managers	-3100	-2500	-400
Managers in transportation	200	100	200
Purchasing agents and officers	800	600	600
Mail, postal and related workers	-200	-200	-100
Letter carriers	100	100	100
Couriers, messengers and door-to-door distributors	100	0	100
Shippers and receivers	300	0	200
Storekeepers and partspersons; Production logistics co-ordinators & Purchasing and inventory control workers	700	400	500
Dispatchers & Transportation route and crew schedulers	200	100	200
Transportation officers and controllers	200	100	100
Technical sales specialists - wholesale trade	-100	-200	300
Retail and wholesale buyers	300	200	300
Sales and account representatives - wholesale trade	2900	1600	2300
Supervisors, railway transport operations & Supervisors, motor transport and other ground transit operators	400	200	400
Railway carmen/women & Aircraft mechanics and inspectors	200	100	100
Longshore workers and material handlers	800	100	200
Transport truck drivers	4400	3200	3600
Bus drivers, subway and other transit operators	900	600	800
Taxi and limousine drivers and chauffeurs	400	300	400
Delivery and courier service drivers	-500	-100	300
Heavy equipment operators (except crane)	900	700	600
Other transport equipment operators & maintenance workers	200	100	100

Sources: *Employment and Social Development Canada - COPS 2015 Projections, and Statistics Canada, unpublished data, Labour Force Survey, 2015*

According to Table 7, in the next four years (2017 to 2020), the number of job openings in most of the supply chain occupations will grow; however, the growth rate will decline in a number of occupations. “Shippers & receivers”, “Couriers, messengers and door-to-door distributors”, “Technical sales specialists - wholesale trade” and “Longshore workers and material handlers” are the occupations that will face more than 50% decrease in the number of new openings over 2017 to 2020. Over the course of 2020 to 2024, “Technical sales specialists - wholesale trade” and “Delivery and courier service drivers” are expected to have the highest growth in job creation (500 jobs or 250% growth, and 400 jobs or 400% growth, respectively).

The number of openings in the “Retail and wholesale trade managers” occupation is expected to drop significantly in the next few years (from 3,100 job cuts in 2017 to 400 job cuts in 2024).

In addition to new job creation, the supply chain industry creates replacement job opportunities due to the retirement of the workforce. Table 8 illustrates the retirement projection for some of the supply chain occupations at the national level. Based on the retirement projection data, over the course of 2017 to 2020, the highest retirement rate will be in “Other transport equipment operators and maintenance workers”, “Shippers and receivers” and” Dispatchers & Transportation route and crew schedulers” (20%, 14.3% and 14.3% respectively). The average retirement rate for all occupations is 7.8% between 2017 to 2020; however, from 2020 to 2024, it is projected to decline to 4.7%. This could be due to the younger population entering the workforce in the near future or the higher tendency of the workforce to continue to work after retirement age. The “Retail and wholesale trade managers” occupations have the highest number of retirements with over 10,000 per year. As mentioned above, in this occupational category the number of openings is expected to drop which can be the direct result of a large number of replacement workers due to the high retirement rate.

Table 8: *Supply Chain Occupations Retirement Projections, Canada, 2014-2024*

Occupations (Retirement)	2017	2020	2024
Trades, transport and equipment operators and related occup	57100	62500	66200
Retail and wholesale trade managers	10800	11000	10700
Managers in transportation	700	700	700
Purchasing agents and officers	1500	1600	1600
Mail, postal and related workers	900	1000	900
Letter carriers	900	1000	900
Couriers, messengers and door-to-door distributors	1100	1100	1100
Shippers and receivers	2100	2400	2600
Storekeepers and partspersons; Production logistics co-ordinators & Purchasing and inventory control workers	1500	1700	1900
Dispatchers & Transportation route and crew schedulers	700	800	900
Transportation officers and controllers	800	900	900
Technical sales specialists - wholesale trade	2500	2800	3100
Retail and wholesale buyers	700	700	700
Sales and account representatives - wholesale trade	4600	4900	5400
Supervisors, railway transport operations & Supervisors, motor transport and other ground transit operators	1100	1100	1200
Railway carmen/women & Aircraft mechanics and inspectors	400	400	400
Longshore workers and material handlers	3300	3700	4100
Transport truck drivers	7800	8400	8900
Bus drivers, subway and other transit operators	2300	2400	2600
Taxi and limousine drivers and chauffeurs	1100	1200	1300
Delivery and courier service drivers	1500	1500	1600
Heavy equipment operators (except crane)	1600	1800	1900
Other transport equipment operators & maintenance workers	500	600	700

Sources: *Employment and Social Development Canada - COPS 2015 Projections, and Statistics Canada, unpublished data, Labour Force Survey, 2015*

Wage

Another key area of study in the supply chain industry is wage. The wage rate varies across the industry and its occupations. Even for identical occupations within an industry or across different industries, it might not be uniform. For example, IT specialists, analysts, researchers and accountants are employed in a variety of industry sectors and business sizes. However, there is a wage gap between accountants working in the financial sector and wholesale trade. Analogously, a financial analyst will be compensated differently in the financial sector (e.g., investment banks or insurance companies) or the healthcare industry. Hence, in order to study the wage rates, both occupational and industry level data need to be analyzed. Due to the lack of regional and municipal level data, in this section, the analysis is performed primarily on the provincial and Toronto CMA data.

Wage by Industry

Figure 24 illustrates the average hourly wage rate for full-time and part-time positions in Ontario and Toronto CMA for the wholesale trade and transportation & warehousing industries.

Figure 24: *Average Hourly Wage Rate by Industry, Toronto CMA and Ontario, 2011 to 2015*

Source: *Statistics Canada, Table 282-0072 Labour force survey estimates (Current Dollars), and Customized Labour Force Survey Data Obtained Through Economic Data Centre, City of Toronto*

Over the past five years, occupations in the transportation & warehousing industry in Toronto CMA made on average $2.2 per hour less compared to the wholesale trade employees. Similarly, in Ontario, the wholesale trade employees gained on average $2.8 per hour more than transportation & warehousing workers.

Within each industry, the average hourly wage in transportation & warehousing was higher in the Toronto CMA while in wholesale trade the Ontario wage rate was higher, except in 2015. Additionally, there was no significant increase in the average hourly wage rate in the transportation & warehousing and wholesale trade industries. In the Toronto CMA and Ontario, "Computer & Communications Equipment and Supplies Wholesaler" which is a subcategory of "Machinery, equipment and supplies merchant wholesalers" had the highest average hourly wage rate (~$36.5) in wholesale trade. In transportation & warehousing, "Rail Transportation" had the highest hourly wage rate in Ontario ($29.8) and "Air Transportation" had the highest hourly wage rate in the Toronto CMA ($28.0).

According to Figure 25, in 2015, the wholesale trade employees were paid above and transportation & warehousing employees were paid below the average wage of all industries. The wholesale trade employees were paid over $28 per hour in Ontario and Toronto CMA. However, transportation & warehousing employees were paid approximately $3 per hour below the average industry wage in both Ontario and Toronto CMA.

Figure 25: *Comparison of the Average Hourly Wage Rate in Transportation & Warehousing and Wholesale trade with Average Wage of all Industries, Toronto CMA and Ontario 2015*

Source: *Customized Labour Force Survey Data Obtained Through Economic Data Centre, City of Toronto*

Wage by Education

One of the key elements impacting wage rates is the educational level of applicants. Although there are several factors influencing wage rates such as years of experience, specific skills and related job experience, the level of education is one of the key determinants.

Figure 26 indicates the average hourly wage rate in the Toronto CMA by the level of education. In both transportation & warehousing and wholesale trade industries, the wage is very well correlated with the education level, i.e. workforce with university degrees had the highest compensation rate. Additionally, the wage increase in workforce with university degree was faster than the other groups.

Figure 26: *Average Hourly Wage Rate by Education, Toronto CMA, 2015*

Wholesale Trade

	2013	2015	%Change
• High School Graduates	$ 21.4	$ 22.6	5.6% ↑
• Post-secondary certificate or diploma	$ 25.6	$ 26.3	2.7% ↑
• University degree	$ 27.5	$ 34.0	23.6% ↑

Transportation & Warehousing

	2013	2015	%Change
• High School Graduates	$ 22.2	$ 22.9	3.2% ↑
• Post-secondary certificate or diploma	$ 24.3	$ 23.9	1.7% ↓
• University degree	$ 25.8	$ 26.6	3.1% ↑

Source: *Customized Labour Force Survey Data Obtained Through Economic Data Centre, City of Toronto*

Wage by Occupation

Table 9 presents the wage rate in some of the supply chain occupations in Ontario and the Toronto Economic Region[41]. Since several data sources have been utilized to extract the closest data to the Peel and Halton regions, the consistency in reporting the Toronto CMA or CMA excluding the City of Toronto data was dismissed in some sections. As seen, the managerial and tactical occupations are better paid compared to operational occupations. The reason is the lower level of education and skills needed for operational occupations. However, there are some tactical occupations that have better compensations than managerial occupations such as some IT jobs. After IT, sales and purchasing jobs, regardless of organizational ranking (whether it is a managerial level or officer/agent level), are the two main categories of supply chain jobs that have decent wage rates.

Although the occupations provided in Table 9 do not include all occupations in the supply chain industry, it represents the majority of occupation categories within the industry. The average wage of the occupations listed in this table is $25.3/hour for the Toronto Economic region and $23.8/hour for Ontario which are close to the average wages in transportation & warehousing and wholesale trade industries provided in Figure 25.

Table 9: *Average Hourly Wage Offered in Supply Chain Occupations, Toronto Economic Region[41] and Ontario, First Quarter of 2016*

National Occupational Classification	Toronto Economic Region	Ontario
Database analysts and data administrators	$50.5	$43.5
Purchasing managers	$46.5	$44.7
Computer and information systems managers	$43.9	$43.1
Other administrative services managers	$36.8	$35.8
Information systems analysts and consultants	$33.7	$33.5
Managers in customer and personal services, not elsewhere classified	$31.6	$20.4
Corporate sales managers	$31.3	$30.8
Technical sales specialists - wholesale trade	$29.5	$26.2
Purchasing agents and officers	$28.3	$28.6
Production logistics co-ordinators	$23.9	$23.3
Supervisors, supply chain, tracking and scheduling co-ordination occupations	$23.4	$22.2
Sales and account representatives - wholesale trade	$22.2	$21.3
Purchasing and inventory control workers	$21.7	$18.8
Retail and wholesale trade managers	$21.7	$19.7
Legal administrative assistants	$21.2	$20.3
Transport truck drivers	$21.1	$20.0
Transportation route and crew schedulers	$19.25	$18.8
Retail and wholesale buyers	$16.1	$15.6
Shippers and receivers	$15.1	$14.5
Dispatchers	$14.6	$15.4
Material handlers	$14.3	$14.3
Bus drivers, subway operators and other transit operators	$14.0	$14.1
Delivery and courier service drivers	$13.9	$13.6
Storekeepers and partspersons	$12.6	$13.0

Source: *Statistics Canada, Table 285-0003 Job Vacancy and Wage Survey (JVWS)*

[41] Toronto Economic Region is 5% larger in population than the Toronto CMA. (***Source:*** *Ontario Chamber of Commerce, Ontario economic update 2016)*

Supply Chain Survey Findings

In the previous sections, various data sources on the labour force, industry, occupations and wages have been analyzed and presented. However, due to the limitations of relevant data at the regional and municipal levels, the analyses have been conducted at the provincial and Toronto CMA levels. In order to build on the findings from prior sections, two surveys were designed for the local (Peel and Halton) supply chain employers and employees. The purpose of the surveys was to investigate and highlight the labour market needs, gaps and challenges in the Peel and Halton supply chain industry. The reason for designing two surveys was to identify and analyze the issues of both the supply (employees) and the demand (employers) sides of the labor market and provide appropriate recommendations for future improvements.

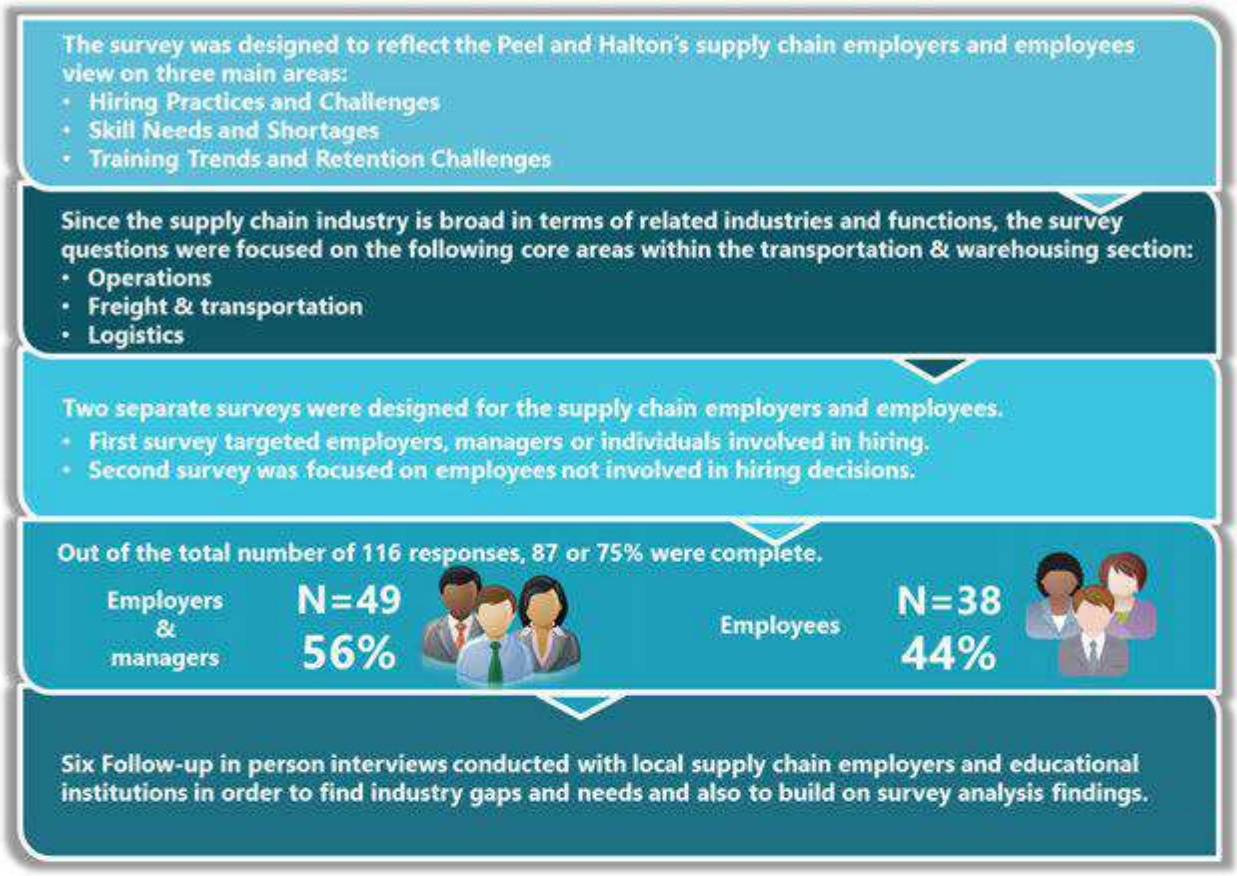
The survey questions were designed based on the results of secondary research, analysis of publicly available data (e.g., Statistics Canada data) and the consultation with working group members. Since the survey was administered electronically (online survey), to maximize the participation of the local employers and employees, various channels were used such as advertising on social media (e.g., LinkedIn, Twitter), advertising on PHWDG website, an email campaign to known and referred employers and employees and mass email to community partners and other employers.

To build on the survey findings and clarify the reasons behind some of the issues raised in the survey analysis results, six follow-up interviews were conducted with local employers and educational institutions as listed in the acknowledgements. The participants for interview were selected randomly through PHWDG organizational outreach to local communities. The participants represented companies with diversified sizes in both transportation & warehousing and wholesale trade industries.

For the last step, the research findings were presented to the working group members and the analyses results and trends were reviewed and discussed. Additionally, the primary recommendations of the research were reviewed and the feedback from working group members was obtained and implemented. At the end, the final recommendations were approved by working group through electronic correspondence.

Figure 27 illustrates the overview of the supply chain industry survey goals and steps. The figure also summarizes the survey process undertaken to gather local and relevant data from the supply chain industry employers and employees.

Figure 27: *Supply Chain Industry Survey at a Glance*



It should be noted that 29 empty surveys without any answer to the questions were excluded from this analysis.

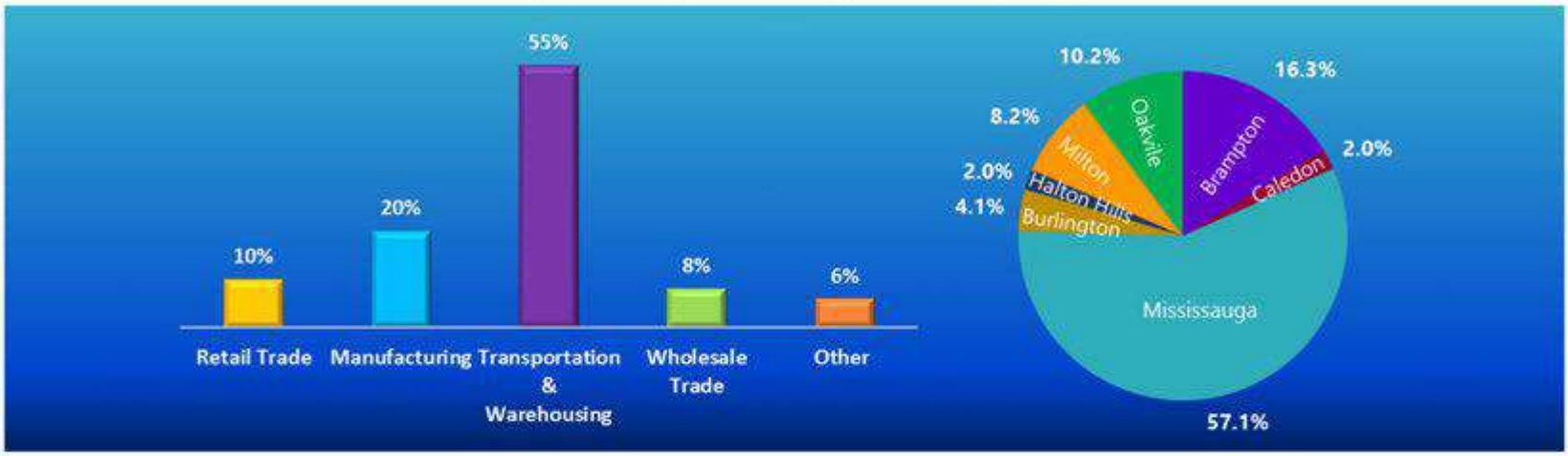
Profile of Local Employers

Supply chain is a large multi-sector industry. The supply chain process is a combination of various activities across several industries. Four industry sectors were selected for this survey study: (1) transportation & warehousing, (2) wholesale trade, (3) manufacturing, and (4) retail trade. The reason that the manufacturing and retail trade industries were included in the survey study is their close ties to the supply chain industry. Additionally, some of the manufacturing and retail trade businesses have warehouses or transportation divisions.

Figure 28 illustrates the distribution of employer respondents across industries and local municipalities. A wide range of employers from different industries from all cities in the Peel and Halton regions participated in this survey study. The majority of the employers belonged to the transportation & warehousing industry which was aligned with the goal of the study. Additionally, the majority of participants were located in the Peel region (Mississauga, Brampton

and Caledon) (75.4%) which is consistent with the geographical distribution of the supply chain establishments within the Peel and Halton regions[42].

Figure 28: *Profile of Employers Participating in the Supply Chain Survey Study in Peel and Halton*



The participating companies' sizes were diverse which increased the credibility of survey results by reflecting the needs and challenges of almost all business sizes[43]. Out of 49 participating employers, 51% were small businesses, 28.6% were medium businesses and 20.4% were large business. It is also important to consider that according to the Canadian business counts data, in December 2015, the proportion of small sized businesses affiliated with the supply chain industry[44] in the Peel and Halton regions was 97%. Accordingly, the results of the survey analysis may underrepresent the voice of small businesses. Table 10 indicates the size distribution of the local supply chain businesses.

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[42] According to Statistics Canada, Canadian Business Counts data, as of December 2015, 80% of the establishments involved in a supply chain system (i.e. transportation & warehousing, wholesale trade, retail trade and manufacturing) were located in the Peel region and 20% were located in the Halton region. Self-employment were excluded from this analysis.

[43] In the analysis of survey findings, the following assumption about business size was made: Small businesses (1-99 employees), Medium businesses (100-399 employees) and large businesses (400+ employees).

[44] Supply chain affiliated businesses: transportation & warehousing, wholesale trade, retail trade and manufacturing

Table 10: *Supply Chain Employers by Size of Establishments*

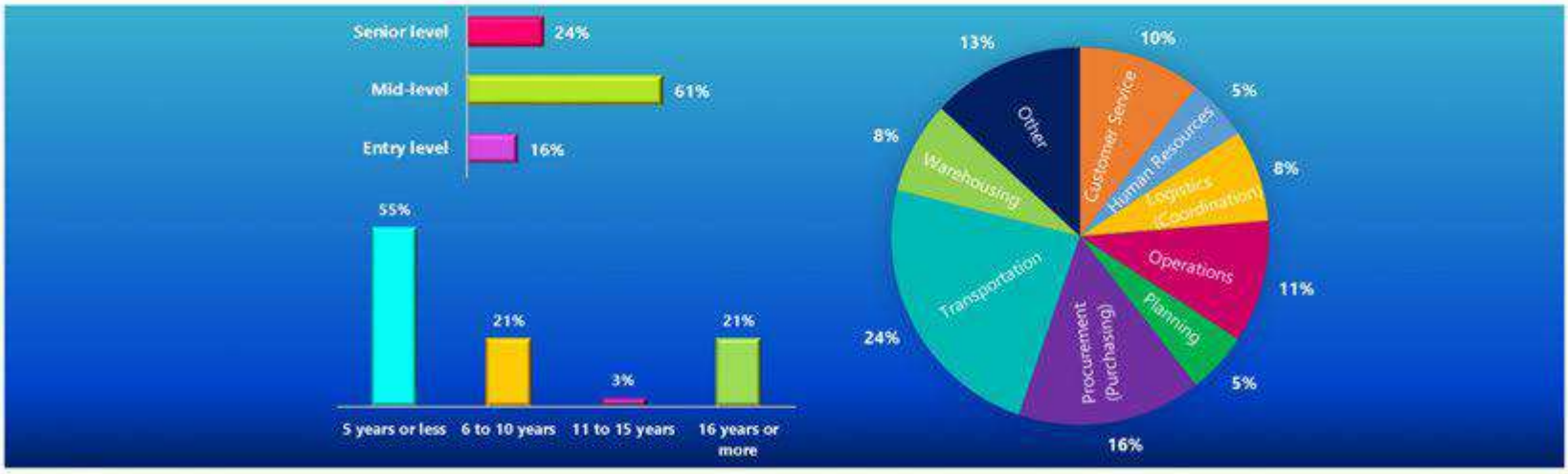
Size of Businesses	Response Percentage	Response Count
1 to 20 employees	34.7%	17
21 to 99 employees	16.3%	8
100 to 199 employees	18.4%	9
200 to 299 employees	6.1%	3
300 to 399 employees	4.1%	2
400 or more employees	20.4%	10

Profile of Local Employees

The second part of the survey was designed for local supply chain employees to reflect their challenges for landing in new jobs and retaining their current positions. In addition to employers, local employees greatly participated in this survey as shown in Figure 29. The majority (61%) of respondents were mid-seniority level employees. Additionally, in terms of current position, the participants were varied across supply chain occupations from procurement to customer service. Most of the respondents worked in transportation occupations which is aligned with the area of focus in this study. Around 55% of the respondents were in their current jobs for less than 5 years and 21% worked in their current jobs for more than 16 years. These variations in occupational level, areas of work and years of experience enriched the diversity of the sample size.

Out of all employees who responded to this survey, 68% lived in the same region (i.e. Peel or Halton) as their work place and the rest were commuters.

Figure 29: *Profile of Employees Contributed to the Supply Chain Survey Study in Peel and Halton*



Employees from some occupational categories (e.g., Human Resources) and employers from some municipalities (e.g., Halton Hills) had a small participation in the survey. However, their representation is proportional to the occupational category or regional sizes. Overall, the

participation of employers' and employees' distributions across various industry subsectors, regions, business sizes, and occupational levels provided a fairly reliable sample for this study.

Hiring Practices and Challenges

The first area of focus in this survey study was the hiring practices and challenges. During the hiring process, employers rank the qualifications of applicants in various ways. However, there are two main areas that are always very important in the eyes of all employers: experience and skills. Regarding these areas, employers were asked about the importance of five main hiring challenges which are presented in Figure 30.

Figure 30: *Importance of Various Skillsets for the Peel and Halton's Supply Chain Employers*

As seen, the most important skills for local supply chain employers were previous relevant work experience and soft skills[45]. Overall, 87.8% of employers ranked relevant work experience either very important or moderately important and 85.8% of them assigned the highest importance to the applicants' soft skills. The importance of these two skills can also be seen from the fact that none of the employers ranked them as unimportant. Technical skills or hard skills[46] are also one of the high demand skills for most of the employers and 81.6% of them ranked technical skills very important or moderately important (Figure 31).

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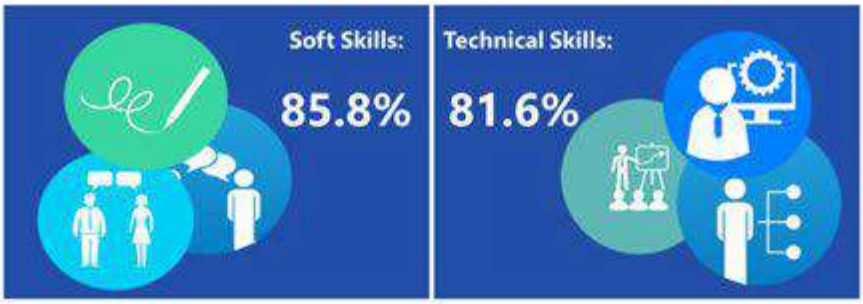
[45] Soft skills refer to the personal attributes that enable someone to interact effectively and harmoniously with other people (Oxford dictionary) such as communicating, conflict management, human relations, making presentations, negotiating, team building (Business dictionary).

[46] Technical skills refer to skills that are required for the accomplishment of a specific task (Business dictionary) such as mathematics, computer or electrical skills.

Figure 31: *Importance of Soft Skills Vs Technical/Hard Skills for Local Supply Chain Employers*



One reason that relevant experience has been ranked as the most important factor for employers is that it can accelerate the hiring process and decrease the hiring costs. For example, if employers hire someone with the lack of skills or experience for jobs such as truck drivers, forklift drivers or material handlers, they have to provide training which needs a fair amount of time and money. Some employers believe that investing in training may not have positive return for their companies because they may lose the employee due to worker poaching or poor performance.

Mississauga transportation & warehousing employer: "Many job candidates have the appropriate license (e.g., AZ commercial driver's license) but lack the driving skills required."

Canadian work experience is less important among all the challenges we asked employers and 12.2% of the respondents ranked it unimportant.

During the job evaluation, enterprises with more than 400 employees put higher rank on soft skills followed by technical skills of applicants' while enterprises with less than 100 employees ranked the opposite way.

Although previous Canadian work experience was not as important as the other factors, it has been ranked by 73.5% of the employers as moderately or slightly important. Considering the demographics of the Peel and Halton regions, the preference of employers for candidates with Canadian experience has caused some limitations and barriers for recent immigrants.

Given the fact that in 2011, 15.5% of the Peel and 11.3% of the Halton residents were recent immigrants[47], obtaining Canadian work experience for many of them was and still is a serious challenge when they are new to the country. In other words, new immigrants experience a hard time finding the right job aligned with their skills and education. One reason is the lack of soft skills in some immigrants and low interest of some employers in hiring internationally trained professionals. This issue can have a negative impact on the labour force supply and demand.

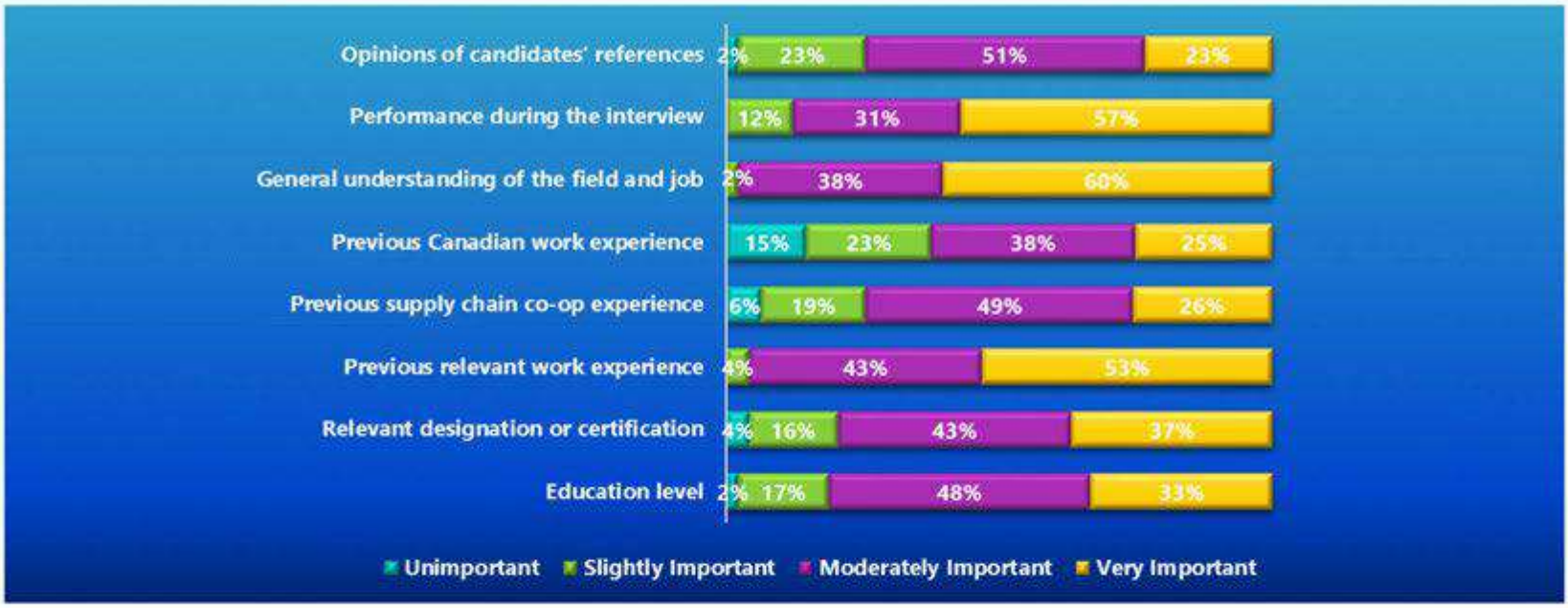
Additionally, appropriate licence, certification or credential was the fourth important hiring challenge for employers; 68.8% ranked this factor very important or moderately important.

To build on the results of the hiring challenges survey question presented in Figure 30, the supply chain employers were asked about the ranking of various candidates' characteristics during job interviews. Unlike the previous question asking about the main hiring challenges, this question focuses on the candidates' characteristics that affect employers' hiring decisions (Figure 32). Out of eight candidate characteristics, 60% of local employers put the highest importance level on candidates' general understanding of the field and the job. This factor along with candidates' performances during interviews and previous relevant work experience were the three crucial parameters for all employers since none of them ranked these parameters unimportant. The least important parameter was candidates' previous Canadian work experience which is in accordance with the employers' responses to the previous hiring challenges question (See Figure 30).

According to employers' responses, the most important factors affecting their hiring decision, were candidates' general understanding of the field and the job and their performances during the interviews.

[47] Statistics Canada, 2011 National Household Survey (NHS)

Figure 32: *Importance of Candidate Characteristics for the Peel and Halton's Supply Chain Employers*



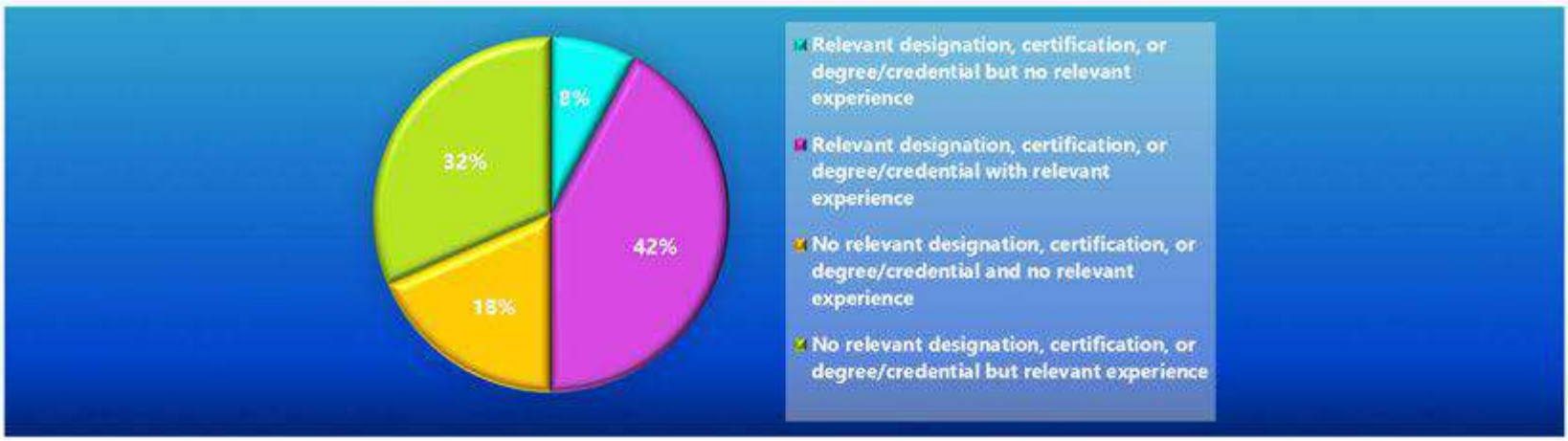
The opinion of candidates' references and previous relevant co-op experience were ranked moderately important by the majority of employers (51% and 49% respectively).

The analysis of the employers' responses by business size reveals that large employers put high weight on candidates' performance during interviews and previous relevant work experience, while in small and medium sized enterprises (SMEs), employers emphasized candidates' general understanding of the field and the job followed by performance during interviews and relevant work experience. One reason could be attributed to the availability of limited resources in SMEs to provide training or rotational programs to enhance the knowledge of employees about the field. Hence, they prefer to hire someone who has decent knowledge of the industry and can quickly start as a team member. Additionally, previous Canadian work experience seems to be the least important factor among employers of different sizes.

Since related experience and education were very important for employers, local supply chain employees were asked a relevant question. According to the employees' responses, 74% got hired with previous relevant work experience while only 42% of them had relevant education/designation.

Figure 33 illustrates the combination of relevant education and experience of local supply chain employees at the time of hiring in their current job.

Figure 33: *Employees Level of Education and Experience at the Time of Hiring*



It is interesting to note that 18% of the employees got hired with no relevant education and experience. Most of them worked in customer service or logistics (coordination) areas and 71% of them found their jobs through referral. On the other hand, most of the employees with relevant education and experience found their jobs through online postings and referral. For the rest of the employees with relevant education but no relevant experience such as fresh graduates, LinkedIn, referral and online postings were equally helpful.

The other question in hiring practices and challenges section was about employers' preferred sourcing/hiring methods. There are various methods that employers use in order to find the right candidate for an open position in their company/organization. Some of the methods are more costly and some of them require significant amount of work for screening and shortlisting best candidates. The survey results indicated that local employers preferred fast, low cost and less risky. The first preferred method of sourcing candidates was referral. Word of mouth and posting on the company website were the next preferred sourcing methods for supply chain employers.

The most preferred methods for sourcing right candidates in small establishments were referral, word of mouth and LinkedIn, in medium sized businesses were LinkedIn, referral and posting on online job boards, and in large establishments were referral, posting on company website and online job boards.

Posting jobs on LinkedIn was more of interest to medium and small businesses. Overall, the least preferred method was posting the job through recruitment or temp agencies. The short term, unsecured, and low quality employment through temp agencies put employees at a huge risk

because of the lack of job security and financial stability. The low interest of local employers in hiring through temp agencies could be indicative of business stability showing that employers are ready to undertake longer commitments to employees and/or offer better quality employment. Across local employers, small businesses had more interest in hiring from temp agencies as opposed to medium and large businesses. The reason could be their limited financial resources or the short term nature of their projects.

In regard to the sourcing methods, the supply chain employees were also asked about how they found their current jobs. The results were consistent with the employers' preferred sourcing methods.

Around half of the supply chain employees (47%) found their jobs through referral. 26% found their jobs through applying on company websites and 13% sent their resumes to recruitment agencies. The other methods such as LinkedIn or college/university career services were not very helpful for most of the applicants.

The fact that referral is the first sourcing choice for 39% of employers and around half of the local supply chain employees got hired through referral raises a concern about other groups of job applicants. To be more precise, newcomers, fresh graduates, new migrated people to the region or in general people with no strong connections within the industry partners have to compete in an unfair situation. The majority of these people spend a lot of time applying through online postings or LinkedIn. The success rate for online applications and LinkedIn was 26% and 11% respectively.

The number of interviews did not seem to be very frustrating since 84% of employees got hired in the first five interviews. 11% went through 6-10 interviews and the rest had more than 11 interviews.

Additionally, local supply chain employees were asked about the level of alignment between the employers' expectations in their current job and the requirements in the job description. The majority of employees believed that employers' expectations were either higher or completely consistent with the job descriptions. Figure 34 reflects the employees' perspective about this question.

Figure 34: Level of Alignment between Employers' Expectations and Job Descriptions in Posting Advertisements

This misalignment was seen more in entry level positions and especially in human resources and operations occupations.

Skill Needs and Shortages

Skill needs[48] and shortages were the second area of focus in the supply chain survey study. Several questions about this area were asked from local employers and employees to highlight issues and misalignments between employers' needs and employees' qualifications. The results from this section will enable job seekers to access valuable information about skill shortages and enhance their profiles in accordance with local employers' needs. In addition to job seekers, educational institutions and community employment services can also benefit from the information about skills needs and shortages and improve their programs accordingly.

There has been some level of concern mentioned by employers about the job readiness of entry-level candidates (ready in terms of overall knowledge about the field and the required skillsets). As shown in Figure 35, local employers were asked about this concern and the results showed that only 22% of employers believed that the entry level candidates knew the field well and were ready to start a supply chain job. 40.8% of employers believed that entry-level candidates were ready and had enough knowledge and expertise to start an entry-level supply chain job, but their knowledge of the supply chain industry and its potentials was limited. This lack of awareness could impact entry-level workers in a way that they might face serious challenges finding their career pathways. Additionally, the lack of awareness about industry potentials and career advancement opportunities might result in lack of job satisfaction over time.

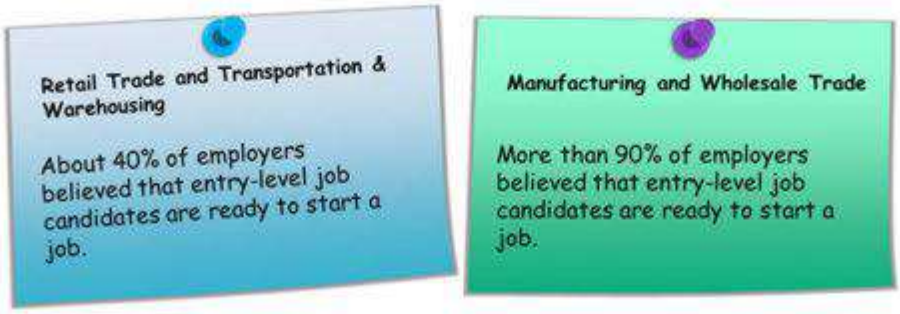
[48] The "Skill Need" term refers to a combination of education, experience and skills required for hiring.

Figure 35: *Employers Opinion on Readiness of Entry Level Job Candidates*

Overall, 51% of the supply chain employers believed that entry-level job candidates knew the field well (industry awareness) and 63.2% believed that they were ready to start a supply chain job.

Figure 36 illustrates the entry-level job candidates' field awareness and job readiness by industry. According to the figure, manufacturing and wholesale trade employers are satisfied with the job readiness of the entry-level candidates. However, less than half of retail trade and transportation & warehousing employers believed that entry-level job candidates were ready to start the work or even knew the field well. One reason could be attributed to the diversity of applicants in these two fields. Many people have started their first work experience in retail. Likewise, transportation & warehousing is one of the target industries for newcomers and immigrants. As a result, these industries have a diverse workforce with various backgrounds and the lack of industry awareness or job readiness can be expected. Another aspect of readiness for a job is the requirements for certificates and licences which is prevalent in the transportation & warehousing industry and might be difficult for some candidates to achieve. In contrast, certificates and licences are not mandatory for many manufacturing related jobs.

Figure 36: *Entry-level Candidates' Job Readiness and Field Awareness by Industry*



Employers were asked about the alignment between the education level of recent graduates and the occupation needs. Most of the employers believe that the education level of recent graduates was not *fully aligned* with the company's needs (94%). Around 63% of employers mentioned that company's needs were *somewhat met* by the educational level of recent graduates. Recent graduates acquired fairly enough knowledge for an entry-level job, but they lacked experience and expertise in both organizational and technical skills. Most of these employers were companies with over 200 employees.

Earlier in this report, the importance of industry awareness for employees, especially for entry-level workers was discussed. Additionally, issues related to worker shortages were elaborated. Here, the question is how the stakeholders can increase awareness about this industry and its potentials and how they can attract more people to supply chain occupations. Employers' opinions regarding the best strategy for this problem were gathered in this survey study. According to local employers, the industry/field awareness will be more effective and impactful, if it starts from early stages of career planning. The majority of employers believed that educational outreach should happen at the college or university level (36.7%). Additionally, summer jobs and co-op programs for youth are the next impactful methods for increasing industry awareness in employers' view (24.5%).

Employers believed that early educational outreach at the college/university level and first-hand experience through summer jobs and/or co-op programs are very important in boosting awareness about supply chain industry and its occupations.

Some employers believed that educational outreach should be started from high school level (22.4%) when youth are at the beginning stage of career planning for their futures. Concurrently, guidance counselors should be educated about the field of supply chain and its career potentials.

Worker shortage is one of the important problems employers face and it might negatively impact their operations. Sometimes, employers have to go through a series of interviews to find the right candidate and job ads remain open for several months without any luck in filling the position. The main reason for such a lengthy recruiting process is the candidates' lack of required skills and expertise for the job. Some skills need several years of experience to be obtained and some are very costly or difficult for employers to provide on-the-job. The skill shortage, especially in key positions, might slow down the operation of an enterprise and cause challenges for the employer. With regard to this issue, employers were asked about the most difficult to fill positions. Figure 37 illustrates employers' responses to this question.

Figure 37: *Difficult to Fill Areas among Supply Chain Occupations*

Operations and logistics occupations were the most difficult to fill occupational areas for local supply chain employers. For these two occupational areas, candidates require a comprehensive knowledge of the end-to-end supply chain process as well as previous experience and expertise in planning and decision making skills. As a result, it is very challenging for employers to recruit the right candidate for these areas.

As shown in Figure 38, the difficult to fill occupational areas were also varied based on the size of establishments. As an example, operations positions was the hardest to fill positions among all business sizes. The analysis showed that filling logistics positions was more challenging for small businesses. Customer service positions were difficult to fill for small and medium sized enterprises (SMEs). On the other hand, large businesses struggle to hire the right candidates for information technology positions while this area is one of the least challenging for SMEs. One reason is that IT positions at large enterprises has a different set of qualifications and requirements compared to IT positions in SMEs.

Figure 38: *Difficult to Fill Supply Chain Areas by Business size*

Some samples of hard to fill job titles are as follows:

- Operations manager / supervisor
- Customer service manager
- Demand planner
- IT specialist / analyst
- Logistic planner
- Truck driver
- Customs rater
- Logistic coordinator
- Import / export coordinator
- Dispatcher

Given the worker shortages in the aforementioned areas, local employers were asked about their level of preparedness to tackle this problem. Around 84% of them stated that they have some sort of plan and they are either very prepared or are moderately prepared. Manufacturing (90%) and transportation & warehousing (85%) companies were more prepared compared to other companies in the retail and wholesale trade industries.

Local employers were also asked about the future areas of hiring and the responses were aligned with the hard to fill areas of supply chain. Table 11 illustrates the areas that supply chain employers prioritized for hiring over the next year.

Table 11: *Potential Areas of Hiring for Local Supply Chain Employers*

	First Priority	Second Priority	Third Priority
Customer Service	21%	13%	14%
Information Technology	2%	9%	12%
Logistics (Coordination)	15%	16%	5%
Operations	23%	27%	12%
Planning	4%	2%	19%
Procurement	0%	2%	5%
Transportation	15%	13%	9%
Warehousing	8%	7%	19%
Other	6%	9%	2%
No intention to hire new employees	6%	2%	5%

According to the employer responses, for 50% of the employers hiring in operations is the first or second priority area over the next year. After operations, customer service is the next area of hiring for local employers. Moreover, hiring in procurement was not the first priority for the employers. Additionally, for 6% of employers, the first priority was not to hire new employees.

Overall, the results showed that the majority of employers had plans to hire new employees over the next year and the new positions are among the hard to fill areas of the supply chain.

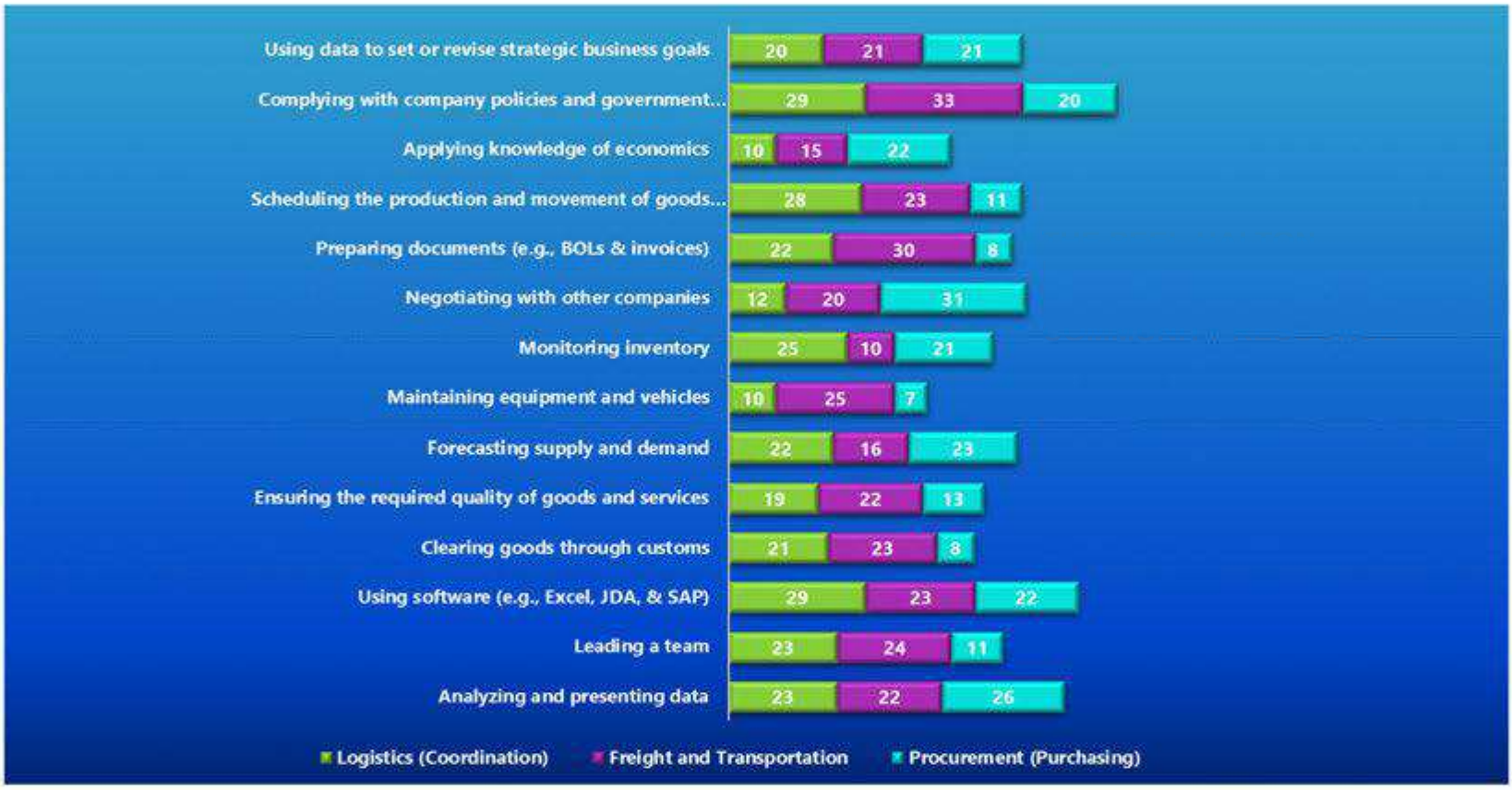
In regard to skills/knowledge required to work in various areas of supply chain, employers' opinions were obtained. The three key areas of focus in this study were procurement

(Purchasing), freight & transportation and logistics (coordination). According to the employers' responses, the following skills were ranked as the top common skills across these three areas of focus:

1. complying with company policies and government or international regulations
2. software skills (e.g., Excel, JDA, & SAP)
3. skills in analyzing and presenting data

Figure 39 illustrates the employers' responses. The numbers in the bar charts represent the number of employers who selected that specific skill according to one of the three areas of inquiry.

Figure 39: *Essential Skills / Knowledge for Jobs in Procurement, Freight & Transportation or Logistics Areas*



Having a job in procurement area, requires analytical, presentation, forecasting and negotiation skills, while landing in a job in freight & transportation needs a decent knowledge of government and international regulations, company policies, documentation and equipment maintenance. For logistics jobs, the ability to use related software, knowledge of government and international regulations and a comprehensive knowledge of scheduling the production and movement of goods turn out to be the most important skills for job applicants.

One issue which is related to the skills requirement, is the candidate's ability to advertise his/her prior experience during the interview. Sometimes, candidates do have the required skills; however, the skills are not acquired through a similar job. Hence, candidates need to show the transferability of their skills to employers. According to the employees' survey, showing the transferability of prior experience was the most challenging part for them (26%). Completing the interview process such as multiple interview rounds and interview written assignments (18%) and lack of Canadian work experience (16%) were the second and third barriers for them to landing a job.

Training Trends and Retention Challenges

Workforce training and retention was the last area of focus in the supply chain survey study. Employers can benefit from the findings of this section about employees' perspective and expectations.

Training is one of the most important tools for enhancing employees' skillsets and knowledge to help them excel in their jobs. Local supply chain employers were asked about their company's current capacity for training employees. The results showed that around 82% of the local employers provided some kind of training programs (comprehensive training (35%) or somewhat detailed training (47%) to their employees. Companies in transportation & warehousing provided more training programs than any other group in the supply chain industry. The reason is that most of the transportation & warehousing jobs need certificates or licenses and the employees need to keep their skill sets at the certain level. In terms of the company size, the survey results showed that there was a one-to-one correlation between the company size and the number of training programs, which means the bigger the company size is, the higher number of training programs will be.

As shown in Figure 40 supply chain employees were also asked about their level of satisfaction with on-the-job training they received in their current jobs. The results were bipolar; 45% were satisfied with the amount and quality of training, however, 32% were not satisfied at all. Most of the employees who were not satisfied with the on-the-job training were working in transportation occupations while the employees in operation roles had an opposite opinion.

Figure 40: *Supply Chain Employees' Level of Satisfaction with on-the job Training*

In regards to employee's retention, employers were asked about the three main factors that have the largest influence on employees' retention rate.

From employers' point of view, the most important barriers to retaining employees were competitive pay or wage rate, lack of career advancement opportunities and unpredictable work hours.

As stated by local supply chain employers, companies that offered competitive wage rates (according or above the industry norm) had higher retention rates and lower risk of worker poaching. In addition to the wage factor, the lack of career advancement programs was the second important barrier to retention. The majority of jobs in transportation & warehousing, manufacturing, retail and wholesale trade industries (e.g., driver, material handler, production line assembler, cashier, etc.) have no or very limited career advancement opportunities. According to the interviews with local transportation & warehousing employers, some employees invested in taking courses or obtaining certificates with the hope of receiving promotions or acquiring an office job. However, due to the limited number of advancement opportunities, they might not receive promotions for months or even years. This delay might cause frustration that impacted job satisfaction and retention rates. Another issue related to lack of career advancement pathways is the high credentials and expectations of some newcomers and immigrants. Since many of the immigrants look at their first job as a gateway to the Canadian labour market, they tend to either change their jobs or receive promotions in long term. The lack of opportunity may turn them down and decrease their retention rates.

As mentioned above, the third top barrier to retaining employees was unpredictable work hours. Sometimes, employees need to accommodate their plans so they can work night shifts, extra shifts (occasionally, depending on project timeline) or weekends. This could be difficult

especially for employees with families. Additionally, the other concern related to irregular working hours (e.g., early in the morning, late at night, overnight, etc.) is the limitations of the public transportation hours of operation. Local supply chain employers believed that the lack of fast and integrated public transit system (e.g., bus, light rail train or subway) in Peel and Halton was one of the main concerns for their employees. According to the supply chain employee's survey, 32% of the local workers do not live in the same region (i.e. Peel or Halton) as their place of work and they commute. Some of them do not even have personal vehicles and are dependent on the public transit system. Long commuting time, limited transportation options and time restrictions for public transit system are the three main barriers for them to stay in a job.

From the employers' point of view, the least important factors to retaining employees were lack of pension and benefits and the seasonal or temporary nature of some occupations.

Similar questions regarding the retention issues were asked of local supply chain employees. In particular, employees were asked about the factors that needed greatest adjustments in their current jobs. According to their responses, the first issue that needs to be addressed is the increase in responsibilities; almost half of the respondents (the majority of them were in transportation and customer service roles) complained about this issue. Additionally, unlike the employers' perspective about the importance of wage rates for employees' retention, compensation adjustment was only important for 11% of employees. On the contrary, the employees put a higher value on change in workplace culture.

From the employee's point of view, increase in responsibility levels and workplace culture are the two main issues that require adjustments.

In regard to the long-term career aspiration, the supply chain employees were surveyed and the results revealed that 87% of them wanted to stay in the supply chain field. Over the next five years, 45% had plans to pursue a promotion in their current area, 24% aimed to pursue careers in different areas of the supply chain and 18% wanted to remain in the same job.

The last question was regarding the employees' knowledge about the advancement opportunities to a higher level position. As seen in Table 12, only 42% of the employees believed that they clearly knew the next steps in their career advancement.

Table 12: *Supply Chain Employees' knowledge about Advancement Opportunities*

Answer Options	Response Percent
I have a clear sense of the next steps in my career	42%
I have some knowledge of how to advance but I need to do more research	37%
I have minimal knowledge of how to advance	0%
I don't know the next steps in my career	3%
My job does not have a career advancement pathway	18%

18% of the supply chain employees stated that their job does not have a career advancement pathway.

Recommendations

To address the gaps and needs of local supply chain industry with actionable and impactful solutions, the following key recommendations are provided based on the research findings and the consultation with the working group members. It is important to note that the recommendations were primarily shaped from the data analysis and qualitative research; however, they were reviewed and edited twice by working group members to ensure the alignment of the recommendations with needs of local employers and employees and also to address the supply chain labour market gaps and challenges.

The proposed solutions aim to enhance the employment outcomes of the educational[49] and employment support programs[50] by eliminating the misalignments of the existing programs and increasing the engagement of employers to address the gaps and challenges of the local supply chain labour market.

The recommendations are categorized into three main sections: Employers, Workforce Development and Enablers. The first two sections are focused on solutions to improve the local supply chain employment outcome, whereas the third section is focused on the commuting challenge which is not limited to the supply chain industry.

It is important to note that the implementation of these recommendations requires further engagement between industry representatives and government bodies. Moreover, a collaborative approach has to be taken by employers, associations and educational institutions to execute the following suggestions at the industry level.

Employers

- ***Employer engagement program:*** As mentioned earlier, there are several educational and employment support programs to prepare a skilled workforce for the supply chain industry. Employers, as the recipients of the skilled workforce, are the key group that can significantly impact the outcomes of these programs. As a result, it is essential to invest in promoting the employers' engagement and awareness of these programs.

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[49] e.g., colleges and associations programs such as SCMP and Canadian International Freight Forwarders Association (CIFFA) management programs.

[50] e.g., programs available by Employment Ontario (EO) or Ministry of Citizenship and Immigration and international Trade (MCIIT) such as youth programs or bridging programs.

Historically, there was a lack of employer willingness to hire from various groups such as immigrants due to the availability of a pool of Canadian-educated applicants. There are two solutions that can help solve this problem:

1. ***Employer outreach program:***
   Informational outreach sessions are one of the best ways to enhance the employers' awareness about the existing educational programs offered by associations, universities or colleges. Some of these programs are very well known by employers such as Supply Chain Management Professional (SCMP); however, some of them are barely recognized by employers, such as bridging programs for immigrants. As a result, the informational sessions are required to promote the employers' awareness to the lesser-known programs and increase the probability of hiring from these programs. One of the benefits of the outreach programs is that the employers' needs can also be recognized and the educational programs can be reviewed and become aligned with the needs of employers accordingly.

2. ***Financial incentive program:***
   Similar to employer outreach program, one way to increase employers' awareness about the available financial support programs such as Canada-Ontario Job Grant (COJG) or the Skills Link program is to invest more in advertisement and informational outreach programs. Moreover, an effective way to improve the employment outcomes in underemployed groups such as recent immigrants or youth[51] is to propose an employer financial incentive program. Such a program will potentially reduce the employers' corporate bias and increase their willingness to hire youth or foreign trained professionals. Given the fact in 2011, 15.5% of the Peel and 11.3% of the Halton residents were recent immigrants, this incentive program can positively impact immigrants' employment rate in both regions.

- ***Career advancement program*:** Career advancement programs should be developed for those occupations that do not have career ladders. This recommendation has been suggested in various supply chain sector studies[52]. Additionally, the lack of such programs has been mentioned and asked for several times by employees to increase job satisfaction and retention rate. Some jobs require a career ladder at the company level and some need it at the industry level. It is also important to note that the lack of career advancement programs is mostly seen in small companies. Since about 97% of the Peel and Halton supply chain businesses are small, it is very important to invest in such programs.

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[51] Youth refers to the 15 to 24-year-old age group.

[52] 2012 HR study update, Canadian supply chain sector council, Prepared by R.A. Malatest & Associates Ltd

Workforce Development

- ***Youth connection programs:*** According to employers' survey responses, in order to increase awareness about the supply chain industry, early educational outreach to youth is essential. This issue was also mentioned in the industry engagement working group meetings and the interview with local employers. As a result, the need for designing a programs for youth to introduce them to the supply chain industry and occupations can be seen. Such programs enable the young generation to make connections with employers, industry partners and professionals and obtain first-hand experience. Moreover, engaging and educating career counselors at the high school level about the supply chain industry and occupations will cause youth to see supply chain as a career option.
  The youth connection programs have two major benefits for the industry:
  1. The industry can attract more people especially for occupations which are projected to face labour shortages in the near future (e.g., truck driver)
  2. The employee retention rate will be increased due to the higher level of industry awareness as a result of youth connection programs.

  Additionally, youth connection programs should offer information about career mapping to help youth navigate toward their career goals.

- ***Immigrant connection programs*:** There are some programs available to support new immigrants, who have related supply chain education and experience, to join the Canadian job market. However, the number of these programs is limited compared to the immigrant population of the Peel and Halton regions. Additionally, these programs are not very well known by local employers. As a result, it is recommended to design new programs aligned with the needs of local employers to prepare the internationally trained workforce for work in the Canadian supply chain industry. Additionally, as mentioned earlier, the effectiveness of these programs is highly dependent on the level of employers' engagement and acceptance to hire program graduates and avoid under employing them. Consequently, outreach and marketing of these programs would be necessary to introduce them to local employers.

Enabler / Prerequisite:

To reduce the barriers for job retention, some improvements in the local infrastructure is required. This recommendation is not limited only to the supply chain industry, rather it is a cross-industry recommendation that will impact the overall productivity of the local economy. The commuting issue that was stated by local employers and employees needs to be addressed

through long-term and short-term approaches especially for those who do not have access to personal vehicles and work in early morning or late night shifts.

1. ***Long-term approach:*** a group comprised of regional planners, economic development offices and local employers/employees should be formed to assess the gaps and challenges of the local transit system and address them accordingly in transportation development projects.
2. ***Short-term approach:*** companies from all industries that are located in the areas with limited access to public transportation should collaborate toward their mutual benefits and provide shared transportation solutions such as a shuttle. A similar project (CrossIron Mills shuttle) has been implemented in Calgary, AB[53].

[53] Attracting Youth to a Sustainable Supply Chain Workforce: A Pilot Project, Van Horne Institute, December 2015

Appendix 1

Table 13: ***Description of Supply Chain Occupation Categories***

	Unit Group	Responsibilities
Managerial	Senior Managers in Construction, Transportation, Production, and Utilities [0016]	▪ Plan, organize, direct, and evaluate, through middle managers, the overall operations of goods production, construction, transportation, and utility companies (formulate or approve policies and organize the establishment of major departments)
	Purchasing Managers [0113]	▪ Plan, organize, direct, and evaluate the activities of purchasing departments (develop purchasing policies and oversee the negotiation of purchase contracts)
	Other Administrative Services Managers (e.g., inventory control manager) [0114]	▪ Plan, organize, direct, and evaluate the activities of departments that provide one or several administrative services not classified elsewhere (e.g., regulatory compliance)
	Postal and Courier Services Manager [0132]	▪ Plan, organize, direct, and evaluate the activities of postal facilities and operational divisions within courier service companies
	Computer and Information Systems Managers [0213]	▪ Plan, organize, direct, and evaluate the activities of computer software, information systems, and electronic data processing (EDP) departments or companies
	Corporate Sales Managers [0601]	▪ Plan, organize, direct, and evaluate the activities of sales departments in commercial, industrial, institutional, wholesale, or retail companies
	Facility Operation and Maintenance Managers [0714]	▪ Plan, organize, direct, and evaluate the operations of commercial, transportation, and recreational facilities and the included real estate (oversee the installation, maintenance, and repair of real estate infrastructures, such as electrical and mechanical systems)
	Transportation Managers [0731]	▪ Plan, organize, direct, and evaluate the operations of transportation companies under the direction of a general manager
	Supervisors, Mail, and Message Distribution Occupations [1214]	▪ Supervise, coordinate, and review the activities of postal workers, letter carriers, and couriers
	Supervisors, Supply Chain, Tracking, and Scheduling Coordination Occupations [1215]	▪ Supervise, coordinate, and review the activities of shippers and receivers, storekeepers and partspersons, production logistics coordinators, purchasing and inventory control workers, dispatchers, and transportation route and crew schedulers (organize the operational logistics of companies)

	Unit Group	Responsibilities
Tactical	Professional Occupations in Business Management Consulting [1122]	▪ Analyze the structure, operations, and managerial methods of business establishments (conduct assessments and propose improvements to methods, systems, and procedures in areas, such as human resources and records management)
	Purchasing Agents and Officers [1225]	▪ Purchase general and specialized equipment, materials, land or access rights, and business services for use or further processing by their establishments (determine or negotiate contract terms and conditions and award supplier contracts)
	Customs, Ship, and Other Brokers [1315]	▪ Customs brokers clear goods through customs and to their destinations on behalf of importer and exporter clients (prepare and process import/export documents and other forms on behalf of clients and in accordance with regulations, laws, and procedures) ▪ Ship brokers buy and sell cargo space on ships, and they also buy and sell ships, yachts, and other watercraft on behalf of clients ▪ Brokers, not classified elsewhere, who negotiate commercial transactions or other services between parties on behalf of clients
	Production Logistics Coordinators [1523]	▪ Coordinate and expedite the flow of work and materials within establishments, prepare work and production schedules, and monitor the progress of production and construction projects (estimate type and quantity of materials and labour required for production, construction, and other projects)
	Purchasing and Inventory Control Workers (e.g., inventory analyst) [1524]	▪ Process purchasing transactions and maintain inventories of materials, equipment, and stock ▪ Purchasing control workers, in particular, review requisition orders for accuracy and verify that materials, equipment, and stock are not available from current inventories (calculate cost of orders and charge, or forward invoices to, the appropriate counts) ▪ Inventory control workers, in particular, monitor inventory levels as materials, equipment, and stock are issued, transferred within establishments, or sold to the public using manual or computerized inventory systems
	Dispatchers [1525]	▪ Operate radios and other telecommunication equipment to dispatch emergency vehicles and coordinate the activities of drivers and other personnel (process and transmit instructions to coordinate the activities of vehicle operators, crews, and equipment using a variety of computer-aided communication and dispatching equipment)
	Transportation Route and Crew Schedulers [1526]	▪ Prepare operational and crew schedules for transportation equipment and operating personnel (review schedule requisitions, passenger counts and cargo, running times, distances, personnel availability and other pertinent information to establish schedule parameters)

Tactical	Information Systems Analysts and Consultants [2171]	▪ Confer with clients to analyze and document requirements, conduct business studies, design and implement information systems business solutions, and provide advice on information systems policy, management, security, and service delivery
	Database Analysts and Data Administrators [2172]	▪ Database analysts design, develop, and administer data management solutions using database management software (design, modify, integrate, implement, and test data models and database management systems) ▪ Data administrators develop and implement data administration policy, standards, and models
	Website Designers and Developers [2175]	▪ Research, design, develop, and produce Internet and Intranet sites (develop website architecture and determine hardware and software requirements)
	Industrial Engineering and Manufacturing Technologists and Technicians [2233]	▪ Industrial engineering and manufacturing technologists develop and conduct production, inventory, and quality assurance programs in manufacturing or other industries (develop applications using CAD/CAM—computer-assisted drafting, computer-assisted manufacturing—for the control of robots, computer numerical control machines, and other manufacturing processes and operations) ▪ Industrial engineering and manufacturing technicians assist in the design of plant layouts (collect and compile operational or experimental data and assist in the development of estimates, schedules, specifications, and reports)
	Retail and Wholesale Buyers [6222]	▪ Buy merchandise for resale by retail or wholesale establishments and are usually responsible for the merchandising operations of retail or wholesale establishments (study market reports, trade periodicals, and sales promotion materials and visit trade shows, showrooms, factories, and product design events)

	Unit Group	Responsibilities
Operational	Shippers and Receivers [1521]	▪ Ship, receive, and record movement of parts, supplies, materials, equipment and stock to and from establishments (assemble containers and crates, record contents manually or by computer, pack goods to be shipped, and affix identifying information and shipping instructions)
	Storekeepers and Partspersons [1522]	▪ Sort, store, and issue parts and supplies for use by their establishments and for sale to the public (prepare requisition orders to replenish parts and supplies)
	Longshore Workers [7451]	▪ Transfer cargo throughout dock area and onto and from ships and other vessels (operate industrial trucks, tractors, and other mobile equipment to transfer cargo, such as containers, crated items, automobiles, and pallet-mounted machinery, around dock to within range of cranes and hoists)
	Material Handlers (e.g., forklift truck operator) [7452]	▪ Handle, move, load, and unload materials by hand or using a variety of material handling equipment (operate winches and other loading devices to load and unload materials onto and off trucks, railway cars, and loading docks of warehouses and industrial establishments)
	Labourers in Food, Beverage, and Associated Products Processing [9617]	▪ Perform material handling, clean up, packaging, and other elemental activities related to food, beverage, and associated products processing (remove filled containers from conveyor and manually pack goods into bags, boxes, or other containers)

Source: *National Occupational Classification (NOC) 2011 (http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVDPage1&db=imdb&dis=2&adm=8&TVD=122372)*

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This report was prepared under the direction of the Peel Halton Workforce Development Group in association with the Peel Halton Local Employment Planning Council. For more information, please visit www.peelhaltonlepc.com