COVID-19 and Logistics

Changes and Challenges in Demand, Business Practices, and Workforce Management

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The Diversity Institute conducts and coordinates multi-disciplinary, multi-stakeholder research to address the needs of diverse Canadians, the changing nature of skills and competencies, and the policies, processes and tools that advance economic inclusion and success. Our action-oriented, evidence-based approach is advancing knowledge of the complex barriers faced by under-represented groups, leading practices to effect change, and producing concrete results. The Diversity Institute is a research lead for the Future Skills Centre.

The Future Skills Centre (FSC) is a forward-thinking centre for research and collaboration dedicated to preparing Canadians for employment success. We believe Canadians should feel confident about the skills they have to succeed in a changing workforce. As a pan-Canadian community, we are collaborating to rigorously identify, test, measure, and share innovative approaches to assessing and developing the skills Canadians need to thrive in the days and years ahead. The Future Skills Centre was founded by a consortium whose members are Toronto Metropolitan University, Blueprint, and The Conference Board of Canada, and is funded by the Government of Canada's Future Skills Program.

The Urban Analytics Institute strives to be a leader in knowledge translation, mobilization, and implementation of smart city solutions. The Institute fosters linkages with industry and governments to identify and implement advanced solutions for cities to be more livable and productive. It also serves as a repository for urban data for analysis and simulation and is a testbed for students and researchers to prototype analytics-driven urban solutions. In this way, the Institute is a leader in training practitioners and students in urban simulation methods for devising smart urban solutions. The Institute has close working relationships with news media to promote evidence-based planning by highlighting applied urban research in economics, engineering, management, and planning.

The Canadian Professional Logistics Institute (Logistics Institute) is a not-for-profit professional organization, delivering online and in-person certification programs to professionals in the supply chain and logistics industry. The primary credential earned by Logistics Institute certified professionals is the P.Log. (Professional Logistician). Being a certified professional demonstrates to employers, colleagues, and clients that someone is competent, skilled, and a leader in the field of global trade and international supply chain logistics. The Logistics Institute, as an industry leader, attests to that fact. In 2020, the Logistics Institute was awarded the Best Competency-Based Supply Chain Logistics Learning Organisation Award from Corporate Vision, and in 2021, the Best Comprehensive Logistics Training & Development Program. To learn more about the Logistics Institute and its certification programs, go to www.loginstitute.ca.

Funder

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Foreword

COVID-19 and Logistics: Changes and Challenges in Demand, Business Practices, and Workforce Management

The COVID-19 pandemic has been felt through every industry, occupation, and sector. In the middle of much of the upheaval is the supply chain and logistics sector. We were reminded of the essential role this sector has within the Canadian economy, providing goods and services to consumers and supporting many key economic areas such as manufacturing, agriculture, and retail. To keep the economy running and to implement all the changes required in a pandemic-gripped world, the logistics industry needed skilled people.

This report, *COVID-19 and Logistics: Changes and Challenges in Demand, Business Practices, and Workforce Management*, examines how the logistics sector was impacted by the pandemic. Logistics supporting the supply chain did not shut down completely, but many of its organizations and processes had to pause and change to keep going. This report details a number of those changes and gives a sense of how varied the pandemic responses were: some organizations grew during the pandemic while others shrunk; some needed more physical space than before the pandemic and some needed less; many found that their client base changed or shifted. Responding to this fluid environment required staff with varied skill sets—from digital skills to management and supervisory skills.

At the Future Skills Centre, we work toward future-focused solutions to skills and workforce development. We collaborate with a growing network of partners to ensure an inclusive approach to supporting workers and employers, particularly those in underserved communities who often bear the brunt of disruption in our supply chain. We are also committed to ensuring that employers have access to the talent they need to innovate and grow their businesses. As we plan for the future of work, we cannot stress enough the urgency of expanding skill strategies, policies, and programs that enable us to rebuild better and drive systems change in workforce development.

We thank our partners at the Diversity Institute, the Urban Analytics Institute, and the Logistics Institute for shedding light on how the backbone of our economy adjusted in response to the many changes the past two years have brought us.

Pedro Barata
Executive Director
Future Skills Centre

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Executive Summary

The COVID-19 pandemic has presented one of the most significant disruptive shocks to the Canadian economy of the past several decades. From the way we eat to the way we get around, how we interact and what we buy, much has changed. The purpose of this study is to explore how the pandemic has impacted the supply chain and logistics industry. This report explores the ways businesses have responded while identifying the opportunities for adaptation and resilience.

The supply chain and logistics industry includes integrated supply chain management, shipping, inventory control, warehousing and storage, procurement, order processing, packaging, kitting, assembly, logistics consulting, and information and financial services. This study begins by exploring the composition and distribution of the industry in Canada using secondary data sources. This is followed by a consultation with 67 business entities in the industry to gain insights into their experiences adapting business practices during the pandemic.

The main findings of this study are:

1. The pandemic had a mixed impact on the industry, with an overall decline in industry activity but a significant increase in demand and productivity for services associated with certain classes of goods whose demand increased.
2. How businesses responded to the pandemic depended upon the types of products or goods they produced and the extent of provincial mandates introduced to help limit the spread of COVID-19. The success of business responses also depended upon their willingness and capacity to adapt.
3. The response to the pandemic highlighted skills deficiencies in management, learning, communication, and worker interaction. These skills became more important during the pandemic than others, such as numeracy and literacy.
4. Feedback from industry representatives identified the difficulty in successfully assessing soft skills during recruitment, in addition to cost and time challenges that impacted their ability to adapt quickly under pandemic conditions.
5. Contingency planning and continued training represent two of the most extensive opportunities to improve adaptability and resiliency. Other opportunities include technical training and offering flexible workplace benefits.

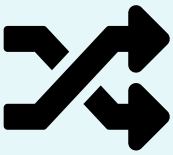
Despite the significant pandemic-driven disruptions, the supply chain and logistics industry appears to have performed well in responding to the pandemic. While the industry had an overall decrease in activity at the onset of the pandemic, many industry participants quickly adapted by shifting productivity to goods and services with solid demand. Contingency planning, technological and "soft skills" training, and transportation infrastructure investments can make the industry more adaptable and resilient to future disruptive developments.

Contingency planning, technological and "soft skills" training, and transportation infrastructure investments can make the industry more ***adaptable and resilient*** *to future disruptive developments.*

Introduction

The COVID-19 pandemic has been challenging for the Canadian economy, as public health interventions aimed at controlling the spread of the virus, such as border closures, lockdowns, and social distancing, have significantly reduced economic activity. However, the unprecedented nature of the pandemic has highlighted the critical role that many industries play in the broader national economy. One such industry is supply chain and logistics, which involves the acquisition, storage, and movement of goods and services. By facilitating trade and commerce and helping businesses distribute their products to customers, supply chain and logistics companies, and the services they provide, have been deemed essential by the federal government and therefore exempt from lockdown measures.

This study aims to understand how the pandemic has altered the demand for supply chain and logistics services in Canada and how businesses within the industry have adapted to pandemic-related health and safety protocols. This report also examines how the pandemic has highlighted skills deficiencies within the industry, the challenges businesses face in closing skills gaps, and the resources and training needed to help workers upgrade their skills.



*The pandemic has highlighted **skills deficiencies** within the industry, the challenges businesses face in **closing skills gaps**, and the resources and training needed to **help workers upgrade their skills**.*

A mixed-methods approach employing both qualitative and quantitative research has been used in the study. The paper consists of the following sections:

Supply Chain and Logistics in Canada: An Overview

This section provides an overview of Canada's supply chain and logistics industry, including the overall value of imported and exported goods, the number of shipments, and employment statistics. The distribution of supply chain and logistics businesses and trade flows in Ontario, Quebec, Alberta, and British Columbia are also discussed, along with the range of occupations within the industry.

COVID-19 Pandemic's Impact on Freight Transport, Trade, Retail, and e-Commerce

This section examines how the pandemic has impacted Canadian industries, commodities, services, freight transport modes, and retail, including e-commerce. Also considered are changes to international trade, gross domestic product, and the unemployment rate.

Findings from the Survey of Logistics Professionals

This section summarizes results from the survey of logistics professionals conducted in partnership with the Logistics Institute. Respondents were asked to describe how the pandemic had altered demand and operations, the skills needed in the logistics industry, the challenges experienced in closing skills gaps, and the resources and training available to help employees adapt to COVID-19 pandemic-related challenges, among other questions.

Recommendations and Opportunities

This section presents recommendations to policymakers based on the findings of the report, with particular emphasis on results from the survey of logistics professionals.

Conclusions

The concluding section discusses how the pandemic has altered demand in the supply chain and logistics industry, what skills deficiencies exist, the challenges in closing skills gaps, and the resources needed to improve industry adaptability to crises.

Supply Chain and Logistics in Canada: An Overview

Logistics entails exchanging value and co-operation between entities involved in providing goods and services to consumers, including manufacturers, wholesalers, retailers, distributors, carriers, forwarders, brokers, warehouse operators, and couriers. It involves a range of activities related to the distribution or transportation of goods, including sourcing, purchasing, and procurement; contract, materials, and inventory management; packing; and freight forwarding and transportation, all toward the goal of meeting the needs of customers. These activities are made possible through the exchange of services among a network of firms that make up the *supply chain*.

*The supply chain and logistics industry **provides support and services** to other sectors, such as manufacturing, retail, construction, and resource extraction.*

The supply chain and logistics industry provides support and services to other sectors, such as manufacturing, retail, construction, and resource extraction. Of these industries, manufacturing is the largest market for supply chain and logistics services, providing an estimated 51% of logistics industry revenues.[1] In addition, many entities in the manufacturing and extraction industries outsource their logistics processes, including freight consolidation and packing, export documentation preparation, transportation, and other services. Retail and wholesale sectors account for the next-largest market segment for supply chain and logistics services, providing an estimated 44% of industry revenues from logistics processes, including arrangement of freight transportation, record keeping, distribution, and warehousing, among other services.

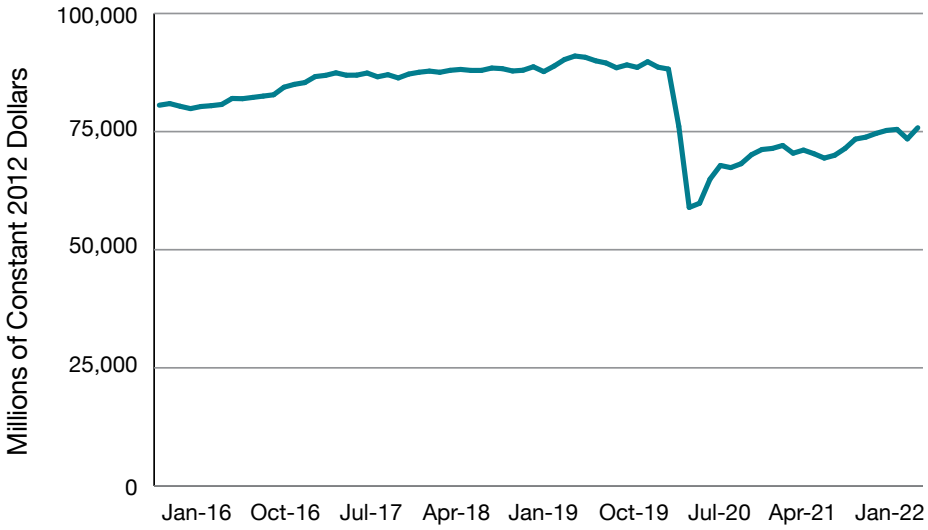
Industry trends

Supply chain and logistics operations in Canada are integral to the country's economy. The industry plays an essential role in moving Canada's goods exports, which are valued at $524.4 billion in 2020.[2] In addition, Canada's domestic and international goods trade is powered by the supply chain and logistics industry, with 88% of Canadian companies reporting their dependence on global supply chains[3] and with over $1 trillion in the value of goods moved annually on the country's transportation system.[4] Not surprisingly, given the industry's broad impact, the transportation and warehousing industry generated $71.62 billion (in unchained 2012 dollars) in 2020, although that was down from almost $89 billion in 2019. However, the industry had been growing steadily before the pandemic; how it will recover remains to be seen.

Canada's domestic and international goods trade is powered by the supply chain and logistics industry, with ***88% of Canadian companies reporting their dependence on global supply chains****.*

FIGURE 1

GDP, transport and warehousing (2012 constant dollars, seasonally adjusted annual rates)



Source: Statistics Canada. (2022). *Gross domestic product (GDP) at basic prices, by industry, monthly (x 1,000,000)* [Table 36-10-0434-01]. https://doi.org/10.25318/3610043401-eng

An overview of the composition of industry employment tells a similar story. The Supply Chain Management Association (now Supply Chain Canada, or SCC) reported in 2016 that 820,000 workers were employed in this industry, with forecasted job vacancies for skilled supply-chain workers estimated at 66,000 nationally.[5] Statistics Canada found that 5% of Canadians over 15 years of age were employed in the transportation and warehousing industry. Employment growth in this industry has mostly correlated with total employment growth in Canada. Table 1 shows that total employment grew steadily between 2016 and 2019, then dipped below 2016 levels in 2020. Employment in transportation and warehousing fared slightly better, dipping below 2018 levels in 2020.

TABLE 1

Number of workers overall and in warehousing and transportation in Canada (x 1,000)

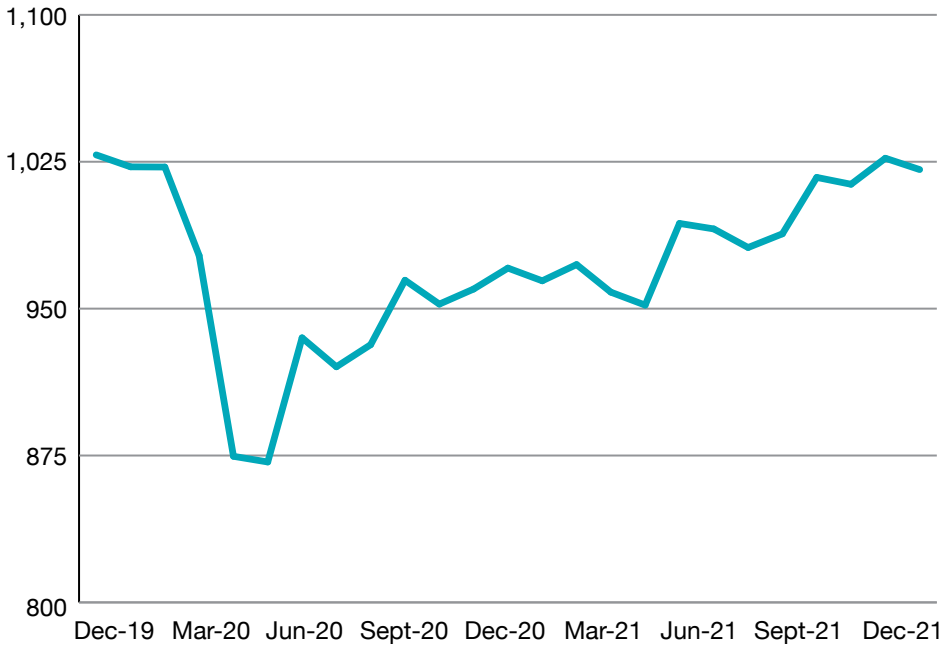
North American Industry Classification System (NAICS)	2016	2017	2018	2019	2020
Total, all industries	18,079.9	18,416.4	18,657.5	19,055.7	18,059.5
Transportation and warehousing	907.4	943.7	990.9	1,037.9	950.9

Source: Statistics Canada. (2022). *Labour force characteristics by industry, annual (x 1,000)* [Table 14-10-0023-01]. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410002301

Statistics Canada reports that the transportation and warehousing industry employed over 742,000 people in the full year 2020, a dip from previous years. On a monthly basis, though, employment showed an ongoing recovery from the early 2020 lows to December 2021.[6]

FIGURE 2

Number of people employed in transportation and warehousing across Canada by month (x1000)



Source: Statistics Canada. (2022). *Employment by industry, monthly, seasonally adjusted and unadjusted, and trend-cycle, last 5 months (x 1,000)* [Table 14-10-0355-01]. https://doi.org/10.25318/1410035501-eng

While in previous years, the industry had recorded growth in its main activities, 2020 mostly saw a levelling-out of activities partly attributed to the impact of the COVID-19 pandemic on manufacturing and retail. Air cargo transportation was hit particularly hard, decreasing by 17.4% in 2020 compared to 2019. Rail traffic declined in 2020 by 1.7% from 2019. Port traffic decreased by 0.5%, and 7.8% fewer trucks crossed the Canada–U.S. border in 2020 than in 2019.[7]

Despite the blip due to the pandemic, industry growth was relatively stable in the freight packing and logistics services industry between 2016 and 2021.[8]

Contributing factors include increased consumer spending, with particular growth in internet shopping, and international trade activity, resulting from increased demand for logistics consulting and supply chain management. As a result, the supply chain and logistics industry is expected to maintain steady growth until 2025 as consumer spending in Canada is expected to increase at an annualized rate of 1.6%. In international trade, Canada's exports are expected to grow by 2.5% annually for the same period.

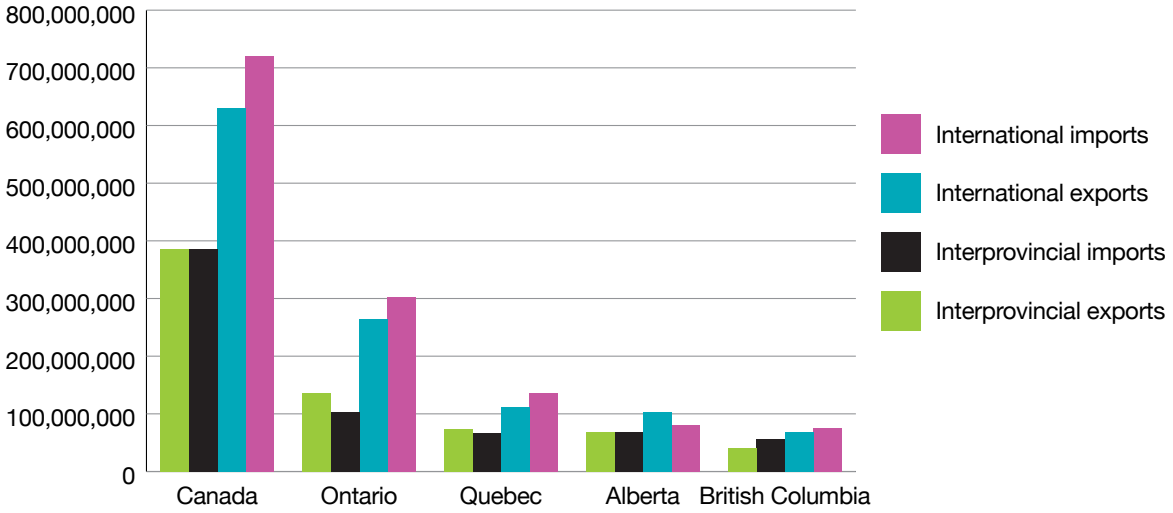
Industry distribution across provinces

Canada's large size and relatively low population density result in a greater distance between its metropolitan areas (compared with those of the United States, for instance) and create a challenge for the distribution of goods. Logistics operations are therefore concentrated in the more populated places.

The provinces with the most significant supply chain and logistics sectors are Ontario, Quebec, Alberta, and British Columbia. Figure 3 shows the value of interprovincial and international trade flows in the four provinces and in all of Canada in 2017.[9]

FIGURE 3

Interprovincial and international trade flows ($ x1000)



Source: Statistics Canada. (2021). *Interprovincial and international trade flows, basic prices, detail level (x 1,000)* [Table 12-10-0101-01]. https://doi.org/10.25318/1210010101-eng

Ontario is the leading province for supply chain and logistics industry establishments, home to almost 50% of the country's establishments.[10] The province is the largest importer and exporter of goods in Canada in terms of both provincial and international trade, exporting over $100 billion more in value than Quebec, the next largest exporter.

Quebec is second only to Ontario for the number of supply chain and logistics organizations, with an estimated 25% of Canada's supply chain and logistics entities located there. Together, Ontario and Quebec have the busiest road traffic in Canada, especially along the Quebec City–Windsor, Ontario, corridor, transporting food and manufactured goods to the United States and around the Great Lakes.[11]

In Alberta, Calgary is the economic centre of the oil and gas industry, a factor that has sustained significant population growth in the region. Lower demand pressure due to the higher availability of land has allowed more development in the region's supply chain and logistics entities. The investment by the Canadian National Railway in an intermodal facility in Calgary in 2013 further increased the city's significance as the most vital region for the industry in Western Canada. Alberta has 11% of Canada's supply chain and logistics organizations.[12]

In British Columbia, the Vancouver area is a significant population centre, with high levels of immigration from other countries and other Canadian regions. It is also the area with the highest land and real estate prices, partly due to geographical constraints created by mountains and rivers. These two related factors limit the location of supply chain and logistics entities in the region, as their operations are highly dependent on space.[13] However, the region's coastal geography positions it as one of Canada's main avenues for shipping freight. As a result, British Columbia has 9% of Canada's supply chain and logistics entities.[14]

The other Canadian provinces play a significantly smaller role in supply chain and logistics, with Saskatchewan, Manitoba, Nova Scotia, New Brunswick, and Newfoundland combined hosting less than 7% of industry entities.

Supply chain and logistics industry skills

The industry is served by workers with varied skills who work in various occupations, from executives to distribution and warehousing staff, as shown in Table 2.

TABLE 2

Occupations in the supply chain and logistics industry

Job Category	Examples of Jobs
Executive	Chief logistics officer, VP logistics, VP operations
Purchase	Purchasing manager, purchasing agent, buyer, inventory clerk
Inventory/Supply	Operations manager, demand forecast analyst, production control supervisor
Traffic/Transportation	Transportation manager, traffic analyst, shipper/receiver
Transport	Transport manager, scheduling supervisor, service agent
Distribution/Warehousing	Distribution manager, warehouse supervisor, materials handler

Skills in the industry are certified by the Logistics Institute, a national organization under the Canada Not-for-Profit Corporations Act. The Logistics Institute works with the federal government to establish the logistics profession through certification in several professional designations; develop competency standards toward professionalism; deliver competency-based training in supply chain logistics; undertake and promote research toward sustaining human resources and talent development; and define career opportunities using career mobility frameworks.[15]

The supply chain and logistics industry is a significant source of direct employment for hundreds of thousands of Canadians. Thousands of business owners and their employees in almost all industries all over Canada depend on this workforce and their operations to keep their businesses running efficiently. One critical demographic factor recently affecting the industry is the average age of transportation workers. Truck drivers, in particular, are older than the national average and, as such, are expected to be retiring in large numbers within the next 10 years, contributing to the gap between the number of jobs available and the number of workers with the required skills in this area.[16] The ongoing COVID-19 pandemic became the most recent challenge to the day-to-day operations of the supply chain and logistics industry. The next section of this report examines the impact of the pandemic on the industry.

*Truck drivers, in particular, are **older than the national average** and, as such, are expected to be retiring in large numbers within the next 10 years, contributing to the **gap between the number of jobs available and the number of workers** with the required skills in this area.*

Impact of the COVID-19 Pandemic on Freight Transport, Trade, Retail, and e-Commerce

The COVID-19 pandemic, including public health interventions such as border closures, lockdowns, and physical distancing measures, has deeply affected Canadians. For example, in April 2020, the first entire month in which COVID-19 pandemic restrictions were in place, Canadian GDP declined by about 16.5% relative to April 2019,[17] while the unemployment rate increased from 5.8% to 13.1% over the same period.[18] By December 2020, GDP had stabilized, but the unemployment rate remained high at 9.4%.

*The pandemic has highlighted the **critical role Canadian freight and logistics companies** play in the **broader national economy**.*

The pandemic has also disrupted trade. International merchandise imports in April 2020 were down 28.5% compared to April 2019, while international merchandise exports were down 38%.[19] In addition, international imports for services in April 2020 were down 36.9% compared to April 2019, while international exports for services were down 16.6%.[20] International merchandise trade had rebounded to pre-pandemic levels by December 2020, but in April 2020, international services trade had not rebounded.

The pandemic has highlighted the critical role Canadian freight and logistics companies play in the broader national economy. This section discusses how the pandemic has impacted Canadian industries, commodities, services, freight transport modes, and retail, including e-commerce.

Impact of the pandemic on industries, commodities, and services

The COVID-19 pandemic has been challenging for Canadian freight and logistics companies. Public health measures to limit the spread of the coronavirus have reduced economic activity. Disruptions vary by

industry, commodity, mode of transport, and geography. The impact of disruptions depends on national priorities, relevance for e-commerce, declining consumer demand for non-essentials, and reliance on foreign suppliers for inputs and foreign markets for sales. The fate of individual freight and logistics companies will depend mainly on their mix of products and customers.

While every industry has been affected by the pandemic, some products and services are more vulnerable to the global nature of the pandemic than others. McKinsey & Company analyzed 23 industry value chains to assess their exposure to specific types of shocks, including pandemics. They found that the automotive, aerospace, and apparel industries were particularly vulnerable during pandemics. This is mainly due to their reliance on foreign suppliers and buyers and the non-essential nature of their products. On the other hand, agriculture, food and beverage, medical devices, and pharmaceuticals were found to be more resilient to the disruptions of the pandemic. The study also indicated that travel, tourism, and migration would take years to return to pre-pandemic levels.[21]

Global Affairs Canada conducted similar research to determine the Canadian industries most vulnerable to interruptions in international supply chains brought on by global shocks such as pandemics. Automobile and light-duty motor vehicle manufacturing, Canada's largest industry by output, was rated most vulnerable to international supply and demand fluctuations because of its heavy reliance on foreign-sourced intermediate inputs

and U.S. buyers. Other Canadian industries considered vulnerable to interruptions in global supply chains are semiconductor and electronic component manufacturing, oil and gas extraction, and chemical product manufacturing. Industries that scored low on the international supply and demand vulnerability index include insurance carriers, banks, and educational services as they are more domestically focussed and require little in the way of internationally-sourced inputs.[22]

Statistics Canada provides data for international merchandise trade both to and from Canada. As expected, the COVID-19 pandemic significantly impacted trade volumes, particularly during the first few months after restrictions were put in place. Table 3 shows the percentage change in international merchandise trade from April to December in 2019 to April to December in 2020. The range from April to December 2020 reflects the first nine full months of pandemic restrictions in Canada.

TABLE 3

Percentage change in international trade of merchandise (April–December 2019 to April–December 2020)

	% Change in Merchandise Imports	% Change in Merchandise Exports
Total Merchandise	-10.0%	-14.6%
Motor Vehicles and Parts	-29.3%	-27.3%
Energy Products	-49.4%	-38.0%
Electronic and Electrical Equipment	-5.3%	-12.5%
Pharmaceutical and Medicinal Products	6.8%	0.7%

Source: Statistics Canada. Canadian International Merchandise Trade Web Application: https://www150.statcan.gc.ca/n1/pub/71-607-x/71-607-x2021004-eng.htm

Canada's international merchandise imports in April to December 2020 were down 10% compared to the same months in 2019, while international merchandise exports were down 14.6%.[23] Several industries experienced significant decreases in imports and exports in the last nine months of 2020 compared to the corresponding nine months of 2019. For example, Canadian imports for motor vehicles and parts decreased by 29.3% in 2020 compared to the last nine months of 2019, while exports fell by 27.3%. Canadian imports of energy products decreased by 49.4% in the last nine months of 2020 compared to the last nine months of 2019, while exports fell by 38.0%. However, some industries experienced only slight decreases in imports and exports, and some even had small increases. For example, Canadian imports of electronic and electrical equipment decreased by 5.3% in 2020 compared to the last nine months of 2019, while exports fell by 12.5%. On the other hand, Canadian imports of pharmaceutical and medicinal products increased by 6.8%, while exports increased by 0.7%.[24] These figures highlight the vulnerability or resiliency of different Canadian industries to the international supply and demand shocks brought on by the pandemic.

Statistics Canada also provides data for international trade in services both to and from Canada. Service classifications include commercial, travel, transportation, and government services. Table 4 details the percentage change in service imports and exports from April to December 2019 to April to December 2020, the first nine full months of pandemic restrictions in Canada.

TABLE 4

Percentage change in international trade of services (April–December 2019 to April–December 2020)

	% Change in Service Imports	% Change in Service Exports
Total Services	-32.0%	-24.1%
Commercial Services	14.5%	-8.5%
Travel Services	-90.5%	-74.2%
Transportation Services	-34.3%	-32.9%
Government Services	-13.9%	-24.9%

Source: Statistics Canada. (2022). *International trade in services, monthly (x 1,000,000)* [Table 12-10-0144-01]. https://doi.org/10.25318/1210014401-eng

In the nine months from April to December 2020, service imports fell 32.0% and service exports fell 24.1% from the corresponding 2019 period. Commercial services were the most resilient during the first nine months of the pandemic in Canada, with imports increasing by 14.5% compared to the year-earlier period and exports decreasing by a relatively modest 8.5%. Unsurprisingly, travel services were hardest hit by the pandemic, with imports decreasing by a staggering 90.5% in the last nine months of 2020 compared to 2019 and exports faring only slightly better, decreasing by 74.2%. Both transportation and government services also saw marked declines in imports and exports over the same period.[25]

Impact of the pandemic on freight transportation modes

Another dimension of trade that the COVID-19 pandemic has impacted is how goods are transported to and from Canada. The most common modes of freight transportation include road (full-truckload and less-than-truckload), rail, water, and air. Each mode generally has different commodity mixes and exposures that impact how it will perform during a global economic downturn such as a pandemic. For example, trucking is likely to perform better economically during a pandemic than other modes because trucks carry a higher proportion of agriculture, food, and other essential commodities. On the other hand, rail volumes may take longer to recover to pre-pandemic levels due to recent slowdowns in coal, oil, and gas production.

At the same time, commodities transported by pipelines are not affected by restrictions on mobility but rather by changes in demand for the products they carry, such as oil or gas. Pipelines are a significant conduit for Canadian exports. Table 5 details the modes of transportation used to move imports and exports in and out of Canada in 2019 as a percentage of total imports and exports.

TABLE 5

Percentage of total Canadian imports and exports by transport mode (2019)

Freight Transport Mode	% of Imports	% of Exports
Road	53%	39%
Water	23%	18%
Rail	9%	15%
Air	13%	12%
Other (e.g., Pipeline)	2%	15%

Source: Global Affairs Canada. (2020). *Canada's state of trade: The early impacts of COVID-19 on trade.* Office of the Chief Economist. https://www.international.gc.ca/gac-amc/assets/pdfs/publications/State-of-Trade-2020_eng.pdf

Because Canada shares a land border with its largest trading partner, the United States, the most widely used freight transportation mode for Canadian imports and exports is by road (trucking), with 53% of total imports and 39% of total exports. The majority of overseas imports and exports move by water, accounting for 23% of the total imports and 18% of the total exports, mostly in large container ships that are measured in 20-foot equivalent unit containers. Imports and exports shipped by rail and air account for similar trade values. However, the rail mode transports a more significant share of exports (relative to imports), with 15% of total exports, while air transports a greater share of imports, with 13% of total imports. The majority of trade value shipped under the category "other" is through pipelines that transport crude and natural gas. As a result, crude and natural gas make up a more significant proportion of exports from Canada than imports to Canada.

Recent figures for Canadian trade by freight transport mode compare merchandise export values from January to September 2019 to export values from January to September 2020. For all freight transport modes, merchandise exports were down in the 2020 period compared to a year earlier.

Exports by road (truck) decreased dramatically in April and May of 2020 due to shutdowns in automotive production in Canada and the U.S. However, road export volumes returned to pre-pandemic levels by July 2020. Exports

by water were the least impacted because of increased exports to China in 2020 compared to 2019. Exports by rail saw a significant decline primarily because of lower exports of motor vehicles and energy products. Exports by air saw a moderate decline due to lower exports of machinery and aerospace products. Other modes of transporting exports saw the sharpest decline, as lower oil prices impacted the volume of energy products transported through pipelines.[26]

TABLE 6

Year-over-year change in Canadian exports by mode of transportation (2019–2020)

Freight Transport Mode	Year-Over-Year Change
Road	-9.8%
Water	-9.4%
Rail	-21.0%
Air	-11.1%
Other (e.g., Pipeline)	-27.0%

Source: Trade Commissioner Service. (n.d.). *All modes of trade transportation were affected by the global pandemic.* www.tradecommissioner.gc.ca/canadexport/0005099.aspx?lang=eng

Impact of the pandemic on retail and e-commerce

Brick-and-mortar retail stores have been hit especially hard during the COVID-19 pandemic as social distancing measures, lockdowns, and decreased discretionary spending brought on by high unemployment rates and low consumer confidence have forced many retail businesses to close their doors. These conditions have prompted an increase in e-commerce as consumers have been forced to shift many of their purchases online. E-commerce has revolutionized the retail supply chain in recent years, and while many online purchases may revert to in-store transactions as the economy reopens, the strong consumer demand for smaller and faster deliveries seen during the pandemic will likely continue. Table 7 shows the year-over-year change in Canadian retail sales from April to November 2019 to April to November 2020.

TABLE 7

Year-over-year change in Canadian retail sales (2019–2020)

Month	Year-Over-Year Change
April	-31.3%
May	-18.0%
June	3.8%
July	4.8%
August	1.0%
September	9.0%
October	8.0%
November	4.2%

Source: Statistics Canada. (2022). *Retail trade sales by province and territory (x 1,000)* [Table 20-10-0008-01]. https://doi.org/10.25318/2010000801-eng

At the beginning of the pandemic in April and May of 2020, retail sales in Canada dropped significantly (31.3% and 18.0%, respectively) as early lockdown measures put in place to mitigate the spread of the coronavirus forced brick-and-mortar stores to close their doors to the public in many parts of the country. However, retail sales increased from July to November 2020 and exceeded sales from the previous year despite higher unemployment rates and reduced discretionary spending. It should be noted that e-commerce sales are considered a subsection of retail sales, so the increase in overall Canadian retail sales seen from July to November 2020 can be partly attributed to e-commerce.[27] Table 8 shows the year-over-year change in Canadian retail e-commerce sales from April to November 2019 to April to November 2020. While the beginning of the pandemic saw Canadian retail sales drop significantly compared to the previous year, retail e-commerce sales increased dramatically during the same period, with sales in April and May 2020 more than doubling the sales in the previous year. E-commerce sales continued to be strong from June to November 2020, with sales up 64% to 80% over June to November 2019. Black Friday and the beginning of the holiday shopping season helped Canadian retail e-commerce sales reach $4.3 billion in November 2020.[28]

TABLE 8

Year-over-year change in Canadian retail e-commerce sales (2019–2020)

Month	Year-Over-Year Change
April	123.6%
May	116.5%
June	80.3%
July	66.2%
August	64.3%
September	73.5%
October	72.0%
November	75.9%

Source: Statistics Canada. (2022). *Retail e-commerce sales (x 1,000)* [Table 20-10-0072-01]. https://doi.org/10.25318/2010007201-eng

Table 9 shows e-commerce sales as a percentage of overall Canadian retail sales from April to November 2020. In April and May 2020, e-commerce represented a more significant proportion of retail sales as lockdowns forced brick-and-mortar businesses to close their doors to the public in many parts of the country. While e-commerce was increasing in the first few months of the pandemic, overall retail sales were decreasing, highlighting the importance of e-commerce in helping to keep the Canadian retail industry afloat during this period.

TABLE 9

E-commerce as a percentage of Canadian retail sales (April–November 2020)

Month	E-Commerce as a Percentage of Retail Sales
April	10.4%
May	8.3%
June	6.1%
July	5.0%
August	5.3%
September	5.7%
October	5.6%
November	7.7%

Source: Statistics Canada. (2022). *Retail e-commerce sales (x 1,000)* [Table 20-10-0072-01]. https://doi.org/10.25318/2010007201-eng

Findings from the Survey of Logistics Professionals

The Urban Analytics Institute at Toronto Metropolitan University, in partnership with the Logistics Institute, surveyed supply chain and logistics professionals to gain an understanding of how the COVID-19 pandemic has impacted supply chains and logistics in Canada and how entities within the industry have responded. The online survey was administered from February 8 to March 8, 2021. The online survey was sent to the entire membership of the Logistics Institute. A letter from the institute's president, Victor Deyglio, accompanied the survey, explaining the purpose and encouraging the members to respond. The institute's staff sent weekly reminders to encourage members to respond.

Sixty-seven respondents completed the survey. The goal of the survey was to assess how the pandemic has impacted business operations and work roles as well as to determine the long-term changes in skills or operations required by the industry to be better prepared for potential future emergencies. The next section of this report presents an analysis of the survey. The survey questionnaire can be found in Appendix A.

Descriptive statistics for survey respondents are presented in Appendix B. The results should not be taken to represent the employees or organizations in the industry, as this was not a probability sample. While no descriptive statistics are available for the respondents themselves, the organizational statistics show that these findings do not represent organizations in the industry. For example, while only 3.1% of respondents reported working for a firm with one to four employees, according to Statistics Canada, 72% of transportation and warehousing companies are of this size.[29] More than a third of respondents worked for organizations with at least 500 employees, though these account for less than 1% of industry organizations in Canada. This is not a surprising sampling bias at the organization level given that individuals, not organizations, were sampled and that even when most organizations are small, it may still be true that most employees work for large organizations.[30] While not surprising, this calls for caution in generalizing these results to logistic industry organizations. The sampling frame included members of the Logistics Institute. It is common to have the membership of professional organizations dominated by large-sized firms. Professionals working for small-sized firms may not receive financial incentives for membership dues.

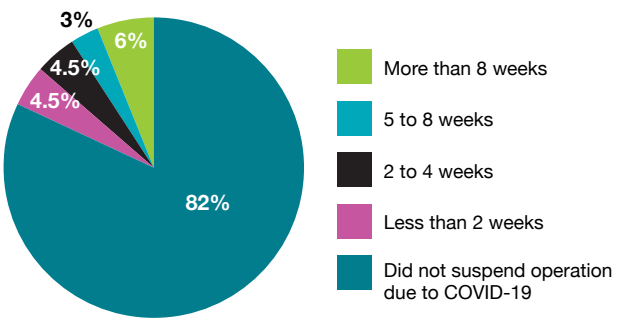
How the pandemic has altered demand and operations in global supply chains

Survey results suggest that the logistics industry may not have been as hard-hit by the pandemic as many other industries. Only 4.5% of respondents indicated that their organizations were not operating. And while 26.9% worked for organizations not operating at full capacity, 68.7% of respondents reported that their organizations were working at full capacity. In addition, most respondents reported that their organizations did not shut down during the pandemic, and only 6% said they shut down for eight or more weeks (see Figure 4). These responses appear to tell a story of stability in the logistics industry.

Where respondents reported change, they were often divided between those reporting an increase in industry activity and those reporting a decrease. For example, most reported no change in their organization's number of clients, with similar numbers reporting more clients and fewer clients (see Figure 5). Only 23.9% of respondents observed no change in market demand. At the same time, those who did report change were equally divided between those who saw an increase and those who saw a decrease in demand (see Figure 6). Not surprisingly then, significant numbers of respondents reported both hiring more workers and reducing their number of workers (see Figure 7), acquiring space and offloading

FIGURE 4

Number of weeks that business operations were suspended due to the COVID-19 pandemic



space, increasing their fleets and reducing their fleets. Respondents whose organizations were directly involved in the global supply chain were almost equally divided among those who said there was no change in the demand for their services, those who reported decreased demand, and those who experienced increased demand (see Figure 8). While these findings show change at the level of individual organizations, they do not *necessarily* suggest changes in the industry's overall activity level.

FIGURE 5

Change in the number of clients served due to the COVID-19 pandemic

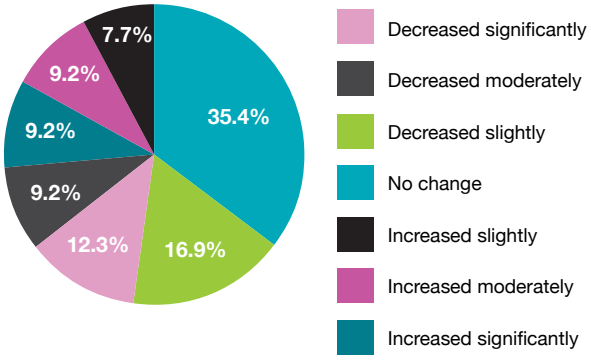


FIGURE 6

Change in market demand for services during the COVID-19 pandemic

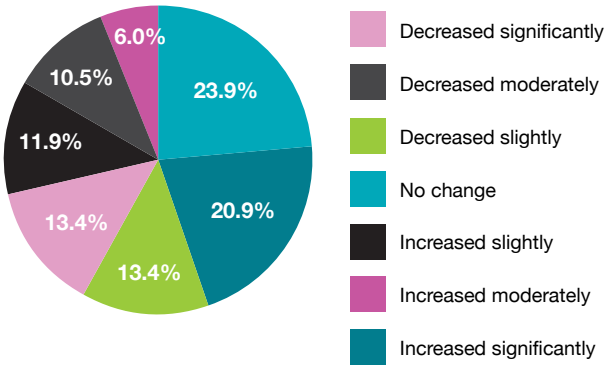


FIGURE 7

Change in the number of employees due to the COVID-19 pandemic

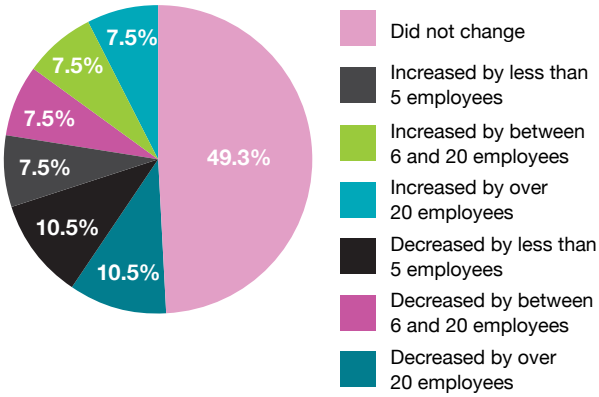


FIGURE 8

Change in demand for services due to international travel restrictions

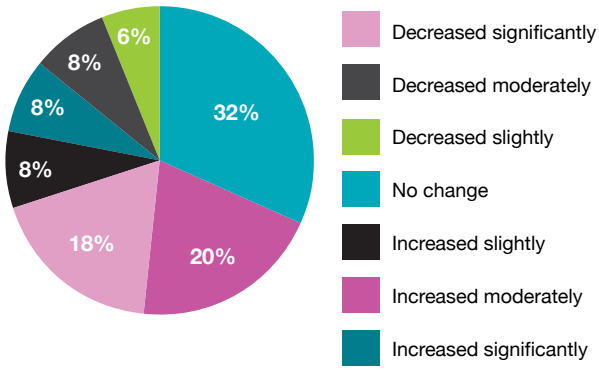
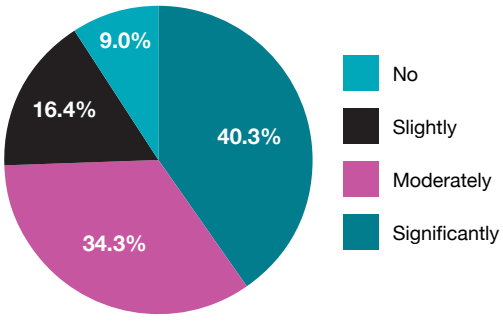


FIGURE 9

Day-to-day changes in operations due to COVID-19



Of course, operating *just as much* as before the pandemic does not mean operating *the same* as before the pandemic. Over 90% of respondents reported that day-to-day operations had changed as a result of the pandemic. Figure 9 shows that while the degree of change varied, almost all respondents reported their organizations adapting to the pandemic. In describing the nature of these changes, respondents mentioned social distancing, personal protective equipment, and sanitizing procedures (see Figure 10). Organizations also reported adopting new technologies or automating procedures, including teleconferencing and digitalization of records (see Figure 11).

FIGURE 10

Impact of provincially mandated safety standards on operations

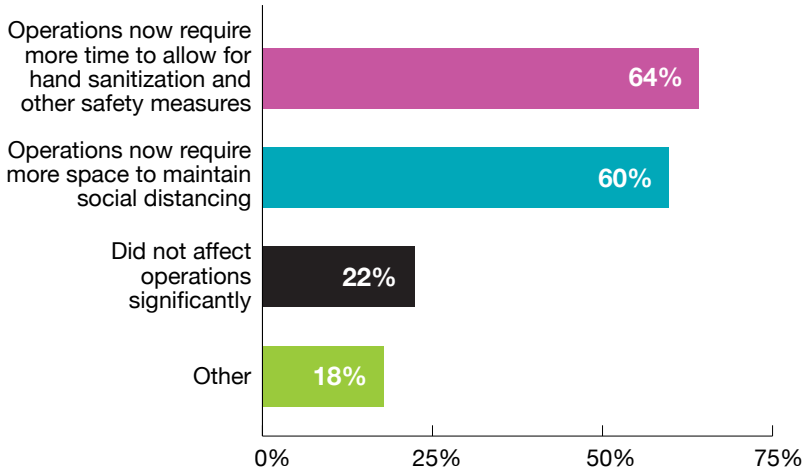
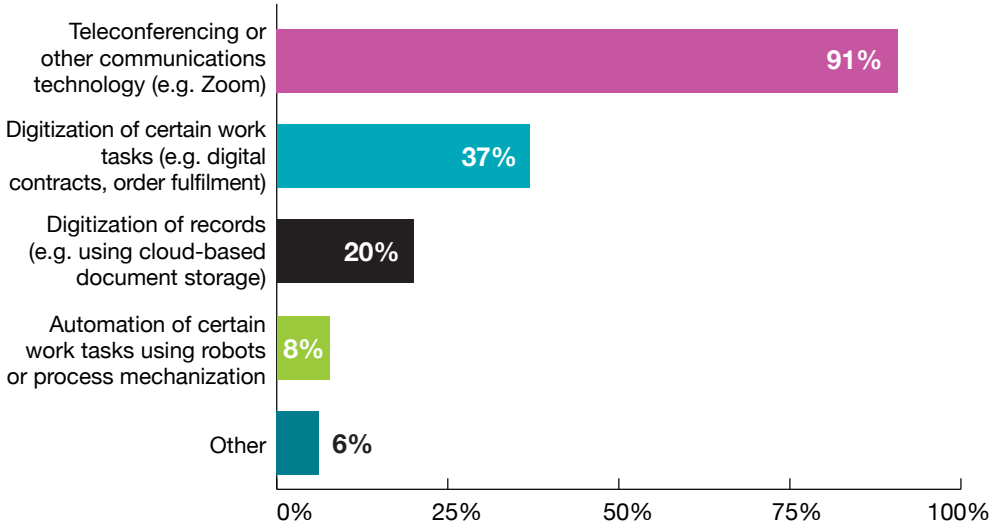


FIGURE 11

Kinds of technology or automation adopted due to reasons related to the COVID-19 pandemic



These changes were expensive and difficult for many organizations, with 63.6% of respondents reporting that costs increased significantly and often citing the costs of PPE, hand sanitizers, and increased space required for physical distancing (see Figure 10). While 65.2% of respondents stated that they experienced a seamless transition to using technologies such as Zoom, 25.8% indicated that they experienced a somewhat difficult transition (see Figure 13). When considering non-technological transitions such as breaking operations into smaller units, 12.1% of the professionals surveyed stated that their business experienced a somewhat difficult transition.

FIGURE 12

Change in cost of operations as a result of the COVID-19 pandemic

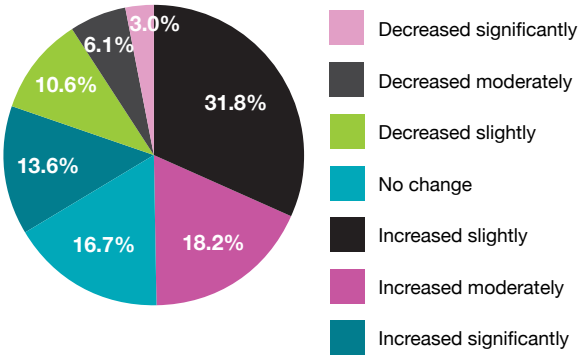
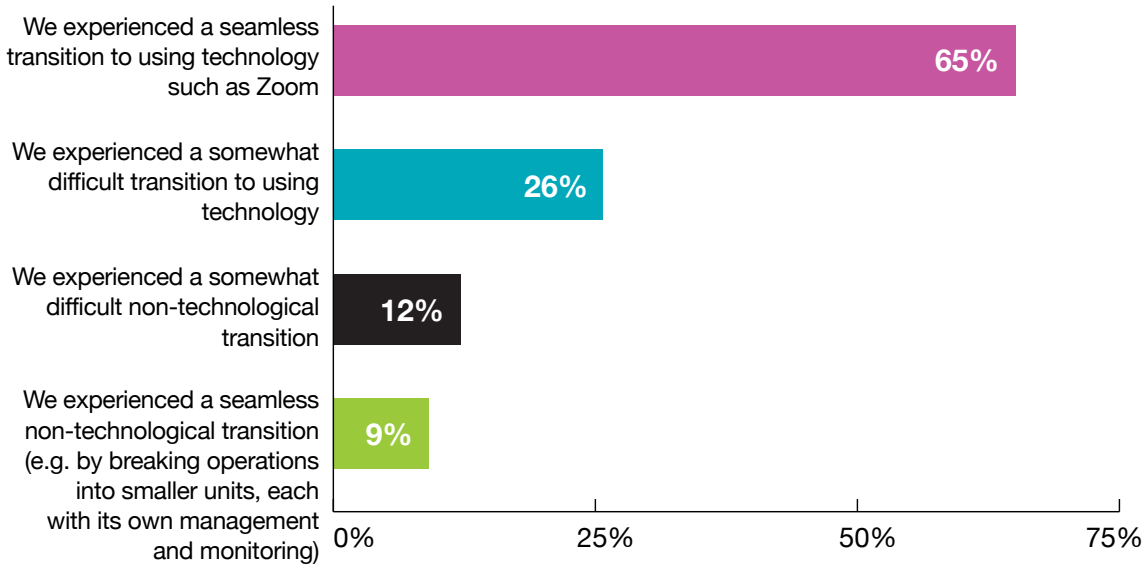


FIGURE 13

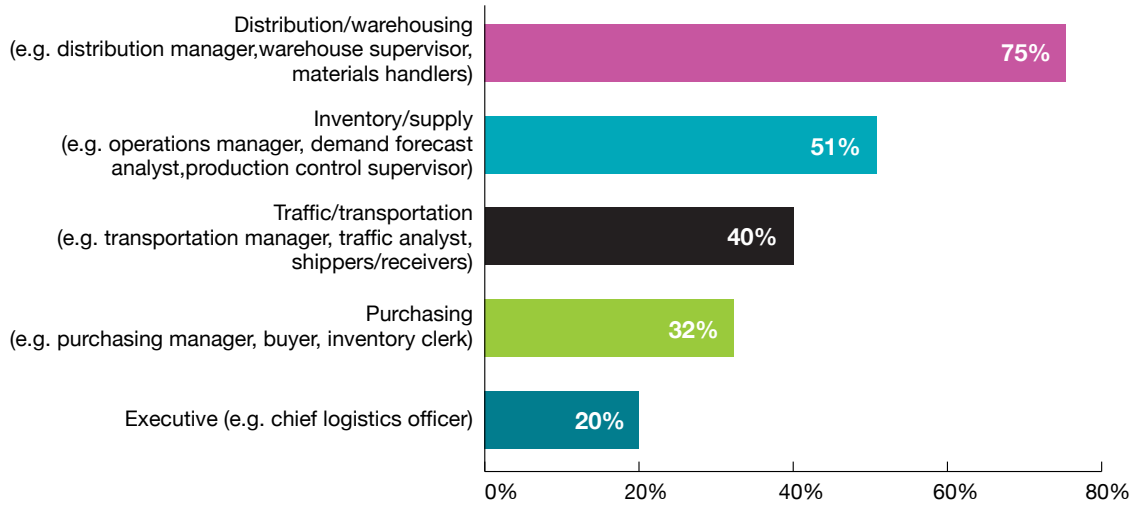
Level of difficulty experienced in adopting technology or automation for operational changes made necessary by the COVID-19 pandemic



The impact of these changes was not evenly felt within organizations. Respondents reported that the impact was greatest in the areas of distribution and warehousing (cited by 75.4%), inventory and supply (50.8%), traffic and transportation (40.0%), and purchasing (32.3%). Executive positions were the least affected (20.0%) (see Figure 14).

FIGURE 14

Team areas where provincially mandated safety standards have created the most challenges

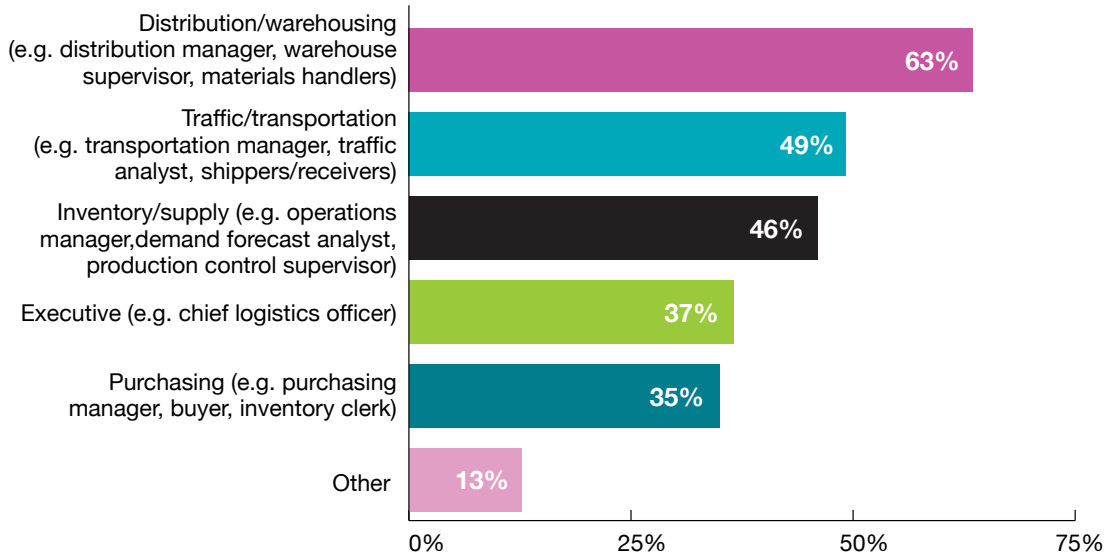


How the pandemic has highlighted skills needs in the logistics industry

Respondents also provided feedback on how the pandemic has highlighted skills needs in the logistics industry. When asked which positions or roles became more important or required for operations after the pandemic, 63.5% said distribution or warehousing roles, 49.2% said traffic and transportation roles, 46.0% said inventory and supply roles, 36.5% said executive roles, and 34.9% said purchasing roles. Other areas, such as information technology; operations, manufacturing, and safety; and compliance and risk management, were identified by 12.7% of respondents (see Figure 15).

FIGURE 15

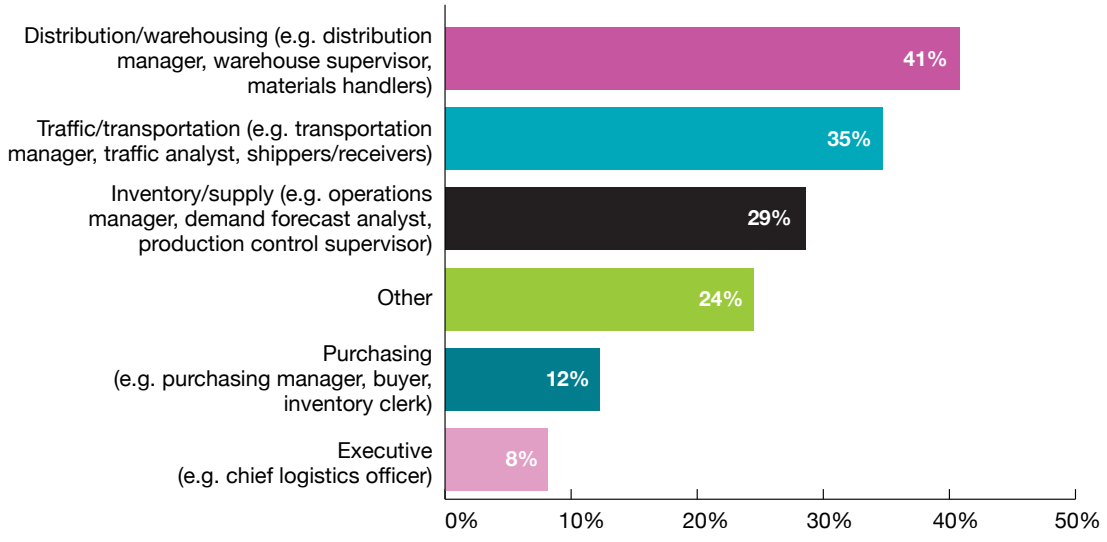
Positions or roles that became more important or required for operations after the onset of the COVID-19 pandemic



Not surprisingly, the roles that became more important were ranked almost identically to the positions that respondents reported having trouble filling (see Figure 16). The one exception was that executive positions were more often reported to have become more critical than purchasing jobs, but purchasing positions were more often reported as difficult to fill.

FIGURE 16

Positions or roles where gaps not fillable with current employees emerged as a result of the COVID-19 pandemic



When asked to describe why certain positions or roles became more important during the COVID-19 pandemic, one respondent pointed to the importance of warehouse staff and corporate social responsibility:

> *"My staff, fork operators, and the CSR (corporate social responsibility). Without them being careful and staying safe to avoid [getting COVID-19], we probably would have reduced our effectiveness to serve our customers considerably."*

Several respondents highlighted the importance of purchasing, stockpiling, and distributing personal protective equipment:

> *"Purchasing became more important, as we needed to source many different products (i.e., face masks, sanitizer) at much [more] frequent and quicker rates. Inventory and Distribution followed to ensure the demands at our campuses were met with the products purchased."*

> *"There was increased emphasis on appropriate and timely purchasing of PPE and personal computing devices, which resulted in increased demand for stockpiling and warehousing space, which was required for effective and timely distribution to internal clients and internal 'brokers.'"*

One participant described the value of management skills:

> *"Staff reduction and telecommuting resulted in a need to rely on less resources to accomplish the same results, putting tremendous pressure on management skills capable of maintaining acceptable service levels by maintaining acceptable productivity levels from fewer resources."*

Another respondent mentioned the importance of human resources:

> *"Human resources [was] helping employees who were/are dealing with all impacts of [the COVID-19 pandemic] and mental wellness."*

The federal government has promoted several essential skills people need for work, learning, and life: communication, digital skills, document use, learning, literacy, numeracy, thinking, and working with others. Definitions of each skill are provided in Appendix C. We asked respondents to rate the difficulty they had filling positions with each skill. Most respondents reported that positions with all skills were easy to fill, though some were easier than others. For example, learning was the skill respondents were most likely to report they had difficulty finding, and document use was the skill most often reported as easy to fill (see Figure 17). It is interesting to note that those skills in which emergent gaps were deemed most challenging to fill can be considered soft skills that are more difficult to quantify, while those skills in which emergent gaps were considered easiest to fill can be regarded as hard skills that are more easily quantified.

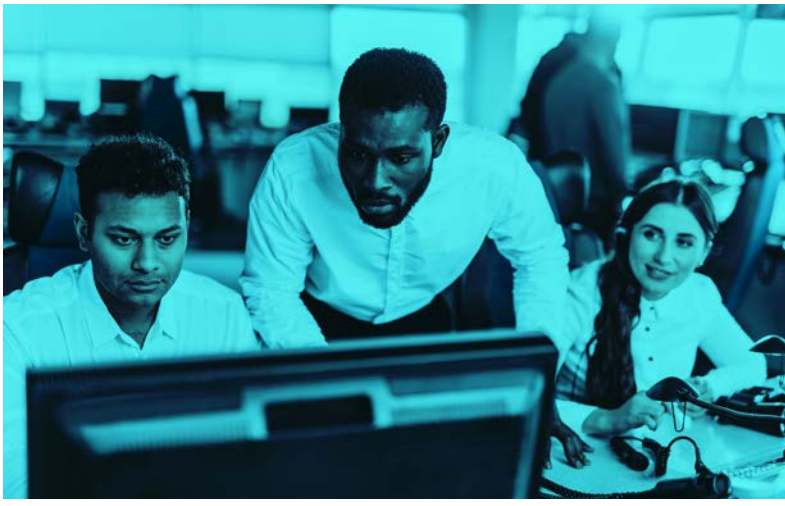
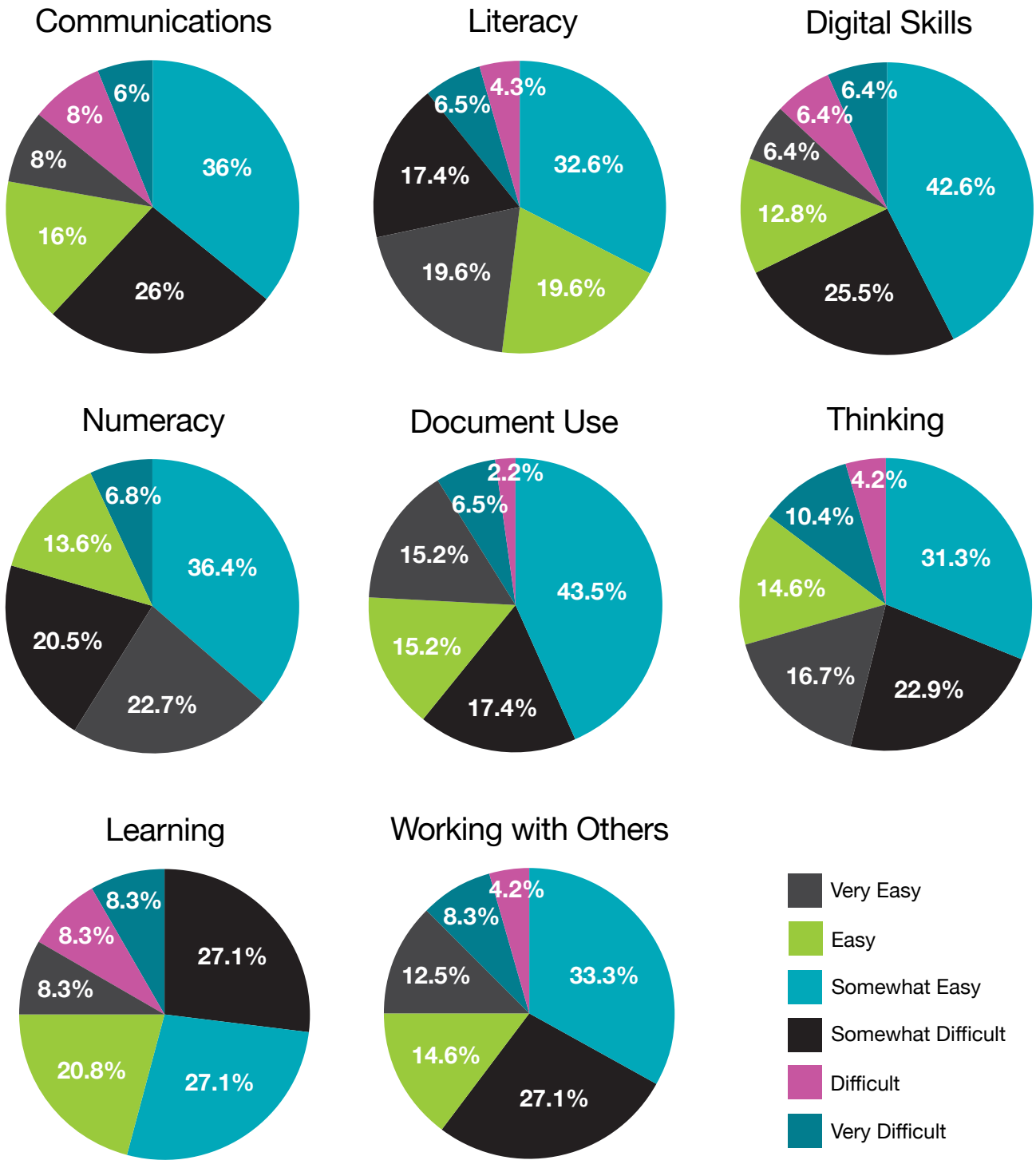


FIGURE 17

Difficulty in filling roles requiring Government of Canada-defined skills



Challenges experienced in closing skills gaps

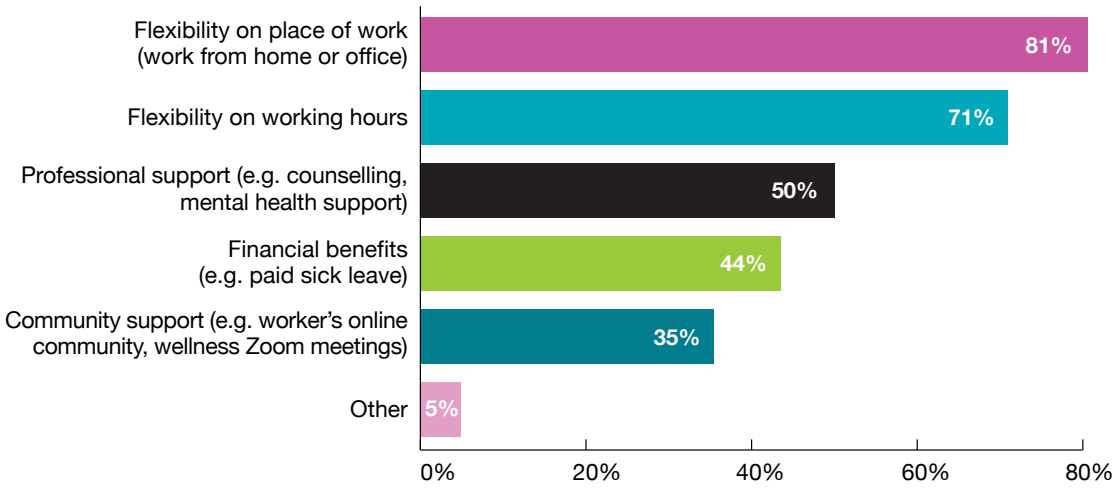
Respondents reported that their most common problems were the need to fill gaps quickly to continue operations (cited by 83.3%) and the high cost of filling gaps (42.6%). Other challenges, including the difficulty of remotely assessing candidates, were cited by 11.1% of respondents.

Resources and training for adaptability

About half of the respondents reported that their organizations had an adequate training program that met the needs for employee adaptability during an emergency like the COVID-19 pandemic. Given this, it is not surprising that about half of respondents said their organizations could train current employees to fill skills gaps—though 8.6% said this would be too costly or that they lacked the surplus capacity to spare employees elsewhere. Resources that were deemed most useful in helping employees adapt to pandemic-related challenges included flexibility in place of work (cited by 80.6%), flexibility in working hours (71.0%), professional support (e.g., counselling and mental health support) (50.0%), and financial benefits such as paid sick leave (43.5%) (see Figure 18).

FIGURE 18

Resources useful in helping employees adapt to challenges related to the COVID-19 pandemic



Survey participants were also asked how training for emergencies like the COVID-19 pandemic could be improved. The most common suggestion was that more time was needed for training, understanding, and integrating safety and emergency protocols. Several participants also cited the importance of ongoing training and having structured emergency plans in place instead of employing ad hoc reactive responses.

Preparing for the future

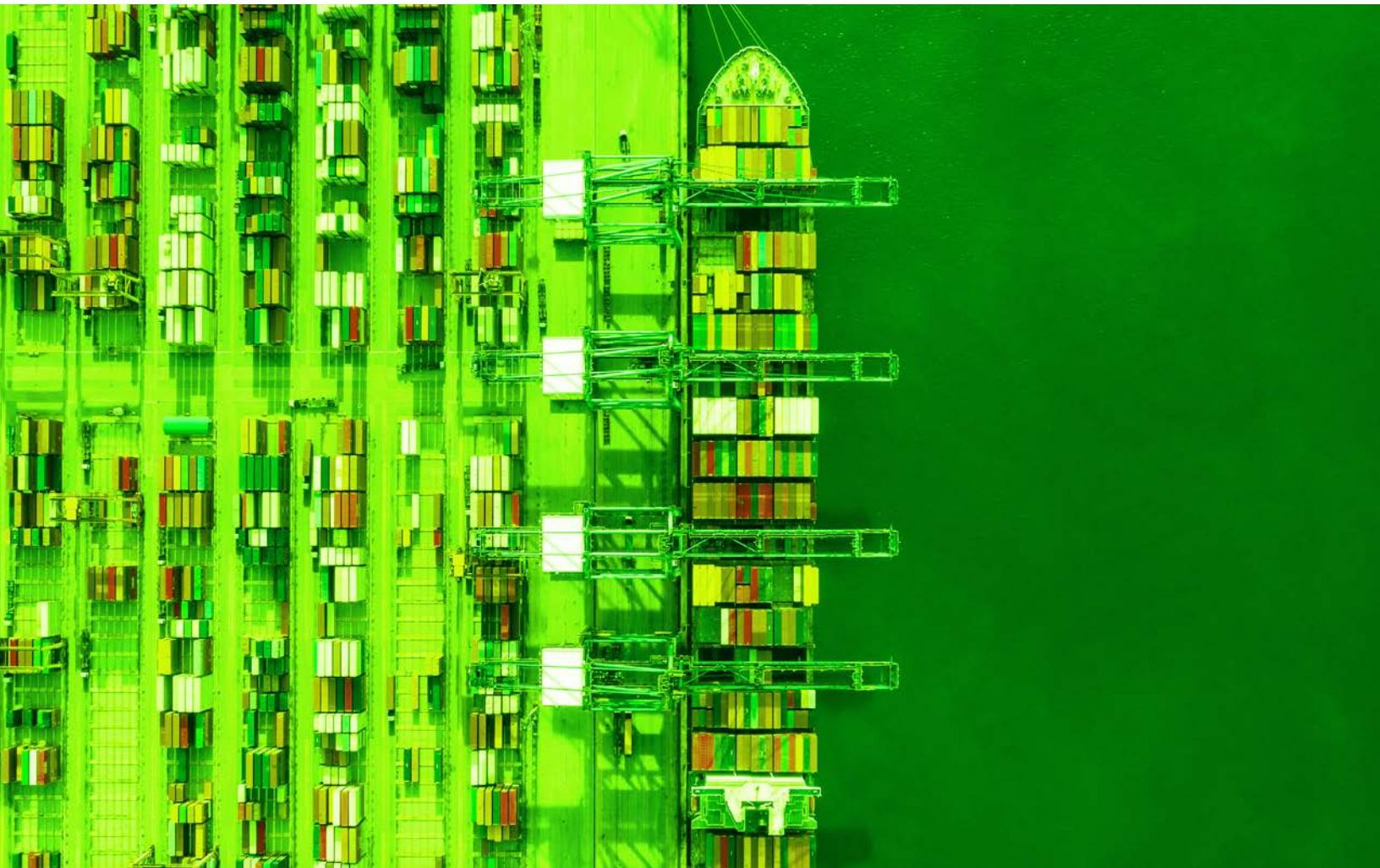
Our final question asked respondents to consider how the industry should prepare for future emergencies.

One participant remarked that events like pandemics should consider longer emergency response timelines to minimize the potential adverse impact on vital economic systems:

> *"As I see it, pandemics are longer running versions of natural disasters. When we are involved in emergency response programs (such as [Hurricane] Katrina or other natural disasters) we need to assess how to extend the longevity of the response from a few weeks or months to years without creating a massive vacuum in the transportation section that pulls capacity out of the market. Pulling that capacity out forces rates to rise and, ultimately, consumer costs to go up with it."*

Other participants highlighted the importance of contingency plans that bolster company resiliency:

> *"Identify key commodities required in advance and include in safety stock. Cost–benefit analyses for black swan events do not account for survival of company. What reserves are readily available to ensure corporate continuity? Beware of [just-in-time] and Lean [manufacturing] without*



factoring in redundancy/resiliency. Need contingency plans for both small bumps and longer-term disruptions. Conversely, such events also provide opportunities. Consider what mechanisms are in place/available to exploit those opportunities. How agile is the company?"

"Plan, build, operate, measure, and improve RESILIENT supply chains. Ensure [management] accepts the (likely) higher cost of such supply chains. Strive for optionality, not just low cost."

"Move beyond 'resilience' as a trite expression and develop a framework or a list of features or activities that resilient and agile organizations possess and act upon."

One professional pointed to reliability issues within the logistics industry that have resulted in cost overruns:

"Intermodal needs to be fixed—rail, ports, and ships—reliability issues, self-created storage costs due to reliability issues—timing and cost overruns, with very little motivation to change under current laws."

And finally, several participants discussed the need to upgrade employee skills within organizations:

"Need to have more skill depth built in to organizations. Put measures in place to ensure suppliers are meeting and maintaining safety protocols so they do not disrupt the supply chain. Have a solid backup plan."

"Target skill recruiting and training in other sectors and train for [the] next level of management."

"Staff equipped for rapid telecommute deployment, management focused on creative motivation, production management with less resources, focus on optimal IT tools to manage the business itself as well as quality of performance and service levels."

"Grooming future management such as team leaders, supervisors, and [operations] managers for added support."

Recommendations and Opportunities

This section presents recommendations based on the findings of the report.

Leverage technology to improve work

Many organizations continued to operate at close to normal levels by adopting technology and automation. They fully embraced some technologies (e.g., Zoom) but lagged behind in others (e.g., digitizing records and automating tasks). While automation is sometimes feared to threaten jobs, most organizations did not report any change in the number of employees within their operations. More organizations recruited more employees by adopting technology and automation than those that had some employees become redundant. We encourage organizations to find ways to integrate technologies and automation further so the industry can remain resilient to future disturbances.

Understand within-industry variations

Both industry data and survey results demonstrate wide variations in the impact of the pandemic on the logistics sector. Some parts have not felt the effects of the pandemic at all, while others have had to change their operations substantially. Therefore, we encourage organizations and policymakers to examine trends within the industry (i.e., commodities, freight transport modes, retail) to offer more tailored recommendations that consider the unique impact of the pandemic on the various sub-industries. This is also true even within organizations, where certain areas such as distribution and warehousing were more affected by the pandemic than executive positions.

Offer more training opportunities to current employees

Most industries will not be able to fill their skills gaps without some investment in “re-skilling” and “upskilling” their current employees. This is also true for the logistics industry, where most organizations find recruitment costly and challenging to accomplish on time without disturbing current operations. In addition, the adoption of technology and automation requires employees who possess digital skills and the openness to adopt new tools. About half of the organizations did not have an option to train current employees to close skills gaps. We recommend organizations offer in-house training to their existing employees to help fill some of the skills gaps, which can be done much more quickly and cheaply than by hiring externally.

Offer more management training

Many respondents reported that management skills became critical during the pandemic, from human resource management to worker safety to production management, to keep up production with diminished resources. Executive roles were reported to be the most difficult to fill. Training should be provided to managers in responding and adapting to emergencies and sudden shifts in the business environment. Organizations should also consider offering management training to current employees to help fill this gap.

Provide flexibility and support to current employees

The most critical factor in adapting to the COVID-19 pandemic was flexibility in place of work and working hours. Professional support and financial benefits such as paid sick leave were also identified as necessary in adapting to the pandemic. In addition, many participants want their organizations to set up proper safety protocols and have contingency plans in place for potential future disruptions. Therefore, we encourage organizations to continue providing their employees with flexible working arrangements and offering as many resources as possible to support their well-being and mental health.

Develop methods to recruit and assess candidates

Many respondents reported difficulty in assessing candidates via remote interviews. Therefore, developing assessment methods suitable for remote or even asynchronous use and providing training in these methods could be helpful in future emergencies. It could also broaden the pool of potential candidates and provide a more diverse applicant pool.

Hire for soft skills

Of the essential skills identified by the federal government, soft skills, which are sometimes difficult to measure, were most commonly cited as difficult to find. Logistics professionals found it relatively easy to fill for numeracy and literacy skills but had difficulties filling emerging gaps in learning skills, communication skills, and skills in working with others. This echoes the sentiment that many professionals have observed—those soft skills are harder to teach than technical skills. Therefore, we recommend that hiring managers put a stronger emphasis on soft skills in the recruitment process. More investment should be made to attract, assess, and retain skilled workers in these areas.

Conclusions

The purpose of this study was to explore how the supply chain and logistics industry might better meet challenges on the scale of the COVID-19 pandemic by examining the composition of the industry and its response to the ongoing pandemic. The study has undertaken two primary exploratory analyses to answer the following research questions:

1. How has the pandemic altered demand in the industry?
2. What skills deficiencies have been highlighted by the pandemic?
3. What challenges to closing skills gaps exist?
4. What resources are needed to improve industry adaptability to crises?

Exploring the answers to these questions has provided a glimpse into the industry's performance in its response to the ongoing pandemic and its potential to weather similar events in the future. Answering the questions also helps chart a course of action to improve the industry's ability to adapt and be more resilient. The following are summaries of the findings derived from the exploratory analyses.

1. How has the pandemic altered demand in the industry?

The pandemic had a mixed impact on demand in the industry. Our analyses showed that there was an overall fall in industrial activity. However, services associated with certain classes of goods and services within the industry saw a boost in demand.

The mixed impact of the pandemic on the industry depended on the class of goods and services provided and the provincial mandates introduced to help limit the spread of COVID-19. The adaptability of a business entity's operations also played a role, with many business entities ceasing operations temporarily to adjust production schedules and plan for the adoption of safety measures.

*The mixed impact of the pandemic on the industry depended on the **class of goods and services provided** and the **provincial mandates introduced** to help limit the spread of COVID-19.*

Many businesses reported adopting technology in adapting their operations during the pandemic. For example, observing the provincial safety mandates meant switching to remote work for many and reconfiguring work sites for some. The technology adopted included telecommunications technologies like Zoom, the digitization of contracting and work orders, cloud storage, and even the adoption of robotics and other process mechanization. These technologies allowed many business entities to continue at or near their pre-pandemic operational capacity.

The adaptability of business entities is also tied to skills at the managerial and higher levels. For example, many business entities reported difficulty recruiting new employees to fill new positions, and others discussed the problem of adapting due to a lack of contingency planning. They also noted the difficulty of managing personnel to keep performance at optimal levels under certain conditions such as remote work. These managerial and labour challenges can significantly impact production and the ability to keep up with demand.

2. What skills deficiencies have been highlighted by the pandemic?

Our analyses highlighted the importance of skills that may be linked with adaptability. Often described as "soft skills," these skills tend to be undervalued during business-as-usual conditions but become key to success in crises. Business entities highlighted the difficulty of recruiting people with learning and communication skills and the skill of working well with others. By contrast, workers with numeracy, document use, and literacy skills were the easiest to recruit. Almost by definition, crisis periods indicate the importance of learning skills as crises often present workers with new, unprecedented, and complex realities that must be quickly understood. What is learned and what may be done must then be effectively communicated among persons working together, highlighting the importance of communication skills and the skill of working well with others. In the same vein, business entities pointed to the difficulty of managing workers in crises in which learning, communication, and working well with others become more critical than oft-cited hard skills.

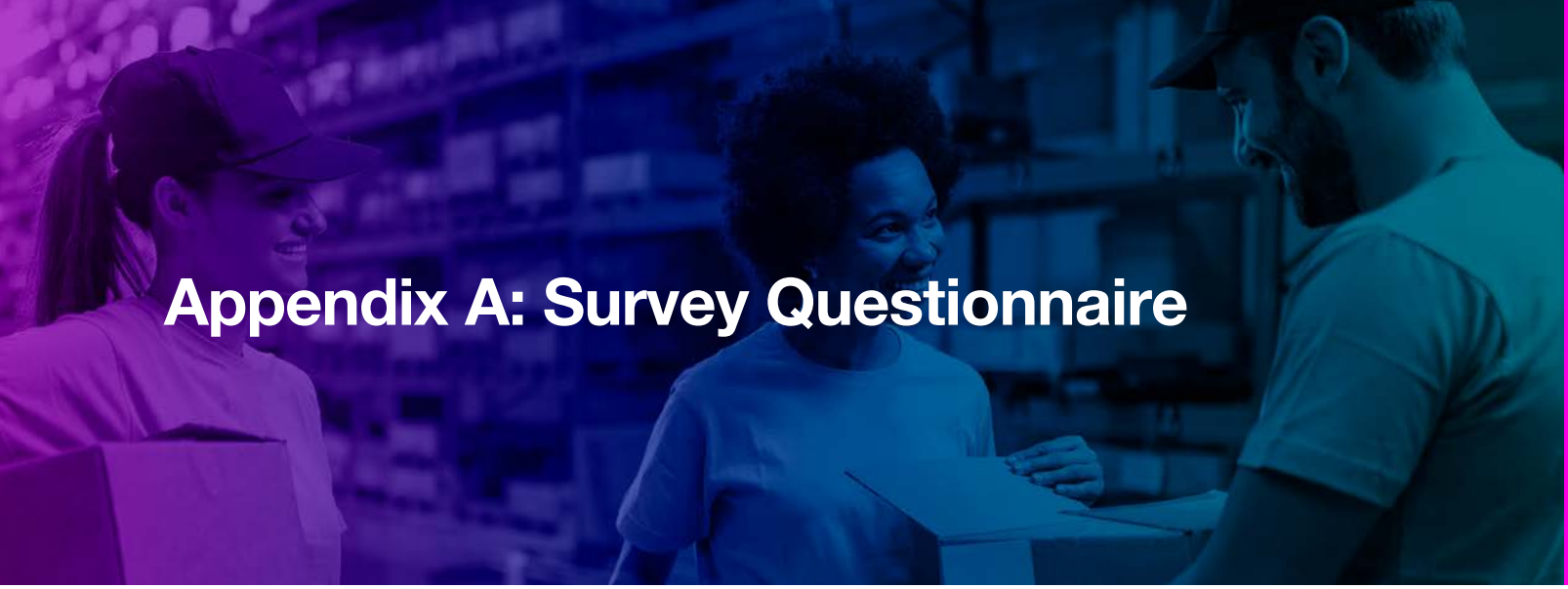
3. What challenges to closing skills gaps exist?

Business entities reported that cost and time constraints presented challenges to closing skills gaps. In addition, recruiting for the "soft skills" such as learning and communication skills and the skill of working well with others is difficult because these skills are not easily measured.

4. What resources are needed to improve industry adaptability to crises?

Contingency planning was identified as necessary, but 50% of businesses consulted did not have a contingency plan at the onset of the pandemic. In addition to contingency planning, other essential resources for weathering emergencies identified at the business-entity level included continued employee training; workplace benefits, such as workplace flexibility, hours of work flexibility, and professional support including counselling and mental health support; and financial benefits such as paid sick leave.

In summary, we identified many ways by which the supply chain and logistics industry could meet challenges resulting from significant disruptions to operations and product demand. We discussed the importance of leveraging technology for flexible and health-promoting work arrangements, ongoing technological and management training, workplace employee benefits/resources, contingency planning, and skills-based recruitment for individual businesses. At the industry or provincial level, maintaining a good state of repair for transportation infrastructure and clear, consistent, and knowledge-based criteria for developing provincial safety mandates were two issues discussed as crucial.



Appendix A: Survey Questionnaire

Opening questions

1. What province and city are your operations headquartered in?

2. Are you currently in operation?
   - ○ Yes, currently in operation - full capacity
   - ○ Yes, currently in operation - less than full capacity
   - ○ No, currently not in operation

3. What industry does your business provide services for? Check all that apply.
   - ○ Accommodation and Food Services
   - ○ Administrative and Support, Waste Management and Remediation Services
   - ○ Agriculture, Forestry, Fishing and Hunting
   - ○ Arts, Entertainment and Recreation
   - ○ Construction
   - ○ Educational Services
   - ○ Finance and Insurance
   - ○ Health Care and Social Assistance
   - ○ Information and Cultural Industries
   - ○ Management of Companies and Enterprises
   - ○ Manufacturing
   - ○ Mining, Quarrying, and Oil and Gas Extraction
   - ○ Other Services (except Public Administration)

- ○ Professional, Scientific and Technical Services
- ○ Public Administration
- ○ Real Estate and Rental and Leasing
- ○ Retail Trade
- ○ Transportation and Warehousing
- ○ Utilities
- ○ Wholesale Trade

4. What is the approximate number of employees in your operation?
   - ○ 1 to 4
   - ○ 5 to 19
   - ○ 20 to 99
   - ○ 100 to 249
   - ○ 250 to 499
   - ○ 500 or more or more

5. What are the main services provided by your business? Check all that apply.
   - ○ Shipping
   - ○ Information services (e.g. tracking and tracing)
   - ○ Warehousing and storage
   - ○ Inventory control
   - ○ Quality inspection
   - ○ Integrated supply chain management (transport, warehousing, inventory, etc.)
   - ○ Financial services
   - ○ Order processing
   - ○ Logistics consulting
   - ○ Packaging
   - ○ Returns and repairs
   - ○ Procurement
   - ○ Assembly
   - ○ Kitting
   - ○ Other (please specify)

How the pandemic has altered demand and operations in global and local supply chains

1. Did your day-to-day operations change as a result of COVID19?
   - ○ No
   - ○ Slightly
   - ○ Moderately
   - ○ Significantly

2. Please describe change in day-to-day operations.

3. Approximately how many weeks in total did you have to suspend operations due to COVID19?
   - ○ Did not suspend operation due to COVID19
   - ○ Less than 2 weeks
   - ○ 2-4 weeks
   - ○ 5-8 weeks
   - ○ More than 8 weeks

4. How did the number of employees in your operation change as a result of COVID19?
   - ○ Did not change
   - ○ Increased by less than 5 employees
   - ○ Increased by between 6 and 20 employees
   - ○ Increased by over 20 employees
   - ○ Decreased by less than 5 employees
   - ○ Decreased by between 6 and 20 employees
   - ○ Decreased by over 20 employees

5. How did the number clients served by your operation change as a result of COVID-19?
   - ○ Decreased significantly
   - ○ Decreased moderately
   - ○ Decreased slightly

- ○ No change
- ○ Increased slightly
- ○ Increased moderately
- ○ Increased significantly

6. Was there a change in industrys or industries served by your business? Check all that apply
   - ○ Yes
   - ○ No

6a. If you answered yes to the previous question please specify which industrys or industries you no longer serve or now also serve.

7. How did market demand for your services change during COVID-19?
   - ○ Decreased significantly
   - ○ Decreased moderately
   - ○ Decreased slightly
   - ○ No change
   - ○ Increased slightly
   - ○ Increased moderately
   - ○ Increased significantly

8. How did change in demand for your services because of COVID-19 impact operational capacity? Check all that apply.
   - ○ No change in operational capacity
   - ○ We increased our transportation fleet
   - ○ We increased other physical assets related to production or distribution
   - ○ We increased work hours for at least one work area or task
   - ○ We acquired more space or more facilities
   - ○ We decreased our transportation fleet
   - ○ We decreased other physical assets related to production or distribution
   - ○ We decreased work hours for at least one work area or task
   - ○ We offloaded some space or facilities
   - ○ Other (please specify)

9. How did your cost of operations change as a result of COVID-19?
    - O Decreased significantly
    - O Decreased moderately
    - O Decreased slightly
    - O No change
    - O Increased slightly
    - O Increased moderately
    - O Increased significantly

10. How have the provincially mandated safety standards such as social distancing impacted your operations? (check all that apply)
    - O Did not affect operations significantly
    - O Operations now require more space to maintain social distancing
    - O Operations now require more time to allow for hand sanitization and other safety measures
    - O Other (please specify)

11. In what area of your team have the provincially mandated safety standards created the most challenges? (Check all that apply)
    - O Executive e.g. Chief logistics officer
    - O Purchasing e.g. Purchasing manager, buyer, inventory clerk
    - O Inventory /Supply e.g. Operations manager, demand forecast analyst, production control supervisor
    - O Traffic/Transportation e.g. Transportation manager, traffic analyst, shippers/receivers
    - O Distribution/Warehousing e.g. Distribution manager, warehouse supervisor, materials handlers

12. Was technology or automation used in any changes to your regular operations?
    - O Yes, in response to mandated safety standards
    - O Yes, in response to market demand change
    - O No, technology/automation was not used in operational changes
    - O No, there have been no operational changes
    - O Other (please specify)

13. Did your operations change the number of employees as a result of adopting technology or automation in changes to your regular operations?

- ○ No
- ○ Yes, less than 5 employees were made redundant
- ○ Yes, less than 10 employees were made redundant
- ○ Yes, 10 or more employees were made redundant
- ○ Yes, between 1 and 5 new employees were recruited
- ○ Yes, between 5 and 10 new employees were recruited
- ○ Yes, over 10 new employees were recruited

14. What kind of technology or automation have you adopted in response to change in demand, mandated safety standards or other COVID-19 related reasons? Check all that apply.

- ○ Teleconferencing or other communications technology e.g. Zoom
- ○ Digitization of records (for instance, using cloud-based document storage)
- ○ Digitization of certain work tasks e.g. digital contracts, order fulfilment
- ○ Automation of certain work tasks using robots or process mechanization
- ○ Other (please specify)

15. Please rate the level of difficulty you experienced in adopting technology or automation for operational changes made necessary by COVID-19. Check all that apply.

- ○ We experienced a seamless transition to using technology such as Zoom
- ○ We experienced a somewhat difficult transition to using technology
- ○ We experienced a seamless non-technological transition e.g. by breaking operations into smaller units, each with its own management and monitoring
- ○ We experienced a somewhat difficult non-technological transition

16. Are you directly involved in a global supply chain?

- ○ Yes
- ○ No

16a. If you answered yes to the previous question, how was the demand for your services affected by international travel restrictions?

- ○ Decreased significantly
- ○ Decreased moderately
- ○ Decreased slightly

- ○ No change
- ○ Increased slightly
- ○ Increased moderately
- ○ Increased significantly

How the pandemic has highlighted skills needs in the logistics industry

1. In what positions or roles did the associated skills become more important or required for your operations after COVID-19? Check all that apply.
   - ○ Executive e.g. Chief logistics officer
   - ○ Purchasing e.g. Purchasing manager, buyer, inventory clerk
   - ○ Inventory/Supply e.g. Operations manager, demand forecast analyst, production control supervisor
   - ○ Traffic/Transportation e.g. Transportation manager, traffic analyst, shippers/receivers
   - ○ Distribution/Warehousing e.g. Distribution manager, warehouse supervisor, materials handlers
   - ○ Other (please specify)

2. Please describe why certain positions or roles became more important after COVID-19.

3. In what positions or roles did gaps (gaps not fillable with current employees) emerge as a result of COVID-19? Check all that apply.
   - ○ Executive e.g. Chief logistics officer
   - ○ Purchasing e.g. Purchasing manager, buyer, inventory clerk
   - ○ Inventory/Supply e.g. Operations manager, demand forecast analyst, production control supervisor
   - ○ Traffic/Transportation e.g. Transportation manager, traffic analyst, shippers/receivers
   - ○ Distribution/Warehousing e.g. Distribution manager, warehouse supervisor, materials handlers
   - ○ Other (please specify)

4. Please rate the ease of your experience in filling the emergent gaps in these different occupational areas.

Executive:

- ○ Very easy
- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

Purchasing:

- ○ Very easy
- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

Inventory/Supply:

- ○ Very easy
- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

Traffic/Transportation:

- ○ Very easy
- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

Distribution/Warehousing:

- ○ Very easy
- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

5. What skills gaps (gaps not fillable with current employees) emerged as a result of COVID-19? Check all that apply.
   - ○ Digital skill
   - ○ Document use (ability to understand and apply information from documents)
   - ○ Literacy skill (ability to read, understand text and write)
   - ○ Numeracy skill (ability to read, understand and use numbers)
   - ○ Communication skill (ability to communicate effectively over available channels)
   - ○ Thinking (ability to problem solve effectively)
   - ○ Working with others (ability to collaborate effectively)
   - ○ Learning (ability to adapt and learn in changing circumstances)

6. Please rate the ease of your experience in filling the emergent gaps in these different skill areas.

   Digital skill
   - ○ Very easy
   - ○ Easy
   - ○ Somewhat easy
   - ○ Somewhat difficult
   - ○ Difficult
   - ○ Very difficult

   Document use (ability to understand and apply information from documents)
   - ○ Easy
   - ○ Somewhat easy
   - ○ Somewhat difficult
   - ○ Difficult
   - ○ Very difficult

Literacy skill (ability to read, understand text and write)

- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

Numeracy skill (ability to read, understand and use numbers)

- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

Communication skill (ability to communicate effectively over available channels)

- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

Thinking (ability to problem solve effectively)

- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

Working with others (ability to collaborate effectively)

- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

Learning (ability to adapt and learn in changing circumstances)

- ○ Easy
- ○ Somewhat easy
- ○ Somewhat difficult
- ○ Difficult
- ○ Very difficult

Challenges experienced in closing skills gaps

1. What were some human resource management challenges faced in closing skill gaps through recruitment? Check al that apply.
   - ○ Time constraints (closing the gap quickly was key to continuing operations)
   - ○ Cost (the skills needed were high-cost, lost supply skills)
   - ○ Other (please specify)

2. Did you have the option to train current employees as a strategy for closing skill gaps?
   - ○ Yes
   - ○ No, current employees were fully occupied, with no capacity for additional contribution
   - ○ Other (please specify)

Resources and training for adaptability

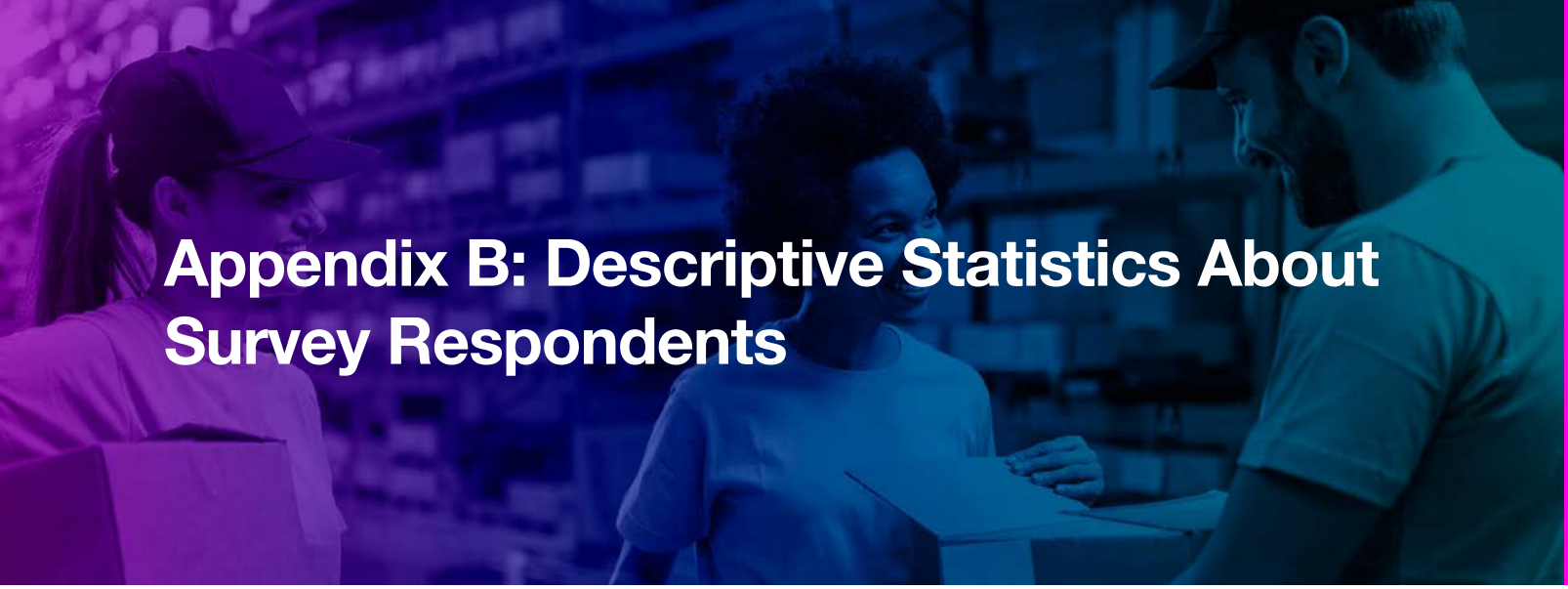
1. Did your operation already have an adequate training scheme in place that met the needs for employee adaptability during an emergency like COVID-19?
   - ○ Yes
   - ○ No

2. What other resources were useful in helping employees adapt to COVID-19 related challenges? Check all that apply.
   - ○ Financial benefits e.g. paid sick-leave
   - ○ Community support e.g. worker's online community, wellness zoom meetings
   - ○ Professional support e.g. counselling, mental health support
   - ○ Flexibility on working hours
   - ○ Flexibility on place of work (work from home or office)
   - ○ Other (please specify)

3. In what ways could any inadequacies experienced in training be improved? Please describe.

Closing question

1. What long-term changes in skills or operations will the Supply Chain & Logistics industry need to undergo to be prepared for the potential of a future emergency? Please describe.



Appendix B: Descriptive Statistics About Survey Respondents

FIGURE 19

Location of operations headquarters for logistics businesses

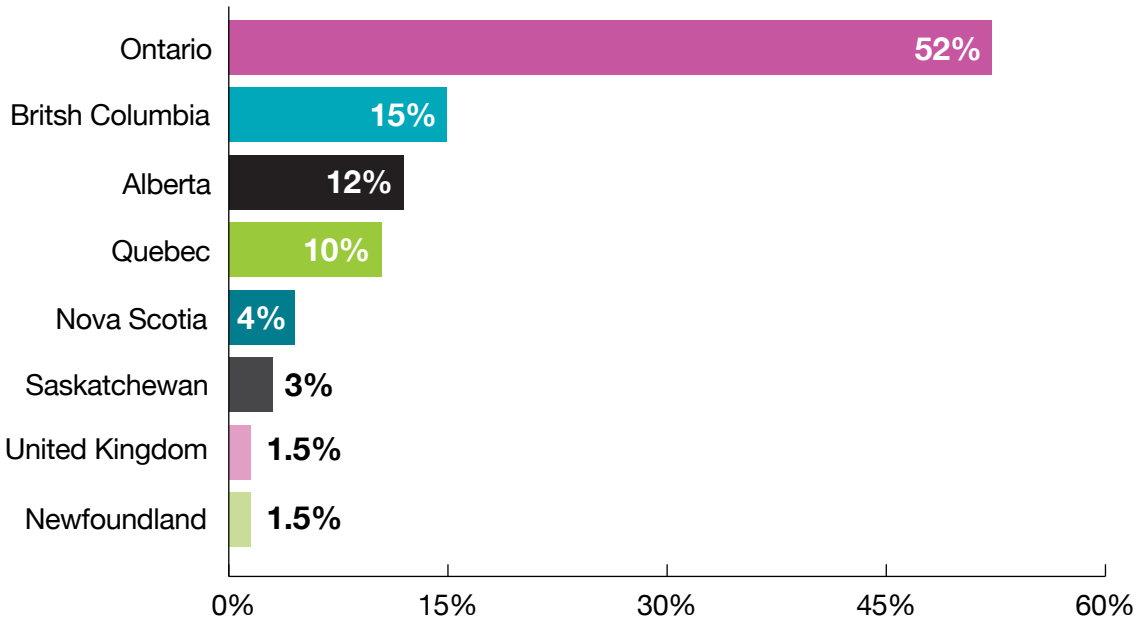


FIGURE 20

Number of respondents who report that their organizations serve different industry types

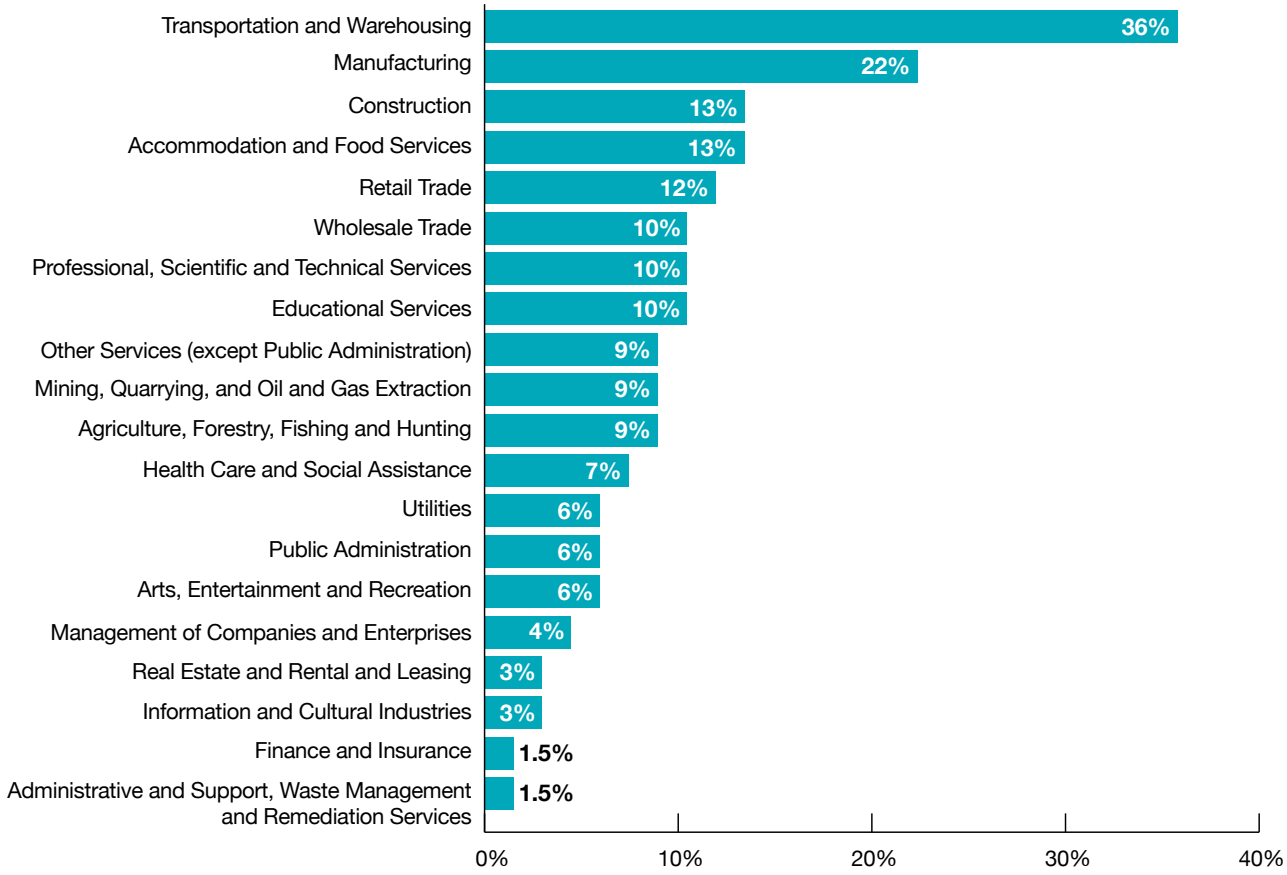


FIGURE 21

Number of respondents who report that their organizations provide different services

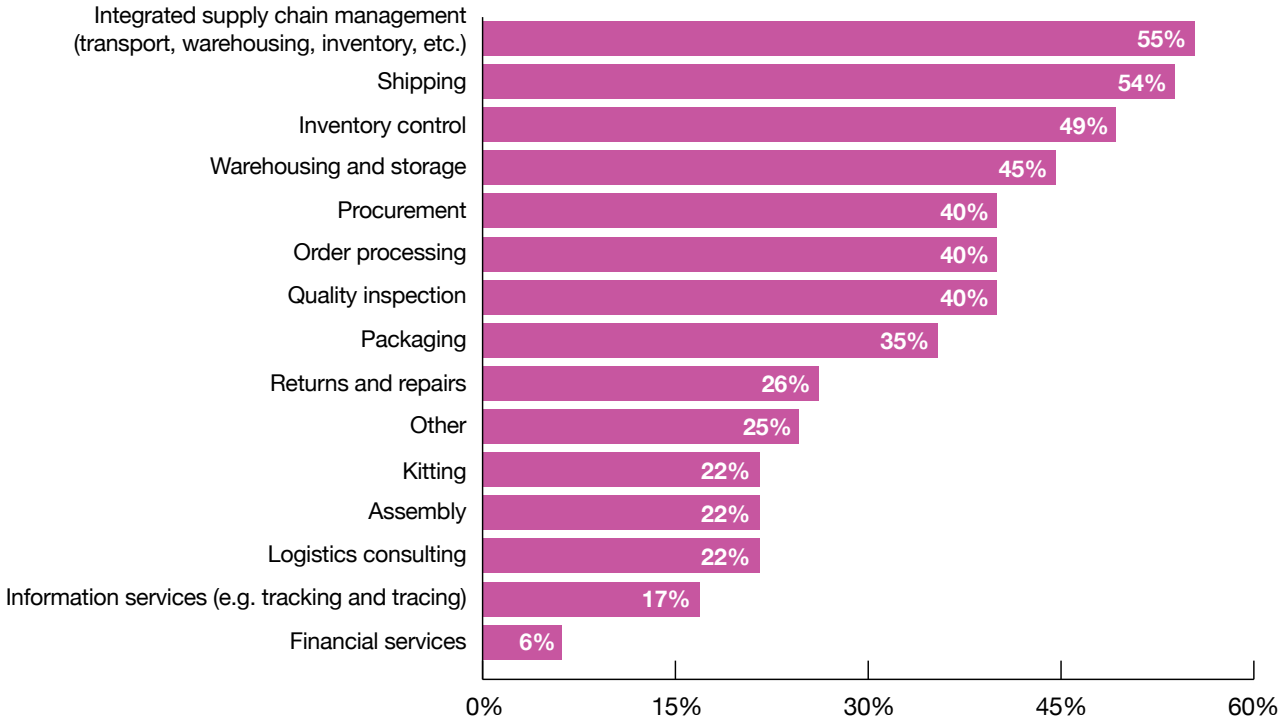


FIGURE 22

Number of employees in respondents' organizations

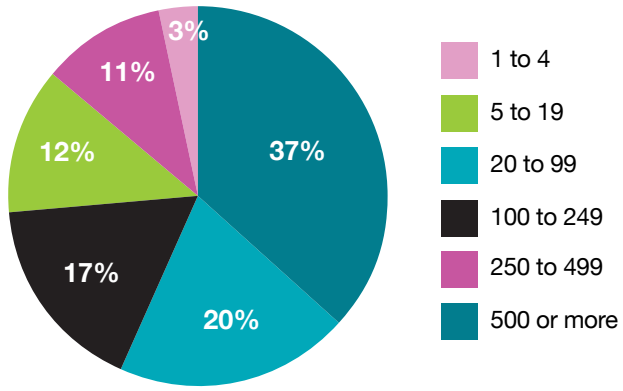
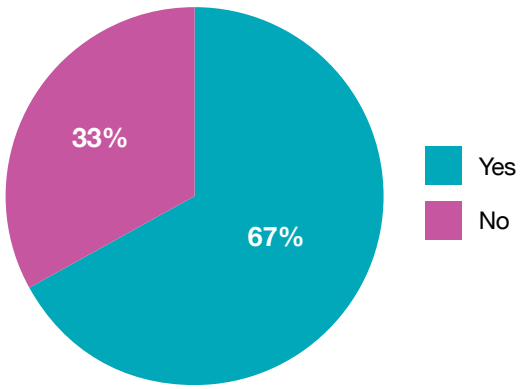


FIGURE 23

Direct involvement in a global supply chain



Appendix C: Government of Canada Essential Skills

TABLE 10

Government of Canada essential skills

Essential Skill	Definition
Communication	The use of speech to give and exchange thoughts and information by workers in an occupational group.
Digital Skills	Skills needed to understand and process information from digital sources and use digital systems, technical tools, and applications.
Document Use	Using a variety of information displays in which words, numbers, icons, and other visual characteristics (e.g., line, colour, shape) are given meaning by their spatial arrangement.
Learning	The requirement for workers in an occupational group to participate in an ongoing process of acquiring skills and knowledge.
Literacy	The ability to understand reading material in the form of sentences or paragraphs.
Numeracy	Workers' use of numbers and their capability to think in quantitative terms.
Thinking	The ability to engage in the process of evaluating ideas or information to reach a rational decision.
Working with Others	The extent to which employees work with others to carry out their tasks.

Source: Employment and Social Development Canada. ***Essential skills definitions.*** Note that since the writing of this report, the Essential Skills framework has been updated to the new Skills for Success model; see: https://www.canada.ca/en/services/jobs/training/initiatives/skills-success/new-model.html

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