



## Agriculture, Transportation, and the COVID-19 Crisis

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### ABSTRACT

In this short paper, I assess how COVID-19-related disruptions in transportation services, as well as new demands for transportation services, could impact Canadian agricultural supply chains. The brief analysis reveals that agricultural access to bulk ocean freight, rail movement, and trucking has generally improved in the pandemic, bolstered by the reduced demand for these transportation services by other sectors of the economy. The intermodal containerized movement of grains and food products has seen some disruption from the lack of empty containers in North America. The widespread consumer adoption of physical distancing measures has vastly increased the demand for retail food pickup and delivery services to the point where these services are being rationed by long wait times. From a policy perspective, there is an apparent need for: 1) continued supply chain monitoring and industry engagement, 2) the proactive development of strategies to deal with absenteeism and other potential threats to the supply chain, and 3) an assessment of the economic and health merits of providing additional public resources to provide greater access to grocery pickup and delivery services.

### RÉSUMÉ

Dans ce court article, j'évalue comment les perturbations des services de transport liées au COVID-19, ainsi que les nouvelles demandes de services de transport, pourraient avoir une incidence sur les

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chaînes d'approvisionnement agricole du Canada. La brève analyse révèle que l'accès des agriculteurs au fret maritime en vrac, au transport ferroviaire et au camionnage s'est généralement amélioré au cours de la pandémie, soutenu par la réduction de la demande de ces services de transport par d'autres secteurs de l'économie. Le mouvement intermodal conteneurisé de céréales et de produits alimentaires a été perturbé par le manque de conteneurs vides en Amérique du Nord. L'adoption généralisée par les consommateurs de mesures physiques de distanciation a considérablement accru la demande de services de collecte et de livraison de produits alimentaires au détail, au point que ces services sont rationnés par de longs délais d'attente. D'un point de vue politique, il existe un besoin apparent de: 1) une surveillance continue de la chaîne d'approvisionnement et un engagement de l'industrie, 2) l'élaboration proactive de stratégies pour lutter contre l'absentéisme et d'autres menaces potentielles pour la chaîne d'approvisionnement, et 3) une évaluation de la conjoncture économique. et les avantages pour la santé de fournir des ressources publiques supplémentaires pour offrir un meilleur accès aux services de cueillette et de livraison d'épicerie.

### **Introduction**

Food supply chains connect heavily-dependent producers and consumers throughout the globe, often with just-in-time delivery. Many of these critical supply chains have been disrupted, or are threatened to be disrupted, by the COVID-19 pandemic.

In this paper, my goal is to assess how COVID-19-related disruptions in transportation services, as well as new demands for transportation services, could impact Canadian agricultural supply chains. The brief analysis examines how different modes of transport, including bulk ocean freight, rail movement, intermodal containerised movement, trucking, and home delivery, have been and will be impacted by COVID-19. I recognise that this is a partial analysis and that supply chains will be differentially impacted depending on the nature and the products in the supply chain and the modes of transportation the supply chain is reliant upon. To conclude my analysis, I discuss the implications for policy, including the need for continued supply chain monitoring and industry engagement, the need for the proactive development of strategies to deal with absenteeism and other potential threats to the supply chain, and, finally, the need to assess the merits of providing additional public resources to augment grocery pickup and delivery services as a means to reduce COVID-19 risk in the last 100 meters of the food supply chain.

## Background

The macroeconomic implications of social distancing measures used to flatten the curve for the spread of the COVID-19 pandemic have been very profound, shutting down many parts of the service sector, the hotel and restaurant sector, the tourism sector, the manufacturing sector, and most of the retail sector. This, combined with an international price war in crude oil and severe international restrictions on travel and immigration, has profoundly impacted the level of economic activity in North America and the global economy as a whole. Despite announcements of unprecedented government stimulus packages, stock markets have lost nearly 30% of their value, and global GDP is expected to drop precipitously.

With the important exception of the restaurant industry, many agricultural and food supply chains are likely to fair much better than the general economy. Food demand will be bolstered by consumers who are eating at home and needing to restock their pantries. Recognising that people have to eat, governments throughout the world have taken measures to protect the integrity of food supply chains. The drop in GDP will almost certainly free up transportation capacity and labour supply, some of which can be redeployed to address potential pandemic-related shortages in the agricultural and grocery supply sector.

The modern transportation of agricultural goods is dominated by trucking, rail transportation, and ocean shipping. Millions of tonnes of grain move to port by rail or truck and from port to port by bulk ocean transport. Longer hauls have some presence of intermodal containerised movement. Inter-continental trade of perishable items relies on refrigerated containers or air freight for high-value perishable products. Short-hauls from farm gate to processor, processor to food manufacturer, processor to distribution centre, and distribution centre to retail are dominated by purpose-built trucks. Consumer pickup and door-to-door delivery services have become increasingly important in the last leg of food delivery. Each of these forms of transport have been impacted differently by the measures related to the COVID-19 pandemic.

## Bulk Ocean Freight

Large ocean freighters are manned with small crews who are naturally isolated from mainland populations while at sea. These crews have become even more isolated with new port landing restrictions and their fear of bringing COVID-19 aboard. With the drop in the demand for non-

agricultural traffic, there is an abundance of ocean freight capacity. As shown in Figure 1, the Baltic Exchange Dry (Ocean Freight Rate) Index has decreased by 80% in the last six months, from a recent peak of 2,500 points in September to a near all-time record low of 450 points in early February. The index, which was established in 1985 at an index level of 1,000, has recovered somewhat since February and was at 620 points on April 2, 2020. These lower-than-normal low bulk ocean freight rates should offset some of the higher-than-normal export basis in western Canada.

### **Rail Movement**

Rail transportation is essential for the movement of 40-50 million tonnes of grain out of western Canada each year. This past crop year, a delayed wet harvest, an early onset of winter temperatures, a labour strike, and protest-related blockages put grain export rail movement well behind schedule, resulting in long lineups for vessel loading in Vancouver in early February (Quorum Corporation, 2020). Fortunately, grain exports have accelerated during the month of March, showing minimal impacts from measures related to COVID-19.

Like trucking, rail movement has become less and less labour intensive, with smaller crews operating larger trains. While not directly impacted by social distancing rules, this sector could be vulnerable if a significant proportion of the very specialised workforce fell ill to COVID-19. Fortunately, the significant reductions in non-agricultural rail freight traffic have created a larger pool of locomotives and crews that are potentially available to move grain and agricultural-related freight if the demand is there.

### **Marine Container Movement**

Marine containers are increasingly used to export pulse crops and edible soybeans. Containers typically arrive from Asia filled with manufactured goods shipped to North America, and some of the empty containers are loaded with specialty crops for the return trip to Asia. The COVID-19-related shutdown of Chinese production and the subsequent drop in North American demand have created a shortage of empty containers for the backhaul to Asia (Shih, 2020). New additional requirements to quarantine containers for 14 days at the port of arrival in several importing countries will lengthen cycle times and exacerbate this problem. The COVID-19 impacts on the demand for

specialty crops in overseas export markets and the ability to switch to bulk ocean transport will dictate the severity of the container shortage.

### **Trucking Services**

Recognised as being vital to food supply chains, most transportation services have not been subject to regulated closures. They have, however, adopted many social distancing protocols to protect employees and their customers. Fortunately, modern transportation systems typically have spatially separated labour deployment with little human-to-human contact required. The protocols for the delivery of farm inputs, farm produce, or intermediate or final processed goods to grocery distribution centers have been very quickly modified so that they do not require a trucker to leave the safe confines of their truck. The most vulnerable are those drivers moving products from a distribution center to institutions or small grocery outlets, where personal contact and service have been important features of the delivery and are therefore resistant to change.

At least two new COVID-19-related trucking issues required, and have already received, policy responses from the government. In mid-March, many long-distance truckers indicated that they lacked sufficient access to toilets because of the closure and reduction in operating hours of roadside restaurants. In response, several provincial governments have placed portable toilets at rest stops and weigh stations (McKeen, 2020). The desire to limit multiple drivers from using the same truck, as well as COVID-19-related delays, have made some trucking routes more difficult to service in a timely manner. In an effort to protect drivers from COVID-19 while keeping the product moving, Transport Canada and several provincial governments increased the maximum hours of service for drivers (Tabak, 2020).

The decentralized trucking industry is in a relatively good position to quickly respond to COVID-19-related disruptions in food supply chains. The supply of potential tractor units and drivers for the transportation of agricultural goods is buttressed with those usually engaged in transporting manufactured goods. The 15% to 20% drop in diesel prices has also reduced the variable cost of trucking.

## Home Delivery

The transportation link in the food supply chain most impacted by COVID-19 has been home delivery. Social distancing measures have required restaurants and bars to stop using table service for their customers, so many have created increased pickup and home delivery options in an attempt to stay in business. Microbreweries, pharmacies, and bakeries have also created home delivery options. Most grocery stores have followed suit. While the supply response and rate of innovation has been impressive, the grocery store response has not been enough to prevent waiting times of several days to access very popular grocery pickup and delivery options. While some consumers prefer instore shopping despite some perceived risk, the waiting times and learning curve for delivery have forced many other consumers to continue to use instore shopping. Once consumers have sunk the learning costs required to adopt these modes of food delivery and firms have adapted their infrastructure to these shifts occurring in these last 100 meters of the supply chain, changes are likely to persist well beyond the COVID-19 pandemic.

## Policy Implications

### 1. *Industry Engagement and Planning for Disruptions*

To a very large extent, the transportation services have continued to operate and have been robust enough to meet the challenges of the COVID-19 pandemic to date. Almost certainly, there will be some unanticipated delays due to absenteeism and some spikes in transport demand due to temporary plant closures and policy changes that will not be immediately addressed. Governments are acutely aware of the critical role that transportation plays in these supply chains. Policy makers need to continue to monitor and plan for absenteeism, exploring ways to recruit and train additional workers for critical parts of the supply chain while they continue to work with industry to anticipate, identify, and address new issues as they arise.

### 2. *Grocery Delivery and Social Distancing*

Nearly every jurisdiction in Canada has taken measures and encouraged the public to socially distance. Anecdotally, many households are practicing strict social distancing and are staying home to avoid all public contact, with the important exception of shopping for groceries.

As evidenced in the updated advice for wearing masks, there is growing scientific evidence that the virus causing COVID-19 (SARS-CoV-2) can be spread by both asymptomatic and symptomatic individuals through surface contact or through airborne droplets and aerosols from the lungs of infected individuals (van Doremalen et al., 2020). If SARS-CoV-2 can be transmitted by aerosol or surface contact (e.g., Tellier et al., 2019; Smieszek et al., 2019), then grocery stores and pharmacies are very dangerous places because they are the only external source of the virus for otherwise isolating households. If this is the case, instore shopping is not only risky for the shopper, but it is also a source of external social cost to other shoppers and the health care system. An incentivized move from instore shopping to grocery pickup or delivery could reduce the extent of this COVID-19 externality.

While one could imagine regulations or pigovian taxes to deter instore shopping, a less draconian alternative would be to encourage and subsidize approved pickup and delivery services. This could be done quickly. There are many newly unemployed individuals in the labour market that could be quickly trained to safely provide grocery packing services. They could be ‘repurposed’ for these jobs, especially if this repurposing was heavily incentivized through public policy. Similarly, there are many underemployed taxi and UBER drivers that could deliver groceries to those who cannot drive to pickup locations.

The government has already announced a 75% wage subsidy for businesses that have seen a 30% reduction in their sales due to COVID-19. It would be simple to expand this subsidy program to all food (and drug) retailers to hire employees to expand pickup and delivery service capacity. Employing individuals to provide additional technical support for consumers and small businesses needing assistance with online shopping or using online payment systems would also support effective social distancing.

Taxpayers will be paying most of this subsidy cost for unemployment in any case, and this measure could save substantial health care costs at the same time. Addressing the instore shopping externality will make it possible for more households to practice strict social distancing, possibly saving lives and public resources. If we are going to move beyond the economy-wide shutdowns, we may need these measures to ensure that COVID-19-vulnerable households all have adequate access to pickup and delivery options. While some consumers may choose to continue to shop in-person, this measure will reduce wait times, allowing more consumers to make a choice to reduce risks to themselves and others.

## Conclusions

The pandemic and the measures to address the pandemic have created significant new challenges for transportation systems. The limited supply of empty non-refrigerated marine shipping containers will cause some delays and increase logistical issues in some export supply chains for specialty grains and processed products. COVID-19-related temporary processing plant closures are likely to create sporadic and exceptional demand for transport services. The grocery supply chains must respond to increased volumes as social consumers stock their pantries and curtail their demand for food away from home. Finally, the requirement for social distancing has created a very large new social demand for grocery pickup and delivery services, which may warrant additional public support.

Not surprisingly, I find that transportation provides vital links for almost all agricultural supply chains. Fortunately, many transportation services are provided by extensive networks staffed by individuals and small teams of drivers, making them more resilient to COVID-19 absenteeism. Also, reduced demand for transportation services in most other sectors of the economy will reduce transportation costs and increase transportation availability for most agricultural supply chains. Barring the worst-case scenario of a severe pandemic that simultaneously impacts a large percentage of the workforce, transportation services are likely to continue to meet the demand of most food supply chains most of the time.

Policy makers need to continue to regularly engage with industry to anticipate, identify, and address new issues as they arise. I also identify a health externality associated with instore grocery shopping and argue the merits of subsidizing food delivery.

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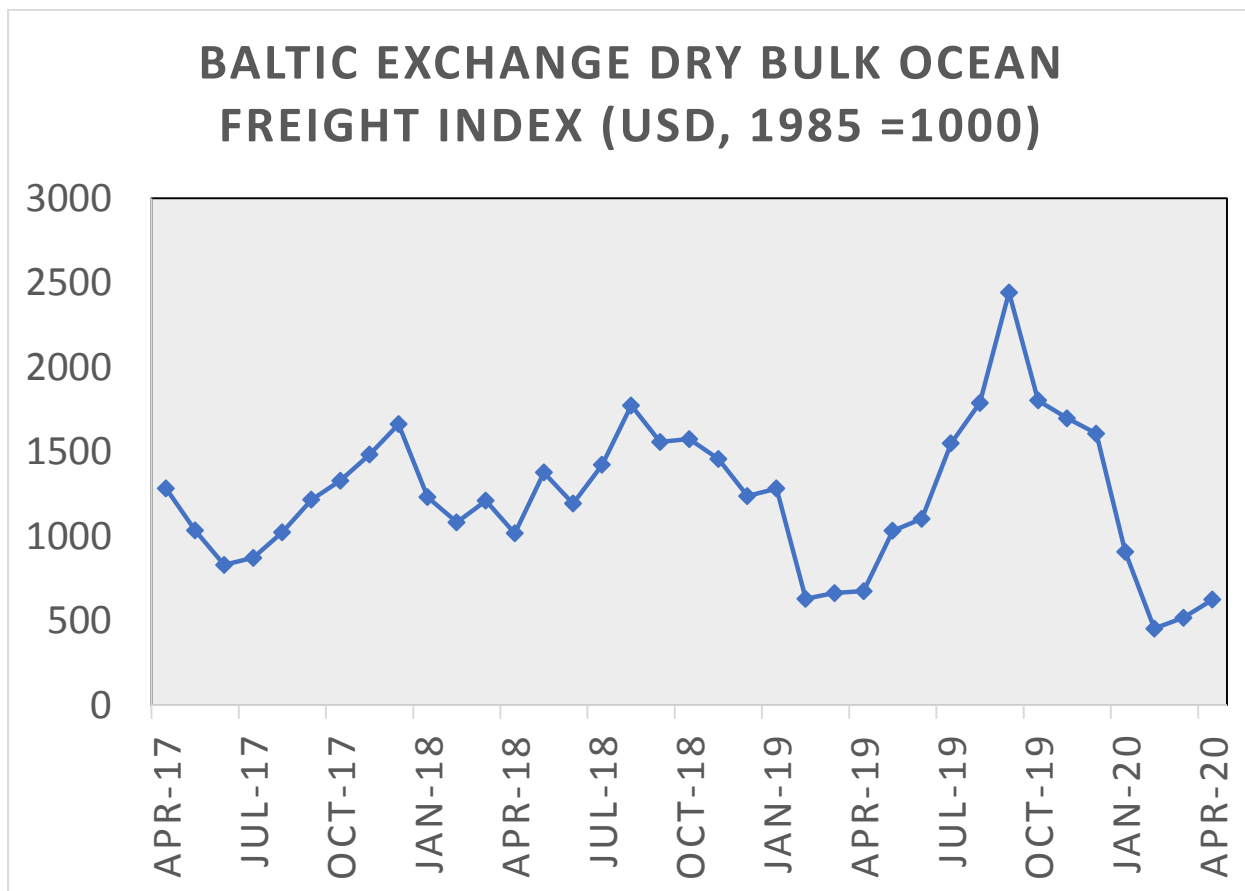


Figure 1. Baltic exchange dry index monthly open values, April 2017-April 2021

Source: Data from Trading Economics <https://tradingeconomics.com/commodity/baltic>