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Economic Impacts of Transportation Labour Disruptions on Canada's Grain Sector

Prepared for:

The Strategic Issues Subcommittee of the Crop Logistics Working Group

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I. Executive Summary

PURPOSE OF REPORT

The Strategic Issues Subcommittee of the Crop Logistics Working Group (CLWG) partnered with Anderson Economic Group (AEG) to estimate the impact of potential work stoppages in the rail and port sectors on the Canadian grain industry. This report analyzes and presents the economic impacts of a number of possible disruptions, which have different durations, arise at different times during the year, and occur in different transportation sectors. The main goal is to measure the lost earnings in the grain industry in the event of a work stoppage.

Canada's grain sector is vulnerable to labour disputes in the domestic rail and port sectors. After harvest, Canadian grain is shipped from farms to country elevators, most of which is then transported to ports on the West Coast and Great Lakes for export. Many Canadian companies, workers, and households depend on the international sale and shipping of grain as a source of income. Labour disputes can disrupt this process by slowing or stopping the movement of grain, which imposes costs and reputational damages on the country's grain industry. Rail and port work stoppages in recent years have demonstrated the need to quantify the economic impacts that a transportation disruption can have on the grain sector.

OVERVIEW OF APPROACH

To analyze the economic impacts of transportation labour disruptions on the Canadian grain sector, AEG completed the following tasks:

1. Collected and reviewed the most recent available data on Canada's grain sector, including production, exports, domestic consumption, prices, transportation linkages, and costs associated with different companies and ports.
2. Compiled a list of labour disruptions in the rail and port sectors between 2019 and 2025.
3. Conducted a literature review on Canada's grain industry, supply chain structure, industry reports, and the Canada Labour Code.
4. Developed an economic impact model to measure the change in earnings based on various transportation disruptions in the rail and port sectors. This model also considered the timing of such disruptions while accounting for factors such as lost sales, contract penalties, demurrage fees, and other costs.
5. Conducted interviews with stakeholders to inform and verify the assumptions utilized in the lost earnings model.
6. Analyzed the effects of recent work stoppages using rigorous statistical methods to inform assumptions in the lost earnings model.

The analysis focuses on income losses to the grain industry that are attributable to a hypothetical work stoppage in either the rail or port sector. We consider 18 crops and two products of canola processing, listed under "The Canadian Grain

Industry" on page 7. *Primary processing of other grains is not included.* Thus, the economic losses presented in this report are conservative estimates of the total impact a transportation labour disruption would have on the grain industry, and would be higher if primary processing were included.

The analysis accounts for the fact that effects can begin to accrue prior to and linger after a disruption. The impacts do not include costs normally incurred in the absence of a work stoppage, losses to Canadian transportation workers or damages to overseas buyers.

SUMMARY OF FINDINGS

Finding 1. Labour disruptions cause severe economic damage to Canada's grain industry. A combined rail and port work stoppage that lasts one week in the peak export season costs the grain industry nearly $540 million.

The most damaging disruption is a total shut down of the rail and port sectors during the peak export season, which typically runs from September through January. A one-week work stoppage in the rail and port sectors during this period is estimated to cost the grain industry $540 million. A similar disruption during the non-peak period results in a lower total cost of $393 million. The economic damage is due to lost sales, contract penalties, and other additional costs such as demurrage charges and interest costs. Impacts scale with the length of the disruption, with longer stoppages leading to greater losses.

Table 1 summarizes lost earnings borne by the grain industry as a result of a one-week work stoppage.

TABLE 1. The Economic Impact of a One-Week Work Stoppage on Canada's Grain Industry (in CAD)

Labour Sector	Peak Season	Non-Peak Season
Rail and Port	$539,656,683	$392,515,551
Both CN and CPKC	$507,277,282	$368,964,618
CN Rail	$258,711,414	$188,171,955
CPKC Rail	$248,565,868	$180,792,663
West Coast Ports	$35,723,899	$25,322,329
East Coast Ports	$10,884,141	$8,080,819

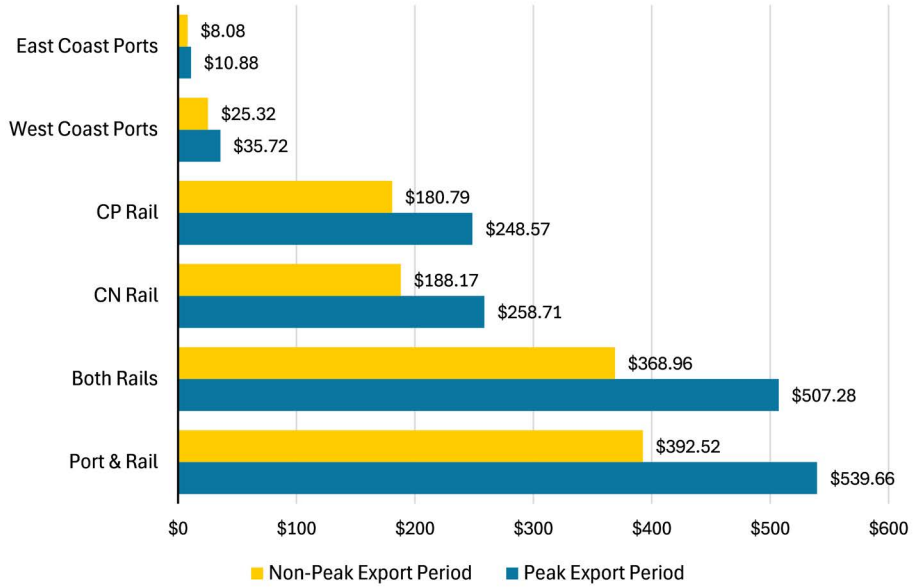
Source: AEG analysis using data on Canadian grain exports in 2024, prices, transportation market shares, and impacts of recent strikes.
Note: Primary processing of grains, other than canola, is not included in calculations.

See "The Economic Impacts of Labour Disruptions on the Canadian Grain Industry" on page 22 for a breakdown of lost earnings by cost categories and losses due to one-day and three-day work stoppages.

Finding 2. Labour disruptions in the rail sector have much higher costs than those in the port sector. A one-week work stoppage by both major Class I railways costs the grain sector more than $507 million.

Rail disruptions are comparatively more damaging than port disruptions. A one-week work stoppage during the peak season by Canadian National (CN) workers costs $259 million, and a similar stoppage by Canadian Pacific Kansas City (CPKC) workers costs $249 million. These losses far exceed those from isolated port strikes on the East Coast ($11 million) or West Coast ($36 million). When rail service stops, grain movement to domestic markets, North American buyers, and Canada's ports effectively comes to a halt, with no viable alternatives. By contrast, the impact of a port work stoppage is partially contained because Section 87.7 of the Canada Labour Code requires longshore workers to maintain necessary services that ensure the movement of bulk grain through licensed terminals. Figure 1 illustrates the damage caused by one-week work stoppages in different labour sectors.

FIGURE 1. Economic Impacts of a One-Week Work Stoppage by Type and Export Season (in millions of CAD)



Source: AEG analysis of data on Canadian grain exports, prices, transportation market shares, and impacts of recent strikes.

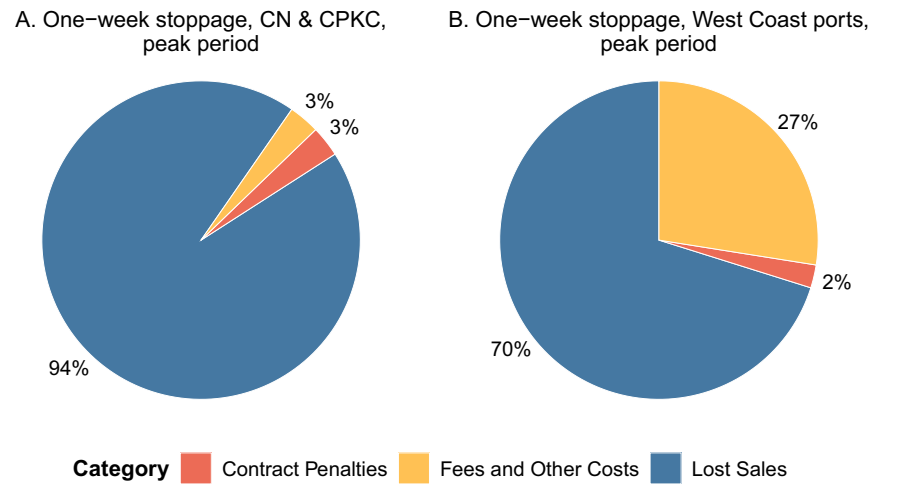
See "The Economic Impacts of Labour Disruptions on the Canadian Grain Industry" on page 22 for more information about the costs of disruptions in different labour sectors.

Finding 3. A reduction in grain sales, or lost sales, is the primary factor in the cost of a transportation labour disruption.

Revenue loss from reduced sales, not added operational expenses or penalties, is the primary cost during a work stoppage. Our economic impact model accounts for lost sales, contract penalties, lower prices in case of defaults, and other costs such as demurrage fees and interest costs. Approximately 94% of the cost of a Class I railway labour disruption is due to revenue loss from reduced sales, while approximately 70% of the cost in the port sector is due to reduced sales. The grain industry starts incurring economic losses before a work stoppage even begins and continues after it ends, as rail and port operations slow down and then recover from a stoppage. This means that pausing demurrage fees or avoiding penalties through contractual clauses (for example, force majeure) has a minimal impact on the total cost of a disruption; the vast majority of impact can only be avoided by shortening or avoiding the transportation disruption.

Figure 2 breaks down the economic impacts of two work stoppage scenarios by cost category. As discussed above, lost sales make up the majority of a labour disruption's total economic costs.

FIGURE 2. Economic Impact of a Work Stoppage Breakdown



Source: AEG analysis of data on Canadian grain exports, prices, transportation market shares, and impacts of recent strikes.

See "The Economic Impacts of Labour Disruptions on the Canadian Grain Industry" on page 22 for a full breakdown of the costs of disruptions for all scenarios.

Finding 4. A transportation labour disruption imposes significant costs on the grain industry before it even begins, with pre-disruption lost sales reaching $112 million.

Economic impacts from transportation labour disruptions begin before any work stoppage occurs. Rail and port operations typically slow down in anticipation of a labour disruption, reducing grain movement and limiting exporters' ability to sell at full capacity. Analysis of grain traffic around past work stoppages shows a marked decline in grain movement during the week leading up to a disruption. This slowdown creates significant pre-stoppage losses—up to $112 million in lost sales prior to a rail-and-port work stoppage during the peak export period. These pre-disruption losses represent about 64% of total lost sales for a one-day stoppage and 22% for a one-week stoppage.

Grain companies also face extra operational costs once a strike notice is issued, as they shift sales, adjust rail and vessel bookings, and manage contract risks. One interviewed grain company estimates $30,000-$50,000 per day in added operating expenses. Although not quantified in this report, these operational costs, combined with pre-disruption lost sales, suggest that even the possibility of a labour disruption can impose substantial economic damage on the grain sector before any actual stoppage begins.

See "Impacts Prior to Work Stoppage" on page 30 for a detailed discussion of the economic impacts before a labour disruption.

Finding 5. Repeated rail and port labour disruptions can cause significant and lasting reputational damages to the Canadian grain industry.

Canada's grain sector faces significant long-term reputational risks from recurring rail and port work stoppages. Interviews with major Canadian grain exporters indicate that repeated disruptions weaken Canada's reputation as a reliable supplier in global markets, strain business relationships, and might permanently shift buyers to alternative suppliers, even when Canada's product quality remains high. This is supported by analyses of U.S. West Coast port congestion and Canada's August 2024 rail shutdown, which reveal cargo diversion, loss of sole-source contracts, and diminished trust in supply-chain resiliency. While direct measurement of reputational damages is limited, survey data suggests that supply chain disruptions often lead to tarnished brand image and loss of regular customers. Based on previous industry reports and surveys, work stoppages likely cause permanent customer loss for Canada's grain industry.

See "Reputational Damages" on page 31 for a full discussion of the potential reputational harms caused by transportation labour disruptions.

ABOUT ANDERSON ECONOMIC GROUP

Founded in 1996, Anderson Economic Group is a boutique research and consulting firm, with offices in East Lansing, Michigan, and Chicago, Illinois. The experts at AEG have particular expertise in public policy and economic analysis.

The experts at AEG have conducted nationally-recognized economic and fiscal impact studies for private, public, and non-profit clients across the United States. Some examples include, the impact of the Obama Presidential Library, and annual benchmarking study for the University Research Corridor, national sporting events, and many others.

Work by AEG has been utilized in legislative hearings, legal proceedings, and public debates, as well as major planning exercises and executive strategy discussions. For more information, please see "Appendix C. About Anderson Economic Group" on page C-1 or visit AndersonEconomicGroup.com.

II. The Canadian Grain Industry

OVERVIEW

This study considers 18 crops and two products of canola processing produced and supplied by Canada's grain industry, which includes pulses, oilseeds, and cereals. Pulses include peas, chickpeas, lentils, dry beans, and fababeans. Oilseeds include flax, mustard, canola (seed, meal, and oil), soy, and sunflower seeds. Cereal grains include barley, buckwheat, corn, canary seed, rye, oat, wheat, and durum wheat. *Other than canola meal and oil, primary processing of other grains is not included.*

Of the 18 crops, wheat makes up 36% of production (measured in metric tonnes), followed by canola at 20% and corn at 17%. The next two largest, barley and soy beans, make up 10% and 7%, respectively. Based on data from the Food and Agriculture Organization (FAO), primary field crop production in Canada was 89.7 million metric tonnes (MMT) in 2023, down slightly from 99.2 MMT in 2019; whereas world production was up, from 3,138 MMT in 2019 to 3,332 MMT in 2023. This means that, based on the most recent available global data, Canada's share in world production is approximately 3%.[1]

Alberta, Manitoba, and Saskatchewan are the top three Canadian provinces in terms of overall grain production. Saskatchewan led with 36.8 MMT, followed by Alberta at 22.3 MMT and Manitoba at 14.3 MMT in 2024, with wheat, canola, and barley being major crops. Ontario and Quebec are major growers of corn and soybeans. Nevertheless, the three Prairie Provinces dominate in overall share, accounting for approximately 75% of Canada's grain output.

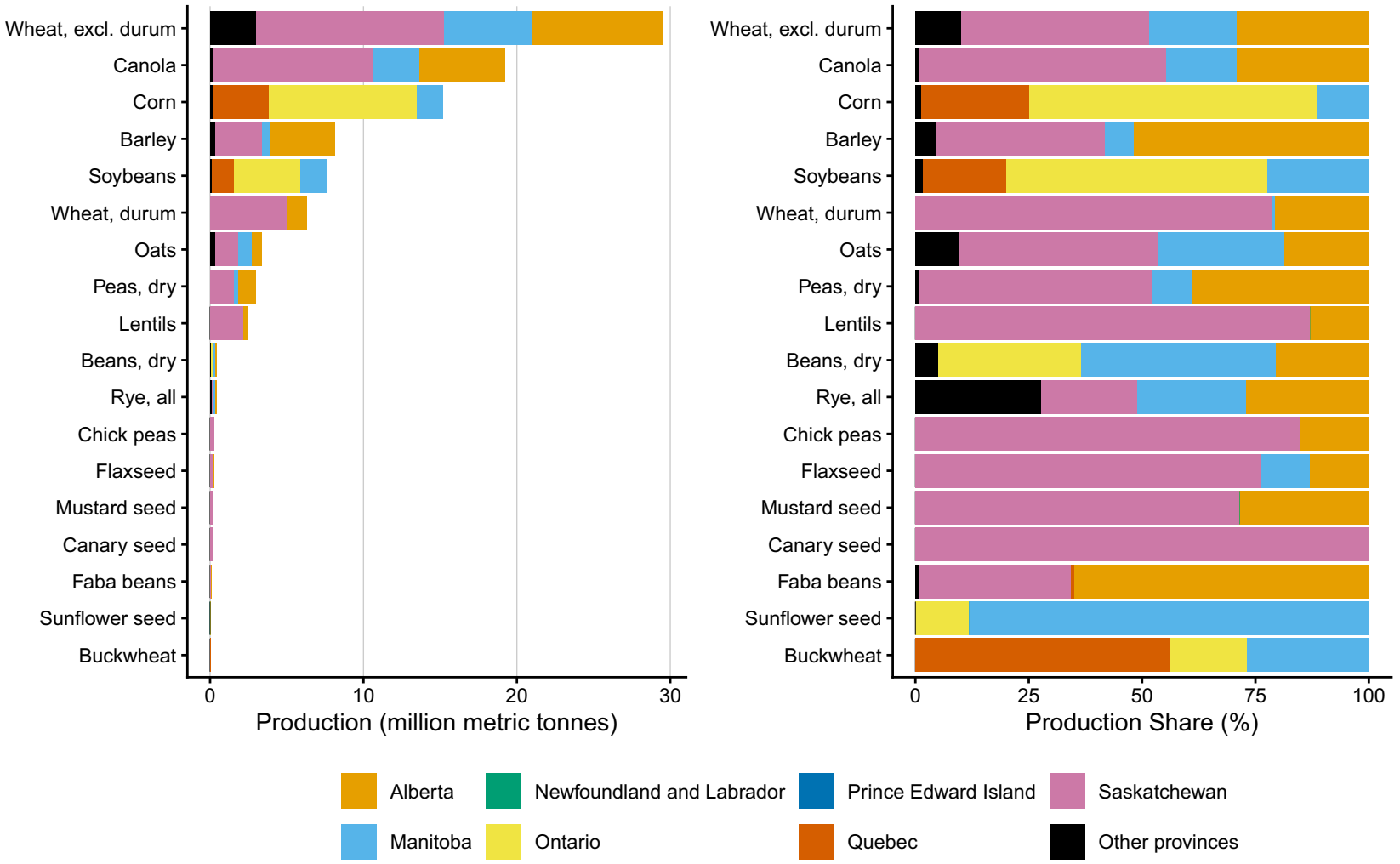
GRAIN PRODUCTION

In 2024, nine of the 18 crops considered in this study had an output exceeding 2 MMT, including five cereals, two oilseeds, and two pulses. The other nine crops were produced at less than 0.5 MMT each. Overall, cereals and oil seeds dominated Canada's crop production, with the top five most-produced crops being non-durum wheat (29.6 MMT), canola seed (19.2 MMT), corn (15.2 MMT), barley (8.1 MMT), and soybeans (7.6 MMT). The most produced pulses are peas (3 MMT) and lentils (2.4 MMT).[2]

Most crops are produced in two or three provinces. The Prairie Provinces (Saskatchewan, Alberta, and Manitoba) are the main producers of cereals and oilseeds, while Ontario and Quebec contribute heavily to corn and soybean output. The other provinces play a comparatively minor role in Canada's grain production. See Figure 3, "Principal Field Crop Production by Province, 2024," on page 8.

1. AEG analysis of global production data published by the Food and Agriculture Organization.
2. AEG analysis of production data published by Statistics Canada.

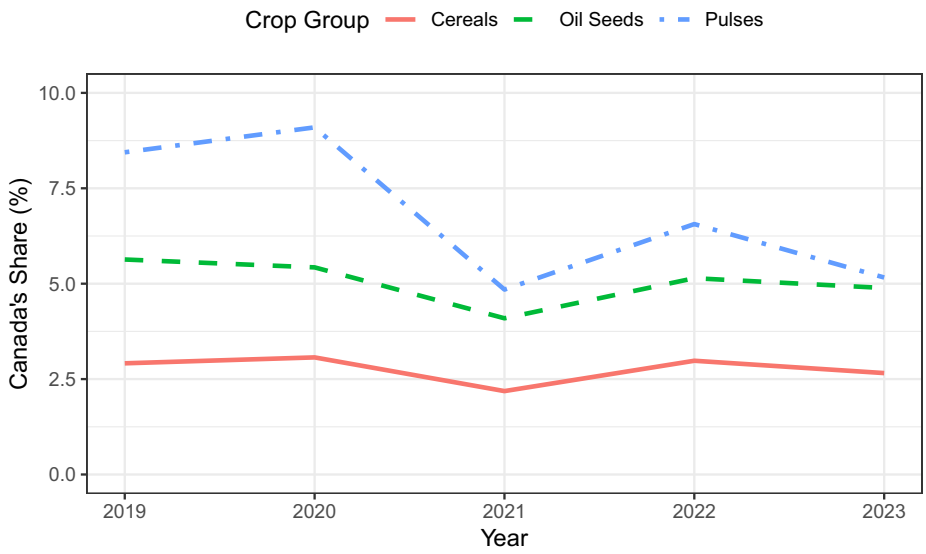
FIGURE 3. Principal Field Crop Production by Province, 2024



Source: AEG analysis of production data published by Statistics Canada.
Note: Primary processing not shown.

In terms of output (as measured in metric tonnes), Canada accounts for roughly 3-5% of global tonnage in 2023, depending on the crop group. Figure 4 shows that between 2019 and 2023, Canada's share of global pulse output peaked at almost 8% in 2020. Canada's shares of global oilseed and global cereal production have been relatively stable at around 5% and 2.5%, respectively.

FIGURE 4. Canada's Share of Global Production by Crop Group



Source: AEG analysis of Food and Agriculture Organization production statistics.

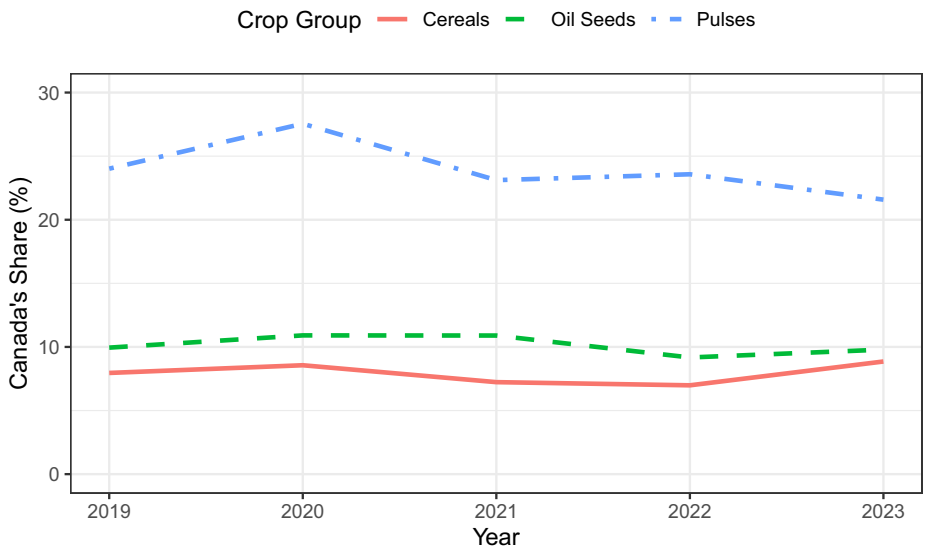
GRAIN EXPORTS

The majority of grain produced in Canada is exported, although this varies across crop groups. In 2024, approximately 70% of cereals, 50% of oilseeds, and 80% of pulses were exported. Roughly 70% of canola oil and 90% of canola meal were exported. Exports thus play a critical role in the Canadian grain sector.[3]

On the global stage, Canada is a major exporter of pulses. Figure 5 on page 10 shows that from 2019 to 2013, Canada's share of total global pulse trade (in dollars) has been steady at around 25%, with minor yearly fluctuations. Canada's shares of global trade in cereals and oilseeds each sit at around 8-10%, again with minor yearly fluctuations.

3. AEG analysis of supply and disposition data published by Statistics Canada.

FIGURE 5. Canada's Share of Global Export Value by Crop Group



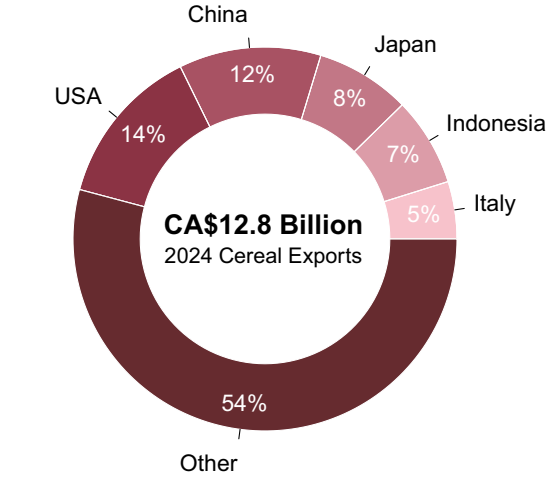
Source: AEG analysis of trade of agricultural commodities data published by Food and Agriculture Organization.

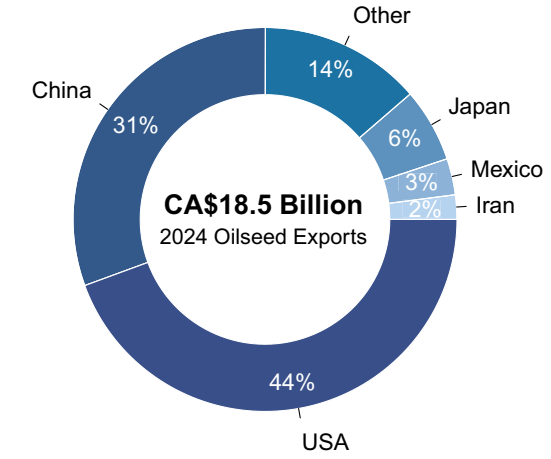
Canada's top competitors in global cereal markets (in terms of traded value) include the United States, Brazil, Argentina, Russia, and Ukraine. Main competitors in oilseed markets are Brazil and the United States. In pulse markets, Canada is the largest global exporter, followed by Australia, Myanmar, and the United States. See Figure B-1 on page B-1, Figure B-2 on page B-2, and Figure B-3 on page B-2 of Appendix B for plots of country share in global trade of cereals, oilseeds, and pulses.

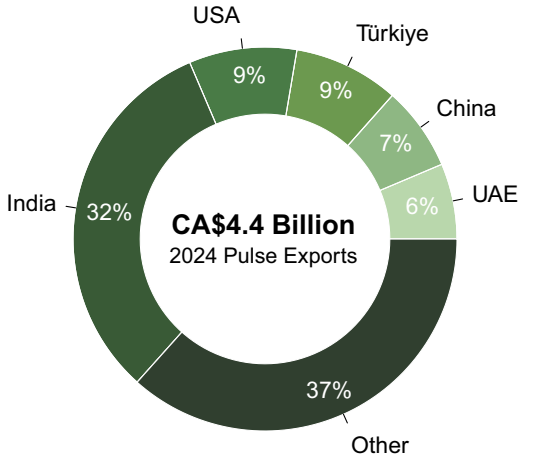
Export sales are an important source of revenue for the industry. In 2024, Canada's cereal exports totaled more than CA$12.8 billion.[4] Figure 6 on page 11 shows that the five most important markets are the United States, China, Japan, Indonesia, and Italy. Oilseed exports brought in CA$18.5 billion, with the United States and China being the two largest buyers.[5] Pulse exports registered at CA$4.4 billion, a third of which bought by India. Other top buyers of Canadian pulses include the United States, Türkiye, China, and UAE.[6]

4. Not including sales of products from cereal processing.
5. For oilseed primary processing, only sales of canola meal and oil are included.
6. AEG analysis of Canadian International Merchandise Trade data.

FIGURE 6. Canada's Grain Export by Destination, 2024



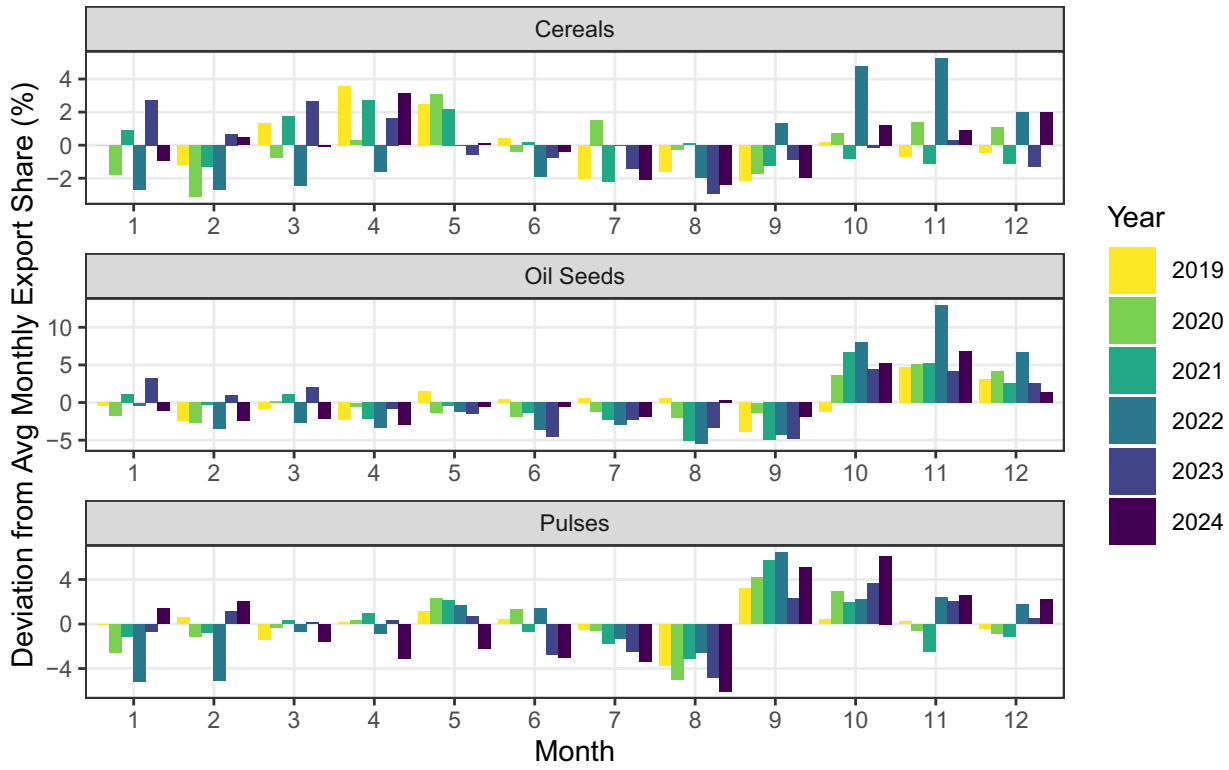




Source: AEG analysis of Canadian International Merchandise Trade data.
Notes: Oilseed exports include canola meal and oil. Other primary processing is excluded.

The peak time for Canada's grain exports generally falls within the last four months of the calendar year as crops are harvested and then transported. The exact months vary by crop and crop group. Figure 7 shows that oilseed exports typically peak in October and November, whereas pulse exports are generally highest in September. Cereal exports are spread throughout the year with slightly higher exports in the first and second quarters of the calendar year. In this report, we set September to January of the next year as the peak period for Canada's grain exports overall.

FIGURE 7. Canada's Export Pattern by Crop Group

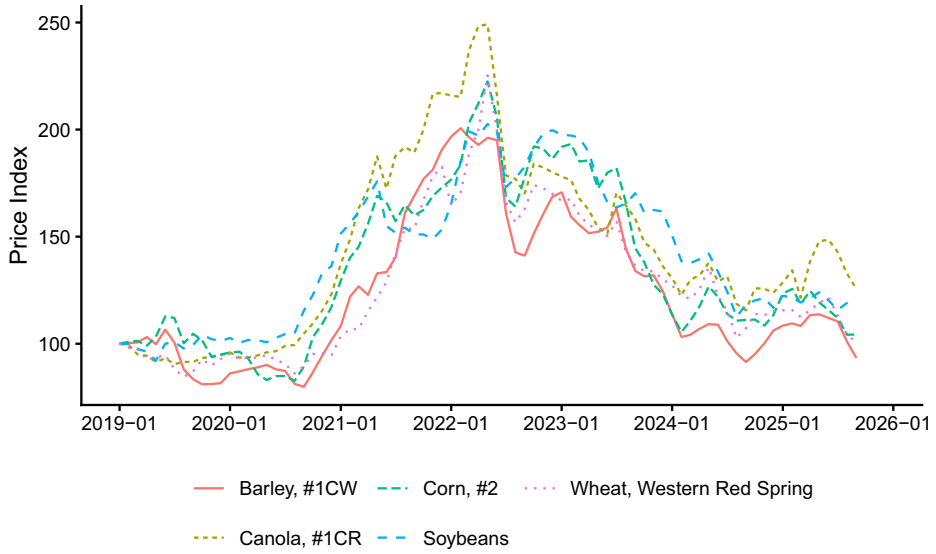


Source: AEG analysis of Canadian International Merchandise Trade data.

GRAIN PRICES

We analyzed historical market prices for 13 crops using data from Manitoba Market Reports.[7] Grain prices have stabilized following a volatile three-year period. Figure 8 shows price trends for major crops, including barley, canola, corn, soybean, and wheat (Western red spring) between 2019 and 2025. Prices increased rapidly during 2021, peaked in 2022, then declined through 2023. Since then, prices have fluctuated within a narrower range rather than trending consistently upward or downward, which is more akin to the pre-2021 period. Nevertheless, 2024-2025 average prices remain above pre-2021 levels. On average, price levels in 2024-2025 are roughly 20% higher than in 2019-2020.[8]

FIGURE 8. Monthly Market Prices of Selected Crops, 2019-2025 (Indexed, Jan 2019 = 100)



Source: AEG analysis of crop price data by Manitoba Market Reports via DataMB.

Price data also shows a within-year seasonality in crop prices. While the details vary by crop and year, prices are typically the lowest during fall harvest (around August) before strengthening in the following months. Prices generally peak in late spring or early summer, then trail off into the next harvest.

7. Manitoba Market Reports document weekly and monthly average prices, in CAD/tonne, for 13 crops: Barley #1CW, canola meal 34% Altona, canola #1CR, corn #2, flaxseed #1CW, oats #2CW, peas #2 yellow, soybeans, soymeal 46% wpg, wheat - Northern hard red, wheat - red winter, wheat - special purpose (low vomi), and wheat - Western red spring. Prices are based on weekly surveys of grain buyers' pricing as well as other publicly available market sources.
8. With the exception of canola meal (34%, Altona), whose price has returned to the 2019-2020 average. The other crops saw a 14-34% change between the 2019-2020 average and 2024-2025 average.

CANADIAN GRAIN SUPPLY CHAIN

Canada's grain sector operates through supply chain fundamentals common to most industries: producing, selling, and delivering. However, the Canadian grain supply chain possesses a few unique attributes. First, Canada's geography and weather pose logistical challenges like no other country competing in global markets. Most grain is grown in the Prairie Provinces and must travel 1,500 km (approximately 1,000 miles) on average to reach tidewater. As a result, the sector is exceptionally dependent on the rail network for moving grain to export terminals at ports. Second, unlike a typical supply chain where producers market and sell to downstream buyers, Canadian grain farmers interact primarily through grain companies that aggregate supply, process and manage grain quality, negotiate sales, and coordinate logistics. If a rail or port work stoppage negatively affects sales by grain companies/exporters, producers must accept the costs that flow back through the supply chain.

Stakeholders across the system play distinct but interdependent roles in moving grain from a farm to a grain elevator to a vessel. Producers seed, harvest, and deliver grain to elevators, where grain handlers and exporters clean, grade, store, and assemble shipments to meet contract specifications. The two Class I railways, CN and CPKC, provide cars and transport grain to ports or domestic corridors. At the port, port authorities oversee terminal access, infrastructure, and vessel movements, while shipping lines and their agents coordinate bookings, equipment, and other ocean logistics.

Canadian grain and grain product exports leave the country in one of three ways: by water in bulk vessels or containers, directly by rail, or by truck. Most grain is exported in bulk, particularly for cereals, while pulses and special crops make up the majority of containerized exports. Containerized grain may be loaded into ocean containers directly at inland locations (source-loaded) or shipped via rail for transloading to ocean containers at ports (transloaded). There are three main transportation corridors for exports out of the Prairie Provinces: Westbound to Vancouver and Prince Rupert, eastbound to Thunder Bay and then on to Quebec via the St. Lawrence Seaway, and to the United States and Mexico via rail and truck. Rail transportation is used for 94% of all exported grain.[9]

9. Quorum Corporation: Grain Supply Chain Study–Final Report, 2014.

III. Transportation and Labour Disruptions

SUMMARY OF RECENT LABOUR DISRUPTIONS

The Canadian grain logistics system is vulnerable to transportation disruptions stemming from railway and port labour disputes, which can result in work stoppages and lockouts. Over 90% of grain exports are transported by rail, either to Canadian ports or to destinations in the United States and Mexico. Working around a disruption in any part of the system is challenging due to limited substitution possibilities, because nearly all exported grain is handled by two rail companies and a handful of major ports. This limits exporters' capability to ship grain during a work stoppage, which lowers sales.

Rail and port work stoppages, which can last from a few days to more than two weeks, are increasingly common. Table 2 provides information about disruptions between 2019 and 2025. The frequency of disruptions has increased from approximately one per year or every two years to several per year. The scope of these disruptions varies, with some affecting one port or rail company, while others simultaneously shut down multiple ports or both major railways.

TABLE 2. Rail and Port Work Stoppages in Canada, 2019-2025

Sector	Union	Company/Port Affected	Start Date	End Date
Port	ILWU	West Coast Ports	11/4/2024	11/15/2024
Port	CUPE 375	Montreal	10/31/2024	11/16/2024
Rail	Teamsters Canada	CN and CPKC	8/22/2024	8/25/2024
Port	Unifor	St. Lawrence Seaway	10/22/2023	10/30/2023
Port	ILWU	West Coast Ports	7/1/2023	7/13/2023
Rail	IBEW	CN	6/18/2022	7/5/2022
Rail	Teamsters Canada	CPKC	3/20/2022	3/22/2022
Port	CUPE 375	Montreal	4/26/2021	4/30/2021
Port	CUPE 375	Montreal	8/10/2020	8/21/2020
Rail	Teamsters Canada	CN	11/19/2019	11/26/2019

Source: AEG compilation based on news articles.

RAIL SYSTEM AND RAIL DISRUPTIONS

The railway system plays a key role in Canada's grain supply chain. 94% of all grain exports are moved by rail, either to port to be shipped overseas or to the United States and Mexico.[10] Moreover, the majority of freight rail traffic is handled by only two major Class I freight railways, CN and CPKC, making labour disruptions especially disruptive.[11] Transportation disruptions in the railway

10. Quorum Corporation: Grain Supply Chain Study–Final Report, 2014.

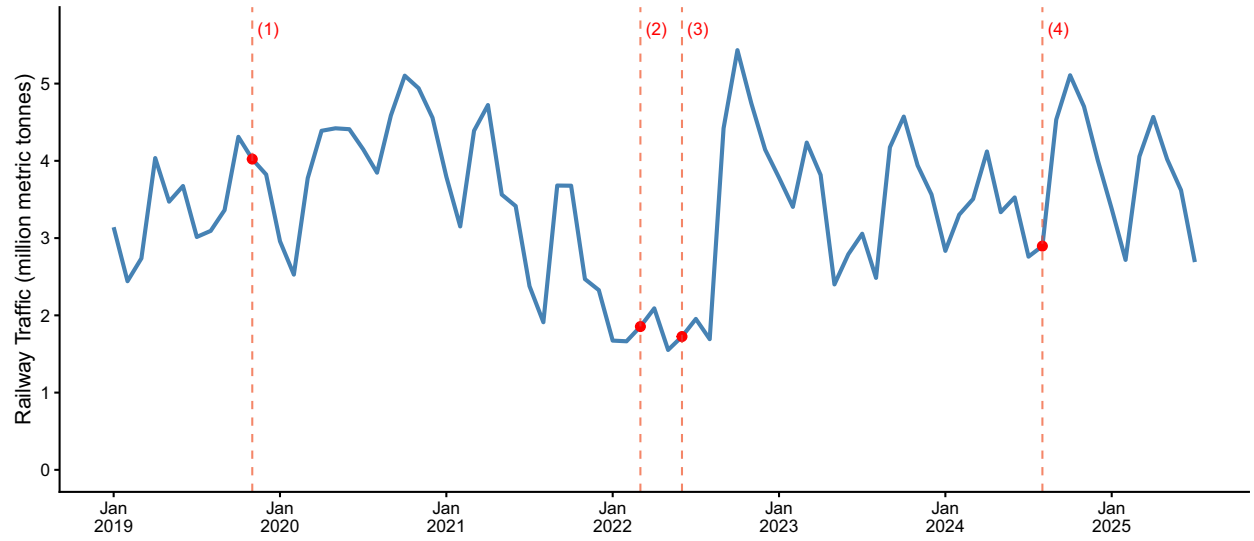
11. In 2024, CN and CPKC own nearly three quarters of all rail tracks (route-kilometres) in Canada. Transport Canada, "Transportation in Canada - 2024 Annual Report."

system restrict the flow of grain as products cannot be moved from country elevators to ports or other destinations. Trucking is not a viable alternative because neither the number of trucks nor road capacity in the Prairie Provinces can handle the amount of grain currently produced. Thus, ensuring smooth and efficient rail transportation is pivotal to maintaining Canada's grain supply chain.

Railway grain traffic follows a seasonal pattern. Typically, traffic increases in August at the start of the crop year and ramps up over the next few months before dropping in January. After January, there is another peak in traffic late in the crop year before slowing down again in June. On an annual basis, railway grain traffic has been relatively stable between 2019 and 2025, except for a sharp drop in 2022 due to a drought-related reduction in grain production.

As shown in Figure 9, since 2016, there have been four notable labour disruptions in the rail system. Two impacted CN, one impacted CPKC, and one affected both. Strikes have major negative effects on rail traffic, not only during the work stoppage, but before and after the stoppage, as well. In the period leading up to a stoppage, not only does rail operation become less efficient, CN and CPKC may (and have in the past) stop accepting new traffic on their lines due to expectations that a work stoppage will occur. In the period following a stoppage, rail lines need time to resume normal operations and deal with the backlog caused by the work stoppage.

FIGURE 9. Monthly Hopper Car Traffic, 2019-2025
For Traffic Originated in Western Canada and Destined to Points Therein



Source: AEG assembly of rail strikes and the Quorum Corporation's Grain Monitor Program Open Data.

Note: The rail labour disruptions denoted are: (1) CN, Nov 19-26, 2019; (2) CPKC, Mar 20-22, 2022; (3) CN, Jun 18-Jul 5, 2022; (4) CN and CPKC, Aug 22-25, 2024. Western Canada includes British Columbia, Alberta, Saskatchewan, and Manitoba. Shipments to Western Canada include those destined to the ports of Vancouver, Prince Rupert, Churchill, and Thunder-bay, as well as those destined to other points inside Western provinces (collectively identified as Western Domestic).

AEG analyzed the effects of work stoppages between 2019 and 2025 using a rigorous statistical methodology. Four models were developed to measure the amount of rail activity before, during, and after a stoppage. These models included the following measures of rail activity:

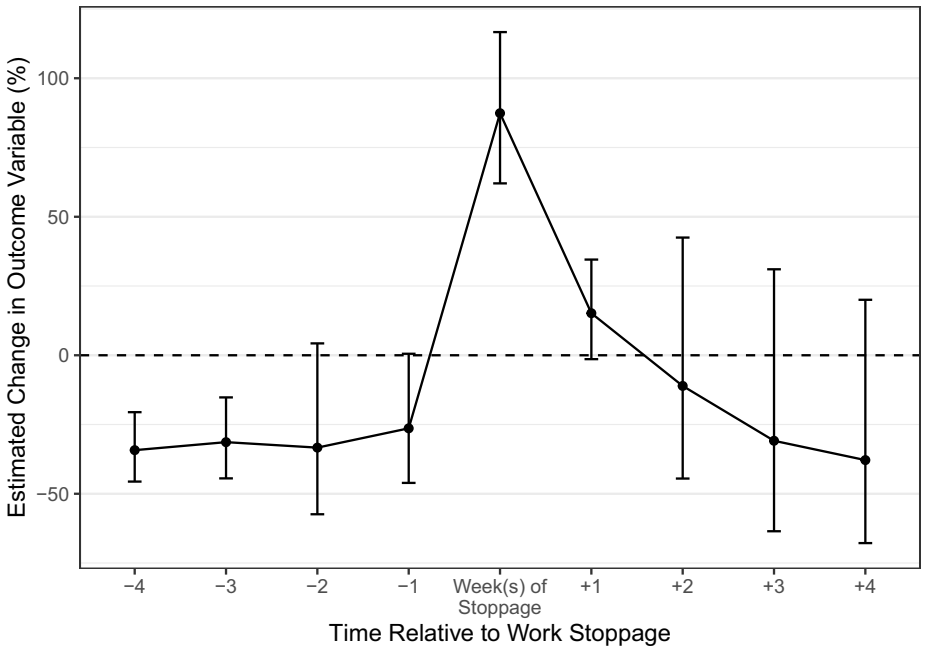
- Released loads: The count of loaded rail cars that enter the system after having been released-loaded at origin and not reported by the railway as unloaded. Counts include all rail cars (hopper cars and boxcars) moving within a corridor.[12]
- Number of cars entering: The count of new rail cars that have entered a given corridor resulting from new traffic being released at origin or being received in interchange from another railway.
- Number of cars enroute: The count of rail cars enroute to destination.
- Number of cars dwelling: The count of loaded rail cars that have not moved for 48 hours or more, whether the car is at origin, enroute, or at destination.

AEG estimated these models using regression analysis and data on real-time grain movements from 2019 to 2025, published through Statistics Canada's Grain Supply Chain Dashboard. The raw data was on a daily basis, which was subsequently aggregated to the weekly level to avoid day-to-day volatility. All models controlled for normal differences in traffic patterns between corridors, crop years, months, and seasons. The key parameters estimated in the regressions measure the change in grain traffic during a work stoppage, net of other factors that normally affect grain movement.

Figure 10 shows the effects on dwelling cars before and after a stoppage based on the regression analysis. The weekly average number of cars not moving for at least 48 hours increases by almost 90% when there is a work stoppage before gradually lowering to the pre-stoppage level over the following weeks. This confirms the disruptive nature of a work stoppage on the rail system.

12. In the context of the Grain Supply Chain Dashboard, the term "corridor" is used to identify the destination to which a rail car is heading towards, which is either a port or a geographical region. The GSCD covers six unique corridors: Eastern Canada, Western Canada, USA/Mexico, Prince Rupert, Vancouver, and Thunder Bay.

FIGURE 10. Weekly Avg. Cars Dwelling Around a Work Stoppage, 2019-2025

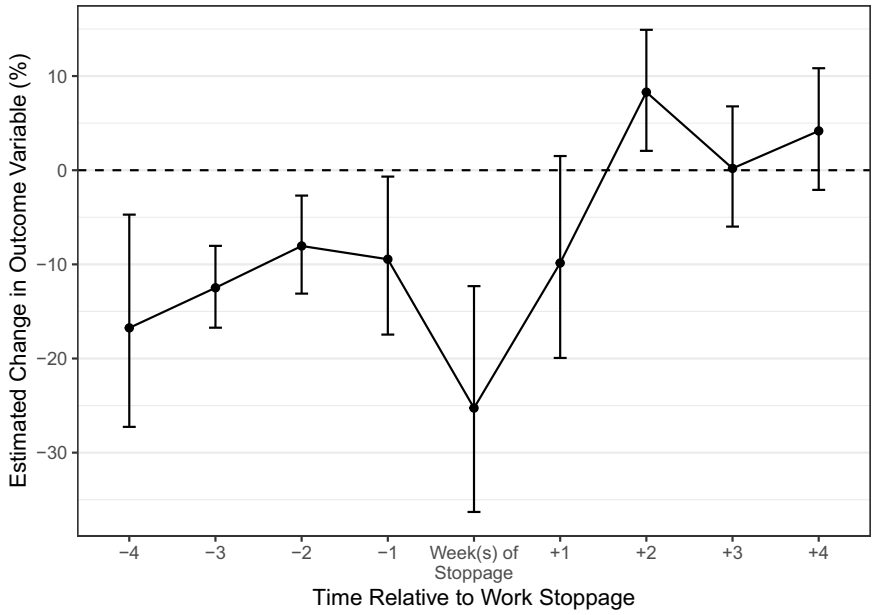


Source: AEG analysis of Statistics Canada's Grain Supply Chain Dashboard data.

Notes: Results from a Poisson model. Whiskers denote 95% confidence intervals. "+1" denotes first week after stoppage ends, "-1" denotes week before stoppage starts.

Figure 11 and Figure 12 show the effects on the number of released loads and number of cars entering. The effects observed here are consistent with expectations based on anecdotal evidence provided by grain companies: The number of cars entering a corridor drops by almost 40% during work stoppage, and the weekly average number of released loads decreases by 25%. There is also a pre-stoppage decrease and a post-stoppage increase in these two measures. In the week before a labour disruption, the expected number of cars entering drops by 10%. A similar decline is observed for released loads. After a work stoppage, it takes more than a week for released loads to return to baseline.

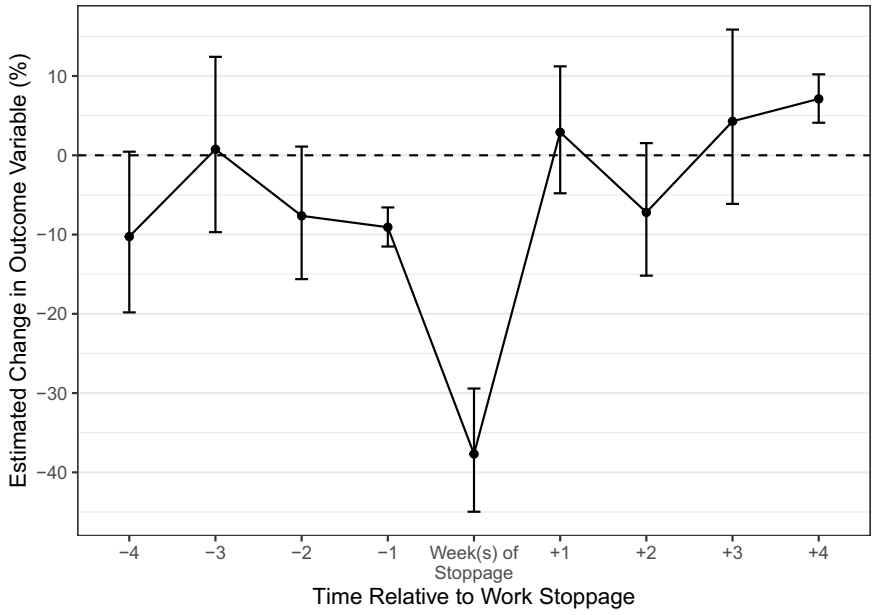
FIGURE 11. Weekly Avg. Released Loads Around a Work Stoppage, 2019-2025



Source: AEG analysis of Statistics Canada's Grain Supply Chain Dashboard data.

Notes: Results from a Poisson model. Whiskers denote 95% confidence intervals. "+1" denotes first week after stoppage ends, "-1" denotes week before stoppage starts.

FIGURE 12. Weekly Avg. Cars Entering Around a Work Stoppage, 2019-2025



Source: AEG analysis of Statistics Canada's Grain Supply Chain Dashboard data.

Notes: Results from a Poisson model. Whiskers denote 95% confidence intervals. "+1" denotes first week after stoppage ends, "-1" denotes week before stoppage starts.

PORTS AND PORT DISRUPTIONS

Canada exports approximately 70% of its grain to international markets, much of which travels to Asia and Europe. This export orientation makes ports indispensable to the functioning of the Canadian grain supply chain. Without efficient port operations, the country's export-dependent grain sector cannot compete effectively.

Grain arriving at a port terminal moves through a set of integrated processes that include receiving and unloading, elevation, weighing and sampling, storage, and transfer to shipping bins and vessel loading, with additional cleaning or blending performed if required. Because port terminals have high throughput-to-storage ratios, these processes depend on accurate and timely alignment of rail deliveries and vessel schedules. Disruptions at any point can quickly cause congestion and system-wide delays.

Both bulk and containerized exports rely on ports. Bulk grain—wheat, canola, barley, and other major crops—moves through licensed grain terminals and transfer elevators equipped for high-volume railcar unloading and rapid vessel loading. Containerized exports, used mainly for pulses and specialty crops, depend on either inland source-loading or port transload facilities, which have limited storage and timing requirements tied to container availability and marine terminal cut-offs.

A small number of ports handle the vast majority of grain exports. The Port of Vancouver ships more than 60% of Canada's grain exports and is the primary route to Asian markets. Prince Rupert handles about 10%, providing an additional Pacific outlet, while Thunder Bay handles more than 15%, moving grain through the Great Lakes–St. Lawrence Seaway system to European and North African markets. Smaller volumes move through Montreal, Churchill, and other ports.[13]

Port labour disruptions have occurred repeatedly in recent years, including strikes at West Coast and East Coast ports that lasted between 5 and 17 days. Their impact on grain exports depends on the type of grain movement involved. Under Section 87.7 of the Canada Labour Code, longshore workers must continue providing services necessary for the tie-up, let-go, loading, and movement of grain vessels at licensed grain terminals. As a result, bulk grain exports handled through licensed terminals retain a significant degree of operational continuity during port strikes.

However, this protection does not extend to non-licensed port facilities, such as vegetable oil terminals and container transloaders, or to containerized grain moving directly to marine terminals. During a port work stoppage, these flows

13. AEG analysis of 2024 cargo statistics from port authorities and exports data from Statistics Canada.

can be fully disrupted, leading to missed vessel cut-offs, staging of railcars, congestion at transloaders, and lost or delayed export opportunities. Thus, while Canada's bulk grain system is relatively insulated by statute, containerized and processed grain exports remain vulnerable during port work stoppages.[14] The congestion and backlogs created by port disruptions interrupt rail services, rippling up the supply chain and slowing down grain movement.[15] This is accounted for in our analysis of grain traffic around work stoppage events.

HOW A WORK STOPPAGE AFFECTS THE GRAIN SECTOR

A labour disruption in the rail or port sector will quickly cascade through the grain supply chain, reducing the flow of grain and increasing the cost of planning sales. Exporters and producers bear the brunt of the impacts, which include lost sales due to reduced capacity and uncertainty, fees and penalties, and reputational damages.

Grain processors and exporters are arguably the most exposed to negative impacts caused by a work stoppage, as they are the most involved in the grain supply chain. These grain companies typically make sales months in advance and rely on predictable car supply on certain "want dates" to move grain to port terminals. Once at port, they rely on the port's ability to load and move vessels efficiently so as not to incur vessel demurrage charges. The uncertainty caused by the threat of potential labour disruptions makes planning more difficult and affects future decisions. If a work stoppage happens, halted rail or port service reduces the flow of grain, and thus companies' capacity to sell grain. Even if a stoppage is averted, the threat itself reduces system capacity and costs grain company sales. Work stoppages make it more challenging for exporters to meet contractual deadlines, which can trigger late-delivery penalties or even default charges, vessel demurrage, and strained relationships with overseas buyers. Furthermore, the system does not immediately recover after a stoppage because railways and ports take time to return to normal operations, extending the period of lost sales.

The effects of lost sales opportunities and congestion costs that affect exporters will ripple up the supply chain and affect producers. During a transportation disruption, elevators and terminals fill up quickly and cannot take on more grain, restricting farmer delivery opportunities and forcing them to turn to on-farm storage or other, less desirable sales opportunities. Additionally, reduced sales by exporters flow back through the supply chain and are reflected in a lower price paid to farmers for their grain.

14. CN 2022-2023 Grain Plan, July 2023 Update.

15. For example, on June 28, 2023, the International Longshore and Warehouse Union Canada (ILWU) issued a 72-hour strike notice that would affect West Coast Canadian ports starting July 1. In preparation for the potential labour disruption, CN issued carload embargoes beginning July 1, for traffic destined to the impacted ports.

IV. The Economic Impacts of Labour Disruptions on the Canadian Grain Industry

QUANTIFYING THE EFFECTS OF A LABOUR DISRUPTION

Labour disruptions in the rail and port sectors affect grain exports in a variety of ways. Sales decline due to a reduced transportation capacity and an increase in the cost of planning sales. Labour disruptions can affect contractual price obligations because exporters must pay for delays or renegotiate contract prices. Exporters may need to pay demurrage and other fees. There can also be long-term reputational damages, as international buyers become less willing to purchase Canadian grain to avoid the complications of a disruption.

The grain sales category is one of the most important in terms of economic impact. The analysis in "Transportation and Labour Disruptions" on page 15 shows that transportation disruptions reduce the ability of exporters to sell grain. Furthermore, it shows that the market has limited capacity to recover lost sales. Work stoppages in the rail sector result in less grain moving to domestic markets and ports. Impacts can start even before a work stoppage begins, as rail and port operations wind down in preparation for a stoppage, preventing exporters from selling as much as they could otherwise. Although rail activity recovers once a stoppage ends, exporters generally do not recover the sales lost. Railing grain operates at, or nearly at, capacity during normal operation, leading to a flat recovery. For grain companies and producers, the loss becomes permanent.

There are also consequences when companies continue to export during a work stoppage. Although prices can fluctuate for different reasons related to supply and demand, prices of most exports are established in advance through contracts before the crop reaches port. Delayed or canceled grain shipments result in contractual penalties or renegotiated prices. In practice, exporters try to avoid penalties by rearranging shipments or sourcing grain from other markets to meet their obligations (if their operations allow). Exporters typically pay an extra percentage of the contract price when delays trigger penalties, and this percentage increases with the length of the delay. In the case of a default, renegotiated prices typically lie below the original contract price because the buyer can face operational challenges in accepting delayed grain (which incurs costs) or because the exporter is in a weaker bargaining position when the grain finally reaches port.

Contract penalties are generally a small percentage of contract prices. Interviews with exporters and a review of typical GAFTA contracts indicate penalties of a few percentage points, ranging from 0.5-1.5% of contract price for shipment extensions of up to eight days. If the seller fails to make shipment after eight days, then the contract is at risk of default and renegotiation. According to stakeholder interviews, default of contract fulfillment is uncommon, as grain companies try to avoid this outcome. In our impact model, for shipments

delayed more than eight days, contract prices are assumed to be renegotiated, and any change in price is counted as an economic loss for the seller. Analysis of Manitoba's weekly crop prices between 2019 and 2025 shows that, on average, prices are 2.8% lower than counterfactuals due to a work stoppage, accounting for other trends in crop type, seasonality, and crop year.[16]

Exporters also face demurrage costs when there is a disruption. Demurrage is a fee that exporters pay when they use more than the free time allotted by a carrier, such as a shipping or container company, which generally lasts a few days. This occurs because the vessel or equipment remains at port during a work stoppage. Demurrage costs increase daily and can total more than hundreds of thousands of dollars for a vessel.

Lost sales from work stoppages result in cash flow disruptions and additional borrowing costs for exporters and producers. Grain producers may rely on loans to cover operating expenses, maintain machinery and equipment, or expand farming operations. Exporters may borrow money to purchase grain from producers. Without a work stoppage, proceeds from grain sales could be used to pay off debt and reduce interest payments. Even if the business has no debt, sale proceeds can be invested or placed in savings to earn interest. The added interest costs are included in the economic impact of a work stoppage.

SCENARIOS ANALYZED

This report presents the economic impacts of six possible labour disruptions. The scenarios analyzed include one-day, three-day, and one-week work stoppages involving:

1. All rail and port workers,
2. Canadian National (CN) and Canadian Pacific Kansas City (CPKC) workers,
3. CN workers,
4. CPKC workers,
5. East Coast port workers, and
6. West Coast port workers.

For each scenario, economic losses are estimated separately for peak and non-peak periods to reflect seasonal variability in sales throughout the year. Peak export period is defined to be from September through January. Non-peak period is from February through August.[17]

The economic impact of these disruptions is measured in terms of lost earnings. The scale depends the transportation sector in which the disruption occurs, as

16. AEG's analysis of weekly crop prices data from 2019-2025 by Manitoba Market Reports.
17. AEG's analysis of Canada's grain exports seasonality. See "Grain Exports" on page 9.

well as the share of grain that typically moves through the affected sector. The impact also depends on the duration and timing of the work stoppage, recognizing that disruptions during peak periods have greater consequences than those at other times of the year.

This report does not quantify long-term reputational impacts. Transportation disruptions can undermine confidence in Canada as a reliable supplier by increasing uncertainty for buyers, which may affect future sales volume and prices. While important, quantifying this impact is challenging. As a result, the economic impacts presented below should be interpreted as a conservative estimate of the losses to the Canadian grain industry. We provide a qualitative discussion of long-term reputational damages on page 31.

The methodology and inputs are detailed more fully in "Appendix A. Methodology" on page A-1.

LOST EARNINGS IMPACT

The most damaging type of disruptions affects the rail and port sectors simultaneously. Table 3 shows the economic losses due to a one-day, three-day, and one-week work stoppage by different labour sectors during peak and non-peak export periods. These scenarios are explained in more detail in subsequent sections.

TABLE 3. Total Economic Losses by Duration and Timing for All Disruption Scenarios (in CAD)

Work Stoppage Scenario	Peak Period			Non-Peak Period		
	1 Day	3 Days	1 Week	1 Day	3 Days	1 Week
Rail and Port	$176,996,082	$289,846,012	$539,656,683	$128,485,083	$210,421,873	$392,515,551
CN & CPKC	$166,376,317	$272,455,251	$507,277,282	$120,775,978	$197,796,561	$368,964,618
CN Rail	$84,851,922	$138,952,178	$258,711,414	$61,595,749	$100,876,246	$188,171,955
CPKC Rail	$81,524,395	$133,503,073	$248,565,868	$59,180,229	$96,920,315	$180,792,663
West Coast Ports	$8,802,103	$14,655,355	$35,723,899	$6,383,269	$10,459,465	$25,322,329
East Coast Ports	$2,681,771	$4,465,105	$10,884,141	$1,952,280	$3,253,908	$8,080,819

Source: AEG analysis of grain exports (Statistics Canada), grain prices (Manitoba Markets Reports), transportation shares (Quorum Corporation and the Saskatchewan Department of Agriculture, Food and Rural Revitalization documents), port grain throughputs (port authority documents), demurrage fees (company documents), GAFTA contract clauses, and rail work stoppages in 2019-2025.

Lost earnings from a one-week work stoppage in a peak export month range from $10.9 million for an East Coast port disruption to $540 million for a combined rail-and-port disruption. In a non-peak month, lost earnings range from $8.1 million to $393 million for an East Coast and combined rail-and-port disruption, respectively. A disruption in a non-peak month produces an impact that is approximately 25% less than that in a peak month.

A stoppage by either CN or CPKC workers produces a similar impact because the two companies ship a comparable amount of grain. However, a West Coast port disruption is substantially more costly than an East Coast disruption because far more grain is exported out of West Coast ports. More grain is exported out of Vancouver than all other Canadian ports combined.

A longer work stoppage is more costly than a shorter stoppage. Lost earnings from a three-day stoppage in a peak month range from $4.5 million to $290 million, which is roughly half the cost of a one-week work stoppage. The timing of a stoppage affects costs through a mix of variable and fixed components. The latter includes the slowdown in shipping and sales that occurs in the run-up to a stoppage, which is assumed to be the same whether the actual work stoppage lasts a few days or a few weeks.[18] The former includes delays during the work stoppage itself and in the recovery period thereafter.

RAIL AND PORT WORK STOPPAGE

A labour disruption affecting both rail and port operations is unsurprisingly the most damaging, resulting in economic losses of approximately $177 million for a one-day stoppage, $290 million for a three-day stoppage, and $540 million for a one-week stoppage during the peak period.

Table 4 presents a break down of the economic loss by timing and category, including lost sales, contract penalties, and other fees. Lost sales account for reduced capacity prior to, during, and after the work stoppage. Contract penalties are due to extension of shipment and defaulting of contracts, if any. Fees and other costs capture vessel and equipment demurrage caused by the delay in transportation, as well as interest costs.

TABLE 4. Economic Losses Due to a Rail and Port Work Stoppage (in CAD)

	Peak Period			Non-Peak Period		
Category	**1 Day**	**3 Days**	**1 Week**	**1 Day**	**3 Days**	**1 Week**
Lost Sales	$175,183,087	$285,418,987	$505,890,787	$127,166,746	$207,187,831	$367,230,001
Contract Penalties	$803,305	$2,409,914	$16,869,399	$583,125	$1,749,375	$12,245,626
Demurrage & Other Costs	$1,009,691	$2,017,111	$16,896,497	$735,212	$1,484,667	$13,039,923
TOTAL	**$176,996,082**	**$289,846,012**	**$539,656,683**	**$128,485,083**	**$210,421,873**	**$392,515,551**
As % of Avg. Monthly Sales in 2024	*4.3%*	*7.0%*	*13.1%*	*3.1%*	*5.1%*	*9.5%*

Source: AEG analysis of grain exports (Statistics Canada), grain prices (Manitoba Markets Reports), transportation shares (Quorum Corp and the Saskatchewan Dept of Agriculture, Food and Rural Revitalization), port grain throughputs (port authority documents), demurrage fees (company documents), GAFTA contract clauses, and work stoppages in 2019-2025.
Notes: Totals may not add up due to rounding. See "Appendix B. Additional Tables and Figures" on page B-1 for details.

18. Because people cannot precisely predict whether a stoppage will happen or for how long.

Table 4 shows that a combined disruption costs grain exporters and producers $540 million if all transportation labour stops for one week and occurs in the peak period, or $393 million if it occurs in the non-peak period. Overall, a work stoppage during the non-peak period causes about 75% as much economic damage as a disruption of similar length during the peak period. This variation is attributable to the difference in the amount of grain typically shipped in each period.

Lost sales make up the majority of economic losses. The cost of lost sales for a one-week stoppage in the peak period is $506 million, compared to about $17 million in contract penalties and $17 million in demurrage plus interest costs. The cost of lost sales for a three-day stoppage in the peak period is $285 million, while contract penalties are $2.4 million and other fees are $2.0 million. Contract penalties and demurrage fees for one-day and three-day stoppages are minimal because exporters are able to adjust the timing of shipping and loading of grain before contractual penalties accrue. Regardless, rail carriers and ports start functioning at reduced capacity in anticipation even before the stoppage begins, which produces lost sales and economic harm to exporters and producers before, during, and in recovery from the stoppage.

CN AND CPKC WORK STOPPAGE

The next most damaging disruptions are those affecting the rail sector. Table 5 presents economic losses when the stoppage involves CN and CPKC workers, broken down by timing and source in terms of lost sales, contract penalties, and fees. The economic loss is $166 million for a one-day stoppage, $272 million for a three-day stoppage and $507 million for a one-week stoppage during the peak period. A disruption in the non-peak period results in smaller losses, including $121 million for a one-day stoppage, $198 million for a three-day stoppage, and $369 million for a one-week stoppage.

TABLE 5. Economic Losses Due to CN and CPKC Rail Work Stoppage (in CAD)

	Peak Period			Non-Peak Period		
Category	**1 Day**	**3 Days**	**1 Week**	**1 Day**	**3 Days**	**1 Week**
Lost Sales	$164,672,101	$268,293,847	$475,537,339	$119,536,741	$194,756,561	$345,196,201
Contract Penalties	$755,106	$2,265,319	$15,857,235	$548,138	$1,644,413	$11,510,889
Demurrage & Other Costs	$949,109	$1,896,085	$15,882,708	$691,100	$1,395,587	$12,257,528
TOTAL	**$166,376,317**	**$272,455,251**	**$507,277,282**	**$120,775,978**	**$197,796,561**	**$368,964,618**
As % of Avg. Monthly Sales in 2024	*4.0%*	*6.6%*	*12.3%*	*2.9%*	*4.8%*	*9.0%*

Source: AEG analysis of grain exports (Statistics Canada), grain prices (Manitoba Markets Reports), transportation shares (Quorum Corp and the Saskatchewan Dept of Agriculture, Food and Rural Revitalization), port grain throughputs (port authority documents), demurrage fees (company documents), GAFTA contract clauses, and work stoppages in 2019-2025.
Notes: Totals may not add up due to rounding. See "Appendix B. Additional Tables and Figures" on page B-1 for details.

Lost sales dwarf other costs, regardless of timing. This includes a cost of $476 million for a one-week stoppage in the peak period, compared to $16 million in contract penalties and $16 million in demurrage and interest costs. The cost of lost sales for a three-day stoppage in the peak period is $268 million, while contract penalties are $2.3 million and other fees are $1.9 million. Penalties and fees grow with duration, reaching 6% of the total cost of a one-week stoppage, compared to penalties and fees contributing 1.5% to the cost of a three-day stoppage and 1% for a one-day stoppage. Nevertheless, lost sales remain the dominant cost driver regardless of duration.

CN RAIL WORK STOPPAGE

Table 6 presents the economic loss when the disruption involves CN workers, broken down by timing and the contribution of lost sales, contract penalties, and fees. The economic loss is $85 million for a one-day stoppage, $139 million for a three-day stoppage, and $259 million for a one-week stoppage during the peak period. A disruption in the non-peak period costs $62 million for a one-day stoppage, $101 million for a three-day stoppage, and $188 million for a one-week stoppage.

TABLE 6. Economic Losses Due to CN Rail Work Stoppage (in CAD)

	Peak Period			Non-Peak Period		
Category	**1 Day**	**3 Days**	**1 Week**	**1 Day**	**3 Days**	**1 Week**
Lost Sales	$83,982,772	$136,829,862	$242,524,043	$60,963,738	$99,325,846	$176,050,063
Contract Penalties	$385,104	$1,155,313	$8,087,190	$279,550	$838,650	$5,870,553
Demurrage & Other Costs	$484,046	$967,003	$8,100,181	$352,461	$711,749	$6,251,339
TOTAL	**$84,851,922**	**$138,952,178**	**$258,711,414**	**$61,595,749**	**$100,876,246**	**$188,171,955**
As % of Avg. Monthly Sales in 2024	*2.1%*	*3.4%*	*6.3%*	*1.5%*	*2.4%*	*4.6%*

Source: AEG analysis of grain exports (Statistics Canada), grain prices (Manitoba Markets Reports), transportation shares (Quorum Corp and the Saskatchewan Dept of Agriculture, Food and Rural Revitalization), port grain throughputs (port authority documents), demurrage fees (company documents), GAFTA contract clauses, and work stoppages in 2019-2025.
Notes: Totals may not add up due to rounding. See "Appendix B. Additional Tables and Figures" on page B-1 for details.

Lost sales make up the majority of the impact, regardless of timing. A three-day peak-period stoppage costs $137 million in lost sales, compared to $1.2 million in contract penalties and nearly $1 million in demurrage and other fees. A one-week peak-period stoppage generates $243 million in lost sales versus $8 million in penalties and about $8 million in other fees. Both contract penalties and fees make up a larger portion of the total loss as the duration of the disruption increases.

CPKC RAIL WORK STOPPAGE

Table 7 presents the economic loss when the disruption involves CPKC workers, broken down by timing and the contribution of lost sales, contract penalties, and fees. The economic loss is $82 million for a one-day stoppage, $134 million for a three-day stoppage, and $249 million for a one-week stoppage. A disruption in the non-peak period costs $59 million for a one-day stoppage, $97 million for a three-day stoppage, and $181 million for a one-week stoppage. The cost of a CPKC stoppage is similar to a CN stoppage because the two companies ship a similar amount of grain.

TABLE 7. Economic Losses Due to CPKC Rail Work Stoppage (in CAD)

	Peak Period			Non-Peak Period		
Category	**1 Day**	**3 Days**	**1 Week**	**1 Day**	**3 Days**	**1 Week**
Lost Sales	$80,689,330	$131,463,985	$233,013,296	$58,573,003	$95,430,715	$169,146,139
Contract Penalties	$370,002	$1,110,006	$7,770,045	$268,587	$805,762	$5,640,335
Demurrage & Other Costs	$465,064	$929,081	$7,782,527	$338,639	$683,838	$6,006,189
TOTAL	**$81,524,395**	**$133,503,073**	**$248,565,868**	**$59,180,229**	**$96,920,315**	**$180,792,663**
As % of Avg. Monthly Sales in 2024	*2.0%*	*3.2%*	*6.0%*	*1.4%*	*2.4%*	*4.4%*

Source: AEG analysis of grain exports (Statistics Canada), grain prices (Manitoba Markets Reports), transportation shares (Quorum Corp and the Saskatchewan Dept of Agriculture, Food and Rural Revitalization), port grain throughputs (port authority documents), demurrage fees (company documents), GAFTA contract clauses, and work stoppages in 2019-2025.
Notes: Totals may not add up due to rounding. See "Appendix B. Additional Tables and Figures" on page B-1 for details.

As with a CN stoppage, most of the impact is due to lost sales. A three-day peak-period stoppage costs $131 million in lost sales, while contract penalties contribute $1.1 million and other fees contribute $0.9 million. A one-week peak-period stoppage costs $233 million in lost sales versus $7.8 million in penalties and $7.8 million in demurrage and other costs. Contract penalties and fees make up a larger portion of the total loss as the duration grows.

WEST COAST PORTS WORK STOPPAGE

Table 8 breaks down economic losses from a West Coast port worker dispute by duration, timing, and cost type. Peak-period disruptions generate losses ranging from nearly $9 million for a one-day stoppage to $36 million for a one-week stoppage. Non-peak disruptions range from $6 million for a one-day stoppage to $25 million for a one-week stoppage. The cost of a West Coast port dispute is much larger than that of an East Coast port dispute (on page 29) because substantially more grain is shipped out of West Coast ports.

A three-day peak-period stoppage costs $14 million in lost sales, while contract penalties contribute about $0.12 million and other fees contribute $0.39 million. A one-week peak-period stoppage causes $25 million in lost sales versus $0.84 million in penalties and $9.8 million in demurrage and other fees. Contract pen-

alties and fees make up nearly 30% of the total cost, up from 1% of the cost of a one-day stoppage and 4% for a three-day stoppage.

TABLE 8. Economic Losses Due to West Coast Ports Work Stoppage (in CAD)

	Peak Period			Non-Peak Period		
Category	**1 Day**	**3 Days**	**1 Week**	**1 Day**	**3 Days**	**1 Week**
Lost Sales	$8,679,521	$14,141,205	$25,064,575	$6,317,034	$10,292,098	$18,242,226
Contract Penalties	$39,800	$119,400	$835,802	$28,967	$86,901	$608,304
Demurrage & Other Costs	$82,782	$394,750	$9,823,522	$37,268	$80,466	$6,471,799
TOTAL	**$8,802,103**	**$14,655,355**	**$35,723,899**	**$6,383,269**	**$10,459,465**	**$25,322,329**
As % of Avg. Monthly Sales in 2024	*0.21%*	*0.36%*	*0.87%*	*0.15%*	*0.25%*	*0.61%*

Source: AEG analysis of grain exports (Statistics Canada), grain prices (Manitoba Markets Reports), transportation shares (Quorum Corp and the Saskatchewan Dept of Agriculture, Food and Rural Revitalization), port grain throughputs (port authority documents), demurrage fees (company documents), GAFTA contract clauses, and work stoppages in 2019-2025.
Notes: Totals may not add up due to rounding. See "Appendix B. Additional Tables and Figures" on page B-1 for details.

EAST COAST PORTS WORK STOPPAGE

Table 9 breaks down economic losses from an East Coast port worker dispute by duration, timing, and cost type. Peak-period disruptions generate losses ranging from $2.7 million for a one-day stoppage to $11 million for a one-week stoppage. Non-peak disruptions follow a similar pattern, albeit at a lower cost: approximately $2 million for a one-day stoppage to $8.1 million for a one-week stoppage.

TABLE 9. Economic Losses Due to East Coast Ports Work Stoppage (in CAD)

	Peak Period			Non-Peak Period		
Category	**1 Day**	**3 Days**	**1 Week**	**1 Day**	**3 Days**	**1 Week**
Lost Sales	$2,644,424	$4,308,457	$7,636,522	$1,924,636	$3,135,734	$5,557,931
Contract Penalties	$12,126	$36,378	$254,647	$8,825	$26,476	$185,334
Demurrage & Other Costs	$25,222	$120,270	$2,992,971	$18,819	$91,698	$2,337,554
TOTAL	**$2,681,771**	**$4,465,105**	**$10,884,141**	**$1,952,280**	**$3,253,908**	**$8,080,819**
As % of Avg. Monthly Sales in 2024	*0.07%*	*0.11%*	*0.26%*	*0.05%*	*0.08%*	*0.20%*

Source: AEG analysis of grain exports (Statistics Canada), grain prices (Manitoba Markets Reports), transportation shares (Quorum Corp and the Saskatchewan Dept of Agriculture, Food and Rural Revitalization), port grain throughputs (port authority documents), demurrage fees (company documents), GAFTA contract clauses, and work stoppages in 2019-2025.
Notes: Totals may not add up due to rounding. See "Appendix B. Additional Tables and Figures" on page B-1 for details.

As with other scenarios, most of the impact is due to lost sales. A three-day peak-period stoppage costs $4.3 million in lost sales, while contract penalties contribute just $36 thousand and other fees another $120 thousand. A one-week peak-period stoppage costs $7.6 million in lost sales versus $0.25 million in

penalties and about $3 million in demurrage and other costs. Contract penalties and fees make up a sizable 30% of the total cost of a one-week stoppage, compared to 4% of the cost for a 3-week stoppage and 1% for a one-day stoppage.

IMPACTS PRIOR TO WORK STOPPAGE

In all of the scenarios presented above, lost sales represent the total sales lost before, during, and after a work stoppage takes place. Tables in "Appendix B. Additional Tables and Figures" on page B-1 show detailed estimates of these impacts.

The economic effects of a transportation labour disruption begin accumulating even before the stoppage itself. Interviews with grain companies indicate that rail and port operations often slow down in anticipation of a labour disruption, limiting exporters' ability to move product and selling at full capacity. Although rail and port activities eventually recover once a stoppage ends, exporters may be unable to recover lost sales if there is no extra capacity or demand. Analysis of grain traffic around past rail and port work stoppages shows a marked decline in grain movement during the week leading up to a disruption.[19]

This pre-disruption slowdown translates to substantial costs—up to $112 million in lost sales in the period before a rail-and-port work stoppage during the peak export window. Overall, the model suggests that for a one-day stoppage, pre-disruption losses account for roughly 64% of total lost sales (including losses before, during, and after stoppage). For a one-week stoppage, pre-disruption lost sales represent about 22% of the total sales lost. The pre-stoppage lost sales figures can be viewed as conservative estimates of the impact that an announcement of labour disruption has on the grain industry, assuming that people cannot precisely predict whether a stoppage will actually happen or for how long, at the time a labour union issues a strike notice.

Beyond lost sales, grain companies incur additional costs as soon as a strike vote is announced. Grain companies immediately try to mitigate potential impacts by shifting sales, adjusting rail and vessel bookings, and managing grower contract risk. These actions increase operational costs and strain relationships with customers and farmers. One grain company estimates that a transportation labour disruption costs them $30,000-$50,000 per day in additional operating expenses. These pre-disruption operational costs are not quantified in this study. Taken together, the added operational costs and the pre-disruption lost sales indicate that a labour disruption, or even the possibility of one, can inflict significant economic damage on the grain industry before any work stoppage actually begins.

19. See "Transportation and Labour Disruptions" on page 15.

REPUTATIONAL DAMAGES

In addition to the economic impacts quantified in this report, reputational harm to Canada's grain sector can be equally, if not more, damaging over the long term. Interviews with major Canadian grain exporters reveal that repeated rail and port work stoppages erode Canada's standing as a reliable supplier in global crop markets.

When grain shipments stall and contracts cannot be fulfilled on time due to a labour disruption, overseas buyers lose confidence in Canada's grain supply chain and business relationships become strained. Over time, some may shift part or all of their sourcing to other countries, despite the high quality of Canada's products—even after a transportation work stoppage has passed or been averted. In the long run, weakened relationships with business partners translate to reduced sales opportunities. Unlike immediate financial losses, reputational impacts can persist for a long time, harming the industry well beyond any single disruption.[20] [21]

Industry studies and reports echo these concerns. One report on the 2014-2015 U.S. West Coast port slowdown documents cases where overseas customers turned to competitor suppliers because exporters could not deliver on time. In some cases, sole-source contracts were at risk of being lost.[22] A 2015 report by the U.S. Federal Maritime Commission shows cargo diversion and market share shift from the United States to Canada and Mexico due to congestion at U.S. West Coast ports.[23] A Wilson Center analysis of Canada's August 2024 rail shutdown frames the disruption as a "reputational risk," warning that repeated disruptions undermine trust in the country's supply-chain resiliency and may redirect future sourcing and investment to alternative suppliers.[24]

Direct quantification of lost contracts due to reputational damages is rare, likely due to data confidentiality and other challenges stemming from confounding market factors. However, some surveys report the prevalence of reputational harm and loss of customers after supply chain disruptions. A 2021 report by The

20. Norman, Don. 2024. "Grain Trade Reputation on the Line." The Western Producer, October 1, 2024. https://www.producer.com/news/grain-trade-reputation-on-the-line.
21. Hamm, Mark. 2024. "Grain Workers Strike Makes Canada Look Unreliable." Winnipeg Sun, September 24, 2024. https://www.winnipegsun.com/news/western-canada/siemens-says-grain-workers-strike-makes-canada-look-unreliable,
22. Community Attributes Inc. 2015. "The Economic Costs of the 2014-2015 West Coast Port Slowdown on Washington State." Prepared for Washington Council on International Trade.
23. U.S. Federal Maritime Commission. 2016. "Fourth Annual Update: U.S. Inland Containerized Cargo Moving Through Canadian and Mexican Seaports. 2015: Diversion, Port Expansion, and Shifting Market Shares."
24. Delgado, Xavier. 2024. "Canada's Rail Shutdown: Reliability, Resilience, and Reputational Risk." Wilson Center Canada Institute, August 22, 2024. https://www.wilsoncenter.org/article/canadas-rail-shutdown-reliability-resilience-and-reputational-risk.

Economist Intelligence Unit, based on a survey of 400 senior supply-chain executives across six industries (including agriculture and food), finds that 23% of respondents experienced a loss of regular customers and 40% reported a tarnished brand image following supply chain disruptions.[25] This suggests that work stoppages likely cause permanent customer loss for Canada's grain industry.

25. The Economist Intelligence Unit. 2021. "The Business Costs of Supply-Chain Disruption." March 2021. https://impact.economist.com/projects/next-gen-supply-chains/reports/the-business-costs-of-supply-chain-disruption.

Appendix A. Methodology

METHODOLOGY

Lost earnings are estimated using a partial equilibrium model of the Canadian grain industry. In the model, a labour disruption can affect the quantity and price of grain but not prices or quantities in related industries, such as transportation. Grain that is not sold domestically flows to ports on the East Coast and the West Coast. This flow varies seasonally, with a larger daily volume during the peak season than the non-peak season. A labour disruption reduces the flow of grain either by lowering the amount transported by rail, depending on the carrier, the amount that can be moved on to vessels in port, or both, depending on the source of the disruption. The reduction depends on the duration of the disruption.

Lost earnings is the sum of lost sales, contract-related penalties and other costs due to a labour disruption. Lost sales is the change in sales compared to a baseline with no disruption. Contract-related penalties include the additional payments and price changes exporters face due to shipping delays. Other costs that were considered include demurrage fees and interest on loans to meet payments that otherwise would have been paid in the absence of a disruption. Wages to agricultural, transportation and processing workers are excluded because they represent a transfer of industry revenue rather than a separate, additional amount of earnings.

Lost earnings in each scenario are calculated by selecting the transportation sector impacted by a work stoppage, which accounts for the portion of grain handled in that sector. The model then passes this portion through a series of calculations for reduced sales, contract penalties, and fees. The calculation accounts for the timing of a stoppage, which includes whether the disruption occurs in the peak period and duration.

The model uses a mix of variable inputs and fixed parameters. The variable inputs include the work stoppage period and duration, as well as data on the amount of grain handled by different sectors. The fixed parameters include prices, price penalties, and reduced sales. The analysis takes into account actual strikes between 2019-2025 to calculate the price and sales effects, allowing the model to benchmark scenarios to historical outcomes.

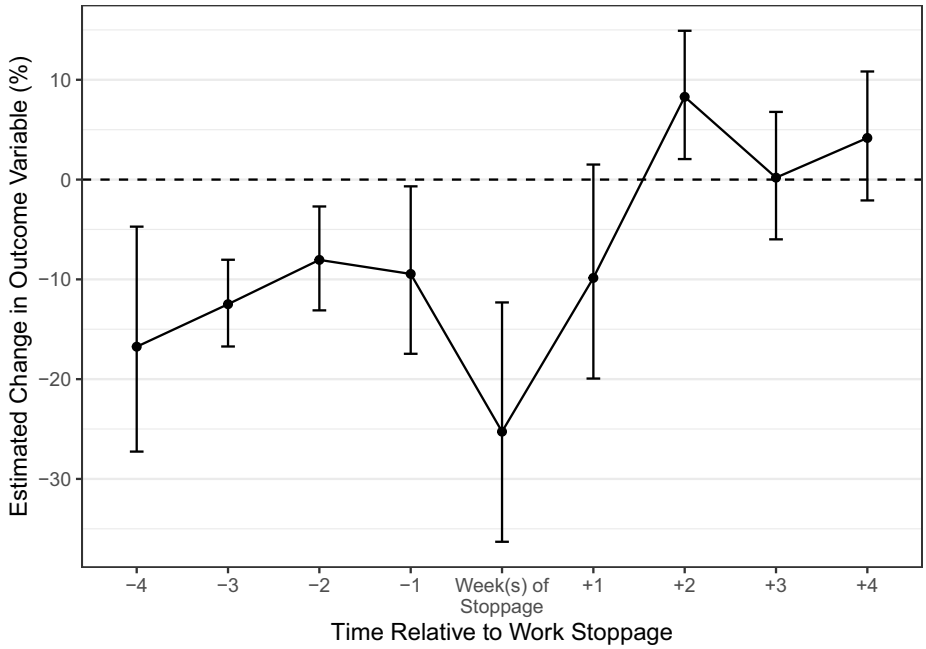
MODEL INPUTS

Duration and impact of labour disruption. AEG considered work stoppages of one-day, three-day, and one-week durations to account for the uncertain duration of a future disruption. Analysis of historical disruptions provides significant evidence that there is a pre-stoppage wind-down period and a post-stoppage recovery period. Railing of grain declines leading up to a stoppage and takes time to recover in the weeks after a stoppage.

AEG used a pre-stoppage period equal to seven days and a post-stoppage period equal to one-half the duration of the stoppage itself. The impact is based on a regression analysis of weekly released loads (2019-2025) as a function of historical strike indicator leads and lags, as well as corridor, crop year and month fixed effects.

Figure A-1 presents the regression estimates. The reduction ranged from approximately 10% during the pre- and post-strike periods to nearly 30% during the strike itself.

FIGURE A-1. The Effect of a Work Stoppage on Weekly Average Released Loads, 2019-2025



Source: AEG analysis of Statistics Canada's Grain Supply Chain Dashboard data.

Notes: Results are from a Poisson regression model, controlling for corridor, crop year, and monthly trends. Whiskers denote 95% confidence intervals. "+1" denotes first week after stoppage ends, "-1" denotes week before stoppage starts, and so on.

Lost earnings due to lost sales. Baseline sales is the average daily amount sold, including export and domestic sales, as reported by Statistics Canada in 2024. The change from the baseline derives from the length of the stoppage and the percent reduction in the flow of grain identified above. Sales are divided seasonally and by final destination based on the share of grain moved each month and by port. Peak sales occur in September through January. East coast ports include Montreal and Thunder Bay, and West coast ports include Vancouver and Prince Rupert.

Lost earnings due to contract-related penalties. Exporters pay a fee to buyers if grain is not delivered within a predetermined, contracted window of time. According to GAFTA contracts, this fee is a portion of the contract price, which varies depending on the number of days the delivery is delayed. After more than eight days, the contract is renegotiated with a price penalty for the exporter. Fee data comes from GAFTA contract extension penalties and price change data comes from AEG analysis of weekly prices.

Lost earnings due to demurrage and other costs. Exporters must pay vessel and equipment demurrage if ships and containers are forced to wait for grain to be transloaded for more than a few days. Vessel demurrage data was obtained from historical charter rates reported by Hudson Shipping Lines, and container demurrage data relied on public demurrage schedules from Maersk, CMA CGM, and Hapag Lloyd. Vessel demurrage charges are calculated by multiplying the per vessel daily time charter rate by the number of affected vessels and the duration of stoppage. Equipment demurrage follows similar logic, accounting for the share of containerized exports, free time, and rates set by major shipping companies.

Interest costs represent the additional borrowing costs incurred due to lost sales—revenue that could have been used to pay down debt and avoid additional interest in the absence of a work stoppage. To remain conservative, we apply the average Canadian prime rate for 2024, even though grain growers and exporters are typically charged higher rates in practice. For one-day and three-day stoppages, we assume that all lost sales would have been completed within one month had the disruption not occurred. For a one-week stoppage, we assume that 90% of lost sales would have been realized within the first month and the remaining 10% in the following month.

See Table A-1, “Main Inputs for Economic Impact Model,” on page A-5 for a summary of key inputs used in the economic impact model.

ADDITIONAL ASSUMPTIONS

The analysis did not consider substitution between transportation providers, such as between CN and CPKC, because shippers typically operate at or near capacity, leaving no available capacity to absorb diverted grain. AEG excluded several factors that industry professionals indicated were not materially important. Substitution to other modes of transportation—trucking in particular—is infeasible. Trucking lacks the capacity to handle significant amounts of grain and is prohibitively expensive. Therefore, no shift from railing to trucking was modeled.

Grain waiting to be moved needs to be stored, however this will be done using existing facilities at no additional cost. Many grain companies own terminals at ports. Costs of storing containers is captured by the equipment demurrage component of the model. Finally, the analysis assumes that no sales are lost due to

quality degradation. Stored grain is not expected to degrade in quality over the work stoppage periods considered here.

STAKEHOLDER INTERVIEWS

To inform the assumptions used in the model, AEG prepared a questionnaire listing key questions and conducted several interviews and discussions with major players in the Canadian grain industry. Information gathered through this process was used to support the professional judgment and the development of key assumptions incorporated into the model.

TABLE A-1. Main Inputs for Economic Impact Model

Input	Input Value	Source and Notes
Export Sales		
Annual Grain Exports, 2024, CA$	$35,611,718,989	Statistics Canada
Cereals	$12,756,438,239	Statistics Canada; primary processing not included
Oilseeds	$18,462,809,948	Statistics Canada; other than canola meal and oil, primary processing not included
Pulses	$4,392,470,802	Statistics Canada
% Exported During Peak Period (Sep-Jan), 2024	50%	AEG calculation using StatCan's Canadian International Merchandise Trade data
Cereals	43%	AEG calculation using StatCan's Canadian International Merchandise Trade data
Oilseeds	52%	AEG calculation using StatCan's Canadian International Merchandise Trade data
Pulses	59%	AEG calculation using StatCan's Canadian International Merchandise Trade data
Total Sales (Exports + Domestic Sales)		
Total Sales During Peak Period (Sep-Jan), 2024, CA$	$24,581,124,404	AEG calculation using StatCan's exports and grain disposition statistics
Cereals	$7,250,701,281	AEG calculation using StatCan's exports and grain disposition statistics
Oilseeds	$14,089,786,217	AEG calculation using StatCan's exports and grain disposition statistics
Pulses	$3,240,636,906	AEG calculation using StatCan's exports and grain disposition statistics
Total Sales During Non-Peak Period (Feb-Aug), 2024, CA$	$24,841,127,361	AEG calculation using StatCan's exports and grain disposition statistics
Cereals	$9,655,930,379	AEG calculation using StatCan's exports and grain disposition statistics
Oilseeds	$12,933,403,630	AEG calculation using StatCan's exports and grain disposition statistics
Pulses	$2,251,793,352	AEG calculation using StatCan's exports and grain disposition statistics
Lost Sales Due to Work Stoppage		
Reduction in Sales Due to Pre-Disruption Wind-Down Period	9.94%	AEG estimation from regression models using data from the Grain Supply Chain Dashboard
Reduction in Sales Due to Work Stoppage	29.12%	AEG estimation from regression models using data from the Grain Supply Chain Dashboard
Reduction in Sales Due to Post-Disruption Warm-Up Period	10.37%	AEG estimation from regression models using data from the Grain Supply Chain Dashboard
Export Sales by Port		
% Exported via ____, 2024		
Vancouver	61%	AEG calculation using port authority's reported grain traffic statistics
Thunder Bay	15%	AEG calculation using port authority's reported grain traffic statistics
Montreal	6%	AEG calculation using port authority's reported grain traffic statistics
Prince Rupert	9%	AEG calculation using port authority's reported grain traffic statistics
Others	9%	AEG calculation using port authority's reported grain traffic statistics
Rail Transportation		
% moved by rail	94%	Quorum Corp, 2014 Grain Supply Chain Study
% of rail moved by CPKC	49%	AEG adjustment based on 2002 Special Crops Processors Survey, Sask. Ag., Food and Rural Revitalization
% of rail moved by CN	51%	AEG adjustment based on 2002 Special Crops Processors Survey, Sask. Ag., Food and Rural Revitalization
% of grain exports by handling methods, 2024		
Bulk	90%	Port of Vancouver Export Grain Traffic Statistics
Containerized	10%	Port of Vancouver Export Grain Traffic Statistics

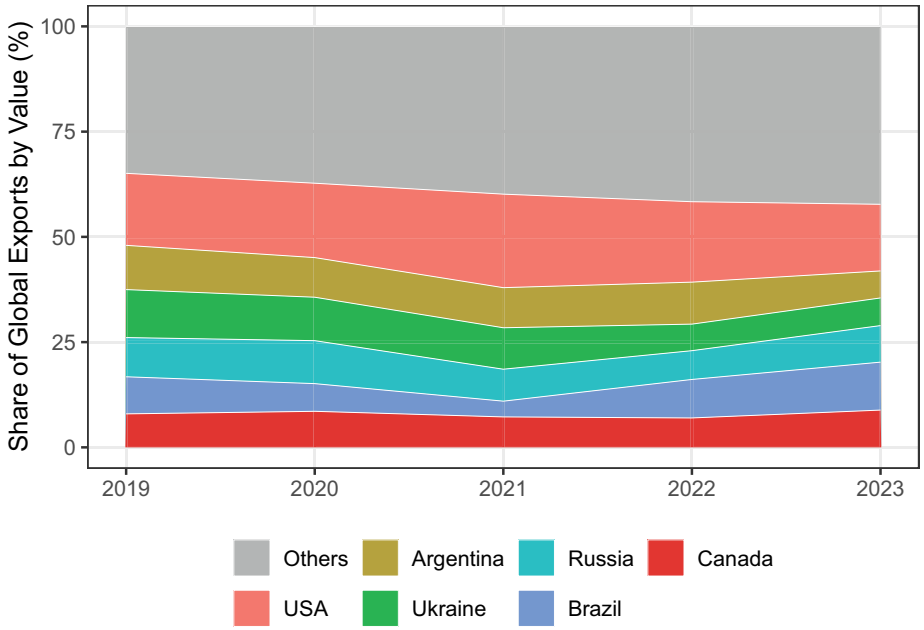
TABLE A-1. Main Inputs for Economic Impact Model (Continued)

Input	Input Value	Source and Notes
Demurrage		
2023-25 Avg Panamax Time Charter Rate, Sep-Jan, CA$/Day	$18,595	AEG calculation using data from Hudson Shipping Lines
2023-25 Avg Panamax Time Charter Rate, Feb-Aug, CA$/Day	$18,279	AEG calculation using data from Hudson Shipping Lines
Median Export Demurrage, CA$/Container/Day		
First 5 Days	$0	AEG calculation using export demurrage schedules by Maersk, CMA CGM, and Hapag-Lloyd
Days 5-10	$260	AEG calculation using export demurrage schedules by Maersk, CMA CGM, and Hapag-Lloyd
Days 11+	$322	AEG calculation using export demurrage schedules by Maersk, CMA CGM, and Hapag-Lloyd
Contracts and Prices		
GAFTA Extension of Shipment Penalty, as % of Contract Price		
1-4 Additional Days	0.5%	GAFTA contracts
5-6 Additional Days	1.0%	GAFTA contracts
7-8 Additional Days	1.5%	GAFTA contracts
Post-Stoppage Drop in Crop Price	2.80%	AEG estimation from regression model using price data from Manitoba Market Reports (DataMB)
Other Inputs		
1 USD to CAD, 2024 Annual Avg Exchange Rate	1.3698	Bank of Canada
2024 Average Prime Rate	6.77%	Bank of Canada, based on rates posted by the six largest chartered banks

Appendix B. Additional Tables and Figures

GLOBAL GRAIN EXPORT SHARES

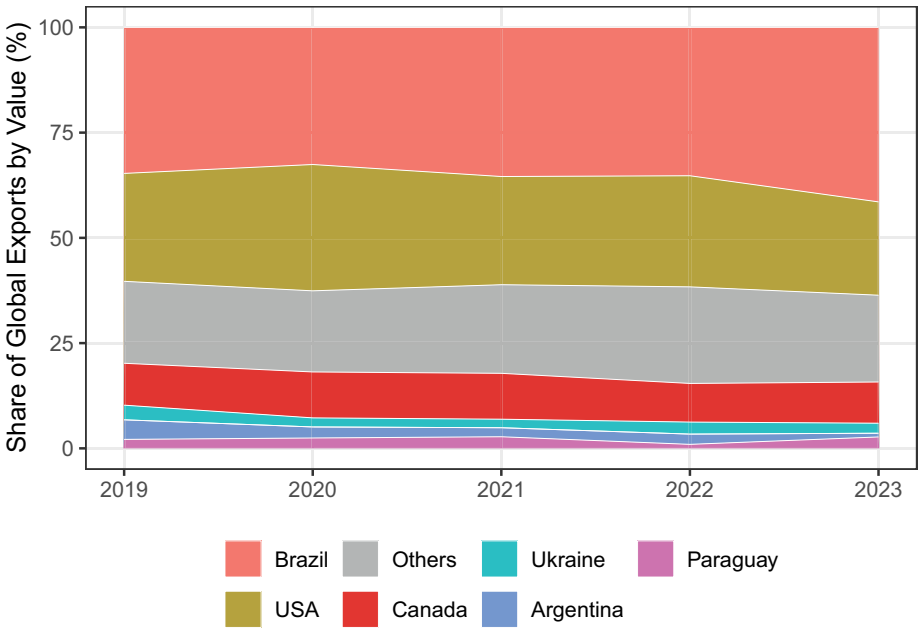
FIGURE B-1. Share of Global Cereal Trade, Canada vs Other Top Exporters



Source: AEG analysis of trade of agricultural commodities data published by the Food and Agriculture Organization.

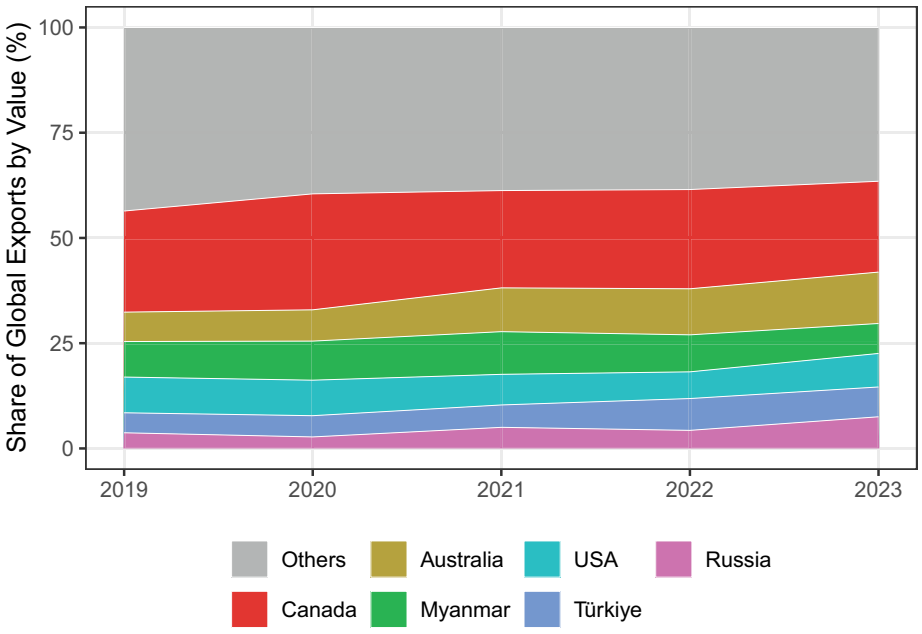
Note: Export values are measured in US dollars.

FIGURE B-2. Share of Global Oilseed Trade, Canada vs Other Top Exporters



Source: AEG analysis of trade of agricultural commodities data published by the Food and Agriculture Organization. Note: Export values are measured in US dollars.

FIGURE B-3. Share of Global Pulse Trade, Canada vs Other Top Exporters



Source: AEG analysis of trade of agricultural commodities data published by the Food and Agriculture Organization. Note: Export values are measured in US dollars.

RAIL AND PORT WORK STOPPAGE

TABLE B-1. Economic Losses Due to Rail and Port Work Stoppage—Detailed (in CAD)

	Peak Period: September-January			Non-Peak Period: February-August		
	1 Day	3 Days	1 Week	1 Day	3 Days	1 Week
Lost sales due to reduced capacity						
Prior to work stoppage	$ 111,731,653	$ 111,731,653	$ 111,731,653	$ 81,106,864	$ 81,106,864	$ 81,106,864
During work stoppage	$ 46,784,467	$ 140,353,401	$ 327,491,268	$ 33,961,203	$ 101,883,610	$ 237,728,423
After work stoppage	$ 16,666,966	$ 33,333,933	$ 66,667,865	$ 12,098,679	$ 24,197,357	$ 48,394,715
Subtotal: Lost sales	*$ 175,183,087*	*$ 285,418,987*	*$ 505,890,787*	*$ 127,166,746*	*$ 207,187,831*	*$ 367,230,001*
Contract penalties due to						
Extension of Shipment	$ 803,305	$ 2,409,914	$ 16,869,399	$ 583,125	$ 1,749,375	$ 12,245,626
	$ 803,305	*$ 2,409,914*	*$ 16,869,399*	*$ 583,125*	*$ 1,749,375*	*$ 12,245,626*
Fees and Other Costs						
Vessel Demurage	$ 50,478	$ 454,303	$ 2,473,429	$ 38,913	$ 350,213	$ 1,906,713
Equipment Demurrage	$ -	$ -	$ 11,374,554	$ -	$ -	$ 8,920,270
Interest Costs	$ 959,213	$ 1,562,808	$ 3,048,515	$ 696,300	$ 1,134,454	$ 2,212,940
Subtotal: Fees and Other Costs	*$ 1,009,691*	*$ 2,017,111*	*$ 16,896,497*	*$ 735,212*	*$ 1,484,667*	*$ 13,039,923*
Total Economic Losses	**$ 176,996,082**	**$ 289,846,012**	**$ 539,656,683**	**$ 128,485,083**	**$ 210,421,873**	**$ 392,515,551**
As % of Average Monthly Sales in 2024	4.3%	7.0%	13.1%	3.1%	5.1%	9.5%

Analysis: Anderson Economic Group

Notes:

a. Lost sales due to reduced capacity are calculated based on 2024 total grain sales statistics and historical grain movement data around work stoppages. Grain exports and domestic consumption are from Statistics Canada. Daily grain movement is from the Grain Supply Chain Dashboard. Work stoppages are compiled for the 2019-2025 period based on news articles.

b. Contract penalties are based on GAFTA contract clauses and length of work stoppage. Sales made during work stoppage are assumed to be delayed by the length of the stoppage. After eight days, settlement for default is calculated based on GAFTA stipulations and historical price movement around work stoppages. In other words, a portion of sales is assumed to be defaulted if stoppage lasts for more than eight days; contract price is renegotiated and the difference between the new price and contract price is counted as economic losses for grain companies. Weekly crop prices are from Manitoba Market Reports published by DataMB.

c. Vessel demurrage charges are calculated based on total sales impacted by the stoppage, an estimated number of vessels needed (without loss of generality, assuming each vessel has a deadweight tonnage of 70,000 metric tonnes, similar to an average Panamax), and historical average time charter rates for such vessels. Historical vessel time charter rates are from Hudson Shipping Lines. Equipment demurrage charges are calculated based on the impacted containerized grain traffic and export demurrage schedules posted by major shipping companies, including Maersk, CMA CGM, and Hapag-Lloyd.

d. Interest costs are calculated based on lost sales—revenue that could have been used to pay down debt and avoid additional interest in the absence of a work stoppage—and the average Canadian prime rate for 2024. Prime rate data is from Bank of Canada, consisting of the rates offered by the six largest banks in Canada.

CN AND CPKC WORK STOPPAGE

TABLE B-2. Economic Losses Due to CN and CPKC Rail Work Stoppage—Detailed (in CAD)

	Peak Period: September-January			Non-Peak Period: February-August		
	1 Day	3 Days	1 Week	1 Day	3 Days	1 Week
Lost sales due to reduced capacity						
Prior to work stoppage	$ 105,027,754	$ 105,027,754	$ 105,027,754	$ 76,240,452	$ 76,240,452	$ 76,240,452
During work stoppage	$ 43,977,399	$ 131,932,196	$ 307,841,792	$ 31,923,531	$ 95,770,593	$ 223,464,717
After work stoppage	$ 15,666,948	$ 31,333,897	$ 62,667,793	$ 11,372,758	$ 22,745,516	$ 45,491,032
Subtotal: Lost sales	*$ 164,672,101*	*$ 268,293,847*	*$ 475,537,339*	*$ 119,536,741*	*$ 194,756,561*	*$ 345,196,201*
Contract penalties due to						
Extension of Shipment	$ 755,106	$ 2,265,319	$ 15,857,235	$ 548,138	$ 1,644,413	$ 11,510,889
	$ 755,106	*$ 2,265,319*	*$ 15,857,235*	*$ 548,138*	*$ 1,644,413*	*$ 11,510,889*
Fees and Other Costs						
Vessel Demurage	$ 47,449	$ 427,045	$ 2,325,023	$ 36,578	$ 329,200	$ 1,792,310
Equipment Demurrage	$ -	$ -	$ 10,692,080	$ -	$ -	$ 8,385,054
Interest Costs	$ 901,660	$ 1,469,040	$ 2,865,604	$ 654,522	$ 1,066,387	$ 2,080,164
Subtotal: Fees and Other Costs	*$ 949,109*	*$ 1,896,085*	*$ 15,882,708*	*$ 691,100*	*$ 1,395,587*	*$ 12,257,528*
Total Economic Losses	**$ 166,376,317**	**$ 272,455,251**	**$ 507,277,282**	**$ 120,775,978**	**$ 197,796,561**	**$ 368,964,618**
As % of Average Monthly Sales in 2024	4.0%	6.6%	12.3%	2.9%	4.8%	9.0%

Analysis: Anderson Economic Group

Notes:

a. Lost sales due to reduced capacity are calculated based on the portion of 2024 grain sales moved by CN and CPKC, and historical grain movement data around work stoppages. Grain exports and domestic consumption are from Statistics Canada. Transportation shares are from the Quorum Corp 2014 Grain Supply Chain Study and AEG's adjustments based on the 2002 Special Crops Processors Survey by the Saskatchewan Agriculture, Food & Rural Revitalization Department. Daily grain movement is from the Grain Supply Chain Dashboard. Work stoppages are compiled for the 2019-2025 period based on news articles.

b. Contract penalties are based on GAFTA contract clauses and length of work stoppage. Sales made during work stoppage are assumed to be delayed by the length of the stoppage. After eight days, settlement for default is calculated based on GAFTA stipulations and historical price movement around work stoppages. In other words, a portion of sales is assumed to be defaulted if stoppage lasts for more than eight days; contract price is renegotiated and the difference between the new price and contract price is counted as economic losses for grain companies. Weekly crop prices are from Manitoba Market Reports published by DataMB.

c. Vessel demurrage charges are calculated based on total sales impacted by the stoppage, an estimated number of vessels needed (without loss of generality, assuming each vessel has a deadweight tonnage of 70,000 metric tonnes, similar to an average Panamax), and historical average time charter rates for such vessels. Historical vessel time charter rates are from Hudson Shipping Lines.Equipment demurrage charges are calculated based on the impacted containerized grain traffic and export demurrage schedules posted by major shipping companies, including Maersk, CMA CGM, and Hapag-Lloyd.

d. Interest costs are calculated based on lost sales—revenue that could have been used to pay down debt and avoid additional interest in the absence of a work stoppage—and the average Canadian prime rate for 2024. Prime rate data is from Bank of Canada, consisting of the rates offered by the six largest banks in Canada.

CN RAIL WORK STOPPAGE

TABLE B-3. Economic Losses Due to CN Rail Work Stoppage—Detailed (in CAD)

	Peak Period: September-January			Non-Peak Period: February-August		
	1 Day	3 Days	1 Week	1 Day	3 Days	1 Week
Lost sales due to reduced capacity						
Prior to work stoppage	$ 53,564,155	$ 53,564,155	$ 53,564,155	$ 38,882,631	$ 38,882,631	$ 38,882,631
During work stoppage	$ 22,428,473	$ 67,285,420	$ 156,999,314	$ 16,281,001	$ 48,843,002	$ 113,967,006
After work stoppage	$ 7,990,144	$ 15,980,287	$ 31,960,575	$ 5,800,107	$ 11,600,213	$ 23,200,426
Subtotal: Lost sales	*$ 83,982,772*	*$ 136,829,862*	*$ 242,524,043*	*$ 60,963,738*	*$ 99,325,846*	*$ 176,050,063*
Contract penalties due to						
Extension of Shipment	$ 385,104	$ 1,155,313	$ 8,087,190	$ 279,550	$ 838,650	$ 5,870,553
	$ 385,104	*$ 1,155,313*	*$ 8,087,190*	*$ 279,550*	*$ 838,650*	*$ 5,870,553*
Fees and Other Costs						
Vessel Demurage	$ 24,199	$ 217,793	$ 1,185,762	$ 18,655	$ 167,892	$ 914,078
Equipment Demurrage	$ -	$ -	$ 5,452,961	$ -	$ -	$ 4,276,377
Interest Costs	$ 459,847	$ 749,210	$ 1,461,458	$ 333,806	$ 543,857	$ 1,060,884
Subtotal: Fees and Other Costs	*$ 484,046*	*$ 967,003*	*$ 8,100,181*	*$ 352,461*	*$ 711,749*	*$ 6,251,339*
Total Economic Losses	**$ 84,851,922**	**$ 138,952,178**	**$ 258,711,414**	**$ 61,595,749**	**$ 100,876,246**	**$ 188,171,955**
As % of Average Monthly Sales in 2024	2.1%	3.4%	6.3%	1.5%	2.4%	4.6%

Analysis: Anderson Economic Group

Notes:

a. Lost sales due to reduced capacity are calculated based on the portion of 2024 grain sales moved by CN Rail, and historical grain movement data around work stoppages. Grain exports and domestic consumption are from Statistics Canada. Transportation shares are from the Quorum Corp 2014 Grain Supply Chain Study and AEG's adjustments based on the 2002 Special Crops Processors Survey by the Saskatchewan Agriculture, Food & Rural Revitalization Department. Daily grain movement is from the Grain Supply Chain Dashboard. Work stoppages are compiled for the 2019-2025 period based on news articles.

b. Contract penalties are based on GAFTA contract clauses and length of work stoppage. Sales made during work stoppage are assumed to be delayed by the length of the stoppage. After eight days, settlement for default is calculated based on GAFTA stipulations and historical price movement around work stoppages. In other words, a portion of sales is assumed to be defaulted if stoppage lasts for more than eight days; contract price is renegotiated and the difference between the new price and contract price is counted as economic losses for grain companies. Weekly crop prices are from Manitoba Market Reports published by DataMB.

c. Vessel demurrage charges are calculated based on total sales impacted by the stoppage, an estimated number of vessels needed (without loss of generality, assuming each vessel has a deadweight tonnage of 70,000 metric tonnes, similar to an average Panamax), and historical average time charter rates for such vessels. Historical vessel time charter rates are from Hudson Shipping Lines. Equipment demurrage charges are calculated based on the impacted containerized grain traffic and export demurrage schedules posted by major shipping companies, including Maersk, CMA CGM, and Hapag-Lloyd.

d. Interest costs are calculated based on lost sales—revenue that could have been used to pay down debt and avoid additional interest in the absence of a work stoppage—and the average Canadian prime rate for 2024. Prime rate data is from Bank of Canada, consisting of the rates offered by the six largest banks in Canada.

CPKC RAIL WORK STOPPAGE

TABLE B-4. Economic Losses Due to CPKC Rail Work Stoppage—Detailed (in CAD)

	Peak Period: September-January			Non-Peak Period: February-August		
	1 Day	3 Days	1 Week	1 Day	3 Days	1 Week
Lost sales due to reduced capacity						
Prior to work stoppage	$ 51,463,600	$ 51,463,600	$ 51,463,600	$ 37,357,822	$ 37,357,822	$ 37,357,822
During work stoppage	$ 21,548,925	$ 64,646,776	$ 150,842,478	$ 15,642,530	$ 46,927,591	$ 109,497,711
After work stoppage	$ 7,676,805	$ 15,353,609	$ 30,707,219	$ 5,572,651	$ 11,145,303	$ 22,290,606
Subtotal: Lost sales	*$ 80,689,330*	*$ 131,463,985*	*$ 233,013,296*	*$ 58,573,003*	*$ 95,430,715*	*$ 169,146,139*
Contract penalties due to						
Extension of Shipment	$ 370,002	$ 1,110,006	$ 7,770,045	$ 268,587	$ 805,762	$ 5,640,335
	$ 370,002	*$ 1,110,006*	*$ 7,770,045*	*$ 268,587*	*$ 805,762*	*$ 5,640,335*
Fees and Other Costs						
Vessel Demurage	$ 23,250	$ 209,252	$ 1,139,261	$ 17,923	$ 161,308	$ 878,232
Equipment Demurrage	$ -	$ -	$ 5,239,119	$ -	$ -	$ 4,108,676
Interest Costs	$ 441,813	$ 719,829	$ 1,404,146	$ 320,716	$ 522,530	$ 1,019,280
Subtotal: Fees and Other Costs	*$ 465,064*	*$ 929,081*	*$ 7,782,527*	*$ 338,639*	*$ 683,838*	*$ 6,006,189*
Total Economic Losses	**$ 81,524,395**	**$ 133,503,073**	**$ 248,565,868**	**$ 59,180,229**	**$ 96,920,315**	**$ 180,792,663**
As % of Average Monthly Sales in 2024	2.0%	3.2%	6.0%	1.4%	2.4%	4.4%

Analysis: Anderson Economic Group

Notes:

a. Lost sales due to reduced capacity are calculated based on the portion of 2024 grain sales moved by CPKC Rail, and historical grain movement data around work stoppages. Grain exports and domestic consumption are from Statistics Canada. Transportation shares are from the Quorum Corp 2014 Grain Supply Chain Study and AEG's adjustments based on the 2002 Special Crops Processors Survey by the Saskatchewan Agriculture, Food & Rural Revitalization Department. Daily grain movement is from the Grain Supply Chain Dashboard. Work stoppages are compiled for the 2019-2025 period based on news articles.

b. Contract penalties are based on GAFTA contract clauses and length of work stoppage. Sales made during work stoppage are assumed to be delayed by the length of the stoppage. After eight days, settlement for default is calculated based on GAFTA stipulations and historical price movement around work stoppages. In other words, a portion of sales is assumed to be defaulted if stoppage lasts for more than eight days; contract price is renegotiated and the difference between the new price and contract price is counted as economic losses for grain companies. Weekly crop prices are from Manitoba Market Reports published by DataMB.

c. Vessel demurrage charges are calculated based on total sales impacted by the stoppage, an estimated number of vessels needed (without loss of generality, assuming each vessel has a deadweight tonnage of 70,000 metric tonnes, similar to an average Panamax), and historical average time charter rates for such vessels. Historical vessel time charter rates are from Hudson Shipping Lines. Equipment demurrage charges are calculated based on the impacted containerized grain traffic and export demurrage schedules posted by major shipping companies, including Maersk, CMA CGM, and Hapag-Lloyd.

d. Interest costs are calculated based on lost sales—revenue that could have been used to pay down debt and avoid additional interest in the absence of a work stoppage—and the average Canadian prime rate for 2024. Prime rate data is from Bank of Canada, consisting of the rates offered by the six largest banks in Canada.

WEST COAST PORTS WORK STOPPAGE

TABLE B-5. Economic Losses Due to West Coast Ports Work Stoppage—Detailed (in CAD)

	Peak Period: September-January			Non-Peak Period: February-August		
	1 Day	3 Days	1 Week	1 Day	3 Days	1 Week
Lost sales due to reduced capacity						
Prior to work stoppage	$ 5,535,792	$ 5,535,792	$ 5,535,792	$ 4,029,000	$ 4,029,000	$ 4,029,000
During work stoppage	$ 2,317,956	$ 6,953,869	$ 16,225,694	$ 1,687,030	$ 5,061,089	$ 11,809,208
After work stoppage	$ 825,772	$ 1,651,544	$ 3,303,088	$ 601,004	$ 1,202,009	$ 2,404,017
Subtotal: Lost sales	*$ 8,679,521*	*$ 14,141,205*	*$ 25,064,575*	*$ 6,317,034*	*$ 10,292,098*	*$ 18,242,226*
Contract penalties due to						
Extension of Shipment	$ 39,800	$ 119,400	$ 835,802	$ 28,967	$ 86,901	$ 608,304
	$ 39,800	*$ 119,400*	*$ 835,802*	*$ 28,967*	*$ 86,901*	*$ 608,304*
Fees and Other Costs						
Vessel Demurage	$ 35,258	$ 317,320	$ 1,727,630	$ 2,679	$ 24,112	$ 131,277
Equipment Demurrage	$ -	$ -	$ 7,944,852	$ -	$ -	$ 6,230,594
Interest Costs	$ 47,525	$ 77,430	$ 151,040	$ 34,589	$ 56,354	$ 109,928
Subtotal: Fees and Other Costs	*$ 82,782*	*$ 394,750*	*$ 9,823,522*	*$ 37,268*	*$ 80,466*	*$ 6,471,799*
Total Economic Losses	**$ 8,802,103**	**$ 14,655,355**	**$ 35,723,899**	**$ 6,383,269**	**$ 10,459,465**	**$ 25,322,329**
As % of Average Monthly Sales in 2024	0.21%	0.36%	0.87%	0.15%	0.25%	0.61%

Analysis: Anderson Economic Group

Notes:

a. Lost sales due to reduced capacity are calculated based on the portion of 2024 grain exports handled by West Coast ports via containers, and historical grain movement data around work stoppages. West Coast ports include Vancouver and Prince Rupert. Grain exports are from Statistics Canada. Grain export statistics by port are from annual reports on cargoes published by port authorities. Daily grain movement is from the Grain Supply Chain Dashboard. Work stoppages are compiled for the 2019-2025 period based on news articles.

b. Contract penalties are based on GAFTA contract clauses and length of work stoppage. Sales made during work stoppage are assumed to be delayed by the length of the stoppage. After eight days, settlement for default is calculated based on GAFTA stipulations and historical price movement around work stoppages. In other words, a portion of sales is assumed to be defaulted if stoppage lasts for more than eight days; contract price is renegotiated and the difference between the new price and contract price is counted as economic losses for grain companies. Weekly crop prices are from Manitoba Market Reports published by DataMB.

c. Vessel demurrage charges are calculated based on total sales impacted by the stoppage, an estimated number of vessels needed (without loss of generality, assuming each vessel has a deadweight tonnage of 70,000 metric tonnes, similar to an average Panamax), and historical average time charter rates for such vessels. Historical vessel time charter rates are from Hudson Shipping Lines. Equipment demurrage charges are calculated based on the impacted containerized grain traffic and export demurrage schedules posted by major shipping companies, including Maersk, CMA CGM, and Hapag-Lloyd.

d. Interest costs are calculated based on lost sales—revenue that could have been used to pay down debt and avoid additional interest in the absence of a work stoppage—and the average Canadian prime rate for 2024. Prime rate data is from Bank of Canada, consisting of the rates offered by the six largest banks in Canada.

EAST COAST PORTS WORK STOPPAGE

TABLE B-6. Economic Losses Due to East Coast Ports Work Stoppage—Detailed (in CAD)

	Peak Period: September-January			Non-Peak Period: February-August		
	1 Day	3 Days	1 Week	1 Day	3 Days	1 Week
Lost sales due to reduced capacity						
Prior to work stoppage	$ 1,686,612	$ 1,686,612	$ 1,686,612	$ 1,227,531	$ 1,227,531	$ 1,227,531
During work stoppage	$ 706,221	$ 2,118,663	$ 4,943,546	$ 513,994	$ 1,541,982	$ 3,597,958
After work stoppage	$ 251,591	$ 503,182	$ 1,006,365	$ 183,110	$ 366,221	$ 732,441
Subtotal: Lost sales	*$ 2,644,424*	*$ 4,308,457*	*$ 7,636,522*	*$ 1,924,636*	*$ 3,135,734*	*$ 5,557,931*
Contract penalties due to						
Extension of Shipment	$ 12,126	$ 36,378	$ 254,647	$ 8,825	$ 26,476	$ 185,334
	$ 12,126	*$ 36,378*	*$ 254,647*	*$ 8,825*	*$ 26,476*	*$ 185,334*
Fees and Other Costs						
Vessel Demurage	$ 10,742	$ 96,679	$ 526,364	$ 8,281	$ 74,528	$ 405,763
Equipment Demurrage	$ -	$ -	$ 2,420,589	$ -	$ -	$ 1,898,299
Interest Costs	$ 14,480	$ 23,591	$ 46,018	$ 10,538	$ 17,170	$ 33,492
Subtotal: Fees and Other Costs	*$ 25,222*	*$ 120,270*	*$ 2,992,971*	*$ 18,819*	*$ 91,698*	*$ 2,337,554*
Total Economic Losses	**$ 2,681,771**	**$ 4,465,105**	**$ 10,884,141**	**$ 1,952,280**	**$ 3,253,908**	**$ 8,080,819**
As % of Average Monthly Sales in 2024	0.07%	0.11%	0.26%	0.05%	0.08%	0.20%

Analysis: Anderson Economic Group

Notes:

a. Lost sales due to reduced capacity are calculated based on the portion of 2024 grain exports handled by East Coast ports via containers, and historical grain movement data around work stoppages. East Coast ports include Montreal and Thunder Bay. Grain exports are from Statistics Canada. Grain export statistics by port are from annual reports on cargoes published by port authorities. Daily grain movement is from the Grain Supply Chain Dashboard. Work stoppages are compiled for the 2019-2025 period based on news articles.

b. Contract penalties are based on GAFTA contract clauses and length of work stoppage. Sales made during work stoppage are assumed to be delayed by the length of the stoppage. After eight days, settlement for default is calculated based on GAFTA stipulations and historical price movement around work stoppages. In other words, a portion of sales is assumed to be defaulted if stoppage lasts for more than eight days; contract price is renegotiated and the difference between the new price and contract price is counted as economic losses for grain companies. Weekly crop prices are from Manitoba Market Reports published by DataMB.

c. Vessel demurrage charges are calculated based on total sales impacted by the stoppage, an estimated number of vessels needed (without loss of generality, assuming each vessel has a deadweight tonnage of 70,000 metric tonnes, similar to an average Panamax), and historical average time charter rates for such vessels. Historical vessel time charter rates are from Hudson Shipping Lines. Equipment demurrage charges are calculated based on the impacted containerized grain traffic and export demurrage schedules posted by major shipping companies, including Maersk, CMA CGM, and Hapag-Lloyd.

d. Interest costs are calculated based on lost sales—revenue that could have been used to pay down debt and avoid additional interest in the absence of a work stoppage—and the average Canadian prime rate for 2024. Prime rate data is from Bank of Canada, consisting of the rates offered by the six largest banks in Canada.

Appendix C. About Anderson Economic Group

Anderson Economic Group is a boutique consulting firm founded in 1996, with offices in East Lansing and Chicago. We specialize in strategy, valuation, public policy, and market analysis. Our team has a deep understanding of advanced economic modeling techniques and extensive experience in multiple industries, as well as in multiple U.S. states and other countries.

The consultants at Anderson Economic Group are often published on topics within their respective fields of expertise. Publications from our team include:

- *Annual State Business Tax Burden Rankings,* published since 2007.
- *The State Economic Handbook,* published by Palgrave Macmillan, 2008, 2009, and 2010.
- *Applied Game Theory and Strategic Behavior,* published in 2009.
- *The Economics of Business Valuation: Toward a Value Functional Approach,* published by Stanford University Press in 2013.
- *Business Economics and Finance with MATLAB®, GIS, and Simulation Models,* published in 2000.

Past clients of Anderson Economic Group include:

- *Governments:* The government of Canada; the states of Michigan, North Carolina, and Wisconsin; the cities of Detroit, Cincinnati, and Sandusky; counties such as Oakland County, and Collier County; and authorities such as the Detroit-Wayne County Port Authority.
- *Corporations:* Bank of America Merrill Lynch, InBev USA, ITC Holdings Corp., Ford Motor Company, First Merit Bank, Labatt USA, Lithia Motors, Meijer, Inc., National Wine & Spirits, Nestle, and Relevent Sports; automobile dealers and dealership groups representing Toyota, American Honda Motor Company, Chrysler, Mercedes-Benz, General Motors, Kia, and other brands.
- *Nonprofit organizations:* Associations such as Pulse Canada, convention and visitor bureaus of several major cities; higher education institutions including Michigan State University, Wayne State University, and University of Michigan; trade associations such as the Michigan Manufacturers Association, Service Employees International Union, Automation Alley, and Business Leaders for Michigan.

Please visit AndersonEconomicGroup.com for more information.