Annual Report

2022-2023 Crop Year

Monitoring the Canadian Grain Handling and Transportation System

Government of Canada | Gouvernement du Canada

Quorum Corporation

Quorum Corporation

Suite 550, 11150 Jasper Avenue
Edmonton, Alberta
T5K 0C7

Telephone: 780 / 447-2111

Website: www.quorumcorp.net
Email: info@quorumcorp.net

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This report is available on the Quorum Corporation website.
www.grainmonitor.ca

Cover Image: A Vancouver-bound Canadian Pacific Railway (CP) grain train is seen on the Canadian National Railway's (CN) Ashcroft Subdivision near Seddall, British Columbia, in September 2022. Since the inception of a co-production agreement in the early 2000s, CN and CP have used directional running to move traffic more efficiently through the Fraser and Thompson River canyons. Under the agreement, westbound trains of both carriers traverse the CN route between Kamloops and Vancouver while eastbound trains are funneled over CP's corresponding rail line. The practice effectively eliminated the need for both carriers to manage two-way traffic flows on their respective single-line routes through this area, thereby increasing capacity, reducing bottlenecks, and improving the fluidity in one of Canada's most critical supply-chain corridors. (Image courtesy of Stephen Arnot)

Foreword

The following report details the performance of Canada's Grain Handling and Transportation System (GHTS) for the crop year that ended 31 July 2023, and focuses on the various events, issues and trends manifest in the movement of Western Canadian grain during the past year. This is the twenty-third annual report submitted by Quorum Corporation in its capacity as the Monitor appointed under the Government of Canada's Grain Monitoring Program (GMP).

As with the Monitor's previous annual reports, it is structured around various measurement indicators, grouped into six series, namely:

Series 1 – Production and Supply
Series 2 – Traffic and Movement
Series 3 – Infrastructure
Series 4 – Commercial Relations
Series 5 – System Efficiency and Performance
Series 6 – Producer Impact

As in the past, each series builds on data collected by the Monitor from the industry's various stakeholders and frames the discussion using year-over-year comparisons. To that end, activity in the 2022-23 crop year is largely gauged against that of the 2021-22 crop year. But the Grain Monitoring Program (GMP) was also intended to frame recent activity against the backdrop of a longer time series. Beginning with the 1999-2000 crop year – referred to as the GMP's "base" year – the Monitor has now assembled relatable data in a time series that extends through 24 crop years. This data constitutes the backbone of the GMP and is used widely to identify significant trends and changes in GHTS performance. Although the Data Tables presented in Appendix 4 of this report can only depict a portion of this data, the full time series can be obtained as MS Excel spreadsheets from the Monitor's website (www.grainmonitor.ca). Similarly, select data elements can also be downloaded through the website's newest online feature, Grain Monitor Open Data System (GMODS).

Analogous space constraints have also made it necessary to limit the graphical presentation of data in this report to the last ten crop years. This report, as well as all past reports, can also be downloaded from the Monitor's website (www.grainmonitor.ca).

QUORUM CORPORATION

Edmonton, Alberta
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Executive Summary

With the total grain supply having risen to 79.2 million tonnes from the previous crop year's drought-ravaged 57.4 million tonnes, it was apparent from the outset that the Grain Handling and Transportation System (GHTS) would be required to handle a near-normal volume in the 2022-23 crop year. Although grain entering the country elevator system initially proved to be less than what had been handled the previous August, monthly throughput built up quickly. This increase foreshadowed what would be a decidedly heavier workload, with Western Canadian producers ultimately delivering 61.1 million tonnes of grain into the GHTS, 43.6% more than in the previous crop year.

For the 2022-23 crop year, it took an average of 40.4 days for grain to move from the Prairies to export positions within Western Canada, a 34.4% decrease from the 61.6-day average posted a year earlier. This average ranked as the lowest yet recorded under the GMP, and 40.7% below the 68.1-day average first benchmarked in the base year. The 21.2-day year-over-year improvement was largely the product of decreases in country-elevator and terminal-elevator storage times, which fell by 14.1 days and 6.0 days respectively. However, these advances were supported by a 1.1-day reduction in the railways' loaded transit time, reflecting what proved to be a less problematic year for the GHTS.

As the harvest progressed, the railways began pulling more of their hopper-car fleets out of storage, pressing nearly 98% into active service by November 2022. Coupled with better crew and motive power availability, this suggested that the railways had deployed significantly more carrying capacity to deal with the larger crop. The effects were visible in noticeably lower average car cycles on movements within Western Canada, which declined by 21.5%, to 14.0 days from 17.8 days a year earlier. This denoted the lowest average observed since the 2015-16 crop year.

However, the improvement in such metrics was amplified by comparisons with the abnormal results posted in the preceding 2021-22 crop year. These earlier results reflected not only the effects of a drought on the Prairies, but the catastrophic flooding in British Columbia that wrought unprecedented damage to the transportation infrastructure serving Vancouver. These disastrous events distort some of the very real performance gains made by the GHTS in the 2022-23 crop year. Better insights into these gains can be drawn through comparison with either the 2019-20 or 2020-21 crop years.

To be sure, little in the way of change was noted in the amount of time spent by grain in storage, be it at country elevators or port terminals. What did show improvement was the amount of time grain spent in transit with the railways, which declined progressively from an average of 7.4 days in the 2019-20 crop year to 5.7 days three years later. This 1.7-day, or 23.0%, reduction proved to be the key driver in drawing down the average time spent by grain in the system to a new record low. Moreover, it reflected a concerted effort by the railways – and especially CN – to improve their service offerings.

The downstream effects of more consistent railway service were equally pronounced. With a more reliable inflow of grain to the ports, terminal stocks remained largely stable and sufficient to meet the prevailing demand of arriving vessels. Moreover, vessels began spending less time in port, with the posted annual average for the 2022-23 crop year falling to 9.8 days from 12.3 days three years earlier.

These improvements were widely acknowledged by grain shippers, who applauded the railway industry's willingness to deploy the resources required to provide for better service. Nevertheless, many remained steadfastly supportive of the measures they deemed necessary to safeguard shippers' rights.

HIGHLIGHTS FOR THE 2022-2023 CROP YEAR

(Comparisons are to the previous crop year)

Production and Supply

- Grain production increased 50.2% to 74.8 million tonnes; slightly beneath the 2020-21 crop year's pre-drought output of 78.8 million tonnes.
  - Cereals comprised 62.0% of the crop; oilseeds 27.3%; and other commodities 10.7%.
  - Early growing challenges gave way to better conditions and the harvesting of a good-quality crop.
- Carry-forward stocks from the 2021-22 crop year decreased 42.8% to 4.3 million tonnes.
- Carry-out stocks increased 23.7% to 5.3 million tonnes.
- Total grain supply (production and carry-forward) increased 38.0% to 79.2 million tonnes.

Traffic and Movement

- Primary-elevator throughput increased by 43.3%, to 49.4 million tonnes, moderately below pre-drought volume of 53.9 million tonnes.
  - Represented 80.7% of all producer deliveries (primary and process elevators, as well as producer cars).
- Railway shipments increased 52.4% to 55.5 million tonnes.
  - Traffic to Western Canada totaled 44.8 million tonnes, up 62.8%.
  - Traffic to Eastern Canada totaled 2.4 million tonnes, up 6.2%.
  - Traffic to the United States and Mexico totaled 8.3 million tonnes, up 25.2%.
- Terminal-elevator throughput increased 64.6% to 39.9 million tonnes.
  - Terminal unloads totaled 410,466 cars, up 63.9%.
  - CN/CPKC traffic shares were 52.2% and 47.8% respectively.
- Containerized traffic increased 34.9% to 3.5 million tonnes.
  - Continued equipment-supply issues hampered the return to pre-COVID-19 traffic levels.
- Truck traffic to the United States decreased 1.8% to 2.2 million tonnes.
  - Limited decline reflects stability of transborder movements.

HIGHLIGHTS FOR THE 2022-2023 CROP YEAR (continued)

(Comparisons are to the previous crop year)

Infrastructure

- The number of country elevators decreased 1.9% to 405.
  - Net reduction of eight facilities reflects the licensing of 11 elevators along with the closure of 19 others.
  - Nine new or retrofitted loop-track elevators became operational, with 46 at crop year's end.
  - Storage capacity increased 1.7% to 9.6 million tonnes, a GMP record.
- The railway network remained unchanged at 17,265.7 route-miles.
  - CN and CPKC operated 84.5% of the network; Regional and shortline carriers operated 15.5% of the network.
- The railways' hopper-car fleet increased by 5.6% to an annualized average of 22,421 cars.
  - Marks first increase since fleet renewal announcement four years earlier.
  - Proportion of cars in active service reached a height of 97.9% in October 2022.
- Terminal elevators remained unchanged at 17 facilities.
  - Storage capacity remained unchanged at 2.8 million tonnes.

Commercial Relations

- Country elevator handling charges saw mixed changes.
  - Elevation rates increased 0.3%; dockage rates decreased 0.4%; and storage rates increased 1.1%.
- Railway freight rates showed continuing cyclicality, with net changes as at 31 July 2023:
  - CN rates to Vancouver increased 0.4% while rates to Prince Rupert and Thunder Bay decreased by 1.6% and 0.6% respectively.
  - CPKC rates to Vancouver decreased 3.3% while Thunder Bay rates increased 0.2%.
  - Multiple-car block discounts were unchanged.
    - CN and CPKC now only provide discounts on movements in blocks of 100 or more cars.
  - Maximum Revenue Entitlements:
    - CN exceeds its MRE by $3.5 million.
    - CPKC exceeds its MRE by $3.4 million.
- Terminal Country elevator handling charges moved modestly higher.
  - Elevation rates increased 1.5% while storage rates remained unchanged.
- Commercial Developments:
  - Port of Vancouver continues development of Active Vessel Traffic Management program.
  - International Maritime Organization moves to reduce ship emissions.
  - Supply-Chain Task Force releases report; prompts federal governmental investment and reinstitution of extended interswitching.
  - CP-KCS merger receives approval of US Surface Transportation Board.
  - New government funding for Churchill announced.
  - Competition Tribunal rejects call for sale of former Louis Dreyfus elevator.
  - Renewable diesel expansion moves forward.
  - Merit Foods enters receivership.
  - Viterra and Bunge announce merger plan.
  - Strike by International Longshore and Warehouse Union Canada employees disrupts west coast port operations.

HIGHLIGHTS FOR THE 2022-2023 CROP YEAR (continued)

(Comparisons are to the previous crop year)

System Efficiency and Performance

- Country elevator operations reflect increased activity.
  - Capacity turnover ratio increased 40.5% to 5.9 turns; includes impact of 119,900-tonne increase in storage capacity.
  - Average weekly stocks decreased 4.7% to 3.4 million tonnes; descended from high of 4.3 million tonnes in September 2022.
  - Average days-in-store decreased 36.8% to 24.2 days; descended from high of 30.8 days in August 2022.
  - Stock-to-shipment ratio decreased 42.4% to 3.4; reflected drawdown of grain stocks due to better movement.
- Railway operations reflect larger movement along with improved service.
  - Average car-cycle to Western Canada decreased 21.5% to 14.0 days; average loaded transit time decreased 16.4% to 5.7 days.
  - Average car-cycle to Eastern Canada decreased 18.6% to 24.3 days; average loaded transit time decreased 19.6% to 10.9 days.
  - Average car-cycle to United States decreased 5.8% to 26.1 days; average loaded transit time decreased 9.3% to 10.3 days.
  - Multiple-car block movement share in Western Canada increased to 83.5% from 82.0%.
    - Annual freight savings increased 68.2% to an estimated $293.3 million.
- Terminal Elevator operations reflect increased activity.
  - Capacity turnover ratio increased 72.5% to 15.7 turns.
  - Average weekly stocks increased 4.5% to 1.2 million tonnes.
  - Average days-in-store decreased 36.4% to 10.5 days; reflected effects of better movement.
  - Out-of-car time decreased to 13.3% from 15.3%, continued to show a high degree of variability.
- Port operations
  - Vessels calls increased 45.4% to 923 ships.
  - Average vessel time in port increased 7.5% to 9.8 days in the face of heavier grain deliveries.
  - Demurrage costs again exceeded dispatch earnings, to produce a net cash outflow of $15.0 million.
    - Demurrage costs increased 62.8% to $31.5 million; dispatch earnings decreased 18.1% to $16.5 million.
- System performance
  - Average time spent in the system decreased 34.4% to 40.4 days, a record low under the GMP.
    - Reflected improved railway service under larger workload and fewer disruptions.

Producer Impact

- Producer Netback
  - 1CWRS wheat: Average price decreased 8.2%; export basis decreased 18.8%; netback decreased 5.7% to $404.10 per tonne.
  - 1CWA durum: Average price decreased 28.2%; export basis decreased 25.5%; netback decreased 28.9% to $441.31 per tonne.
  - 1 Canada canola: Average price decreased 20.2%; export basis decreased 9.8%; netback decreased 20.9% to $795.48 per tonne.
  - Large yellow peas: Average price decreased 27.0%; export basis decreased 15.8%; netback decreased 28.5% to $459.52 per tonne.
- Producer cars
  - Producer-car loading sites remained unchanged at 272.
  - Scheduled producer-car shipments increased 75.6% to 1,954 carloads.
    - Second lowest volume recorded under the GMP.

Section 1: Production and Supply

Indicator Description	Table	1999-00	2020-21	2021-22	2022-23 Q1	Q2	Q3	Q4	YTD	% VAR
Western Canada Production and Supply										
Crop Production (000 tonnes)	1A-1	55,141.7	78,829.6	49,812.6	74,839.5				74,839.5	50.2%
Carry Forward Stock (000 tonnes)	1A-2	7,418.2	8,383.6	7,542.1	4,311.8				4,311.8	-42.8%
Grain Supply (000 tonnes)		62,559.9	87,213.2	57,354.7	79,151.3				79,151.3	38.0%
Crop Production (000 tonnes) – Special Crops	1A-3	3,936.7	8,420.0	4,442.0	6,491.7				6,491.7	46.1%

DISCUSSION AND ANALYSIS

PRODUCTION AND SUPPLY
[See TABLES 1A-1 through 1A-3]

Owing to much-improved growing conditions, Western Canadian grain production rose to 74.8 million tonnes in the 2022-23 crop year, a 50.2% gain over the previous crop year's drought-ravaged 49.8-million-tonne crop. That drought resulted in the smallest crop witnessed under the Grain Monitoring Program (GMP) since the 2007-08 crop year, and the steepest year-over-year decline in its history. The scope of the downturn had far-reaching implications for the Grain Handling and Transportation System (GHTS), which were reflected in sharply reduced volume and performance measures. But the upturn in production during the 2022 growing season reversed much of this, giving rise to much improved system performance.

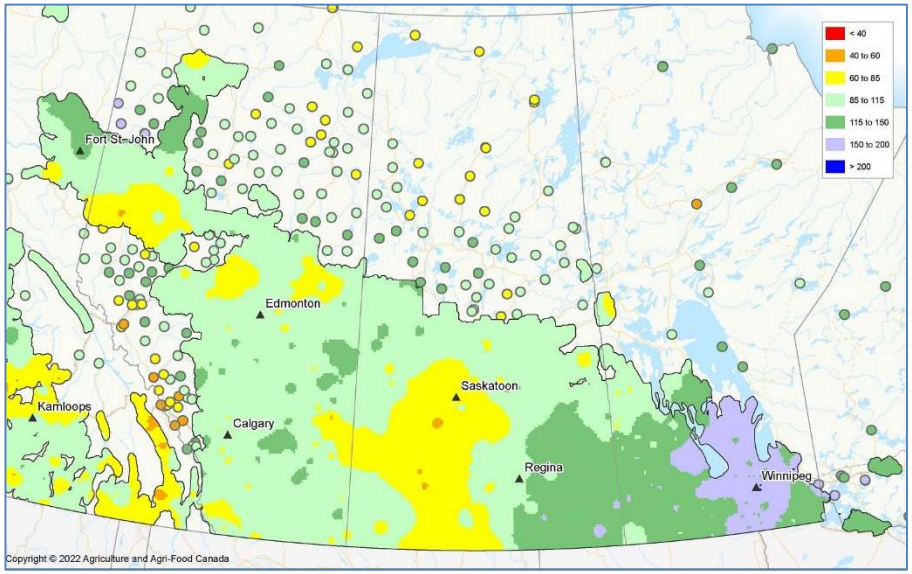
General Growing Conditions

The crop harvested at the close of the 2022 growing season embodied an impressive turnaround in production following the previous year's broad drought. However, earlier indications had proved worrisome given below-normal soil moisture, which had raised concerns over potentially lower crop yields in the face of the global food-security fears that were driving grain prices to new highs.

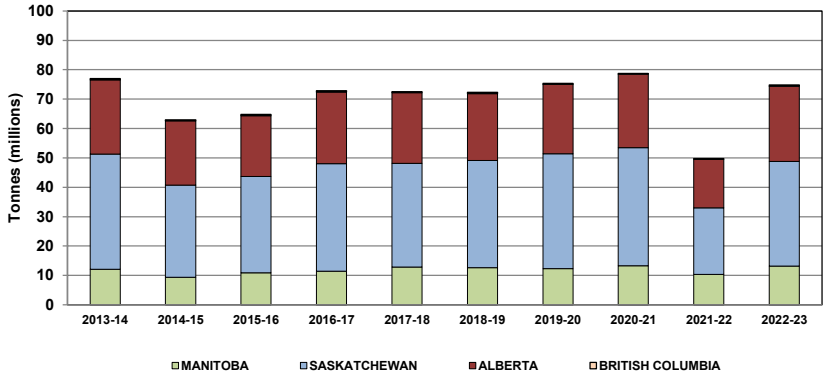
Although record rainfalls in southern Manitoba and eastern Saskatchewan alleviated some of the dryness, they also delayed seeding, especially in the flood-prone Red River Valley. Ultimately, this meant that seeding lagged normal completion by a few weeks. Germination proved slow as well, especially in the western regions that didn't receive any beneficial spring rainfall. June brought some much-needed relief, especially in the more northern regions of the prairies, while the southern tier remained stubbornly dry.

Despite the erratic rainfall and challenging conditions experienced throughout much of the growing season, above-normal temperatures in July spurred crop development. Growth progressed well throughout the

Percent of Average Precipitation (1 April to 31 August 2022)



Grain Production - Provincial Distribution
(Western Canada)



period leading into harvest, with a good crop canopy observed for most field grains, oilseeds, and special crops.

Although a late start to the harvest gave rise to frost worries, early September brought ideal weather conditions, and the alleviation of much of the concern. While damp weather later in the month, along with the slow maturity of some crops – especially canola – delayed harvesting, most crops came off in relatively good condition. The canola crop proved somewhat disappointing, however, with the effects of heat blast during flowering believed to have led to a reduced yield.

Impact on Provincial Production

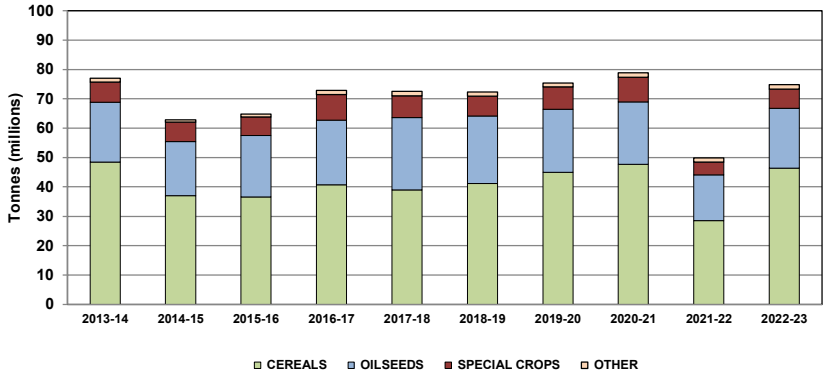
Saskatchewan saw the largest post-drought increase in grain production, with a 57.3% surge. This was followed by increases of 55.7% in Alberta, 26.9% in Manitoba, and 21.3% in British Columbia. However, these variances did little to change the traditional ranking of the provinces themselves. Saskatchewan remained the largest grain producer with 35.6 million tonnes harvested, or a 47.6% share. This was followed in turn by Alberta with 25.7 million tonnes, or 34.4%; Manitoba with 13.1 million tonnes, or 17.5%; and British Columbia with 366,600 tonnes, or 0.5%.

Changing Face of the Harvest

While growing conditions have always resulted in significant swings in the size of the overall crop, there has been a significant longer-term shift in both the quantity and mix of grains that are now harvested. Until 2013 prairie grain production seldom reached beyond an average of 55 million tonnes annually. At that point, grain production surged dramatically, reaching a then record 77.0 million tonnes. In the wake of that historic harvest, the amount of grain drawn from prairie fields rose steadily, regularly surpassing 70 million tonnes. These enlarged harvests reflected the better yields achieved through advancements in plant genetics and agronomic practices, although favourable weather and moisture conditions remained key determinants.

At the outset of the GMP, cereals constituted about three-quarters of all grains grown in Western Canada. However, since the 2014-15 crop year,

Grain Production - Principal Commodities
(Western Canada)



these same commodities have generally accounted for under 60% of the total tonnes harvested. The 2022-23 crop year saw a modest uptick in this apportionment, with 46.4 million tonnes of cereal production garnering a 62.0% share. Cereal's general decline reflects the growing significance of oilseeds and other commodities in today's marketplace, which rebounded to a combined 28.4 million tonnes of production, claiming a 38.0% share of all grains harvested.

By far, the most significant contributor to the displacement of cereals has been oilseeds, with combined canola, soybean and flaxseed harvests totalling 20.4 million tonnes in the 2022-23 crop year; virtually double the base year's 9.7-million-tonne production. This was bolstered by an analogous increase in the output of special crops, especially dry peas and lentils, which rose to 6.5 million tonnes from 3.9 million tonnes during this same period.

Increasing Grain Supply and GHTS Workload

The amount of grain that the GHTS handles in any given crop year is not defined by production alone; it is augmented by the amount of grain held

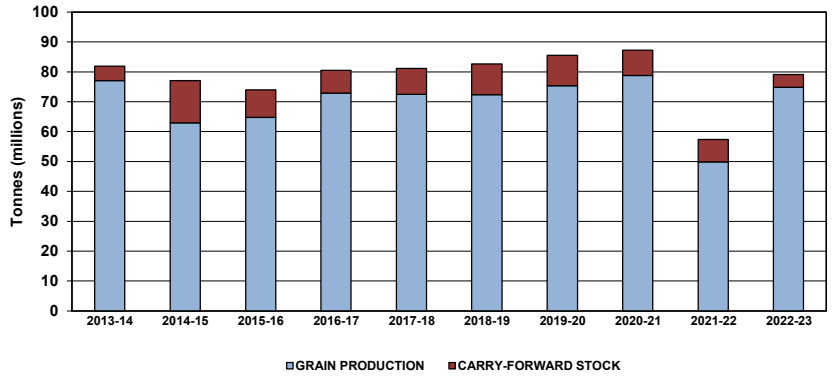
over in inventory from the previous crop year.[1] These carry-forward stocks have reached as much as 20% of annual production values. Until the 2021-22 crop year's sharp downturn in production, carry-forward stocks had regularly helped lift the annual grain supply to over 80.0 million tonnes. With more modest carry-forward stocks of almost 4.3 million tonnes, the grain supply reached a slightly lesser 79.2 million tonnes in the 2022-23 crop year. This, however, still proved to be 38.0% above the previous crop year's recent low of 57.4 million tonnes. Moreover, given the 5.3 million tonnes that remained as carry-out stocks at the close of the crop year, this meant that the GHTS faced a sharply increased handle of 73.8 million tonnes.

Notwithstanding recent variations, growth in the grain supply has spurred the GHTS into adding new capacity. The most visible manifestation of this has been in the establishment of extra storage, be it on individual farms or at country elevators. Moreover, it has also spurred investment in still more efficient high-throughput elevators, with many featuring loop tracks that allow for the continuous loading of unit trains reaching up to 150 railcars in length. At the close of the 2022-23 crop year, 46 such facilities had already been commissioned, with several more still under construction.

Significant investments in additional port handling capacity have also been made over the last decade, with much of this being centred in Vancouver, British Columbia. This has resulted in the expansion of several existing facilities, along with construction of the all-new, state-of-the-art G3 Vancouver Terminal. Analogous modernization initiatives were also in evidence at the port of Prince Rupert, with much of its current efforts being directed towards supporting increased container movements.

These same market forces have also been exerting pressure on the railways to invest in additional grain-handling capacity, with perhaps the most visible facet of this being the ongoing replacement of the government-supplied, hopper-car fleet with new, higher-capacity equipment. In addition, both the Canadian National Railway (CN) and Canadian Pacific

Grain Supply
(Western Canada)



Kansas City Limited (CPKC) have continued to move on a variety of fronts aimed at adding capacity through other means, including double-tracking and the building of new sidings, locomotive purchases, and the hiring of new employees. Much the same can be said of marine carriers, which have been commissioning larger ships in a parallel effort to improve the efficiency of their own operations. All these initiatives have played a role in enabling the GHTS to deal with ever-increasing grain volumes.

However, the growth in traffic – be it in the form of grain or other commodities – has drawn still more attention to existing transportation bottlenecks. Recognizing the need for improved supply-chain fluidity, the Government of Canada launched its National Trade Corridors Fund (NTCF) in 2017. The NTCF, which was allocated $4.6 billion in total funding through 2028, is aimed at supporting critical investments in the country's marine, rail, and road infrastructure.[2]

1 Carry-forward stocks are defined as inventories on hand at farms and primary elevators at the close of a crop year (i.e., 31 July) and the beginning of a new crop year (i.e., 1 August).

2 More information on the National Transportation Corridors Fund, including approved projects, can be found at https://tc.canada.ca/en/programs/funding-programs/national-trade-corridors-fund.

Section 2: Traffic and Movement

Indicator Description	Table	1999-00	2020-21	2021-22	2022-23 Q1	Q2	Q3	Q4	YTD	% VAR
Country Elevator Throughput										
Grain Throughput (000 tonnes) – Primary Elevators	2A-1	32,493.9	53,876.8	34,442.1	12,775.8	14,063.2	13,218.3	9,306.1	49,363.4	43.3%
Railway Traffic										
Traffic to Western Canada										
Railway Shipments (000 tonnes) – Ports Only	2B-1	26,439.2	49,774.3	26,533.3	11,572.2	12,589.5	11,405.0	8,152.8	43,719.6	64.8%
Railway Shipments (000 tonnes) – Western Domestic	2B-1	n/a	857.2	961.8	202.1	312.2	263.3	262.3	1,039.9	8.1%
Traffic to Western Canada (Ports Only)										
Railway Shipments (000 tonnes) – All Grains	2B-1	26,439.2	49,774.3	26,533.3	11,572.2	12,589.5	11,405.0	8,152.8	43,719.6	64.8%
Railway Shipments (000 tonnes) – Hopper Cars	2B-1	25,664.6	47,669.7	25,709.5	11,362.9	12,382.2	11,215.2	8,002.0	42,962.2	67.1%
Railway Shipments (000 tonnes) – Non-Hopper Cars	2B-1	774.7	2,104.6	823.8	209.3	207.4	189.9	150.8	757.4	-8.1%
Special Crop Shipments (000 tonnes) – All Grains	2B-2	2,102.9	5,519.6	2,515.4	1,404.1	958.3	982.9	497.4	3,842.6	52.8%
Special Crop Shipments (000 tonnes) – Hopper Cars	2B-2	1,844.1	5,122.5	2,425.0	1,387.5	942.1	958.6	473.8	3,761.9	55.1%
Special Crop Shipments (000 tonnes) – Non-Hopper Cars	2B-2	258.7	397.1	90.4	16.6	16.2	24.3	23.6	80.7	-10.8%
Hopper Car Shipments (000 tonnes) – Origin Province	2B-3									
Hopper Car Shipments (000 tonnes) – Primary Commodities	2B-4	25,664.6	47,669.7	25,709.5	11,362.9	12,382.2	11,215.2	8,002.0	42,962.2	67.1%
Hopper Car Shipments (000 tonnes) – Detailed Breakdown	2B-5									
Hopper Car Shipments (000 tonnes) – Grain-Dependent Network	2B-6	8,685.9	13,302.0	7,198.5	3,115.2	3,557.6	3,140.5	2,150.2	11,963.5	66.2%
Hopper Car Shipments (000 tonnes) – Non-Grain-Dependent Network	2B-6	16,978.7	34,367.7	18,511.0	8,247.7	8,824.5	8,074.7	5,851.8	30,998.7	67.5%
Hopper Car Shipments (000 tonnes) – Class 1 Carriers	2B-7	23,573.5	46,024.2	25,047.3	10,997.3	11,933.3	10,852.5	7,833.8	41,616.9	66.2%
Hopper Car Shipments (000 tonnes) – Non-Class-1 Carriers	2B-7	2,091.0	1,645.5	662.1	365.6	448.8	362.7	168.2	1,345.3	103.2%
Traffic to Eastern Canada										
Railway Shipments (000 tonnes) – All Grains	2B-8	n/a	4,059.3	2,270.8	594.3	712.0	729.7	375.1	2,411.1	6.2%
Railway Shipments (000 tonnes) – Hopper Cars	2B-8	n/a	3,224.8	1,673.6	422.7	582.0	624.3	271.6	1,900.6	13.6%
Railway Shipments (000 tonnes) – Non-Hopper Cars	2B-8	n/a	834.5	597.2	171.6	130.1	105.3	103.5	510.4	-14.5%
Special Crop Shipments (000 tonnes) – All Grains	2B-9	n/a	509.0	499.9	172.9	137.0	90.1	46.4	446.4	-10.7%
Western Canadian Originated Traffic										
Railway Shipments (000 tonnes) – All Grains	2B-15	n/a	61,637.7	36,393.6	14,240.4	15,829.0	14,655.6	10,741.8	55,466.8	52.4%
Railway Shipments (000 tonnes) - Canada	2B-15	n/a	54,690.8	29,765.9	12,368.5	13,613.7	12,398.0	8,790.2	47,170.5	58.5%
Railway Shipments (000 tonnes) – United States	2B-15	n/a	6,592.2	6,246.2	1,777.3	2,113.0	2,140.1	1,867.7	7,898.1	26.4%
Railway Shipments (000 tonnes) – Mexico	2B-15	n/a	354.7	381.5	94.6	102.3	117.5	83.9	398.2	4.4%
Terminal Elevator Throughput										
Grain Throughput (000 tonnes) – All Commodities	2C-1	23,555.5	44,686.8	24,262.2	9,012.2	12,300.4	10,193.4	8,441.5	39,947.5	64.6%
Hopper Cars Unloaded (number) – All Carriers	2C-2	278,255	457,559	250,400	100,180	120,768	109,526	79,992	410,466	63.9%
Hopper Cars Unloaded (number) – CN	2C-2	144,800	215,145	129,524	49,178	63,648	59,183	42,054	214,063	65.3%
Hopper Cars Unloaded (number) – CPKC	2C-2	133,455	242,414	120,876	51,002	57,120	50,343	37,938	196,403	62.5%
Truck Volumes to US Destinations										
Truck Shipments to US (000 tonnes) – Destination Region / Origin Province	2D-1									
Truck Shipments to US (000 tonnes) – Origin Province / Commodity	2D-2	n/a	2,281.3	2,230.0	542.1	521.4	598.7	527.2	2,189.5	-1.8%
Truck Shipments to US (000 tonnes) – Destination Region / Commodity	2D-3									

DISCUSSION AND ANALYSIS

COUNTRY ELEVATOR THROUGHPUT
[See TABLE 2A-1]

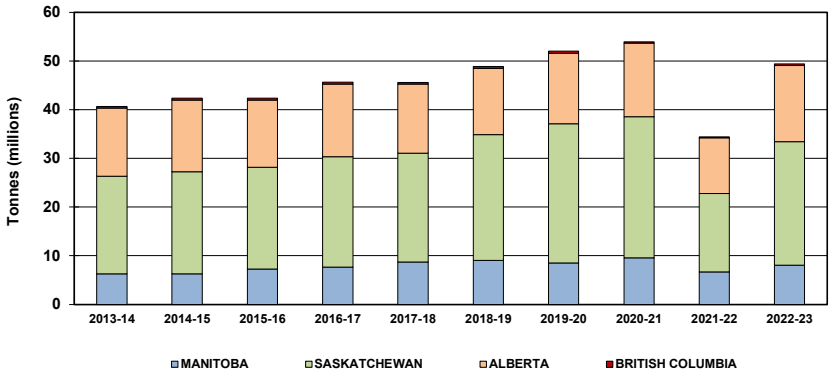
Country elevator throughput, as gauged by all road and rail shipments from the primary elevators situated across Western Canada, increased by 43.3% in the 2022-23 crop year, to 49.4 million tonnes from 34.4 million tonnes a year earlier. This denoted a sharp resurgence in volume from the drought-reduced handlings witnessed in the 2021-22 crop year, and a near-return to pre-drought throughput levels.

Primary-elevator shipments from Saskatchewan rose by over 9.3 million tonnes, or 58.1%, to almost 25.4 million tonnes. This was accompanied by increases in the throughput for Alberta, which grew by over 4.2 million tonnes, or 37.1%, to nearly 15.7 million tonnes; Manitoba, which gained 1.3 million tonnes, or 19.7%, to 8.0 million tonnes; and British Columbia, with a 37,800-tonne, or 14.7%, increase in volume to 295,300 tonnes. Even with such tonnage gains, the proportion accorded to shipments from each province has remained generally consistent with those benchmarked in the GMP's base year. Saskatchewan claimed a 51.4% share; Alberta, 31.7%; Manitoba, 16.3% share; and British Columbia, 0.6%.

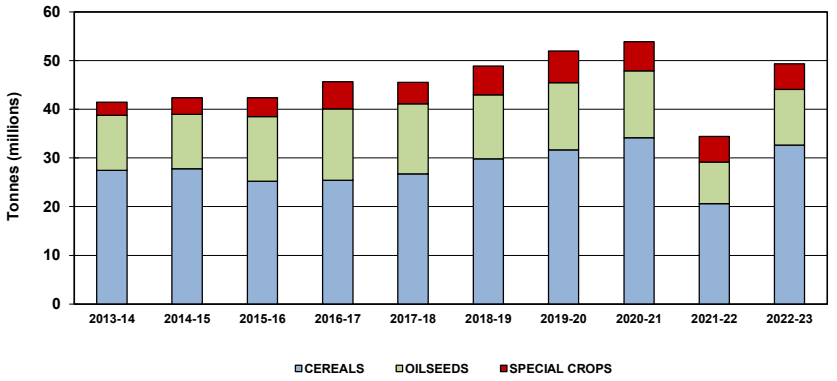
Cereals accounted for most of the grain shipped through the primary elevator network, with the total handle increasing by 58.4%, to almost 32.7 million tonnes from 20.6 million tonnes a year earlier. Their share of total shipments also climbed, to 66.2% from 59.9%. Oilseed shipments also rose, albeit by a somewhat lesser 34.3%, to 11.4 million tonnes from 8.5 million tonnes, with its share slipping to 23.2% from 24.7%. Conversely, special-crop shipments remained largely unchanged at 5.3 million tonnes, falling by a mere 1.0%. However, this resulted in the securement of a lesser 10.6% share against 15.4% a year earlier.

Primary-elevator throughput provides the all-important signal to industry stakeholders of the attendant workload to be borne by the GHTS's railways and terminal elevators. With throughput rising to 49.4 million tonnes from the previous crop year's drought-reduced 34.4 million tonnes, significantly more pressure was brought to bear on the GHTS.

Primary Elevator Throughput - Originating Province



Primary Elevator Throughput - Principal Commodities



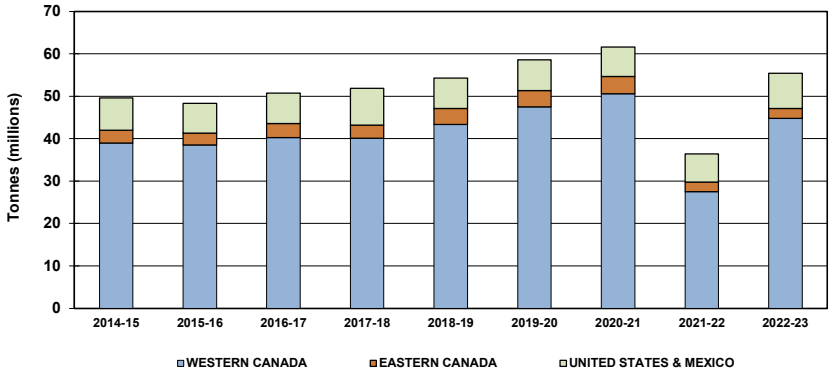
RAILWAY TRAFFIC
[See TABLES 2B-1 through 2B-21]

Although primary elevators serve as the principal gateway in moving grain through the GHTS, grain also enters the system by way of process elevators and producer-car loading sites. Producer deliveries to all of these facilities totaled 61.1 million tonnes in the 2022-23 crop year, 43.5% more than the 42.6 million tonnes tendered a year earlier.[3] Ultimately, all of this grain is loaded into railcars or trucks for movement to destinations located throughout the system, with rail being the dominant mode.

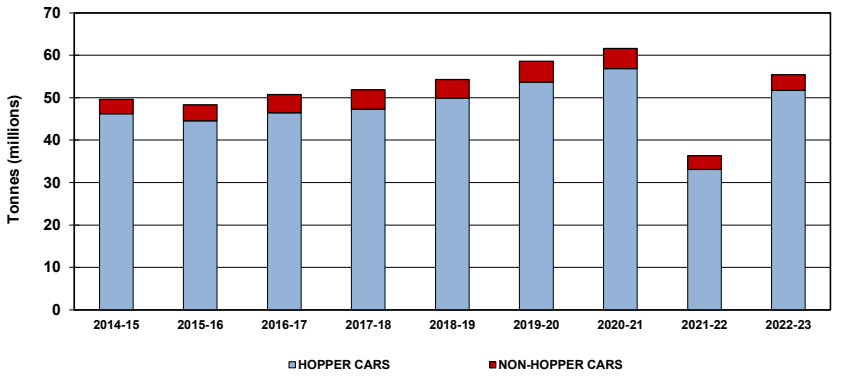
Railway grain shipments from Western Canada totaled almost 55.5 million tonnes in the 2022-23 crop year, up 52.4% from the previous crop year's 36.4 million tonnes. Almost 47.2 million tonnes of this traffic, or 85.0%, was directed to destinations within Canada itself, be it for export or domestic use. Much of this volume, almost 44.8 million tonnes, was destined to points within Western Canada, chiefly the ports of Vancouver, Prince Rupert, and Thunder Bay. Together with a comparatively stable share of the overall volume, these shipments easily overshadowed the 2.4 million tonnes that were directed into Eastern Canada as well as another 8.3 million tonnes destined to the United States and Mexico.

Almost 51.8 million tonnes of the traffic originated in Western Canada, or 93.4%, moved to its destination in covered hopper cars. The remaining 3.7 million tonnes moved in alternate forms of railway equipment, including boxcars and containers for bulk and bagged grain products, and tank cars for liquids such as canola oil. It is worth noting that these latter movements represented only 6.6% of total railway shipments in the 2022-23 crop year, down from the comparatively stronger, drought-related 9.1% share garnered a year earlier. This decline marked a noticeable reversal in the trend that had witnessed this share inching its way steadily upwards from the 6.9% benchmarked just eight years earlier. Although partially reflective of slumping container volumes – owing to continuing supply-chain problems – this share loss was largely indicative of the greater surge in hopper-car shipments.

Railway Grain Shipments - Principal Destinations



Railway Grain Shipments - Hopper and Non-Hopper Cars



3 Statistics drawn from Canadian Grain Commission, *Grain Deliveries at Prairie Points.*

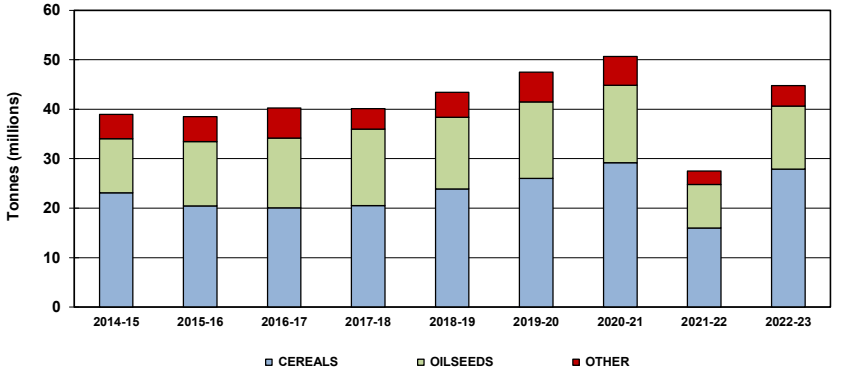
Traffic to Western Canada
[See Tables 2B-1 through 2B-7]

Much of the 44.8 million tonnes of grain moved by rail to points in Western Canada during the 2022-23 crop year were directed to one of three ports: Vancouver, Prince Rupert, and Thunder Bay.[4] These shipments totaled just over 43.7 million tonnes, increasing 64.8% from the 26.5 million tonnes handled a year earlier. An additional 1.0 million tonnes were directed to points outside of the ports themselves, denoted as Western Domestic destinations, which rose by 8.1% from the 961,800 tonnes handled the previous year.

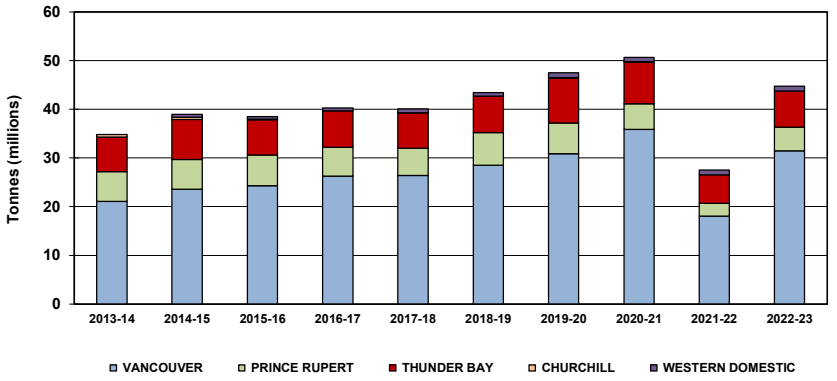
As the largest element in the movement of grain to points in Western Canada, cereals accounted for 62.4% of all railway traffic in the 2022-23 crop year, just over 27.9 million tonnes. This was followed by oilseeds with a 28.5% share, at 12.8 million tonnes, and a 9.2% share for other commodities, at 4.1 million tonnes. Segmental tonnage gains proved especially strong for cereals, which increased by 74.4%, while oilseed and other-commodity shipments rose by 44.9% and 52.4% respectively.

Of all the ports in Western Canada, Vancouver continues to be the preferred destination for railway grain shipments. This is due not only to the ready access it provides to Asia-Pacific markets, but to the concentration of export terminal facilities. During the 2022-23 crop year, Vancouver received almost 31.5 million tonnes of inbound grain, an increase of 74.1% over the previous year's 18.1-million-tonne handle. This denoted 72.0% of all railway grain shipments originated in Western Canada. Prince Rupert, which represents an additional west-coast outlet for this traffic, received 4.8 million tonnes of grain, jumping 84.7% from the 2.6 million tonnes handled a year earlier. This resulted in the port's share rising to 11.1% from 9.9%. Together, these two ports accounted for 83.0% of all the grain originated in Western Canada, up from the 78.0% share garnered a year earlier.

Railway Grain Shipments - Main Commodities
(Western Canada)



Railway Grain Shipments - Main Destinations
(Western Canada)



4 The Port of Churchill, normally a destination for Western Canadian export grain, was closed to traffic during the 2022-23 crop year.

The gain in share for West Coast ports was reflected in comparatively weaker rail deliveries to Thunder Bay, which rose by a lesser 26.9%, to 7.4 million tonnes from 5.8 million tonnes a year earlier. This reduced the port's share to 17.0% from 22.0%. Owing to the extensive repair work being conducted on the Hudson Bay Railway's route to the port of Churchill, its terminal remained shutout of handling any grain traffic for a second consecutive year. Railway grain shipments to non-port destinations – designated as Western Domestic – accounted for just 2.4% of all traffic. However, this too proved noticeably less than the 3.6% share reported a year earlier.

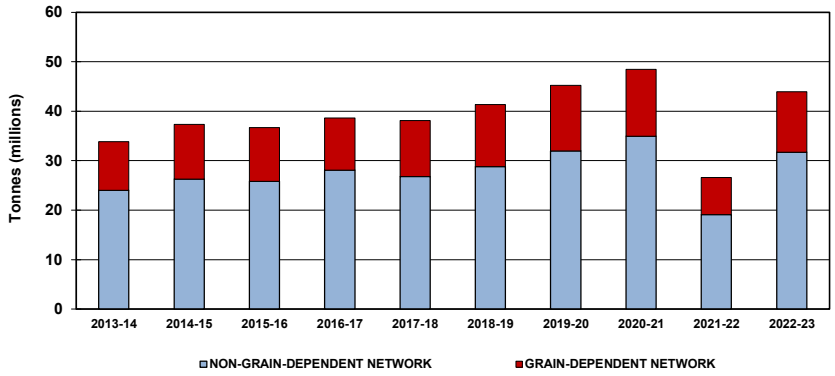
Covered Hopper Car Shipments

Covered hopper cars remain the primary means by which grain is conveyed to destinations within Western Canada. Of the 44.8 million tonnes shipped during the 2022-23 crop year, 43.9 million tonnes, or 98.1%, moved in covered hopper cars. Just 834,600 tonnes, or 1.9%, of grain and grain-related products moved in other forms of railway equipment, including boxcars, tank cars and containers.

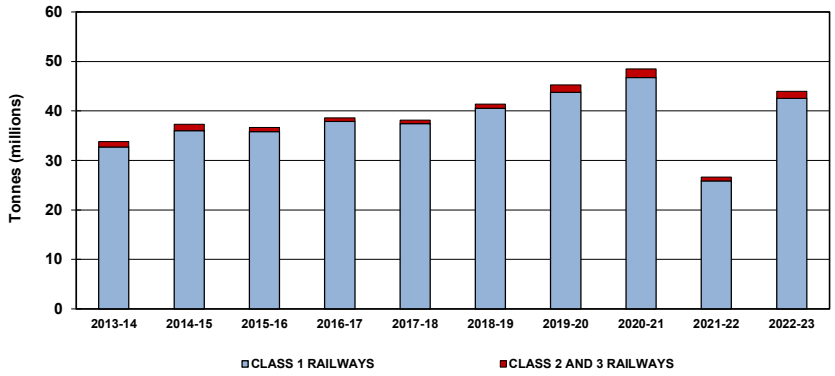
From the outset of the GMP, roughly two-thirds of covered-hopper-car shipments have originated at points on the railways' non-grain-dependent branchline network. Of the 43.9 million tonnes that were directed to destinations in Western Canada in the 2022-23 crop year, 31.7 million tonnes, or 72.2%, were sourced from points on such lines. This proportion stands moderately above the 66.2% share recorded at the beginning of the GMP. Conversely, just 12.2 million tonnes, or 27.8%, originated at points on the grain-dependent network.

More significantly, about 42.5 million tonnes, or 96.8% of the covered-hopper-car traffic, originated on the railway lines directly operated by the major Class I carriers, CN and CPKC. This dominance is even greater than the 91.9% share observed in the base year. Correspondingly, the share garnered by the smaller Class 2 and 3 carriers (commonly referred to as regional and shortline railways) has contracted to about one-third of what it represented twenty-three years earlier. Just 1.4 million tonnes, or 3.2%, originated with these smaller carriers in the 2022-23 crop year. Much of the reduced share is attributable to declining producer-car loadings.

Hopper-Car Shipments - Branchline Originations
(Western Canada)



Hopper-Car Shipments - Carrier Originations
(Western Canada)



Traffic to Eastern Canada
[See Tables 2B-8 through 2B-14]

Grain shipments into Eastern Canada represented a mere fraction, 5.4%, of the tonnage directed into Western Canada. During the 2022-23 crop year, these railway shipments amounted to slightly over 2.4 million tonnes, a gain of 6.2% from the nearly 2.3 million tonnes shipped a year earlier. About two-thirds of this volume, nearly 1.7 million tonnes, were shipped to the ports that extend from the Lower Great Lakes through the Gulf of St. Lawrence, and on to Halifax. Another 758,800 tonnes were directed to inland points, designated as Eastern Domestic destinations.

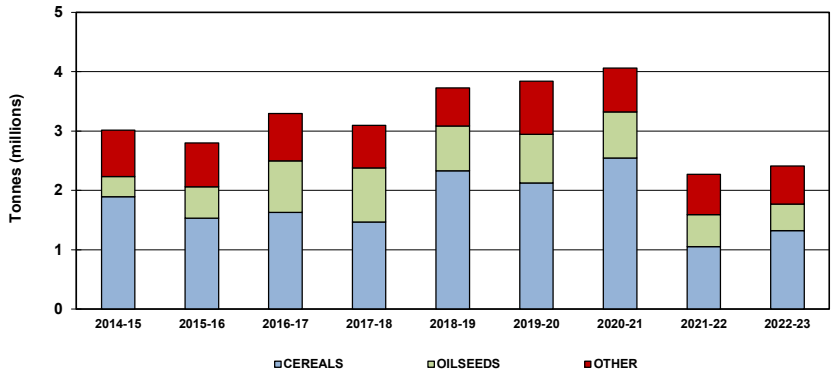
As with traffic routed to destinations in Western Canada, much of the traffic headed to points in Eastern Canada, about 1.9 million tonnes, or 78.8%, moved in covered hopper cars. The remaining 510,400 tonnes moved in other types of railway equipment. These latter movements represented a more substantive 21.2% of the regional total than the 1.9% they constituted in Western Canada.

Similarly, cereals also embodied the largest traffic segment in eastbound movements, with total shipments of just over 1.3 million tonnes, up 25.2% from nearly 1.1 million tonnes a year earlier. Oilseeds accounted for 449,100 tonnes, a decrease of 16.3% from the previous crop year's 536,300 tonnes. A further 639,100 tonnes were tied to special crops and other commodities, which declined by a much lesser 5.7% from the preceding crop year's 677,800 tonnes. Unlike those headed to Western Canadian destinations, these latter shipments accounted for a larger share of the overall traffic volume, 26.5% versus 9.2%.

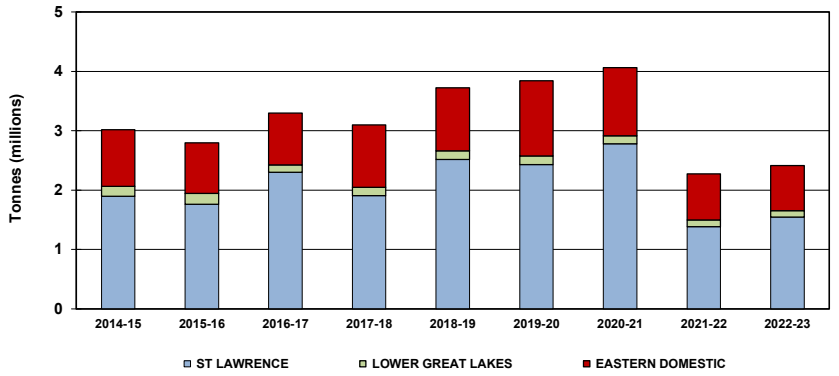
Covered Hopper Car Shipments

Most of the grain moving to Eastern Canada in covered hopper cars was sourced from points on the non-grain-dependent railway network in Western Canada. During the 2022-23 crop year this amounted to slightly more than 1.5 million tonnes, up 31.8% from the 1.2 million tonnes originated a year earlier. Traffic originating at points on the grain-dependent network fell by a comparable 28.2%, to 364,600 tonnes from 508,000 tonnes. With 80.8% of the tonnage attributable to non-grain-

Railway Grain Shipments - Main Commodities
(Eastern Canada)



Railway Grain Shipments - Main Destinations
(Eastern Canada)



dependent originations, this division proved marginally greater than the 72.2% share tied to traffic destined to points in Western Canada.

Similarly, some 1.8 million tonnes, or 92.4% of the grain shipped to Eastern Canada in covered hopper cars, originated on the lines of the major Class-1 railways. The tonnage originated by non-Class-1 carriers, which amounted to 144,000 tonnes, accounted for just 7.6%. These proportions were moderately less skewed than the shares garnered by traffic destined to points within Western Canada, which were reported as 96.8% and 3.2% respectively.

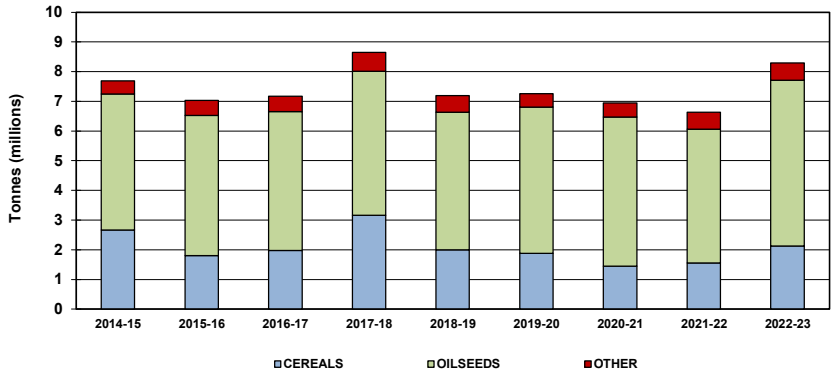
Traffic to the United States and Mexico
[See Tables 2B-15 through 2B-18]

The amount of grain moved by rail to the United States and Mexico during the 2022-23 crop year totaled almost 8.3 million tonnes. This denoted a 25.2% increase from the 6.6 million tonnes directed into these markets a year earlier. The increase stands well below a steeper 58.5% gain in domestic movements, owing largely to the comparative shielding given transborder shipments a year earlier.

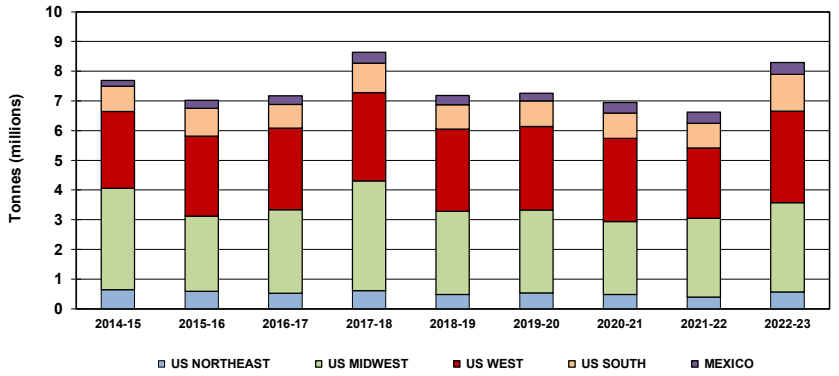
With almost 7.9 million tonnes, exports to the United States accounted for 95.2% of the total volume. This embodied an increase of 26.4% over the 6.2 million tonnes handled the previous year. With just 398,200 tonnes directed into Mexico, traffic to that country grew by a much lesser 4.4%. Almost two-thirds of the nearly 1.7-million-tonne increase in overall tonnage was attributable to a 23.7% gain in oilseed volumes, which rose by almost 1.1 million tonnes. This was joined by increases of 569,800 tonnes, or 36.6%, in cereals, and 32,100 tonnes, or 5.7%, in other commodities.

Over 5.7 million tonnes of US-bound traffic moved in covered hopper cars in the 2022-23 crop year. This represented a 24.0% increase from the 4.6 million tonnes handled a year earlier. Another 2.2 million tonnes moved in other types of railway equipment, which rose by 33.2% from the 1.6 million tonnes shipped the previous year – virtually all of which was tied to the movement of canola oil in tank cars.

Railway Grain Shipments - Main Commodities
(United States and Mexico)



Railway Grain Shipments - Main Destinations
(United States and Mexico)



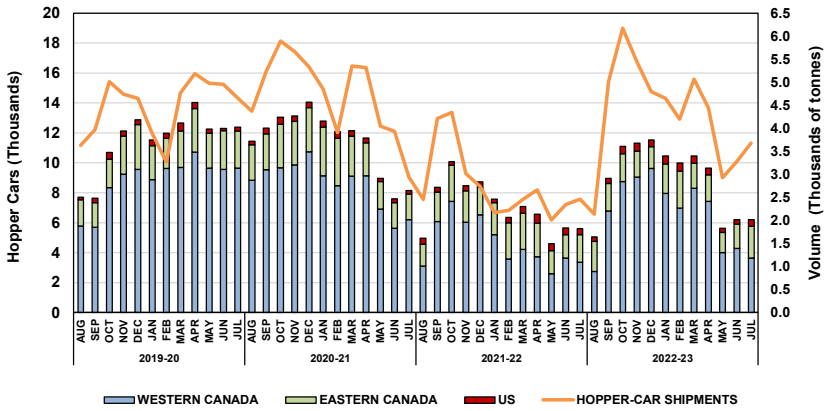
Canola and canola-related products (be it in the form of seed, meal or oil) accounted for a little more than 5.4 million tonnes, or about 68.4%, of all US-bound shipments. Approximately half of this volume, over 2.8 million tonnes, was directed to states in the US West, chiefly California. This was followed by another 1.3 million tonnes that moved into the Midwest, 928,200 tonnes into the South, and 320,600 tonnes into the Northeast.

It is worth noting that the increase in canola-oil shipments occurred in conjunction with a December 2022 determination by the US Environmental Protection Agency that hydrotreated canola/rapeseed oil met the greenhouse gas threshold requirements for advanced biofuels under its Renewable Fuel Standard, thereby opening the door to still more imports. Such elevated volumes are expected to be the norm while canola oil remains a key feedstock in US biofuel production. Additional canola oil shipments will necessarily involve the use of more tank cars which, with their extended car cycles, may well constrict the supply of equipment available for domestic movements.

Traffic from the United States
[See Table 2B-19]

Grain imported into Canada by rail from the United States during the 2022-23 crop year fell by 68.2%, to over 1.6 million tonnes from almost 5.2 million tonnes a year earlier. The largest portion, amounting to over 1.4 million tonnes, was destined to points in Western Canada, with Eastern Canadian destinations drawing in just 223,700 tonnes. Much of the decline stems from the curtailment of the extraordinary influx of corn occasioned by a drought that left Western Canadian livestock producers in desperate need of feed in the 2021-22 crop year. While this need may have passed, the strategic merits of preserving American sourcing options has left imports elevated well beyond the typical 250,000-tonne level of three years earlier.

Loads on Wheels



Loads on Wheels
[See Table 2B-20]

The pace at which bulk grain moves through the GHTS can be gauged by tabulating the number of loaded hopper cars in transit at regular moments in time; normally the Friday of any given week.[5] The 2022-23 crop year began with a weekly in-transit average of 5,037 cars for the month of August 2022, a modest 1.5% increase over the 4,962 reported a year earlier. Traffic volumes increased sharply through the next four months, ultimately peaking with a weekly average of 11,512 cars in December 2022. Thereafter, as total shipments declined and winter operations set in, the weekly number of cars in transit began to drift steadily lower, ultimately reaching a low of 5,615 in May 2023.

Collectively, an average of 8,784 loaded cars were in transit to their destinations during any given week of the 2022-23 crop year, 24.7% more than the 7,043-car average recorded a year earlier. As with other traffic measures, a large majority of these cars, some 74.7%, were tied to the

5 The measure cited here relates only to railway-supplied equipment. It specifically excludes the private equipment also employed by shippers in moving grain.

movement of grain to destinations in Western Canada, 20.5% to markets in Eastern Canada, and 4.8% to those in the United States.

Tank-Car Shipments
[See Table 2B-21]

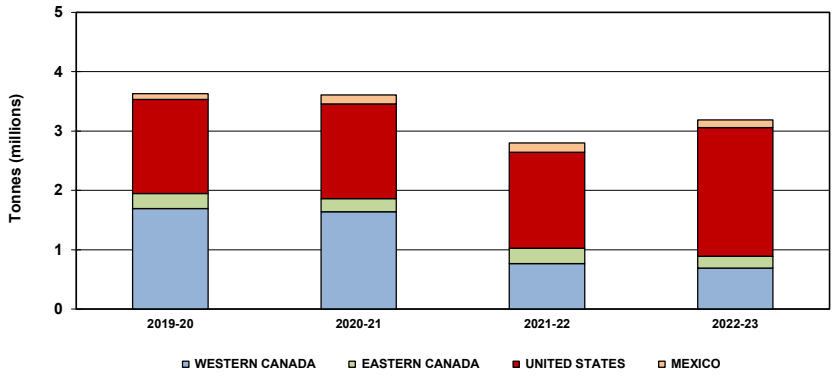
From its outset, the GMP has largely been focused on the movement of Canada's traditional grain exports. Whereas cereals represented more than three-quarters of the grain grown in 2000, it now constitutes about 60%. As cited earlier, much of this dilution is attributable to increased oilseed production, with canola accounting for much of the overall growth.

Although canola seed remains a significant export commodity, roughly 40% of the crop is directed into one of 14 domestic crushing operations (11 of which are in Western Canada), which then extract the seed's oil for sale to consumer and industrial markets. The processing of canola oil has increased along with canola-seed production. The enlargement of this segment, coupled with canola oil's comparatively higher value, led to the addition of related measures in the 2021-22 crop year.

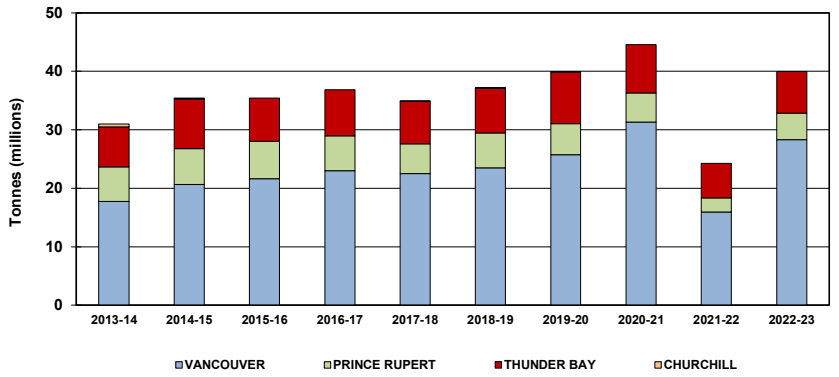
Canola-oil shipments from origins in Western Canada totaled slightly under 3.2 million tonnes in the 2022-23 crop year, up 14.0% from the 2.8 million tonnes reported a year earlier. Despite this gain, shipments still stood below the 3.6 million tonnes observed in both the 2019-20 and 2020-21 crop years. However, there was a noticeable shift in underlying traffic patterns. Until the 2020-21 crop year, these shipments were concentrated in near equal 1.6-million-tonne movements to Vancouver and the United States, supplemented by smaller volumes to Eastern Canada and Mexico.

The 2021-22 crop year saw a significant reduction in shipments to Vancouver, with US shipments remaining largely unchanged but taking a noticeably larger share of the overall volume. The 2022-23 crop year saw US shipments climb to almost 2.1 million tonnes, up 33.7% from the 1.6 million tonnes handled a year earlier, to capture an even larger 67.9% share. As discussed previously, this shift largely reflected changes in the US regulatory environment, which is expected to bolster future US exports still further.

Railway Tankcar Shipments - Main Destinations



Terminal Elevator Throughput - Port
(Western Canada)



TERMINAL ELEVATOR THROUGHPUT
[See TABLES 2C-1 through 2C-2]

Ultimately, a large portion of the traffic handled by the railway system is directed into the various terminal elevators and bulk loading facilities located at Western Canadian ports. Port throughput, as gauged by the amount of grain shipped through these facilities, increased by 64.6% in the 2022-23 crop year, to 39.9 million tonnes from 24.3 million tonnes a year earlier.

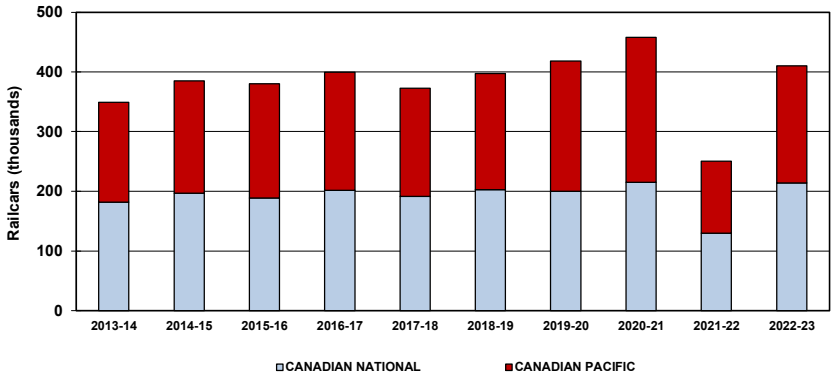
The most significant grain volumes continued to move through the west-coast ports of Vancouver and Prince Rupert. For Vancouver, total terminal elevator throughput increased by 77.1%, to just under 28.3 million tonnes, from 16.0 million tonnes a year earlier. Prince Rupert posted a gain of 92.4%, with terminal shipments rising to almost 4.6 million tonnes from 2.4 million tonnes. Combined, the tonnage passing through these two west-coast ports represented 82.2% of the overall handle, up from the 75.6% share reported a year earlier.

Traffic directed through the eastern gateway of Thunder Bay rose by a notably lesser 20.0%, to 7.1 million tonnes from the previous crop year's 5.9 million tonnes. As a result, the port's overall share fell to 17.8% from 24.4%. This decline was reinforced by the continued closure of the port of Churchill, which saw no throughput for a second year in a row.

Terminal Elevator Unloads

Carrier activity is reflected in the number of covered hopper cars unloaded at Western Canadian bulk grain terminals. The total number of railcars unloaded during the 2022-23 crop year increased by 63.9%, rising to 410,466 cars from 250,400 cars a year earlier. CN unloaded 214,063 hopper cars, up 65.3% from the 129,524 cars delivered a year earlier, while CPKC's handlings rose by 62.5%, to 196,403 cars from 120,876 cars. This made CN the largest serving railway to bulk grain terminals in Western Canada, with a share of 52.2% against 47.8% for CPKC.

Terminal Elevator Unloads - Carrier
(Western Canada)



EXPORT CONTAINER TRAFFIC
[See TABLE 2C-3]

For well over a century, Canadian grain exports have been reliant on bulk ocean shipping to reach offshore markets. With the advent of larger ships, the preponderance of grain exports now physically moves in shipload lots of 50,000 or more tonnes. Yet an increasingly larger share of total grain exports has been moving in containers. This share hit a highwater mark in the 2019-20 crop year, when it reached roughly 11% compared to just 4% in the GMP's base year. Central to this growth was the emergence of new, state-of-the-art transloading facilities, which allowed grain carried to port in railway hopper cars to be efficiently reloaded into containers for shipment overseas.

Containerized export grain shipments are tied to the servicing of much smaller-lot purchasers catering to the needs of niche markets, be it specialty flour mills, brewers or processors. In large measure, these movements are made possible by employing the empty container equipment being returned by steamship lines to their offshore origins (predominantly Asia-Pacific countries) for reloading. Using this returning

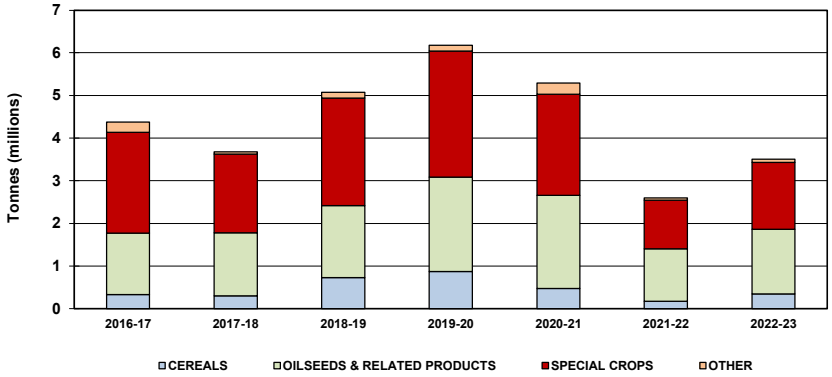
equipment typically engenders lower "backhaul" freight rates that make foreign purchases of Canadian-sourced grain in small quantities more price competitive.

Containerized grain shipments from the ports of Montreal, Vancouver and Prince Rupert totaled just over 3.5 million tonnes in the 2022-23 crop year. This denoted a 34.9% increase over the 2.6 million tonnes shipped a year earlier but remained well below the pre-COVID-19 high of 6.2 million tonnes. Although the gain mirrored the rebound in the grain supply, total volumes still ranked among the lowest in the last seven years. Moreover, containers garnered a 6.3% share of the total grain movement, the lowest secured during this same period. This contraction was largely tied to the limited supply of empty container equipment made available by steamship lines since late 2020, and which had also propelled ocean freight rates substantially higher, thereby making their movement much more costly.

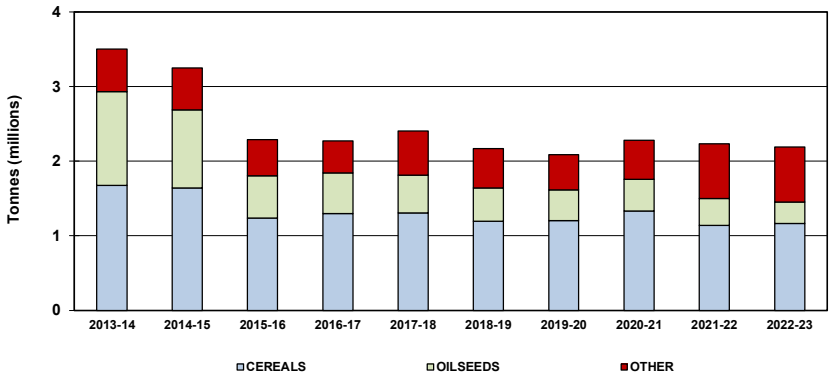
Until reaching a peak in the 2019-20 crop year, containerized grain traffic had shown substantial growth, increasing by over 1.0 million tonnes in each of the preceding two crop years. Although significant gains were made by cereals and oilseeds, it was special crops that figured most prominently in the growth of containerized shipments. Despite the ensuing decline in overall volume, special crops still accounted for nearly half of all containerized shipments, with almost 1.6 million tonnes, or 44.8%, being moved in the crop year just ended. This share proved only marginally higher than the 43.8% claimed a year earlier.

Similarly, oilseeds also played an important role in the overall growth of container exports. Moreover, with 1.5 million tonnes, or 43.2%, of total shipments in the 2022-23 crop year, they continue to rival special crops for dominance within this segment of the market. Cereal movements ranked a distant third in the commodity mix, with just 347,700 tonnes claiming a 9.9% share of total movements. Even so, cereal shipments rebounded sharply, nearly doubling the 174,400 tonnes handled a year earlier. Other commodities, while also posting a stronger showing, accounted for just 73,300 tonnes, or 2.1% of all container movements.

Export Container Shipments - Canadian Ports



Truck Shipments - United States Destinations



TRUCK TRAFFIC TO THE UNITED STATES
[See TABLES 2D-1 through 2D-3]

Shipments of Western Canadian grain into the United States by truck totaled slightly under 2.2 million tonnes in the 2022-23 crop year. This proved to be a marginal 1.8% less than the near identical 2.2 million tonnes shipped a year earlier. This marginal decline reflected the relative stability that has characterized these short-haul transborder movements for several years. Modest volume gains were noted for most commodity groups, with cereals increasing by 2.5%, or 28,600-tonne, to nearly 1.2 million tonnes. This was accompanied by a 1.0%, or 7,200-tonne, increase in other commodities, which totaled 737,500 tonnes. A 21.2%, or 76,300-tonne, reduction in oilseed movements, which totaled just 283,800 tonnes, more than offset the gains already cited.

In contrast to railway shipments, much of the grain trucked into the United States travels shorter distances. Almost 1.2 million tonnes, or 54.0% of the total volume, were directed into the US Midwest, a market closer to the international border. This was followed by destinations in the US West, with 628,800 tonnes; the US Northeast, with 242,100 tonnes; and the US South, with 136,500 tonnes.

Section 3: Infrastructure

Indicator Description	Table	1999-00	2020-21	2021-22	2022-23 Q1	Q2	Q3	Q4	YTD	% VAR
Country Elevator Infrastructure										
Delivery Points (number)	3A-1	628	287	285	284	285	286	282	282	-1.1%
Elevator Capacity (000 tonnes)	3A-1	7,443.9	9,269.2	9,406.4	9,415.0	9,449.3	9,454.8	9,563.5	9,563.5	1.7%
Elevators (number) – Province	3A-1									
Elevators (number) – Railway Class	3A-2	917	411	413	411	411	409	405	405	-1.9%
Elevators (number) – Grain Company	3A-3									
Elevators Capable of MCB Loading (number) – Province	3A-4									
Elevators Capable of MCB Loading (number) – Railway Class	3A-5	317	269	265	266	266	267	268	268	1.1%
Elevators Capable of MCB Loading (number) – Railway Line Class	3A-6									
Elevator Closures (number)	3A-7	130	35	17	8	2	3	6	19	11.8%
Elevator Openings (number)	3A-8	43	44	19	6	2	1	2	11	-42.1%
Delivery Points (number) – Accounting for 80% of Deliveries	3A-9	217	104	104	n/a	n/a	n/a	n/a	104	0.0%
Railway Infrastructure										
Railway Infrastructure (route-miles) – Total Network	3B-1	19,390.1	17,265.7	17,265.7	17,265.7	17,265.7	17,265.7	17,265.7	17,265.7	0.0%
Railway Infrastructure (route-miles) – Class-1 Network	3B-1	14,503.0	14,596.1	14,596.1	14,596.1	14,596.1	14,596.1	14,596.1	14,596.1	0.0%
Railway Infrastructure (route-miles) – Non-Class-1 Network	3B-1	4,887.1	2,669.6	2,669.6	2,669.6	2,669.6	2,669.6	2,669.6	2,669.6	0.0%
Railway Infrastructure (route-miles) – Non-Grain-Dependent Network	3B-1	14,513.5	14,028.7	14,028.7	14,028.7	14,028.7	14,028.7	14,028.7	14,028.7	0.0%
Railway Infrastructure (route-miles) – Grain-Dependent Network	3B-1	4,876.6	3,237.0	3,237.0	3,237.0	3,237.0	3,237.0	3,237.0	3,237.0	0.0%
Railway Fleet Size (railcars) – Average Weekly	3B-2	n/a	25,679	21,226	21,597	22,405	22,512	23,156	22,421	5.6%
Served Elevators (number)	3B-3	884	342	337	335	335	334	334	334	-0.9%
Served Elevators (number) – Class 1 Carriers	3B-3	797	310	304	305	305	303	303	303	-0.3%
Served Elevators (number) – Non-Class-1 Carriers	3B-3	87	32	33	30	30	31	31	31	-6.1%
Served Elevators (number) – Grain-Dependent Network	3B-3	371	102	104	101	101	102	102	102	-1.9%
Served Elevators (number) – Non-Grain-Dependent Network	3B-3	513	240	233	234	234	232	232	232	-0.4%
Served Elevator Capacity (000 tonnes)	3B-3	7,323.0	8,886.3	8,971.7	8,979.2	9,014.2	9,015.6	9,115.1	9,115.1	1.6%
Served Elevator Capacity (000 tonnes) – Class 1 Carriers	3B-3	6,823.2	8,610.1	8,657.8	8,680.9	8,716.0	8,714.0	8,813.5	8,813.5	1.8%
Served Elevator Capacity (000 tonnes) – Non-Class-1 Carriers	3B-3	499.7	276.1	314.0	298.2	298.2	301.5	301.7	301.7	-3.9%
Served Elevator Capacity (000 tonnes) – Grain-Dependent Network	3B-3	2,475.4	2,084.4	2,167.4	2,152.9	2,165.8	2,169.1	2,246.0	2,246.0	3.6%
Served Elevator Capacity (000 tonnes) – Non-Grain-Dependent Network	3B-3	4,847.6	6,801.9	6,804.4	6,826.3	6,848.4	6,846.4	6,869.1	6,869.1	1.0%
Terminal Elevator Infrastructure										
Terminal Elevators (number)	3C-1	15	18	17	17	17	17	17	17	0.0%
Terminal Elevator Storage Capacity (000 tonnes)	3C-1	2,678.6	2,767.5	2,752.5	2,752.5	2,752.5	2,752.5	2,752.5	2,752.5	0.0%

DISCUSSION AND ANALYSIS

COUNTRY ELEVATOR INFRASTRUCTURE
[See TABLES 3A-1 through 3A-9]

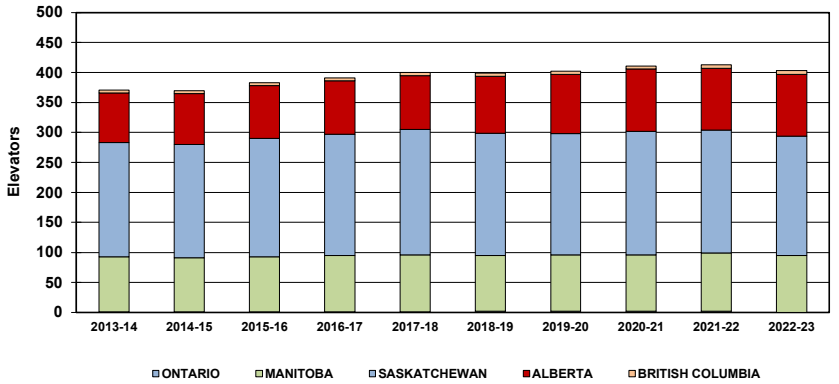
At the outset of the 1999-2000 crop year, there were 1,004 licensed primary and process elevators situated across the prairies. By the close of the 2010-11 crop year, that total had fallen to a low of 366 facilities, a reduction of 63.5% from the GMP's base year. This decline marked one of the most visible changes to the GHTS. Over the course of the next decade the number of elevators rose, albeit only modestly, to encompass a total of 413 at the end of the 2021-22 crop year.

The 2022-23 crop year saw another eight elevators culled from this network, which fell by 1.9%, to 405 facilities from 413. This came about through the delicensing of 19 elevators, chiefly smaller Class A and B facilities, along with the licensing of 11 others.[6] Included within the latter count were nine newly constructed or retrofitted loop-track facilities: four operated by Viterra; two by G3 Canada; two by Richardson International; and one by Parrish & Heimbecker.

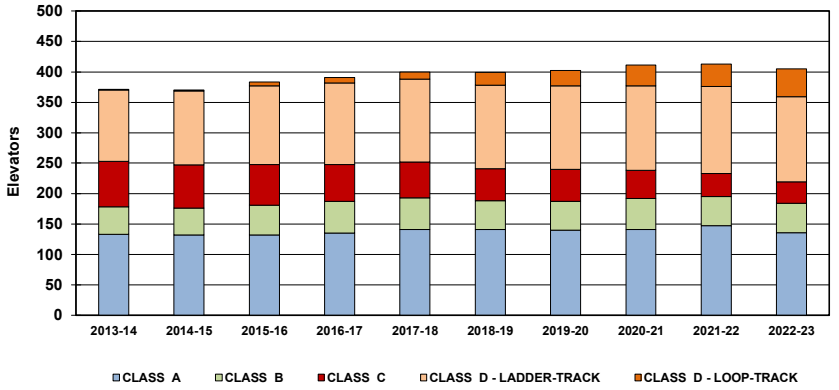
At the close of the 2022-23 crop year, 199, or 49.1% of Western Canada's licensed elevators, were situated in Saskatchewan. This was followed by Alberta and Manitoba, with 103 and 95 elevators respectively, and corresponding shares of 25.4% and 23.5%. The GHTS's remaining eight facilities were divided between British Columbia, with six, and Ontario, with two. These proportions remain consistent with those observed in the GMP's base year.

Much of the observed decline in elevators came from the closure of hundreds of the iconic wood-crib facilities that used to be found in virtually every small prairie town. Although some would be repurposed by new owners, 569 licensed Class A elevators, along with 132 Class B

Country Elevators - Provincial Distribution



Country Elevators - Facility Class



6 The facility classes employed here mirror the thresholds delineated by Canada's major railways at the beginning of the GMP for the receipt of discounts on grain shipped in multiple-car blocks. At that time, these thresholds involved shipments of 25, 50 or 100 railcars. For comparative purposes, the GMP groups elevators into four classes, which are based on the loading capability of each facility as defined by the number of railcar spots each possesses. Those with less than 25 car spots are deemed to be Class A facilities; those with 25-49, Class B; those with 50-99, Class C; and those with 100 or more, Class D.

elevators, ultimately closed their doors during the last 24 years. The closure of these elevators effectively drove a 403-community constriction in the grain-delivery network itself, which by the end of the 2022-23 crop year encompassed 282 locations as compared to the 685 benchmarked at the beginning of the GMP's base year.

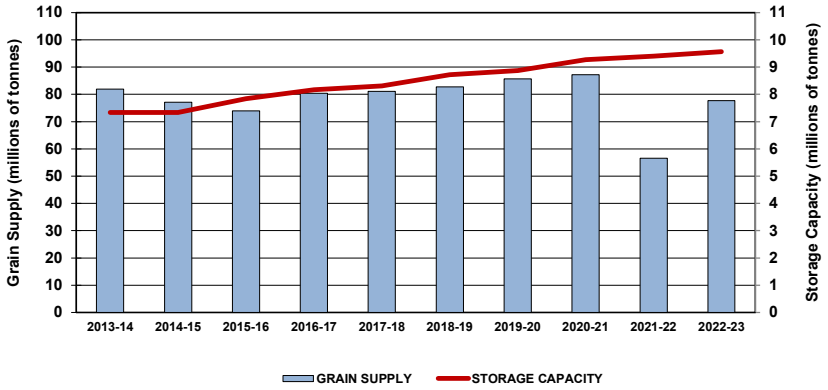
These smaller elevators became a casualty in the quest for efficiency as the grain-handling industry turned to high-throughput elevators capable of loading 50 or more railcars at a time. But even this expansion proved evolutionary, with the early Class C facilities ultimately giving way to their still larger Class D counterparts. Since peaking at 111 elevators in the 2001-02 crop year, Class C facilities have been in a progressive decline, reaching a new low of 35 in the crop year just ended. Only the largest high-throughput facilities – the licensed Class D elevators – have steadily increased in number, expanding to 186 from 38 in the base year. By the close of the 2022-23 crop year, these larger high-throughput facilities accounted for 46.0% of total system elevators and 77.2% of its storage capacity. Both shares stand significantly above their respective base-year values of 3.8% and 19.5%.

And while the overall number of elevators has increased by 9.2% over the last decade, the network's storage capacity has risen by over three times as much, by 30.5%. At the close of the 2022-23 crop year, the system's overall storage capacity stood at just under 9.6 million tonnes, a new GMP record. Moreover, this embodies a 68.1% increase over the 5.7-million-tonne low reached under the GMP 19 years earlier. With an average of more than 200,000 tonnes of storage being added annually, this expansion has largely kept pace with growth in the grain supply itself, effectively adding handling capacity as needed.

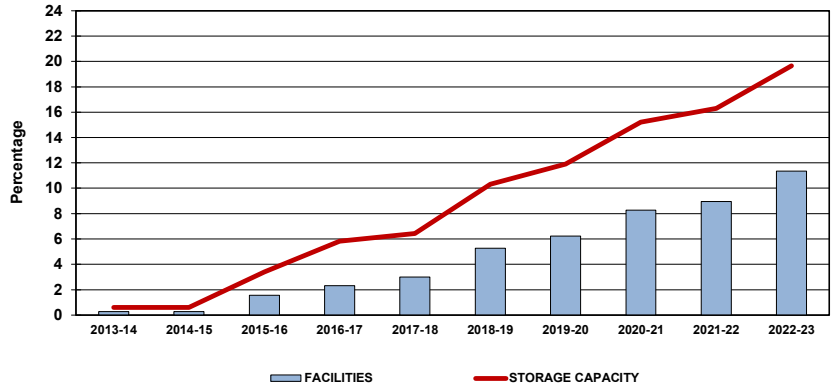
Loop-Track Facilities

Much of the recent increase in elevators and storage capacity can be traced to the emergence of still more efficient Class-D facilities. Not only are these facilities larger than their forerunners, but they also feature loop tracks with standing capacity for up to 150 covered hopper cars (or about 8,500 feet in total length) that allows for faster grain loading and more

Grain Supply and Country Elevator Storage Capacity



Loop-Track Elevators - Share of Facilities and Storage



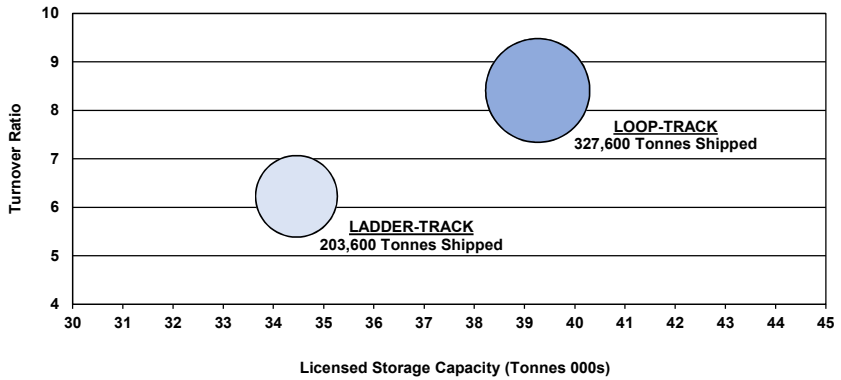
efficient unit-train operations.[7] More importantly, these facilities are proving to be as equally transformative as the older high-throughput facilities that preceded them were, producing a marked increase in elevator productivity.

Pioneered in Canada by Paterson Grain over a decade ago, the concept has been embraced by most major grain handlers. In fact, virtually all new elevator construction undertaken in Western Canada since 2015 has incorporated a loop-track. Furthermore, several established ladder-track facilities have also been retrofitted for loop-track operations. By the close of 2022-23 crop year, 46 loop-track facilities with almost 1.9 million tonnes of storage capacity had been established, with nine of these facilities having come online in the preceding twelve months. Loop-track facilities now account for 11.4% of total system elevators and 19.7% of its storage capacity.

A comparison of elevator data for the 2022-23 crop year reveals that an average loop-track-equipped facility has close to 14% more storage capacity than a ladder-track peer, 39,300 tonnes versus 34,500 tonnes respectively. Yet a loop-track facility also turns its storage capacity over nearly 35% faster, originating almost 60% more in annual grain shipments; 327,600 tonnes compared to 203,600 tonnes. These metrics hint at the economies-of-scale that can be realized through the adoption of such facilities.

While loop-track facilities present shippers with the potential to improve efficiency and reduce costs, its realization remains contingent on the provision of consistent and reliable railway service. As discussed later in this report, there is ample evidence to suggest that the railways have made significant strides in this regard during the 2022-23 crop year. More explicitly, loop-track facilities appear to enjoy a near three-day, or 20%, advantage in car-cycle times over comparative ladder-track elevators. However, the grain industry remains concerned with railway practices that often interfere with the planned flow of grain into – and through – export terminals. As the delays associated with such practices are often measured in days, their downstream effects frequently lead to slower terminal processing, postponed ship loadings, lengthier stays of vessels in port, and more burdensome demurrage costs.

HTP Elevators - Comparative Annual Shipments 2022-23



Corporate Ownership

The 405 facilities comprising the country-elevator network are licensed by dozens of separate companies. Yet much of Western Canada's grain-handling assets are controlled by just seven companies. Chief among them are such established names as Cargill Limited, Parrish & Heimbecker Limited, Paterson Grain, Richardson International, and Viterra Inc. But their ranks have also increased with the emergence of newer market entrants, including G3 Canada Limited and GrainsConnect Canada. Together, these companies have driven much of the industry's

7 Covered hopper cars vary in physical capacity and length. Actual standing capacity depends on the type of equipment employed. The 150 cars cited here reflects an estimate based on the newest generation of 56-foot-long hopper cars.

modernization efforts, and collectively oversee the operation of 56.8% of its facilities and 76.9% of its associated storage capacity.

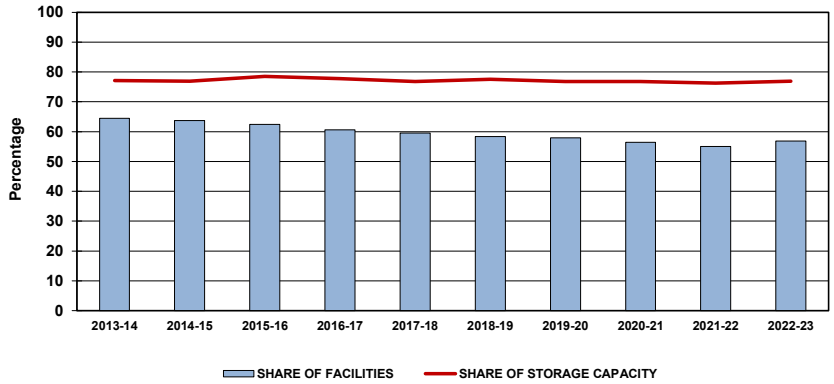
Despite this dominance, non-major grain handlers continue to thrive, with the specialization of many in the pulse and special-crops sectors serving to fortify their positions in a highly competitive environment. These include firms like AGT Foods and Ingredients, Ceres Global Ag, Providence Grain Group and Scoular Canada, which, along with other players, jointly operate 43.2% of the GHTS's licensed facilities but only 23.1% of its associated storage capacity.

RAILWAY INFRASTRUCTURE
[See TABLES 3B-1 through 3B-3]

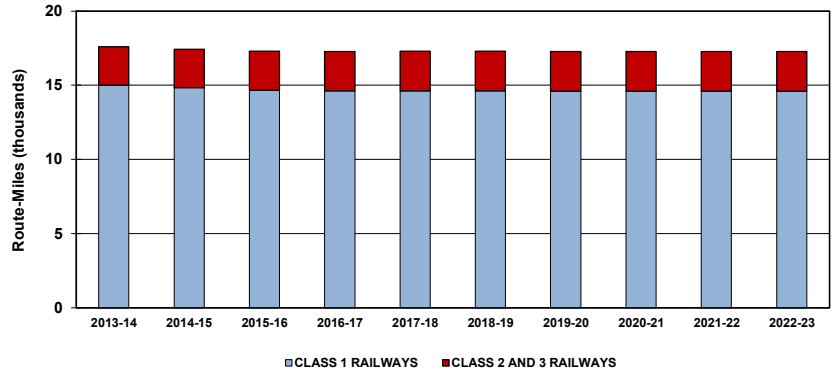
Changes to the GHTS's railway infrastructure have been substantially less than that of the country-elevator network. This is chiefly because elevator closures precede any railway rationalization effort that would ensue. Moreover, given the breadth of the railway network and the diversity of the traffic it supports, any rationalization can never fully mimic that of grain elevators alone. In fact, over the last 24 years, the railway network contracted only one-fifth as much as the country elevator network, shedding 2,202.5 route-miles, or 11.3%, of the 19,468.2 route-miles originally benchmarked in the GMP's base year. More importantly, this decline has all but ceased in the face of the last decade's minimal elevator changes. This was amply signalled in the 2022-23 crop year, where no changes were again recorded, and the railway network was left unaltered at 17,265.7 route-miles.

To date, over three-quarters of the network reduction has been tied to the discontinuance of some 1,717.7 route-miles of light-density, grain-dependent branch lines.[8] Other changes in the composition of the railway network came from the transfer of various branch lines to smaller shortline railways, although none were recorded in the last twelve months. At the close of the 2022-23 crop year Class-1 carriers operated 84.5%, or 14,596.1

Largest Grain Companies - Facilities and Storage Capacity
(Western Canada)



Railway Infrastructure - Route-Miles Operated
(Western Canada)



8 The term "grain-dependent branch line", while largely self-explanatory, denotes a legal designation under the *Canada Transportation Act*. Since the Act has application to federally regulated railways only, grain-dependent branch lines transferred to provincially regulated carriers lose their federal designation. This can lead to substantive differences between what might be considered the physical, and the legally-designated, grain-dependent branch line networks. For comparison purposes only, the term has been affixed to those railway lines so designated under Schedule I of the *Canada Transportation Act (1996)* regardless of any subsequent change in ownership or legal designation.

route-miles, while the smaller Class-2 and 3 carriers operated the remaining 15.5%, or 2,669.6 route-miles.[9]

More important than the physical scope of the railway network itself are the logistical weaknesses inherent within it. In short, does the railway infrastructure, as currently constituted, meet the transportation needs of its users? Notwithstanding the sharp downturn in volume witnessed in the 2021-22 crop year, the handling needs of the GHTS have risen steadily over the last two decades, largely due to a near 50% increase in grain production. This demand for additional carrying capacity has brought more pressure to bear on the railway system. Moreover, the demand across a multitude of commodities continues to point to an even greater need for capacity if network fluidity is to be maintained.

This same need was identified in the Final Report of The National Supply Chain Task Force, released in October 2022, which called for urgent action to create supply chains that are more resilient and efficient. The report noted that this went beyond the practicalities of identifying pinch points and investing in the physical infrastructure needed to safeguard the operation of crucial corridors and gateways, and required all stakeholders to work towards the goal of organizing and adapting transportation supply chains that function in the public interest.

Among the most critical vulnerabilities for the GHTS involve access to west coast ports, especially Vancouver. In recent years this access has been impeded by catastrophic wildfires, washouts and flooding in the Fraser River Canyon; conflicting marine and railway movements through the Second Narrows; congestion within the greater Vancouver area; as well as antiquated, insufficient and aging infrastructure.

To be sure, both CN and CPKC continue to invest heavily in new plant and equipment. But in crowded urban settings like Vancouver, established pinch points, such as CN's Thornton Tunnel and Second Narrows Bridge, have become increasingly problematic in conducting grain and non-grain traffic to and from terminals on the North Shore.[10] This became an even greater issue following G3 Terminal Vancouver's opening in July 2020. With projected increases occasioned by other expansions (most notably that of Neptune Terminals to accommodate additional coal and potash movements), it is widely estimated that total volumes on this already congested route segment will surge from about 45 million tonnes to 65 million tonnes annually by 2027. Competing with this growth is an expected 50% increase in marine traffic passing under the bridge, which is largely tied to completion of the Trans Mountain pipeline expansion

A view of the vertical lift on CN's Second Narrows Bridge in Vancouver's Burrard Inlet. The growth in both rail and marine traffic has already heightened congestion problems on this vital piece of transportation infrastructure. Completion of the Trans Mountain Pipeline is expected to result in a more than 50% increase in the number of ships moving under the bridge. (Image courtesy of Mark Hemmes)

9 The classes used here to group railways are based on industry convention: Class 1 denotes major carriers such as the Canadian National Railway or Canadian Pacific Kansas City; Class 2, regional railways such as the former BC Rail; and Class 3, shortline entities such as the Great Western Railway.

10 Rail access to the north shore of Vancouver's Burrard Inlet is largely achieved via CN's Thornton Tunnel and Second Narrows Bridge. Although also accessible from the west using the former BC Rail line (now operated by CN) that runs south from Prince George to North Vancouver, traffic along this route is restricted by the extreme grades and curvatures, which dictate the employment of shorter trains and correspondingly lighter train loads.

project in 2024. The need to better coordinate these rival movements served, at least in part, as justification for development of the port's Active Vessel Traffic Management program.

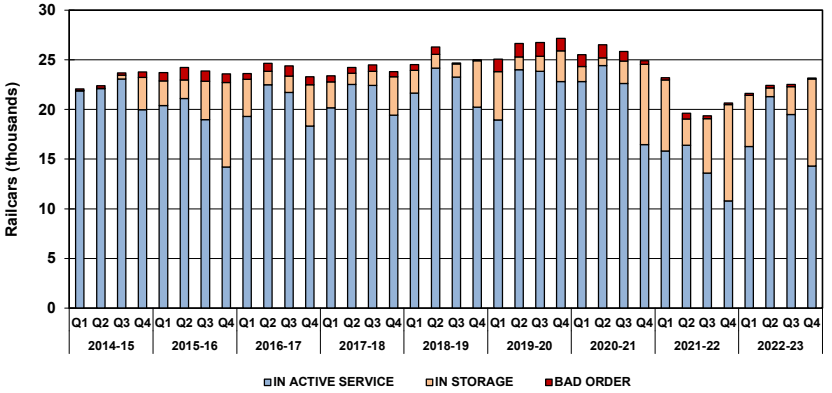
Congestion also impedes rail service to the terminals situated on Burrard Inlet's south shore. This is complicated by the fact that access to the grain and container terminals located there is shared with scheduled commuter trains which, owing to their frequency, severely constrict the windows for both industrial switching and freight train movements. Adding capacity to alleviate these bottlenecks is neither easy, immediate nor inexpensive.

Recognizing that congested trade routes have hampered Canadian export activity, various public and private sector stakeholders have moved to address the need for additional investment in railway infrastructure. The federal government alone has contributed nearly $1.0 billion in financing through the National Trade Corridors Fund to multiple capacity-enhancing projects in the Vancouver and Prince Rupert areas. These projects involve building a variety of new roads, grade separations, bridges, and railway sidings. Although these investments will help tackle some of the GHTS's more immediate infrastructure needs, they do not fully address the longer-term need for increased railway carrying capacity.

Covered Hopper Car Fleet

The GHTS's handling capacity is heavily influenced by the number of covered hopper cars employed by the railways in moving grain. The size of the fleet arrayed varies with prevailing market conditions, expanding and contracting with changes in traffic volume. The 2022-23 crop year saw a 5.6% increase in this fleet, which rose to an average of 22,421 hopper cars from the 21,226-car average posted a year earlier.[11] It is worth noting that this marked the first overall increase recorded since CN and CPKC both announced new hopper-car acquisition programs four years earlier. Moreover, despite a more comparable workload, the fleet stands some 15% below the 26,381-car peak recorded in the 2019-20 crop year. Part of this reduction is attributable to a near 20% gain in the carrying capacity of these new cars, which allows for a comparable cutback in the number of cars needed to fully replace the government hoppers that are rapidly reaching the end of their useful lives and being withdrawn from service.

Covered Hopper Cars - Number and Status



At any given moment in time, the equipment used for this purpose is categorized in one of three ways: as being in active service moving grain; in storage awaiting later use; or "bad order" (i.e., removed from active service for repair). Typically, the proportion assigned to active service rises to meet peak demand, usually reaching a zenith sometime in the fall or early winter.

The proportion pressed into active service rose to a height of 97.9% in October 2022, a level markedly higher than the 81.3% reached a year earlier. As traffic volumes began to wane, this proportion started to decline, ultimately falling to a low of 59.9% in June 2023. This meant that the average active fleet increased by 25.7%, to 17,804 cars from 14,166 cars a year earlier.

11 The fleet information supplied by the railways is believed to exclude many of the privately-owned or leased cars supplied by the grain companies themselves. The actual number of cars in grain service is, therefore, believed to be understated.

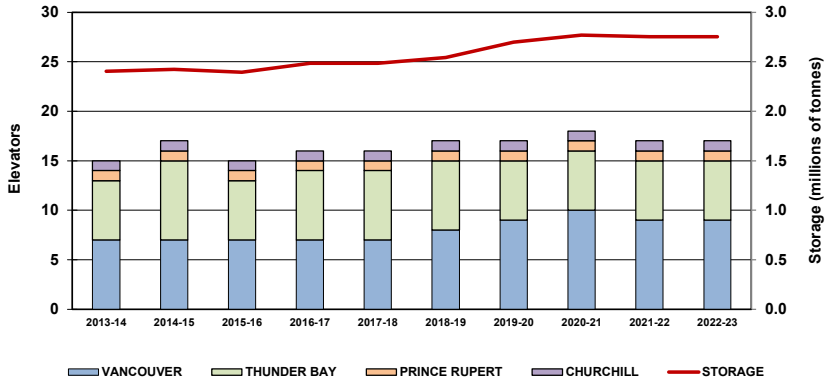
TERMINAL ELEVATOR INFRASTRUCTURE
[See TABLE 3C-1]

At the outset of the 1999-2000 crop year, there were 14 licensed terminal elevators operating in Western Canada. This network was largely tied to the traditional grain-handling ports of Thunder Bay and Vancouver, with outlying terminals at Churchill and Prince Rupert. By the close of the 2022-23 crop year, the overall number of facilities had risen to 17, a gain of 21.4% over those counted in the base year. The associated storage capacity increased by a lesser 8.2% during this same period, to somewhat under 2.8 million tonnes from 2.6 million tonnes.

Thunder Bay had long been home to the majority of the GHTS's terminal-elevators. But its position in the GHTS has steadily eroded in the face of a growing Asian grain trade. Recent facility closures have left the port with six facilities and more than 1.1 million tonnes of licensed storage capacity, garnering system shares of 35.3% and 41.0% respectively. Both values are down from the 50.0% shares benchmarked over two decades earlier.

Nevertheless, since the inception of the GMP, the growing handling needs of the GHTS – particularly along the west coast – have spurred the demand for additional handling capacity. Vancouver has been the focus of much of the ensuing investment, which largely started with an 81,720-tonne expansion of the Richardson International terminal in North Vancouver in 2016. This was followed by major upgrades to the ship-loading galleries at Viterra's Pacific Terminal and the Alliance Grain Terminal, and a significant enhancement of the Fibreco Export facility to permit handling of other commodities, including agricultural products. More noteworthy still was G3 Canada's construction of an all new 183,000-tonne loop-track terminal in North Vancouver, which opened officially in July 2020. This was followed a year later by the opening of the new 72,000-tonne Fraser Grain Terminal, whose development was spearheaded by Parrish & Heimbecker Limited in partnership with GrainsConnect Canada.[12]

Terminal Elevators - Location and Storage Capacity
(Western Canada)



Given the completion of these projects, the terminal elevator infrastructure at the port of Vancouver remained unaltered for the first time in five years. At the close of the 2022-23 crop year this encompassed nine licensed facilities with almost 1.3 million tonnes of storage capacity, giving the port system shares of 52.9% and 46.3% respectively.

12 The Fraser Grain Terminal was intended to replace the 15,000-tonne Parrish & Heimbecker facility, which remained licensed until November 2021.

Section 4: Commercial Relations

Indicator Description	Table	1999-00	2020-21	2021-22	2022-23 Q1	Q2	Q3	Q4	YTD	% VAR
Trucking Rates										
Composite Freight Rate Index – Short-haul Trucking	4A-1	100.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Country Elevators Handling Charges										
Composite Rate Index – Receiving, Elevating and Loading Out	4B-1	100.0	138.2	137.7	137.7	138.0	138.0	138.0	138.0	0.3%
Composite Rate Index – Dockage	4B-1	100.0	144.9	146.8	146.8	146.2	146.2	146.2	146.2	-0.4%
Composite Rate Index – Storage	4B-1	100.0	250.7	256.4	255.5	259.1	259.1	259.1	259.1	1.1%
Railway Freight Rates										
Composite Freight Rate Index – CN Vancouver	4C-1	100.0	139.5	152.7	194.7	179.2	161.3	153.2	153.2	0.4%
Composite Freight Rate Index – CPKC Vancouver	4C-1	100.0	167.1	176.7	199.8	182.8	178.0	170.9	170.9	-3.3%
Composite Freight Rate Index – CN Prince Rupert	4C-1	100.0	123.3	134.9	166.6	155.6	1139.8	132.7	132.7	-1.6%
Composite Freight Rate Index – CN Thunder Bay	4C-1	100.0	146.4	153.8	188.1	178.7	160.9	152.8	152.8	-0.6%
Composite Freight Rate Index – CPKC Thunder Bay	4C-1	100.0	176.2	158.1	187.8	173.7	164.9	158.3	158.3	0.2%
Effective Freight Rate ($ per tonne) – Maximum Revenue Entitlement	4C-3	n/a	$39.36	$39.03	n/a	n/a	n/a	n/a	$44.66	14.4%
Terminal Elevator Handling Charges										
Composite Rate Index – Receiving, Elevating and Loading Out	4D-1	100.0	165.8	168.9	168.9	171.5	171.5	1171.5	1171.5	1.5%
Composite Rate Index – Storage	4D-1	100.0	186.1	186.8	186.8	186.8	186.8	186.8	186.8	0.0%

DISCUSSION AND ANALYSIS

COUNTRY ELEVATOR HANDLING CHARGES
[See TABLE 4B-1]

Grain companies assess fees for a variety of elevator-handling activities, predominantly the receiving, elevating and loading out of grain. These are accompanied by additional charges for the removal of dockage (cleaning) and storage, all of which differ according to the activity, grain, province, and company involved. Given the multitude of tariff rates involved, the GMP necessarily uses a composite price index to track their change over time. Throughout much of the GMP these rates have moved generally higher, albeit by varying margins.

Generally modest changes were again observed in the 2022-23 crop year. Elevation rates, which averaged $16.56 per tonne at the close of the 2022-23 crop year, increased by a marginal 0.3% from the previous crop year's $16.51-per-tonne year-end average. This lifted the composite price index to 138.0 from 137.7.

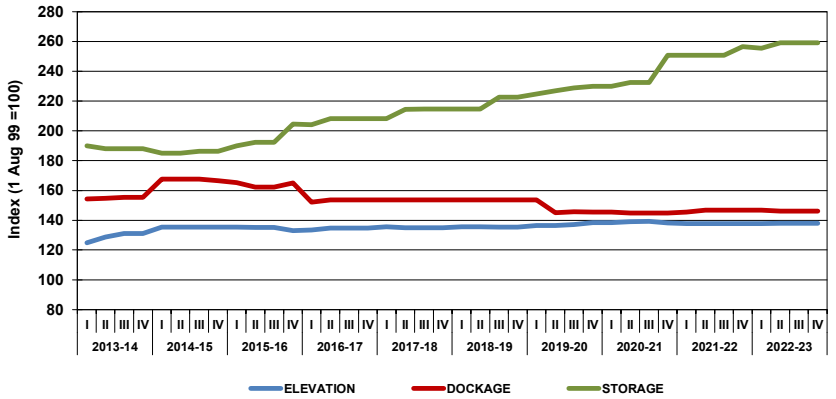
In contrast, dockage fees, which amounted to a lesser $6.57 per tonne at the close of the crop year, fell by 0.4%, reducing the index value to 146.2 from 146.8. Storage rates increased by 1.1% to an average of just over $0.15 per tonne for each day held, which raised the index value to 259.1 from 256.4.

RAILWAY FREIGHT RATES
[See TABLES 4C-1 through 4C-3]

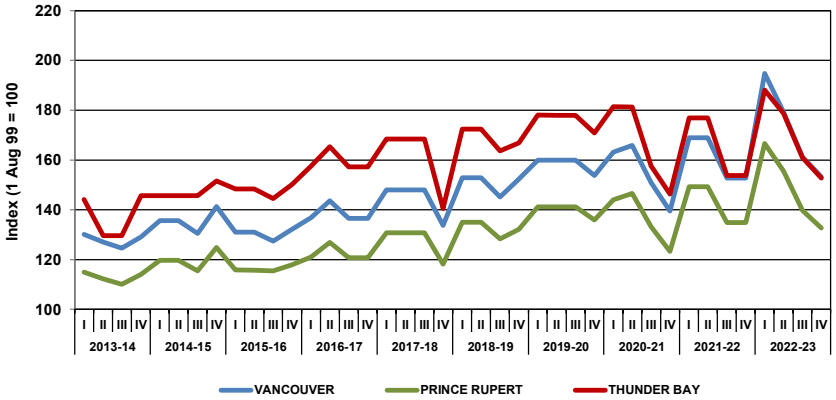
The single-car freight rates charged by the railways (CN and CPKC) for the movement of regulated grain have changed substantially since the beginning of the GMP, evolving from what were largely mileage-based per-tonne rates into a less rigidly structured set of more market-responsive per-car charges. Additionally, these per-car charges began to differentiate between commodities, size of railcar, destination, and the period in which the traffic was to move.

As with country elevator handling charges, the myriad of applicable freight rates makes the tracking of price changes over time difficult. As a result,

Primary Elevator Handling Charges



CN Single-Car Freight Rates - Primary Corridors
(Western Canada Destinations)

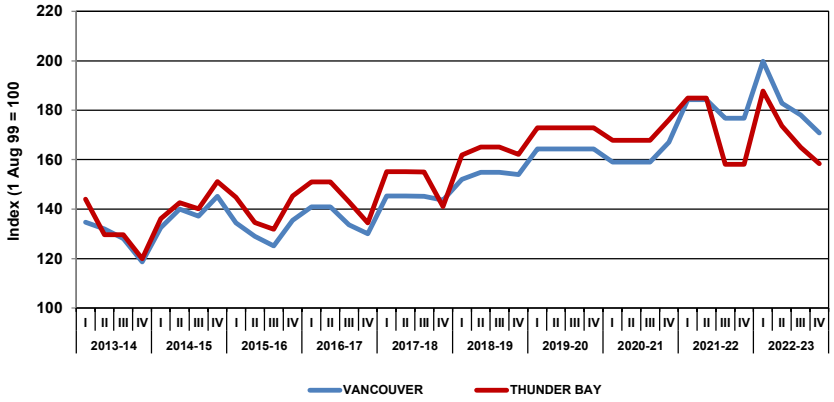


the GMP focuses only on changes in the single-car rates tied to the movement of wheat, deeming these to be reflective of general pricing action. Similarly, a composite price index is also used to track the longer-term change in rate levels. The 2022-23 crop year again saw significant swings in these rates throughout the year, with both CN and CPKC initially increasing their single-car freight rates substantially in the first quarter, with gradual reductions following in later months.

At the outset of August 2022, CN escalated its rates on westbound movements into Vancouver and Prince Rupert by an average of 12.1%, with its Thunder Bay rates remaining unchanged. Increases ranging from 5.0% to 16.5% followed in September, as did increases of 5.0% to 8.4% in October. These rates remained unchanged until January 2023, when CN initiated reductions of between 5.0% to 9.0%. Across-the-board reductions of 10.0% in March, and 5.0% in June, followed. The compound effect of these actions produced a net increase of 0.4% on movements into Vancouver, and reductions of 1.6% and 0.6% for Prince Rupert and Thunder Bay respectively. The posted per-tonne average year-end rate in these corridors amounted to $56.25 on westbound movements into Vancouver, $55.14 on those into Prince Rupert, and $49.39 on eastbound movements into Thunder Bay.

In comparison, CPKC left its preceding year-end rates unchanged until September, when it applied an average increase of 5.5% on movements into Vancouver, and 14.2% on movements into Thunder Bay. This was followed in October with additional increases averaging 7.2% and 4.1% respectively. These rates also remained unchanged until January 2023 when CPKC put forward reductions ranging anywhere from 3.0% to 18.0%. A more selective set of cuts reaching up to 10.0% were also advanced in March. An across-the-board reduction of roughly 4.0% followed in June. The net effect was a 3.3% cut in CPKC's Vancouver rates, and a 0.2% increase in its Thunder Bay rates. The posted per-tonne average year-end rate in these corridors amounted to $62.86 on movements into Vancouver, and $47.63 on movements into Thunder Bay.

CPKC Single-Car Freight Rates - Primary Corridors
(Western Canada Destinations)



Multiple-Car-Block Discounts

The discounting of single-car freight rates has been the principal mechanism employed by the railways to entice shippers into moving grain in larger quantities. Such discounting – widely known as multiple-car-block discounts – have evolved considerably since the beginning of the GMP. The first significant structural change in this evolution came nearly two decades ago when the discounts on movements in blocks of 50 or more cars were increased while those for smaller block movements were phased out. Together, these actions provided grain handlers with a powerful economic incentive to ship in trainload – or partial trainload – quantities.

The next important change came in the 2018-19 crop year, when CP withdrew the $4.00-per-tonne incentive that it had long been offering on movements in blocks of 56-111 cars. This left the carrier's $8.00-per-tonne discount for movements in blocks of 112 or more cars the only published incentive still being offered to grain shippers. In contrast, CN left its existing incentives unaltered, and continued to offer a $4.00-per-tonne discount on movements of 50-99 cars, and an $8.00-per-tonne discount on movements of 100 or more cars. However, the carrier also broadened its latter incentive to allow for as much as $2.00 per tonne in

additional discounts if shippers also complied with certain "heavy-loading" criteria.[13]

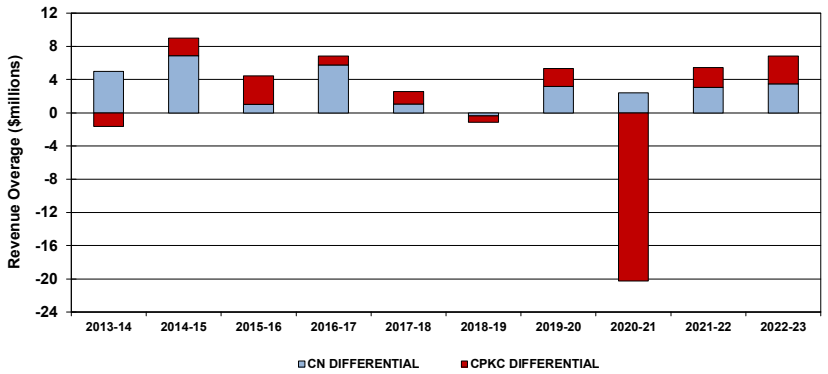
The resultant disparities occasioned by these actions were narrowed at the outset of the 2019-20 crop year when CN eliminated its $4.00-per-tonne discount on movements of 50-99 cars, effectively matching the commercial step taken by CPKC a year earlier. At the same time, CPKC brought forward a $10.00-per-tonne discount for movements under its newly introduced High-Efficiency-Product train program, which built on the deeper discounts previously made available by CN to qualifying trainload shippers.[14] These discounts remained effectively unchanged through the 2022-23 crop year.

Taken altogether, the railways' incentive programs are now clearly aimed at realizing the fullest economic potential of unit train operations. And while these incentives work to the financial benefit of the largest and most modern grain-handling facilities, those incapable of moving grain in trainload lots have seemingly been put at a commercial disadvantage. However, such impediments have not precipitated a sizable reduction in the number of smaller elevators.

Maximum Revenue Entitlement

Under the federal government's Maximum Revenue Entitlement (MRE), established in 2000, the unadjusted revenues that CN and CPKC are entitled to earn from the movement of regulated grain are based on a legislated maximum of $348.0 million and $362.9 million respectively.[15] However, these limits, expressed in year-2000 dollars, are adjusted annually to reflect changes in volume, average length of haul, and inflation. Outside of the inflationary component, these adjustments are determined by the Canadian Transportation Agency (Agency) following a detailed analysis of the traffic data submitted to it by CN and CPKC at the end of any given crop year.

Maximum Revenue Entitlement - Carrier Compliance



The Volume-Related Composite Price Index (VRCPI), which provides for an inflationary adjustment to carrier revenues, is determined by the Agency in advance of each crop year. For the 2022-23 crop year, the Agency determined the value of the VRCPI to be 1.6319 for CN, and 1.6709 for CPKC. These values denoted a year-over-year increase of 12.0% for CN, and 12.7% for CPKC.[16] As a result, the MRE for CN and CPKC were set at $1,076.1 million and $940.5 million respectively.[17] The Agency also determined that, for the 2022-23 crop year, the statutory revenues derived from the movement of regulated grain by CN amounted to $1,079.5

13 In addition to meeting all basic tariff requirements, a shipper of 100 or more cars could also receive an additional $0.50 per tonne (approximate) under CN's "Ready Train Incentive" as well as another $1.50 per tonne under it's "Loop/Tangent Track Incentive."

14 CPKC's High-Efficiency-Product train program is built around the carrier's plan to operate trains to an 8,500-foot standard and takes advantage of the efficiency gains to be had by using the higher-capacity hopper cars it is purchasing to increase trainloads by over 40%. When combined with the promise of faster and more efficient loop-track loading systems, these trains can help accelerate the flow of grain to market.

15 The regulated railway grain traffic referred to includes only that portion moving to a designated Western Canadian port in accordance with the provisions of the *Canada Transportation Act*. It does not include grain traffic originating in Western Canada and destined to locations outside these ports (denoted as Western Domestic), Eastern Canada or the United States of America.

16 The Volume-Related Composite Price Index (VRCPI), which had been expressed as a single value applicable to both CN and CPKC, was re-established as separate values by amendment to the *Canada Transportation Act* in 2018.

17 See Canadian Transportation Agency Determination R-2023-254 dated 20 December 2023.

million, and to $943.9 million for CPKC. Accordingly, the Agency cited CN and CPKC for having exceeded their maximum revenue entitlements by $3.5 million and $3.4 million respectively.[18]

TERMINAL ELEVATOR HANDLING CHARGES
[See TABLE 4D-1]

About two-thirds of terminal-elevator revenues are derived from the charges levied for the receiving, elevating and loading out of grain. These are accompanied by additional charges for storage, all of which differ according to the activity, grain, province, and company involved. As with other price-related measures, the myriad of applicable tariff rates naturally lends itself to the use of composite indexes in gauging price movement over time.

The 2022-23 crop year again brought modest changes to these rates. The rates for elevation, which averaged $15.64 per tonne at the close of the crop year, increased by 1.5% from the previous crop year's $15.40-per-tonne year-end average. This lifted the composite price index to 171.5 from 168.9.

The daily charge for storage remained unchanged in the 2022-23 crop year. The year-end average stood at just over $0.12 per tonne with the associated composite price index remaining at 186.8.

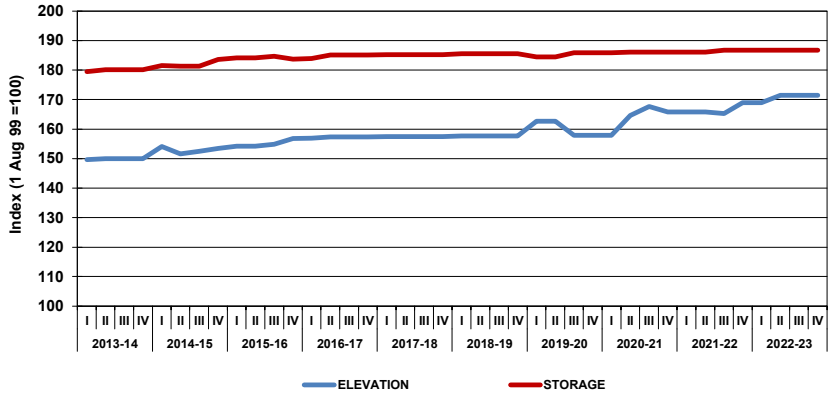
COMMERCIAL DEVELOPMENTS

Active Vessel Traffic Management development continues

With the growth in marine traffic through the Port of Vancouver has come an increasing need to optimize the movement of vessels through its busy and confined waterways. At the outset of the 2021-22 crop year the Vancouver Fraser Port Authority (VFPA) launched its Active Vessel Traffic Management (AVTM) program, with the goals of improving the port's efficiency, increasing collaboration between stakeholders, reducing environmental and social impacts, and ensuring the port remains capable of handling continued growth.

18 Excess revenues, along with applicable penalties, are payable by the carrier to the Western Grains Research Foundation.

Terminal Elevator Handling Charges



The AVTM consists of five elements to be rolled out in stages. These include centralized scheduling, anchorage management, supply chain collaboration, port call optimization, and port community systems. Two elements of the AVTM, both of which relate to anchorage management, came into effect during the 2022-23 crop year. The first of these, introduced in February 2023, involved the adoption of a code of conduct relating to the 33 Southern Gulf Island anchorages managed by the VFPA. The code's purpose is to reduce the disruptions that vessel movement causes to nearby communities and local wildlife, without compromising safety. Light and noise pollution, dragged anchors, and potential for spills are the primary concerns the code aims to address.

The second element, which is aimed at further reducing overnight disruptions, began on 1 July 2023. As a six-month trial program, it asks ship operators to limit their movements around the Southern Gulf Islands between 23h00 and 07h00. An AVTM update for 2023 indicated that this pilot program had effectively reduced nighttime arrivals and departures by 44%.

Significant progress was also made in the development of the VPFA's centralized scheduling system after partnering with DHI SeaPort OPX, a leading industry provider of digital management tools, in February 2023. The system, which will be used to plan and direct the movement of all vessels within the port, is expected to be gradually phased into the operations of each of the port's four traffic control zones. Rollout of the system began in October 2023 when it was implemented in the Second Narrows Traffic Control Zone, an area that sees more than 1,000 vessel movements annually.

The Second Narrows Bridge was the focal point of AVTM development due to the critical role it plays in both rail and marine infrastructure. As cargo volumes increase, the Second Narrows Bridge will increasingly become a chokepoint for terminals on the north-shore or east of the Second Narrows, as they compete for rail capacity across the bridge or maritime capacity under it. There are three grain terminals and two bulk terminals that handle agricultural products on the north-shore that rely on rail access: Cargill, G3, and Richardson terminals along with PKM Marine Terminal and Fibreco. East of the Second Narrows Bridge is Pacific Coast Terminals, which exports canola oil, and relies on access under the bridge for their tanker vessels. Moreover, completion of the Trans Mountain pipeline expansion project is expected to increase oil-tanker volumes out of Westridge Marine Terminal significantly beginning in 2024.

Height restrictions, even while the bridge is raised, necessitate that vessels transit during periods of low tide to ensure safe passage. The AVTM centralized scheduling system will provide a simplified means for vessel operators to request passage during one of the upcoming tidal windows. Furthermore, the schedule will be visible to all port users which allows CN, terminal operators, and shipping agents to plan their operations with more complete information.

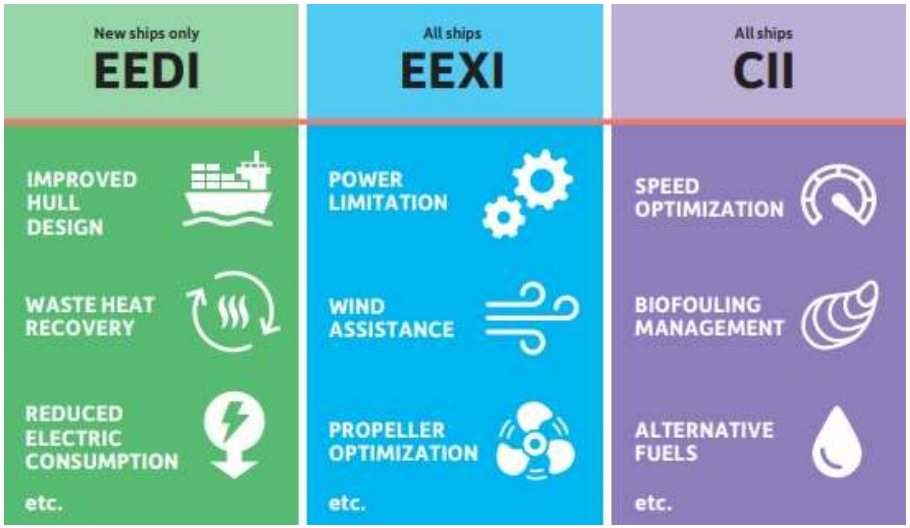
With the phasing-in of the three remaining traffic control zones, it is expected that the port authority will take a more active role in when and where vessels go to anchor. Shippers will request a vessel movement through the centralized system, which will optimize the timing of movements based on a holistic view of port conditions.

An overview of the traffic control zones within the Vancouver Port Authority's jurisdictional waters. (Image courtesy of the Vancouver Fraser Port Authority)

International Maritime Organization moves to reduce emissions

In November 2022, the International Maritime Organization (IMO), put into force an amendment with the stated goal of reducing emissions from the maritime shipping industry. The target is to reduce emissions to 40% of their 2008 baseline value by 2030. To achieve this, two measures were introduced: the Carbon Intensity Index (CII) and the Energy Efficiency Existing Ship Index (EEXI). The EEXI is a one-time determination of the attained energy efficiency of each ship to be compared against an index of required energy efficiency. The CII is an annual rating that measures and rates each vessel's carbon reduction efforts during operation.

Annually, each ship will be awarded a CII rating based on a formula that considers fuel consumption, CO_2 emissions, vessel weight, and distance travelled. The rating goes from A to E, where A is the best possible rating and ships that consistently score D or E ratings are required to submit corrective action plans to bring their rating up to a C. The CII mandate took effect on 1 January 2023 for all ships registered above 5,000 gross tonnes.



Summary of International Maritime Organization strategy on the reduction of greenhouse gas emissions from ships. (Image courtesy of International Maritime Organization)

Lower emission fuels, such as bio- or renewable-diesel, are cited as effective ways to improve a ship's CII, but IMO provides examples of other ways to improve the rating. Reducing drag through proper hull cleaning, speed and route optimization for just-in-time arrival, and auxiliary power systems such as solar can all reduce emissions and improve a ship's CII rating. It is expected that IMO will refine the CII measure with updated guidelines in 2024 following review of the initial year and feedback from industry. Early feedback from industry members have shown concerns with the formula that calculates the CII as it includes fuel use during time at anchor and does not consider the weight of cargo.

While the shipping industry is in the process of transitioning to lower emissions, there is a reluctance toward building new vessels as the best fuel sources to reach their goals are not yet determined or available in sufficient volume. New vessel builds risk being outdated long before their operating life comes to an end should there be significant progress towards lower emission fuel production and regulations that mandate their use. As such, it is anticipated that vessel supply will decrease in the short to medium term and raise charter rates, increasing the transportation costs for all importers and exporters, including those in the grain industry.

Supply-Chain Task Force releases report

In March 2022 the Government of Canada announced the establishment of a National Supply Chain Task Force to study the underlying issues that had made Canada's access to essential goods and supplies slower, more expensive, and less reliable. These problems were deemed to have made it more difficult for Canadian businesses to get their products to global markets. Moreover, they had been compounded by issues stemming from the ongoing COVID-19 pandemic, climate change, and other major events.

On 6 October 2022, the Task Force released its final report. The report, which built on extensive consultations with industry stakeholders, claimed that Canada's transportation supply chain was approaching a "breaking point" and that urgent action from both government and industry was needed to keep goods flowing. The Task Force advanced 21 immediate and longer-term recommendations. Among the higher priority items were

the need for measures to ease container congestion at ports; expand the existing railway interswitching distance; and address immediate labour needs.

Longer-term recommendations included the creation of a governmental Supply Chain Office to address issues reaching across federal departments; the development of a digital data structure to increase supply chain visibility; revising the mandate and structure of the Canadian Transportation Agency; actions to protect transportation corridors and border crossings from disruptions, be they from natural disasters, or human actions such as blockades or labor disputes; and working with the provinces and the United States government for reciprocal recognition of transborder regulations and policies.

Extended interswitching reinstituted

Building on one of the recommendations put forward by the National Supply Chain Task Force (Task Force) in its Final Report issued in the fall of 2022, the federal government's 2023 budget included a provision for the resurrection of a 160-km extended interswitching zone for Prairie rail movements on an 18-month "pilot" basis. With passage of the *Budget Implementation Act (2023)* in late June, this provision was scheduled to return on 20 September 2023.

However, the concept of extended interswitching remains contentious, and has again pitted shippers against carriers as to both its need and practicality. Originally brought forward in 2014 as an interim measure to aid in addressing railway service failures occasioned by the 2013-14 crop year's record harvest, it was allowed to lapse in 2016. The provision's reintroduction was advocated by the Task Force as a means of increasing supply-chain resiliency by heightening carrier competition and offering shippers transportation alternatives.

Government invests in supply-chain improvements

The federal transport minister announced three new investments under the National Trade Corridors Fund (NTCF) intended to increase supply chain capacity for Canada's grain sector. The final report of the National Supply Chain Task Force, released late in 2022, called on the federal government to address such capacity and infrastructure needs.

The first project, announced in October 2022, included $8.0 million in federal funding towards an $18.0-million investment in new equipment and processing improvements at the CanEst Transit grain-handling terminal in Montreal. The second project, announced in January 2023, was to provide up to $22.7 million in funding towards a $45.3 million project to rebuild and rehabilitate three out-of-service wharves located along the Welland Canal in Port Colbourne. The last came in March 2023 with the announcement of up to $23.0 million in funding for Surrey-based Global Agriculture Trans-Loading to add a new rail spur, container-lift equipment, and other operational features.

CP-KCS merger receives STB approval

Following a favourable vote by shareholders of both Canadian Pacific Railway Ltd. (CP) and Kansas City Southern Railway Company (KCS) in early December 2021, CP formally acquired the KCS for US$31 billion. Subject to final approval by the US Surface Transportation Board (STB), the shares of the KCS were placed into a voting trust designed to ensure that it would continue to operate independently of CP during the regulatory review process.

The STB's approval would create Canadian Pacific Kansas City Limited (CPKC), the only single-line railroad linking Canada, the United States, and Mexico. Given the geographic reach of the combined CPKC rail system, many within the grain industry voiced support, suggesting that the merger would provide them with improved access to American and Mexican markets.

On 15 March 2023 the STB approved the merger, subject to certain conditions including a seven-year oversight period aimed at monitoring the competitive impact. With that approval, the two railways formally combined on 14 April 2023. Headquartered in Calgary, CPKC remains the smallest of the six US Class 1 railroads by revenue, but has a much larger network, operating approximately 20,000 miles of track, and employing close to 20,000 people. Full integration of the two systems was expected to take place over the course of the next three years.

New funding for Churchill

On 3 August 2022 the governments of Canada and Manitoba announced that they would be providing $133 million in new funding to the Arctic Gateway Group (AGG) to aid in the upgrading of its rail line between The Pas and Churchill, which had forced the suspension of grain shipments to the port a year earlier. The federal government pledged a further $60 million while the Manitoba government promised to contribute $73 million to the project.

This new investment came in addition to the $40 million provided by Ottawa just a year earlier, as well as a $117 million commitment made in 2018 that allowed First Nations and northern Manitoba communities to purchase AGG, which owns the Hudson Bay Railway, the Port of Churchill, the Churchill Marine Tank Farm and other assets. In the fall of 2021, AGG announced that it was closing the port and suspending grain shipments through 2023 to effect heavy repairs on the rail line, especially the stretch between Gillam and Churchill, that largely sits atop muskeg.

Competition Tribunal rejects call for elevator sale

In a decision dated 31 October 2022, the Competition Tribunal (Tribunal), the quasi-judicial body with the power of approval over any antitrust actions proposed by the federal Competition Bureau (Bureau), dismissed an application from the Bureau that would have ordered Parrish & Heimbecker (P&H) to sell either the former Louis Dreyfus (Dreyfus) elevator at Virden, Manitoba, or its own facility at Moosomin, Saskatchewan, about 60 km to the northwest.

The Bureau proposed the order following P&H's September 2019 deal to purchase all 10 of the primary grain elevators operated by Dreyfus in Western Canada. P&H had challenged the proposed order shortly after closing its deal with Dreyfus in December 2019, claiming that there was no evidence of any imminent harm to farmers as alleged by the Bureau. The Tribunal sided with P&H, ruling that the Bureau had not established that the acquisition had lessened competition substantially in any relevant market, or that it was likely to do so in the future.

Vancouver gateway fee faces legal challenge

With the start of 2023, the Vancouver Fraser Port Authority began collecting a second Gateway Infrastructure Fee, which ranges widely by commodity and trade area, on goods moving through the port. According to the Authority, the new fee is intended to help defray the $1.1-billion cost associated with some 13 infrastructure-improvement projects, some of which are already completed, while others are either in progress or still under consideration. However, some terminal owners on the south shore, including Viterra Canada and Parrish & Heimbecker, are contesting these fees in Federal Court, with the Western Grain Elevator Association (WGEA) along with the provinces of Saskatchewan and Manitoba having sought intervenor status.

They contend that these fees will significantly increase the cost of moving goods, favour containerized shipments over bulk grain shipments on a per-tonne basis, and vary too significantly between north and south shore grain terminals. Similarly, it questions the differential between grain terminals situated on the north shore, which are now required to pay $0.08 per tonne, and those on the south shore and the Fraser River, which must pay a higher $0.25 per tonne, and $0.40 per tonne, respectively. Furthermore, the WGEA has also called into question the intrinsic conflict of interest it sees in the Authority's role as both a developer and a regulator.

Renewable diesel expansion moves forward

In late January 2023 Imperial Oil Canada confirmed that it had begun construction on its previously announced plan to build a $720 million renewable diesel facility at its Strathcona refinery near Edmonton. When fully operational, the plant will produce more than one billion litres of renewable diesel per year. A significant portion of this production will be destined for British Columbia in support of that province's efforts to reduce carbon emissions. Imperial said that the plant is expected to be operational by 2025 and will draw on locally sourced feedstock. This means still more demand for canola and canola oil. In a reflection of this growth, in mid-April 2023 Louis Dreyfus Company (LDC) added its name to the list of firms planning to expand canola-crushing operations with an effective doubling in size of its Yorkton facility. Although this expansion

supports the company's existing merchandising activities it was also aimed at positioning LDC as a strategic feedstock provider to renewable energy producers such as Imperial.

Merit Foods enters receivership

On 1 March 2023 Merit Functional Foods (Merit) of Winnipeg, a pea and canola protein processor, was forced into receivership by two of its secured creditors, Farm Credit Canada and Export Development Canada. Merit surrendered its Canadian Grain Commission license and was believed to have settled with all producers who had delivered grain to the company. PricewaterhouseCoopers became the receiver for both Merit and the numbered company that owned its processing plant and property in Winnipeg's CentrePort industrial park following a court order. The company's 94,000-square-foot state-of-the-art facility, which opened in February 2021, was seen as a kick-starter in developing a plant-based protein-processing industry for Manitoba.

Merit was founded in 2019 as a joint venture between Vancouver-based Burcon Nutrascience (Burcon), which owned its protein extraction technology, and several other industry partners. Construction of the facility, designed to extract food-grade protein from peas and canola for use in alternative food products, came with a projected price tag of $150 million. In 2020, the federal government announced nearly $100 million in funding, much of it taking the form of loans and repayable contributions. Although the Merit plant, along with the much larger Roquette pea protein plant in Portage la Prairie, garnered much attention, interest in non-meat, plant-based substitutes for hamburgers and sausages did not translate into a sustainable demand, with many consumers ultimately returning to traditional meat-based products. This, coupled with lower-than-anticipated extraction rates, higher processing costs, and COVID-19 related issues all served to undermine the company's financial viability.

Viterra and Bunge announce merger plan

On 13 June 2023 St. Louis-based Bunge Limited announced that it had entered into a definitive agreement to merge with Viterra in a stock and cash transaction worth $US8.2 billion. The transaction, which is largely

A view of the Viterra grain elevator located in Lethbridge, Alberta, one of many Canadian facilities to be acquired by Bunge Limited through a potential merger of the two companies. (Image courtesy of The Western Producer)

viewed as complementary, would effectively marry the world's largest oilseed processor with one of its largest grain handlers. With both entities having operations that span the globe, the combined company – which would continue under the Bunge name – would constitute one of the largest agribusinesses in the world. With an estimated market capitalization of roughly $US25 billion, the merged entity would be better positioned to compete with acknowledged industry leaders, Cargill Inc. and Archer Daniels Midland.

Viterra has a large presence in Canada, with a physical footprint that extends from British Columbia to Quebec and encompasses 66 primary and process elevators along with six port terminals. More recently, the company announced plans to build the world's largest integrated canola-crushing facility in Regina. These would dovetail with Bunge's smaller, yet no less significant domestic operations, which include several oil-processing facilities on the Prairies as well as a 25% minority interest in G3

Canada. The merger is expected to close in mid-2024, subject to regulatory and shareholder approvals.

From the outset of its June announcement, it was known that the global reach of the proposed merger between Bunge and Viterra would require the regulatory approval of numerous countries. Shortly afterwards, the Competition Bureau affirmed that it would be undertaking an appropriate assessment of the proposed transaction in Canada. However, on 26 September 2023 the federal transport minister stated that it would be launching its own review under the merger and acquisition provisions of the *Canada Transportation Act*. Noting that both companies had ownership interests in port terminals throughout Canada, and that the transaction was important to the smooth functioning of the transportation sector and the broader supply chain, this review was to focus on the public interest. The Transport Canada review, which will include consultations with various stakeholders, must be completed by 2 June 2024.

ILWU strike disrupts port operations

On 1 July 2023 about 7,500 members of the International Longshore and Warehouse Union Canada (ILWU) went on strike against the British Columbia Maritime Employers Association (BCMEA) over disagreements relating to wages, the contracting out of work, and automation. This action effectively prevented the movement of traffic through some 30 west coast ports, including the commercially critical gateways of Vancouver and Prince Rupert. Although the Canada Labour Code insulated the movement of bulk grain through these ports, shipments of other goods were effectively immobilized (including containerized grain shipments).

Given the threat to Canadian supply chains, many stakeholders called on the Government of Canada to take immediate action to end the strike through the enactment of back-to-work legislation. The government communicated that it would consider all options, but that it believed in a collective bargaining process and would help to facilitate an end to the action. After nearly two weeks of on-and-off negotiations, it appeared that a tentative agreement had finally been reached, but it was subsequently voted down by the ILWU membership. A second tentative agreement was secured a few days later, but it too suffered the same fate. The parties came to a third agreement on 30 July 2023, which was ratified by the ILWU membership later that same week. Clearing the traffic backlogged by the strike extended throughout the fall.

An arial view of the Fairview Container Terminal in Prince Rupert, British Columbia, which, among other facilities, was affected by striking International Longshore and Warehouse Union Canada employees in July 2023. (Image courtesy of Prince Rupert Port Authority)

Section 5: System Efficiency and Performance

Indicator Description	Table	1999-00	2020-21	2021-22	2022-23 Q1	Q2	Q3	Q4	YTD	% VAR
Country Elevator Operations										
Average Elevator Capacity Turnover Ratio	5A-1	4.8	6.5	4.2	1.5	1.7	1.6	1.1	5.9	40.5%
Average Weekly Elevator Stock Level (000 tonnes)	5A-2	3,699.3	3,847.2	3,548.6	3,445.5	3,796.2	3,893.9	2,425.8	3,382.3	-4.7%
Average Days-in-Store (days)	5A-3	41.7	25.4	38.3	23.9	23.8	26.1	22.9	24.2	-36.8%
Average Weekly Stock-to-Shipment Ratio – Grain	5A-4	6.2	3.7	5.9	3.4	3.2	3.8	3.3	3.4	-42.4%
Railway Operations										
Movements to Western Canada										
Railway Car Cycle (days) – Empty Movement	5B-1	10.7	7.3	9.7	7.9	6.6	6.7	8.2	7.3	-25.2%
Railway Car Cycle (days) – Loaded Movement	5B-1	9.2	8.0	8.1	6.1	7.2	6.9	6.3	6.7	-17.1%
Railway Car Cycle (days) – Total Movement	5B-1	19.9	15.3	17.8	14.0	13.9	13.6	14.5	14.0	-21.5%
Railway Car Cycle (days) – Non-Special Crops	5B-2	19.3	15.0	17.5	13.4	13.7	13.3	14.3	13.7	-22.0%
Railway Car Cycle (days) – Special Crops	5B-3	25.8	18.2	20.9	18.9	16.0	16.9	18.2	17.5	-16.0%
Railway Loaded Transit Time (days)	5B-4	7.8	7.0	6.8	5.2	6.2	5.9	5.2	5.7	-16.4%
Movements to Eastern Canada										
Railway Car Cycle (days) – Empty Movement	5B-5	n/a	9.6	14.4	13.1	10.7	10.8	12.6	11.5	-19.8%
Railway Car Cycle (days) – Loaded Movement	5B-5	n/a	12.3	15.5	15.0	11.7	11.7	14.4	12.8	-17.5%
Railway Car Cycle (days) – Total Movement	5B-5	n/a	21.9	29.9	28.1	22.4	22.5	27.1	24.3	-18.6%
Railway Loaded Transit Time (days)	5B-8	n/a	10.7	13.6	13.1	9.8	10.0	12.4	10.9	-19.6%
Movements to the United States										
Railway Car Cycle (days) – Empty Movement	5B-9	n/a	11.5	12.3	10.4	11.0	11.7	11.7	11.2	-9.0%
Railway Car Cycle (days) – Loaded Movement	5B-9	n/a	14.7	15.4	13.5	16.1	15.6	14.4	14.9	-3.3%
Railway Car Cycle (days) – Total Movement	5B-9	n/a	26.2	27.7	23.9	27.1	27.3	26.1	26.1	-5.8%
Railway Loaded Transit Time (days)	5B-12	n/a	10.7	11.4	9.3	11.1	10.8	10.2	10.3	-9.3%
Traffic to Western Canada										
Hopper Car Grain Volumes (000 tonnes) – Non-Incentive	5B-13	12,718.7	7,724.1	4,781.2	1,990.6	2,098.8	1,778.3	1,395.8	7,263.5	51.9%
Hopper Car Grain Volumes (000 tonnes) – Incentive	5B-13	12,945.9	40,725.3	21,798.2	9,555.9	10,574.0	9,679.4	6,852.0	36,661.4	68.2%
Hopper Car Grain Volumes ($ millions) – Incentive Discount Value	5B-14	$31.1	$325.8	$174.4	$76.4	$84.6	$77.4	$54.8	$293.3	68.2%
Traffic Density (tonnes per route mile) – Total Network	5B-15	330.4	701.5	384.9	668.8	734.0	663.6	477.7	636.0	65.3%
Terminal Elevator Operations										
Average Terminal Elevator Capacity Turnover Ratio	5C-1	9.1	17.6	9.1	n/a	n/a	n/a	n/a	15.7	72.5%
Average Weekly Terminal Elevator Stock Level (000 tonnes)	5C-2	1,216.2	1,265.3	1,118.4	997.3	1,302.5	1,306.5	1,078.8	1,168.8	4.5%
Average Days-in-Store – Operating Season (days)	5C-3	18.6	9.8	16.5	10.6	9.2	9.5	12.1	10.5	-36.4%
Average Weekly Out-of-Car Time	5C-5	n/a	15.1%	15.3%	11.4%	12.4%	14.8%	14.6%	13.3%	-13.1%
Port Operations										
Average Vessel Time in Port (days)	5D-1	4.3	10.6	9.1	7.2	11.5	12.7	7.5	9.8	7.5%
Average Vessel Time in Port (days) – Waiting	5D-1	1.9	5.7	4.6	3.6	6.6	6.7	4.0	5.3	14.7%
Average Vessel Time in Port (days) – Loading	5D-1	2.4	4.9	4.5	3.6	4.9	5.9	3.4	4.5	0.1%
System Performance										
Total Time in Supply Chain (days)	5E-1	68.1	42.2	61.6	39.7	39.2	41.5	40.1	40.4	-34.4%

DISCUSSION AND ANALYSIS

COUNTRY ELEVATOR OPERATIONS
[See TABLES 5A-1 through 5A-4]

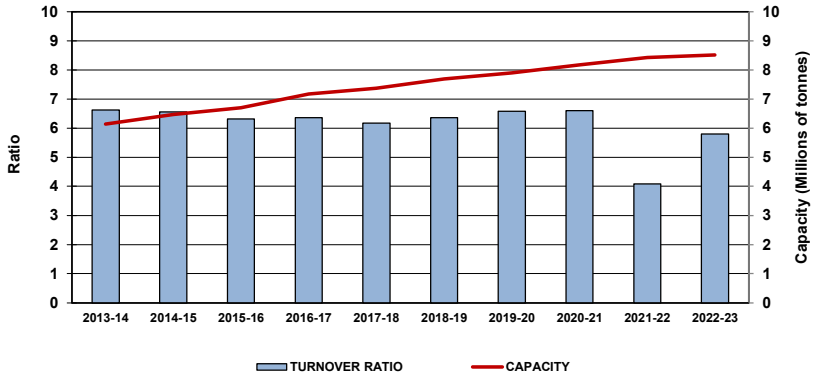
The combined effects of changes in primary elevator throughput and storage capacity are reflected in the system's capacity-turnover ratio. With primary elevator throughput having increased by 43.3% to 49.4 million tonnes, the turnover ratio for the 2022-23 crop year rose by a comparable 40.5%, to 5.9 turns from 4.2 turns a year earlier. A further 119,900-tonne expansion in the storage capacity of the primary-elevator system, which has been steadily rising for several years, served to modestly temper this increase.

Elevator Inventories

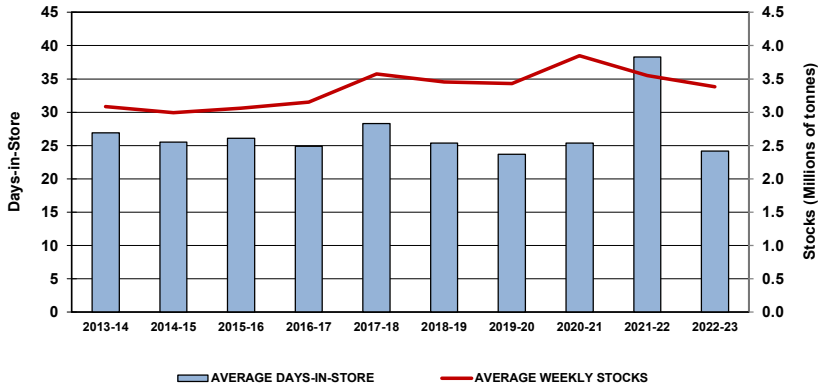
In assessing the operational efficiency of the primary elevator system, the GMP also considers the amount of grain maintained in inventory. Beyond measuring stock levels alone, this examination also considers the amount of time grain spent in inventory, along with its ability to satisfy immediate market needs.

Notwithstanding periodic fluctuations, approximately half of the GHTS's primary elevator storage capacity is employed in maintaining its operational grain inventories. From the outset of the GMP primary elevator stocks seldom rose above the 3.0-million-tonne mark. It was not until the 2013-14 crop year that the expansion in associated storage capacity allowed primary elevator stocks to consistently rise above this level, facilitating the handling of ever larger harvests without congesting the system. The 2022-23 crop year saw average primary elevator inventories of just under 3.4 million tonnes reach above this threshold for a tenth consecutive year, down 4.7% from the previous crop year's 3.5 million tonnes. In parallel with these gains, the system's storage capacity had increased by almost 2.6 million tonnes.

Primary Elevator Capacity Turnover Ratio



Primary Elevator Inventories



Days in Store

While stock levels have progressively risen, the amount of time spent by grain in inventory has declined. From a benchmark 41.7 days in the GMP's base year, the average has moved gradually lower, breaking through the 30-day mark about a decade later. Further reductions brought the average closer to 25 days. This decline simply reflected the faster pace at which grain was flowing through elevators to maintain fluidity. These needs eased significantly in the 2021-22 crop year but returned in the face of the 2022-23 crop year's larger harvest. As a result, grain began moving through the GHTS at a faster rate, with the average days-in-store declining by 36.8%, to 24.2 days from 38.3 days.

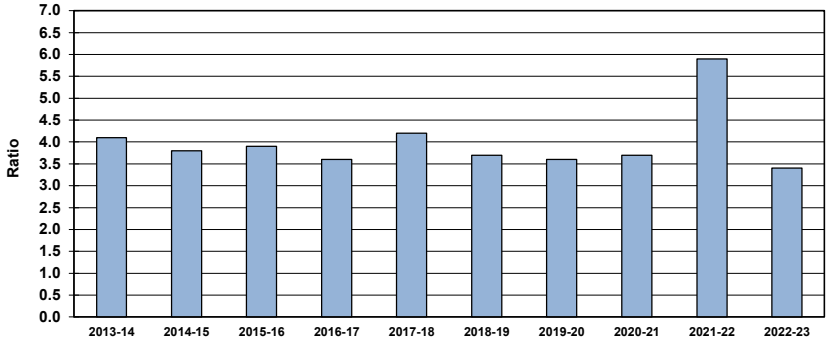
Stock-to-Shipment Ratios

The adequacy of country elevator inventories can be broadly gauged by comparing their level at the end of any given shipping week, with the truck and railway shipments that follow in the next seven days. Over a decade ago, the average stock-to-shipment ratio typically assumed a value around 4.5. In more recent years, however, the average ratio has repeatedly fallen below 4.0, suggesting the maintenance of tighter inventories in relation to the volume of grain slated for shipment in the coming week. Much of this was reversed in the 2021-22 crop year owing to reduced throughput and slower rail service, but the resurgence in volume in the 2022-23 crop year effectively restored previous inventory practices, with the average ratio falling by 42.4%, to 3.4 from 5.9 a year earlier.

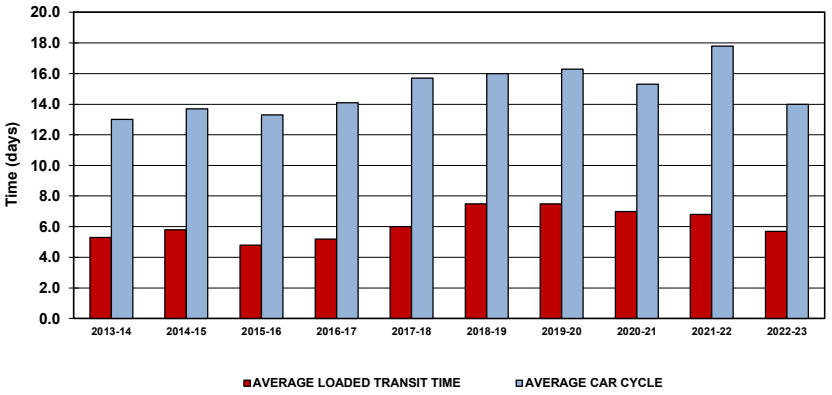
RAILWAY OPERATIONS
[See TABLES 5B-1 through 5B-15]

The average amount of time taken by the railways in delivering a load of grain to its destination and then returning the empty railcar back to the prairies for reloading is represented by the average car cycle. Since expansion of the GMP's measures in the 2014-15 crop year, car-cycle data are gathered on movements to Western Canada, Eastern Canada, and the United States.

Primary Elevators - Stock-to-Shipment Ratio



Railway Car Cycles and Loaded Transit Times
(Western Canada)



Hopper-Car Movements to Western Canada
[See Tables 5B-1 through 5B-4]

During the 2022-23 crop year the car cycle for shipments terminating within Western Canada averaged 14.0 days, a 21.5% reduction from the 17.8-day average recorded a year earlier. This average also proved to be the lowest observed since the 2015-16 crop year. The decrease was driven by sharply lower values in each of the primary corridors, with the critical Vancouver average car cycle falling by 21.6%, to 14.3 days from 18.2 days a year earlier. This was reinforced by a 28.2% decline in the Prince Rupert average, which fell to 13.1 days from 18.2 days, and a 19.2% drop in the Thunder Bay corridor, where the average fell to 13.2 days from 16.4 days.

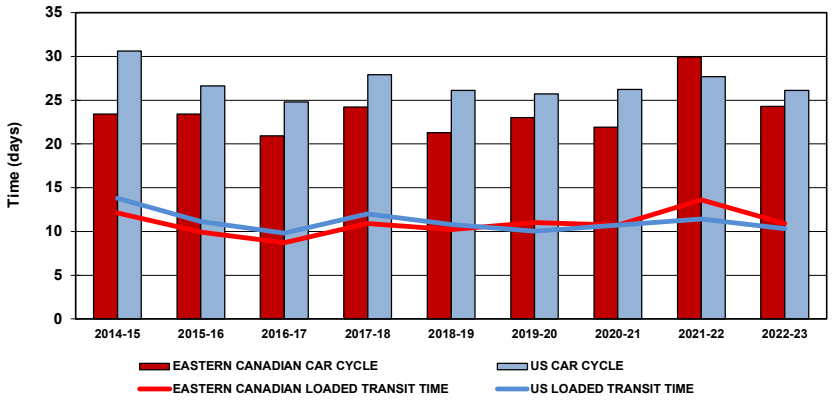
Owing to the heavy weighting of non-special crops in the overall traffic mix, the car cycle for these commodities showed an analogous decrease, with the average falling 22.0%, to 13.7 days from 17.5 days a year earlier. The car cycle tied to special crops showed a similar improvement, falling by 16.0%, albeit to a more elevated average of 17.5 days from 20.9 days. The higher average for special crops still appears linked to the handling traits of these shipments, which tend to move in smaller numbers in merchandise-train service rather than in the unit-train lots more typical of non-special crops.

Loaded Transit Time

A key component in the railways' average car cycle is its average loaded transit time. This measure focuses on the amount of time taken in moving grain from a country elevator to a port terminal for unloading. Changes in the average loaded transit time tend to move in tandem with changes in the overall car cycle. Such was again the case in the 2022-23 crop year given a 16.4% reduction in the average loaded transit time, which declined to 5.7 days from 6.8 days a year earlier. This improvement saw the average drop to its lowest level since the 2016-17 crop year.

The irregularity in the underlying distribution, as gauged by the coefficient of variation, proved little different in the 2022-23 crop year, declining modestly to 35.1% from 39.5% a year earlier. Both values are not far removed from those observed in earlier years, indicating that the amount of time taken in moving a loaded hopper car to a port in Western Canada remains highly variable.

Railway Car Cycles and Loaded Transit Times
(Eastern Canada and the United States)



Hopper-Car Movements to Eastern Canada and the United States
[See Tables 5B-5 through 5B-12]

Parallel performance measures for grain shipments into Eastern Canada and the United States were added to GMP reporting in the 2014-15 crop year. Owing to the greater distances involved in reaching these markets, these data show noticeably higher averages than observed for Western Canadian destinations. In the case of movements into Eastern Canada, the car cycle decreased 18.6% in the 2022-23 crop year, with the average falling to 24.3 days from 29.9 days a year earlier. A comparatively modest 5.8% decrease was observed on movements into the United States, with the average car cycle declining to 26.1 days from 27.7 days. It is worth noting that the average car cycle into Eastern Canada once again fell below that of movements into the United States.

In equal measure, the average loaded-transit time associated with movements into Eastern Canada and the US are substantially higher than those to Western Canadian destinations. In the case of the former, this

amounted to an average of 10.9 days, which represented a decrease of 19.6% from the 13.6 days reported a year earlier. Movements into the United States saw a reduction of 9.3%, with the average falling to 10.3 days from 11.4 days. Interestingly, the average tied to movements into Eastern Canada reached above that for movements into the United States. The underlying distributions proved equally irregular, with the coefficient of variation on movements into Eastern Canada standing at 27.8% against 36.9% for those into the United States.

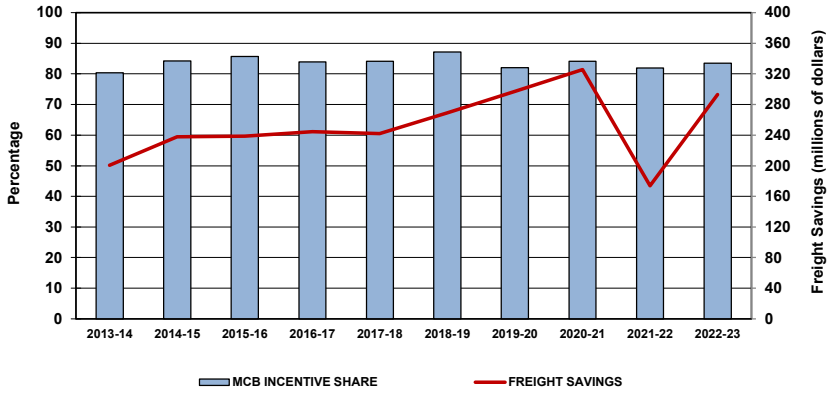
Multiple Car Blocks
[See Tables 5B-13 through 5B-14]

The amount of railway traffic moving in multiple car blocks has increased substantially over the past two decades. In fact, since the 2013-14 crop year, at least 80% of the regulated grain moving to the four ports in Western Canada has earned an incentive discount, against only half in the GMP's base year. However, the structure of these discounts has been changing, with ever greater emphasis being placed on larger block movements.

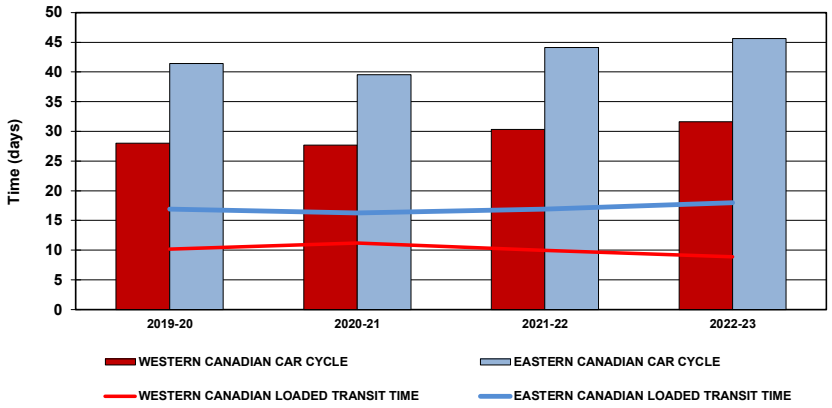
In effect, CN and CPKC now only offer an $8.00-per-tonne freight discount on trainload shipments of 100 or more cars (112 or more cars in the case of CPKC). A further $2.00-per-tonne discount can also be earned if such shipments meet certain high-efficiency train conditions, typically associated with loop-track originations. These requirements effectively preclude less-than-trainload shippers from receiving any discounts on what had previously been qualifying smaller car-block movements. Even so, the proportion of grain shipped in these qualifying multiple car blocks continues to reach above 80%, with 83.5% having done so in the 2022-23 crop year, up from 82.0% a year earlier.

The monetary value of the discounts earned by these qualifying grain shipments – estimated as gross savings in railway freight charges – has consequently risen over the span of the GMP.[19] Owing to the 2022-23 crop year's larger grain supply, these savings rose by an estimated 68.2%, to $293.3 million from $174.4 million a year earlier.

MCB Movements and Freight Savings
(Western Canada)



Tank Car Cycles and Loaded Transit Times
(Western Canada and Eastern Canada)



19 Data supplied by CN and CP does not allow for the identification of grain movements earning the maximum $10.00-per-tonne discounts made available on qualifying trainload shipments. As a result, the gross savings in railway freight charges estimated here are based on a nominal $8.00-per-tonne minimum, effectively understating the actual value of these discounts.

Tank-Car Movements
[See Tables 5B-16 through 5B-17]

As outlined earlier, the GMP has been expanded to include more specific measures relating to the movement of canola-oil from origins in Western Canada. This expansion also extended to the calculation of average car-cycles and loaded-transit times on domestic movements. During the 2022-23 crop year the car cycle for shipments terminating within Western Canada averaged 31.6 days, up 4.3% from the 30.3-day average recorded a year earlier. Movements to Eastern Canada showed a significantly longer car cycle, with the average reaching 45.6 days, 3.4% higher than the 44.1-day average attained a year earlier.

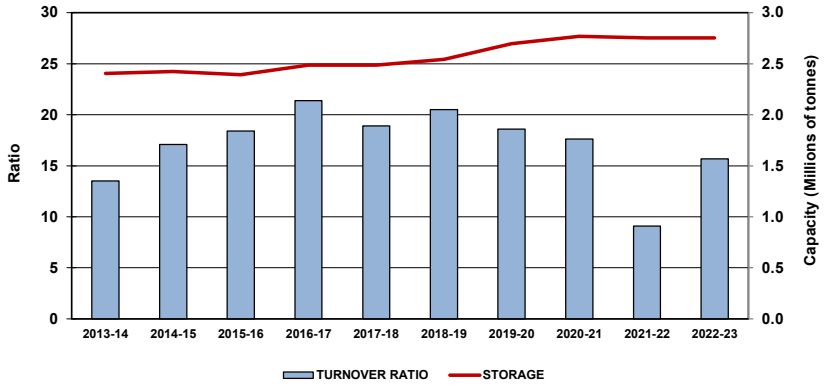
The movements' average loaded transit time delineates how long it takes to move canola oil from a prairie crushing facility to port terminals for unloading. As with the movement of covered hopper cars, changes in the average loaded transit time of tank cars tends to mimic that of the overall car cycle. However, this was not the case in the 2022-23 crop year given an 11.0% reduction in the average loaded transit time for movements terminating in Western Canada, which declined to 8.9 days from 10.0 days a year earlier. Conversely, the average on movements into Eastern Canada rose by 6.0%, to 18.0 days from 16.9 days a year earlier.

TERMINAL ELEVATOR OPERATIONS
[See TABLES 5C-1 through 5C-5]

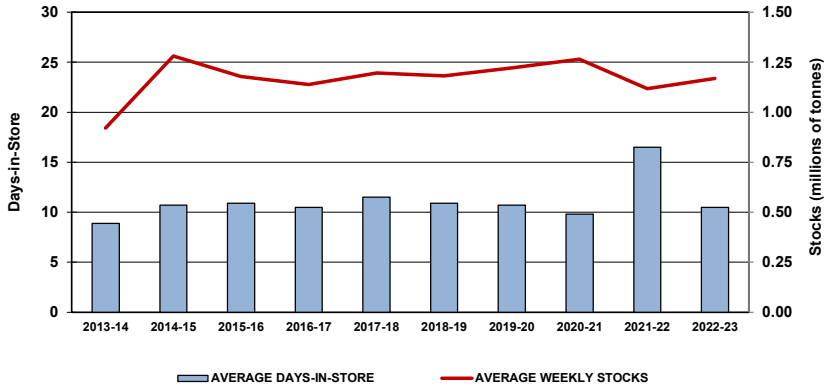
A key indicator of terminal activity is the system's capacity-turnover ratio, which gauges terminal-elevator throughput against storage capacity. The 2022-23 crop year saw this measure rose by 72.5%, to an average of 15.7 turns from 9.1 turns a year earlier. This increase reflected the 64.6% jump in terminal-elevator throughput noted earlier. However, changes in the turnover ratio are often amplified because, as a simple composite value, it is sensitive to any significant swing in the tonnage handled through, or the storage capacity of, individual facilities. The turnover values tied to some of the smaller terminals at the ports of Vancouver and Thunder Bay can be especially distortionary.

Despite the rebound in volume that saw terminal throughput rise to 39.9 million tonnes in the 2022-23 crop year, shipments fell short of the record

Terminal Elevator Capacity Turnover Ratio



Terminal Elevator Inventories



44.7 million tonnes reached in the 2020-21 crop year. The west-coast gateways of Vancouver and Prince Rupert accounted for much of this increase, posting capacity-turnover ratios that were almost twice that posted a year earlier. Moreover, the overall turnover ratio stood well above the 9.1 first recorded in the GMP's base year.

Terminal Elevator Inventories

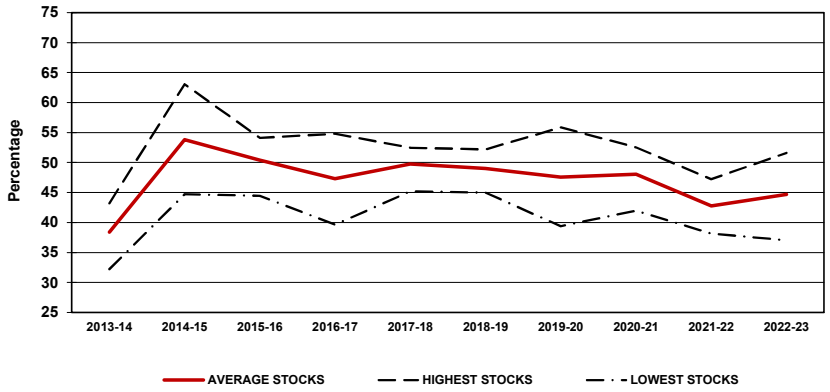
Despite recent changes to the physical makeup of the GHTS's terminal elevator system, grain inventories have not varied substantially since the beginning of the GMP. In fact, average weekly stock levels have tended to fluctuate in a band between 1.0 million tonnes and 1.5 million tonnes. This was again the case in the 2022-23 crop year, with the average weekly stock level increasing by 4.5%, to almost 1.2 million tonnes from 1.1 million tonnes a year earlier.

Although terminal stocks are typically maintained at about half of the system's licensed storage capacity, they fluctuate from week to week, rising and falling in conjunction with the workings of the supply chain itself. This means that stocks normally occupy anywhere from 40% to 60% of the licensed storage capacity at any given time. A utilization rate that exceeds these bounds, such as was the case in the 2013-14 crop year, typically denotes a major exception in the orderly flow of grain through the GHTS. Although weekly terminal stocks varied throughout the 2022-23 crop year, they represented an average of 44.7% of the system's stated storage capacity, up from the previous crop year's 42.8% average. However, with quarterly utilization rates ranging from a low of 37.0% to a high of 51.6%, the inbound flow of grain remained comparatively tight.

Days in Store

Heightened throughput exerted more pressure on the maintenance of adequate terminal stocks. Average stocks fell to 2.9% of the system's annual throughput, down from 4.6% a year earlier. This only increased the need for the consistent flow of the right grain, to the right terminal, at the right time. Stock adequacy is also reflected in the amount of time grain spends in terminal inventory, which has effectively been cut almost in half over the life of the GMP.

Terminal Elevator Capacity Utilization



The 2022-23 crop year's average of 10.5 days decreased 36.4% from the previous crop year's uncharacteristically higher 16.5-day average. This improvement signalled a return to more recent norms. Much of the reduction was shaped by less time at Vancouver, which fell by 35.3%, to an average of 8.6 days from 13.3 days a year earlier. This was supported by equally substantial declines at the ports of Prince Rupert and Thunder Bay, which posted decreases of 38.6% and 25.2% respectively, and produced corresponding averages of 8.1 days and 16.3 days.

However, these annual averages disguise some of the more significant monthly swings, among them: Vancouver's decrease from an average of 17.3 days in August 2022 to a low of 7.1 days in October. Such declines underscore the faster pace at which grain moved through the GHTS in the first half of the 2022-23 crop year.

Stock-to-Shipment Ratios

Equally indicative of the increased pressure on terminal inventories was the decrease in many of the grain-specific stock-to-shipment ratios. Although most commodities showed overall averages that stood comfortably above 1.0, almost all had minimums that fell substantially below this threshold. Moreover, these minimum ratios show that almost every grain was in short supply at various points during the crop year, which indicates that there were problems in getting the right grain in terminal position when needed.

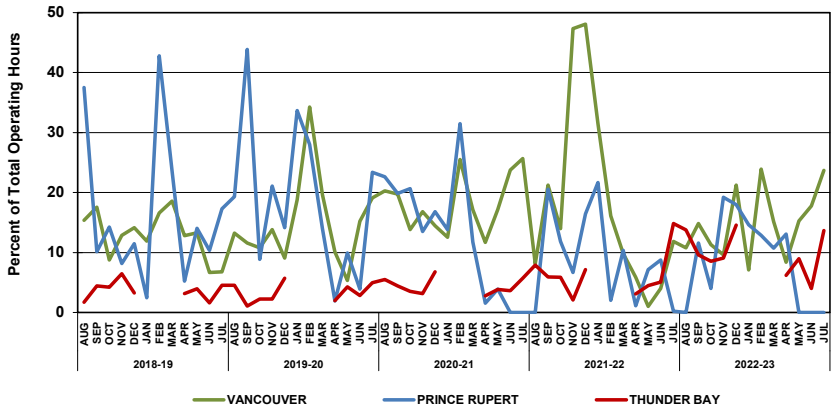
This is consistent with long-standing indications that inbound rail deliveries are often out of sequence, which leads to erratic grain stocking and interruptions in vessel loading. Non-sequential railcar deliveries can be highly disruptive to the efficient flow of grain through a terminal. Oftentimes, vessel loading schedules must be juggled to deal with the grain on hand. This commonly requires the exporter to contend with the additional costs incurred, be it from the need for multiple berthings or vessel demurrage.

Port Terminal Out-of-Car Time

A related measure, out-of-car time, gauges how often a port terminal had no railcars to unload while staffed, operating, and expecting cars to arrive. The proportion suggests how consistently grain flowed through the terminal system during the period specified. This measure offers some insight into how the pace of inbound rail deliveries matches with the terminals' handling capacity, and whether a slowdown in the flow of traffic has generated any undue idle activity. These statistics tend to show a degree of seasonality, with out-of-car time often peaking in the winter months, typically the most difficult operational period of the crop year. Taken collectively, terminal elevators were left without grain to unload 13.3% of the time in the 2022-23 crop year, down from 15.3% the previous year.

With its greater operating hours, Vancouver's out-of-car time is most indicative of the system's overall efficiency. Proportionately, 14.6% of the port's total terminal operating hours were idled during the 2022-23 crop year, down from the 18.4% recorded in the previous year. However, the

Terminal Elevator Out-of-Car Time



underlying monthly values showed greater variability, ranging from a low of 7.1% to a high of 23.9%, with sharp swings among terminals on both the north and south shores. These gyrations continue to suggest that terminal efficiency is highly dependent on consistent railway service.

Much the same can be said of Prince Rupert, which has reported substantially elevated out-of-car times in past crop years. Even so, the port saw its idle-time proportion fall by 4.3% in the 2022-23 crop year, to 8.9% from 9.3% a year earlier.

Unlike Vancouver and Prince Rupert, Thunder Bay saw a sharp increase in the 2022-23 crop year, with its out-of-car time proportion rising to 10.3% from 6.0% a year earlier. It should be noted, however, that while Thunder Bay has regularly posted the lowest proportion among the three principal ports in Western Canada, its monthly scores belie an equally irregular pattern. This was particularly evident in the 2022-23 crop year, with the out-of-car proportion rising noticeably, reaching a high of 14.5% in December 2022.

PORT OPERATIONS
[See TABLES 5D-1 through 5D-8]

A total of 923 vessels called for grain at Western Canadian ports during the 2022-23 crop year. This represented a 45.4% increase over the 635 ships that arrived for loading a year earlier. Over half of these, 522, called at Vancouver. This was followed by Thunder Bay with 323, and Prince Rupert with 78.

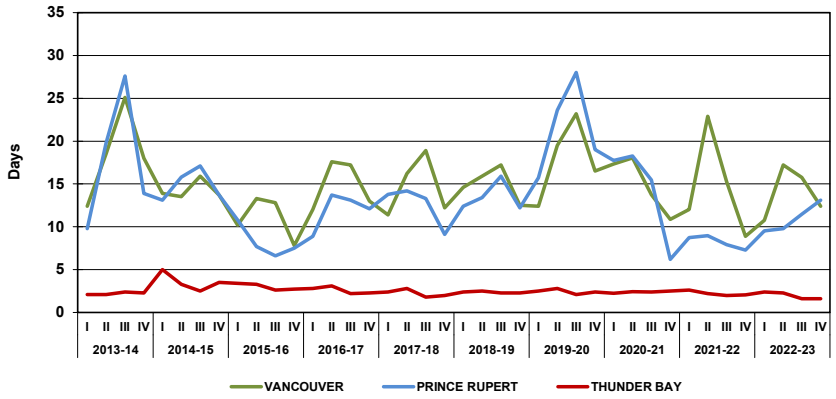
Average Vessel Time in Port

The amount of time spent by vessels in port is generally indicative of the GHTS's overall efficiency: when low, it suggests that grain is moving through the system in a timely and uniform manner; when high, it hints at some underlying impediment. The 2022-23 crop year saw a 7.5% increase in this average, which rose to 9.8 days from 9.1 days a year earlier. This was chiefly due to a 14.7% increase in the amount of time vessels spent waiting to load, which rose to an average of 5.3 days from 4.6 days a year earlier. A marginal 0.1% increase in the amount of time vessels spent loading, which effectively remained unchanged at an average of 4.5 days, supported the broader rise.

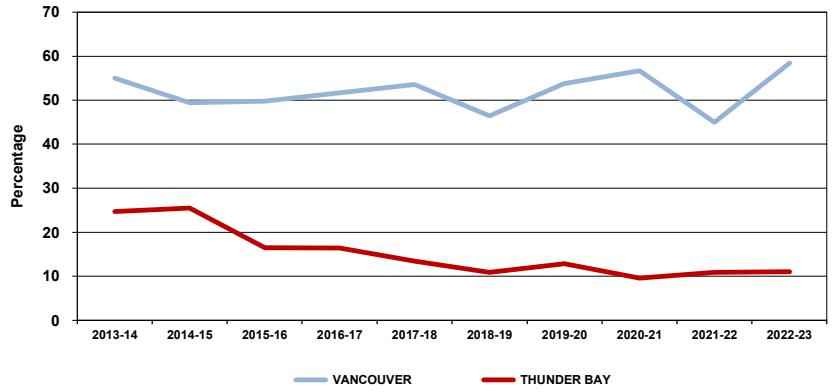
The overall rise in time-in-port occurred despite individual reductions at the ports of Vancouver, which fell by a modest 2.6%, to 14.5 days from 14.9 days, and Thunder Bay, which saw a 12.2% decrease, to 2.0 days from 2.3 days. Together these two ports accounted for 91.5% of the 923 vessels that called at Western Canadian ports during the 2022-23 crop year. However, Vancouver's comparative 5.8-point gain in share, coupled with its longer 12.5-day average, drove the overall average upwards. This was supported by a 32.0% increase for Prince Rupert, with an average that rose to 10.9 days from 8.3 days, but which proved less impactful owing to a much smaller 8.5% share.

It is worth noting that the time spent by vessels in port rose progressively throughout much of the crop year's first three quarters, with the overall average reaching a height of 16.6 days in February 2023. This rise was driven by increases in the amount of time ships spent at west-coast ports, with the Vancouver average plateauing at 20.6 days in January, and the Prince Rupert average at 12.3 days in April. And whereas the average for

Vessel Time in Port
(Western Canada)



Multiple Vessel Berthing Rate



Vancouver moved steadily lower thereafter, the average for Prince Rupert drifted still higher, ultimately peaking with 19.0 days in July 2023.

The variations cited here point yet again to the critical underpinnings inherent in coordinating the inbound movement of grain by rail with its scheduled outbound movement by ship. The better synchronization of these flows leads to fewer waiting vessels, and the better use of available achorages.[20] All of which helps to limit harbour congestion and reduce vessel demurrage costs.

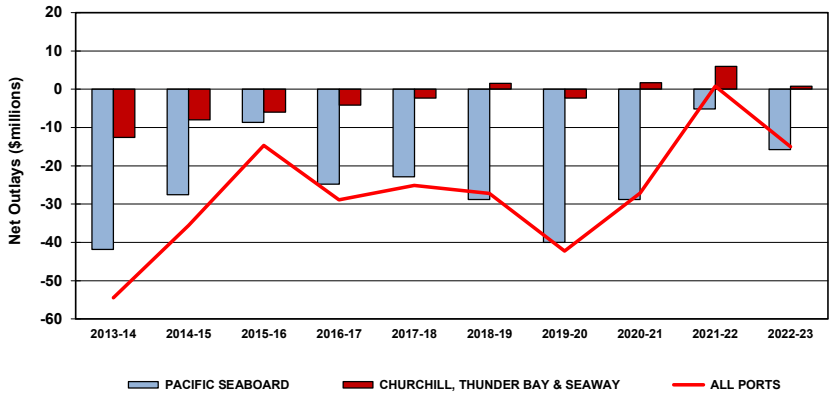
Distribution of Vessel Time in Port

Impediments to the flow of grain through the terminal network are also reflected in the number of ships spending long periods of time in port. The proportion of ships with stays of more than five days rose markedly in the 2022-23 crop year, to 55.9% from 47.2% a year earlier. Moreover, ships in port for an unusually long time also increased, with the proportion of vessels spending 16 or more days in port rising to 23.8% from 21.1%. This, however, was more than double the 8.7% level witnessed just a decade earlier. These averages suggest that exports remain vulnerable to impediments in the flow of grain, whether on the inbound movement by rail or the dockside loading onto ships.

Distribution of Berths per Vessel

Similarly, there were noteworthy changes in the proportion of vessels needing to berth more than once during the 2022-23 crop year. At Vancouver, this proportion rose to 58.4% from 45.0% a year earlier. Thunder Bay saw a more marginal increase, with the proportion rising to 11.1% from 10.9%. Although the Vancouver proportion remains generally consistent with those observed in the first years of the GMP, the percentage accorded Thunder Bay has moved significantly lower.

Annual Demurrage and Dispatch



Demurrage and Dispatch

Changes to the amount of time vessels spend in port are often reflected in the demurrage costs and dispatch earnings reported by the Western Grain Elevator Association, which provides a monetary indication of how efficiently grain flowed through Western Canadian ports.[21] Once again, these two elements dovetailed to produce a net cash outflow of almost $15.0 million. This financial result was shaped chiefly by a 62.8% increase in demurrage costs, which rose to $31.5 million from $19.4 million the previous year. However, the financial loss was enlarged by an 18.1% decrease in dispatch earnings, which fell to $16.5 million from $20.2 million.

These results were driven by an increase in the financial penalties incurred along the Pacific Seaboard, which produced a net cash outlay of $15.8 million against $5.1 million a year earlier. Similarly, the results from activity at Churchill, Thunder Bay and points along the St. Lawrence

20 There have been instances in the last several crop years where vessels waiting to load grain in Vancouver have tied up all of the nearby anchorages, with the overflow then forced to moor further to the west along the coast of Vancouver Island.

21 Demurrage is charged when an ocean vessel remains in port for a period longer than that contracted with the shipper in the charter party agreement. Dispatch is paid when the contracted vessel loads and departs the port in less time than stated in the agreement.

Seaway were also more punitive, with increased demurrage costs and reduced dispatch earnings leading to a modest net cash inflow of $813,000, down 86.4% from the near $6.0 million earned a year earlier.

Loading Grain Vessels During Inclement Weather

To prevent spoilage, grain must be kept dry while it is being loaded into vessels. Since 2017 there has only been one practical option available to terminal operators to load during inclement weather, which is to load through feeder holes.[22] While feeder holes provide an option for continuing loading operations, the process is not without limitations. Setup and teardown procedures to ensure safe working conditions take from one to five hours, the loading rate is reduced to about 30-40% of normal, not all vessels have feeder holes, and not all terminals have loading setups conducive to reaching the feeder holes. With these limitations, operators have found that it is generally more efficient to wait until rain stops rather than mobilize for loading in the rain with feeder holes.

The 2022-23 crop year had 12% of time (1,067 hours) with precipitation recorded at the Vancouver Harbour Climate Station.[23] This is the upper limit of how long terminals were potentially unable to load due to inclement weather during the crop year. It may be the case that a terminal is not ready to load due to vessel-related or grain-supply-related issues, and therefore inclement weather causes no lost productivity, nor will fair weather increase it.

The GHTS is a large supply chain with many factors independent of current local weather, that influence day-to-day operations at the Port of Vancouver. Vacillations within all components of the supply chain contribute to a high level of variability regardless of the volume or duration of rainfall.

The process for unloading railcars is not subject to the same challenges as vessel loading since it is done in enclosed sheds. Thus, it is not expected that inclement weather directly affects the terminal operator's ability to unload railcars. On occasions when the inability to load vessels has created terminal congestion, spotting additional cars at the terminal may be delayed. Analysis of rainfall and unloads on the same day, and offset up to three days, concluded that there is no significant effect of precipitation on the amount of grain unloaded from railcars.

There is ample testimony from grain companies and railways that inclement weather disrupts vessel loading, but only in rare circumstances, does it lead to car spotting being deferred.

SYSTEM PERFORMANCE
[See TABLE 5E-1]

Overall GHTS performance can most readily be gauged by the amount of time taken by grain in moving through the system. For the 2022-23 crop year, it took an average of 40.4 days for grain to move from the Prairies to export positions within Western Canada, a 34.4% decrease from the 61.6-day average posted a year earlier. This average ranked as the lowest yet recorded under the GMP, and 40.7% below the 68.1-day average first benchmarked in the base year.

The 2022-23 crop year's 21.2-day improvement stemmed from reductions in all three of its constituent elements. The most significant gain came from a 36.8% reduction in country-elevator storage time, which fell to an average of 24.2 days from 38.3 days a year earlier. This was paired with a 36.4% decrease in terminal-elevator storage time, which declined to an average of 10.5 days from 16.5 days. Supporting both was a 16.4% reduction in the railways' loaded transit time, which fell to an average of 5.7 days from 6.8 days. These improvements reflected what proved to be a less problematic year for the GHTS.

With the total grain supply having risen to 79.2 million tonnes from the previous crop year's drought-ravaged 57.4 million tonnes, it was apparent that the GHTS would be required to handle a near-normal volume. From the outset, however, grain entering the country elevator system proved to be about one-sixth less than what had been handled the previous August.

22 Feeder holes are built into vessel hatches and provide an access point that protects the grain from precipitation during loading.

23 Environment and Climate Change Canada Station Id 888

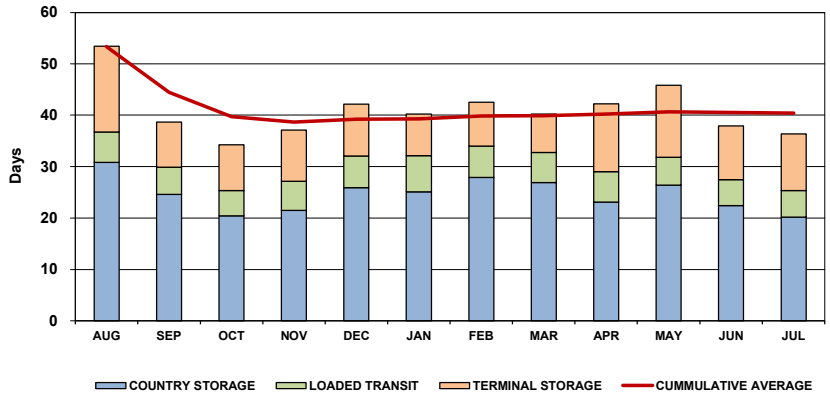
Despite the slow start, monthly throughput built up quickly. This increase foreshadowed what would be a decidedly heavier workload, with weekly grain deliveries proving substantially above 2021-22 crop year levels. Ultimately, Western Canadian producers delivered an estimated 61.1 million tonnes of grain into the GHTS, 43.6% more than in the previous crop year.

With much of the railways' combined hopper-car fleet having already been placed in storage, just over half were initially pressed into active service at the outset of the 2022-23 crop year. However, this percentage rose rapidly, surpassing 82% in September to reach a height of nearly 98% in November. Coupled with better crew and locomotive availability, this suggested that the railways had deployed significantly more carrying capacity to deal with the larger crop. The effects were visible in noticeably lower average car cycles on movements within Western Canada, which fell progressively from 20.4 days in July 2022 to a low of 12.1 days in October. Moreover, the average for the 2022-23 crop year declined by 21.5%, to 14.0 days from 17.8 days a year earlier. This denoted the lowest average observed since the 2015-16 crop year.

The improvement in such metrics is amplified by comparisons with the abnormal results posted in the previous crop year, which were adversely impacted not only by a drought on the Prairies, but the catastrophic flooding in British Columbia that wrought unprecedented damage to the transportation infrastructure serving Vancouver. These disastrous events distort some of the very real performance gains made by the GHTS in the 2022-23 crop year.

To fairly gauge these improvements, it is necessary to reach back somewhat further in time. Comparisons to either the 2019-20 or 2020-21 crop years provide better insight into the performance gains made in the 2022-23 crop year. To be sure, little of the time spent by grain in storage, be it at country elevators or port terminals, showed much in the way of change. In fact, the corresponding 24.2-day and 10.5-day averages for the 2022-23 crop year proved to be consistent with those posted two and three years earlier. What did show improvement was the amount of time grain spent in transit with the railways, which declined progressively from an average of 7.4 days in the 2019-20 crop year to 5.7 days three years later.

Time in the System



This 1.7-day, or 23.0%, reduction proved to be the key driver in drawing down the average time spent by grain in the system to a new record low.

Even so, it does not constitute the lowest value posted by the railways under the GMP. That came in the 2015-16 crop year, when the loaded-transit-time average reached a low of 4.8 days. But it does reflect a concerted effort by the railways to improve their service offering. Mention was made earlier of the economic and operational benefits inherent in moving the growing number of unit trains coming from new loop-track-equipped elevators. These train movements have had a perceptible impact on the railways' loaded-transit times and overall car cycles. But their operation has also been undermined by the railways' efforts to run still longer trains.

The philosophical underpinnings that give rise to such practices are deeply ingrained within the railway industry but have also received more critical scrutiny in recent years. Even as the foremost practitioner of running longer trains in Canada, CN reassessed its usage. Following the appointment of a new president in February 2022, the railway largely shed the strategy of holding back traffic simply to build longer trains. This does not mean that CN abandoned the idea of running 12,000-foot trains

altogether. Rather, it refocused its efforts on running trains reliably and on time. The carrier also brought on some 1,700 new employees to replace those lost through earlier job cuts. Since making these changes, CN has reportedly lifted its on-time departure rate to 90% and improved its car velocity by as much as 20%.[24] Moreover, it began reducing the longer car cycles that had prevailed for several years.

The downstream effects of more consistent railway service have been equally pronounced. With a more reliable inflow of grain to the ports, terminals stocks remained largely stable and sufficient to meet the prevailing demand of arriving vessels. Moreover, vessels began spending less time in port, with the posted annual average for the 2022-23 crop year falling to 9.8 days from 12.3 days three years earlier.

These improvements were widely acknowledged by grain shippers, who applauded the railway industry's willingness to deploy the resources required to provide for better service. Nevertheless, they remained concerned that service levels could just as easily be reversed in the face of future changes in railway leadership and management practices.

Mindful of this, many remained steadfastly supportive of the measures they deemed necessary to safeguard shippers' rights, such as the reintroduction of extended interswitching. More broadly, they support a wider suite of measures that includes the prioritization of shipper needs, the use of monetary penalties to address railway service failures, simplified dispute-resolution mechanisms, enhanced railway-performance metrics, and an expansion to the investigatory powers of the Canadian Transportation Agency.

Days Spent Moving Through the GHTS Supply Chain

FARM OPERATIONS

COUNTRY ELEVATOR STORAGE TIME

RAILWAY LOADED TRANSIT TIME

TERMINAL ELEVATOR STORAGE TIME

MARINE OPERATIONS

				TOTAL	NET CHANGE
1999-00	41.7	7.8	18.6	68.1	
2019-20	23.7	7.4	10.7	41.8	-40.7%
2020-21	25.4	7.0	9.8	42.2	
2021-22	38.3	6.8	16.5	61.6	
2022-23	24.2	5.7	10.5	40.4	

24 Castaldo, Joe. "Newcomer of the Year: How Tracy Robinson got CN Rail back on track." The Globe and Mail, 22 November 2023.

Section 6: Producer Impact

Indicator Description	Table	1999-00	2020-21	2021-22	2022-23 Q1	Q2	Q3	Q4	YTD	% VAR
Export Basis										
1CWRS Wheat ($ per tonne) – Original Methodology	6A-10A	$54.58	n/a	n/a						
1CWRS Wheat ($ per tonne) – Revised Methodology (1)	6A-10A	n/a	$101.43	$97.19					$78.89	-18.8%
1CWA Durum ($ per tonne) – Original Methodology	6A-10B	$67.63	n/a	n/a						
1CWA Durum ($ per tonne) – Revised Methodology (1)	6A-10B	n/a	$105.97	$161.87					$120.61	-25.5%
1 Canada Canola ($ per tonne)	6A-10C	$52.51	$54.75	$68.45					$61.71	-9.8%
Canadian Large Yellow Peas – No. 2 or Better ($ per tonne)	6A-10D	$54.76	$39.08	$82.64					$69.57	-15.8%
Producer Cars										
Producer-Car-Loading Sites (number) – Class 1 Carriers	6B-1	416	142	142	142	142	142	142	142	0.0%
Producer-Car-Loading Sites (number) – Class 2 and 3 Carriers	6B-1	122	130	130	130	130	130	130	130	0.0%
Producer-Car-Loading Sites (number) – All Carriers	6B-1	538	272	272	272	272	272	272	272	0.0%
Producer-Cars Scheduled (number) – Covered Hopper Cars	6B-2	3,441	2,734	1,113	440	751	475	288	1,954	75.6%

(1) The methodology used to calculate the export basis in the 2012-13 through 2022-23 crop years does not allow for direct comparison with those of previous crop years.

DISCUSSION AND ANALYSIS

CALCULATION OF THE EXPORT BASIS

One of the GMP's principal objectives involves gauging the logistics cost associated with moving prairie grain to market – commonly referred to as the "export basis" – along with the resultant "netback" earned by producers after subtracting these costs from a grain's sale price. Both the export basis and the producer netback are location-specific calculations that include provisions for the elevation, cleaning, storage and transportation costs tied to the handling of grain.

There are well over 1,000 distinct origin-destination pairs that arise from tying together the hundreds of grain-delivery points scattered across the prairies with the four principal export gateways in Western Canada. Moreover, given the number of differing grains, grain grades, grain company service charges, and freight rates, the permutations inherent in calculating the export basis and netback of individual producers takes on extraordinary dimensions.

The only practical means of addressing these calculations rests in standardizing the estimates around a representative sample of grains, and grain stations. As a result, the GMP consciously limits its estimations to four specific grains: wheat; durum; canola; and peas.[25] The export basis and producer netback for each commodity is then calculated for each of the 43 grain stations in the sample. These location-specific calculations are then clustered to portray the averages for nine geographic areas, comprised of four to six grain stations each, namely: Manitoba East; Manitoba West; Saskatchewan Northeast; Saskatchewan Northwest; Saskatchewan Southeast; Saskatchewan Southwest; Alberta North; Alberta South; and Peace River.

Components of the Calculation

It is important to remember that every individual producer's cost structure differs. As a result, no general calculation can be expected to precisely depict the export basis and netback that is specific to each farmer. The methodology employed here is intended to typify the general case within each of the nine geographic areas identified. Caution, therefore, must be exercised in any comparison between the general values presented, and those arising to individual producers within each of these areas. The specific assumptions employed in these determinations are delineated in the table that follows. The reader is encouraged to consider these before drawing any specific conclusions from the calculations presented.

25 In addition to the grains themselves, the GMP also specified the grades to be used, namely: 1 CWRS Wheat; 1 CWA Durum; 1 Canada Canola; and Canadian Large Yellow Peas (No. 2 or Better).

ELEMENT	WHEAT AND DURUM	CANOLA AND YELLOW PEAS
Grain Price	The price for 1 Canada Western Red Spring Wheat and 1 Canada Western Amber Durum are tonnage-based weighted averages of the West Coast export quotation from Canadian Grain Exporters and the St. Lawrence export quotation from the International Grains Council (ICG), as reported by AAFC.	As of the 2015-16 crop year, the price for 1 Canada Canola is represented by the Track Vancouver Cash price (as reported by AAFC). For all previous crop years, the price for 1 Canada Canola was the weighted average Vancouver cash price provided by ICE Futures Canada. The weights used reflect monthly exports as recorded by the Canadian Grain Commission (CGC). The price for Canadian Large Yellow Peas is based on the average weekly dealer closing price, track Vancouver, reported by Stat Publishing for the months of October and November.[1]
Trucking Costs	The trucking costs are based on the commercial short-haul trucking rates for an average haul of 40 miles as presented in Table 4A-1. Although current data is unavailable, the last published value is still employed for the purpose of continuity.	The trucking costs are based on the commercial short-haul trucking rates for an average haul of 40 miles as presented in Table 4A-1. Although current data is unavailable, the last published value is still employed for the purpose of continuity.
Price Differential	A price differential – or spread – is used to estimate certain costs for 1 Canada Western Red Spring Wheat and 1 Canada Western Amber Durum. For the 2012-13 through 2014-15 crop years this spread was based on the difference between the weighted average of the West Coast and St. Lawrence export quotations and the average Saskatchewan producer spot price (both reported by AAFC). However, the average Saskatchewan producer spot price encompassed all grades and, therefore, provided an imperfect comparison to the export quotations. As of the 2015-16 crop year the latter element in this comparison was altered, with it now being made against an average of the daily bid prices within each region as reported by PDQ.[2] Readers should consider this when attempting to draw conclusions from the data.	A price differential – or spread – is used to estimate certain costs for 1 Canada Canola. Prior to the 2015-16 crop year this spread was based on the difference between the weighted Vancouver cash price and the weighted average spot price in each of the nine regions as reported by ICE Futures Canada. For 2015-16 to 2019-20 crop years this was replaced by a differential based on the Track Vancouver Cash Price (as reported by AAFC) and the average of the daily bid prices within each region reported by PDQ.[2] As of 2020-21, the spread is the differential between the Par Region Cash Price and the Track Vancouver Cash Price (as reported by AAFC). For yellow peas, a price differential is calculated using the average weekly dealer closing price, track Vancouver, and the average weekly grower bid closing price for the months of October and November. These differentials effectively represent the incorporated per-tonne cost of freight, elevation, storage and any other ancillary elements. As such, it encompasses a large portion of the Export Basis.
Grower Association Deductions	Elevator deliveries of wheat and durum are subject to various per-tonne "check-offs" in order to fund variety research, market development and technical support to the industry. The check-offs are administered by the appropriate provincial wheat commission.	Elevator deliveries of canola and peas are subject to various per-tonne "check-offs" in order to fund variety research, market development and technical support to the industry. The check-offs are administered by the appropriate provincial canola and pulse-grower association.
Trucking Premiums	Grain companies report on the trucking premiums they pay to producers at each of the facilities identified in the sampling methodology.[3] The amounts depicted reflect the average per-tonne value of all premiums paid for the designated grade of wheat or durum within the reporting area. In the post-monopoly environment, grain companies have increased the use of their basis (the spread between their cash and the nearby futures price) as the mechanism to attract producer deliveries. This has been accompanied by a significant decline in the use of trucking premiums.	Grain companies report on the trucking premiums they pay to producers at each of the facilities identified in the sampling methodology.[3] The amounts depicted reflect the average per-tonne value of all premiums paid for the designated grade of canola or yellow peas within the reporting area. Grain companies primarily use their basis (the spread between their cash and the nearby futures price) as the mechanism to attract producer deliveries. This practice results in relatively little use of trucking premiums.
Other Deductions	Other deductions, such as drying charges, GST on services, etc., may also be applied to, and appear as an itemized entry on the cash ticket of, any grain delivery. No attempt is made to capture these deductions within the framework employed here.	Other deductions, such as drying charges, GST on services, etc., may also be applied to, and appear as an itemized entry on the cash ticket of, any grain delivery. No attempt is made to capture these deductions within the framework employed here.

1) – Data provided by Stat Publishing. Using a "snapshot" period of two months during the fall, when pricing of the new crop is relatively heavy, was deemed to be an appropriate representation of producer prices, thereby avoiding the need to incorporate a weighting factor.
2) – PDQ (Price, Data, Quotes) is a web-based information service operated by the Alberta Wheat Commission which publishes cash grain market price and related statistical data (www.pdqinfo.ca).
3) – Various terms are used by grain companies to describe the premiums they offer to producers in an effort to attract deliveries to their facilities – i.e., trucking premiums, marketing premiums, and location premiums. The most common term, however, remains "trucking premium," and it is utilized generically in the calculation of the Export Basis.

WHEAT AND DURUM
[See TABLES 6A-1A through 6A-10B]

In its earlier reports, the Monitor described how higher prices have generally been responsible for any improvement in the per-tonne returns accruing to producers of wheat and durum. In comparison, reductions in the export basis have proven to be secondary. Whether it be price or the export basis, their periodic rise and fall have been the prime determinants in the financial returns for producers.

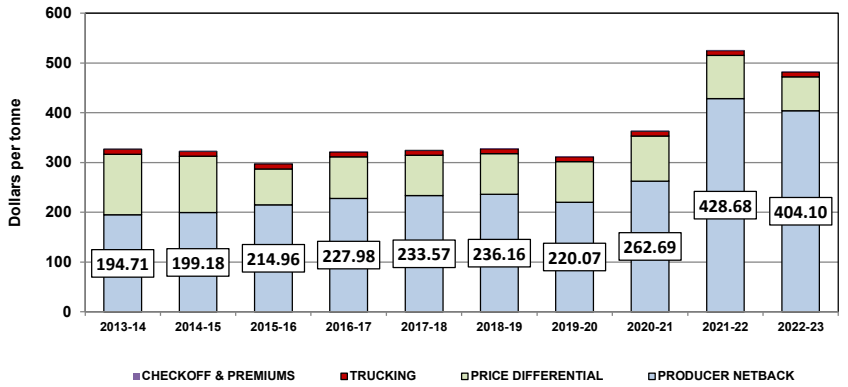
The 2022-23 crop year brought a general easing in commodity prices. Much of the decline was attributable to a better grasp of the commercial impacts stemming from Russia's invasion of Ukraine in February 2022, which had initially stoked fears over global grain supplies and sent commodity prices sharply higher. This set the stage for a broad decline in the market price of most field crops as the crop year got under way. A substantial rebound in Canadian crop production, which rivaled some of the better harvests witnessed during the past decade, brought still further downward pressure on market prices. Inflationary fears along with the failure of two regional US banks and the near collapse of Credit Swiss also had a dampening influence on commodity markets early in 2023.

1CWRS Wheat
[See Tables 6A-1A through 6A-10A]

The financial return to farmers of 1CWRS wheat amounted to an estimated $404.10 per tonne in the 2022-23 crop year. This represented a 5.7% reduction from the $428.68 estimated a year earlier. Much of the decrease was attributable to a decline in the average price, which is constructed around a tonnage-based weighted average export quotation for 1CWRS wheat (13.5% protein), and which fell by 8.2%, to $482.99 per tonne from $525.87 per tonne a year earlier.

The decrease in the average price of wheat reflected the effects of various global forces. The most significant of these involved the resumption of wheat exports from the Black Sea region, which had been disrupted following the outbreak of war between Russia and Ukraine in early 2022. The establishment of a safe-shipping corridor through the conflict zone, coupled with a large Russian harvest, alleviated much of the supply

Producer Netback - 1CWRS Wheat



pressure that had lifted global wheat prices to record levels. Adding to this was the speculative power of the futures market, where short-selling exerted further downward pressure on prices.

The $42.88-per-tonne decrease in wheat prices was partially offset by an $18.30-per-tonne decrease in the export basis, which fell by 18.8%, to $78.89 per tonne from $97.19 per tonne a year earlier. Virtually all of the decrease was attributable to a narrowing of the price differential – or spread – between the export quotation and the elevator spot price, which fell 21.2%, to $68.10 per tonne from $86.42 per tonne a year earlier. In effect, the price differential includes applicable freight, handling, cleaning, storage, weighing and inspection charges, as well as an opportunity cost or risk premium. With trucking charges and check-offs remaining unchanged at $9.82 per tonne and $1.03 per tonne respectively, a comparatively marginal reduction in trucking premiums, which fell to $0.06 per tonne from $0.08 per tonne a year earlier, was the only cost element to rise in the export basis.

1CWA Durum
[*See Tables 6A-1B through 6A-10B*]

The financial return to farmers of 1CWA durum amounted to an estimated $441.31 per tonne in the 2022-23 crop year. This represented 28.9% less than the $620.71 per tonne reported in the 2021-22 crop year. The decline was driven primarily by lower durum prices, which fell to an average of $561.92 per tonne, 28.2% below the $782.58-per-tonne average recorded a year earlier.

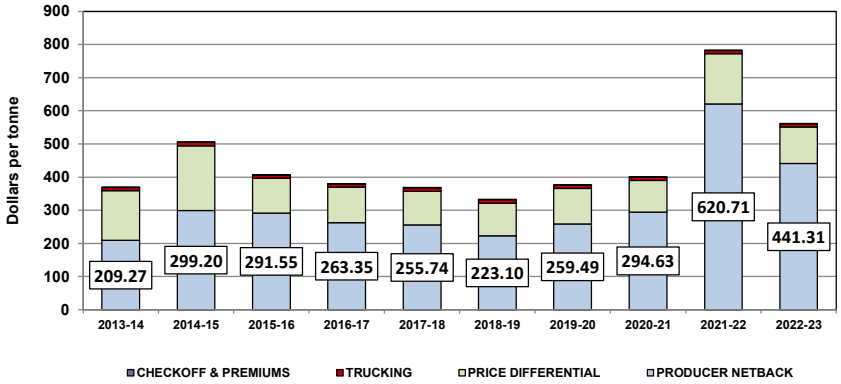
Owing to its prominent role in the global durum trade, a near doubling of Canadian production following the 2021 drought led to a dramatic decline in prices. This was complemented by a near doubling of US production as well. Nevertheless, the demand for Canadian durum remained strong due to production problems in several major consuming countries. Despite dry conditions and lower production in the European Union and North Africa, the large price premiums seen in the previous crop year largely disappeared.

The price decline was softened by a 25.5% decrease in the export basis, which fell to $120.61 per tonne from $161.87 per tonne a year earlier. Virtually all of this $41.26 reduction was attributable to a $41.21 decrease in the price differential, which fell to $109.87 per tonne from $151.08 per tonne the year before. As outlined with respect to 1CWRS wheat, the $9.82-per-tonne trucking cost did not change in the 2022-23 crop year, so did not factor into the decline of the producer netback. Nor did an unchanged check-off charge of $1.03 per tonne. However, a $0.05-per-tonne increase in trucking premiums marginally cushioned the fall in the producer netback.

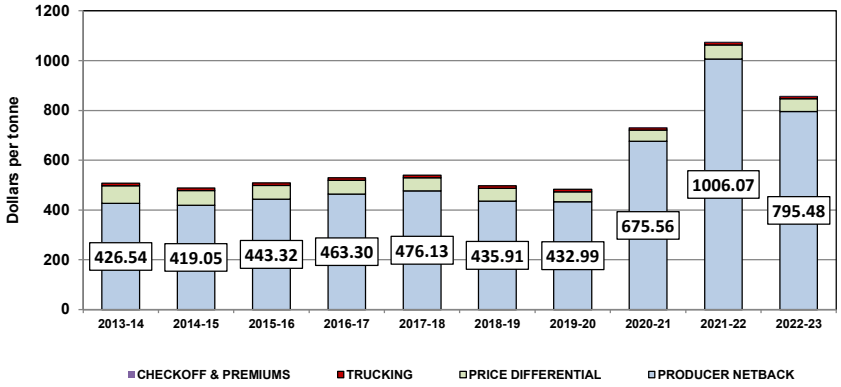
CANOLA AND YELLOW PEAS
[See TABLES 6A-1C through 6A-10D]

Like wheat and durum, the data used in calculating the financial return to producers of canola and large yellow peas shows that they have also been heavily influenced by the prevailing prices for these commodities. While the export basis has also risen over time, it has proven to have far less sway over these returns.

Producer Netback - 1CWA Durum



Producer Netback - 1 Canada Canola



1 Canada Canola
[See Tables 6A-1C through 6A-10C]

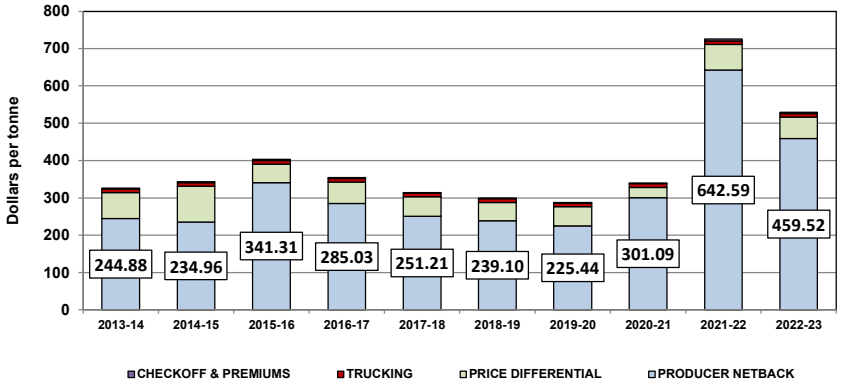
The netback to producers of 1 Canada canola decreased sharply in the 2022-23 crop year, falling to $795.48 per tonne from $1,006.07 per tonne a year earlier. This result was driven by significantly lower canola prices, with the average Vancouver cash price slumping 20.2%, to $857.19 per tonne from $1,074.52 per tonne.

The price decrease was the result of multiple factors, not the least of which involved the huge canola crops harvested in Russia, the United States, and Australia. Moreover, Canada had lost market share because of the previous year's drought, with Australia displacing its role in traditional export markets like Japan. Even so, China proved a ready alternative, buying nearly 60% of Canada's exports. In the absence of such alternate markets, prices may well have declined still further. Expectations of a record Brazilian soybean crop also put downward pressure on oilseed prices, despite the dry conditions that limited Argentinian production. European rapeseed prices declined later in the year on the expectation of a huge EU crop as well as a large increase in imported biodiesel made from waste cooking oil and animal fat, all of which pulled canola prices lower.

Canola prices also lost ground against soybeans as the price of meal pushed higher, although domestic crush margins remained very good throughout the year. The price of meal has a greater impact on soybeans due to the larger volume of meal produced in the crushing process. By comparison, canola prices weakened due to its larger oil content.

The decline was dulled by a 9.8% decrease in the export basis, which fell to an average of $61.71 per tonne from $68.45 per tonne a year earlier. As observed with wheat and durum, virtually all the decrease was tied to a change in the price differential, which fell to $51.02 per tonne from $57.83 per tonne a year earlier. The costs derived from trucking and the payment of a check-off did not change in the 2022-23 crop year, so did not contribute to the variance in the producer netback. These were estimated at $9.82 per tonne and $0.92 per tonne respectively. However, a $0.07-per-tonne decrease in the trucking premiums paid to producers served to marginally raise the export basis.

Producer Netback - Large Yellow Peas



Large Yellow Peas
[See Tables 6A-1D through 6A-10D]

The visible netback to producers of large yellow peas has proven the most erratic of the four commodities monitored under the GMP. Producers experienced a 28.5% decrease in these returns during the 2022-23 crop year, which fell to $459.52 per tonne from $642.59 per tonne a year earlier. Much of this decline was attributable to a weaker demand from China, which still bought more than 60% of Canada's exports. Competition from Russian pea sales following a large harvest and a strengthening of its relationship with China contributed to the downward pressure on price. A 50% increase in carry-out stocks also contributed to the softening of prices. As a result, the dealer's closing price decreased by 27.0%, to $529.09 per tonne from $725.23 per tonne.

The export basis for large yellow peas declined by 15.8% in the 2022-23 crop year, to $69.57 per tonne from $82.64 per tonne a year earlier. As with other commodities, much of the decrease was rooted in a lower price differential, which stands in for the cost of freight as well as other handling activities, and which fell by 17.3%, to $56.61 per tonne from $68.44 per tonne. This was supported by a $1.23-per-tonne decrease in Pulse Growers

Association fees. No impact on the export basis was derived from changes in trucking costs. However, trucking premiums rose by $0.01 per tonne to marginally shave these costs.

PRODUCER CARS
[See TABLES 6B-1 through 6B-2]

Producer-car loading increased substantially through the first decade of the GMP. This was due in large measure to the advent of modern producer-car loading groups that invested significantly in fixed trackside storage and carloading facilities. Some even went so far as to purchase the branch lines then being abandoned by CN or CPKC to establish shortline railways that became integral elements in their broader grain-handling operations. Ultimately, their aim was to safeguard a cost-competitive alternative for producers in moving their grain to market.

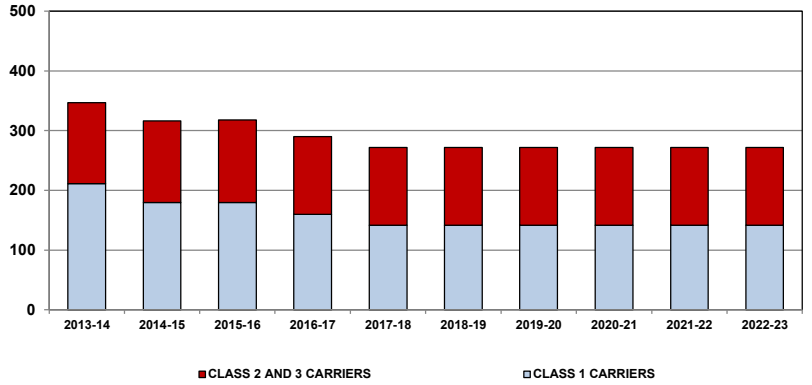
Loading Sites
[See Table 6B-1]

The number of producer-car loading sites situated across Western Canada has declined significantly from the 710 first benchmarked at the beginning of the GMP. However, after having been culled by a factor of nearly 60%, the decline effectively came to an end in the 2017-18 crop year. The 2022-23 crop year marked the sixth consecutive year in which the overall number of producer-car loading sites remained unchanged at 272, with Class 1 carriers operating 142, while Class 2 and 3 carriers operated 130.

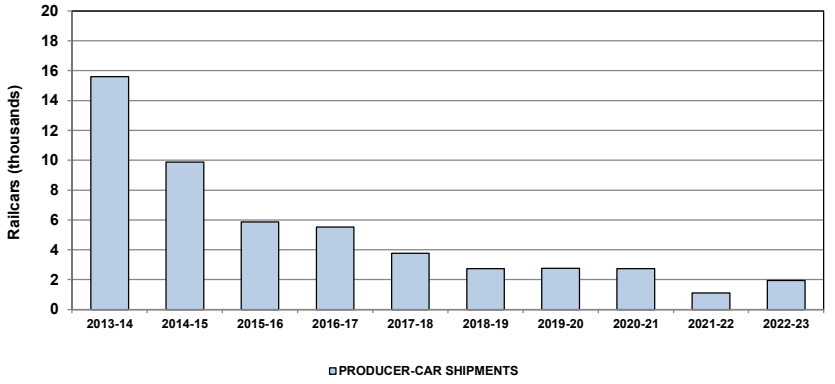
Producer-Car Shipments
[See Table 6B-2]

Scheduled producer-car shipments increased by 75.6% in the 2022-23 crop year, to 1,954 cars from 1,113 a year earlier. Despite the rebound in volume, these shipments fell short of their pre-drought levels. Moreover, they stood 87.5% below the 15,603-car high reached in the 2013-14 crop year. Much of this decline reflects the realities of today's competitive environment, where the limited financial reward of the producer-loading option is often outweighed by its broader commercial risks. Simply stated, few producers feel that it is worth the trouble. Still, what remains has largely been refocused on serving the American market for select grains,

Producer-Car Loading Sites



Producer-Car Shipments



with about two-thirds of total producer-car shipments now being directed into the United States.

Equally noteworthy is the attendant shift in the mix of commodities handled. Until the 2009-10 crop year, wheat, durum, and barley were dominant, representing virtually all the traffic moved. But the proportion accorded to oilseeds and other commodities soon began to climb. By the close of the 2018-19 crop year the share given over to wheat, durum and barley shipments had fallen to an estimated 24.6%, while oilseeds and other commodities commanded a 75.4% share.

However, the last four crop years have witnessed a modest recovery in the proportion given over to major cereal-grain shipments, with the 2022-23 crop year producing a 45.0% share, up sharply from the 34.6% estimated a year earlier. Conversely, shipments of oilseeds, special crops and oats slipped to a 55.0% share, down from the 65.4% claimed the previous year. Even so, this marked the eighth consecutive crop year in which the shipment of these latter commodities displaced those of wheat, durum, and barley.

Appendix 1: Program Background

The Government of Canada selected Quorum Corporation to serve as the Monitor of Canada's Grain Handling and Transportation System (GHTS) in June 2001. Under this mandate, Quorum Corporation provides the government with a series of regular reports relating to the system's overall performance, as well as the effects of the various policy reforms enacted by the government since 2000.

In a larger sense, these reforms were expected to alter the commercial relations that have traditionally existed between the primary participants in the GHTS: producers; the former Canadian Wheat Board; grain companies; railway companies; and port terminal operators. Using a broad series of indicators, the government's Grain Monitoring Program (GMP) was designed to measure the performance of the GHTS as this evolution unfolded. Moreover, these indicators are intended to reveal whether grain is moving through the supply chain with greater efficiency and reliability.

To this end, the GMP provides for a number of specific performance indicators grouped under six broad series, namely:

- Series 1 – Production and Supply: Measurements relating to grain production in western Canada. In addition to the major cereal grains, this also includes oilseeds and special crops.

- Series 2 – Traffic and Movement: Measurements focusing on the amount of grain moved by the western Canadian GHTS. This includes shipments from country elevators; by rail to western Canada, eastern Canada, the United States and Mexico; by vessel from terminal elevators at the four ports in western Canada; and by truck to the United States.

- Series 3 – Infrastructure: Measurements illustrating the makeup of the GHTS. These statistics include both the number and capacity of the country as well as terminal elevator systems, and the composition of the western Canadian railway network.

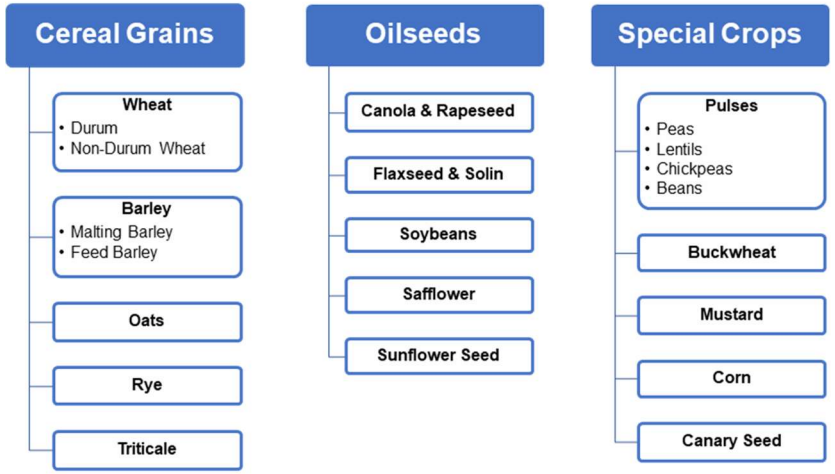
- Series 4 – Commercial Relations: Measurements relating to the rates applicable on various grain-handling and transportation services.

- Series 5 – System Efficiency and Performance: Measurements aimed at gauging the operational efficiency with which grain moves through the logistics chain.

- Series 6 – Producer Impact: Measurements designed to capture the value to producers from changes in the GHTS, and which are focused largely on the calculation of the "producers' netback."

Appendix 2: Commodity Guide

The following provides a high-level overview of the various commodities discussed in this report. The delineations made here are drawn from the Canadian Grain Commission's Official Grain Grading Guide Glossary.



Cereal Grains: Cereal grains are any grain or edible seed of the grass family which may be used as food.

Oilseeds: Oilseeds include flaxseed and solin, canola and rapeseed, soybeans, safflower and sunflower seed.

Canola: The term "canola" was trademarked in 1978 by the Western Canadian Oilseed Crushers' Association to differentiate the new superior low-erucic acid and low-glucosinolate varieties and their products from older rapeseed varieties.

Special Crops: Special crops are considered to be beans, buckwheat, chick peas, corn, fababeans, lentils, mustard, peas, safflower, soybeans, and sunflower.

Pulses: Pulses are crops grown for their edible seeds, such as peas, lentils, chick peas or beans.

Screenings: Screenings is dockage material that has been removed by cleaning from a parcel of grain.

Appendix 3: Acknowledgements

The scope of this review is far-reaching and could not have been completed without the assistance of the various stakeholders that submitted views on the detailed monitoring design and provided the data in support of the Grain Monitoring Program (GMP). Quorum Corporation would like to thank the following organizations, and more particularly the individuals within them, for the cooperation they have extended in our efforts to develop the GMP. We have come to appreciate not only their cooperation as suppliers of data under the program, but to value their assistance in helping to improve the GMP itself. We look forward to their continued input and cooperation.

Agricultural Producers Association of Saskatchewan
Agriculture and Agri-Food Canada
AGT Food and Ingredients
Alberta Agriculture and Irrigation
Alberta Federation of Agriculture
Alberta Grains
Alberta Transportation and Economic Corridors
Alliance Grain Terminal Ltd.
Archer Daniels Midland Co.
Battle River Railway
BC Chamber of Shipping
BC Maritime Employers Association
Boundary Trail Railway Company Inc.
Canada Grains Council
Canadian Canola Growers Association
Canadian Federation of Agriculture
Canadian Grain Commission
Canadian Maritime Chamber of Commerce
Canadian National Railway
Canadian Pacific Kansas City Limited
Canadian Ship Owners Association
Canadian Special Crops Association
Canadian Transportation Agency
Canadian Transportation Research Forum
Cando Contracting Ltd.
Canola Council of Canada
Cargill Limited
Cereals Canada
Ceres Global Ag Corp.
Chamber of Shipping of British Columbia
CMI Terminal Ltd.
Fibreco Export Inc.
Fraser Grain Terminal
G3 Canada Limited
Government of British Columbia
Grain Growers of Canada
GrainsConnect Canada
Great Western Railway Ltd.
Inland Terminal Association of Canada
Intercontinental Exchange / ICE
Keystone Agricultural Producers
Lake Line Railroad Inc.
Long Creek Railroad
Louis Dreyfus Canada Ltd.
Manitoba Agriculture
Manitoba Crop Alliance
Manitoba Transportation and Infrastructure
National Farmers Union
North West Terminal Ltd.
Northern Lights Rail
OmniTRAX Canada, Inc.
Parrish & Heimbecker Ltd.
Pacific Pilotage Authority
Paterson Grain
PKM Canada Marine Terminal Limited Partnership
Port of Churchill
Port of Hamilton
Port of Montreal
Port of Thunder Bay
Prairie Oat Growers Association
Prince Rupert Grain Ltd.
Prince Rupert Port Authority
Pulse Canada
Railway Association of Canada
Red Coat Road and Rail Ltd.
Richardson Pioneer Ltd.
St. Lawrence Seaway Management Corporation
Saskatchewan Agriculture
Saskatchewan Highways
Saskatchewan Association of Rural Municipalities
Saskatchewan Barley Development Commission
Saskatchewan Wheat Development Commission
South West Terminal
Statistics Canada
Stewart Southern Railway
The Scoular Company
Transport Canada
Vancouver Fraser Port Corporation
Viterra Inc.
Western Barley Growers Association
Western Canadian Short Line Railway Association
Western Canadian Wheat Growers Association
Western Grain Elevator Association