



Western Canadian Grain Handling and Transportation System

CHAMBER OF SHIPPING
BUSINESS OF SHIPPING CONFERENCE
VANCOUVER, BC
SEPTEMBER 9, 2024



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Grain Monitoring Program



- Performance Measures
 - Infrastructure, volume and performance metrics
 - Measures from farm to ocean vessel departure
 - Consolidated reporting, avoids commercial sensitivity
 - Suggests industry benchmarks
- 25-year time series providing ongoing assessment and analysis
- The Grain Monitor strives to retain a neutral and balanced position on issues
- Subscribe @ www.grainmonitor.ca

Grain Monitoring Program Weekly Performance Update

For Grain Week 44 2023-24 CY
May 27, 2024 to June 02, 2024

Summary

	Week 44	Week 43	Year to Date
1. Stocks in Store (000 tonnes)			
Country Elevators	2,240.0	1,971.7	+1%
% of Working Capacity	41%	38%	
Terminal Elevators	1,148.0	1,144.7	0%
% of Working Capacity	100%	99%	
2. Country Deliveries (000 tonnes)			
Country Deliveries	1,645.2	858.6	+42%
3. Port Performance (Cont)			
Vancouver Unloads	3,553	5,540	+29%
Prince Rupert Unloads	541	1,054	+37%
Churned Unloads	0	0	0%
Thunder Bay Unloads	1,287	1,770	+37%
Total Weekly Unloads	5,481	7,364	+31%
6-Week Rolling Average	7,890	8,796	+9%
Year to Date Rolling Average	-30%	-11%	+19%
YTD Unloads	134,002	130,405	+3%
Weekly Total of 100	1.7%	18.3%	+17.6%
4. Terminal Shipments Year-to-Date (000 tonnes)			
Vancouver	24,134.0	23,674.4	+2%
Prince Rupert	2,896.5	2,851.5	+2%
Churned	0.0	0.0	0%
Thunder Bay	4,610.4	5,965.5	-22%
Total Western Canada	31,640.9	32,591.4	-3%
5. Vessels at Port as of June 8, 2024			
Vessels at Port	13	11	+2%
Vessels Cleared	7	11	-4%
Vessels Arrived	0	0	0%
6. Vessels at Port as of June 10, 2024 to June 16, 2024 (Week 46)			
Vessels at Port	2	2	0%
Vessels Cleared	1	2	-50%
Vessels Arrived	1	2	-50%
Shipments	0	0	0%
Shipments	0	0	0%

Grain Monitoring Program Report for April 2024 / Q3 2023-24 CY

Release Date: May 29, 2023

GMP Dashboard

Table #	Item	APR 2024	2023-24	Year to Date
1	Total Grain in System	412	354	+17%
2	Grain in System	297	227	+31%
3	Grain in System	7.0	6.3	+11%
4	Grain in System	7.0	6.4	+10%
5	Grain in System	7.0	6.4	+10%
6	Grain in System	7.0	6.4	+10%
7	Grain in System	7.0	6.4	+10%
8	Grain in System	7.0	6.4	+10%
9	Grain in System	7.0	6.4	+10%
10	Grain in System	7.0	6.4	+10%
11	Grain in System	7.0	6.4	+10%
12	Grain in System	7.0	6.4	+10%
13	Grain in System	7.0	6.4	+10%
14	Grain in System	7.0	6.4	+10%
15	Grain in System	7.0	6.4	+10%
16	Grain in System	7.0	6.4	+10%
17	Grain in System	7.0	6.4	+10%
18	Grain in System	7.0	6.4	+10%
19	Grain in System	7.0	6.4	+10%
20	Grain in System	7.0	6.4	+10%
21	Grain in System	7.0	6.4	+10%
22	Grain in System	7.0	6.4	+10%
23	Grain in System	7.0	6.4	+10%
24	Grain in System	7.0	6.4	+10%
25	Grain in System	7.0	6.4	+10%
26	Grain in System	7.0	6.4	+10%
27	Grain in System	7.0	6.4	+10%
28	Grain in System	7.0	6.4	+10%
29	Grain in System	7.0	6.4	+10%
30	Grain in System	7.0	6.4	+10%
31	Grain in System	7.0	6.4	+10%
32	Grain in System	7.0	6.4	+10%
33	Grain in System	7.0	6.4	+10%
34	Grain in System	7.0	6.4	+10%
35	Grain in System	7.0	6.4	+10%
36	Grain in System	7.0	6.4	+10%
37	Grain in System	7.0	6.4	+10%
38	Grain in System	7.0	6.4	+10%
39	Grain in System	7.0	6.4	+10%
40	Grain in System	7.0	6.4	+10%
41	Grain in System	7.0	6.4	+10%
42	Grain in System	7.0	6.4	+10%
43	Grain in System	7.0	6.4	+10%
44	Grain in System	7.0	6.4	+10%
45	Grain in System	7.0	6.4	+10%
46	Grain in System	7.0	6.4	+10%
47	Grain in System	7.0	6.4	+10%
48	Grain in System	7.0	6.4	+10%
49	Grain in System	7.0	6.4	+10%
50	Grain in System	7.0	6.4	+10%
51	Grain in System	7.0	6.4	+10%
52	Grain in System	7.0	6.4	+10%
53	Grain in System	7.0	6.4	+10%
54	Grain in System	7.0	6.4	+10%
55	Grain in System	7.0	6.4	+10%
56	Grain in System	7.0	6.4	+10%
57	Grain in System	7.0	6.4	+10%
58	Grain in System	7.0	6.4	+10%
59	Grain in System	7.0	6.4	+10%
60	Grain in System	7.0	6.4	+10%
61	Grain in System	7.0	6.4	+10%
62	Grain in System	7.0	6.4	+10%
63	Grain in System	7.0	6.4	+10%
64	Grain in System	7.0	6.4	+10%
65	Grain in System	7.0	6.4	+10%
66	Grain in System	7.0	6.4	+10%
67	Grain in System	7.0	6.4	+10%
68	Grain in System	7.0	6.4	+10%
69	Grain in System	7.0	6.4	+10%
70	Grain in System	7.0	6.4	+10%
71	Grain in System	7.0	6.4	+10%
72	Grain in System	7.0	6.4	+10%
73	Grain in System	7.0	6.4	+10%
74	Grain in System	7.0	6.4	+10%
75	Grain in System	7.0	6.4	+10%
76	Grain in System	7.0	6.4	+10%
77	Grain in System	7.0	6.4	+10%
78	Grain in System	7.0	6.4	+10%
79	Grain in System	7.0	6.4	+10%
80	Grain in System	7.0	6.4	+10%
81	Grain in System	7.0	6.4	+10%
82	Grain in System	7.0	6.4	+10%
83	Grain in System	7.0	6.4	+10%
84	Grain in System	7.0	6.4	+10%
85	Grain in System	7.0	6.4	+10%
86	Grain in System	7.0	6.4	+10%
87	Grain in System	7.0	6.4	+10%
88	Grain in System	7.0	6.4	+10%
89	Grain in System	7.0	6.4	+10%
90	Grain in System	7.0	6.4	+10%
91	Grain in System	7.0	6.4	+10%
92	Grain in System	7.0	6.4	+10%
93	Grain in System	7.0	6.4	+10%
94	Grain in System	7.0	6.4	+10%
95	Grain in System	7.0	6.4	+10%
96	Grain in System	7.0	6.4	+10%
97	Grain in System	7.0	6.4	+10%
98	Grain in System	7.0	6.4	+10%
99	Grain in System	7.0	6.4	+10%
100	Grain in System	7.0	6.4	+10%

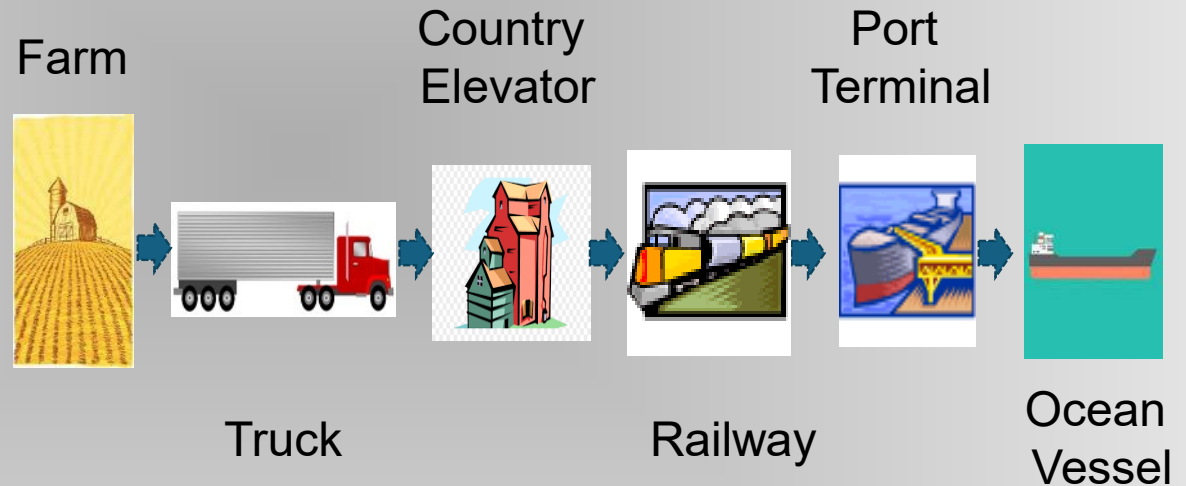
Highlights for April 2024 and Third Quarter 2023-24 CY

- **Stocks in Store (Page 2)**
 - Country elevators increased to 2.24 MMT in Week 44, up from 1.97 MMT in Week 43, a 14% increase. Stocks in primary elevators are 41% of the system's working capacity. Stocks in primary elevators are 38% of the system's working capacity.
 - Total western port terminal stocks increased to 1.15 MMT in Week 44, up from 0.86 MMT in Week 43, a 33% increase. Stocks in primary elevators are 1.02 MMT in Week 44.
- **Country Deliveries (Page 3)**
 - Deliveries to primary elevators were 1.65 MMT in Week 44.
- **Port Performance (Page 3)**
 - Total western port unloads were 5.48 MMT in Week 44, up from 7.36 MMT in Week 43, a 25% increase. Unloads in Vancouver were 3.55 MMT, up from 5.54 MMT in Week 43, a 36% increase. Unloads in Prince Rupert were 0.54 MMT, up from 1.05 MMT in Week 43, a 48% increase. Unloads in Thunder Bay were 1.29 MMT, up from 1.77 MMT in Week 43, a 27% increase. Unloads in Churned were 0 MMT, up from 0 MMT in Week 43, a 0% increase. The 6-week rolling average for western port unloads is 7.89 MMT, up from 8.79 MMT in Week 43, a 10% increase. The 6-week rolling average for western port unloads is 7.89 MMT, up from 8.79 MMT in Week 43, a 10% increase. The 6-week rolling average for western port unloads is 7.89 MMT, up from 8.79 MMT in Week 43, a 10% increase.
- **Shipments (Page 4)**
 - Year-to-date western Canadian shipments from port terminal elevators at Week 44 are 31.64 MMT, up from 32.59 MMT in Week 43, a 3% increase. Shipments from Vancouver were 24.13 MMT, up from 23.67 MMT in Week 43, a 2% increase. Shipments from Prince Rupert were 2.90 MMT, up from 2.85 MMT in Week 43, a 2% increase. Shipments from Thunder Bay were 4.61 MMT, down from 5.97 MMT in Week 43, a 22% decrease. Shipments from Churned were 0 MMT, up from 0 MMT in Week 43, a 0% increase.
- **Vessels (Page 5)**
 - Vancouver vessel trips for Week 45 2023-24 increased to 13, up from 11 in Week 44, a 18% increase. Prince Rupert vessel trips for Week 45 2023-24 increased to 2, up from 2 in Week 44, a 0% increase.

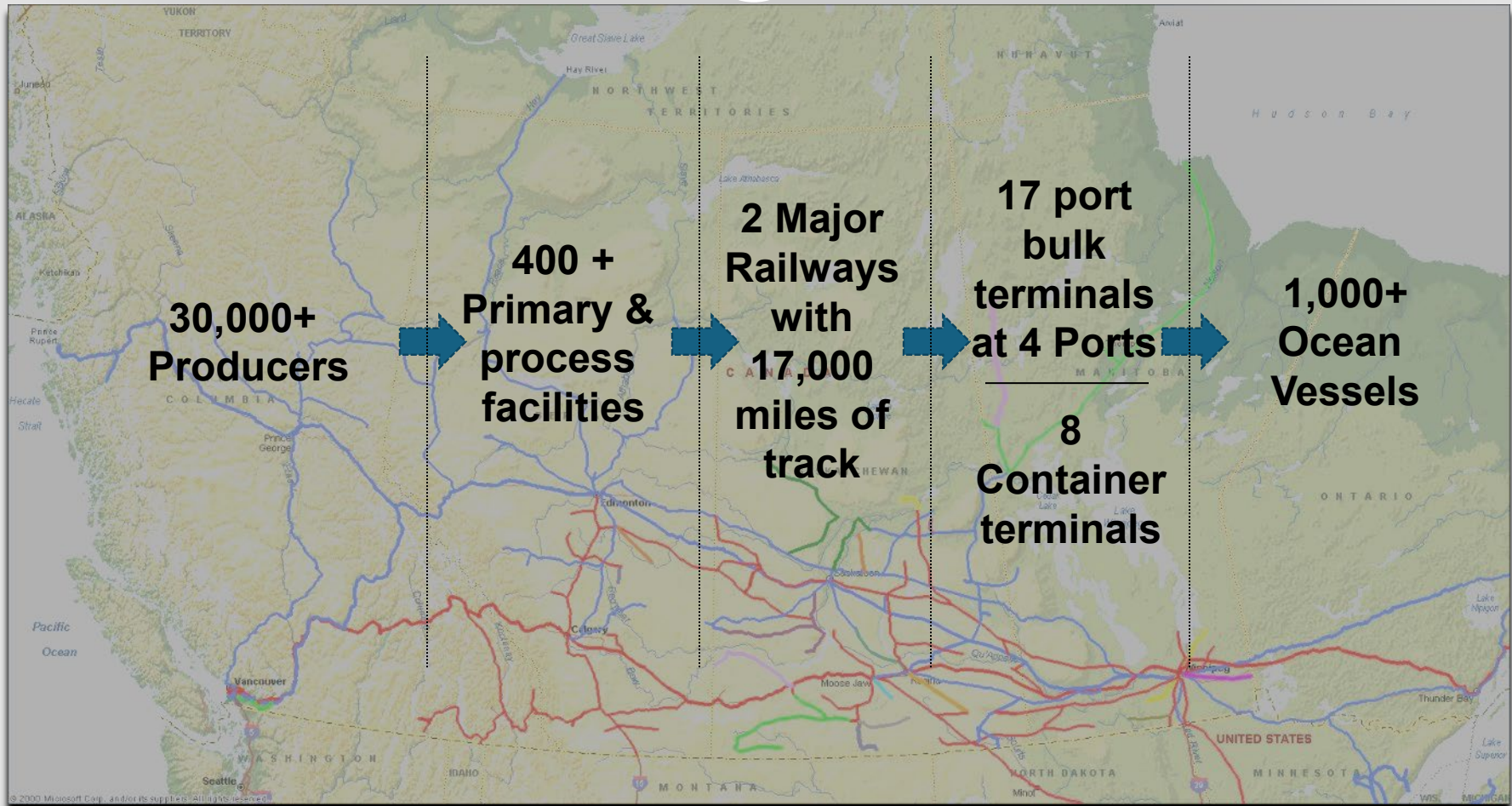


GHTS Overview

- Canada in Global Market
- Western Canadian Grain Supply
- Country Elevator Network
- Grain Movement
- Rail Capacity
- Port of Vancouver
- Climate Concerns
- Other Issues



The Canadian “Playing Field”



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Canadian Grain Logistics in the Global Market



Length of haul to port of export



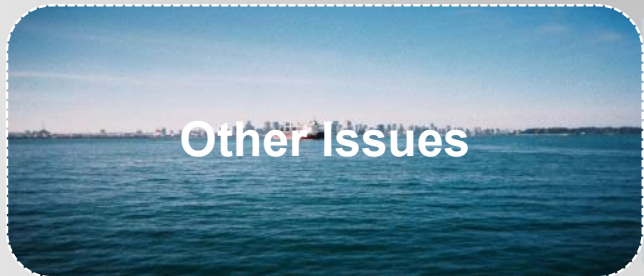
- Brazil: 100 – 150 miles (Truck 90% ++)
- Australia: 50 – 150 miles (Truck 50%/ Rail 50%)
- United States: 350-600 miles (Rail 60%+, Truck –Barge)
- Canada: 790 – 1,150 miles (Rail 95%, Truck 5%)

Agriculture dependency on Exports (% of Crop Exported)



- Brazil: 57% (163 M of 287 M)
- Australia: 23% (17 M of 74 M)
- United States: 20% (100 M of 500 M)
- Canada: 60% (62 M of 95 M)
- *Covers all field crops exported against total grains production*

Other Issues



- Climate
- Distance to market (ocean)
- Relative market position (size)

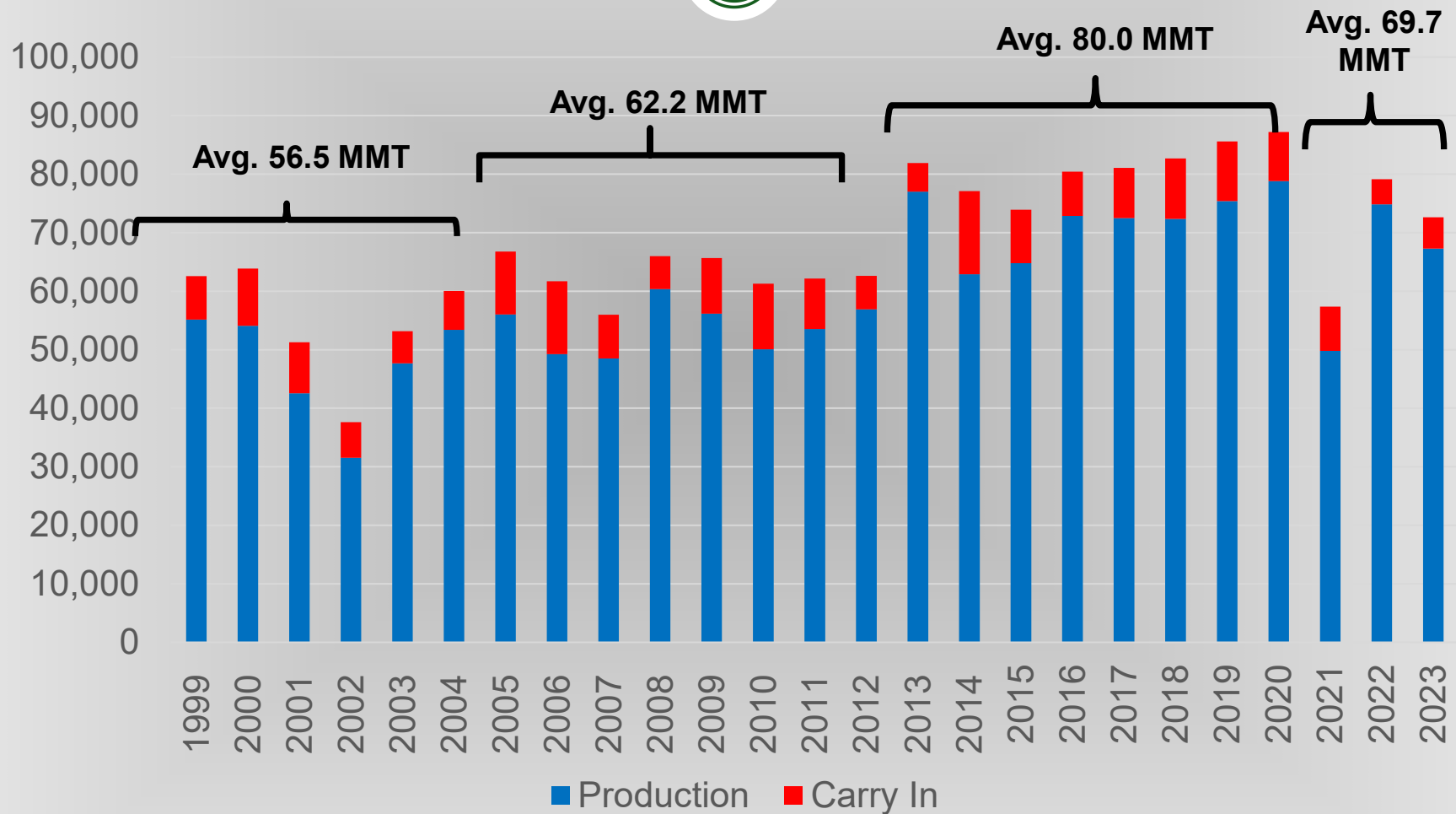


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Total Grain Supply

(Western Canada Production and Carry-In Stock MMT)



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Country Elevators

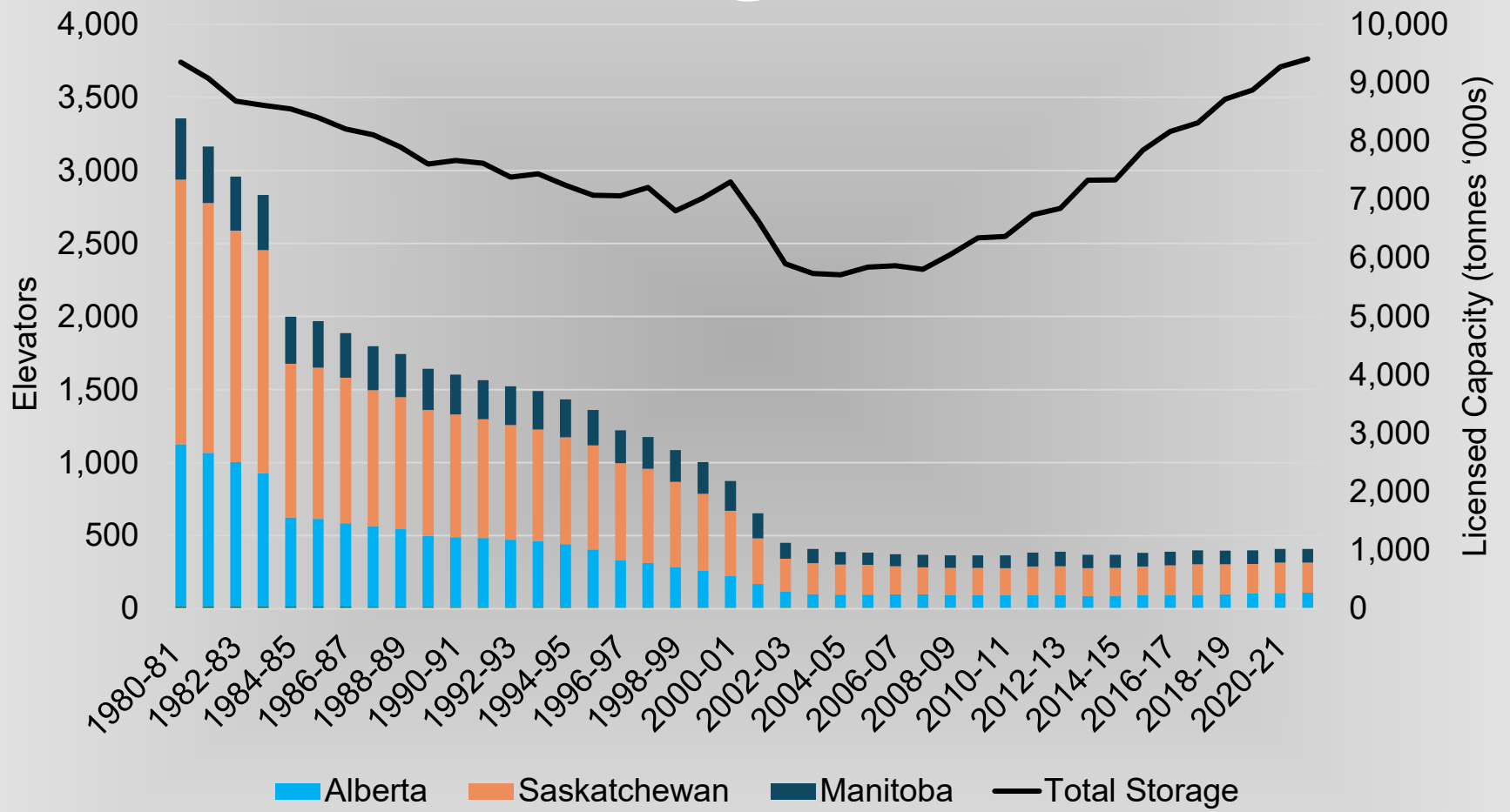
- 1980 had ~3300 elevators
- 1990 had ~1000 elevators
- 2024 had ~400 elevators
- First loop-track country elevator – Paterson Grain at Long Plain (Gleichen), AB opened in 2012
- July 2024 – 51 licensed loop-track facilities



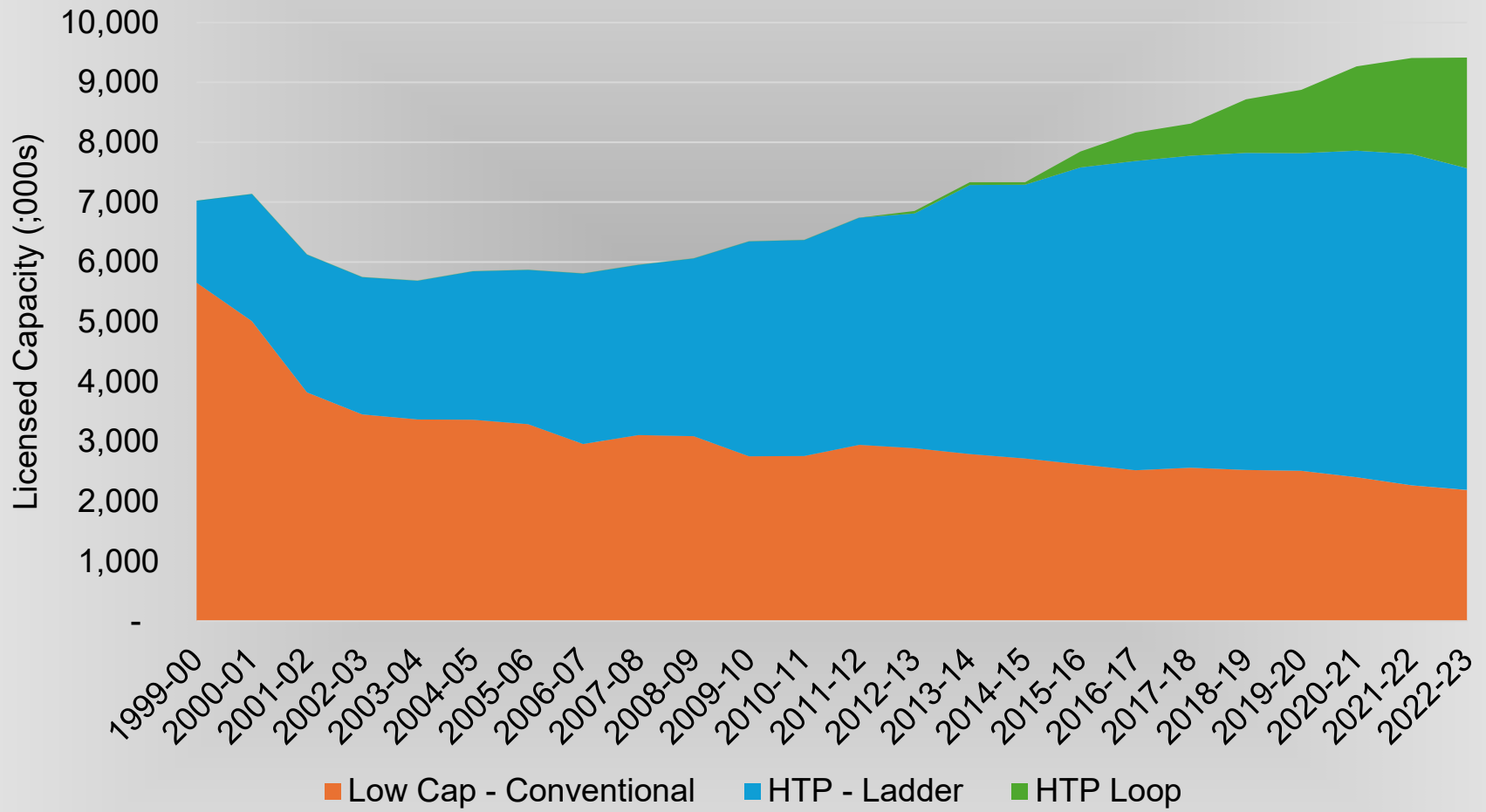
Paterson Grain @ Bowden, AB



Rationalization of the Country Network



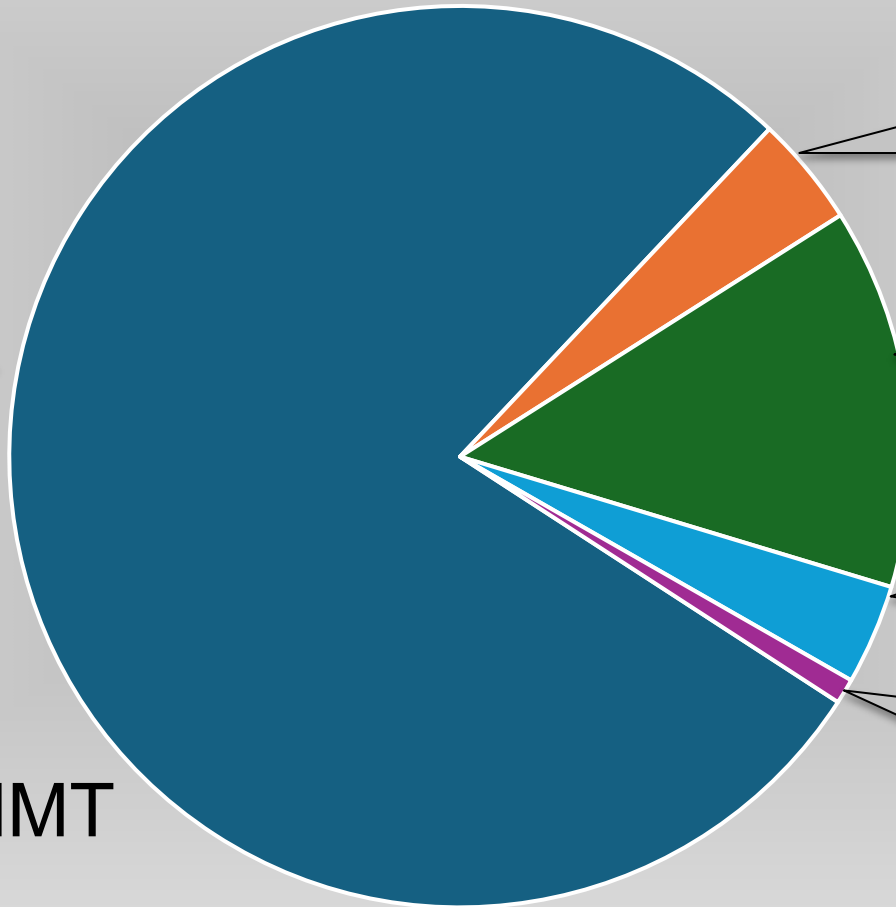
Shift in Country Storage



Where Does Western Canadian Grain Go?

2023-24 Crop Year

Western Canada
Rail
43.3 MMT
(78%)



Eastern Canada
Rail
2.2 MMT
(4%)

United States
Rail
7.6 MMT
(14%)

United States
Truck*
2.0 MMT
(3%)

Mexico
Rail
0.5 MMT
(1%)

Total = 55.6 MMT

*July 2024 Trucking Estimated

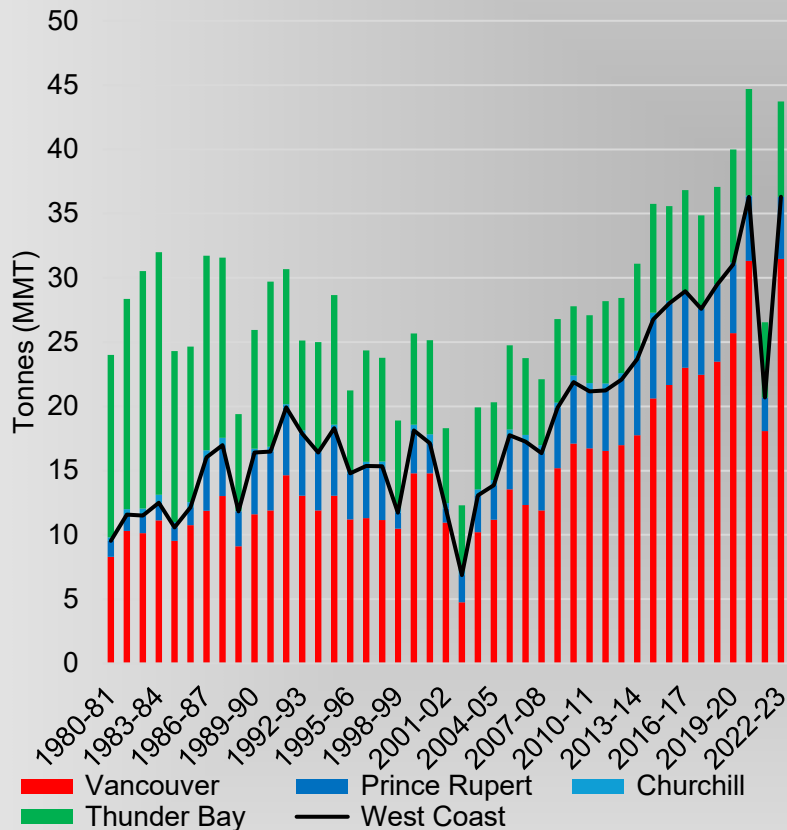


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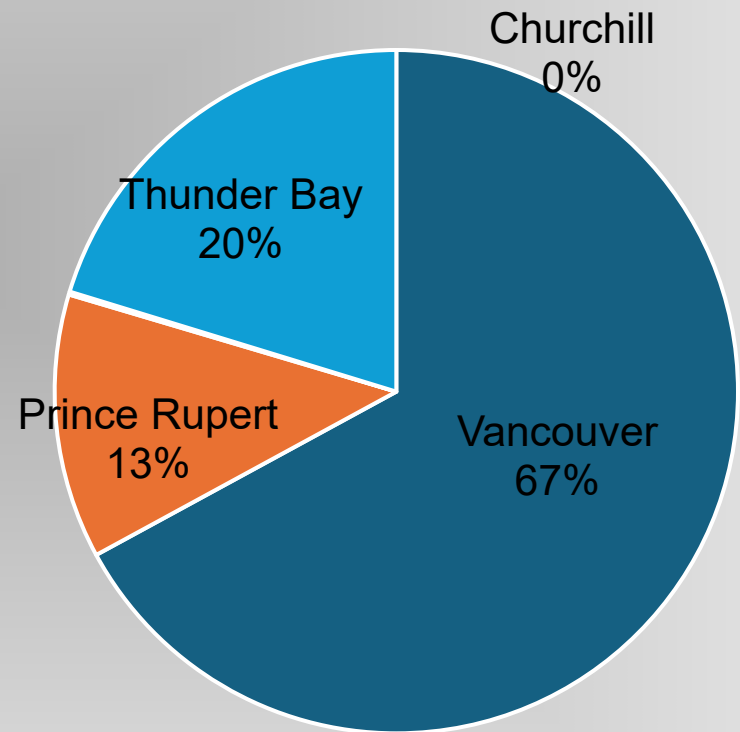


Western Port Volumes

**Historic Volume by Port Destination
(1980-81 to 2022-23)**

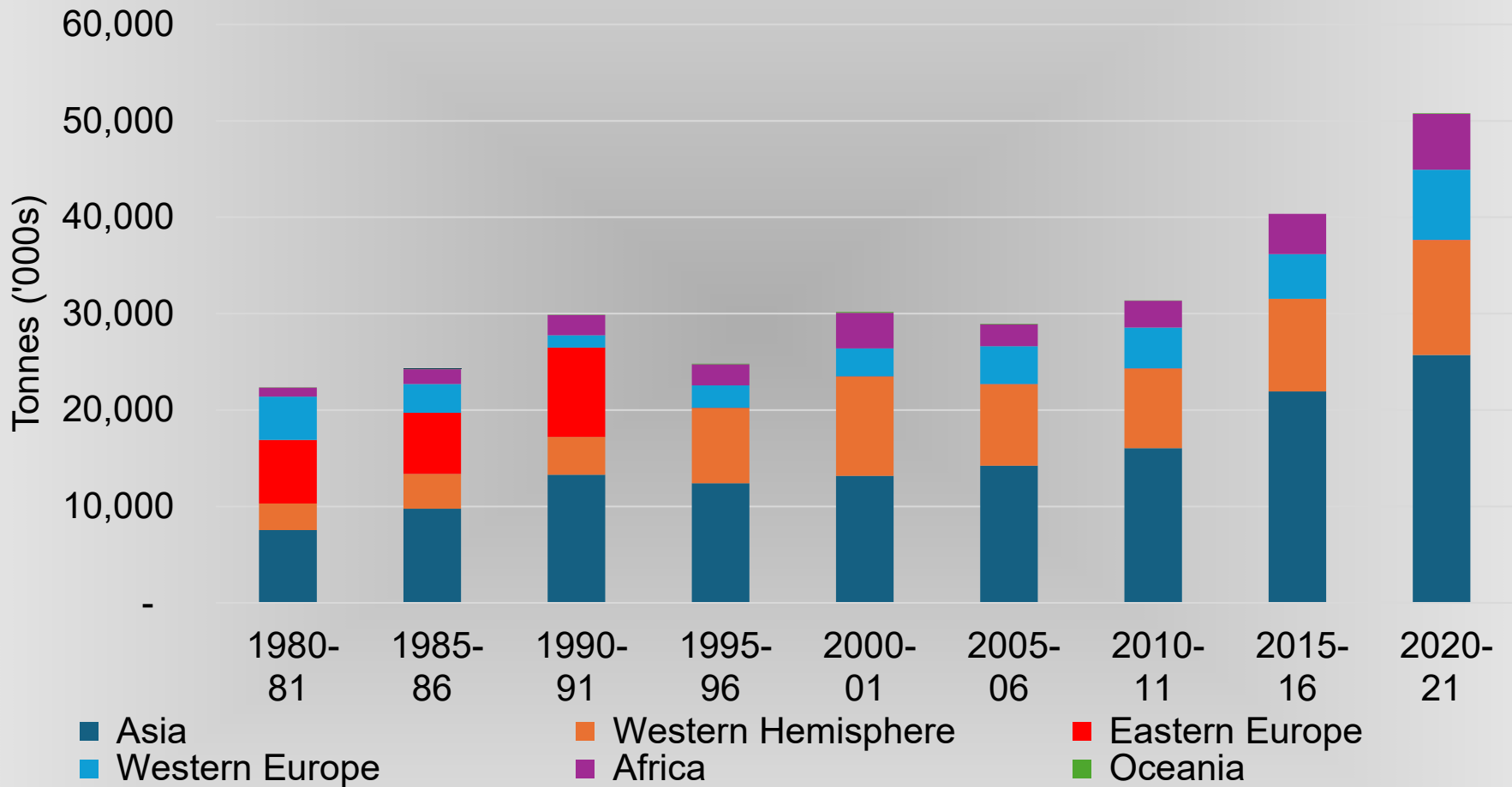


**5-Year Average Port Proportion
(2019-20 to 2022-23)**



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Canadian Grain to Export Regions





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Grain Carrying Capacity

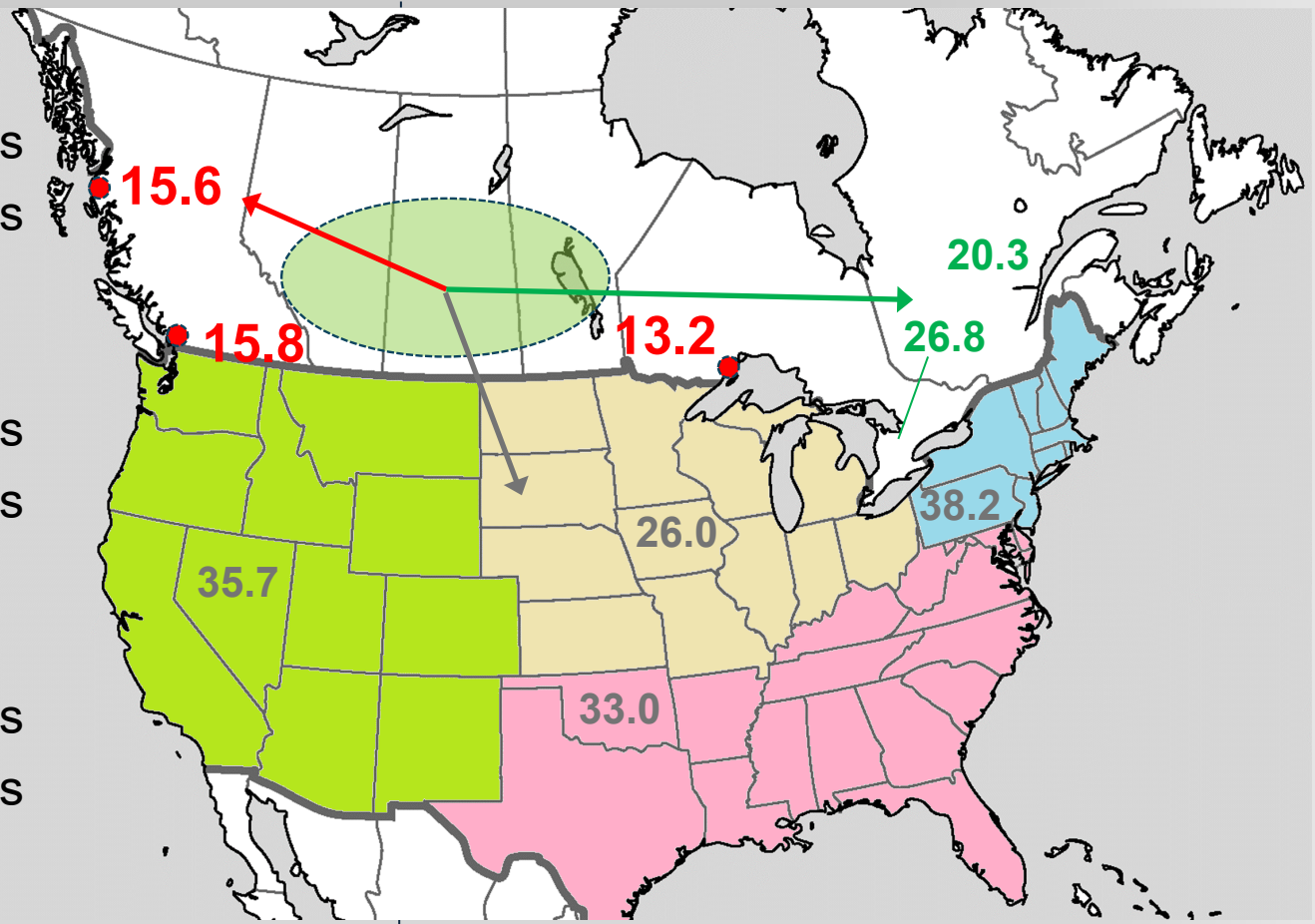
- Simplified explanation is the combination of:
 - How fast the railcars move
 - ✦ Car cycle times
 - How many railcars are available
 - ✦ Hopper cars in service of moving grain
 - ✦ Crews & locomotives to move them
 - How much volume per train
 - ✦ Newer high-capacity hopper cars vs standard
 - ✦ Train lengths



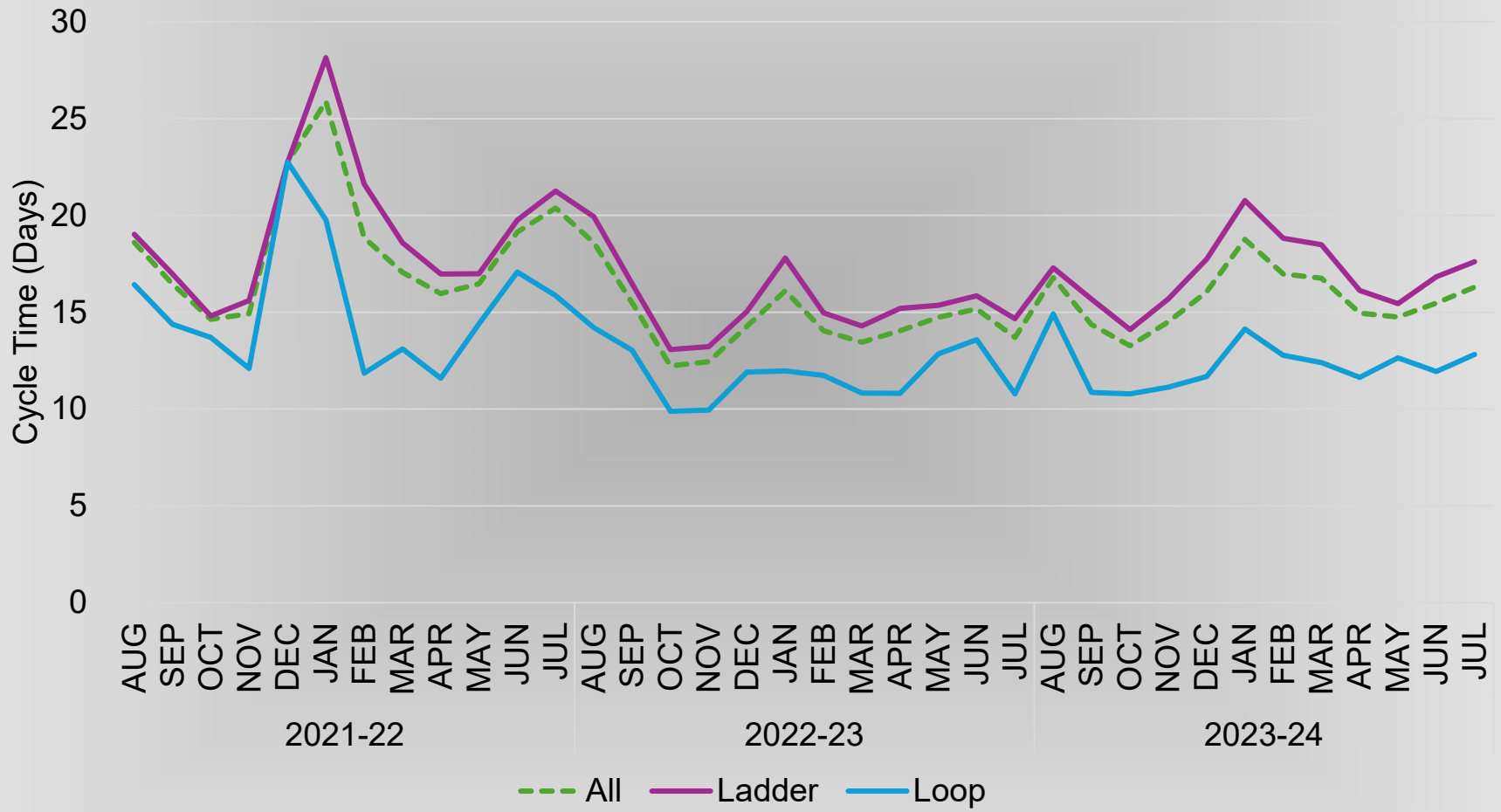
Western Canadian Car Cycles

2023-24 Crop Year (GMP Monthly Tables 5B Series)

- Western Canada
 - 2023-24 = 15.3 days
 - 2022-23 = 14.0 days
- Eastern Canada
 - 2023-24 = 25.8 days
 - 2022-23 = 24.3 days
- United States
 - 2023-24 = 26.8 days
 - 2022-23 = 26.1 days



Car Cycles – Ladder vs Loop Origins



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Photo: G3 Terminal Vancouver

Next-generation terminal elevator, with loop track capable of holding three 150 car trains



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Why does Vancouver get the most grain?



- Asia/Pacific market focus
- Logistics cost structure has three major components
 - Rail Transportation to port (plus St. Lawrence Seaway for Eastern)
 - Port handling fees
 - Marine transportation to destination
- Canada is BIG – rail transportation can be as much as 3x ocean costs, per tonne
- Transportation costs vary by distance
 - Rail \$25 to \$80 per tonne of wheat
 - Marine \$10 to \$33 per tonne of wheat
- Most grain moves by rail to their closest port of export, with a “break-even” point in central/east SK



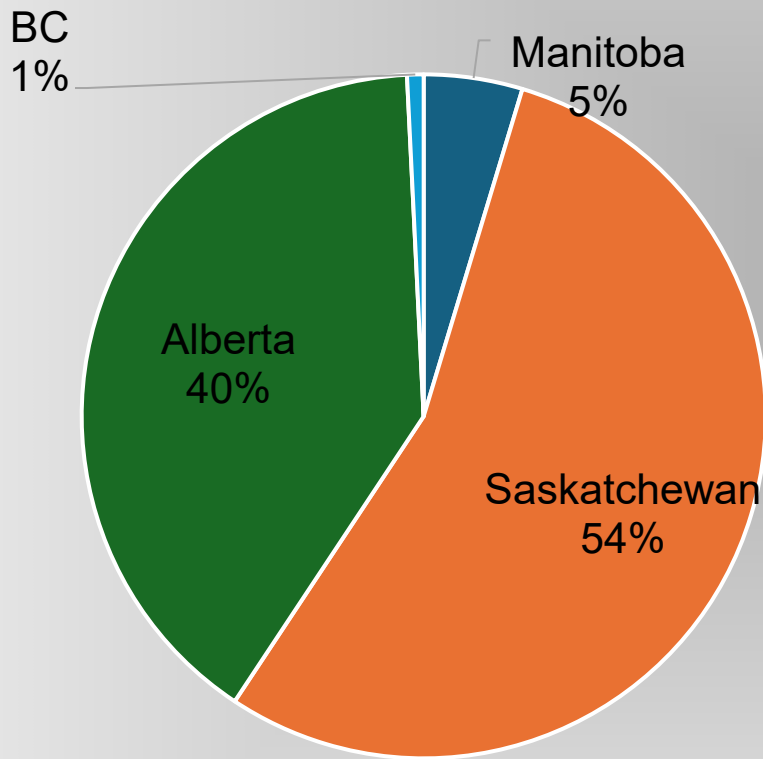
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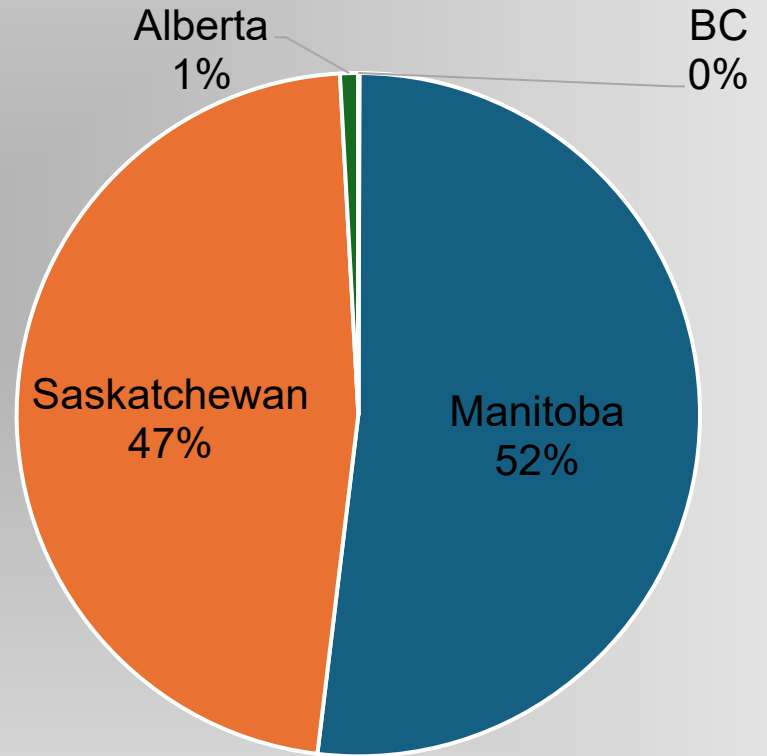
Grain Shipments to Port by Origin Province

5-Year Average

Vancouver Traffic by Origin



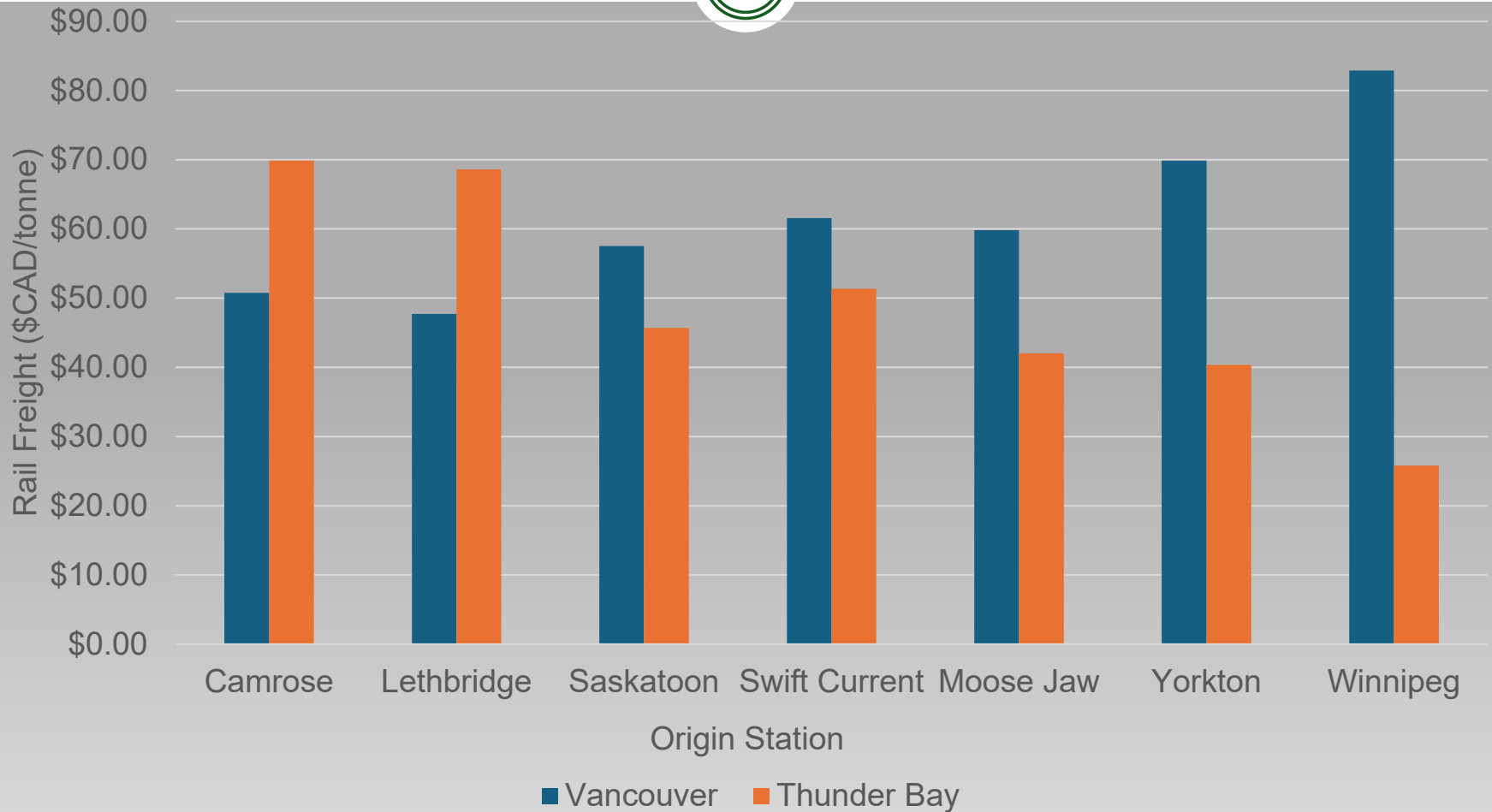
Thunder Bay Traffic by Origin



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Rail Cost to Vancouver & Thunder Bay

(\$CAD/tonne Wheat, August 2023)

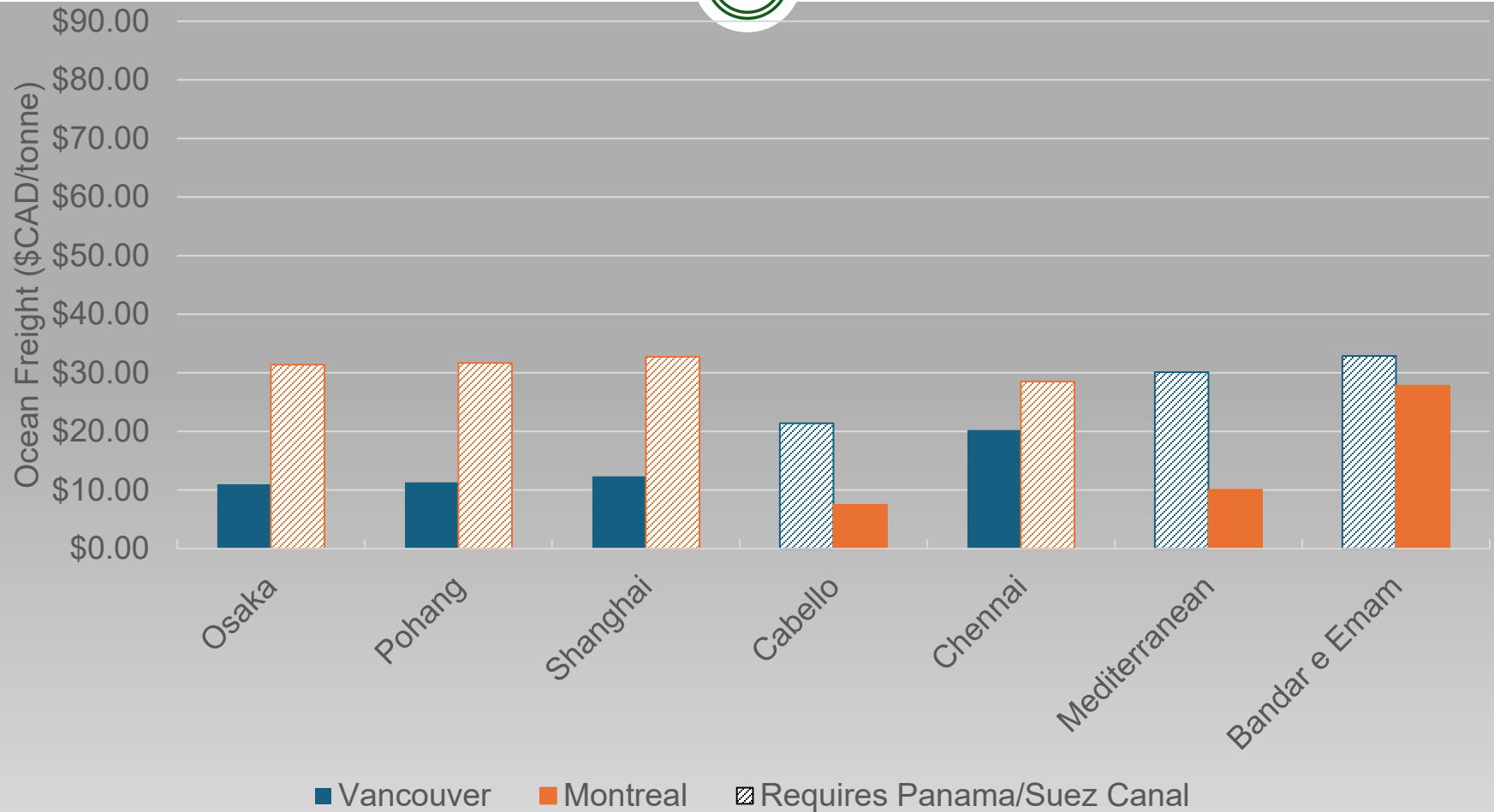


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Marine Cost From Vancouver & Montreal

(\$CAD/tonne Estimate, August 2023)

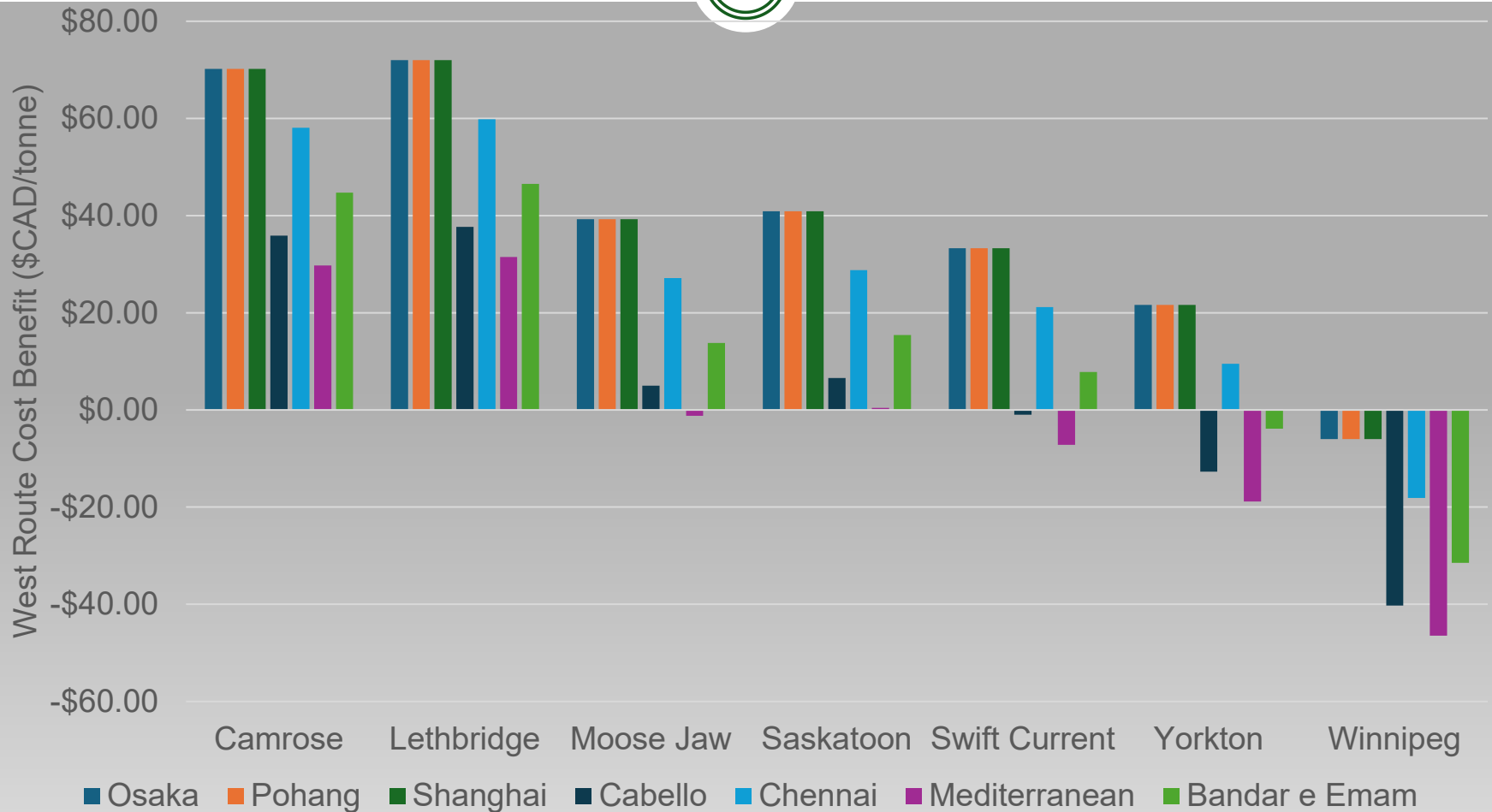


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Vancouver Cost Benefit by Orig/Dest Pairs

(\$CAD/tonne Wheat, August 2023)



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- Winter operating for railways
- Loading grain during inclement weather (Port of Vancouver)
- Wildfires, floods, other natural events

Impact of Cold on Train Length



Maximum Train Length Based on Ambient Temperature

	Above -25C	-25C to -30C	-30C to -35C	Colder than <35C
Head End Power				
Bulk	10,000	8,800 -12%	6,000 -40%	4,500 -55%
Manifest	10,000	7,000 -30%	6,000 -40%	4,500 -55%
Intermodal	12,000	8,000 -33%	6,000 -50%	4,500 -63%

With Distributed Power

Bulk	11,300	11,000	-3%	9,000	-20%	7,500	-34%
Manifest	11,300	10,000	-12%	8,500	-25%	7,000	-38%
Intermodal	14,000	12,000	-14%	10,500	-25%	8,500	-39%

Source: Railway Association of Canada

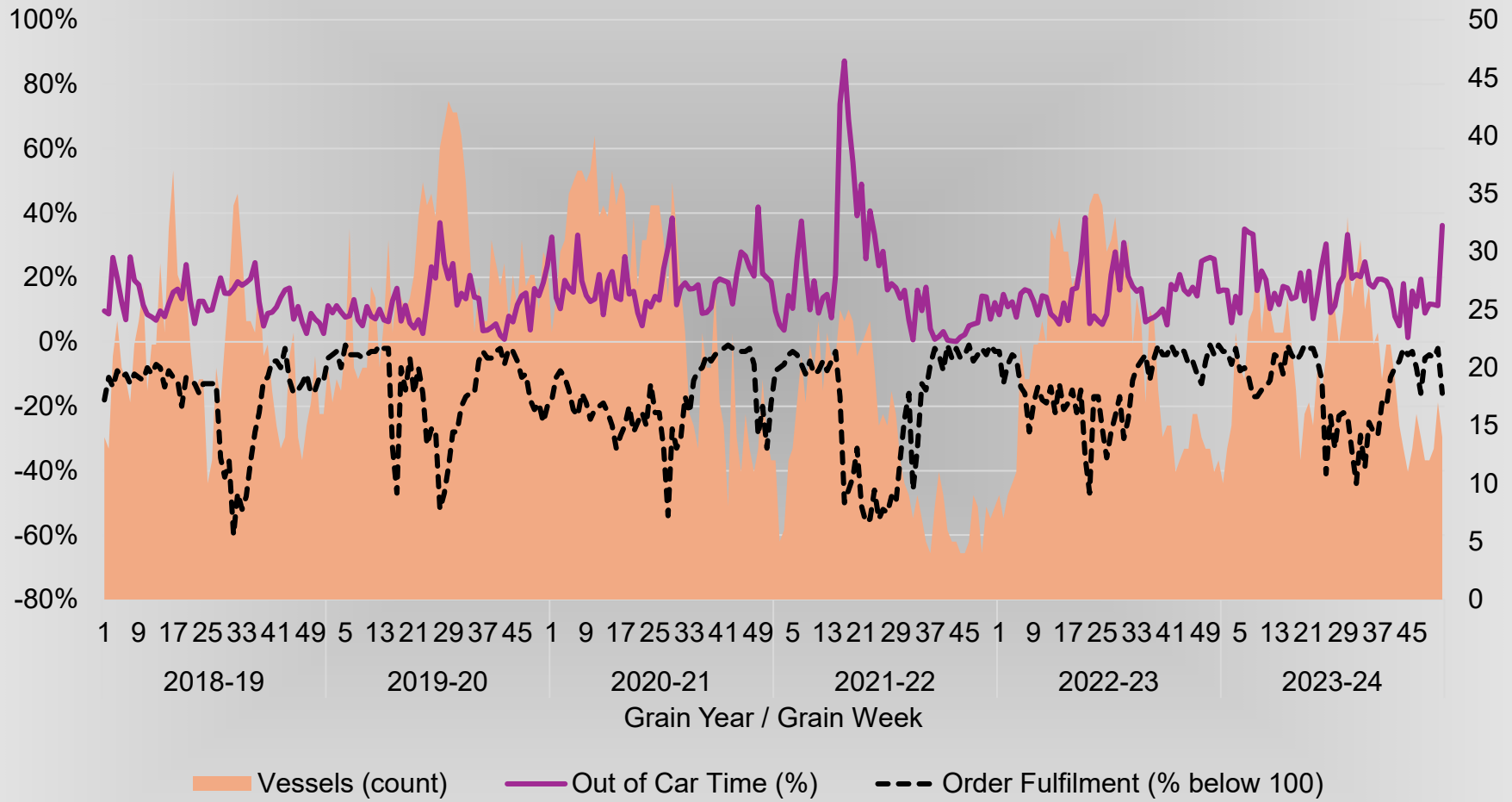


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Rail Performance vs Vessel Lineup

Vancouver 2018-19 to 2023-24



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Loading in the Rain - Overview



- Approximately 15% of hours have any amount of rainfall
 - Overwhelmingly considered light precipitation (below 2.5 mm/hr)
 - Occurs during peak grain demand periods (Sep through Feb)
- Loading ceases per the shipmaster's request
 - The Canadian Grain Commission (CGC) also informs terminals of risks to cargo
- Long term analysis:
 - Slight impact to vessel loading
 - No discernable impact on railcar unloading
- In “high” demand periods:
 - Moderate impact to vessel loading
 - Slight impact to railcar unloading as terminal storage fills

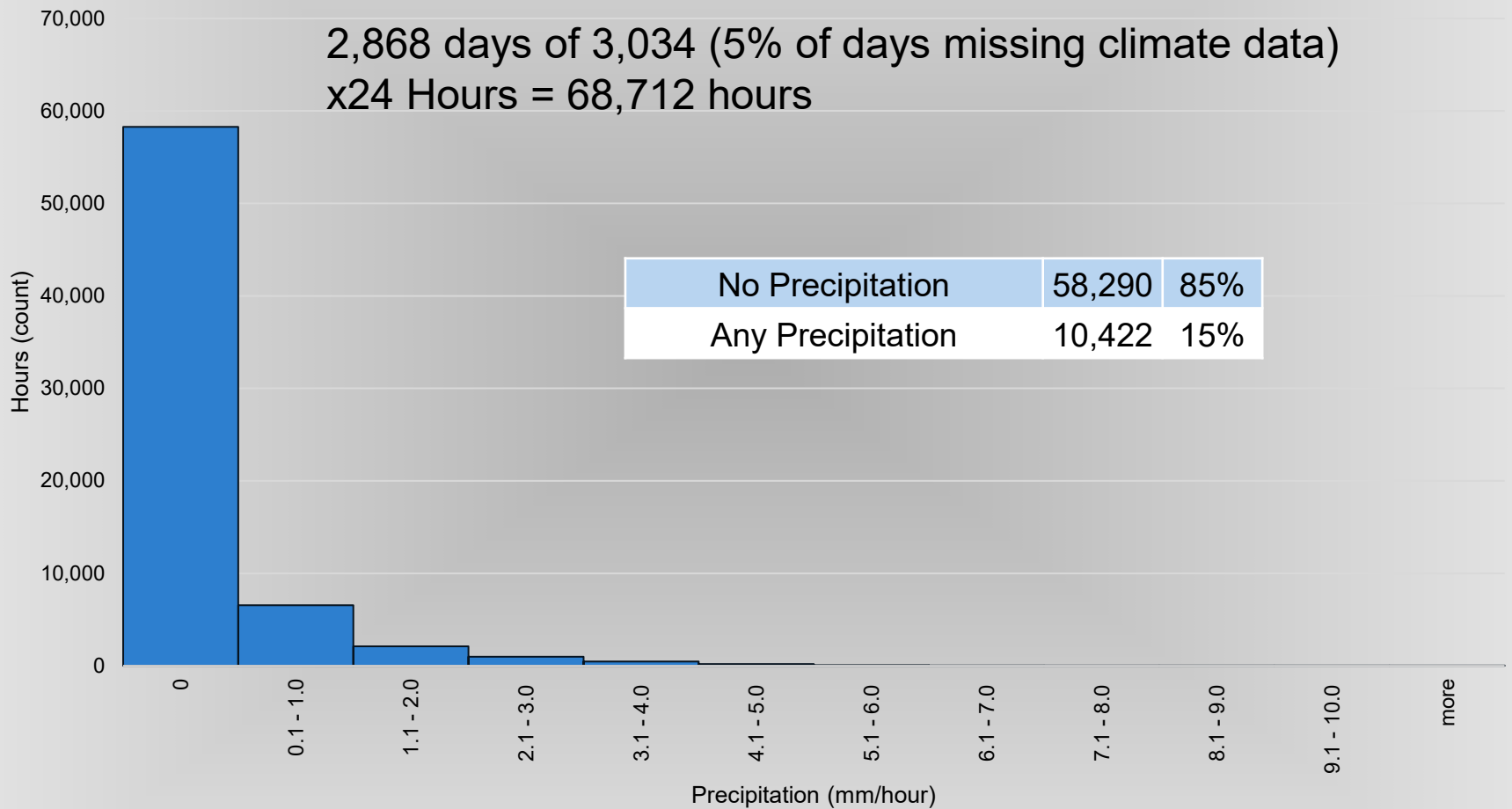


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How much rain does Vancouver get?

Vancouver Rainfall – Hours (Aug 2015 to Nov 2023)

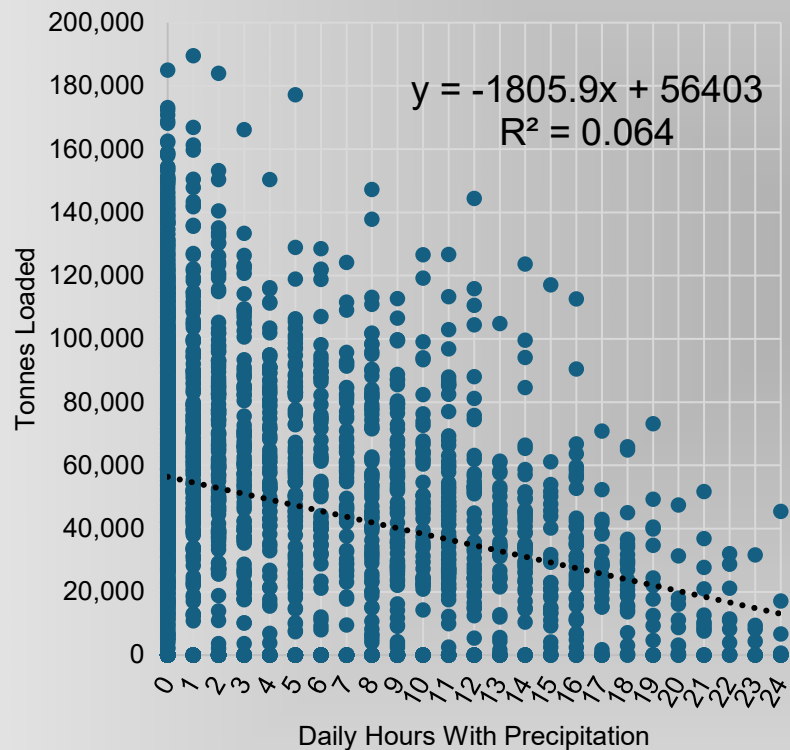


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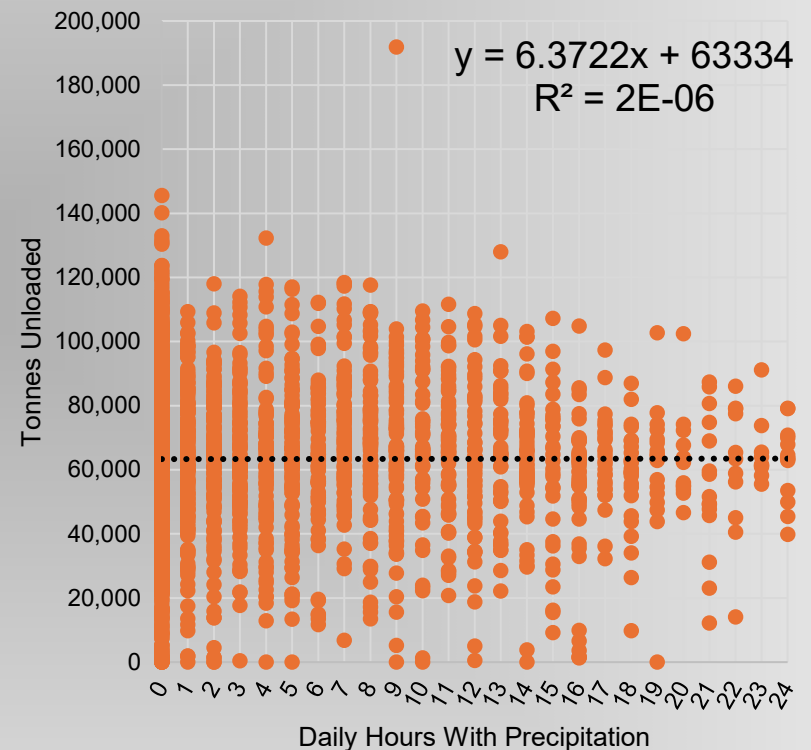
Long Term Historic (2015-16 to 2023-24)

Vessel Loading



● Tonnes Loaded Linear (Tonnes Loaded)

Railcar Unloading



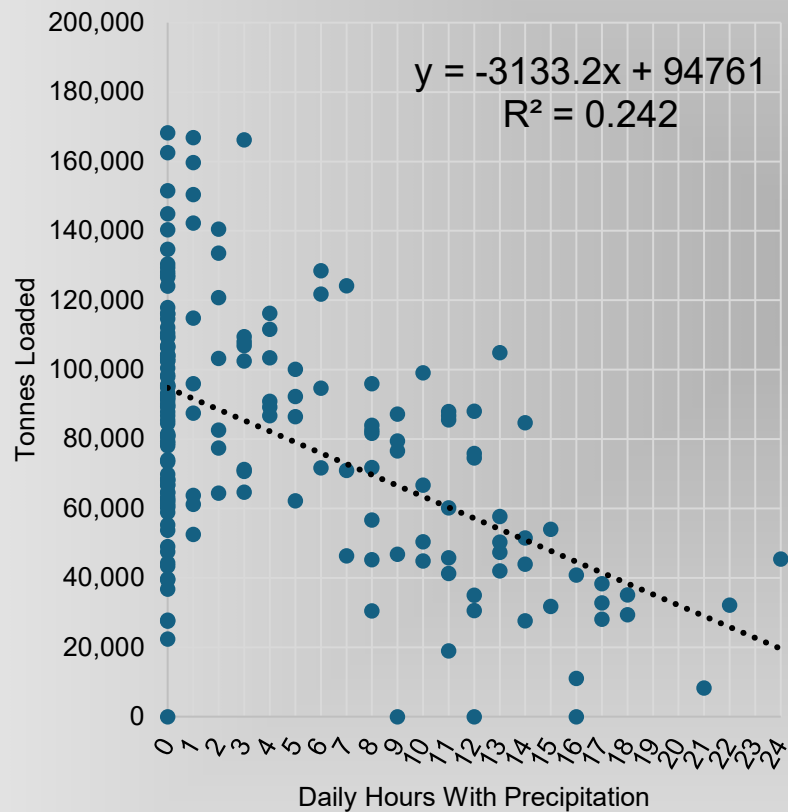
● Tonnes Unloaded Linear (Tonnes Unloaded)



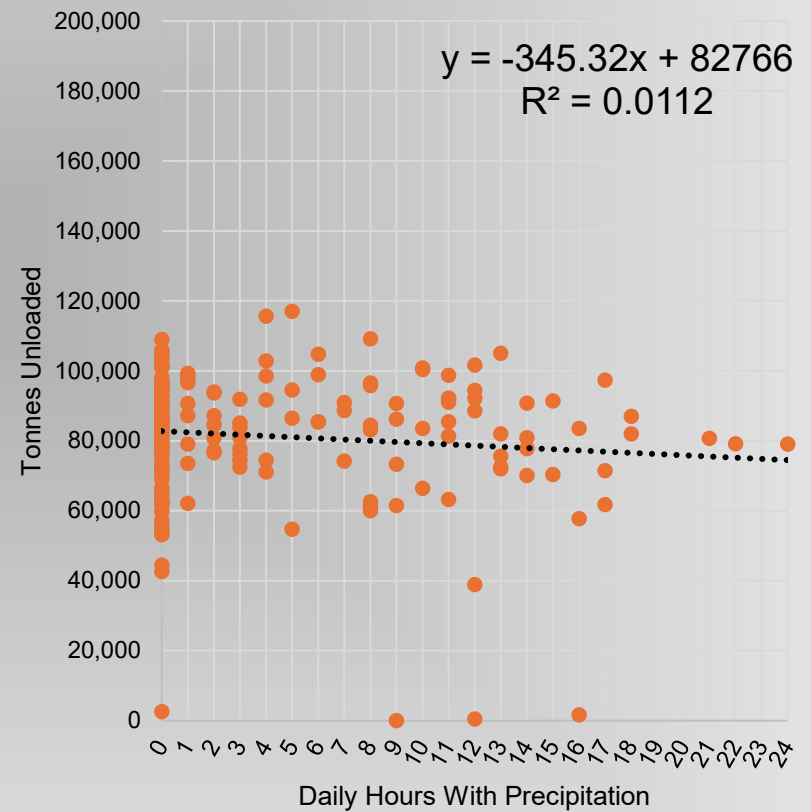
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High Demand Period (2020-21 Q1 to Q3)

Vessel Loading



Railcar Unloading



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Cold Weather vs Loading in the Rain



- Since 2015, up to 12% of days under winter operating conditions, varying by year and region
 - Winter operating conditions reduce bulk train lengths by 3-55%, depending on train configuration and minimum temperature
 - Distributed power configuration, or air cars, lessen the impact to train length
- Since 2015, it rains ~15% of the time over the Vancouver harbour
 - Upper limit on how many hours of loading are “lost”
 - In practice, not every terminal had a vessel ready during each of those hours, so the total loss is lower
- Vancouver terminal loading rates (onto vessels) exceed unloading rate (from railcars)
 - Terminals can “catch up” very quickly when they fall behind on vessel loading once the weather clears
- Rail “catch up” on delays from cold are not as immediate
 - The rail network handles more than just grain and all sectors are affected



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- In Country:
 - Bunge-Viterra Merger
- On Rail:
 - Extended Interswitching
 - Work/Rest Rules
 - Recovery from 2024 Rail Work Stoppage
- At Port:
 - Active Vessel Traffic Management (AVTM)
 - Loading in the Rain
 - Vancouver North Shore Access

Grain Supply Chain Issues



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Extended Interswitching



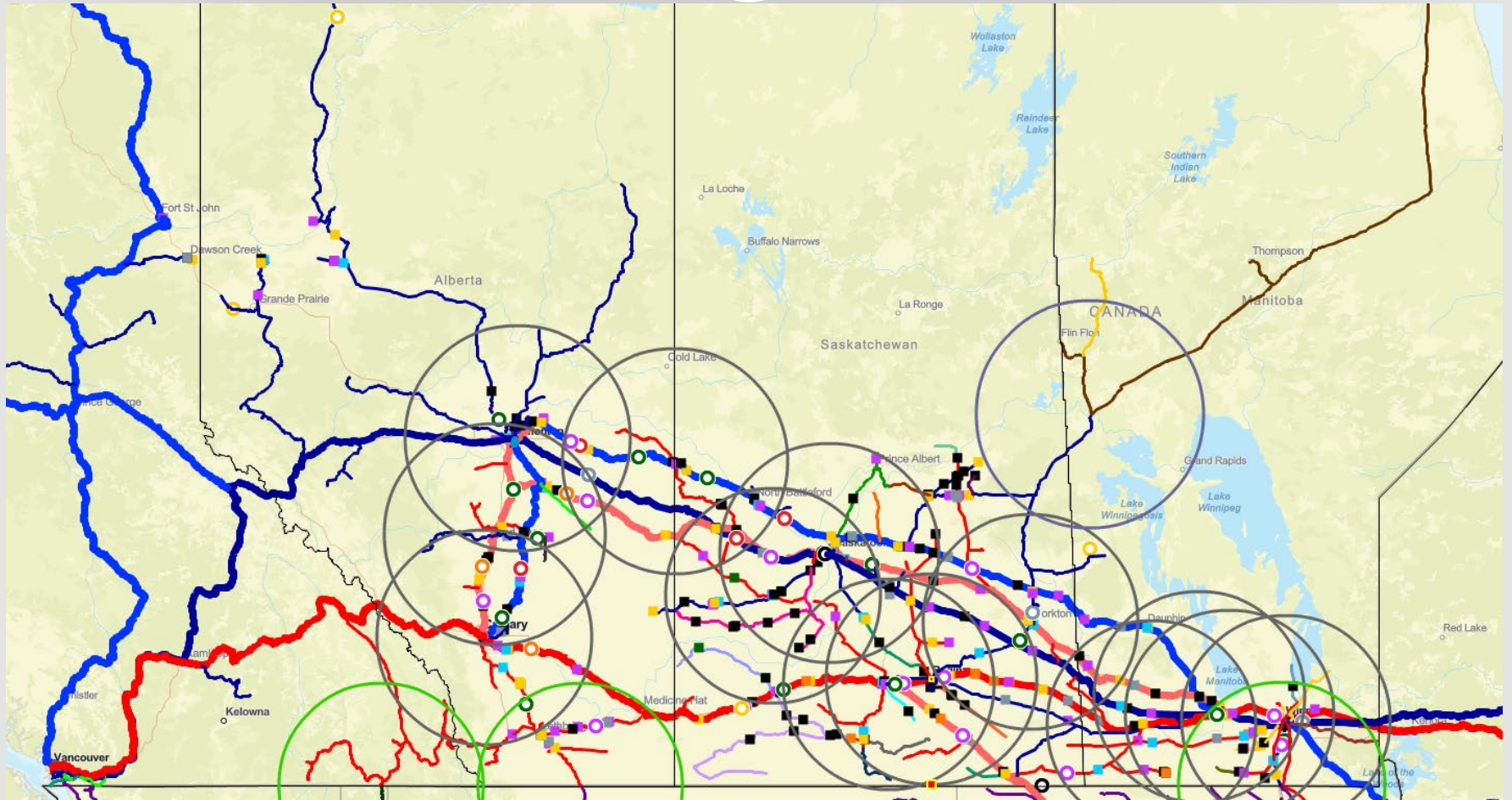
- Tool used to encourage market forces in the rail industry
- Provides access to competing railways for elevators within 160km of an interchange
 - 7% of elevators are within 30km of an interchange, the previous limit
 - 88% of elevators are within 160km of an interchange, the extended limit
- Even if extended interswitching is not directly used it still benefits shippers when it exists
 - Improved positions during negotiations for car supply and freight rates



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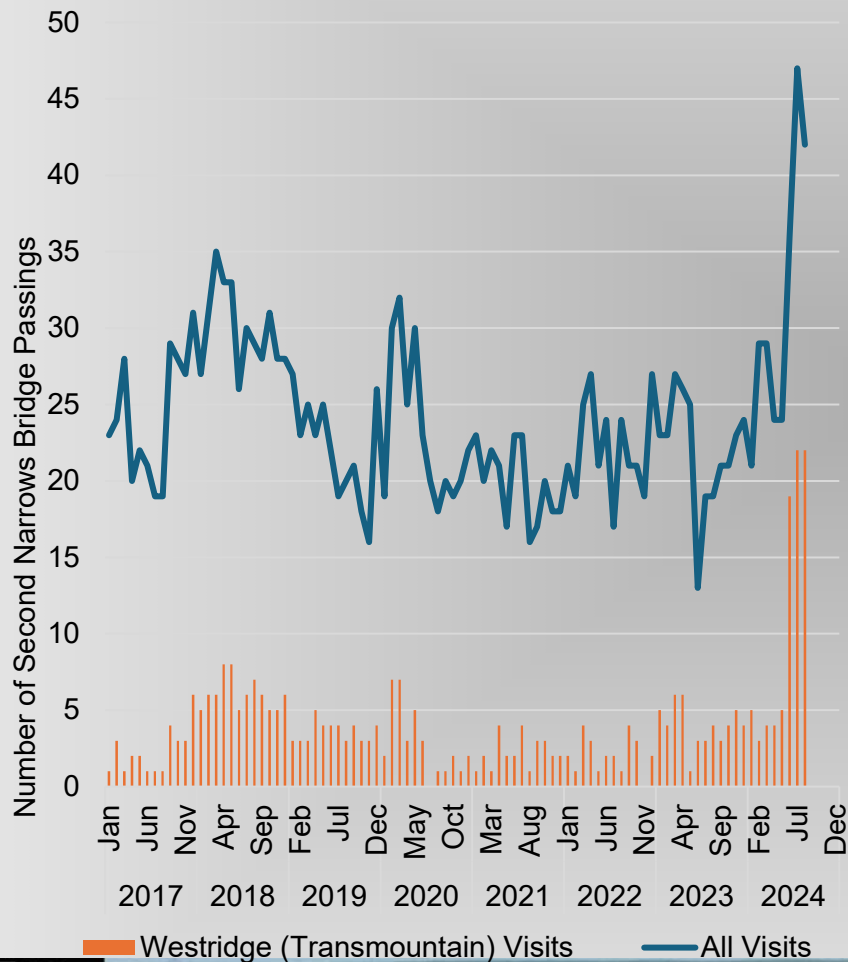
Extended Interswitching Network Map



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Monthly Visits to Terminals East of Second Narrows Bridge (Jan 2017 – Aug 2024)



- Transmountain expansion (TMX) is too recent to note any impacts to grain.
- TMX may not yet be at full capacity and peak grain shipping starts September.
- *North Shore rail capacity remains a concern for CN, the port, and all terminals affected.*

Thank You

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