2019–2020

CN Grain Plan

CONTENTS

GrainsConnect Canada – Maymont, Saskatchewan Inland Storage Terminal

MESSAGE FROM JJ RUEST

During this, our 100-year anniversary, it's with great pleasure I can report that CN achieved record grain movement from Western Canada in 2018–2019, exceeding 27.5 million metric tonnes. This achievement was all the more remarkable as the crop year was not without significant challenges for both Canadian farmers and CN. By working collaboratively with producers and other stakeholders, CN was able to put in place strategic capital investments and a comprehensive Grain Plan that met the challenges.

This performance was made possible in large measure by the $3.5 billion in investments CN made in 2018. Strategic investments were made to double track key corridors on our mainline in Western Canada, to increase our fleet of locomotives and hopper cars, and to invest in innovative air repeater cars. We entered the winter with 10% more locomotives and 26% more crews in Western Canada. However, an unusually delayed harvest, due to poor weather conditions, impacted many of our customers and resulted in losing precious rail capacity in September and October, particularly in Alberta.

From crop week 15 to crop week 35, grain shipments were on or above our maximum sustainable supply chain capacity target for car spottings per week, with the exception of two weeks in February. An extended period of deep cold across the Canadian Prairies in February and March of 2019 saw this level of performance falter as temperatures dipped to record lows. As a result, we were forced to shorten our trains and, in some locations, halt nighttime operations in the name of employee and community safety.

During this difficult period, we continued to meet or exceed our maximum sustainable supply chain capacity, with the exception of crop weeks 30 and 31. Starting in crop week 37, customer demand for our service dropped off well below available capacity, in part due to the imposition of import restrictions by China on Canadian canola. Given all these challenges, I am proud of our performance and extend my thanks to all our customers and supply chain partners for their patience and understanding.

Looking ahead at the upcoming 2019–2020 crop year, I have no doubt it will not be without similar challenges, ranging from extreme weather events to the shifting and unpredictable nature of today's global trade environment. In anticipation of strong demand and in support of our customers and Canada's competitiveness in world grain markets, CN has continued its record investment in system infrastructure. We have once again invested a record $3.9 billion to continue double tracking, increasing our locomotive and hopper car fleets, extending passing tracks, adding yard tracks, and investing in more air repeater cars. All of these investments increase our capacity and resiliency as well as our ability to recover quickly after an incident or spate of extreme weather.

We also welcome the investments made by our customers and supply chain partners to expand their onsite footprints with loop tracks and greater grain storage at both origin and destination terminals. These investments are aligned with an end-to-end view of the supply chain that is critical for Canada to fully realize its potential as a leader in global grain markets.

This is our second annual public Canadian Grain Plan and, like last year, is the product of extensive consultation with key stakeholders and reflects the valuable feedback they have provided. CN believes that a collaborative approach to grain transportation aligns all of the actors in the supply chain in order to secure and grow Canada's place in world markets. We thank those who took the time to speak with us and share details of their 2019–2020 forecasts, including our newly created Agricultural Advisory Council.

CN continues to welcome input and feedback from its customers, supply chain partners and other stakeholders. As we did throughout the 2018–2019 crop year, to maintain transparency with our stakeholders, we will update our Plan monthly to reflect changing conditions and we will post our weekly statistics on our website.

We firmly believe that CN is well positioned to meet again the transportation needs of its customers and the Canadian economy for the 2019–2020 crop year.

JJ Ruest
President and CEO

EXECUTIVE SUMMARY

CN has prepared this Grain Plan for the 2019–2020 crop year in accordance with the requirements of Canada's *Transportation Modernization Act*. The Plan has two purposes: first, it assesses CN's ability to move anticipated levels of grain during the coming crop year; and, second, it identifies the steps that CN has taken and is taking to put in place the capacity required to move the grain in an efficient and timely manner.

The Plan is based on a collaborative effort. It was prepared with input from a wide range of interested stakeholders, including leaders of major farm and commodity organizations. Consultation with these stakeholders took place in person and on conference calls. We are committed to ongoing consultation with our stakeholders to ensure our Grain Plan is based on and updated with the best information and perspectives available.

In 2018–2019, there were two key challenges. One was the late harvest in much of the Prairie region, which forced CN customers to cancel large numbers of car orders in September and October 2018. The other was the extended period of extreme cold in February and March 2019, which forced CN to operate under winter restrictions and reduce train lengths.

In spite of the challenges, CN was able to capitalize on the increased capacity and resiliency created by its investments in more crews, hopper cars, locomotives and track capacity. The result was CN moving a record of over 27.5 million metric tonnes (MMT) of Western grain in 2018–2019 exceeding the previous record of 26.3 MMT set in 2016–2017.

In addition to weather-related challenges, trade issues have had a significant impact. China's restrictions on the import of Canadian canola has led to a much larger than normal carry-out (3.9 MMT) and trade-related uncertainty continues to impact the sector for the foreseeable future.

While moisture conditions remain a concern in some areas and trade issues present an ongoing challenge, CN recognizes that Prairie crop yields are trending upwards. Therefore we continue to invest to increase capacity to meet the growing needs of the grain sector and of the many other users of the rail system.

In 2019, CN is investing a record $3.9 billion to expand network capacity and resiliency. This follows our 2018 program for a total of $7.4 billion in capital investment over two years. This infrastructure spending includes the addition and lengthening of passing tracks and the addition of new sections of double track.

CN has also partnered with the Government of Canada and the Ports of Vancouver and Prince Rupert on a number of key projects under the National Trade Corridors Fund. The investments will address bottlenecks and increase capacity in crucial parts of the network leading to the western ports.

These initiatives have enabled CN to increase the maximum sustainable supply chain capacity. As a result, we anticipate moving 5,650 CN-supplied cars per week outside of winter, and 4,150 per week in the winter months. This is an increase of 150 car spottings per week over the maximum sustainable supply chain capacity for the 2018–2019 crop year (2.7% in non-winter months and 3.8% in winter months).

It is important to note that these targets do not include the use of private customer cars, which are estimated to represent upwards of an additional 500–700 car spottings per week for bulk grain. Although private cars are dedicated to specific customers' grain shipments, the increased capacity these cars represent is beneficial to all grain shippers on the CN network. We have seen a significant annual increase in the amount of grain moving in private hopper cars supplied and controlled by our customers and we expect this trend to continue.

At CN, we are confident that with the assets we have in place, and the innovative programs we continue to offer our customers, we have the capacity to meet the demand to move grain over the course of the 2019–2020 crop year.

Again this year, we will voluntarily provide monthly updates outlining our progress – as compared to the Plan – and report any significant events that may have temporarily impacted performance.

INTRODUCTION

This CN Grain Plan covers the 2019–2020 crop year and has been prepared in accordance with Canada's *Transportation Modernization Act*. As with our 2018–2019 plan, it does two things. First, it assesses CN's ability to move anticipated levels of grain during the coming crop year. And second, it identifies the specific steps that CN has taken, is taking, and will take to put in place the operational capacity required to move grain in an efficient and timely manner.

The 2019–2020 Plan was developed using four interrelated factors: projected grain supply, maximum sustainable supply chain capacity, CN's capacity improvements, and CN's grain marketing programs.

CN is positioned to meet the transportation needs of its grain customers for the 2019–2020 crop year and beyond.

CONSULTATION

Again, this year, in developing the Grain Plan, CN consulted widely with interested stakeholders and customers. This collaborative approach is part of a much broader CN focus on increasing engagement with grain producers. This includes participating in major agricultural events in Western Canada, seeking out opportunities to present to and discuss grain supply chain issues with producer organizations, being proactive in providing updates on grain supply chain performance, increasing presence in social media, and creating relevant content to increase understanding of how the end-to-end grain supply chain operates.

To ensure it is aware and responsive to the needs of producers, CN recently created an Agricultural Advisory Council involving a cross-section of industry leaders to provide ongoing advice and feedback on grain transportation and the Company's interaction with producers. We would like to express our thanks to the Council members for agreeing to help us in our efforts to maintain strong communications with our stakeholders and grow our understanding of the needs and concerns of producers.

During late June and July, CN proactively consulted with leaders of major farm and commodity organizations seeking their input into the Grain Plan for the 2019–2020 crop year. CN also published an open invitation on its website seeking comments on its draft Grain Plan from interested individuals and stakeholders.

CN GRAIN PLAN

1 PREVIOUS CROP YEAR

The 2018–2019 crop year clearly illustrated the many external factors that can have a significant impact on the Western Canadian grain sector and the end-to-end grain supply chain. The Prairies experienced one of the most drawn-out harvests in recent history due to significant weather issues, creating tremendous stress for producers most seriously affected by the extreme weather. A great deal of rail capacity went underutilized as a reduced pace of grain deliveries forced grain companies to cancel large numbers of car orders through the first 14 weeks of the crop year. The situation was particularly challenging in Alberta.

When the crop was harvested and deliveries picked up, CN was able to move grain at record levels through January 2019. In February, however, the Western grain region was hit with record extreme cold temperatures, which persisted for a number of weeks, forcing CN to operate under winter restrictions and, in some locations, to halt operations at night completely. All rail traffic was impacted by reduced train lengths, reduced speed and other measures that adversely affected capacity and efficiency.

In addition to weather-related challenges, trade issues – particularly the move by China to block the import of Canadian canola – had a serious impact on Western producers and all players in the end-to-end grain supply chain. The trade issues with China remain unresolved and represent a major unknown factor in preparing for the 2019–2020 crop year.

Overall, in spite of the weather challenges both for producers at harvest and for all supply chain partners in February, the 2018–2019 crop year was very strong for grain movement on the CN network. CN moved over 27.5 MMT of bulk grain and processed grain products in hopper cars, tank cars, and boxcars, surpassing the previous record of 26.3 MMT set in 2016-2017.

2 ESTIMATING THE GRAIN SUPPLY FOR 2019–2020

Prairie crop yield potential is steadily trending upwards, and our planning recognizes that this trend is expected to continue due primarily to continuous improvements in crop genetics and more intensive crop management practices. As a result, CN will continue to increase capacity in order to meet this growing demand. Timing and location of this increased capacity is determined in part with critical input from all our customers, including the grain sector.

CN has a grain supply chain team in place that is responsible for the oversight and management of the Grain Plan, including the confirmation and distribution of assets required to fulfill customer commitments. The fleet plan is committed on a weekly basis and regular dialogue takes place with customers and other supply chain partners.

There are several factors that must be considered in order to have the information needed for effective transportation system decision-making. Determining the total volume of traffic to be moved across various sectors is the first necessary step for proper transportation planning. When designing service, and especially recognizing that long lead times are required to get the right level of resources into the right places at the right time, CN engages with all its customers to assess the volume of products to be moved. To that end, resource planning requires a comprehensive assessment of not only the grain supply chain, but all commodities that use the shared rail network, i.e., commodities that support good-paying Canadian jobs in other sectors, including mining, energy, forestry, manufacturing, and retail. In the case of grain, we rely primarily on government estimates to determine crop size along with forecasted demand from our customers.

In a given crop year, the grain supply potentially available for exports and domestic use is made up of the carry-in inventory plus production. Production is a function of harvested area and yields. Adding a layer of complexity to the grain supply chain is the significant variability from year to year in regional production and crop quality depending on growing season and harvest conditions. These factors also influence the supplies available for shipment by rail for each of the two major Canadian railways. It is also important to note that information varies, sometimes significantly, at different intervals, requiring adjustments to service design and asset allocation as the information becomes more reliable, typically closer to harvest.

The level of grain demand, comprised of exports and domestic use, is determined by external and domestic market forces that change during the crop year. They, in turn, drive the sales and marketing decisions of the industry participants in the grain supply chain. These external forces create uncertainty with respect to what quantity of grain will enter the grain supply chain, affecting the quantity of domestic processing, exports, or other disposition. For example, the import restrictions that China imposed on Canadian canola created serious and immediate issues for grain companies whose export licences were revoked with immediate effect, forcing them to significantly alter grain supply chain flows and marketing decisions. Further actions by Chinese authorities to halt new purchases of Canadian canola resulted in the projected carry-out of canola increasing to unprecedented levels. Similarly, high tariffs imposed by India on imports of peas and lentils, combined with increased production in major pulse-crop-producing countries, translated into significantly reduced prices and export volumes for Western Canadian farmers in 2017–2018. The result was less interest in selling products at those price levels, which reduced overall export and reduced usage of the available supply chain capacity.

Overall, the rise in trade disputes and the increased use of tariffs in the past several years has introduced an additional variable that can impact the availability of markets for Western Canadian grain. These trade measures have the potential to impact the destinations for Western Canadian grain and the demand for capacity on specific rail corridors. There is consensus in the grain industry that the unprecedented trade issues at play heading into the 2019–2020 crop year, particularly with China, create a great deal of uncertainty in determining the volume of grain that will move through the supply chain and into export markets.

It is also important to note that, in recent years, the increase in domestic usage has not kept up with the increase in Western Canadian grain production. This has placed an increasing emphasis on the movement of grain to port for export.

3 SEASONALITY OF CAPACITY UTILIZATION

There are a number of factors that influence the extent to which grain supply chain capacity is utilized during the crop year. Many of these, such as the reduced pace of grain deliveries during spring seeding, are a function of the significant time and effort that farmers put into producing a crop. The impact of weight restrictions on provincial highways and local roads is another good example of a seasonal factor that affects overall grain movement. Every year, millions of tonnes of grain export capacity go unutilized from April through early September. This situation was exacerbated in the 2018–2019 crop year as the late harvest led to very large numbers of cancelled car orders in the first 10 weeks of the crop year. The unprecedented poor harvest weather was a reminder of just how dramatically weather can impact the grain supply chain.

The marketing decisions of farmers, and the commercial trading decisions of grain companies, to generally reduce participating as heavily in the export market compared to the fall and winter months, are key drivers to reduced grain movement from spring through to early fall. Many key import markets harvest their wheat crop in the spring and summer, making for plentiful local supplies. Furthermore, export competitors such as Russia, Ukraine, Europe, and the United States harvest their winter crops at this time of year, leading to stronger competition in the export market. It is not a lack of overall wheat demand that limits the size of the Western Canadian wheat export program from spring to early fall. Instead, it is in part the price at which Western Canadian wheat is offered into the export market compared to other options available to importers on global markets.

4 INCREASING CAPACITY WITH INTERMODAL OPTIONS

In addition to the grain moved in both CN-supplied hopper cars and hopper cars supplied by customers, an increasing quantity of grain has been moving out of Western Canada in intermodal containers, exceeding 1 MMT annually in recent years. Containers, which bring a variety of products primarily from Asia into Canadian ports, often return to ports empty. As a result, a significant number of containers are available at CN intermodal terminals in the Prairie region for the use of grain customers. Not making full use of the available container capacity to move grain represents a lost opportunity, as these containers are returned to port using rail capacity, whether or not they are loaded. CN's Saskatoon intermodal yard is currently the focal point of CN's containerized grain program in Western Canada. The opening of the InterMobil East Regina Intermodal Terminal during the 2019–2020 crop year will increase the capacity available on the CN network to move grain by container directly from Western Canada to export destinations.


ACL
Hapag-Lloyd

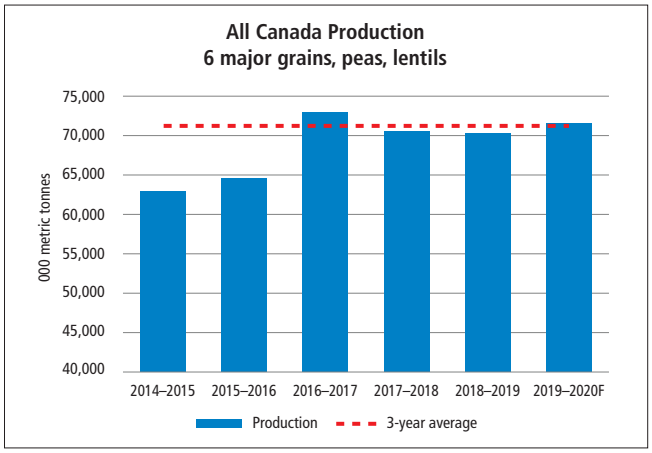
5 FORECAST DEMAND FOR 2019–2020

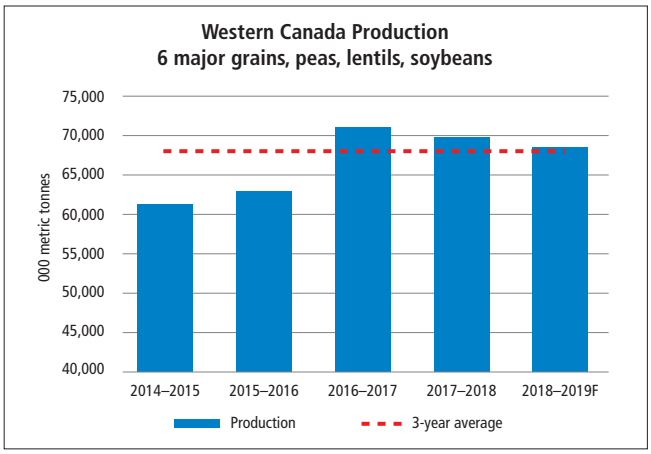
Based on its July Outlook for Principal Field Crops, Agriculture and Agri-Food Canada (AAFC) projects overall 2019–2020 All-Canada carry-in to be slightly below the three-year average, in spite of the drag of trade restrictions on canola export volumes that have increased canola carry-in stocks from 2.5 MMT in 2018–2019 to 3.9 MMT in 2019–2020. Production of the six major grains (wheat, barley, oats, flax, rye and canola), plus peas and lentils, is projected to be 71.6 MMT, versus 70.3 MMT in 2018–2019 and the three-year average of 71.2 MMT. Western Canada production of the six majors, peas, lentils and soybeans through 2018–2019 is presented in the charts below for reference, reflecting the fact that soybean production in Western Canada has increased considerably in recent years.

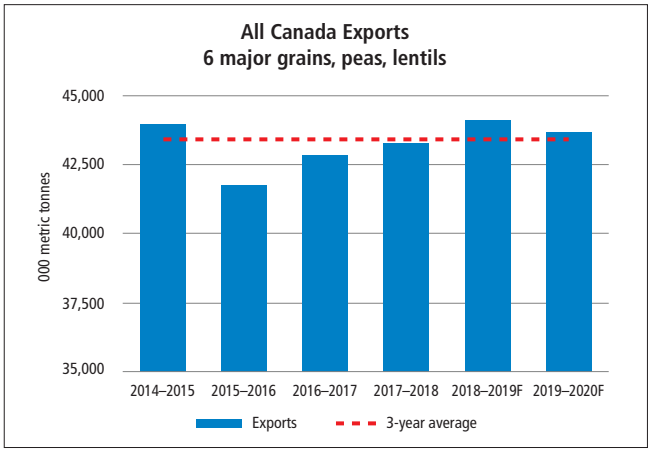
Between higher carry-in and production versus the three-year average, total projected supplies available are expected to be slightly above the three-year average.

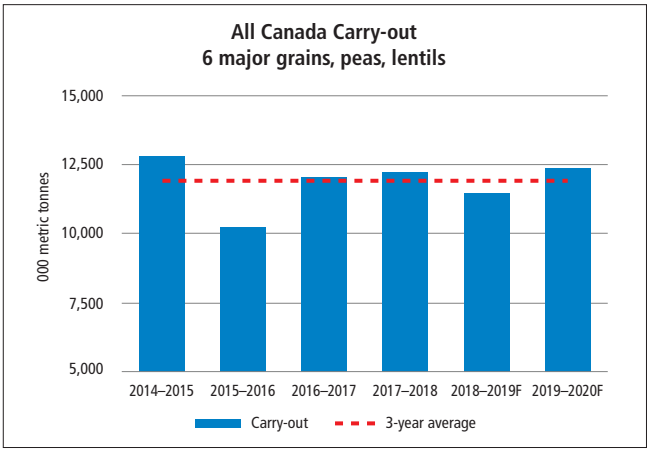
Exports are expected to be in line with three-year average levels as well as being comparable to 2017–2018 and 2018–2019 crop year levels, recognizing that the potential impact of trade restrictions to the Chinese market and other markets will have a significant bearing on export levels. Overall carry-out levels for 2019–2020 are projected to be slightly higher than 2018–2019 levels and slightly higher than the three-year average.

During the consultations, some comments received suggested that 2019–2020 production would be uncertain given the impact of dry weather in the spring and early summer, while others expected production to be consistent with AAFC's outlook.

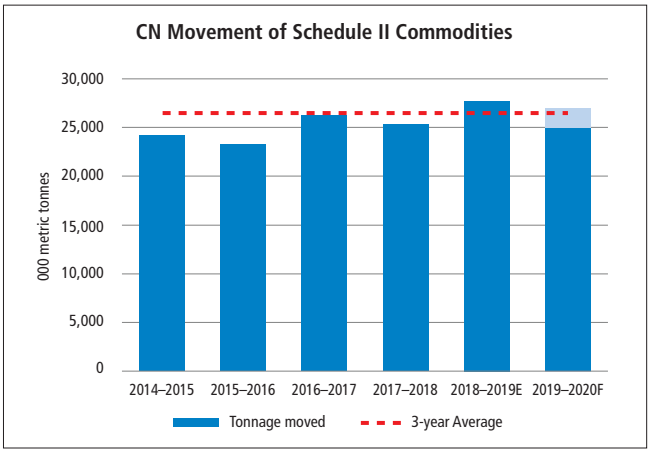








This Grain Plan assesses CN's ability to move the grain that it is required to move during the crop year. Specific to CN, the following volumes (based on an estimate for the 2018–2019 crop year) of Schedule II commodities have been moved in hopper cars, tank cars, and boxcars over each of the past five crop years. **Grain volumes moved using intermodal equipment are in addition to these numbers.** Based on the estimates above, CN expects its share of grain to be moved in hopper cars, tank cars, and boxcars over the course of the 2019–2020 crop year will be 25 to 27 MMT, consistent with the range of the past three crop years.



However, experience shows that forecasts are exactly that – forecasts – and may not always reflect what turn out to be actual volumes. Therefore, CN will continue its practice established last year of regularly refining its assessment of overall crop production, exports, and anticipated volumes to be moved. This assessment will draw on insight gained from market analysts, grain companies, grain grower organizations, Western provincial agriculture ministries, and other stakeholders in the grain supply chain. In addition, close attention to the trade issues will be necessary.

From the beginning of April through mid-June, rainfall across much of the Prairies was below normal to well below normal, impacting crop germination and development in the areas most severely affected by the dry conditions. Between mid-June and mid-July, soil moisture conditions improved across most of the Prairies after widespread rainfall. Areas of southern Alberta, the Peace River region, and parts of Manitoba were drier than normal during this same period, however. Anecdotal information suggests that the rains may have come too late to significantly benefit crops in some areas, considering how dry the start to the growing season was.

FORECASTS FOR OTHER COMMODITIES

Forecasts for other commodities sharing the CN network are not as readily available from other industries as they are from the grain industry. Many of the customers we serve are grappling with ever-changing market dynamics and are unable to provide us with advance notification of their shipping requirements.

Since the beginning of 2019, our customers, and by extension our traffic levels, have been impacted by factors including abrupt changes in demand and unplanned changes in production and sourcing patterns at origin and destination. Geopolitical realities have also had a significant impact on traffic levels, including the still-unresolved softwood lumber dispute, the only-recently resolved steel and aluminum trade tariff disputes, the yet-to-be-ratified replacement to NAFTA, China–U.S. trade challenge impacts on containerized imports, delays to building pipelines and the ensuing volatility of the movement of crude oil and fracking sand.

In light of this challenge, estimates are based on trends, key indicators and market demand as well as the voluntary input from those customers who choose to supply their outlooks. The 2018–2019 crop year illustrated that the necessary reliability of this kind of forecast is contingent on the disruptive geopolitical environment, extreme weather events that are increasingly prevalent, and a variable economy where product demand can shift significantly from quarter to quarter. Just as trade tariffs can unexpectedly impact our grain customers, so can similarly unpredictable events impact the approximately six million carloads we ship per year within North America. Despite these challenges, it is always on a best efforts basis that CN prepares for the transportation of all its customers' goods and products.

6 ESTABLISHING THE MAXIMUM SUSTAINABLE CAPACITY OF THE SUPPLY CHAIN FOR WESTERN CANADIAN GRAIN

INDUSTRY CONSIDERATIONS

The capacity of Canada's grain supply chain varies through the crop year, and a number of factors place a real limit on the maximum sustainable capacity that the grain supply chain can deliver at any point in time. The maximum sustainable capacity of the grain supply chain is also a function of the capacities and operational efficiency of all the various pieces of that supply chain, from origin to final destination. The grain harvest creates a particularly challenging transportation situation. It occurs over a short period, generating very large volumes of inventory that cannot be all moved immediately after harvest.

Supply chain processes have evolved over time in order to manage the strong demands placed on grain export assets during this peak period. One such example in the grain industry is the practice of Terminal Authorization. Customers place orders for hopper cars on a weekly basis with CN, and orders are validated upon receipt with the destination terminal to ensure that the tendered traffic can be fully received at destination. Once the receiving terminal confirms capacity and CN ensures that the pipeline to the destination terminal can actually handle the volume of traffic, the orders are accepted as valid. If the export facility cannot accept or handle the volume of orders destined to it, CN will not accept and plan the orders.

Accepting demand that exceeds a facility's true capacity leads to congestion and reduces the fluidity of the supply chain, which in turn reduces the size of the grain-spotting program that CN can accommodate on a weekly basis. Overloading the pipeline affects the service level for all CN customers. This program has proven essential to maintaining fluidity in the export facilities, which in turn prevents traffic from backing up into rail yards and onto the mainline. Based on the success in the grain sector, this best practice is now being applied to other commodities as well.

CN recognizes that during this peak period, the grain handling and trading-margin structure of the grain business is, on average, the most profitable for grain buyers and when farmer delivery pressure is the greatest. Terminal Authorization assists in aligning demand with rail system capacity, as not all of it can fit into the supply chain during a given period of time, especially during peak demand between September and April.

CLOSURE OF THE GREAT LAKES–ST. LAWRENCE SEAWAY

Furthermore, export capacity is significantly constrained when the Great Lakes–St. Lawrence Seaway system is closed to navigation. The last export vessels, as well as lakers destined to transfer grain to elevators in the St. Lawrence River, generally depart Thunder Bay between December 20 and 24; resumption of vessel loading in Thunder Bay generally does not occur until after March 25. Overall, Thunder Bay railcar unloads decline from a peak level of 2,600–3,000 unloads per week in the fall to no more than a few hundred per week over the winter, with the pace of unloads picking up in the last half of March. Direct rail shipments to grain elevators in the St. Lawrence, as well as to other destinations in Eastern Canada and the U.S. represent a limited offset to this significant loss of export capacity.

WINTER CAPACITY

In addition to the closure of the Great Lakes–St. Lawrence Seaway, severe winter weather directly impacts railway operations. Cold temperatures and heavy snowfall hamper rail operations. When temperatures reach -25°C, it becomes necessary to reduce train lengths to maintain safe operation of the train's braking system. For safety purposes, CN has a four-tiered system of restrictions (train length, train speed, hours of operation), which come into effect as temperatures drop. Heavy winds and heavy rainfall hamper port operations and vessel loading on the West Coast. At the time of writing, there was no resolution for terminating the process of loading grain through feeder holes or via tarping during inclement weather in the Port of Vancouver.

Although no two winters are alike, CN prepares in a wide variety of ways such as ensuring locomotives are in good mechanical working order, snow-clearing equipment is positioned across the network, excess railcars are removed from operating yards, and management crews are available to supplement regular crews if the need arises.

Despite our very serious efforts to offset the effects of cold temperatures on our operations, we can never fully mitigate the very real impact of these extreme conditions. While we are committed to a strategy of building resiliency and continuously improving, operating under winter conditions is governed first by safety to protect our employees, our customers and the communities in which we operate.

CN's Winter Plan clearly outlines the challenges of winter on our operations, and our preparation and planning for meeting winter head on.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7 OTHER FACTORS IMPACTING CAPACITY

Notwithstanding current construction projects at the Port of Vancouver and new high-throughput elevators being built on the Prairies, and unlike many other grain supply chains around the world, the commercial storage capacity in Western Canada is very limited in relation to the size of the crop. Grain companies rely on producers to store most of the crop at harvest time, with supplies gradually drawn into the grain supply chain over the course of the crop year. The Canadian grain supply chain needs the entire crop year to move the total volumes produced and shipped. Thus, the efficiency of the grain supply chain at any point in time must take into account the operational performance of other modes of grain transport involved in the movement of grain to its final destination, including domestic laker freight and export vessel freight.

Should a vessel not arrive for loading in the period it was expected, not be in all respects ready to load upon arrival, or be unable to load in inclement weather, terminal storage space may limit railcar unloading and affect the grain supply chain upstream. For example, if CN must hold trains at origin or along the route to the destination terminal because the terminal cannot accept the traffic, that equipment takes longer to return to the Prairies for loading. As a consequence, the overall car supply available to load grain at delivery points on the Prairies is reduced. The CN pipeline management and port operations group is in daily contact with grain shippers and with CP in order to manage the flow of grain traffic to destination, recognizing that grain shipment plans and the timing of vessel loading, due to changes in vessel arrival times and weather impacts on terminal productivity, are continuously changing.

The operational performance of other rail carriers also has a direct impact on CN, considering that a significant amount of traffic that CN handles does not terminate at a destination directly served by CN. A good example of this is the grain traffic that CN interchanges with CP in Vancouver for furtherance to South Shore grain terminals. CN and CP pipeline management/port operations groups coordinate the flow of traffic within the Port of Vancouver steadily, but the arrival of railcar traffic at its final destination could be delayed if plans changed for any number of operational or other reasons or if the windows available for the interchange of traffic were significantly modified.

An additional factor that impacts the supply chain performance is the complexity of the mix of products being moved through the country elevator network and terminal elevator system. Multiple grades and product quality levels may originate from multiple country elevators and be blended together at export position to produce a given quality specification called for by the sales contract. In years where crop quality is adversely impacted by weather, the complexity of products moving to port increases, adversely affecting grain supply chain performance. Multiple commodities are frequently loaded on the same export vessel, meaning more complicated terminal and rail logistics for that vessel shipment.

CN-SPECIFIC CONSIDERATIONS

CN delivers grain to three principal export destinations (Vancouver, Prince Rupert and Thunder Bay), with the balance moving to commercial destinations in Canada, the United States and Mexico. The closure of Thunder Bay outside the navigation season on the Great Lakes–St. Lawrence Seaway System and the impacts of weather on supply chain performance significantly affect the overall capacity of the end-to-end grain supply chain during the winter months. (For more detailed information regarding the destinations served by CN, see Appendix 1.)

SIZE OF HOPPER CAR FLEET

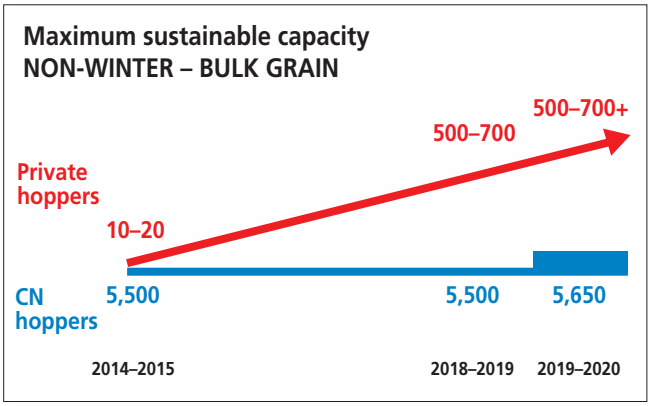
The size of the Western Canadian CN hopper car fleet has been increasing in recent years (see Fleet discussion below). CN purchased 1,000 new grain hoppers in 2018–2019. In addition, there has also been a significant increase in the amount of Western Canadian bulk grain moving in customer-supplied, customer-controlled, private hopper cars, where it is operationally efficient to do so. **Where movement of bulk grain in private cars represented 10 to 20 cars per week five years ago, this past year during peak fall demand, it was upwards of 500 to 700 cars per week (excluding processed products like meal and malt), and upwards of 350 to 500 cars per week during winter. The resulting car spots are *in addition to* the maximum sustainable supply chain capacity levels for CN-supplied hoppers laid out below.** The growth in bulk grain movement in private hopper cars has been made possible in part by the significant amount of additional network capacity created in large part by CN's investments in network capacity, locomotives, and people.

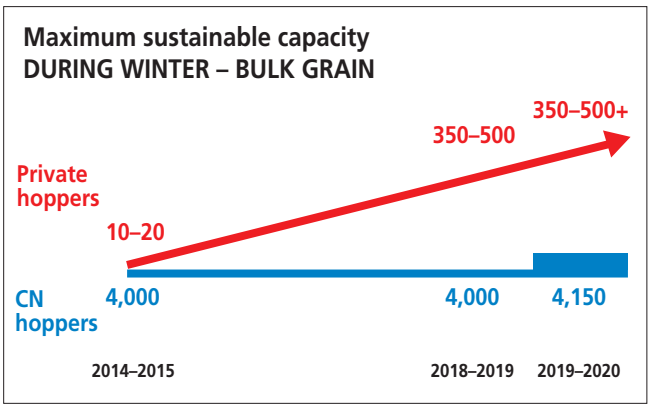
The numbers set out in this report for the monthly maximum number of hopper car spots refer specifically to CN-supplied equipment for the movement of bulk grain. The movement of grain in private customer-controlled equipment is in addition to these numbers. It is our view that, for planning purposes, based on an expectation that demand will continue to be heavily focused on exports via Prince Rupert, Vancouver and Thunder Bay (when available), the system can accommodate and CN can handle the following monthly average of weekly hopper car spots for CN-supplied equipment on a sustained basis.

CN Maximum Sustainable Capacity – Weekly Western CN-Supplied Covered Hopper Spots[1]		
	Grain Weeks	2019–2020 Maximum
August	1–4	5,650
September	5–8	5,650
October	9–13	5,650
November	14–17	5,650
December	18–22	4,150
January	23–26	4,150
February	27–30	4,150
March	31–34	4,150
April	35–39	5,650
May	40–43	5,650
June	44–47	5,650
July	48–52	5,650

1 These numbers assume a fleet composed of government cars, CN-owned and -leased cars and customer-supplied cars fully integrated into CN's common fleet. Private cars provided by customers and dedicated to their service are **not included** in these numbers.

The figures below illustrate the dramatic growth in grain movement over the past five years in customer-controlled private equipment in relation to the maximum sustainable supply chain capacity represented by CN-supplied equipment.





For planning purposes, shippers can anticipate CN's aggregate weekly shipping program will, on average, be reflective of the above carload volumes. We would stress that we believe these numbers, when added to the private cars (customer-owned and -controlled cars discussed earlier), reflect the overall sustainable capacity of the supply chain. However, there will be weeks where these levels are likely to be exceeded and others where these levels may not be achieved, depending on the fluidity of the overall grain supply chain. CN is committed to making every effort to meet these levels consistently. CN also expects that demand for CN-supplied equipment will exceed the maximum sustainable capacity of the supply chain in some weeks (especially during fall and winter, when grain handling and trading margin profitability is highest for grain companies), which will require CN to apply its rationing criteria to the demand it receives.

It is important to note that these numbers assume several key factors, including:

- Grain supply chain fluidity across corridors;
- Seven-day terminal and rail unload operations at all major grain export facilities;
- A full resumption of loading during inclement weather at West Coast terminals;
- Normal (winter) rail operating conditions; (issues related to winter operating conditions and measures CN has taken to address them will be addressed in our Winter Contingency Report);
- No significant labour disruptions or other major supply chain disruptions, including mainline disruptions; and
- A stable global trade environment.

Achieving these levels will enable CN to move the grain that it is required to transport during the crop year.

8 INCREASED NETWORK CAPACITY

Over the past several years, CN has undertaken a record level of capital spending aimed at addressing bottlenecks, improving efficiency and increasing the overall network capacity that CN has available to serve customers. In the last year and again this year, CN has publicly stated its plans for a total record $7.4-billion investment between 2018 and 2019. Most notable among these investments is the doubling of sections of CN's mainline between Edmonton and Winnipeg, and Winnipeg and Chicago; the expansion of sidings and yard tracks; and the acquisition of new Tier 4 locomotives and new hopper cars, boxcars, and lumber centrebeams. The resulting increased capacity is of benefit to all CN customers. In terms of direct benefit to CN's grain customers, the increased capacity is reflected in the projected maximum sustainable supply chain capacity, which has increased from the 2018–2019 levels.

It is also CN's expectation that the significant investments made to increase the capacity of the CN rail network will provide us with more resiliency in dealing with and recovering from severe weather, network disruptions and other unanticipated events that can impact grain movement. This is of benefit to all CN customers.

The amendments included in Canada's *Transportation Modernization Act* gave CN the incentive to invest in new high-capacity grain hopper cars, which have directly impacted our capacity to move grain. New grain hoppers continue to be added to the CN fleet. Overall capacity will continue to increase as the capital projects outlined in this plan are completed. The efficiency of the overall end-to-end grain supply chain has also improved, as shippers have increased the overall efficiency of country elevator and export terminal assets.

Clearly, there are a number of factors regarding the supply chain – some within, but many outside, CN's control – that can unpredictably restrict the week-to-week supply chain capacity. A mainline disruption, for example, causes significant impacts to the grain supply chain, as well as the overall supply chain, that affect not only the immediate period after the incident, but also the size of the program that CN can deliver for several subsequent weeks as it recovers.

As well, the transportation demands of other Western economic sectors must be factored into planning. CN expects there to be continued strong demand, albeit uncertainty in timing, for rail network capacity from most business segments in Western Canada over the course of 2019 and 2020. The needs of those industries must also be taken into consideration when assessing what portion of overall network capacity can accommodate each segment of CN's business, including grain.

9 CN CAPACITY

This Plan details the action CN has taken and will take to put in place the resources to move the grain crop over the course of the 2019–2020 crop year.

THE FLEET

CN operates a fleet of approximately 12,650 hopper cars in Canada to move customers' grain. This shared fleet is made up of Government of Canada hopper cars, CN-owned and -leased cars, and customer-supplied private cars that have been integrated into the common fleet. To maximize fluidity, CN fully deploys the fleet at times of peak demand and places cars into storage when customer demand declines. For example, there was an average of 2,500 hoppers stored during the first two months of the 2018–2019 crop year, and nearly 3,500 cars were in storage in late May 2019. These fluctuations in fleet size reflect the seasonality of grain demand.

To further expand capacity, in 2018 **CN announced the acquisition of 1,000 new generation high-cube grain hopper cars over the next two years**. As of June 2019, 500 of these new cars had been delivered, with the balance expected by the end of the 2019–2020 crop year. This important acquisition has enabled CN to adjust to additional grain demand, in part through greater carrying capacity on average relative to older cars.

LOCOMOTIVES

CN operates a fleet of approximately 1,950 high/mid-horsepower locomotives. To accommodate future growth opportunities and drive operational efficiency across its system, **CN had announced in 2017 the acquisition of 260 new locomotives over the next three years from GE Transportation**. CN is the only North American railway company acquiring such a large number of locomotives. It is an unequivocal statement about our commitment to improving our capacity to serve the Canadian economy. CN expects the first 200 of these new locomotives to be delivered in full by August 2019, with an additional 60 locomotives expected to be delivered over the course of the 2019–2020 crop year.

CREWS

CN is positioned well from a crew base perspective to meet anticipated levels of traffic moving on its network over the course of the 2019–2020 crop year. CN undertook an aggressive hiring campaign in 2018 to ensure that sufficient crews were in place for the 2018–2019 winter season. This campaign added 18% more qualified crew employees to CN overall on a year-over-year basis, with a concentration of 26% more crews in Western Canada. These added crews helped CN deal with the operating challenges caused by the extreme cold in February 2019. As the new crews have become fully qualified and have gained more experience through 2019, their impact on CN's operations has grown.

CN continues to recruit, hire and train new employees. Both of CN's state-of-the-art, purpose-built campuses, located in Winnipeg, MB, and Homewood, IL, continue to graduate employees into Transportation (conductors and locomotive engineers), Engineering (track and maintenance of way) and Mechanical (car and locomotive repairs). These employees will replace those retiring and increase our base in key areas of higher demand.

Maintaining the right level of operating crews through the highs and lows of customer demand is an ongoing challenge. It is difficult to retain crews if there is not sufficient demand to provide them with regular work. Contracts and work rules largely prevent CN from moving crews between regions should there be unanticipated increases or decreases in demand. If workers are laid off, there is a risk that they could be lost to other industries or require recertification before they can return to work. At times of weaker demand, CN makes efforts to redeploy and retrain its employees where it can.

RAIL INFRASTRUCTURE

CN has followed up on its record level of capital investment in 2018 with another record year in 2019. This year, CN is planning to invest another record $3.9 billion focused on enabling growth in all areas of its business. Over two years, CN is looking at $7.4 billion of investment to expand network capacity and resiliency, especially in Western Canada. Again, this year, we are focusing on investments that enable us to maintain fluidity in our network while accommodating a growing level of traffic and recover more quickly after disruptions and extreme weather events. Key projects in 2019 include the addition and lengthening of passing siding tracks where two trains can operate simultaneously, adding new sections of double track and increasing yard capacity. These projects will improve network resiliency, which in turn allows CN to better manage through and recover from unplanned network disruptions.

Disruptions to the mainline, especially in the Winnipeg to Edmonton, Winnipeg to Chicago, Edmonton to Vancouver, and Edmonton to Prince Rupert corridors, have the greatest potential impact on network fluidity given the sheer volume of traffic moving along a section of mainline versus less busy parts of the CN network.

Following an incident, CN looks for opportunities to reroute traffic around the disruption. This may include rerouting our customers' shipments over other railways at our expense in order to meet our commitments. While traffic may not move as quickly and efficiently on an alternate route compared to the higher speed mainline, it is still able to continue to move to end markets, which is paramount to our customers.

In order to speed recovery after an incident or a bout of extreme weather, CN develops a start-up plan that is put into action once the track is made passable, which includes determining how traffic will move. Reopening a line does not signal an immediate return to business as usual. The process of getting the network and equipment properly synchronized, and in the case of grain, regaining the proper balance of loaded and empty cars, can take as long as several weeks following a significant disruption. This was the case in February 2019 when, following weeks of extreme cold, the network was badly out of balance and several weeks of improved winter conditions were required to get the network back to normal winter operations.

To meet these ongoing challenges, and to improve the resiliency of the network, **CN is already well into the capital work programs supported by the $3.9-billion investment planned this year.**

The capacity improvements include the following:

Saskatchewan

- Construction of about 10 miles of double track near Atwater, east of Melville;
- Construction of about 10 miles of double track near Fenwood, west of Melville;
- Construction of about 8 miles of double track near Biggar, west of Saskatoon; and
- Construction of about 7 miles of double track near Clavet, southeast of Saskatoon.

Alberta

- Construction of about 12 miles of double track between Leaman and Niton, west of Edmonton;
- Construction of about five miles of double track near Entrance, east of the Alberta-British Columbia border;
- Construction of about seven miles of double track near Greenshields, east of Edmonton; and
- Building new tracks at Scotford Yard, northeast of Edmonton, to increase yard capacity for growing local demands.

Manitoba

- Construction of 6.3 miles of double track near Exira, west of Portage la Prairie.

British Columbia

- Construction of a new train passing siding at Port Edward, west of Prince Rupert;
- Construction of 2.5 miles of double track, west of Prince George; and
- Multi-year initiatives to increase capacity at the Port of Vancouver in collaboration with the Government of Canada and the Vancouver Fraser Port Authority.

Other basic capital program elements will focus on the replacement, upgrade and maintenance of key track infrastructure to improve overall safety and efficiency. **Those investments will also facilitate grain movement and will contribute to the efficiency of the end-to-end grain supply chain, of which CN is one component.**

CN is working diligently to ensure these projects are completed prior to the coming winter. Managing major infrastructure work on busy corridors is a highly complex task. It requires significant planning and resources, which CN has committed. It also involves some temporary disruptions of service to provide work crews with needed access to the network.

NATIONAL TRADE CORRIDORS FUNDING

On June 22, 2018, the Government of Canada announced funding for several key projects at the Port of Vancouver through the National Trade Corridors Fund (NTCF). This included funding for projects that will increase the rail capacity in the corridor leading to the export grain and other terminals on Vancouver's North Shore. CN is pleased to partner with the Government of Canada and the Port of Vancouver on these projects, which will help alleviate serious capacity constraints in future years.

The opening of G3 Terminal Vancouver on the North Shore along with the increase in capacity in many of the existing terminals will lead to a significant increase in the number of trains needing to move through the single-track CN tunnel and across the single-track Second Narrows rail bridge to reach terminals handling grain and other commodities. Access is further constrained by the need to raise the rail bridge for significant parts of the day to accommodate marine traffic. NTCF will enable CN to significantly increase capacity in the corridor by improving ventilation in the tunnel, reducing the time required between trains and enabling the construction of additional tracks outside the tunnel entrance, thus removing the need for trains to be held several kilometres away from the tunnel.

CN'S GRAIN MARKETING PROGRAMS

In recent years, CN has moved from a general car allocation program for the movement of bulk grain to various commercial programs tailored to the specific needs of its customers. Having consulted with its customers, CN has developed programs that enable customers to secure priority car supply. The result is a more timely allocation of hopper cars that better meets the needs of grain shippers.

CN offers the following auction programs under which customers bid to secure capacity in the CN fleet:

- CN Commercial Fleet Auction Program Western Canada Grain;
- CN Export Fleet Auction Program Western Canada Grain;
- CN Commercial Fleet A10 Auction Program Western Canada Grain; and
- CN Export Fleet A10 Auction Program Western Canada Grain

To provide performance certainty for both customers and CN, the programs include reciprocal penalties assessed on the basis of objective criteria, which maintains balance in the reciprocal obligations of both railways and shippers.

CN also offers fleet integration programs under which customers can place their own railcars into CN fleets and benefit from greater asset utilization and capacity:

- 2019 Western Canada Commercial Fleet Integration Program; and
- 2019 Western Canada Export Fleet Integration Program

In return for this equipment commitment, customers are provided priority car supply in relation to the supply they contribute to CN. Reciprocal penalties are also provided in case either party fails to meet its commitments.

Between these products as well as other commercial car supply agreements that CN expects to enter into with customers, CN anticipates that for crop year 2019–2020, over 90% of its hopper car fleet capacity will be subscribed under its commercial programs. CN has been able to design commercial programs that are consistent with the needs of its customers while also being balanced through the application of reciprocal penalties.

More details about CN's programs, guidelines and list of producer loading sites can be found at https://www.cn.ca/en/your-industry/grain/grain-documents-and-programs/.

CONCLUSION

COMMITMENT TO CONTINUOUS IMPROVEMENT AND NEW INVESTMENT

CN is committed to continuous consultation with stakeholders in the grain supply chain over the course of the crop year. Based on the supply chain and market analysis outlined in this document, CN believes it will have the resources in place to effectively and efficiently meet the demand to move the grain crop over the course of the 2019–2020 crop year. **CN continues to invest in the necessary resources at an unprecedented level in order to meet our commitment to move more traffic, including grain.**

CN has made significant investments that will increase overall capacity, improve the resiliency of CN's rail network, and improve CN's ability to recover from significant disruptions to its network.

CN is committed to adding capacity and aligning its resources to meet the demand. It is doing that by taking into account the limitations of the supply chain and its obligations to service other segments of the Canadian economy, and also recognizing that right-sizing its infrastructure is in the best long-term interests of the grain industry, as well as the other industries served by CN. Based on the best market forecasts available and recognizing there are external variables beyond its control, CN is confident this action plan will meet the needs of its grain customers.

We thank all stakeholders who took the time to provide their views on CN's grain plan. We want to work collaboratively with the industry respecting grain movements and believe this consultation was a success.

We will update this plan as estimates of crop production evolve. As in 2018–2019, we will voluntarily publish monthly updates to the 2019–2020 Grain Plan to reflect our performance to date and report on any significant events that may have temporarily impacted performance. We also intend to keep consulting the industry through the course of the crop year.

We welcome your ongoing participation in our many engagements with the grain sector throughout the year. Your input is always considered and your feedback confirms there is mutual benefit in continuing this way.


PRINCE RUPERT GRAIN LTD.

APPENDIX 1

DESTINATIONS FOR EXPORT GRAIN SERVED BY CN

The Port of Vancouver

The Port of Vancouver is by far the primary focus of bulk export grain movement from Western Canada. The emphasis on grain shipping through Vancouver is due to a number of factors. First, shipment to most major export markets for Canadian grain is, for the most part, the most cost- and/or distance-favourable via the Canadian West Coast relative to shipment east – this even applies to destinations in Europe and the Mediterranean. Second, the cost of moving grain from Western Canada to the Canadian West Coast is considerably lower than the costs of moving grain from Western Canada through the eastern grain supply chain (Thunder Bay–St. Lawrence). Finally, all of the major grain companies involved in export grain movement own their own terminal assets at the Port of Vancouver, meaning that these companies are able to capture all the profits associated with grain handling and trading relative to situations where grain companies must move grain through other parties' assets.

CN directly serves grain export facilities on the North Shore of Vancouver and at Fraser Surrey Docks along the Fraser River, in addition to receiving traffic at interchanges from Canadian Pacific Railway (CP). Cargill, Richardson, and G3 Canada Limited have major grain export terminals on the North Shore, while facilities such as Fibreco and Kinder Morgan are direct-hit facilities that ship lower volumes of grain. Grain is also delivered to transload facilities on the South Shore that transfer grain from hopper cars to export containers.

Traffic originating on the CN network is also interchanged with CP when destined to the South Shore of Vancouver. Viterra has two terminals (Cascadia and Pacific) on the South Shore, and other major facilities include Alliance Grain Terminal and Columbia Containers. It is important to note the efficiency of CP in moving traffic interchanged from CN to CP-served destinations on the South Shore of Vancouver and back to the interchange with CN has a direct impact on CN performance.

The Port of Prince Rupert

Prince Rupert Grain is the primary grain export facility at the Port of Prince Rupert. Three grain companies own the Prince Rupert Grain export terminal (Viterra, Cargill and Richardson). Prince Rupert Grain may allow the shipment of grain from other grain companies through the terminal, but the owners of Prince Rupert Grain ship the vast majority of grain through the terminal.

While grain companies place car orders with CN through CN's car ordering system, Prince Rupert Grain decides on terminal authorization for car orders, which in turn is driven by the timing of vessel freight and other factors. There are frequently situations where the car orders of grain companies for a given week exceed the number of cars authorized by Prince Rupert Grain, reducing overall supply chain capacity in the Prince Rupert corridor.

Grain is also delivered to Ray-Mont Logistics' transload facility that is able to receive unit train quantities of grain for transfer from hopper cars to export containers.

Prince Rupert capacity is generally used to the fullest extent possible from September through May, with grain companies typically reducing their relative shipment volume through Prince Rupert sooner than they would through the Port of Vancouver, but later than they would through the Eastern grain supply chain.

The Port of Thunder Bay

With the exception of a few companies, all of the major grain exporters in Western Canada own terminal assets wholly or jointly at the Port of Thunder Bay. The amount of terminal storage and throughput capacity at Thunder Bay is proportionally far greater in relation to the quantity of grain shipped through the Port than is the case at Vancouver or Prince Rupert. The number of "turns" that a grain terminal in Thunder Bay sees over the course of the crop year is significantly lower than for the West Coast terminals.

Throughput capacity is generally fully utilized at Thunder Bay from September through the middle of December. The close of navigation along the Great Lakes–St. Lawrence Seaway System generally occurs in the last week of December, and the loading of vessels in Thunder Bay generally does not resume until around March 25, depending on the severity of ice conditions on the Great Lakes. In years when ice conditions are extreme, vessel loading at Thunder Bay resumes as late as April 10–15. Unless export market demand for Canadian wheat and durum is unusually strong, the Thunder Bay shipment program generally slows in early May, leaving capacity utilization well below the level seen during peak demand between September and April.

MOVEMENT OF GRAIN IN OTHER CORRIDORS

While more than 80% of CN grain movement terminates at the ports of Vancouver, Prince Rupert, and Thunder Bay, grain originated by CN moves to a variety of commercial destinations within Canada, the United States and Mexico. Major destinations in Eastern Canada include wheat mills, malting plants and oilseed processing facilities, as well as transfer elevators and transloading facilities in the Quebec City and Montreal markets. Movement of grain to destinations within Western Canada is primarily to processing facilities and feed mills in the B.C. interior. Grain originated by CN destined for the U.S. market is primarily interchanged to other Class I railroads for movement to final destination, and as such, cycle times on CN-supplied equipment are driven in large part by what happens beyond the point of interchange.

PERMANENT

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