

2020–2021 **CN Grain Plan**





TABLE OF CONTENTS

1. Message from JJ Ruest	4
2. Executive Summary	6
3. 2019–20 Review	8
a. Results Achieved	8
b. Contextual Challenges	8
c. Look Back on Previous Plan and Lessons Learned	9
4. Key Factors Affecting Estimates	11
a. Growing, Harvest and Commercial Conditions	11
b. Rail's Intrinsic Realities	13
c. Current Capacity	14
5. The Grain Plan for 2020–21	16
a. Projected Volumes to be Moved	16
b. Grain Movement and Car Spotting Forecasts	17
c. New Investments and Best Practices	20
6. Post-Pandemic Recovery	22
a. Impacts on Grain Sector	22
b. Impacts of Other Commodities on Grain	23
7. Conclusion	25
Annexes	27
A. Tackling COVID-19 Head On	27
B. Grain Flow on CN Network	28
C. Grain Handling and Transportation System	31

PHOTO ABOVE:
Spruce Grove, AB

COVER PHOTO:
Acheson, AB

1 Message from JJ Ruest

CN is pleased to submit its 2020–21 Grain Plan – *Progress and Flexibility in the Face of Adversity.*

The Minister of Transport introduced new policy in 2018 whereby Class I railways in Canada had to submit annual grain plans. CN recognizes that this initiative has been helpful to increase supply chain performance and keep everyone focused on moving the grain crop.



The 2019–20 crop year was tumultuous and trying. Canadian farmers, grain companies and CN faced unprecedented challenges. They included inclement weather in the fall, trade disputes, labour interruption, environmental disruption like landslides, illegal blockades, and, to top it all off, a pandemic that plunged the economy and the world's supply chain system into uncharted territory.

While these significant factors have had a major impact on the grain supply chain, they also tested its resilience. At CN, we are pleased with the manner that we all worked together as ONE TEAM to overcome these challenges. In the end, we move more grain than ever, reaching record volumes and making 2019–20 our best crop year ever.

Looking forward to the new crop year, we are determined to be equally focused and flexible in meeting new challenges. We keep learning and there is no doubt in my mind that our ability to deal with and recover from the extraordinary obstacles we faced in the last year is largely due to the record-high strategic capital investments we made in the last two years; and more will be made during this crop year.



Maymont, SK

“We have moved more grain than ever and overcome many challenges, thanks to the network we have built in the last two years and the culture of resilience at CN.”



Overall, CN achieved record Canadian grain shipments in 2019–20, moving over 30 million metric tonnes (MMT) of bulk and processed grain products between carload and intermodal, exceeding the previous record set in 2018–19 by over one MMT. Although we achieved our best ever grain movement in 2019–20, we are far from complacent. We continue to make capacity-expanding investments to our network and to upgrade our railcar fleet, including the purchase of 1,500 hopper cars in 2020–21. With all those, we are on our way to reach continuously improved performances in 2020–21.

These investments benefit our grain customers as well as those customers from the other sectors we serve. We continue to work with our customers and their industry associations to extract accurate and timely forecasts on volumes and industry patterns as this is essential to our resource and service planning processes. Our focus on the safety of the communities we serve and of our employees is the cornerstone of our success and we fully understand the expectations of our customers, governments and the public on this front.

This Grain Plan builds on the experience and learnings of the past. Its objective is to ensure we have the resources and focus necessary to move the anticipated levels of grain during the coming crop year. It is purposefully designed to meet CN's long-term goals of strengthening the farm-to-global-market supply chain and enhancing Canada's reputation as a reliable and quality supplier to global grain markets.

All of us at CN firmly believe that we are well positioned to meet the transportation needs of our customers for the 2020–2021 crop year. CN is built strong, it is built to last; together, we will deliver.

A handwritten signature in black ink, reading "JJ Ruest". The signature is stylized, with the first letters of the first and last names being prominent.

JJ Ruest
President and CEO

A photograph of a grain train in a field. The train consists of several dark-colored hopper cars, some with orange accents, moving across a flat landscape. The foreground is filled with tall, golden-brown grain, likely wheat or barley, which is slightly out of focus. The sky is a clear, pale blue. The overall scene conveys a sense of agricultural productivity and transportation.

2 Executive Summary

CN has prepared this Grain Plan in accordance with the requirements of Canada's *Transportation Modernization Act* and with the input of its key stakeholders. It sets out the priorities, investments and measures CN has undertaken, and will make, to ensure the capacity required to safely and efficiently meet the demand for grain transportation in the coming 12 months.

During the 2019–20 crop year, CN, along with grain producers and handlers, faced a unique set of challenges. They ranged from service interruptions due to a labour dispute, illegal blockades, and landslides that incapacitated portions of its mainline in Western Canada. This was followed by the pandemic, during which CN did not stop operating despite its risks and the challenges brought by the virtual shutdown of the economy. The scale of what CN has faced has both tested and proven its resilience and flexibility.

In spite of these issues, CN can report a 2019–20 crop year record performance of moving over 30 million metric tonnes (MMT) of Canadian grain between carload and intermodal, with over 29 MMT shipped from Western Canada alone. This record comes as a result of several key factors. The most crucial was the \$7.4 billion in capital investment over the last two years to improve the efficiency and resilience of the network. These included strategic projects such as the acquisition and implementation of cutting-edge technology and modern equipment along with the addition and lengthening of passing tracks and twinning of key segments of the main line. And this year, because CN understands its key role in the economic recovery of Canada, it is investing another \$2.9 billion along with the purchase of 1,500 additional hopper cars, despite the financial impacts of the pandemic.

Other important factors have been the unfailing dedication of CN's workforce along with the adoption of best work practices, such as CN's commitment to transparency and two-way communication with farm producers and its customers. A key example was the creation of the CN Agricultural Advisory Council, an innovative venue for regular dialogue between members of the farming community and senior CN officials, keeping all abreast of the needs and the issues they face in getting their products to market.

Vegreville, AB



RECORD MOVEMENT OF GRAIN IN 2019–20 IN SPITE OF MAJOR CHALLENGES



STRATEGIC CAPITAL INVESTMENTS, EMPLOYEES' COMMITMENT AND NEW AGRICULTURAL COUNCIL WERE KEY TO SUCCESSFUL RESULTS



\$2.9B OF NEW INVESTMENTS IN 2020



ANTICIPATING MOVING 26 TO 28 MMT OF BULK AND PROCESSED GRAIN IN UP TO 7,600 CARS PER WEEK (6,100 IN THE WINTER MONTHS)

These initiatives enabled CN to increase its maximum sustainable grain supply chain capacity. The result is a system that can overcome challenges, recover operating levels quickly, and still move grain at, or near, record levels. **In the coming crop year, CN is well positioned to spot up to 7,600 hopper and tank cars per week outside of winter, and up to 6,100 hopper and tank cars per week during winter.** For bulk grain, these numbers include an increase of 350 car spots per week during winter and 150 car spots per week outside of winter for CN-supplied hopper cars alone when compared to the anticipated spotting capacity indicated in its Grain Plan of the last crop year, as well as increased shipments of bulk grain moving in private cars. They also include up to 850 customer-supplied cars CN expects to spot per week for processed grain products, canola meal, canola oil, and malt.

CN is confident that with the assets it currently has in place, the additional **\$2.9 billion** in capital investments already underway this year and the 1,500 hopper cars to be purchased there will be sufficient capacity to meet the anticipated demand to move grain efficiently and safely over the course of the 2020–21 crop year as well as to play its essential role in the timely delivery of critical inputs for crop production, such as fertilizer.

Spruce Grove, AB





3 2019–20 Review

When planning to meet the needs of grain producers for 2020–21, CN closely examined its performance for 2019–20, using it to draw lessons from the year’s results. This section discusses these factors.

a. Results Achieved

CN moved over 28.2 million metric tonnes (MMT) of bulk and processed grain products from Western Canada in hopper cars, tank cars and boxcars in 2019–20, exceeding the record set in 2018–19 by over 0.8 MMT. It also exceeded the upper end of the 25.5 MMT to 27.5 MMT range of grain movement CN had projected in its 2019–20 Grain Plan. In addition, CN moved over 1.1 MMT of grain from Western Canada via container (in addition to volumes shipped from Eastern Canada), which is not included in the 2019–20 Grain Plan projections. Consequently, movement of total Western Canadian grain in 2019–20 amounted to over 29 MMT.

b. Contextual Challenges

This CN performance represents a significant achievement considering the challenges faced in 2019–20. They include:

- **Harvest delays across the Prairies.** Exceptionally poor weather during the 2019 harvest resulted in significant harvest delays along with abnormally high volumes of tough, damp and poor quality grain, negatively affecting the pace of grain deliveries. Compared to historical volumes, grain movements recorded their biggest decline in September 2019.
- **Movement interruptions.** CN experienced interruptions of movement through an eight-day strike by the Teamsters Union in November 2019 and close to one month of illegal blockades in February 2020. Both these unfortunate situations halted traffic movements to varying degrees, creating significant backlogs that needed to be subsequently caught up once CN had recovered to normal operating levels.
- **Network velocity.** Following the derailment of a non-CN train, a Ministerial Order was issued for safety purposes, reducing the speed of crude and LPG trains. This affected the movement of all trains across the network. Fortunately, the Order was subsequently revised to provide for a more nuanced speed restriction allowing for safer operations with less drag on the overall network.

c. Look Back on Previous Plan and Lessons Learned

Important lessons can be drawn from the 2019–20 crop year. The first is how beneficial the capital investments in rail infrastructure and motive power over the last two years have been in delivering better results and overcoming the challenges. These improvements have formed the building blocks upon which CN has increased, and continues to increase, its capacity, recoverability and resilience.

In addition, the Agricultural Advisory Council has opened clear and direct lines of communications between farmers and CN. As a result, there is greater collective understanding of the issues that need to be addressed and the challenges inherent in a grain transportation system that is part of a multi-participant supply chain.

The creation in 2019 of the CN Agricultural Advisory Council, an initiative that allows CN to do things differently, has been important to help shape CN's Grain Plan and foster greater collaboration and transparency.



Another important factor has been the monthly updates and weekly reports that CN has voluntarily and proactively implemented over the last few years. In addition to fostering transparency, they have proven to be very effective in increasing flexibility, allowing all parties to be more responsive and adjust as necessary to deal with the fluctuations and uncertainties of the grain season, as they occur.

The very nature of any rail network makes it vulnerable to disruptions, such as the illegal blockades experienced in February 2020 and weather-related outages. CN invests heavily in technology to detect, mitigate and prevent such disruptions. With respect to protestor activism, despite CN's strong relationships with the communities in which it operates, rail, much like highways, bridges and pipelines, is inherently vulnerable to these situations. CN will continue to work with neighbouring communities and, when necessary, take action to protect its critical infrastructure, including legal action.

These lessons have been incorporated into this year's plan. In addition, although unforeseen events are impossible to predict, contingencies are constantly adjusted based on frequent communications with customers to update forecasts and understand the uncertainties that can impact markets and demand.





4 Key Factors Affecting Estimates

In addition to analyzing past results, detailed forecasted demand — including that of other commodities — is crucial in creating CN's Grain Plan.

The grain forecast is determined by using the best available estimates of crop production and quality, which hinge on constantly changing factors such as the growing season, harvest, and commercial conditions, as well as the inherent realities faced by rail transportation, which influence the pace of commodity movement.

a. Growing, Harvest and Commercial Conditions

Crop growing season and harvest conditions affect crop quantity and quality, which in turn influence grain transportation demand. While recognizing that favourable weather conditions — which are always unpredictable — are required to fully maximize crop yield potential, industry consensus is that baseline yield potential can be expected to increase two to three per cent annually as a result of improved crop genetics and management techniques. This type of increase quickly translates into upside on Western Canadian crop production towards 80 MMT within the next five years.

Commercial factors also need to be considered. They can come in many forms such as ongoing trade disputes and import restrictions, global competition, duties for certain commodities, diplomatic tensions and the uncharted economic repercussions of COVID-19. These conditions can affect rail traffic volumes in different ways; hence, making them a much needed part of the planning and frequent adjusting that continues once the plan is communicated.

Outdoor operations of the magnitude involved in the running of a rail business include intrinsic challenges and safety imperatives that must be met constantly.



- **COVID-19.** At the end of crop year 2019–20 and going into crop year 2020–21, the world economy had been severely hit by the pandemic. Market volatility, price fluctuations and economic uncertainty are now a reality. But the effects are not always negative. For example, specific to grain movement, there has been a spike in demand for Western Canadian grain exports as certain countries increase their inventories to ward off food insecurity.¹
- **Canadian dollar.** From June 2018 to January 2020, the Canadian dollar maintained a value between \$0.77 and \$0.80 US. It then started to drop, falling to a low of \$0.71 US (April 2020)², which has helped stimulate Canadian exports.
- **Trade issues and tariff barriers.** There remain a number of ongoing trade issues that have the potential to impact overall grain movement in 2020–21. At the time of writing, some specific restrictions with respect to canola exports to China are still in effect. Greater domestic canola usage and increased exports to the European Union and other destinations largely made up for reduced exports to China. However, changes in the situation concerning Canadian canola exports to China still have an impact on overall grain movement prospects and on traffic patterns and supply chain requirements, as would any changes in market conditions of such alternate export destinations. Any other trade disruptions related to import tariffs or other non-tariff trade barriers may also have a material impact on overall grain movement.

¹ Refer to Section 6 and Annexe A for more information of the pandemic's impacts.

² Now (June 2020) back up to \$0.74 – data from [Bank of Canada Website](#).

b. Rail's Intrinsic Realities

Difficult operating conditions and safety imperatives can have a significant impact on the end-to-end grain supply chain, regardless of the investments and best practices. As such, these challenges need to be part of any realistic plan.

- **Operational performance of terminals.** If CN must hold trains at origin or along the route to the destination terminal because it cannot accommodate the traffic, the resulting congestion may affect the grain supply chain upstream. Contingencies for imperfect origin to destination connections are in place but cannot be considered an unlimited safety net.

In addition, persistent heavy rainfall on the West Coast affect terminal operations, especially in the Port of Vancouver, as there currently remains no ability for grain vessels to be loaded during periods of inclement weather. As a result, CN must sometimes split trains to suit railcar unloading operations at export terminals. This situation directly affects the fluidity of the network. This perennial constraint deserves consideration and discussion with other grain supply chain stakeholders and government officials on possible solutions.

The terminal elevator system can also affect the supply chain performance. In years where crop quality is adversely impacted by weather, the complex mix of products and grades moving to port increases, adversely affecting grain supply chain performance. This is due to multiple commodities being frequently loaded on the same export vessel, which means more complicated terminal and rail operations for that vessel shipment.



- **Transportation demands for other commodities.** Due to COVID-19, experts are predicting weaker demand for other segments of CN's business through 2020. Although some may assume that this should free up rail network capacity for grain, it is not necessarily the case. CN right-sizes its resources in accordance with demand across all sectors and based on its customers' forecasts. Therefore, although this can result in greater flexibility, less demand for other commodities does not equate to an excess of resources. Above all, CN structures its plan on the basis of the volumes of grain the full end-to-end supply chain can handle efficiently on a sustainable basis.
- **Weather conditions.** CN moves grain in three main corridors: Vancouver, Prince Rupert and Thunder Bay. The closure of Thunder Bay during winter, which removes upwards of 1,000 CN unloads per week, significantly affects the overall capacity of the system. Extremely cold weather and heavy snowfall also hamper rail operations and network fluidity.³ To counter those, CN has put in place effective procedures. Safety imperatives also require that CN impose a four-tiered system of restrictions⁴, which come into effect as temperatures drop below -25°C.

³ Of note, it is the extended duration of extremely cold periods that has the greatest negative impact, not the numbers of occurrences.

⁴ Refer to CN's Winter Plan for details (www.cn.ca/winterplan).



c. Current Capacity

In order to have the flexibility to deal with the above-mentioned supply chain realities and challenges described in Section 3, CN has completed a record \$7.4 billion in capital investments in the past two years to increase its network capacity. In doing so, it has significantly enhanced safety — a core value at CN — and increased its resilience. Those investments resulted in:

- **Addition and lengthening of passing tracks (sidings)** where two trains can meet and pass safely.
- Close to 140 miles of **doubling sections of CN's mainline track** in Western Canada, including between Winnipeg and Chicago.
- **Increasing yard track capacity** in Winnipeg, Melville and Edmonton.
- **Eight automated track inspection safety cars.**⁵ These move in regular train service at track speed, and will create network capacity because track time is no longer consumed in carrying out these inspections as is the case with earlier generation inspection vehicles.
- **Seven automated car safety inspection portals.**⁶ These allow for the inspection of a train at track speeds versus a roll-by inspection at train departure from a yard, significantly reducing initial train start delays and improving yard capacity.
- **260 new locomotives**, the largest acquisition of the industry in North America, for a total fleet of over 2,200.
- **800 new hopper cars** (out of 1,000 ordered), totalling approximately 13,200 deployed primarily in Western Canada grain service.

Remaining committed to making CN the safest and most innovative railroad in North America for the benefit of all its customers, including those in the agriculture sector.

⁵ These cars are equipped with the latest sensor and artificial intelligence technology, allowing CN to assess, as trains go by, track gauge, geometry, and alignment in order to identify defects before they become an issue. These are in use on the CN network in a pilot project and do not replace the mandatory inspections as per regulation.

⁶ The safety portals have high-resolution imaging hardware coupled with powerful machine learning software. Personnel who perform the roll-by inspection can be freed up to work on repair and other tasks using their time more efficiently.

To further enhance its capacity and efficiency, CN has implemented the following operational procedures — or best practices — with a view to complement the capital investments, which increase capacity and maximize fluidity of the supply chain while improving safety:

- **Keeping trains as long as it is safely possible to do so** despite extreme drops in temperature. This is achieved through “distributed power,” a best practice of placing an additional locomotive in the middle or at the end of a train to better maintain air pressure, and by using “distributed braking cars” (also known as air repeater cars) to supplement the air supply to the train’s air brake system.
- **Daily contact** with grain shippers, inland and waterfront terminals, and other railways to manage the flow of grain and other traffic so as to match train delivery to vessel arrivals and to improve overall network fluidity.
- **Adapting the fleet (right-sizing)** through fully deploying cars at times of peak demand and placing them into storage when it declines so as to alleviate congestion.
- **Accepting orders of hopper cars⁷** only after ensuring that the receiving terminal can fully process them upon arrival.
- **Reducing response time to the events that CN cannot control by putting in place contingencies.** For example, if CN sees a severe weather event developing it may arrange for additional track patrols. It has on-call crews to remove debris from the track and stages emergency ballast and track panels so that it can respond quickly in the event of a washout or other track damage.
- **Re-routing traffic when disruptions occur** over alternate CN tracks or via other railways at CN’s expense in order to meet its commitments.
- **Formally involving a cross-section of industry leaders** with the creation of CN’s Agricultural Advisory Council (2019), to provide ongoing advice and feedback on grain production, market conditions and supply chain requirements, and allow CN to have real-time interaction with producers.
- **Proactively and voluntarily updating the Grain Plan monthly** on CN’s website to reflect changing conditions, and sending detailed weekly progress reports to its various stakeholders, also posted on CN’s website.
- **Increasing capacity with intermodal options within the Prairies.** Containers, which bring a variety of products primarily from Asia through Canadian ports to North America, would normally return to port empty. Not making full use of the available container capacity represents a lost opportunity for grain shippers. CN’s Saskatoon intermodal yard and the opening of the InterMobil East Regina Intermodal Terminal in 2019–20 increased the opportunity for grain producers to fill those containers and move them on CN tracks directly to Western Canadian ports and onwards to export destinations.

These investments and best practices result from successive planning exercises over the years. They stem from a careful analysis of past performances, lessons drawn from them, and extensive consultations with stakeholders.

⁷ 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, enabling them to secure priority car supply. The result is a more timely allocation of hopper cars that better meets the needs of grain customers.

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 customers.

CN also offers commercial car supply programs under which customers can place their own railcars into CN fleets and benefit from greater asset utilization and capacity. 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 commitments of each party are not met.

More details about CN’s programs, guidelines and list of producer loading sites can be found at www.cn.ca/grain-documents-and-programs.



5 The Grain Plan for 2020–21

This section opens with the expected volumes and related demand. It then presents the supporting car spotting forecasts, before closing on new investments and measures that will be added to those already in place, ensuring that the 2020–21 plan for moving grain unfolds successfully.

a. Projected Volumes to be Moved

Forecasting the volume of grain traffic to be moved during the crop year requires the assessment of three key items. First is **grain production**, which is the starting point and largest factor affecting the overall volumes to be moved. Second is the **carry-in** from the previous crop year, which is added to the crop volumes to reflect total supply available. Lastly, are exports and domestic usage, which must be estimated and deducted, leaving the balance as **carry-out** to the following crop year. The result of this analysis provides the estimated volume of grain to be moved during the crop year.

Agriculture and Agri-Food Canada (AAFC) projects overall 2020–21 All-Canada carry-in of the six major grains, peas and lentils to be below three-year average levels as well as being comparable to 2018–19 and 2019–20 crop year levels.⁸ Overall production and exports are projected by AAFC to be above three-year average levels and above 2018–19 and 2019–20 levels.

AAFC projects 2020–21 crop production of the six major grains (wheat, barley, oats, flax, rye and canola), plus peas and lentils to be 74.5 MMT, versus 72.8 MMT in 2019–20 and the three-year average of 71.5 MMT.

⁸ Based on its 2020 Outlook for Principal Field Crops:
www.agr.gc.ca/eng/crops/reports-and-statistics-data-for-canadian-principal-field-crops/

The carry-in from crop year 2019–20 is estimated at just 10.7 MMT due to record demand during spring–summer 2020, and AAFC expects 2020–21 exports to be slightly higher than the three-year average levels at 45.2 MMT.

Increased total supplies year over year, combined with slightly higher exports, translate into total projected carry-out for 2020–21 being marginally higher than the three-year average at 12.5 MMT. However, various sources indicated that favourable yield prospects in Western Canada could result in total available supplies exceeding the levels noted above, should final harvest results exceed the levels reflected in AAFC's forecast.

b. Grain Movement and Car Spotting Forecasts

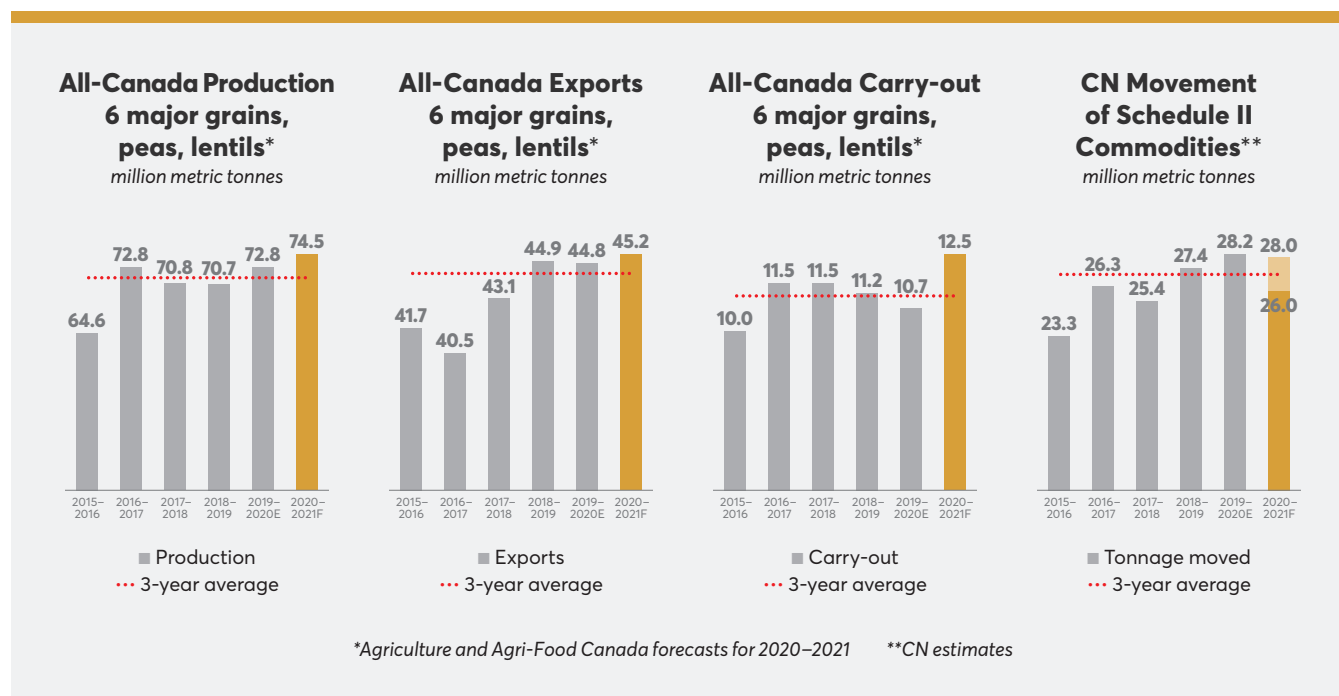
I. GRAIN MOVEMENT

Considering the above forecasts along with the key factors discussed in Section 4, **CN expects to move, over the course of the 2020–21 crop year, 26 to 28 MMT of grain** (excluding intermodal) volumes consistent with the range of the past three crop years. Grain volumes moved using intermodal equipment are in addition to this.

Experience shows that forecasts may not always reflect what turns out to be actual volumes. Therefore, CN will continue its practice of refining its assessment of anticipated volumes to be moved based on overall crop production and insights gained from maintaining open lines of communications and consultations with stakeholders in the grain supply chain.⁹

II. CAR SPOTTING

In advance of harvest, CN engages with its grain customers in order to review anticipated car supply requirements for the upcoming crop year along with the mix of commercial car supply products that they intend to utilize. CN anticipates that for the 2020–21 crop year, over 90% of CN-supplied hopper cars will be committed to customers in advance of harvest through commercial car supply agreements and other car supply products, with reciprocal penalties for both CN and the customer. CN makes commercial car supply products available to the market to ensure their widest possible application, with car block sizes of as few as 10 cars.



⁹ Grain producers, market analysts, grain companies, grain grower organizations and associations, western provincial agriculture ministries.

It is in CN's view that the supply chain system can accommodate — and CN can handle — the following monthly average of weekly hopper car spots, specifically for CN-supplied equipment and customer-supplied private equipment:

TABLE 1
Weekly Projected CN Spots of Bulk Grain and Processed Grain Product Equipment and Equivalent Tonnage

MONTH	GRAIN WEEKS	BULK GRAIN			PROCESSED GRAIN	2020–21 WEEKLY CAPACITY
		SYSTEM HOPPERS	PRIVATE HOPPERS	TOTAL	TOTAL	
August	1–4	5,800	950	6,750	850	7,600
September	5–8	5,800	950	6,750	850	7,600
October	9–13	5,800	950	6,750	850	7,600
November	14–17	5,800	950	6,750	850	7,600
December	18–22	4,500	750	5,250	850	6,100
January	23–26	4,500	750	5,250	850	6,100
February	27–30	4,500	750	5,250	850	6,100
March	31–34	4,500	750	5,250	850	6,100
April	35–39	5,800	950	6,750	850	7,600
May	40–43	5,800	950	6,750	850	7,600
June	44–47	5,800	950	6,750	850	7,600
July	48–52	5,800	950	6,750	850	7,600

When compared to the anticipated spotting capacity indicated in last crop year's Grain Plan, these numbers¹⁰ represent, for bulk grain, an increase for CN-supplied hopper cars of 350 spots per week for winter months (150 for non-winter months). Also, CN's guidance for weekly spots for customer-supplied private cars for bulk grain movement has increased relative to last year's Grain Plan guidance. In addition, CN expects to move 850 cars per week of processed grain products.

While private cars are dedicated to specific customers, the increased capacity they represent is beneficial to all grain shippers on the CN network. This segment of car supply has represented an increasingly larger proportion of overall bulk grain movement over the past five years.

The bottom line is more cars spotted means more grain shipped. Not only will CN be moving more carloads this crop year due to its expanded network capacity, but each new railcar, acquired as part of the capital investments made in 2018–19 and again in 2020–21, will also carry more grain. The percentage average size increase of the bulk grain hopper car has matched the percentage increase in the size of the Western Canadian crop. In fact, the average tonnage of bulk grain loaded and shipped per railcar over the past four years has increased by over 3% (or over three tonnes per railcar). This alone represents a greater increase in total tonnage shipped than the increase due to the additional car spots.



For planning purposes, shippers can anticipate CN's aggregate weekly shipping program will, on average, be reflective of the carload volumes indicated in Table 1 (on page 18). However, there will come a point in the crop year where demand for CN-supplied equipment will exceed the maximum sustainable capacity of the end-to-end supply chain in some weeks, especially during peak grain handling and grain companies' trading margin profitability periods (fall and winter). This will require CN to use an allocation process for its fleet.

As part of CN's railcar allocation process, all hopper car orders are reviewed in order to ensure that they are valid orders, including being subject to shipment authorization from the receiving terminal at the waterfront. CN first allocates railcar supply against valid orders tied to commercial car supply agreements, and any remaining car supply is allocated evenly across the remaining orders for each customer.

For a better understanding of the workings of the grain supply chain, readers are referred to Annex B and to podcasts available at the following link: www.cn.ca/grain-podcasts.

¹⁰ These numbers are based on maximum sustainable end-to-end supply chain capacity and are reflective of key assumptions: 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 its Winter Contingency Report); no significant labour, mainline or other major supply chain disruptions; a stable global trade environment; and no additional important material effect on demand for grain or the capacity of the supply chain due to COVID-19.

c. New Investments and Best Practices

In its planning efforts, CN takes into account the limitations of the end-to-end supply chain and its similar obligations to service other segments of the Canadian economy. In doing so, CN knows that right-sizing its infrastructure and resources is in the best long-term interests of the grain industry, as well as that of the other industries served by CN.

While most investments presented in Section 4 have turned into projects now concluded and equipment already in use, CN and its customers are further reaping benefits through the delivery, in 2021, of two automated track inspection cars and the last 200 hopper cars out of the 1,000 purchased in 2018.

CN is now undertaking the second phase of this program. In response to its customers' increased demand, CN will purchase **1,500 hopper cars in 2020–21**. Aside from handling more payload each, these new hopper cars — now totaling 2,500 purchased since 2018 — are shorter than the previous generation. This means that eight to 10 more hopper cars can fit on the same length of track at origin and destination terminals, which further increases the amount of grain moved per train, resulting in more network capacity. Ports of Vancouver and Prince Rupert will therefore benefit from more fluid rail operations.

Further, CN is continuing a number of major, multi-year, capacity-expanding projects at multiple strategic locations on the network:

- **Between Edmonton and the ports of Prince Rupert and Vancouver**, to accommodate future growth in the Prince Rupert corridor for grain, intermodal traffic, and coal, along with other commodities:
 - Three 12,000-foot sidings are being constructed between **Prince George and Prince Rupert**¹¹ and are expected to be in service in late 2020.
 - **At Prince Rupert**, the single track Zanardi Bridge, which is CN's main point of entry and exit to the port, is being upgraded, and two sidings are being constructed at Kaien.



- **In Vancouver**, all of these projects will help to further decongest the port area:
 - Two double-track projects totalling eight miles.
 - 12,000-foot by-pass track around CN Thornton Yard and 6,000 feet of track capacity within Thornton Yard itself.
 - The Thornton Tunnel ventilation project will allow trains to pass through the tunnel more frequently and better utilize capacity when the CN Second Narrows Bridge is available for transit.
 - 19,000-foot third track between the Thornton Tunnel and Thornton Yard will also increase North Shore capacity by allowing staged trains to be positioned closer to the CN Second Narrows Bridge, better utilizing North Shore capacity when the bridge is available for transit.
 - Vancouver Burard Inlet Line twinning project¹², will increase rail capacity by double tracking the 2.5-mile section of single track that connects the South Shore terminals to CN's North American rail network.

¹¹ Bulkley Canyon, Skeena, and Watson Island.

¹² Currently in its design phase.

CN recognizes that meeting growing demand and facing new challenges requires that it constantly review its infrastructure, resources, and work practices.

In terms of monetary value, out of the \$2.9 billion planned for in 2020–21¹³, CN is committing to the following that will positively impact the movement of grain this crop year and into the future:

- **\$1.6 billion on track and railway infrastructure maintenance** to support safe and efficient operations; including the replacement of rail and ties, bridge improvements, as well as other general track maintenance;
- **Approximately \$200 million on capacity initiatives**, which includes double tracks, sidings and yard track expansion projects.

With regards to best practices, CN will continue to encourage and assist customers and partners to adopt and apply the following:

- **Winter-ready infrastructure**, through releasing loaded freight cars with air hoses already connected and having the train line already charged with air from a mobile or fixed trackside air system. This allows trains to depart more quickly from origin and reduces cycle times.
- **Hook-and-haul operations** at grain elevators and other facilities in order to improve supply chain efficiency and network fluidity.

¹³ For details on all **\$2.9B** capital investments, refer to the press releases (www.cn.ca/capital-investments) of which the following is a summary:

- **British Columbia: \$445M** on adding track in yards to handle growing traffic, new sidings as well as in multi-year initiatives to increase capacity at the ports of Vancouver and Prince Rupert in collaboration with the Government of Canada, the Vancouver Fraser Port Authority, and the Prince Rupert Port Authority (the National Trade Corridors Fund).
- **Alberta: \$305M** on constructing double track to allow more trains to pass on the mainline and other maintenance track infrastructure projects.
- **Saskatchewan: \$105M** on the replacement of rail and ties, as well as the maintenance of bridges, level crossings, culverts, signal systems and other track infrastructure.
- **Manitoba: \$105M** on maintenance including the replacement of rail and ties, as well as bridges, level crossings, culverts, signal systems and other track infrastructure.
- **Ontario: \$310M** on intermodal facilities, the replacement of rail and ties, as well as the maintenance of bridges, level crossings, culverts, signal systems and other track infrastructure.
- **Quebec: \$235M** on various IT projects, Positive Train Control, the replacement of rail and ties, as well as the maintenance of level crossings, culverts, signal systems and other track infrastructure.
- **New Brunswick: \$20M** on rebuilding and strengthening bridges, the replacement of rail and ties, rebuilding road crossing surfaces as well as maintenance work on culverts, signal systems and other track infrastructure.
- **Nova Scotia: \$10M** on the replacement of rail and ties, rebuilding road crossing surfaces as well as maintenance work on bridges, culverts, signal systems and other track infrastructure.



6 Post-Pandemic Recovery

From the very early days of the pandemic, CN moved quickly to establish a safe working environment for its approximately 25,000 employees. The safety and health of each of them was critical to CN playing its role as an essential service provider to its customers and to the North American economy.

Just like when faced with adversity in 2019 and earlier in 2020, CN's employees stepped up and pulled together as **ONE TEAM**. In fact, approximately 20,000 operating employees have been in the field working every day of the pandemic, supported by another approximately 5,000 employees who have been running the railway from their homes. Their dedication and perseverance were instrumental in CN successfully overcoming the obstacles. This section covers how CN is adjusting to the new reality that the pandemic has brought about.

a. Impacts on Grain Sector

All segments of the end-to-end grain supply chain made significant changes to operating protocols in 2020 in order to mitigate the risks associated with COVID-19. But unlike many other types of rail traffic, overall demand for Western Canadian grain has increased since the beginning of the pandemic, both within North America as well as overseas. Record demand, combined with strong operational execution by CN and its increased capacity gained over the last two years, were the factors driving record bulk grain movement between April and July 2020.

Nevertheless, COVID-19 had multiple impacts on containerized grain movement. Grain shippers load millions of tonnes of grain annually into containers. The containers may be loaded inland in Western Canada or loaded at port. The major disruption of the manufacturing industry in China in particular due to the pandemic combined with the disruption of retail and commercial business in North America, caused severe disruption to the supply chain for containerized traffic in many forms. Specifically for the grain supply chain, reduced empty export container

Acheson, AB

availability was the first problem to develop, followed by a reduced number of vessel sailings, which prevented loaded product from leaving port, causing congestion on docks and at waterfront terminals. As a result, grain shippers were unable to send as much product by hopper car as they wanted to port for reloading into containers, and the reduced supply of containers in the Prairies meant reduced direct-to-port container shipments from Western Canada.

Given the uncertainty surrounding the future impacts of COVID-19 on the global containerized goods supply chain, this may remain a concern heading into the 2020–21 crop year.

b. Impacts of Other Commodities on Grain

CN expects the pandemic to continue to have more unforeseen impacts on grain movement throughout the 2020–21 crop year. The pandemic is probably the single most important factor that is likely to impact the economy and significantly reduce rail traffic of many other goods. However, on grain movement, protectionism may have a far greater impact (see Section 4).

Despite early signs of recovery in some sectors, all other commodities have faced a decline in volumes shipped to varying degrees. Carload volumes were down significantly across almost all North American railroads, ranging from 25% to 30% versus 2019 levels. It will remain to be seen which segments of business recover and which may remain at reduced levels for the foreseeable future. During this pandemic, CN did not — and will not — remain idle.

CN took advantage of the decline in its customers' demand to increase the number and average duration of 2020 workblocks. These are specific periods of time reserved to carry out maintenance and other capacity-expanding capital investment

projects, during which time trains are prevented from moving through the area where the engineering and construction activity is being carried out. But with the reduced customer shipments due to the pandemic, those usual traffic restrictions were avoided. And since CN expects to have completed its work on mainline corridors in advance of the peak 2020 grain season, track capacity will be freed up ahead of the usual schedule.

Although other segments of the agri-food supply chain experienced difficulties during the pandemic, the bulk grain supply chain was largely unaffected. CN moved more grain in April–May–June–July 2020 than it did in its history. It is important to understand that these results are not because CN was moving less of everything else, but rather, those record volumes are a reflection of an increased demand, limited only by the entire grain supply chain's capacity. They also result from CN's dedication to respond to the needs of its customers. To accomplish this, CN's Operations team went to great lengths, despite right-sizing fleets and crews as was dictated by reduced customer demand in other sectors.

CN's plan is built on what the supply chain can handle efficiently, even when peak volumes are present. Therefore, the return of normal volumes in other commodities is not expected to negatively affect the movement of grain, other than the usual ramp-up to recovery when the equipment is re-inspected and removed from storage, and crews must complete their compulsory safety refreshers. CN is committed to moving grain in accordance to the Grain Plan, no matter how other commodities perform.



Acheson, AB

7 Conclusion

Again, this year, in developing its Grain Plan, CN consulted widely with a large number of interested parties and stakeholders.

This collaborative approach is very much part of CN's commitment to a broader focus on increasing engagement with grain producers. This includes participation at major agricultural events, seeking out opportunities to present and discuss grain supply chain issues with producer organizations and being proactive in providing updates on grain supply chain performance.

CN is committed to continuous consultation with its customers and 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 has the resources in place to effectively, efficiently and safely meet the anticipated demand to move the grain crop over the course of the 2020–21 crop year.

CN thanks all stakeholders¹⁴ who took the time to provide their views on CN's grain plan. CN wants to work collaboratively with the industry with respect to grain movements and believes this consultation was a success.

In terms of contingencies aimed at implementing appropriate measures or taking timely actions to preserve or restore service when required, the Plan presented the following main elements:

- **Washouts or other track damages:** Adding track patrols, on-call crews, emergency ballast and track panels.
- **Fluidity:** obtaining terminal authorization before delivery and coordination with other key supply chain partners (vessels, water front terminals, stuffers, other railways, inland terminals and farmers). These also ensure that orders which exceed weekly supply chain capacity are identified as such.
- **Resilience,** which also includes the ability to catch up on orders missed when something does impede the delivery of empty cars.
- **Capacity:** maintaining strategic capital investments.

In addition, and as per previous years, the Plan will be voluntarily updated monthly and shared with all stakeholders as estimates of crop production evolve. These updates will reflect CN's performance over time and report on any significant events that may have affected it. CN also intends to keep up the consultations through the course of the crop year and to prepare weekly reports to scorecard performance against the Plan.

CN welcomes ongoing participation of the grain sector throughout the year. For that purpose, a short survey is available on CN's website and remains so for the remainder of the year. Input is always considered and participants' feedback confirms there is mutual benefit in continuing this way. Additionally, those who wish to be added to the recipient list for the monthly updates of the Plan can do so by sending an email at contact@cn.ca.

¹⁴ CN Agricultural Advisory Council (2 June); Alberta Federation of Agriculture (15 June); Keystone Agricultural Producers (16 June); Grain Growers of Canada's Transportation Committee (17 June); Prairie Oat Growers Association (18 June); Canadian Federation of Agriculture (19 June); Pulse Canada (23 June); Agricultural Producers Association of Saskatchewan (23 June) and all Western provincial ministries of Agriculture (Ministers, Chiefs of Staff, Deputy Ministers and policy Advisors).





ANNEX A

Tackling COVID-19 Head On

CN has an essential role to play in the North American economy, and that role has become even more obvious during the COVID-19 crisis.

Canada and the United States announced in March that the border between both countries would be temporarily closed to non-essential travel. CN worked with authorities on both sides of the border to emphasize that rail is essential to the delivery of goods. CN is pleased that this temporary closure does not affect rail shipments between Canada and the United States. CN maintains seven secure border crossings. Its experienced team of border experts are working with government officials to ensure goods get to market and that the border remains fluid.

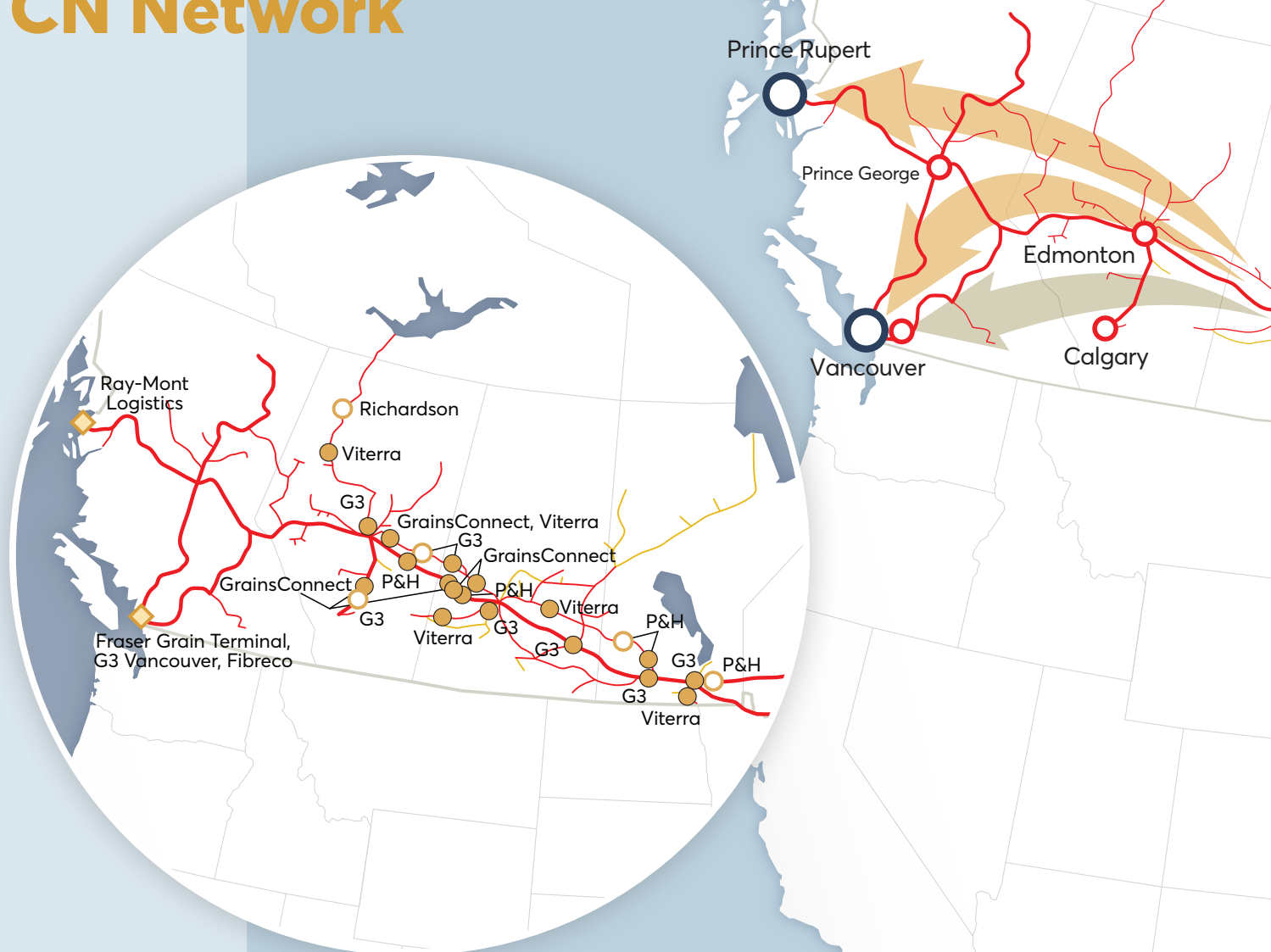
CN has taken concrete actions under the direction of its Occupational Health and Safety to fight COVID-19 and avoid its propagation within its ranks as much as possible. In doing so, it focuses on the safety of employees and safeguards the flow of traffic. To support this, strict physical distancing restrictions are being followed. This takes the form of holding job and safety briefings over radio and spreading out and isolating work areas in buildings. CN has split staff at the Rail Traffic Control (RTC) centres in Edmonton and Chicago into separate physical locations and provided dedicated parking and building elevators to RTC staff in downtown Montreal. It has increased the cleaning and disinfecting of work areas, kitchens, restrooms, and common areas, making more hand sanitizing products available as required. CN has also increased cleaning of locomotive cabs, and shut down the Homewood and Winnipeg training centres. Those employees who could work from home were told to do so. Last but not least, CN has introduced a policy by which all employees, contractors and suppliers must wear a mask when working on CN property.

More recently, CN has embarked on the second phase of its pandemic plan: embracing a new normal. In the best interest of its customers, partners and stakeholders, CN has adopted new and innovative ways to conducting business safely and successfully. For instance, CN has implemented a modern Work From Home Policy, which forms part of a greater package of instructions, directives or policies, all captured in a master document: *New Normality – The How-To Playbook*. The latter introduces, in a clear and organized fashion, how to work in the office or from home to ensure business success while preserving health and safety in this new reality.

The pandemic might have hit hard, but CN is built strong; it is built to last. It is also flexible enough to adapt to a new reality for the benefit of its employees and its customers.

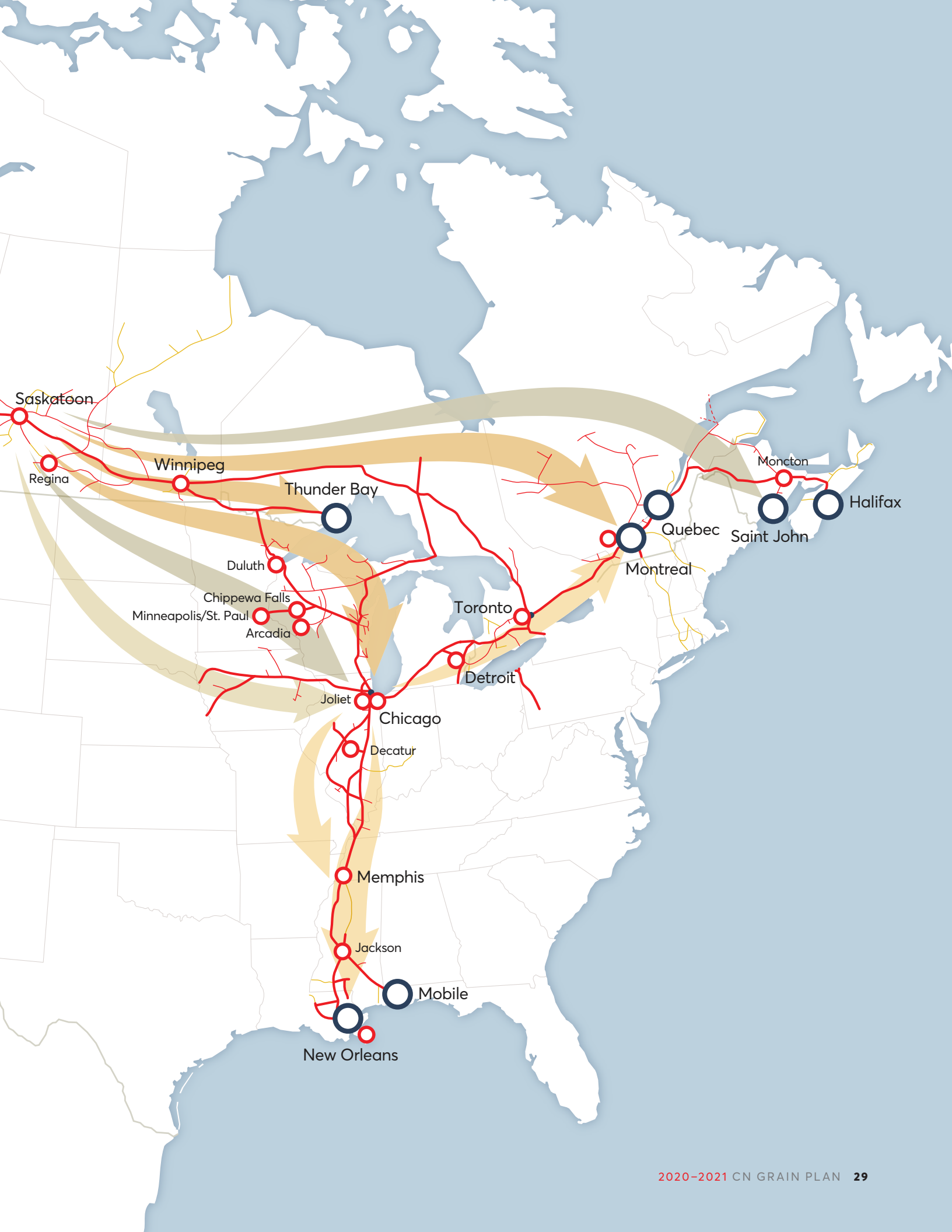
ANNEX B

Grain Flow on CN Network



**Western Canada CN-Served
Grain Network Expansion since 2015**

- Canadian grain
- U.S. grain
- Fertilizers – potash
- Fertilizers – other
- Ports served by CN
- Intermodal terminals
- Announced new grain elevators
- Completed new grain elevators
- Waterfront export facilities





Spruce Grove, AB

ANNEX C

Grain Handling and Transportation System

Feedback received during the course of CN's 2020–2021 Grain Plan consultations has shown that providing additional detail on the workings of the grain supply chain would be helpful to some. This Annex presents a pictogram for that purpose.

1 GRAIN MOVEMENTS BEGIN WITH A SALE

Grain companies enter into contracts to sell Western Canadian grain, at an agreed time in the future, to their customers in many countries around the world.



2 GRAIN IS DELIVERED TO A COUNTRY GRAIN ELEVATOR

Grain companies gather grain into prairie grain elevators from many producers who have the type and grade required to fulfill the sales contract — all grain starts in a truck from the farm-gate.



3 GRAIN COMPANIES ORDER RAIL CARS

As the sales contract date approaches, the grain companies order railcars from the railway and instruct the railway where to place the car (i.e. to which prairie grain elevators).



4 PIPELINE MANAGEMENT

CN works closely with grain companies and terminal operators to ensure the fluidity of each corridor. For instance, when a waterfront terminal is encountering weather challenges and cannot offload railcars, the grain companies will cancel some of their car orders into that pipeline to avoid worsening terminal congestion.



5 CAR SPOTTING

The railway delivers the empty railcars to the particular prairie grain elevators for that week, as determined by the grain companies.



6 CAR LOADING

Prairie grain elevators load railcars with the type and grade of grain specified by the grain company to meet their sales contract. The more rapidly the railcar is loaded and released to the railroad, the quicker it can be delivered to port, emptied and sent back to the country. Prairie grain elevator infrastructure varies resulting in different levels of efficiency (i.e. single car loading; block loading; unit train loading; loop track).



7 LOADED CARS ONLINE

Once the loaded railcars are released from the prairie grain elevator, the railcars begin their journey to destination. In most cases, this is a four- to five-day journey to the West Coast. However, there can be occasional rail network disruptions, or staging of trains en route at shippers' request to manage inbound pipelines and terminal capacity.



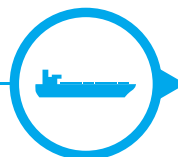
8 UNLOADING CARS AT PORT TERMINAL

Railways place the railcars at an export terminal, and the terminal unloads the grain to the storage silos or directly loads a vessel. The more rapidly the railcar is unloaded and released empty back to the railroad, the quicker the empty car can be sent back to the country. Availability of labour, weekend and holiday downtime, and planned and unplanned maintenance shutdowns can all affect the speed with which railcars are unloaded.



9 LOADING OCEAN-GOING VESSELS

Port terminals load grain into ocean-going vessels, either from storage silos or directly from arriving grain hoppers. Poor weather can delay vessel loading, which will slow or stop railcar unloading.





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