White Paper: RailState Data on Train Volume During a Crisis

At a Glance

- Current railroad data only gives system average train velocities for each of the major railroads, and the data is not real-time

- When crises strike, shippers need to understand the extent of damage, and the impacts on their shipments

- RailState's data provides overall network insight, as well as information on individual shipments

- The bottom line? Fewer supply chain disruptions during and after a crisis

Some Background

When crises strike, railways and shippers need answers fast. How has the average number of passing trains been affected along each line? What percent of pre-crisis level operations are still intact? And, once the crisis settles, how are railways affected on qualitative levels?

Answering these questions is crucial to maintaining effective, efficient rail operations; and yet, in both the US and Canada, the rail operating data collected and reported by regulatory agencies only gives system average train velocities for each of the major railroads; and the data is not real-time. In Canada, this data is reported in kilometers per hour, on a system average basis for the Canadian National ("CN") and Canadian Pacific ("CP") railways.

The Problem

The problem? The system average data can significantly understate the local impact of crises in rail operations; or, in the case of the recent washouts in British Columbia (Nov. 14th – Dec 6th, 2021), this system data was meaningless to shippers in BC. CN and CP each reported varying data regarding their trains' velocities.

As shown in the top half of Figure 1, the nationwide system average data reported during the washout crisis actually showed an increase in CN's system average velocity, while CP's average velocity declined to about 86% of the pre-crisis level. Shippers in BC had no service until the railways got the lines back in service (a heroic effort on their part to restore service so quickly); the system average statistics provided no useful information for a shipper in BC.

Figure 1
System Average vs. BC-Specific Rail Operating Data for CN & CP During Nov-Dec 2021 BC Washout Crisis

System Average Train Velocities
(km/hour, average for all commodities, per StatsCanada)

	Pre-Crisis (weeks beginning 10/30 and 11/6/21)	Average During Crisis (weeks beginning 11/13 - 11/27/21)	Post-Crisis (weeks beginning 12/4 and 12/11/21)
Canadian National	40.2	40.7	38.8
Canadian Pacific	40.7	35.0	38.7

System Average Train Velocities
(% of pre-Crisis level, average for all commodities)

	Pre-Crisis (weeks beginning 10/30 and 11/6/21)	Average During Crisis (weeks beginning 11/13 - 11/27/21)	Post-Crisis (weeks beginning 12/4 and 12/11/21)
Canadian National	100.0%	101.2%	96.5%
Canadian Pacific	100.0%	86.0%	95.1%

RailState, BC-Specific Data
(average number of trains per day, all commodities)

	Pre-Crisis (10/31-11/13/21)	Average During Crisis (11/14-12/6/21)	Post-Crisis (12/7 - 12/21/21)
W from Chilliwack or Mission	26.7	7.8	22.9
E from Chilliwack or Mission	23.5	6.2	20.5
W from Kamloops (CN)	17.4	4.7	15.3
W from Kamloops (CP)	12.1	6.3	12.3
E from Kamloops (CN)	16.9	4.1	17.0
E from Kamloops (CP)	13.8	5.8	13.1

**RailState, BC-Specific Data**
(% of pre-Crisis level, all commodities)

	Pre-Crisis (10/31-11/13/21)	Average During Crisis (11/14-12/6/21)	Post-Crisis (12/7 - 12/21/21)
W from Chilliwack or Mission	100.0%	29.2%	85.8%
E from Chilliwack or Mission	100.0%	26.4%	87.2%
W from Kamloops (CN)	100.0%	27.0%	87.9%
W from Kamloops (CP)	100.0%	52.1%	101.7%
E from Kamloops (CN)	100.0%	24.3%	100.6%
E from Kamloops (CP)	100.0%	42.0%	94.9%

The RailState Solution

This is where RailState comes in. We tracked the actual movements of trains before, during and after the three-week crisis period, and our data shows that the number of trains per day passing either Chilliwack (on CN) or Mission (on CP – both points just east of Vancouver) actually declined to an average of about 25%-30% of the pre-crisis level during the crisis period. (See the lower half of Figure 1.) Further to the east, near Kamloops, RailState's data demonstrates that train flows declined to an average of about 25%-50% of the pre-crisis level (depending on which route in the Kamloops area is analyzed).

Now, if you turn to Figure 2, you'll see daily data for the November 14th-December 6th, 2021 period shows that the rail traffic passing Chilliwack or Mission dropped to nearly zero for a nine-day period (November 15th-23rd, 2021), and then rebounded gradually over the following two weeks. How exactly did the rebound play out? Thanks to our data, we were able to see which commodities were prioritized and when. If you turn to Figure 2, you'll see the total number of trains passing Chilliwack or Mission plummeted from 28 trains to zero after November 14th.

Figure 2
Trains per Day Passing Chilliwack or Mission During BC Washout Crisis
(11/14 to 12/6/2021)
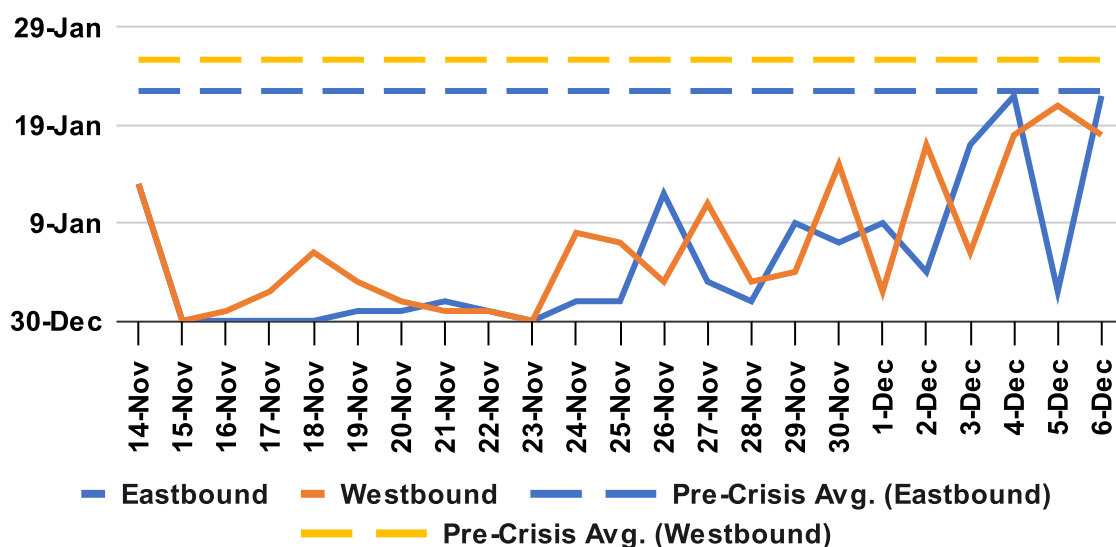
Numbers remained low until traffic slowly began to pick up again, with intermodal trains getting priority. Between November 24th and 29th, intermodal trains maintained a clear lead — four intermodals compared to three grains and one manifest on the 24th, for example. It wasn't until November 30th that manifest trains started moving in larger numbers. Potash trains got the lowest priority. Two potash trains passed on November 24th, and no trains passed again until November 29th (when two trains passed).

The data in Figure 2 is especially illuminating for shippers. Without a clear picture of which trains and commodities are moving and which aren't, shippers remain in the dark. Our detailed data helped them understand how the washouts affected their shipments. Our insight into the extent of lost traffic painted a picture of how long the recovery period would last for all trains and for individual train types.

In Conclusion

The bottom line? The BC washout had a major impact on both CN's and CP's operations; however, the system average data mandated by regulators provided no useful information for rail shippers in BC.

RailState's comprehensive, real-time data on rail operations is generated using our own proprietary system, completely independent of the railways. For the shippers affected by this crisis — and any other crisis — RailState's data served as a crucial management tool. It allowed rail customers, regulators and others to understand both the big picture of what was happening to each railway's local operations, as well as the more detailed picture of what was happening to individual shipments. Shippers engaged in real-time dialog with the railways, minimizing the impact of supply chain disruptions. Fewer supply chain disruptions equates to less money lost and more satisfied customers. And that is the RailState mission in a nutshell.

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