CANADA'S RAILWAYS

Extreme weather events in the railway industry

Canada's railway franchise

About the RAC

Class 1: CN, CP and US carriers

Short line: 50+ across Canada

Passenger: Commuter, Intercity, Tourist

500 rail industry suppliers.

Our network in Canada

Locomotives

2,842

in service last year and used to haul, on average 99 cars per train.

Rail Cars

5.2+ M

originated carloads in Canada.

Employees

31,780

dedicated railroaders committed to safety and excellence.

Customers

+10,000

companies using our network to compete in domestic and international markets.

Main-track kilometers

42,557

privately owned, operated and maintained.

Average length haul

1,524

kilometers.

Revenue per tonne-klm

3.16

cents to move one tonne of freight one kilometer.

Traffic

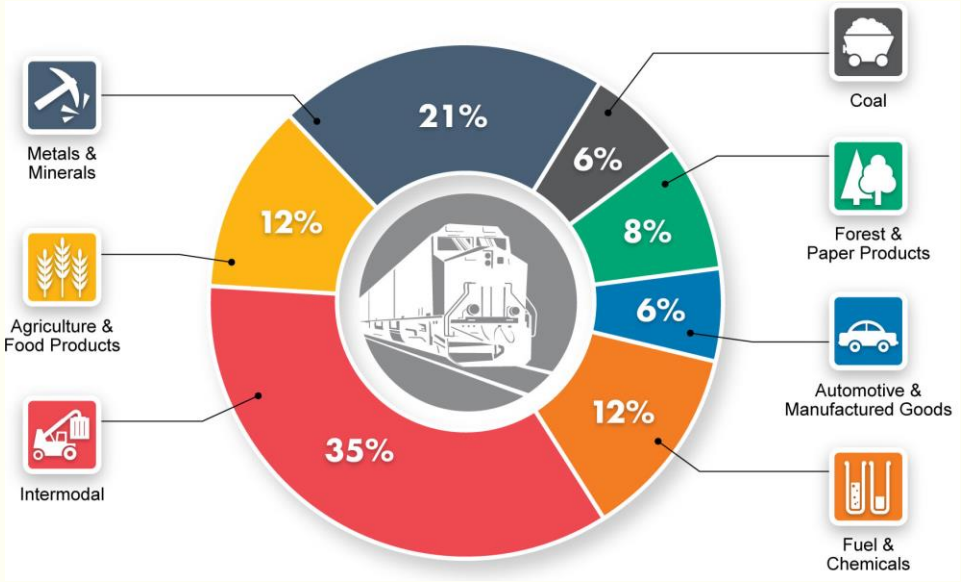
$310 B

in goods handled by our network in Canada.

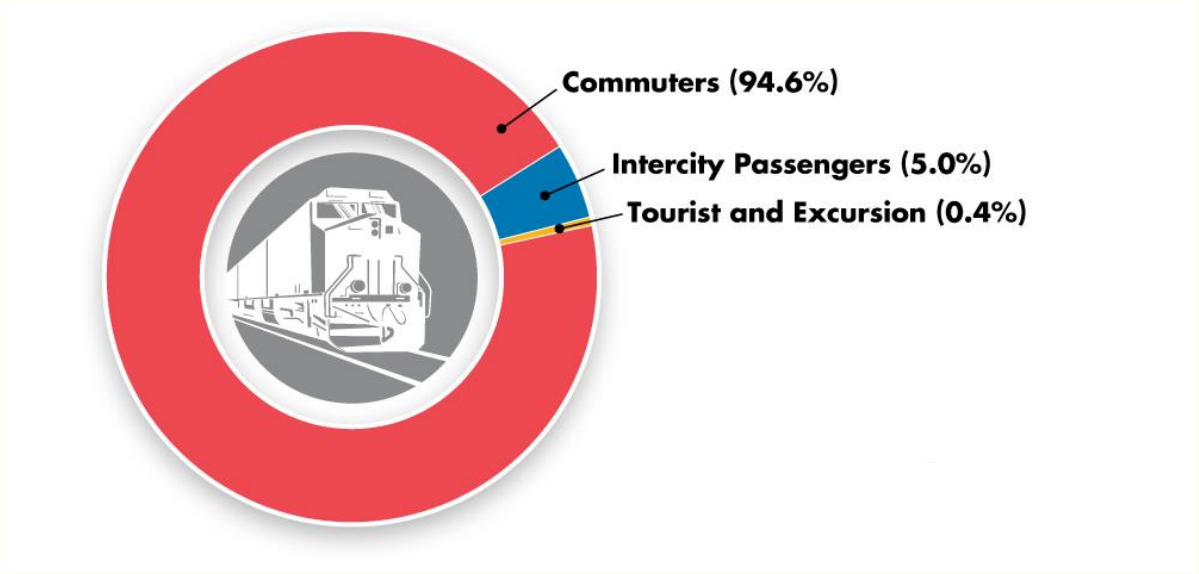
Source: RAC, Rail Trends 2018

Our portfolio

Freight rail

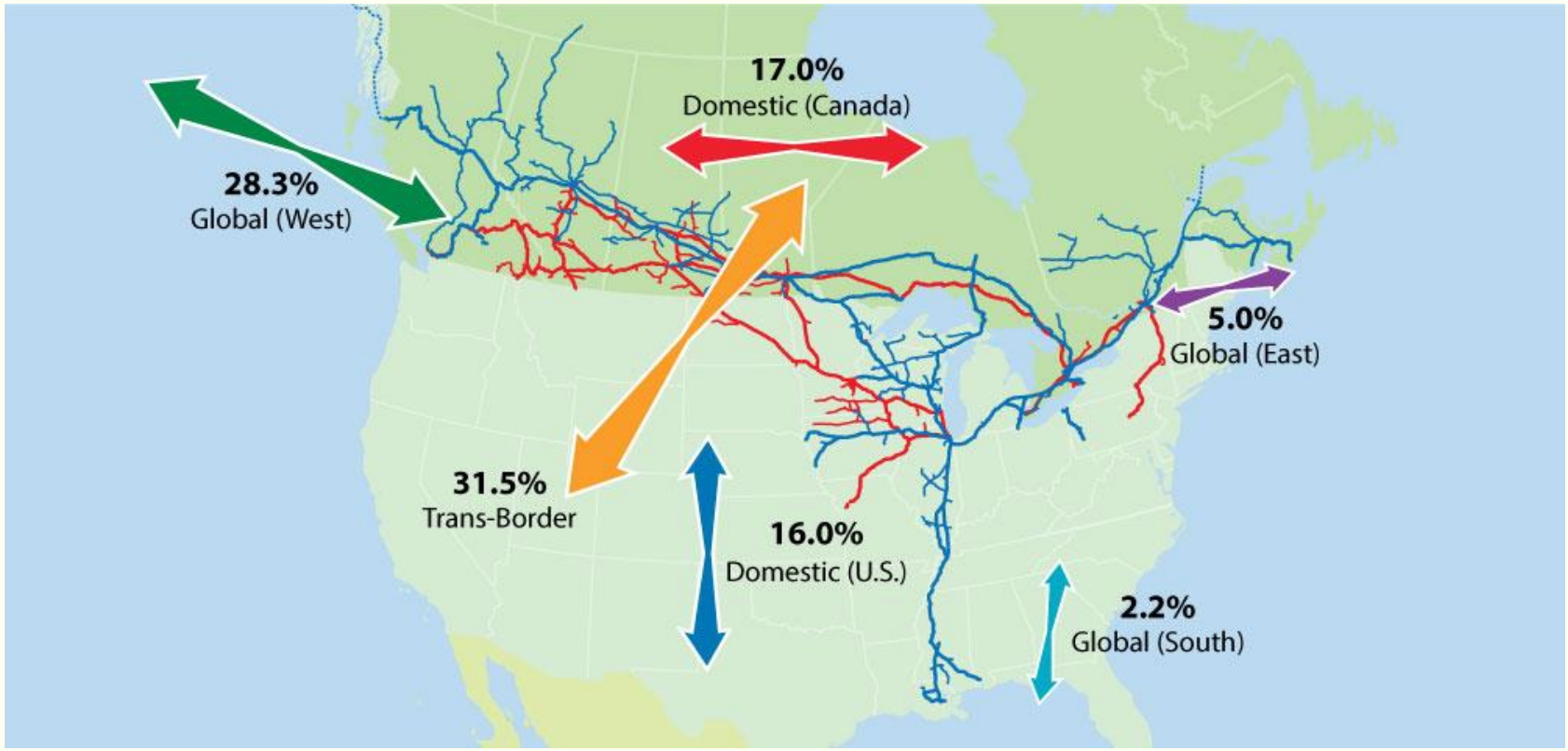


Passenger rail



Sources: Railway Association of Canada, 2019. Rail Trends 2017 database.

Rail trade profile



$310 B	Value of goods
50%	Canadian exports
75%	Canadian rail traffic is exported
Top Rail Exports	1. Agriculture and food 2. Grain 3. Forest products 4. Coal 5. Fertilizer materials
65%	Rail revenues generated by trade

Sources: Railway Association of Canada, 2019. Rail Trends 2017 database, CN and CP 2018 annual reports.

Severe weather challenges

High extreme temperatures	• Buckles and breaks • Temperature control failure/overheating • Rail expansion/contraction/sun-kinks • Impacts to shop operations, health and safety • Impacts to operations/mechanical failure
Low extreme temperatures	• Ice build up on rail, overhead wires • Public & employee safety hazards • Mechanical failure/air brake failure • Switch heater challenges/failure • Frost penetration/track bed issues
High winds	• Risks to rolling stock, falling trees, debris
Rain fall intensity, increase flooding	• Culvert failure, bridge stabilization • Scour of embankment material • Roadbed saturation/stability reduction/drainage • Track flooding (mainline shutdowns) • Access to rail yards, operational facilities

Toronto, Ontario (2013)

Sources: Canadian Press, July, 2013. Metrolinx.

Guttenburg, Iowa (March, 2019)

Source: Canadian Pacific, 2019.

Davenport, Iowa (April/May 2019)

Source: Canadian Pacific, 2019.

Halifax (2003) & Letellier (2011)

Source: CN, 2019.

Call to action

- Improve the ability to assess historical and projected climate probabilities and extreme weather events.
  - Hardening rail infrastructure is good management, and important to maintain operational resiliency – data is key.
- Recognize that not all railways are alike, support for shortlines is required.
- Chicken or egg? Leverage the environmental benefits of rail to reduce emissions in Canada.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