



Railway Association  
of Canada



# ***PEOPLE. GOODS. CANADA MOVES BY RAIL.***

Ben Chursinoff, Policy Analyst & Program Coordinator



## We're the voice of Canada's railway industry



Representing close to 60  
freight and passenger  
railways



With 60 industrial railways  
and rail supply company  
members



Over 100 Million  
passengers annually



\$320 billion worth of goods  
moved annually



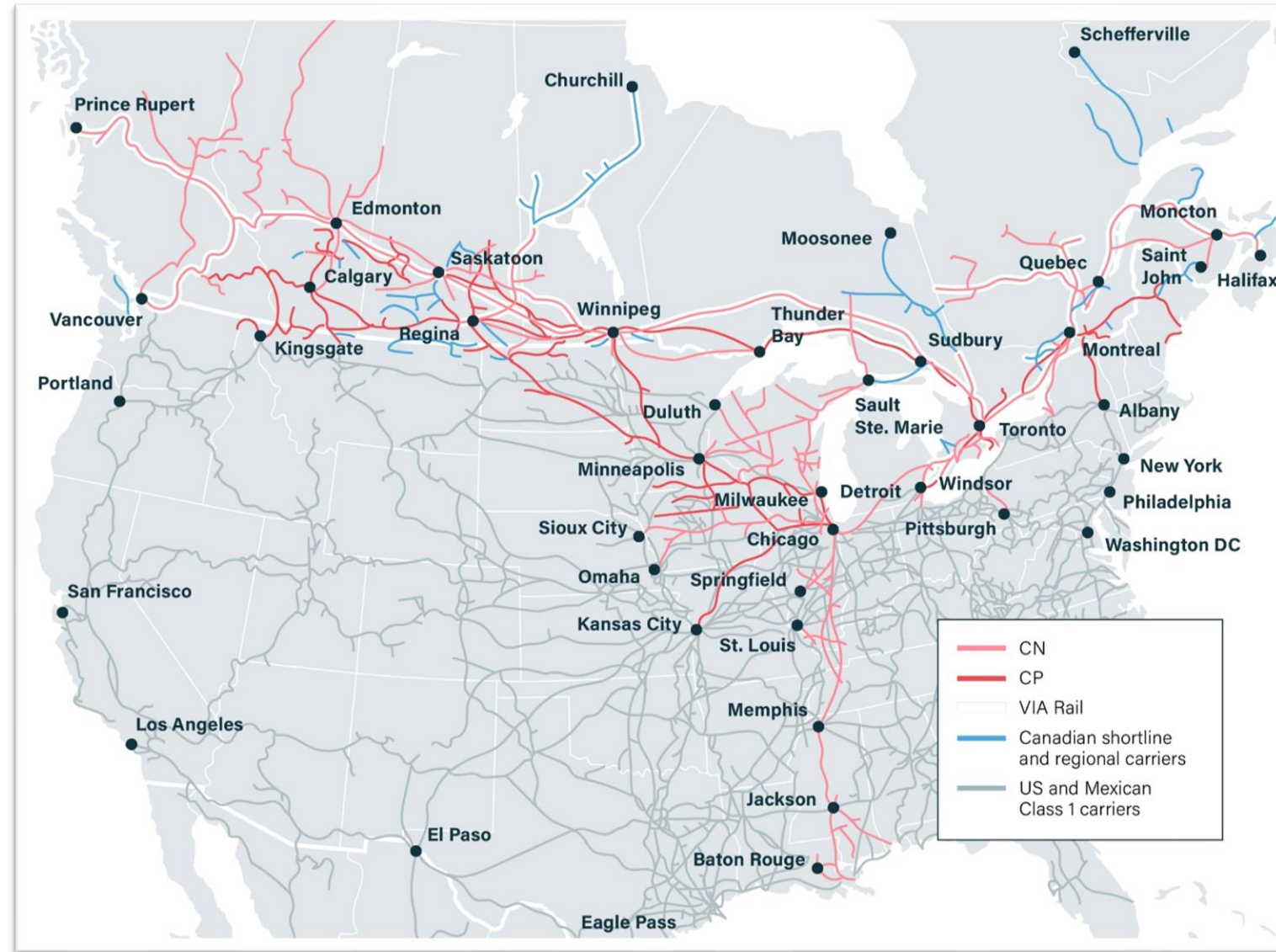


# Canada's Rail Network

5th largest network in the world

12% larger than highway system

Both Class I railways operate large U.S. networks



## Impact of Canada's Railways



Infrastructure

42,865

kilometers of  
track operated



Taxes

\$2.1B

paid in taxes in  
2019



Employees

173,000

jobs supported  
by rail<sup>1</sup>



Freight

455.8B

revenue tonne  
kilometers



Investment

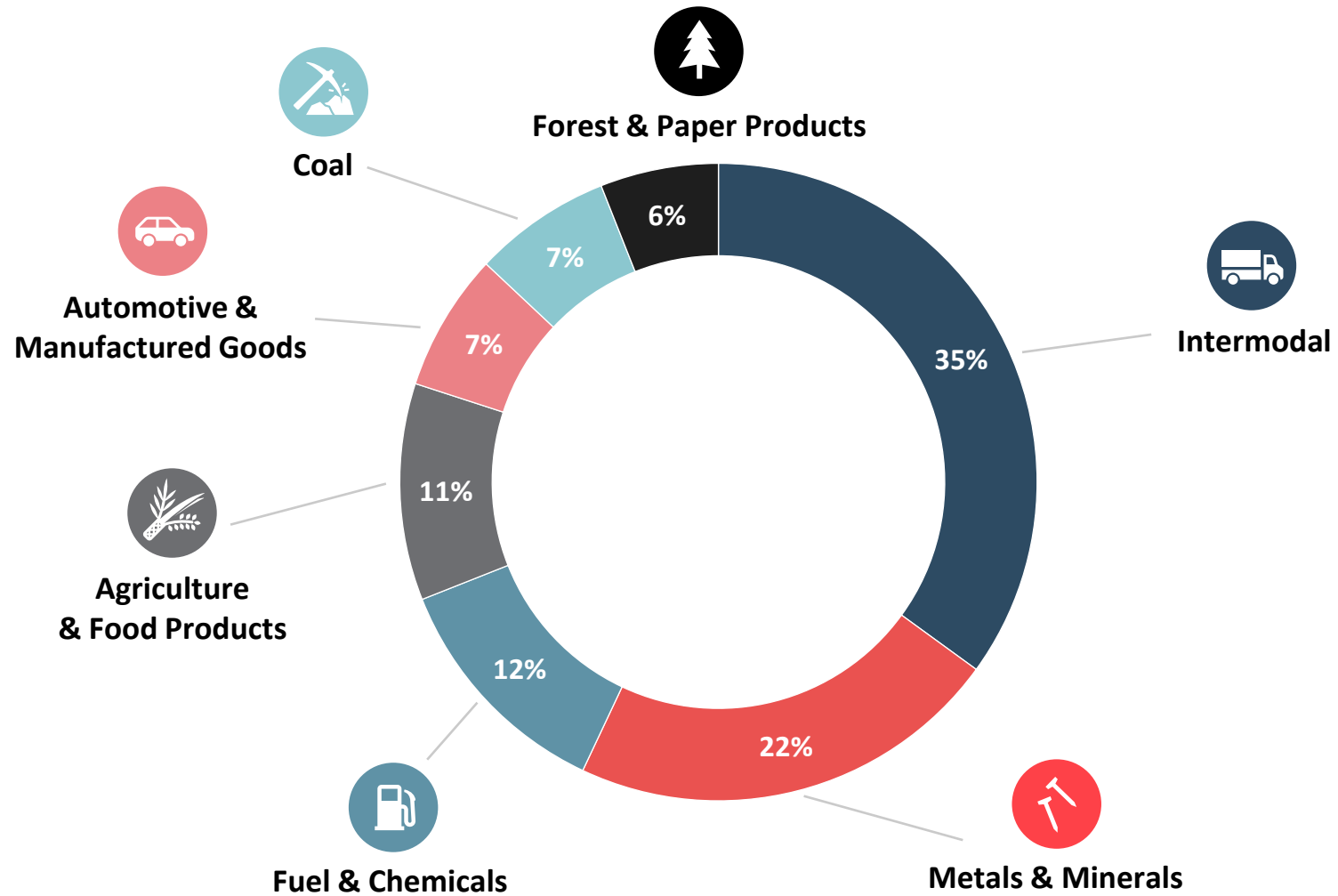
\$3.1B

in private capital  
investment in 2019

Source: Rail Trends Database | 1 Conference Board of Canada and RAC



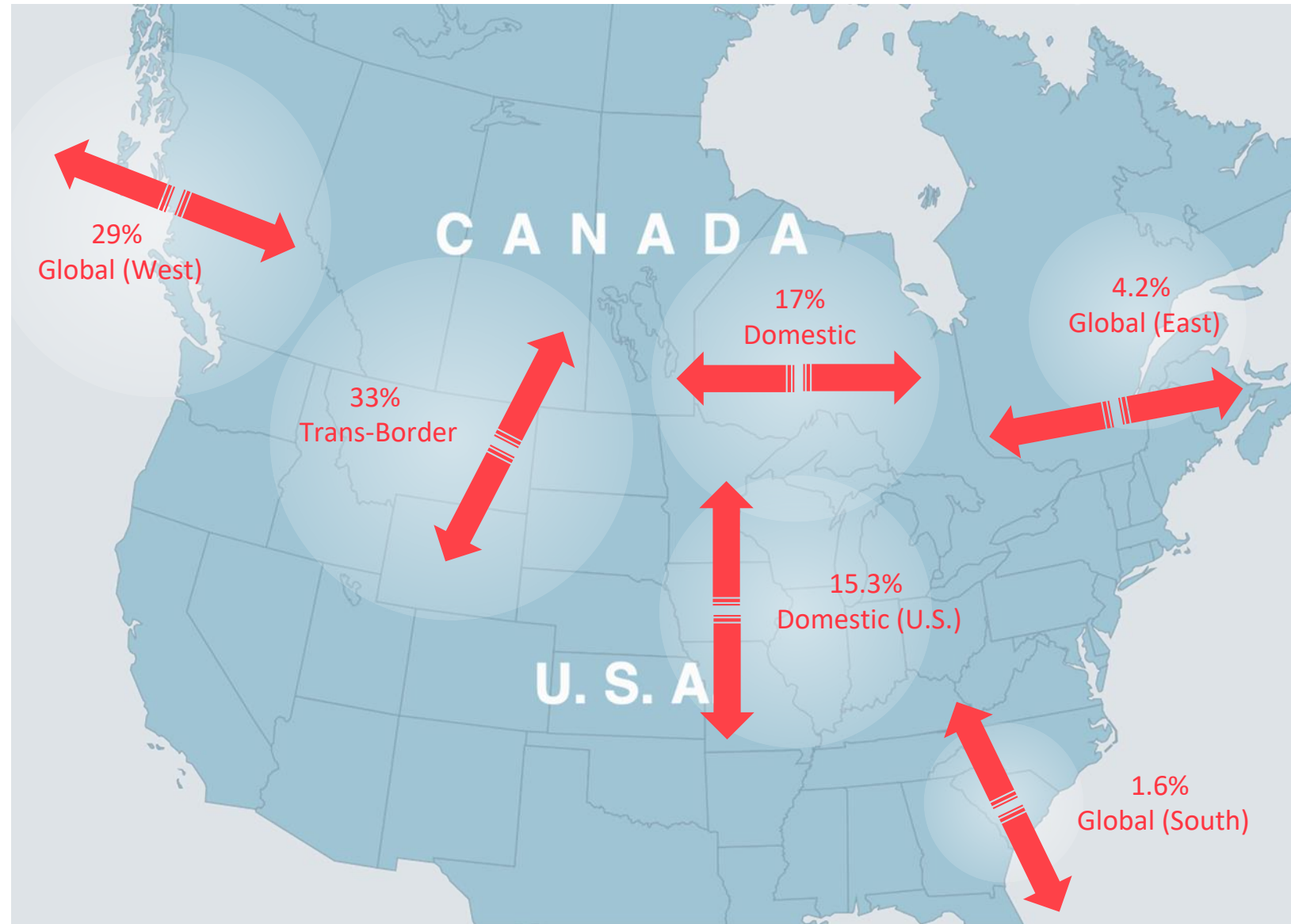
# National Freight Portfolio: Originated Carload Profile



# Canadian Freight Rail Trade Map

Our members move half the country's exports (by volume)

Railways move more intercity freight than any other mode of transport



Sources: CN 2019 Investor Factbook Update and September 2020 Investor Presentation; CP 2019 Annual Report and October 2020 Investor Presentation.





4.1 Megatonnes

Can be avoided if just 10% of truck traffic is shipped by rail instead, removing more than 3.6 million trucks off the road instead.

## Environmental Benefits of Rail



1 train = 300 trucks

One unit-train of freight can remove upwards of 300 trucks from our congested roads.



4x more efficient

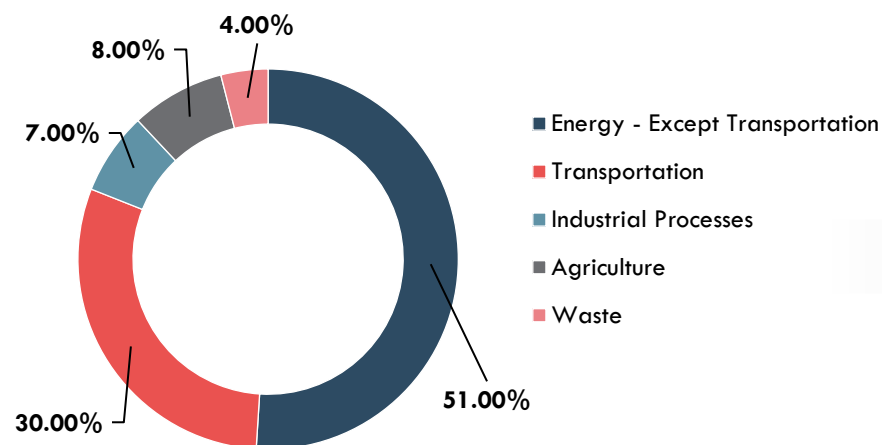
On average, railroads are 3-4 times more fuel efficient than trucks.



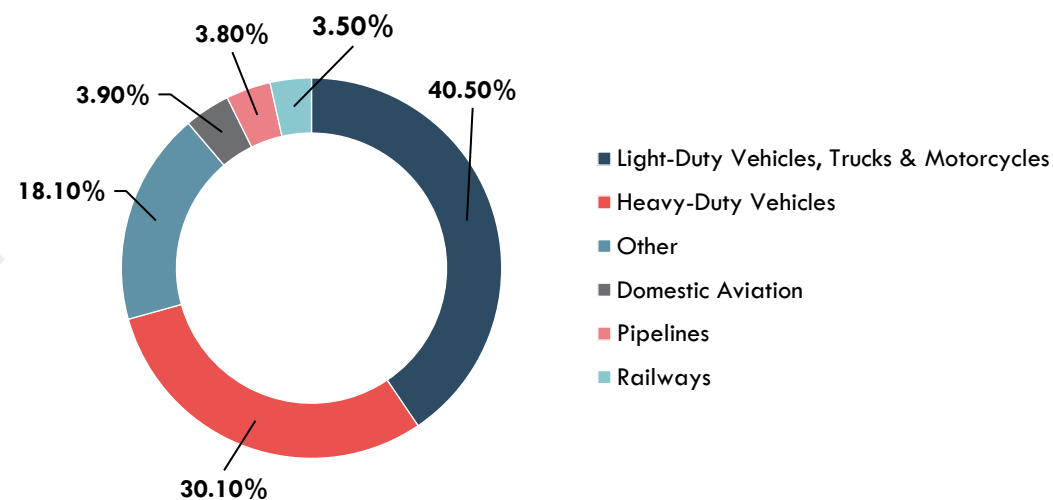
# GHG by IPCC sector

- In 2019, the transportation sector accounted for 217 Mt (29.7%) of Canada's total 730 Mt of Co<sub>2</sub>e.
- Railways accounted for 7.7 Mt of Co<sub>2</sub>e – only 1 percent of Canada's total emissions, and less than 4% of total transportation emissions.

Canada's GHGs by Sector - 2019



Greenhouse Gas Emissions by IPCC Sectors - 2019



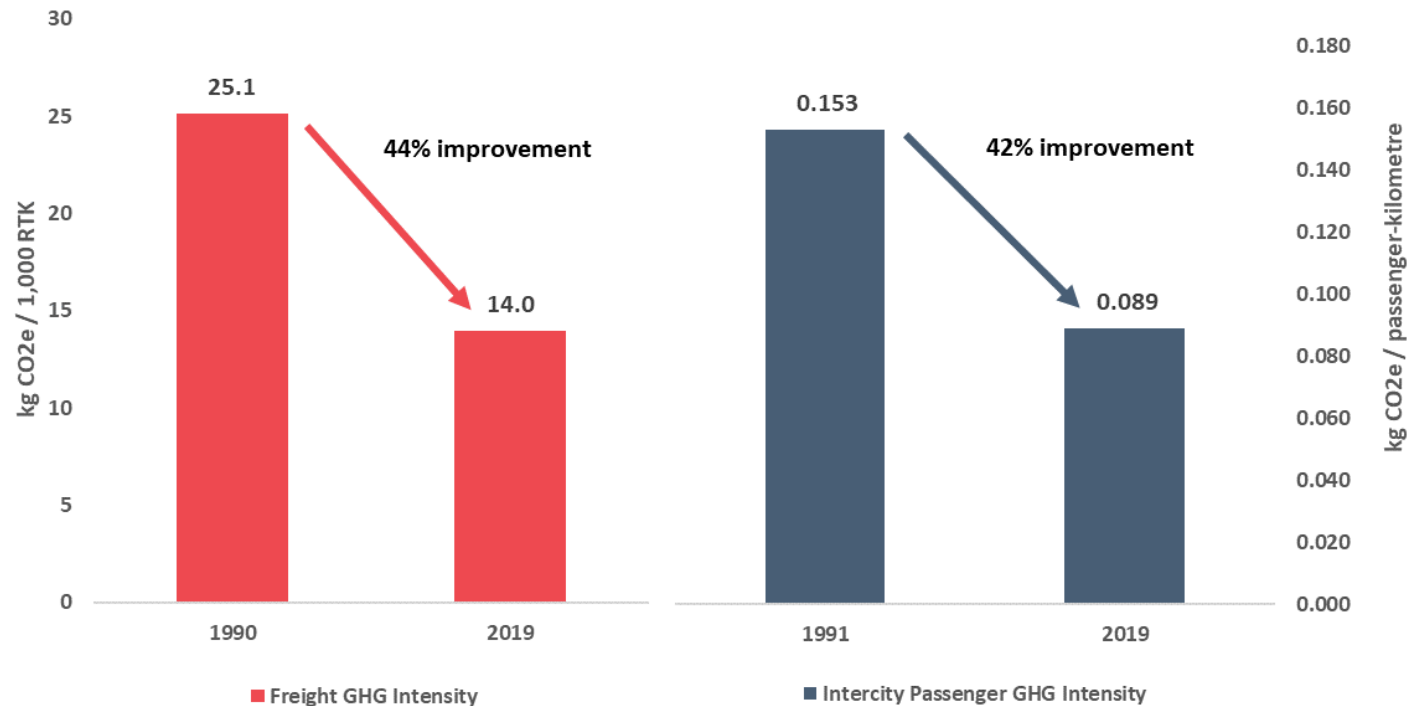
Note: Other includes propane & natural gas vehicles; off-road transportation; and marine.





# Locomotive Emissions Monitoring

Improvement in GHG emissions intensity



Since 1990/91, both freight and intercity passenger railways have improved their emissions intensities by over 40%.

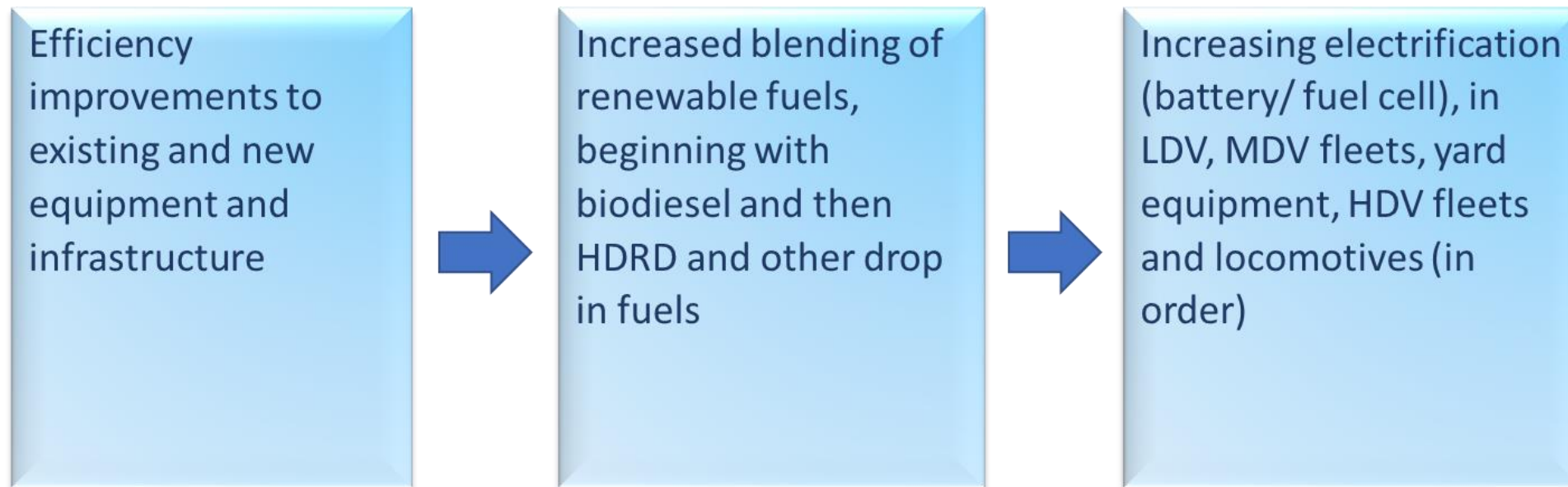


# Rail Pathways Initiative: Phase 1 – Landscape Document

- Partnership between RAC and its members, Transport Canada, Environment and Climate Change Canada, and Natural Resources Canada to identify further opportunities for decarbonization
- Objectives:
  1. Develop a common understanding of the current state of rail sector decarbonization in Canada, which can be used as a tool for collaboration between industry and government;
  2. Create a repository of current federal, provincial and territorial GHG reduction legislative instruments and activities impacting the rail sector; and
  3. Contribute to next-phase work on a roadmap to achieving future GHG reductions in Canada's rail sector.
- Phase 1 report - [https://www.railcan.ca/wp-content/uploads/2021/06/Rail-Pathways-Initiative-Landscape-Document\\_FINAL.pdf](https://www.railcan.ca/wp-content/uploads/2021/06/Rail-Pathways-Initiative-Landscape-Document_FINAL.pdf)



# Rail decarbonization will look like...



# Rail Pathways Initiative: Phase 2 – Rail Decarbonization Roadmap

- Objectives:

1. Develop an analytical framework for assessing GHG reduction opportunities in Canada's rail sector.
2. Identify and assess potential GHG reduction measures.
3. Create a multi-stakeholder work plan and initiate a Roadmap implementation strategy



# Analytical Assessment Framework





# CP Hydrogen Powered Locomotives

(Pilot Project) Launched in the Fall 2020, CP plans to develop North America's first freight-line hydrogen-powered locomotive.

- Program aims to retrofit a freight-line locomotive with hydrogen fuel cells and battery technology
- Builds on prior experience with low-emitting locomotive technologies, including biofuels, compressed natural gas and battery-powered solutions.
- Field testing commencing Q1 2022



## UBC Okanagan – SRY Switcher Locomotive

- Converting a switcher from diesel-electric to hydrogen-electric power
- Partnership between University of British Columbia Okanagan School of Engineering, Southern Railway of British Columbia Ltd., Loop Energy, and Hydrogen in Motion.
- Intended to demonstrate the viability of the technology, GHG reductions and impacts to community



# Hydrail Railway Transition in Canada: Technological, Operational, Economical, and Societal (TOES) Barriers and Opportunities

- Transport Canada engaged a firm to assess the implications of a conceptual transition from diesel to hydrogen as the primary fuel to power Canada's railway services, inclusive of freight and passenger modes
- Hypothetical transition model was constructed, consisting of a period of initial prototyping and testing of hydrail systems from present day to 2030, followed by a period of aggressive deployment to 2050
- The cost of a full transition scenario is estimated at \$30 billion in locomotive and tender equipment and infrastructure
- The report suggests that a joint Canada-U.S. initiative involving government and industry would help advance commercialization, as the freight and passenger operations are continentally integrated.



# Thank you - Merci



Comments or questions can be directed to:

Ben Chursinoff

Policy Analyst & Program Coordinator

[bchursinoff@railcan.ca](mailto:bchursinoff@railcan.ca)

Railway Association of Canada

99 Bank Street, Suite 901

Ottawa, ON K1P 6B9

(613) 564-8090

[www.railcan.ca](http://www.railcan.ca)

