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Laying track for the future success of freight railroads

September 30, 2022

Executive summary

Precision Scheduled Railroading has been an enormous success, generating substantial benefits for Class I railroads and their investors. Most Class I's have now implemented PSR to some degree. What's next for the freight rail industry?

Railroads are now facing constrained network capacity and market share erosions to the trucking industry. The industry is currently struggling with labor shortages as well as external shipper, regulatory, and investor pressure.

How will the industry evolve? In this point-of-view we will discuss potential paths forward. How will railroads benefit from collaboration – either with each other or with third parties – to gain economies of scale, use investor capital efficiently, and increase commercial opportunities for their business?

Over 700 railroads in North America encompass seven Class I railroads, regional railroads, and shortlines

Freight railroads are organized into carrier classes based on annual operating revenues

Class I railroads

- Major railroad networks in North America
- Provide heavy bulk commodity and intermodal transportation
- CN and CP (Canada HQ); BNSF, CSX, KCS, NS, and UP (US HQ)
- US Class I railroads account for ~70% of freight mileage, 88% of employees, and 94% of industry revenue
- Over CAD $250M revenue (Canada) & over $505M revenue (US)

Class 2 and 3 railroads *(Shortlines, Terminal, Industrial Railroads)*

- Connect local and regional railways to Class I networks
- Provide first- and last-mile service for shippers
- Shortlines account for ~20% of freight carloads in Canada and US
- Terminal and industrial do not usually operate trains; instead, they perform switching services and provide important rail infrastructure

+160k **route miles across US and Canada**

205m **short-tons of inter-NA rail trade flow***

~33% **of US exports move by rail**

~40% **of US long-distance freight ton-miles**

+25.3% **5-year inter-NA rail trade flow growth***

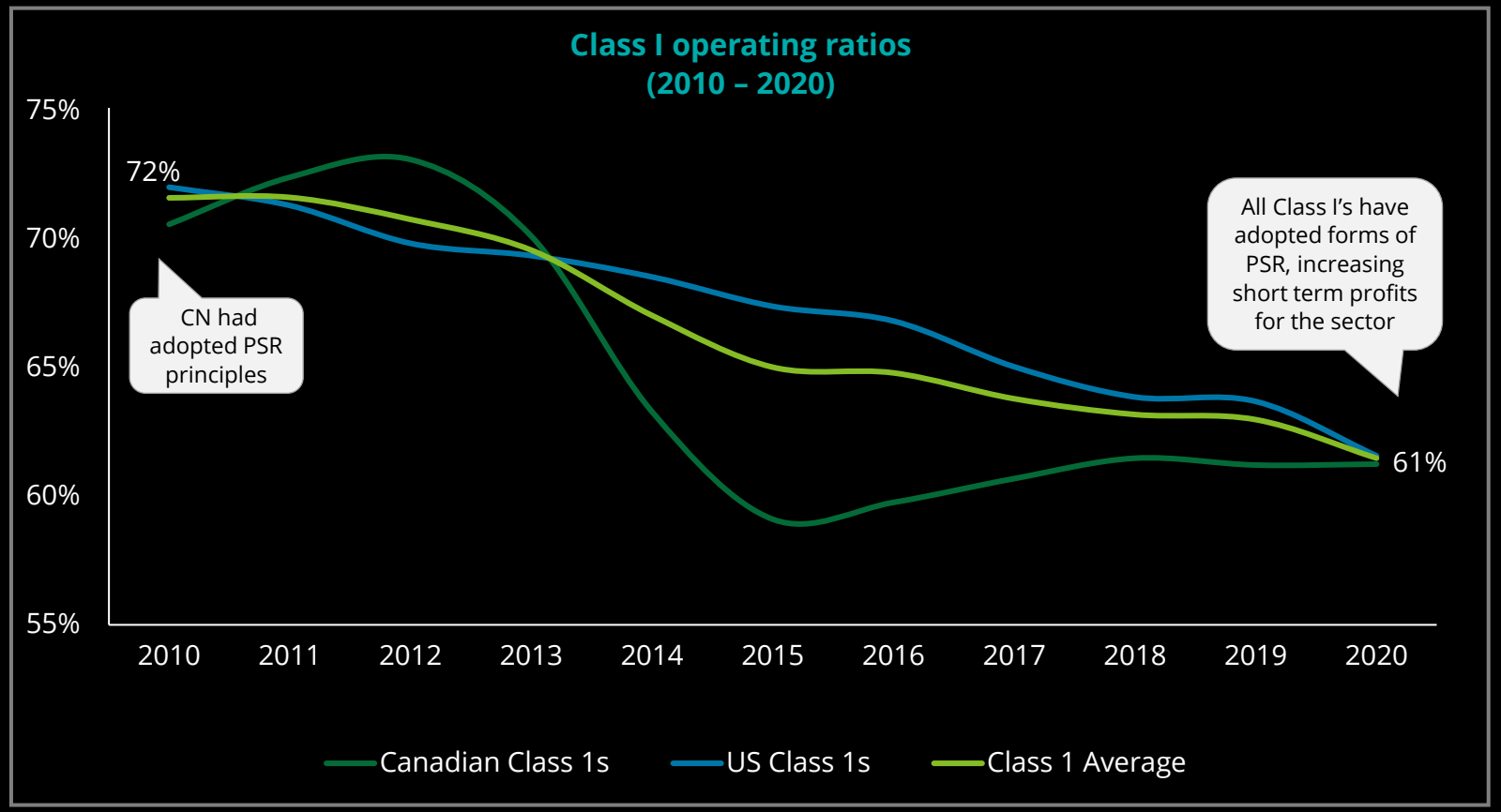
+4.6% **5-year NA rail trade flow CAGR***

The North American Railroad network is critical to intercontinental trade, facilitating large-scale import and export of goods across Canada, the US, and Mexico

**figures as of 2021*

Source: US Bureau of Transportation Statistics, Dr. Jean-Paul Rodrigue - Hofstra University; American Association of Railroads, US Surface Transportation Board, Canada Carriers Information Regulations, Statistics Canada

Over the last decade, many North American railroads have adopted Precision Scheduled Railroading (PSR), resulting in strong operating results



Benefits of PSR

- **Lower costs, higher profitability**
- **Improved asset utilization**
- **Improved operating safety**
- **Greater reliability, more fluid networks**
- **Standardized customer delivery**

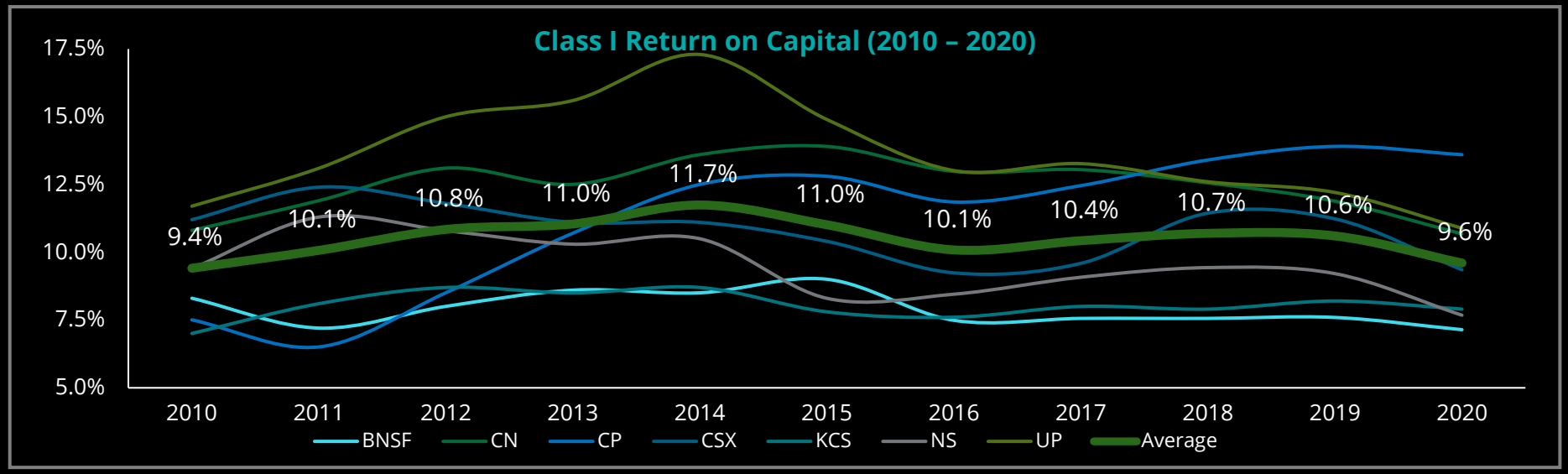
Implementation effects of PSR:

Railroads became lean: they shed assets (rail cars, locomotives, and employees, and, in some cases, network infrastructure) and some even contracted out functions, including track maintenance and switching and terminal operations

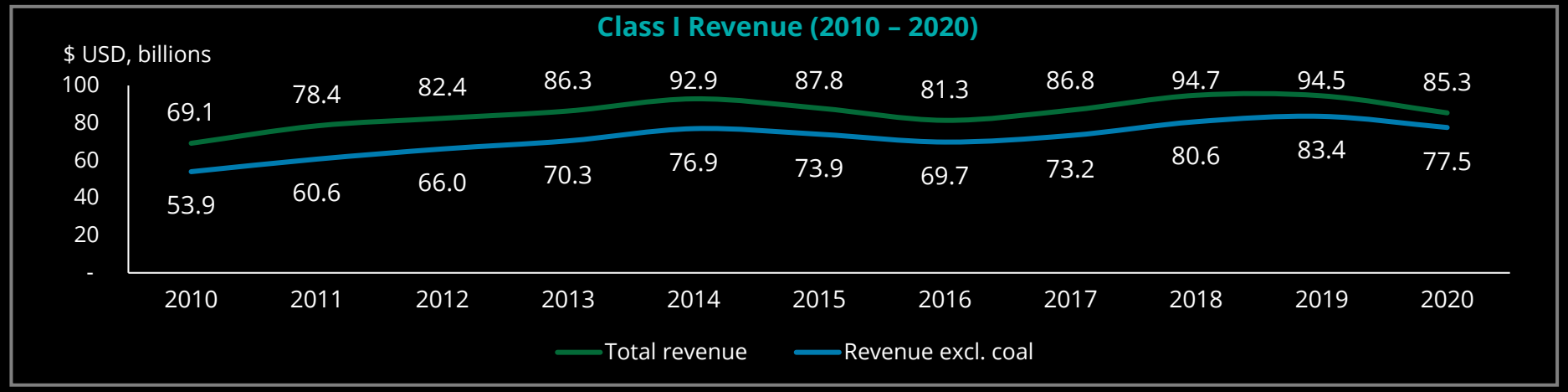
Source: US Bureau of Transportation Statistics

However, the tradeoffs are evident in return of capital and revenue trends

Class 1 railroad return on capital continues to be almost constant



Pointing to revenue growth constraints in the industry, stemming from restrictions on pricing (average rail rates are 44% lower today than in 1981)



Source: S&P Capital IQ, Company Annual Reports, Deloitte analysis

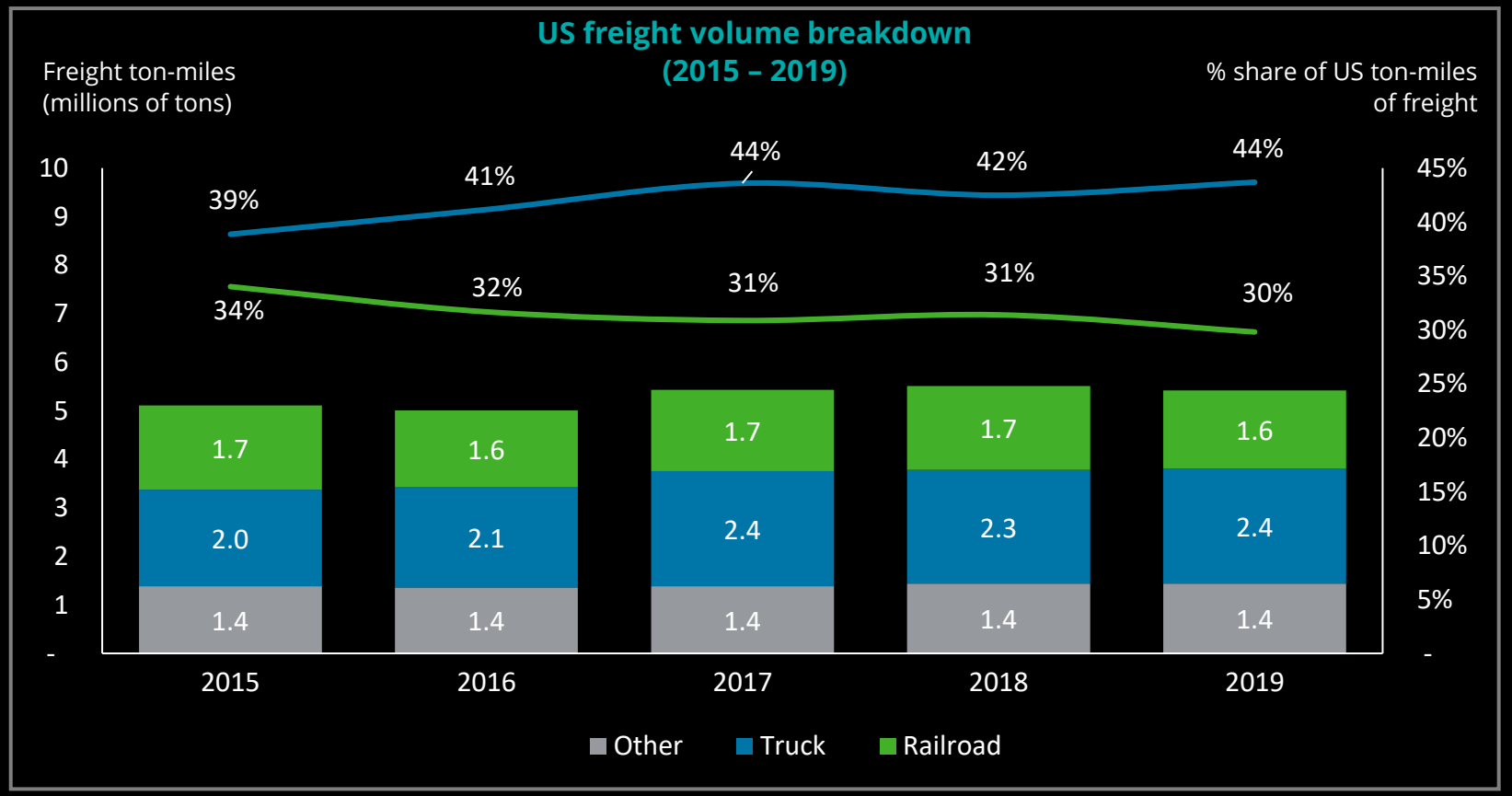
Key highlights

PSR focused Class 1 carriers on higher margins and volumes shippers, but arguably at the expense of smaller, lower growth customers

- Class 1 carriers are lean and less able to handle sudden demand surges as a result of deploying less equipment, crews, and infrastructure. Further, tighter network means lower resiliency to operational impacts
- Shippers and regulators are blaming PSR for poor service and performance

Prioritizing higher volume, higher margin shippers came at the expense of smaller shippers further leading to loss of market share to trucks

While PSR was effective in creating more efficient railroad operating systems, it has not been as effective at attracting business. Freight volumes have increased recently, but railroads have been less able to absorb volume relative to trucking.

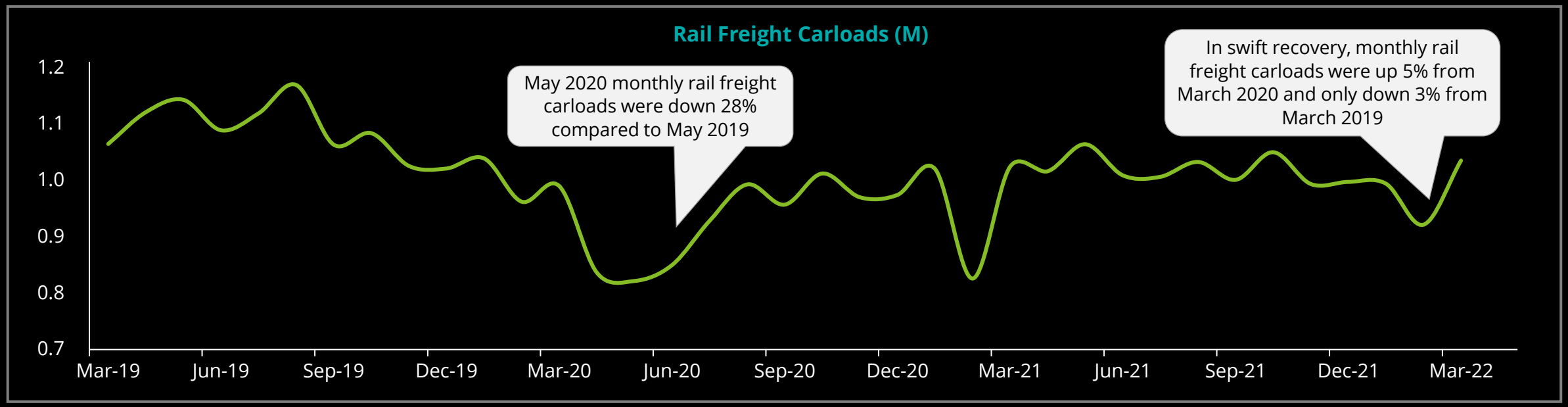


Growth challenges abound for Class I railroads

- Data shows US rail freight volumes were declining pre-COVID, due to:
  - Reduced intermodal shipments, stemming from global trade tensions and weakening consumer confidence
  - Reduced shipments of thermal coal due to environmental concerns; long-term demand will likely continue to fall
  - Reducing trucking freight rates (after the sharp increase in freight volume in 2017, that led to a boom in trucking supply)
- Trucking is expected to face driver shortages in the future; however, Class 1 railroads currently lack the flexible network capacity to absorb demand
- This could present an opportunity for shortlines, as they are more flexible
- Railroads should explore and invest in increasing intermodal capacity to reduce future congestion at intermodal terminals and increase reliability

Source: US Bureau of Transportation Statistics (data unavailable for 2020 - "Other" includes water transportation methods), Wall Street Journal, RailTrends 2021

During COVID-19, Class I railroads reacted quickly to furlough employees; while volumes returned, staff did not, compounding supply chain issues



Challenges with post-COVID recovery

- As rail volumes returned, the ramping up of staff did not happen as planned - Running trade employees chose not to return to work for various reasons, resulting in significant demand for employees and higher costs due to incentives and training requirements
- Congestion at ports and across the world's supply chain resulted in impaired operating performance, delays, car shortages, and other customer impacts
- In April 2022, the US Surface Transportation Board (STB) held hearings to discuss service impairments experienced by shipper associations. This resulted in a requirement for the four largest US carriers (UP, BNSF, NS, CSX) to provide service recovery plans that will be monitored

Source: American Association of Railroads, US Bureau of Transportation Statistics

Looking ahead

There is no consensus on “what’s next.” Investors have focused on operating ratios (OR), which are the inverse of margins. PSR has brought about impressive gains. However, efficiency improvements from operations are approaching their maximum thresholds. We can expect future improvements with technology.

A shift away from the existing business model to a focus on volume growth and EBITDA will require a shift in investor sentiment and expectations.

Continued market share loss to trucking, pressure from regulators, and service-level demands from shippers may force long-term change. A shift to commercial, volume-based approach can grow revenue and reclaim lost market share.

A trend to watch is recent CEO appointments at two major Class I railroads from the commercial side of the business—will this shift signal to investors that companies are betting that performance improvement can be achieved with commercial focus?

As executives look for answers, they should keep in mind sector-wide challenges

Service failures	• Frequent rail service failures and disruptions • Network congestion due to rail network reductions and post-COVID supply chain challenges • Delays due to supply chain challenges at other segments, such as ocean ports
Labor shortages	• Difficulties attracting and retaining employees, resulting in severe labor shortages • Lost institutional knowledge from past job cuts, high competition for running trade employees, and retirements by an aging labor force
Regulatory pressure	• Lack of support from STB on PSR-based solutions • Additional reporting needs of STB including proposal to introduce regulations if service levels are not increased
Possible US reciprocal switching	• STB is exploring a form of mandated reciprocal switching, like the system in Canada, with the intent of expanding the rail network available to a shipper and potentially reducing freight rates • If implemented, reciprocal switching allowances in the US could lead to up to five years of disruption and freight rate compression, adding complexity for railroads
Investor pressure	• Investors remain highly focused on maintaining low-cost business as measured by operating ratios • Increasing trend of activist investing may make Class I management teams wary of deviating from traditional investor expectations, even as the industry is experiencing a time of disruption that requires new strategic thinking

What is next for Class 1 railroads?

Reversing market share erosion

- What actions are required to shift investor expectations from lower operating ratios to higher EBITDA?
- How can railroads stop the long-term erosion of market share towards trucking?

Increasing network capacity

- How can railroads develop needed network capacity infrastructure and regain market share?
- PSR has removed capacity from the rail network – labor capacity and network capacity while running very tight operations where recovery from disruption is difficult

Onshoring

- As calls for onshoring production in North America rise, how can the rail industry position itself to take advantage? Supply networks have become global, interdependent, and prone to systemic risk
- How should the rail industry take opportunity of the industrial production growth in Mexico?

Delivering on ESG expectations

- Will the demand change knowing that rail is less-carbon intensive than trucking and technology is being developed to reduce rail carbon intensity through bio-diesel, hydrogen, and electrification of locomotives?
- How long until investors increase their ESG expectations for more conversion to rail?

Achieving a bigger role in industrial development

- How can railroads play a bigger part in e-commerce and other third-party fulfillment? With the rise of big box stores and online sellers controlling their own fulfillment, railroads could explore industrial partnerships
- How can railroads look to attract factories, port facilities, and warehouses to railroad-adjacent real estate?

Potential paths forward

Railroads should collaborate – either with each other or with third parties—to gain economies of scale, use investor capital efficiently, and increase commercial opportunities for their businesses

1 Collaboration among railroads

Class 1 railroads should take a more holistic view of rail transportation and realize that collaborative solutions may be necessary for long-term prospects of rail freight

- There are examples in North America of negotiated commercial agreements among carriers to share infrastructure, collaborate to create network fluidity, and increase shipper service
  1. Areas with running rights and haulage rights that have been imposed to improve competition, such as occurs during railroad mergers
- Railroads may be able to collaborate with government agencies to reduce operational bottlenecks at borders, port areas, and interchanges

2 Railroad industrial parks and third-party switching

Increased use of shortlines, third-party switching, and industrial terminals could allow railroads to focus on the "hook and haul" business and allow third-party switching for first and last mile service.

- To increase the focus and service given to shippers, shortline and terminal railroads can take on the shipper "retail" segment in a hub and spoke model by developing "rail industrial parks"
- Third-party logistics terminals operated by switchers could improve network fluidity in congested rail corridors, adding capacity and services to the network
- Short-term rail providers have different cost structures and different investors than the Class 1 railroads
  - By letting each segment of the industry focus on their specialty, infrastructure investment into network capacity can be allocated more efficiently

3 Technology enablement

Technology alone will not be able to solve all of the current issues facing railroads, but it may help alleviate some pressures. Technology can contribute to lowering costs through automation. It can also be used in managing growth through more advanced demand forecasting

- Inspection portals, drone track inspections, and perhaps, in the long term, autonomous trains, can help with labor shortages
- The industry through the Association of American Railroads is researching autonomous trains
- Internet of Things ("IoT") enable tracking and tracing that can help rail catch up to the rest of the transportation sector in terms of transparency
- More dynamic and accurate demand forecasting and operating plan optimization can help for intelligent scheduling using advance statistical modelling and AI

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Appendix

Shortlines are critical to the greater railroad network, providing the first- and last-mile of railroad

Categories of Small Railroads

Shortline Railways

- Shortlines are small railroads that operate in tandem with the larger Class 1s to provide customers with end-to-end connectivity operating on lower density lines effectively because of greater labor flexibility and lower cost structures
- Shortline owners focus on business and industrial development – converting local shippers to rail or converting more of their business to rail. Small shippers are very important to shortlines, and this feeds the Class 1 network

Terminal and Industrial Railroads

- Industrial railroads have always existed, typically owned by shippers in large industrial complexes such as auto plants, large factories, mines, and refineries.
- Terminal railroads have also existed but there is an emerging trend to have railroads developed in new large industrial parks and third-party intermodal terminals.

Opportunities for shortlines

Class I PSR Efforts

- PSR improves profitability by running longer, higher velocity trains. To maximize asset utilization, Class I's look to shortlines to manage smaller customers

Increased Shortline Presence in Switching Services

- Class I's have been reducing switching services and other rail services, as they focus on "hook and haul" operations
- Switching in customer/terminal facilities has been taken over by smaller railroads.

Sector Consolidation

- Holding companies have been consolidating small railroads to form shortline holding companies with scale

Financial Investor Interest

- Shortlines have been very attractive to private equity in the past. Now, there are significant infrastructure fund investors with lower costs of capital and a longer investment horizon focused on long-term, sustainable growth

Rising Urban Land Prices

- High land prices, particularly in urban areas, are pushing industrial production and warehousing away from larger urban areas where we can observe the creation of large rail-served industrial parks and new intermodal yards

Large industrial parks and terminal railroads can provide a low-cost solution to maintain margins, a customer focus to grow business, and a longer-term multi-modal solution

We are observing an increase in rail service companies who are performing switching, transloading, and other rail operations work with railroads and their customers that offers a solution to gaining market share

Yard Operations Providers

Contracting of rail services for industrial rail switching by railroad customers

Rail Terminal Operators

Contracting of rail services by railroads

Logistics Parks

Multi-modal and multi customer facilities in large industrial parks with distribution and transloading

Shortlines and Terminal Railroads

Opportunity for shared service areas leveraging shortlines and creation of terminal railroads

Facing high levels of shipper dissatisfaction, the STB is considering regulations to enforce reciprocal switching with the intent of increasing competition and service levels

Situation in the US

- Reciprocal switching a remedy is intended to create rail competition at origin or destination shipper facilities physically served by only one railroad. Despite being created in 1985, this remedy has never been used, in part, because it is too difficult for a shipper to prove anticompetitive behavior
- The STB held hearings in March 2022 to create new standards of proof
- Industry is strongly opposed on the basis that it is forced access and government intervention
- If reciprocal switching is implemented in the US, there will likely be a disruptive period where affected shippers renegotiate rates, and the railroads figure out how best to adapt
- Alternatively, the US Class I railroads could collaborate to create their own reciprocal switching framework, as to avoid more restrictive government regulation

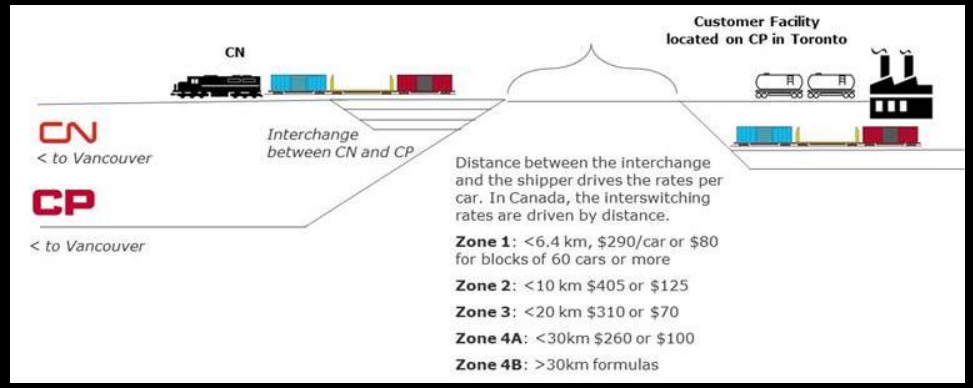
Parallel Canadian Legislation

- Reciprocal switching has been permitted on federally regulated railroads in Canada (referred to as “interswitching”) for some time and is an established part of the industry structure
- There are reciprocal switching rules that prescribe set rates, based on distance, that the shipper pays their initial railroad to facilitate the connection

Illustrative Reciprocal Switching Example

Reciprocal switching is the practice of granting shippers with access to one railroad the opportunity to connect to another competing railroad within a specific radius. The objective is to provide competition to captive shippers and hence potentially lower rates

Example: “ABC Co. has a plant served by CP and there is a CN interchange within 10 km away. Under interswitching rules, ABC Co. can have CP take the traffic to the CN interchange at a prescribed rate based on distance and the competing railroad can take the traffic to destination”



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