CANADIAN NATIONAL RAILWAY

Ticker: (TSE:CNR)
Recommendation: BUY

Target Price: C$128.82
8.8% Upside

Current Price: C$117.47
As at 31/12/2019

UNIVERSITÉ Concordia UNIVERSITY

JOHN MOLSON SCHOOL OF BUSINESS

By:
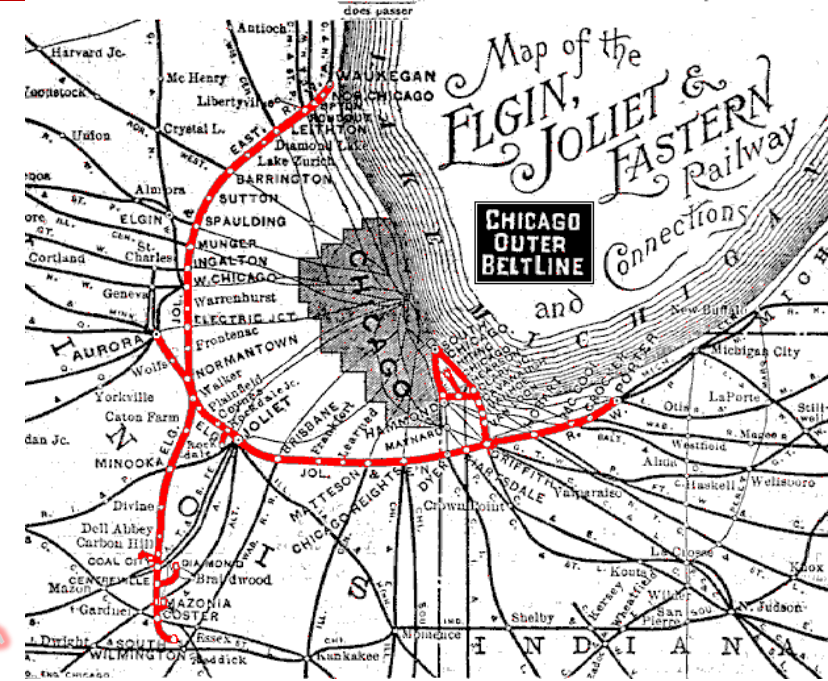Fation Veizi, Tim Papadopoulos, and Jonathan Dybka

Business Overview

Unbeatable Network

1. **Serves Ports of Prince Rupert & Halifax exclusively**

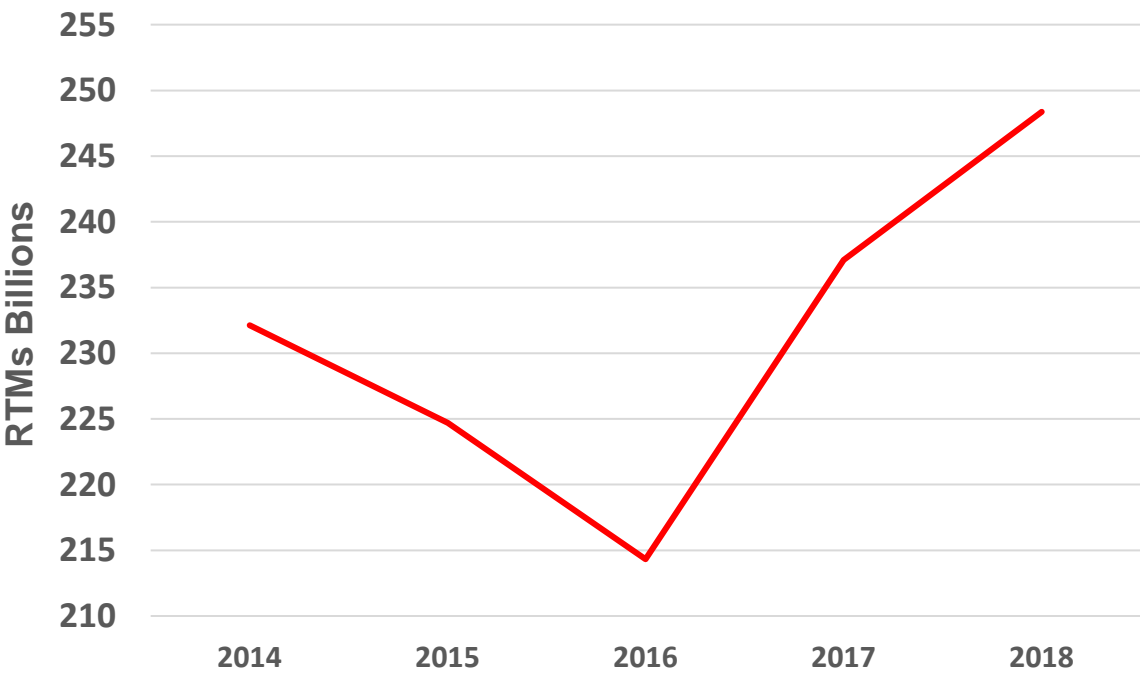2. **Bypasses Chicago traffic with the Elgin, Joliet & Eastern Line (EJ&E Line)**
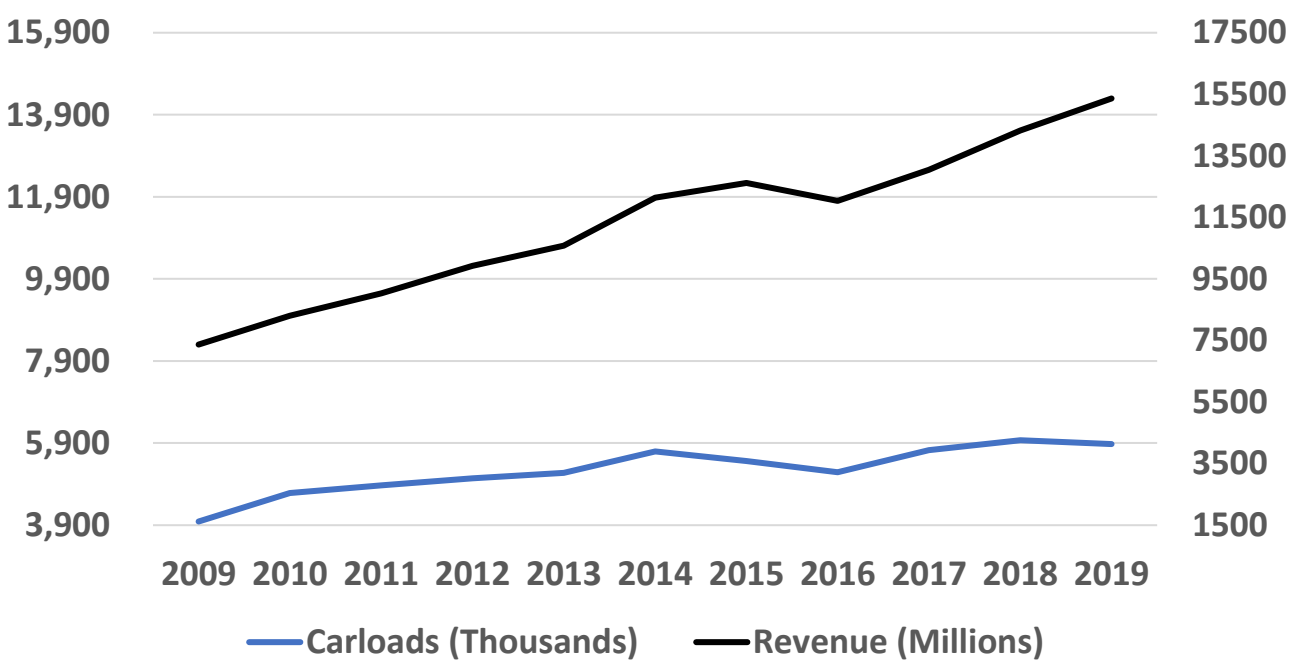

Source: CN Website
Alchetron.com

Industry Overview

CN: Lowest operating ratio in industry
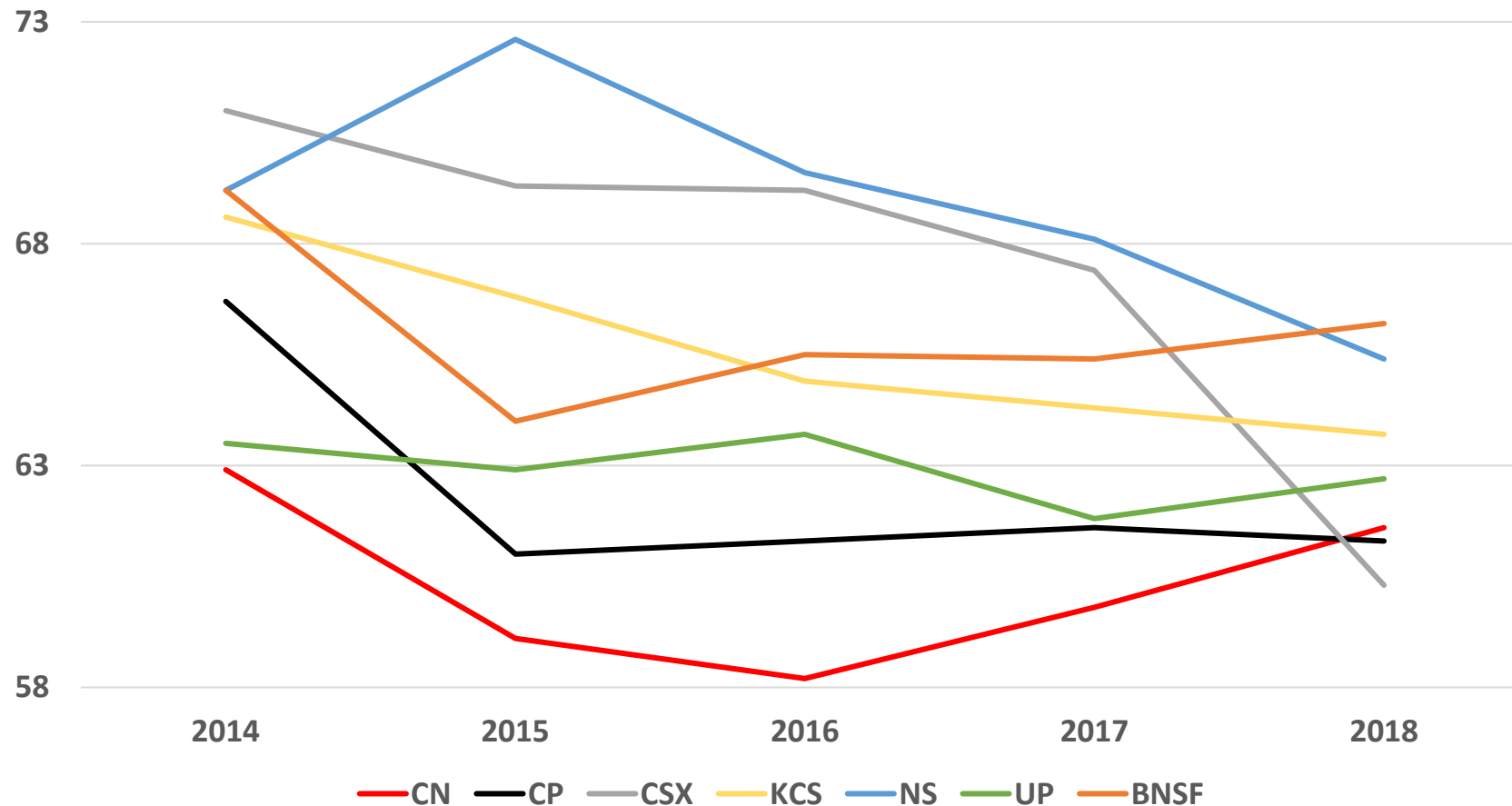
Operating Ratio 5-Year Average

Industry: 65.5%

CN: 60.3%

Operating ratios: Annual Reports of each Company

Efficient Use of Labour & Fuel

Labour Efficiency

Employee per Billion RTM vs Length of Haul: RTM per Carloads

Under average line = Efficient use of labour

Fuel Efficiency- Gallon of Fuel per 1000 GTM

CN — CP — CSX — KCS — NS — UP
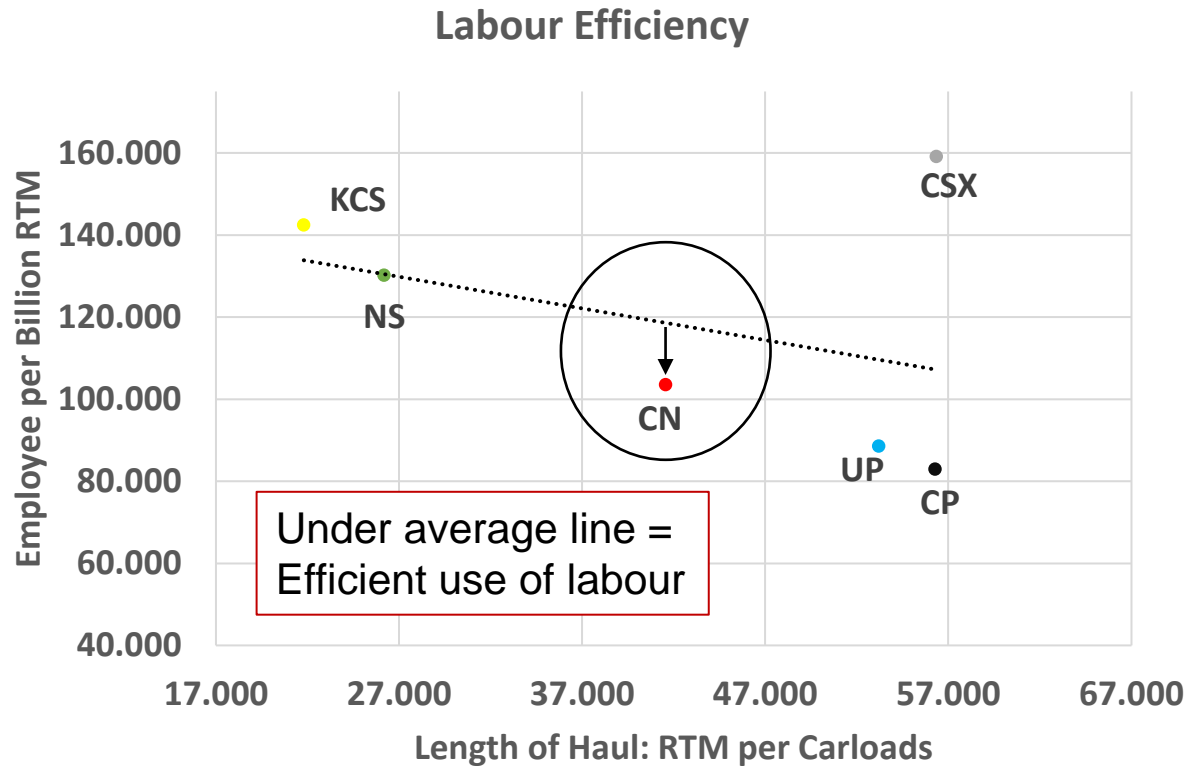
Fewer employees to generate revenue
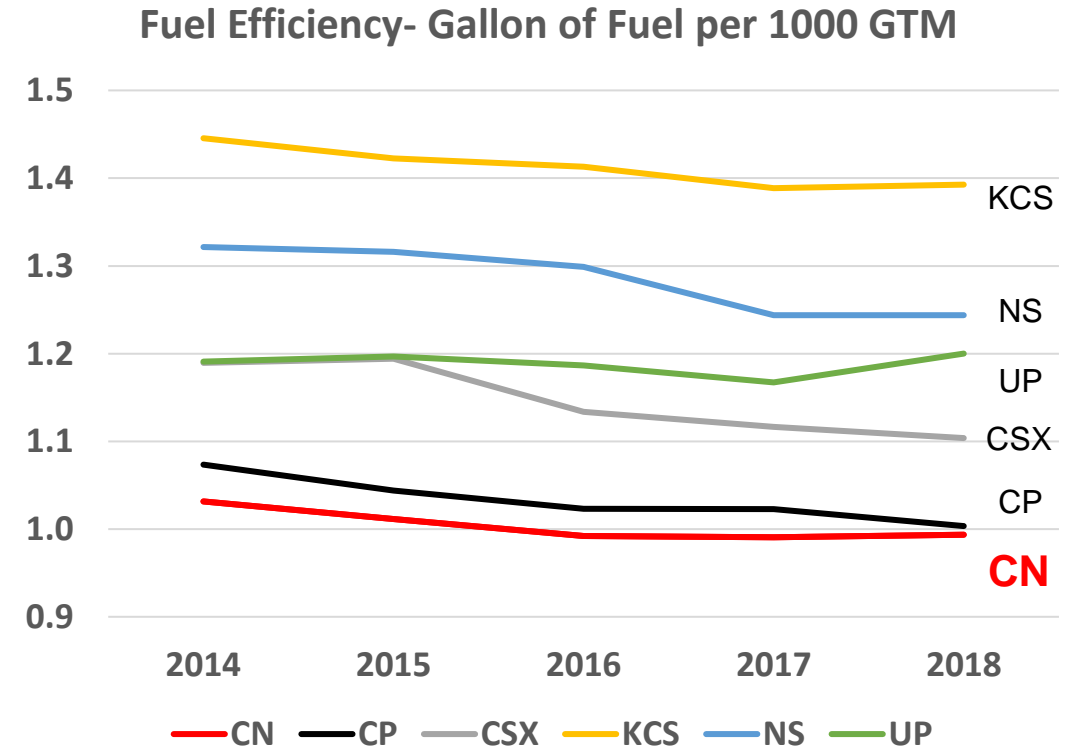
Best fuel efficiency in industry

Competitive Positioning

Revenue per RTM vs Length of Haul

Above average line = Efficient revenue generation

Longer length of haul = lower costs
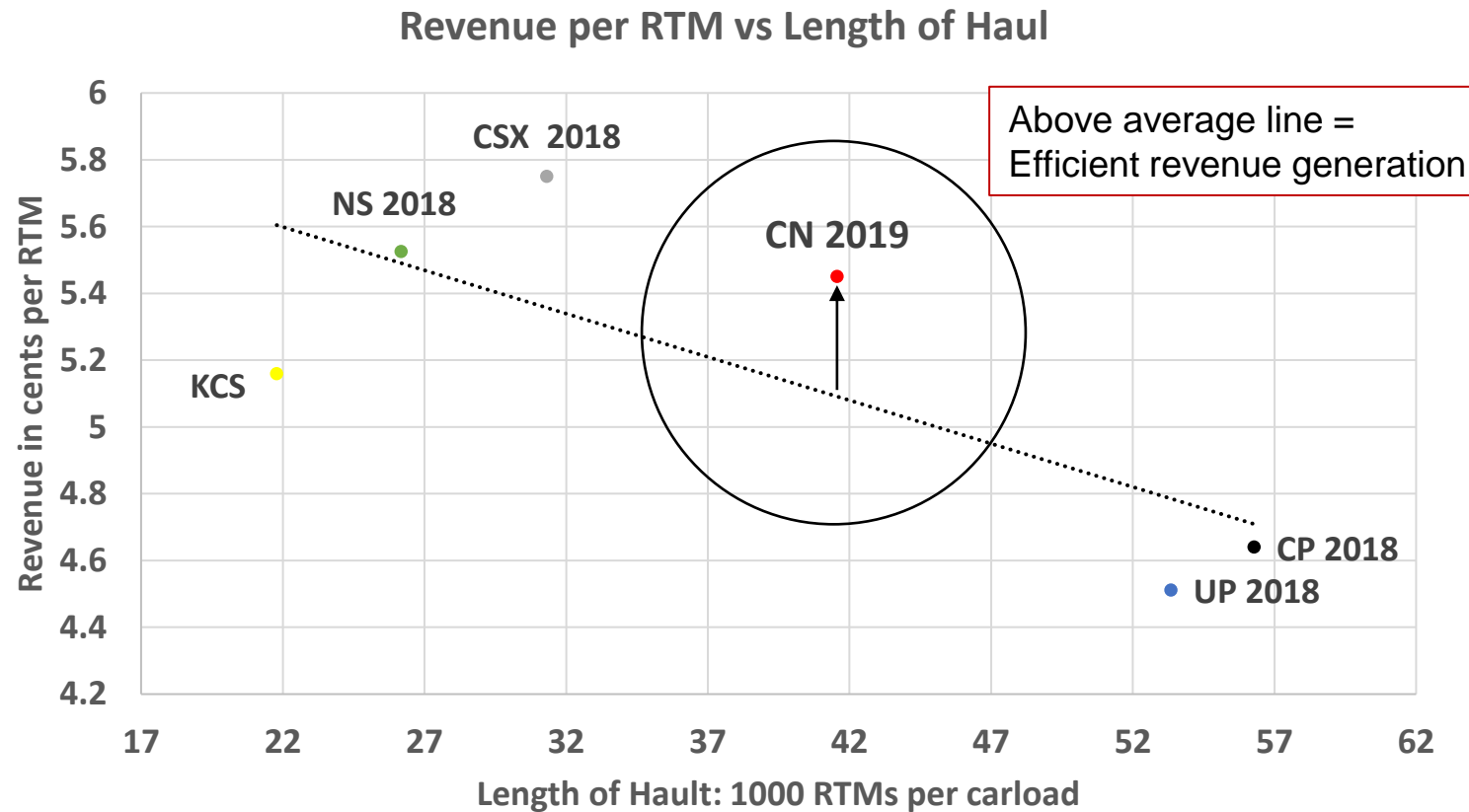
Efficient Per-unit Revenue Generation

Valuation

Methodology: 5-year DCF

Combination of 2 Approaches

Perpetuity Approach	Exit Multiple Approach
$110.38/Share	$147.26/Share
50%	50%
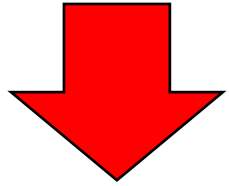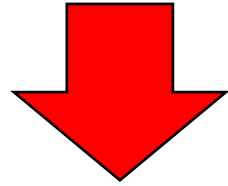
Buy Recommendation

Target Price: $128.82

8.8% Upside

31/12/2019 Price: $117.47

Revenues, Forecasts and Assumptions

REVENUE FORECASTS

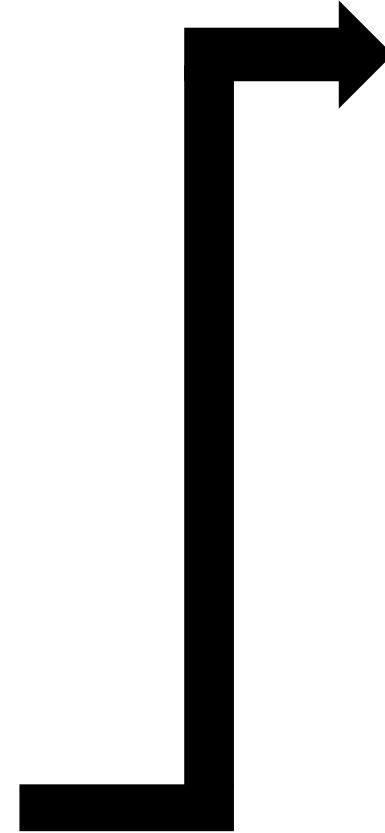| Fiscal Year	2016A	2017A	2018A	2019E	2020E	2021E	2022E	2023E	2024E
Fiscal Year End Date	31/12/16	31/12/17	31/12/18	31/12/19	31/12/20	31/12/21	31/12/22	31/12/23	31/12/24
Total Revenue	**12,037**	**13,042**	**14,322**	**15,357**	**16,522**	**17,575**	**18,603**	**19,607**	**20,571**
Total Revenue Growth %	*NA*	*8.3%*	*9.8%*	*7.2%*	*7.6%*	*6.4%*	*5.8%*	*5.4%*	*4.9%*

Assumptions

Revenues	7.6% → 4.9%
CAPEX	22% → 18%

WACC Calculation	
Inputs	**Rate**
Cost of Debt	4.0%
Tax Rate	25.0%
After-tax cost of debt	**3.0%**
Risk-free rate	1.6%
Equity risk premium	5.5%
Beta	1.04
Cost of Equity	**7.3%**
Net Debt / Firm Value	14.1%
MV of Equity / Firm Value	85.9%
Cost of Capital (WACC)	**6.7%**

Long-Term Growth Rate

2% (CA GDP and Inflation)

Multiples and Sensitivity

Company Name	Price As of 31/12/19	Market Value As of 31/12/19	Enterprise Value As of 31/12/19	Enterprise Value/ EBIT	Enterprise Value/ EBITDA	EV/EBITDA 12 Month Trailing 2019	P/E As of 31/12/19
CN	$117.47	$84,035	97,949	17.3x	13.7x	13.1x	19.7x
Average		**$80,498**	**90,134**	**16.8x**	**13.2x**	**12.9x**	**20.5x**
Median		**$81,509**	**81,509**	**17.2x**	**13.5x**	**13.7x**	**20.4x**
CP	$331.03	$45,404	54,612	18.4x	14.9x	14.2x	20.4x
UP	$234.63	$162,880	197,762	17.2x	13.7x	13.7x	21.4x
NS	$251.94	$81,509	81,509	15.5x	12.1x	11.7x	19.7x
CSX	$93.91	$92,995	92,995	14.9x	11.7x	11.1x	18.1x
KCS	$198.77	$19,702	23,791	18.2x	13.5x	14.1x	23.1x

EV/EBITDA Multiples **12 Month Trailing = 13.1x** **Last 3Y Trailing = 13.1x**

Source: Factset

Investment Summary – 3 Catalysts

1. Unique Rail Network

2. Diversified Revenue

3. New Technology

Source: CN Website, Canadiansailings.ca

Port of Halifax

59% TEU Growth in 10 years

44% TEU Industry Average

Port of Prince Rupert

36 hours closer to Shanghai than Vancouver

68 hours closer to Shanghai than L.A.

Sources: martime-executive.com, Westerninvestor.com

Percent of Total Revenue per Segment

Chart legend:
- Intermodal
- Petroleum & Chemicals
- Grain and Fertilizers
- Forest Products
- Metals and Minerals
- Automotive
- Coal
- Other

Categories: CN, CP, CSX, KCS, NS, UP
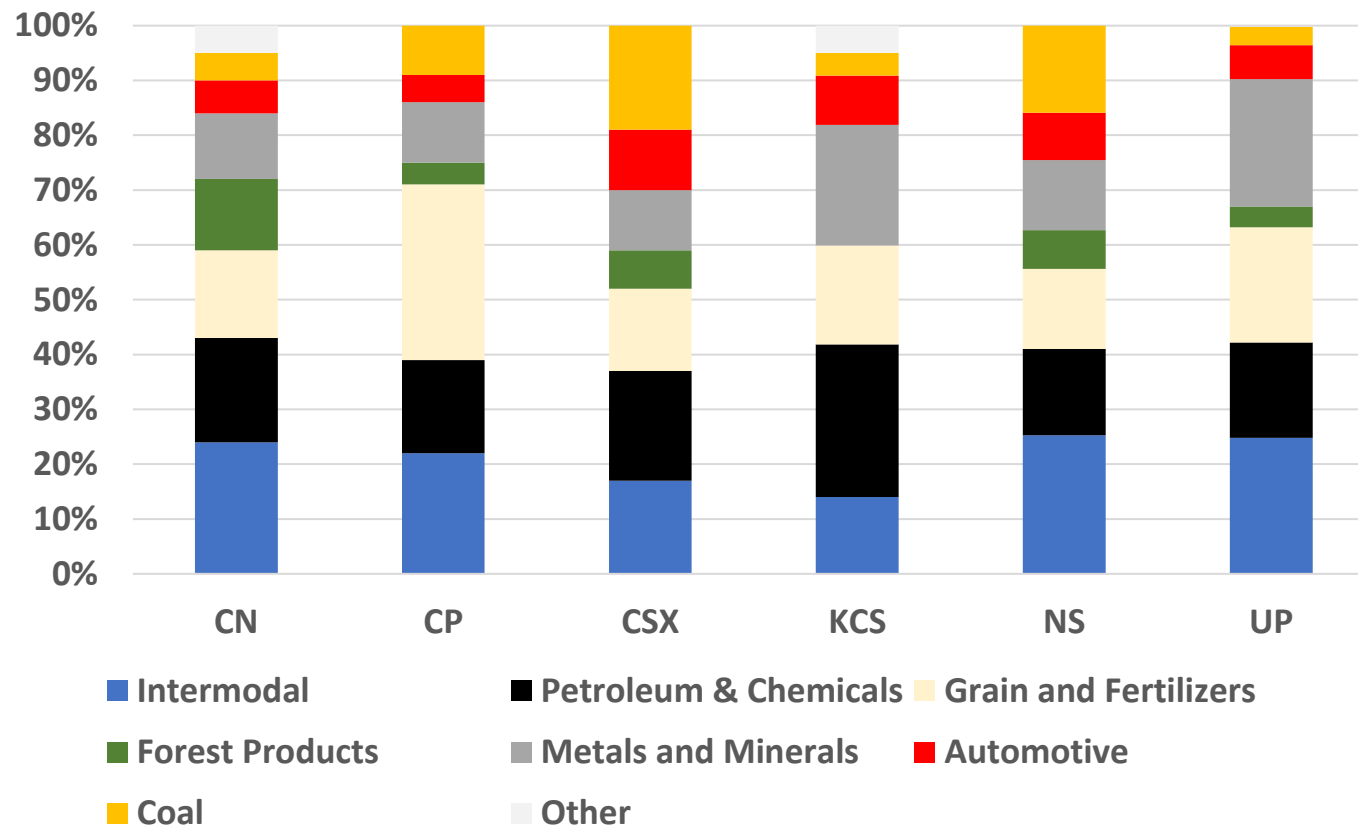
Ships 300mm tons of cargo worth $250b annually

No segment makes up more than 25% of total revenue

Lower sensitivity to commodities

Source: CN 2018 Annual Report

Investment Summary - Technology

| Automated Track Inspection |
| Automated Inspection Portal |
| Handheld Technologies |

$200- 400 mm in savings

Sources: Progressiverailroading.com, CN Website

Risks

Competition

Likelihood: Low
Cost: ~ $38mm

Labour

Likelihood: Medium
Cost: ~ $140mm

Environmental

Likelihood: Low
Cost: ~ $35mm

Environment, Social & Governance

CanaPux

Non Combustible Floats on Water

GE Tier 4 Locomotives

70% less Emissions

FIN

THANK YOU

Appendix: Business Overview

Revenue Ton Miles

RTM (Billions of USD)

- +7%* (CN)
- +2.9%* (CP)
- -17%* (CSX)
- -1.3%* (KCS)
- -0.9%* (NS)
- -13.7%* (UP)

Categories: CN, CP, CSX, KCS, NS, UP

Legend: ■ 2014 ■ 2015 ■ 2016 ■ 2017 ■ 2018
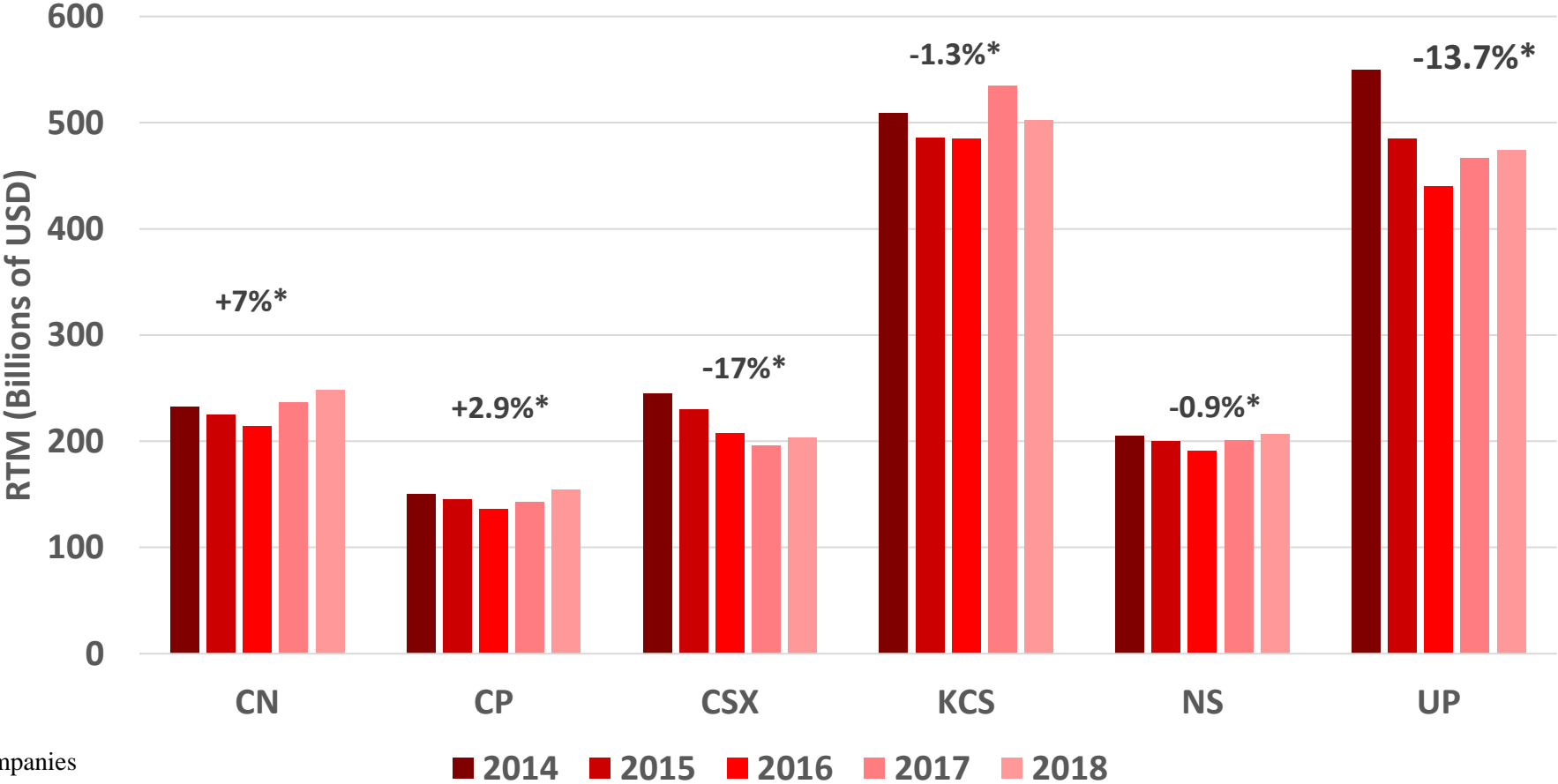
Source: Annual Report of all companies
*Represents 4 year growth
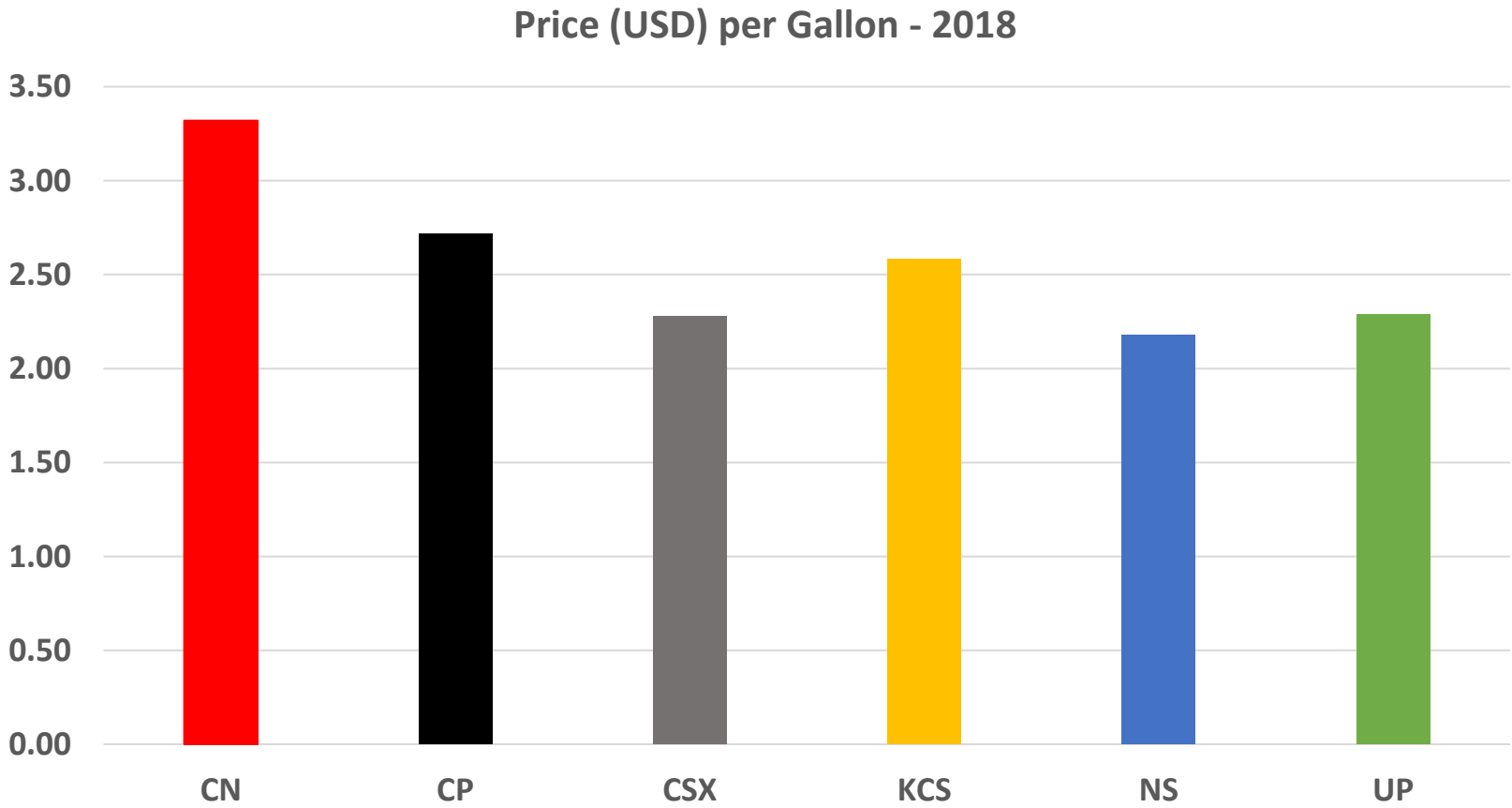
Appendix: Business Overview

Fuel Costs

Price (USD) per Gallon - 2018

Appendix: Business Overview

Revenue Breakdown per Railroad
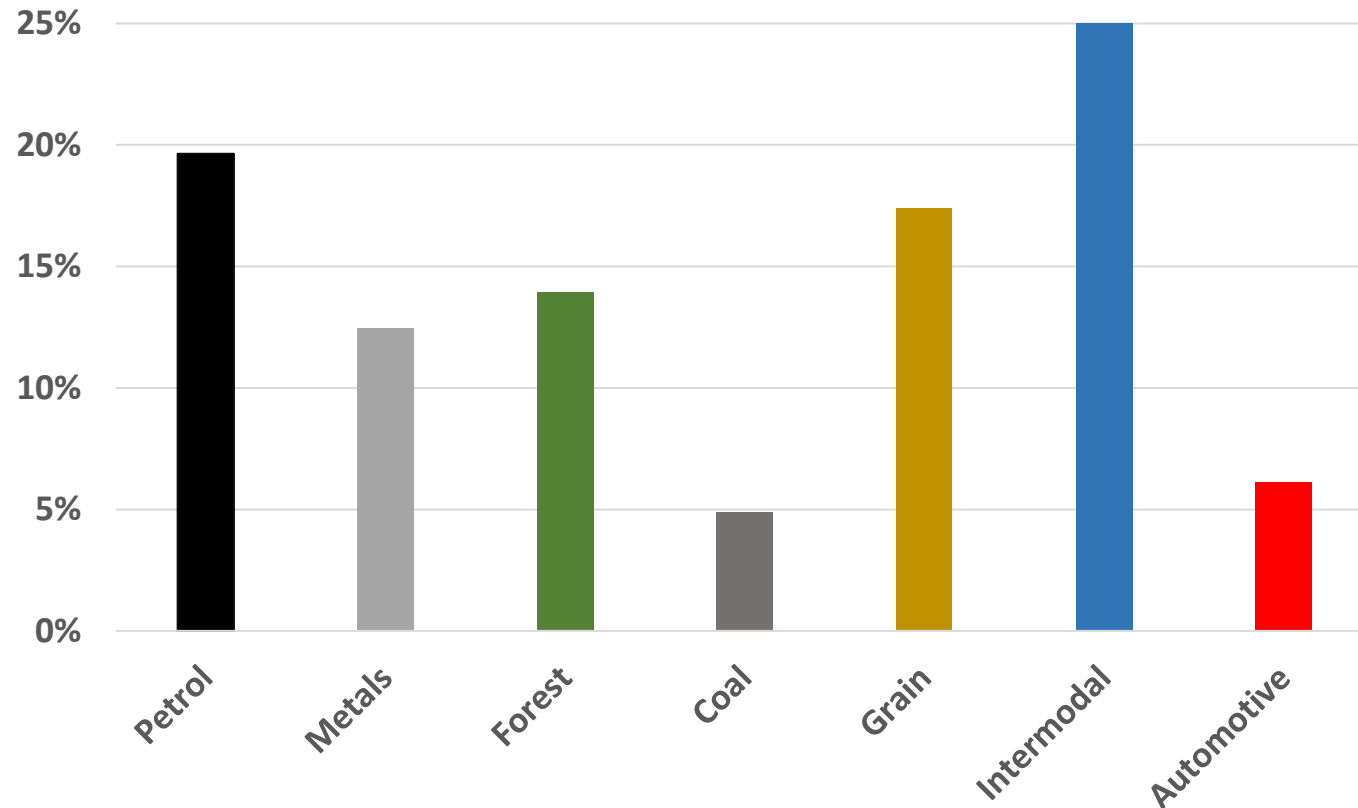
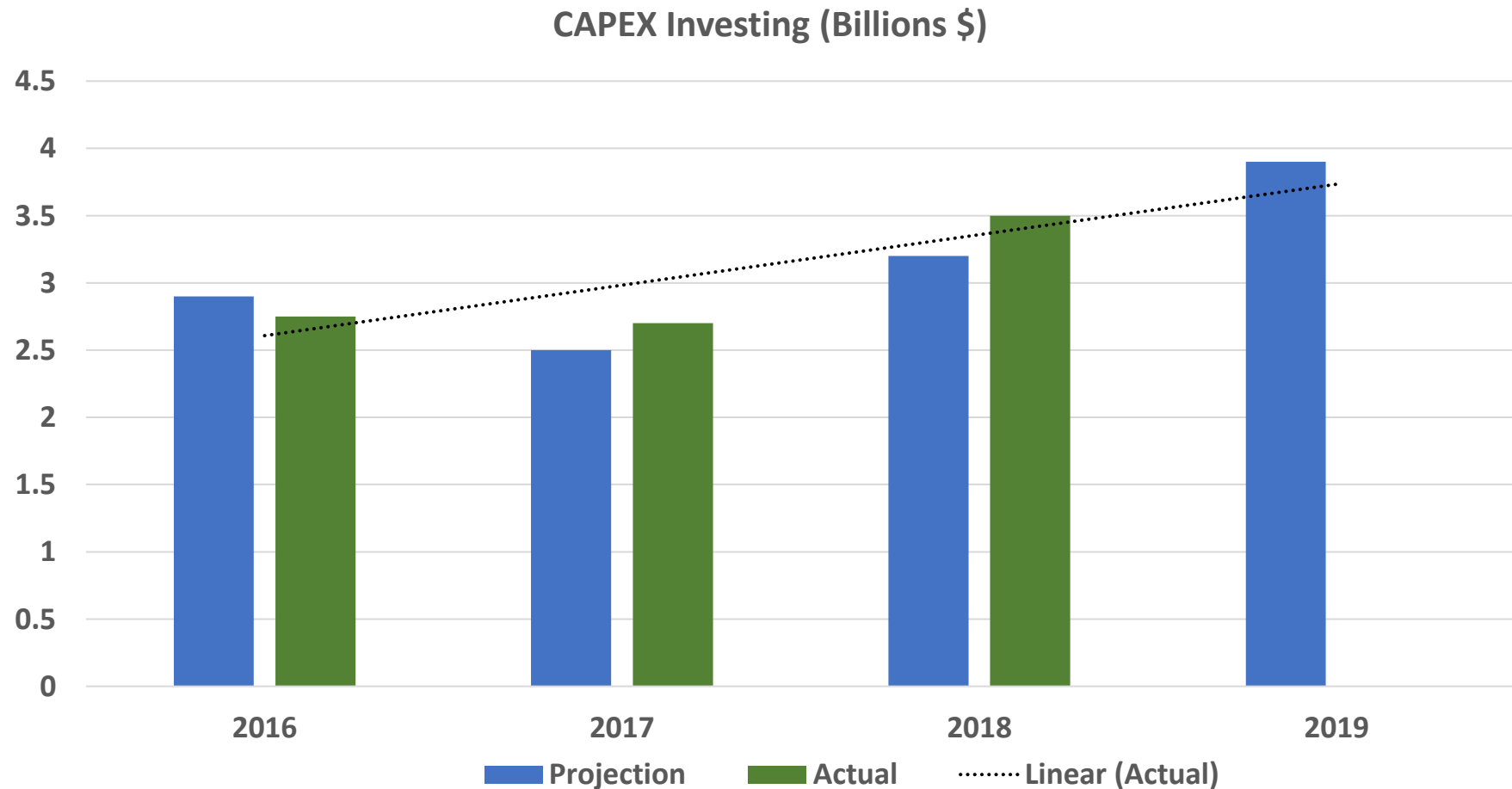Source: Annual Report of all companies

Appendix: Industry Overview & Competitive Positioning

Railroad Comparisons Operating Statistics	CN	CP	CSX	KCS	NS	UP	BNSF
Operating ratio	61.6	61.3	60.3	63.7	65.4	62.7	66.2
Revenue Ton Miles (Billions)	248.4	154.2	202.9	50.2	207	474	-
Gross Ton Miles (Billions)	490.4	275.4	402.4	100.5	394.9	928.6	-
Carloads (Thousands)	5,976	2,740	3,601	23,056	7,907	8,908	-
Diesel Price per Gallon	3.3	262.5	2.3	2.6	2.2	2.3	2.2
Average dwell hours *	8.3	6.8	9.6	25	27.6	29.6	-
Average train speed (MPH)	18	21.5	17.9	26.9	19.1	24.5	-
Total Employees	25,720	12,793	32,287	7,156	26,955	41,967	-
Diesel locomotives	2,412	1,423	3,898	1,049	4,197	8,274	8,000
Freight Cars	66,978	35,805	71,430	20,274	61,495	62,160	70,000

* CN, CP and CSX use a different method to calculate dwell time

Source: Annual reports of above companies

Revenue per RTM vs Length of Haul

Appendix: Industry Overview & Competitive Positioning
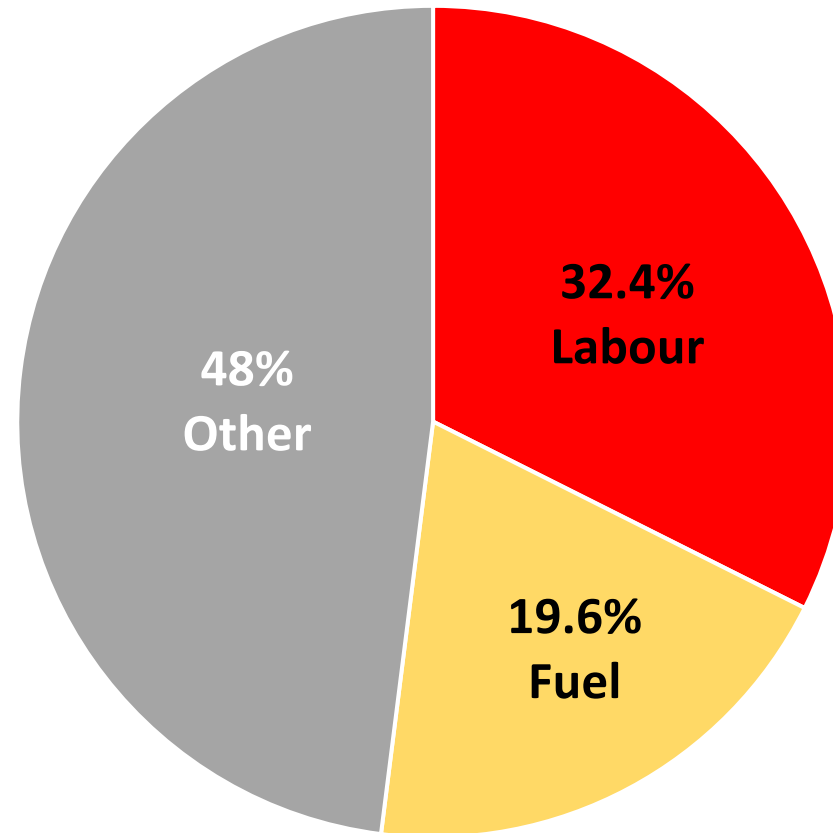
CN Expenses

Source: Annual Report

Appendix: Industry Overview & Competitive Positioning

Porter's Five Forces	
Moderate	
Bargaining Power of Buyers	CN is obligated by law to provide their services to any Canadian business in order maintain fair competition. Some segments of their revenue have more regulation on pricing than others. The grain segment is the most regulated, and CN must offer prices that are 20% lower than any other segment. The segments of; intermodal, coal, forest producst, and automotive segments, the number of carloads have fallen(or stayed flat) while revenues for those respective segments rose. This indicates pricing power as CN was able to increase freight rates.
High	
Barganing Power of Suppliers	Fuel costs make up 19.6% of expenses which is the second largest expense. CN pays the highest amount per gallon of diesle compared to it's industry peers. This indicates it has a low level of control over the price it pays.
Low	
Threat of New Entrants	It is virtually impossible to set up a new class one railroal. The costs to acquire enough land and build the infrastructure are prohibitively expensive. Regulation would also be a significant hurdle. Consolidation among the class one railroads is unlikely as the industry is already an oligopoly with competition concerns among regulators.
Moderate	
Threat of Substitues	Air freight is not a threat as it is significantly more expensive and cannot haul the same volumes as rail can. Trucking could compete with rail over shorter distances as it is usually cheaper and faster. Overseas shipping is generally cheaper but not always a practical option.

Appendix: Industry Overview & Competitive Positioning

SWOT Analysis	
Strengths	**Weakneses**
·Exclusive access to the growing ports of Prince Rupert and Halifax ·Only major class one railroad to service the maritimes ·Diversified revenue stream, with no segments exceeding 25%	·High fuel costs
Opportunities	**Threats**
·Exclusive access to the growing ports of Prince Rupert and Halifax ·Automoting track and railcar inspections to save labour costs	·Oil pipeline capacity could grow in the next few years and take market share from CN ·Recession would severely weaken all revenue segements ·Price fluctuations in oil and metals could affect volumes. Weather also plays a role in grain volumes.

Appendix: Valuation

REVENUE FORECASTS

Fiscal Year	2016A	2017A	2018A	2019E	2020E	2021E	2022E	2023E	2024E
Fiscal Year End Date	31/12/16	31/12/17	31/12/18	31/12/19	31/12/20	31/12/21	31/12/22	31/12/23	31/12/24
Revenue by Segment									
Petroleum & Chemicals	2,174	2,208	2,660	3,192	3,767	4,143	4,516	4,877	5,219
% Growth	*NA*	*1.6%*	*20.5%*	*20.0%*	*18.0%*	*10.0%*	*9.0%*	*8.0%*	*7.0%*
Metals and Minerals	1,218	1,523	1,689	1,655	1,705	1,773	1,862	1,955	2,053
% Growth	*NA*	*25.0%*	*10.9%*	*(2.0%)*	*3.0%*	*4.0%*	*5.0%*	*5.0%*	*5.0%*
Forest Products	1,797	1,788	1,886	1,848	1,700	1,726	1,752	1,778	1,805
% Growth	*NA*	*(0.5%)*	*5.5%*	*(2.0%)*	*(8.0%)*	*1.5%*	*1.5%*	*1.5%*	*1.5%*
Coal	434	535	661	707	778	848	882	917	954
% Growth	*NA*	*23.3%*	*23.6%*	*7.0%*	*10.0%*	*9.0%*	*4.0%*	*4.0%*	*4.0%*
Grain & Fertilizers	2,098	2,214	2,357	2,404	2,596	2,739	2,876	3,020	3,171
% Growth	*NA*	*5.5%*	*6.5%*	*2.0%*	*8.0%*	*5.5%*	*5.0%*	*5.0%*	*5.0%*
Intermodal	2,846	3,200	3,465	3,881	4,308	4,652	4,978	5,277	5,540
% Growth	*NA*	*12.4%*	*8.3%*	*12.0%*	*11.0%*	*8.0%*	*7.0%*	*6.0%*	*5.0%*
Automotive	759	825	830	888	879	897	933	970	1,009
% Growth	*NA*	*8.7%*	*0.6%*	*7.0%*	*(1.0%)*	*2.0%*	*4.0%*	*4.0%*	*4.0%*
Total Rail Freight Revenue	**11,326**	**12,294**	**13,549**	**14,576**	**15,734**	**16,779**	**17,799**	**18,794**	**19,751**
% Growth	*NA*	*8.5%*	*10.2%*	*7.6%*	*7.9%*	*6.6%*	*6.1%*	*5.6%*	*5.1%*
Other Revenue	711	748	773	781	789	796	804	812	821
% Growth	*NA*	*5.2%*	*3.3%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
Total Revenue	**12,037**	**13,042**	**14,322**	**15,357**	**16,522**	**17,575**	**18,603**	**19,607**	**20,571**
Total Revenue Growth %	*NA*	*8.3%*	*9.8%*	*7.2%*	*7.6%*	*6.4%*	*5.8%*	*5.4%*	*4.9%*

Appendix: Valuation

Segment	Yearly Growth Rate	Qualitative
Petroleum & Chemicals	5 to 10%	·Insufficient Pipeline Capacity over next 3 years ·Increase in demand for heavy crude in Gulf, resulting from Venezuela sanctions.
Metals and Minerals	1 to 5%	·Continued growth in carloads, inline with North American demand for aluminium/iron
Forest Products	-5 to 2%	·Growing demand for forest products in Asia ·Low single digit contraction for demand in North America
Coal	-2 to 3%	·Growing demand for coal coke used in mettalurgy in Asia ·Low single digit contraction for demand in North America
Grain and Fertilizers	0 to 3%	·Stable low digit growth. Inline with steady Canadian grain production
Intermodal	5 to 9%	·Continued growth inline with North American retail sales ·Exclusive access to Ports of Prince Rupert/Halifax, fastest growing TEU as a result of growing Asian imports
Automotive	2 to 5%	·Continued single digit growth inline with auto sales in North America

Canadian National Railway Company	2014	2015	2016	2017	2018
Profitability					
Gross Margin	43.9%	47.8%	50.3%	49.1%	44.9%
SG&A to Sales	5.7%	6.1%	6.1%	6.5%	6.5%
Operating Margin	38.1%	41.8%	44.1%	42.6%	38.4%
Pretax Margin	35.9%	38.6%	40.9%	39.0%	39.7%
Net Margin	26.1%	28.1%	30.2%	42.1%	30.2%
Asset Turnover (x)	0.39	0.36	0.32	0.34	0.36
Return on Assets	10.1%	10.2%	9.8%	14.5%	10.9%
Return on Equity	24.0%	24.9%	24.4%	34.8%	25.2%
Operating Efficiency					
Revenue/Employee (actual)	475,284	544,234	541,013	544,623	556,804
Net Income/Employee (actual)	124,050	152,684	163,603	229,025	168,274
Assets/Employee (actual)	1,260,360	1,597,790	1,689,200	1,588,223	1,620,607
Valuation/Per Share					
Dividend Yield (%)	1.25%	1.62%	1.66%	1.59%	1.80%
EPS (diluted)	$3.85	$4.39	$4.67	$7.24	$5.87
Diluted Shares Outstanding	823.50	805.10	779.20	757.30	737.70

Source: FactSet

Appendix: Valuation

FREE CASH FLOW CALCULATION

Fiscal Year	2016A	2017A	2018A	2019E	2020E	2021E	2022E	2023E	2024E
Fiscal Year End Date	31/12/16	31/12/17	31/12/18	31/12/19	31/12/20	31/12/21	31/12/22	31/12/23	31/12/24
EBITDA	6,257	6,524	6,822	7,510	8,311	8,999	9,618	10,235	10,841
EBIT	5,032	5,243	5,493	5,820	6,711	7,375	7,981	8,596	9,212
Tax Rate %	26.1%	(7.8%)	23.8%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
EBIAT	**3,718**	**5,650**	**4,184**	**4,365**	**5,033**	**5,531**	**5,986**	**6,447**	**6,909**
(+) D&A				1,689	1,599	1,624	1,637	1,639	1,629
(-) CAPEX				(3,839)	(3,635)	(3,691)	(3,721)	(3,725)	(3,703)
(-) Inc. in NWC				(124)	(38)	(46)	(23)	(26)	(30)
Unlevered Free Cash Flows				**2,091**	**2,960**	**3,418**	**3,879**	**4,334**	**4,806**
Discount Factor				0.0%	100.0%	200.0%	300.0%	400.0%	500.0%
Present Value of UFCFs				**2,091**	**2,774**	**3,002**	**3,193**	**3,344**	**3,475**

Fiscal Year	2016A	2017A	2018A	2019P	2020P	2021P	2022P	2023P	2024P
Fiscal Year End Date	31/12/16	31/12/17	31/12/18	31/12/19	31/12/20	31/12/21	31/12/22	31/12/23	31/12/24
Basic EPS	$4.69	$7.28	$5.89	$5.79	$6.89	$7.75	$8.56	$9.40	$10.25
Diluted EPS	**$4.67**	**$7.24**	**$5.87**	**$5.76**	**$6.85**	**$7.71**	**$8.51**	**$9.34**	**$10.19**

Appendix: Valuation

Beta calculation

Beta calculation	Observed β (5 year)	Dil. shares	Market cap	Net Debt	Tax rate	Delev. β
CN Railway	1.01	718.9	87,195	13,914	23.83%	0.90
Canadian Pacific	1.16	138.7	47,013	9,353	24.61%	1.01
Union Pacific	1.07	701.9	163,008	36,617	22.93%	0.91
Norfolk Southern	1.07	264.3	68,163	16,415	23.15%	0.90
CSX	1.12	792.0	75,811	22,894	23.12%	0.91
Kansas City Southern	1.04	99.7	20,720	3,736	29.03%	0.92
Industry average delevered beta	0.93					
CN Railway beta	1.04					

Equity value per share (Perpetuity Approach)

$110.38	Long term growth rate (g):				
	1.0%	1.5%	2.0%	2.5%	3.0%
8.7%	$62.00	$66.30	$71.26	$77.01	$83.76
7.7%	$74.33	$80.30	$87.31	$95.67	$105.80
WACC: 6.7%	$91.03	$99.70	$110.22	$123.24	$139.77
5.7%	$114.85	$128.36	$145.53	$168.05	$198.88
4.7%	$151.56	$174.95	$206.98	$253.53	$327.33

Equity value per share (Exit Multiple Approach)

$147.26	Exit EBITDA Multiple				
	11.0x	12.0x	13.0x	14.0x	15.0x
8.7%	$113.56	$123.49	$133.43	$143.36	$153.29
7.7%	$119.32	$129.73	$140.13	$150.54	$160.94
WACC: 6.7%	$125.41	$136.31	$147.22	$158.12	$169.02
5.7%	$131.85	$143.27	$154.70	$166.13	$177.55
4.7%	$138.65	$150.63	$162.61	$174.60	$186.58

Appendix: Valuation

Equity value per share (Weighted Average Approach)

		Weight of Perpetuity Valuation %			
$128.82	**40%**	**45%**	**50%**	**55%**	**60%**
8.7%	$108.56	$105.45	$102.34	$99.23	$96.12
7.7%	$119.00	$116.36	$113.72	$111.08	$108.44
6.7%	$132.42	$130.57	$128.72	$126.87	$125.02
5.7%	$151.03	$150.57	$150.11	$149.66	$149.20
4.7%	$180.36	$182.58	$184.80	$187.02	$189.24

WACC:

Appendix: Investment Summary

Annual Percentage Fluctuations

Legend: Carloads CN^ — CNR.TO* — GSPTSE*
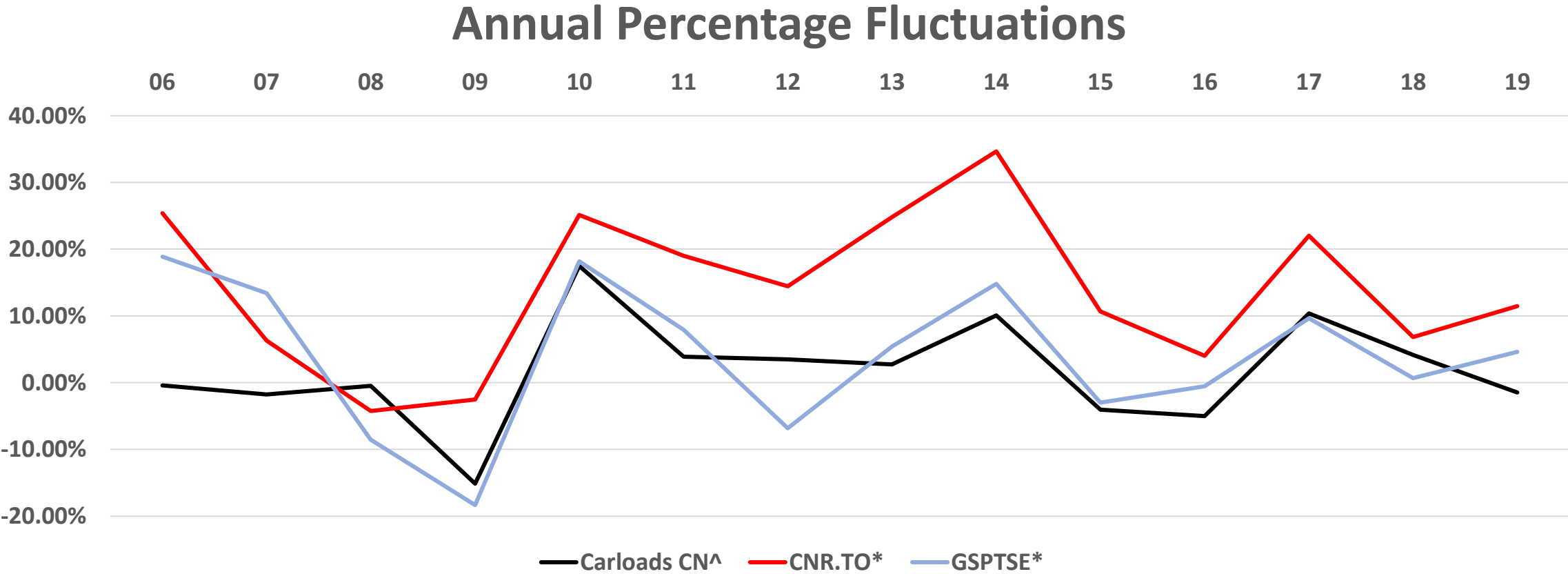
Appendix: Investment Summary

Growing Network

Acquisition of TransX in Q1 of 2019, and Massena rail from CSX Corp. in Q3 of 2019

Underutilised double tracks in the eastern part of Canada positioned to capture any potential future growth in trade with European countries or those originating from Asia via the Suez Canal.

Appendix: Risk

Economic

Global growth is projected to improve to 3.5% in 2020 from 3.2% in 2019
Canadian growth is projected to improve to 1.8% in from 1.5% from 2019

Forex

The estimated annual impact on net income of a one-cent change in the Canadian dollar relative to the U.S. dollar is approximately $30 million.
Average USD/CAD forecast for 2020, first half is 1.3102 and second half 1.3089 (forecast poll from 34 experts conducted by fxstreet.com).

Fuel

CN manages fuel price risk by offsetting the impact of rising fuel prices with the fuel surcharge program.
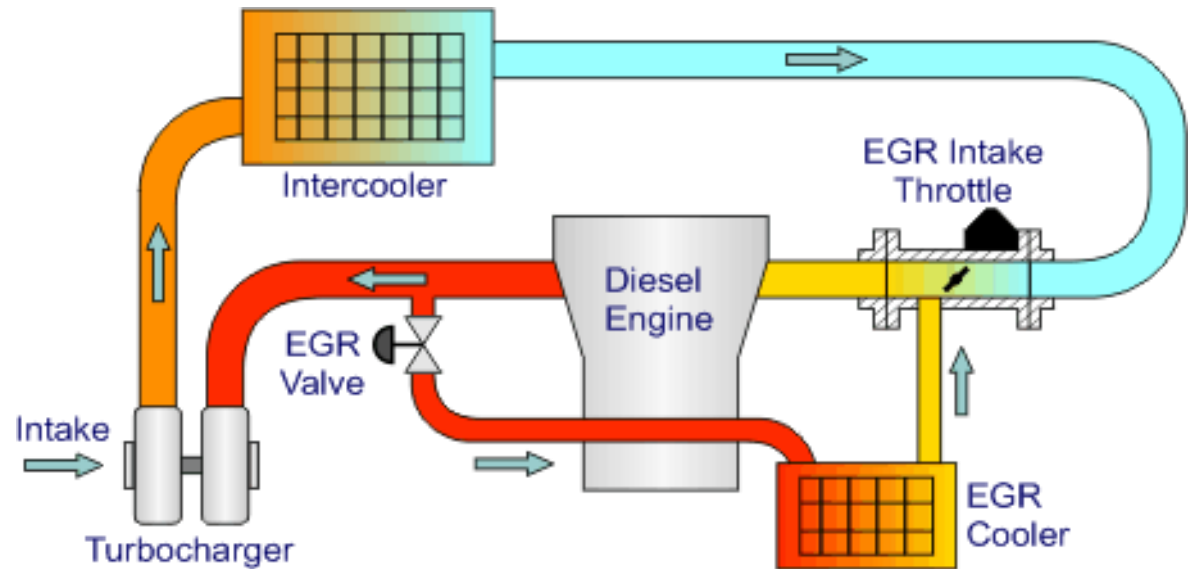
Environment

CN's risk mitigation strategies include periodic audits, employee training programs, emergency plans and procedures, and insurance

Appendix: ESG

Exhaust Gas Recirculation (ERG) System

70% Reductions in Air emissions

Works Cited

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