

COST OF CAPITAL STUDY

YIELD CAPITALIZATION
2021 ASSESSMENT YEAR

APPENDIX C

Railroads

EQUITY RATE				11.50%	
CAPITAL ASSET PRICING MODEL					PAGE
	CAPM Ex Ante		5.85%		6
DIVIDEND GROWTH MODELS (Single Stage)					
	Value Line, based on Dividends Growth		10.50%		7
	Value Line, based on Earnings Growth		12.75%		8
	Value Line, based on Return on Equity		13.25%		9
FCFE GROWTH MODEL (Multi Stage)					10
	Average		10.62%	5.85% - 13.25%	RANGE
DEBT RATE				3.50%	11
SECURED DEBT (LEASE) RATE				2.50%	11
MARKET CAPITAL STRUCTURE					
	Equity	78%	x 11.50%	=	8.97%
	Secured Debt	3%	x 2.50%	=	0.08%
	Debt	19%	x 3.50%	=	0.67%
	Marginal Tax Rate	24%	= (1-.24)	x 0.74%	<u>0.56%</u>
WEIGHTED AVERAGE COST OF CAPITAL				9.5%	

rounded

SUPPORT FOR GUIDELINE COMPANIES

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

RAILROADS

Capital Structure at Book Value

Company	Ticker	Beta	Fin'l Strength	Operating Margin	P/E Ratio	Div'd Yield	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
Union Pacific Corp.	UNP	1.10	A++	50.0%	22.6	2.02%	16,105,445,200	38.6%	-	0.0%	25,660,000,000	61.4%	41,765,445,200
Norfolk Southern Corp.	NSC	1.15	A+	46.0%	20.9	1.74%	15,315,295,500	55.9%	-	0.0%	12,102,000,000	44.1%	27,417,295,500
CSX Corp.	CSX	1.10	B++	52.0%	20.9	1.32%	11,777,519,600	41.9%	-	0.0%	16,304,000,000	58.1%	28,081,519,600
Kansas City Southern	KSU	1.10	A	52.0%	24.6	0.86%	4,375,846,750	53.8%	242,170	0.0%	3,764,000,000	46.2%	8,139,846,750
Canadian National	CNI	0.85	A	47.0%	23.1	1.68%	14,594,610,000	61.6%	-	0.0%	9,116,960,000	38.4%	23,711,570,000
Canadian Pacific	CP	1.00	A	49.0%	23.1	0.83%	6,274,425,000	49.0%	-	0.0%	6,524,600,000	51.0%	12,799,025,000
Mean		1.05		49.3%	22.5	1.41%	11,407,190,342	50.1%		0.0%	12,245,260,000	49.9%	
Weighted Mean							68,443,142,050	48.2%	242,170	0.00%	73,471,560,000	51.8%	141,914,702,050
Median		1.10			22.9	1.50%		51.4%		0.0%		48.6%	
Std Dev		0.11			1.45	0.5%		8.7%		0.00		8.7%	
Coeff Var		0.10			0.06	0.35		17.4%		-		17.4%	
Harmonic Mean		1.04			22.45	0.01		48.8%				48.6%	
Max		1.15			24.59	2.02%		61.6%		0.0%		61.4%	
Min		0.85			20.85	0.83%		38.6%		0.0%		38.4%	

Say **1.05**

**SUPPORT FOR CAPITAL STRUCTURE
MARKET VALUE**

WASHINGTON STATE DEPARTMENT OF REVENUE
2021 ASSESSMENT YEAR
RAILROADS

Capital Structure at Market Value

Company	Ticker	Stock Price	Common Shares	Common Stock	%	Preferred Stock	%	Operating Lease	%	Long Term Debt	%	Total Debt & Equity
Union Pacific Corp.	UNP	208.22	673,868,000	140,312,794,960	79.3%	-	0.0%	7,658,080,077	4.3%	28,970,000,000	16.4%	176,940,875,037
Norfolk Southern Corp.	NSC	236.65	253,985,000	60,105,550,250	75.3%	-	0.0%	3,104,696,040	3.9%	16,664,000,000	20.9%	79,874,246,290
CSX Corp.	CSX	90.75	764,774,000	69,403,240,500	75.5%	-	0.0%	1,490,626,800	1.6%	21,076,000,000	22.9%	91,969,867,300
Kansas City Southern	KSU	204.13	93,601,000	19,106,772,130	79.5%	242,170	0.0%	558,189,712	2.3%	4,368,600,000	18.2%	24,033,804,012
Canadian National	CNI	109.85	710,200,000	78,015,470,000	83.1%	-	0.0%	3,716,552,934	4.0%	12,194,960,000	13.0%	93,926,982,934
Canadian Pacific	CP	346.69	134,500,000	46,629,805,000	81.4%	-	0.0%	1,818,120,495	3.2%	8,813,720,000	15.4%	57,261,645,495
			Mean		79.0%		0.0%		3.2%		17.8%	
			Weighted Mean	413,573,632,840	78.9%	242,170	0.0%	18,346,266,058	3.5%	92,087,280,000	17.6%	524,007,421,068
			Median		79.4%		0.0%		3.5%		17.3%	
			Harmonic Mean		78.9%				2.9%		17.2%	
			Std Dev		3.1%		0.0%		1.1%		3.7%	
			Coeff Var		25.2%		0.4%		3.0%		4.9%	
			Max		83.1%		0.0%		4.3%		22.9%	
			Min		75.3%		0.0%		1.6%		13.0%	
			Target		78%		0%		3%		19%	100%

Source:
Stock Price: Yahoo
Market Value Debt: Bond Analysis

SUPPORT FOR MARKET MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

RAILROADS

Company	Ticker	Stock Price	Revenues	Multiple	Cash Flow	Multiple	Earnings	Multiple	Book Value	Multiple
Union Pacific Corp.	UNP	208.22	29.60	7.0	11.05	18.8	7.80	26.7	23.90	8.7
Norfolk Southern Corp.	NSC	236.65	38.85	6.1	12.70	18.6	9.17	25.8	60.30	3.9
CSX Corp.	CSX	90.75	13.95	6.5	5.25	17.3	3.61	25.1	15.40	5.89
Kansas City Southern	KSU	204.13	28.80	7.09	10.85	18.8	7.00	29.2	46.75	4.4
Canadian National	CNI	109.85	14.45	7.6	5.60	19.6	4.00	27.5	20.55	5.35
Canadian Pacific	CP	346.69	44.00	7.9	17.30	20.0	13.35	26.0	46.65	7.43
		Mean		7.0		18.9		26.7		5.9
		Median		7.1		18.8		26.3		5.6
		Harmonic Mean		7.0		18.8		26.6		5.5
		Max		7.9		20.0		29.2		8.7
		Min		6.1		17.3		25.1		3.92
		Std Dev		0.7		0.9		1.4		1.8
		Coefficient of Variation		0.1		0.1		0.1		0.3
		Percentile .25		6.6		18.7		25.8		4.6
		Percentile .75		7.5		19.4		27.3		7.0
		Say		7.00		19.00		26.50		5.50

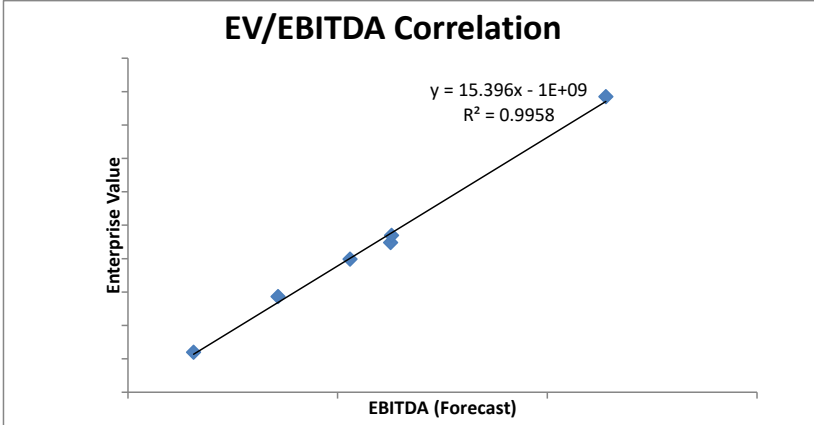
ENTERPRISE VALUE MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

RAILROADS

Guideline Companies	Ticker	EV+OL	EBITDA + OL	EV / EBITDA	Annual Cash Flow Rate Change VL	EBITDA	EV / EBITDA	Revenue	EV/Sales	Cash Flow	Debt Service	EV / CF
					forecast							
Union Pacific Corp.	UNP	\$ 176,899,875,037	10,454,000,000	16.92	9.00%	11,394,860,000	15.52	20,796,250,000	8.51	7,937,500,000	1,013,950,000	19.76
Norfolk Southern Corp.	NSC	\$ 79,716,246,290	4,880,000,000	16.34	8.50%	5,294,800,000	15.06	10,731,000,000	7.43	3,699,500,000	583,240,000	18.61
CSX Corp.	CSX	\$ 89,547,867,300	5,827,000,000	15.37	7.50%	6,264,025,000	14.30	11,491,250,000	7.79	4,531,250,000	737,660,000	17.00
Kansas City Southern	KSU	\$ 23,883,804,012	1,422,800,000	16.79	10.00%	1,565,080,000	15.26	2,923,650,000	8.17	1,108,050,000	152,901,000	18.94
Canadian National	CNI	\$ 93,926,982,934	5,793,480,000	16.21	8.50%	6,285,925,800	14.94	11,571,750,000	8.12	4,517,500,000	426,823,600	19.00
Canadian Pacific	CP	\$ 57,261,645,495	3,282,440,000	17.44	9.00%	3,577,859,600	16.00	6,298,500,000	9.09	2,522,000,000	308,480,200	20.23
Mean							15.18			8.18		18.92
Median							15.16			8.14		18.97
Max							16.00			9.09		20.23
Min							14.30			7.43		17.00
Std Dev							0.58			0.58		1.12
Coefficient of Var							0.04			0.07		0.06
Harmonic Mean							15.16			8.15		18.87
						Say	15.00			8.25		19.00



15.00 put in income direct excluding IPP
 15.75 put in income direct including IPP

Forecast EV/EBITDA By Rank

Guideline Companies	EV/EBITDA forecast		
CSX Corp.	14.30	14.89	Low Average
Canadian National	14.94	15.00	Low Median
Norfolk Southern Corp.	15.06	15.00	Say
Kansas City Southern	15.26	15.60	Average
Union Pacific Corp.	15.52	15.52	Median
Canadian Pacific	16.00	15.75	Say

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT CAPITAL ASSET PRICING MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE
2021 ASSESSMENT YEAR
RAILROADS

$$\text{Ex Ante} \\ \text{Ke} = \text{Rf} + \text{B} (\text{Rp})$$

Ke = Cost of Equity	5.85%
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Rm =	rate of return	5.65%
Rf =	risk free rate	1.65%
Rp =	risk premium	4.00%
B =	Beta	1.05

Rp = Risk Premium	4.00%
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to above

Shannon Pratt and Roger Grabowski	3.5 - 6%	
Cost of Capital, Applications and Examples, Fifth Edition, 2014		
Dr. Aswath Damodaran	4.72%	chart page 15
http://pages.stern.nyu.edu/~adamodar/ 2020 Implied Premium	4.00%	adjusted for Rf
John Graham and Campbell Harvey	6.20%	10 year expected real re
Duke CFO magazine Global Business Outlook survey - U.S. 4th Quarter - Dec 2020	5.48%	adjusted for Rf
	0.93%	Rf rate adjusted by 10 y

Rf = Risk Free Rate	1.65%
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to above

Value Line Investment Survey, Selected Yields January 8, 2021, page 689
as of 12-28-20

US Treasury Securities year end data		
	5 year	0.37%
	10 year	0.94%
	30 year	1.67%
	30 year Zero	NA

Federal Reserve Statistical Release (<http://www.federalreserve.gov/Releases/H15/Current/>)

As of 12-31-20

Treasury Constant Maturities		
	5 year	0.36%
	10 year	0.93%
	20 year	1.45%
	30 year	1.65%
	20 year TIPS	-0.61%
	30 year TIPS	-0.37%
		2.06%
		2.02%
		TIPS inflation indication

Inflation	2.00%
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Value Line Investment Survey, Economic Series January 1, 2021, page 1500	
Consumer Price Index Annual Rate of Change 2023-2025	2.30%
The Livingston Survey December 18, 2020, page 4, 10	
Inflation median (measured by CPI) over next 10 years	2.23%

Gross Domestic Product (GDP)	3.80%
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real GDP + inflation est

Federal Reserve Projected Long Run Real GDP Growth	
Median Projection Value From Dec 16, 2020 Report https://www.federalreserve.gov/monetarypolicy/files/fomcprojtibl20181219.pdf	1.80%

Congressional Budget Office Real GDP Economic Projections		
The Budget and Economic Outlook 2021-2031		Table 2.3, pg 15
Average Percentage Change Year To Year	2021-2025	1.90%
https://www.cbo.gov/system/files/2021-02/56970-Outlook.pdf	2026-2031	1.70%

Federal Reserve Bank of Philadelphia	
The Livingston Survey, December 18, 2020, page 4, 10	
Average Annual Real GDP Growth Rate for Next 10 Years https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey	2.20%

**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT
DIVIDEND GROWTH MODEL**

WASHINGTON STATE DEPARTMENT OF REVENUE
2021 ASSESSMENT YEAR
RAILROADS

Based on Dividend Growth

$$K_e = (D_1 + BB_1) / P_0 + G_D$$

Ke = Cost of Equity
D1 = Expected Dividends
BB1 = Expected Share Repurchase
P0 = Current Stock Price
GD = Sustainable Growth -- Dividend

Company	Ticker	Stock Price (Po)	Expected FCFE1	Expected Dividend (D1)	Expected Buyback	Dividend Yield (D1/Po)	Buyback Yield (BB1)	Total Yield	Growth	Ke
Union Pacific Corp.	UNP	208.22	4.86	4.20	0.66	2.02%	0.32%	2.33%	7.50%	9.83%
Norfolk Southern Corp.	NSC	236.65	5.99	4.12	1.87	1.74%	0.79%	2.53%	8.00%	10.53%
CSX Corp.	CSX	90.75	2.63	1.20	1.43	1.32%	1.57%	2.90%	8.00%	10.90%
Kansas City Southern	KSU	204.13	3.95	1.76	2.19	0.86%	1.07%	1.93%	7.00%	8.93%
Canadian National	CNI	109.85	2.75	1.84	0.91	1.68%	0.83%	2.50%	7.50%	10.00%
Canadian Pacific	CP	346.69	7.92	2.88	5.04	0.83%	1.45%	2.28%	13.50%	15.78%
				Mean				2.41%		11.00%
				Median				2.42%		10.27%
				Harmonic Mean				2.38%		10.64%
				Std Dev				0.32%		2.44%
				Coeff Var				13.23%		22.18%
				Max				2.90%		15.78%
				Min				1.93%		8.93%

Source: Value Line Projections 23-25

Say

10.50%
to page 1

SUPPORT FOR YIELD CAPITALIZATION EQUITY C DIVIDEND GROWTH MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE
2021 ASSESSMENT YEAR
RAILROADS

Based on Earnings Growth

$$K_e = (D_1 + BB_1 / P_0) + G_D$$

Ke = Cost of Equity
D1 = Expected Dividends
P0 = Current Stock Price
G = Sustainable Growth -- Earnings
assumptic Sustainable growth can not exceed inflation plus real GDP

Company	Ticker	Stock Price (P ₀)	Expected FCFE1	Expected Dividend (D ₁)	Expected Buyback	Yield (D ₁ /P ₀)	Buyback Yield (BB ₁ /P ₀)	Total Yield	Growth	K _e Sustainable Growth
Union Pacific Corp.	UNP	208.22	4.86	4.20	0.66	2.02%	0.32%	2.33%	10.50%	12.83%
Norfolk Southern Corp.	NSC	236.65	5.99	4.12	1.87	1.74%	0.79%	2.53%	10.50%	13.03%
CSX Corp.	CSX	90.75	2.63	1.20	1.43	1.32%	1.57%	2.90%	9.00%	11.90%
Kansas City Southern	KSU	204.13	3.95	1.76	2.19	0.86%	1.07%	1.93%	11.50%	13.43%
Canadian National	CNI	109.85	2.75	1.84	0.91	1.68%	0.83%	2.50%	9.50%	12.00%
Canadian Pacific	CP	346.69	7.92	2.88	5.04	0.83%	1.45%	2.28%	10.50%	12.78%
					Mean	1.41%				12.66%
					Median	1.50%				12.81%
					Harmonic Mean	1.25%				12.64%
					Std Dev	0.49%				0.60%
					Coeff Var	34.67%				4.73%
					Max	2.02%				13.43%
					Min	0.83%				11.90%
									Say	12.75%

Source: Value Line Projections 23-25

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**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT
DIVIDEND GROWTH MODEL**

WASHINGTON STATE DEPARTMENT OF REVENUE
2021 ASSESSMENT YEAR
RAILROADS

Based on Return on Equity

$$K_e = (D1 / P_o) + G$$

Ke = Cost of Equity
D1 = Expected Dividends
E1 = Expected Earnings
Po = Current Price
G = Sustainable Growth
b = Retained Earnings % (plowback)
ROE = Return on Equity

Company	Ticker	Stock Price (Po)	Expected Earnings (E1)	Total Yield	\$ Payout	Payout Ratio	b (1-payout ratio)	ROE	Growth (b*ROE)=(G)	Ke
Union Pacific Corp.	UNP	208.22	9.20	2.33%	4.86	0.53	0.47	39.50%	18.64%	20.98%
Norfolk Southern Corp.	NSC	236.65	11.35	2.53%	5.99	0.53	0.47	18.00%	8.50%	11.03%
CSX Corp.	CSX	90.75	4.35	2.90%	2.63	0.60	0.40	28.00%	11.08%	13.98%
Kansas City Southern	KSU	204.13	8.30	1.93%	3.95	0.48	0.52	17.00%	8.92%	10.85%
Canadian National	CNI	109.85	4.75	2.50%	2.75	0.58	0.42	21.00%	8.84%	11.34%
Canadian Pacific	CP	346.69	15.00	2.28%	7.92	0.53	0.47	29.50%	13.92%	16.21%
									Mean	14.06%
									Median	12.66%
									Harmonic Mean	13.28%
									Std Dev	3.98%
									Coeff Var	28.33%
									Max	20.98%
									Min	10.85%
									Say	13.25%

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT MULTISTAGE FREE CASH FLOW TO EQUITY MODEL

Washington State Department of Revenue
2021 ASSESSMENT YEAR

Based on Earnings Growth and Required Reinvestment

Company	Ticker	Ke
Union Pacific Corp.	UNP	10.92%
Norfolk Southern Corp.	NSC	11.96%
CSX Corp.	CSX	11.24%
Kansas City Southern	KSU	10.36%
Canadian National	CNI	10.18%
Canadian Pacific	CP	10.66%
Mean		10.89%
Harmonic Mean		10.86%
Median		10.79%
Say		10.75%

SUPPORT FOR DEBT RATING AND DEBT YIELD RATE

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

RAILROADS

Company	Ticker	Mergent's Ratings	S&P Ratings	WAYTM	S&P YTM (avg)	Mergent's Ratings	S&P Ratings	Mergent's	S&P	
Union Pacific Corp.	UNP	Baa1	A-	1.91%	2.19%	10	9	Aaa1	AAA+	1
Norfolk Southern Corp.	NSC	Baa1	BBB+	2.19%	2.35%	10	10	Aaa2	AAA	2
CSX Corp.	CSX	Baa1	BBB+	2.17%	2.32%	10	10	Aaa3	AAA-	3
Canadian Pacific	CP	Baa1	BBB+	1.98%	1.85%	10	10	Aa1	AA+	4
Kansas City Southern	KSU	Baa2	BBB	2.69%	2.73%	11	11	Aa2	AA	5
Canadian National	CNI	A2	A	1.62%	1.93%	8	8	Aa3	AA-	6
Overall Average Debt Rating		Baa1	BBB+	2.09%		9.8	9.7	A1	A+	7
					bond analysis, A-CCC bonds	2.23%		A2	A	8
								A3	A-	9
					All issues			Baa1	BBB+	10
					20+ year maturities			Baa2	BBB	11
Guideline Companies, All Ratings			2.05%	3.50%						
					bond analysis page 12					
Mergent's Bond Record January 2021, page 13										
Corporate	Aaa	Aa	A	Baa						
October	2.35%	2.55%	2.88%	3.44%						
November	2.30%	2.47%	2.79%	3.30%						
December	2.26%	2.44%	2.72%	3.16%						
4th Qtr Average	2.30%	2.49%	2.80%	3.30%						
2020 Average	3.03%	3.13%	3.38%	3.92%						
Public Utilities	Aaa	Aa	A	Baa						
October		2.72%	2.95%	3.27%						
November		2.63%	2.85%	3.17%						
December		2.57%	2.77%	3.05%						
4th Qtr Average		2.64%	2.86%	3.16%						
2020 Average		3.24%	3.41%	3.74%						
Industrials	Aaa	Aa	A	Baa						
October	2.35%	2.37%	2.81%	3.60%						
November	2.30%	2.30%	2.72%	3.41%						
December	2.26%	2.31%	2.66%	3.27%						
4th Qtr Average	2.30%	2.33%	2.73%	3.43%						
2020 Average	3.03%	3.02%	3.35%	4.09%						
Debt Yield Rate				3.50%						
Cost of Secured Debt (Operating Lease) Rate				2.50%						

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01/06/2021

Railroad Bond Analysis

2021.5

Company	type	Call	coupon	maturity	Price	Issued / Book	rrrent yield	YTM	Weighted Ave	S&P Rating	Mkt Val	Mkt : Book	Embedded Rate	Debt Service	WAYTM	WAYTM	Finra YTM
Canadian National			2.250	2022	102.00	\$ 250,000,000	2.21%	-1.70%	-0.01%	A	\$ 255,000,000	102.00%		5,625,000	-0.00057	-0.00065	0.418
Canadian National	Deb (frgn)	NC	7.625	2023	116.87	\$ 300,000,000	6.52%	-3.18%	-0.01%	A	\$ 350,610,000	116.87%		22,875,000	-0.000128	-0.00145	0.164
Canadian National			2.950	2024	108.76	\$ 350,000,000	2.71%	-0.52%	0.00%	A	\$ 380,660,000	108.76%		10,325,000	-0.000025	-0.00028	0.45
Canadian National			2.750	2026	109.16	\$ 500,000,000	2.52%	0.68%	0.00%	A	\$ 545,800,000	109.16%		13,750,000	0.000045	0.00051	0.803
Canadian National	Notes (frgn)	Z100	6.900	2028	137.59	\$ 475,000,000	5.01%	0.92%	0.01%	A	\$ 653,552,500	137.59%		32,775,000	0.000058	0.00066	1.529
Canadian National			7.375	2031	150.56	\$ 200,000,000	4.90%	1.60%	0.00%	A	\$ 301,120,000	150.56%		14,750,000	0.000043	0.00049	2.073
Canadian National			6.250	2034	149.13	\$ 500,000,000	4.19%	1.82%	0.01%	A	\$ 745,650,000	149.13%		31,250,000	0.000122	0.00138	2.057
Canadian National	Secured (fr)	Put-able	6.712	2036	156.69	\$ 250,000,000	4.28%	2.13%	0.01%	A	\$ 391,725,000	156.69%		16,780,000	0.000071	0.00081	2.326
Canadian National			6.200	2036	149.95	\$ 450,000,000	4.13%	2.15%	0.01%	A	\$ 674,775,000	149.95%		27,900,000	0.000130	0.00147	2.307
Canadian National	SR Notes		6.375	2037	152.97	\$ 300,000,000	4.17%	2.28%	0.01%	A	\$ 458,910,000	152.97%		19,125,000	0.000092	0.00104	2.492
Canadian National	SR Notes		3.500	2042	110.16	\$ 250,000,000	3.18%	2.84%	0.01%	A	\$ 275,400,000	110.16%		8,750,000	0.000095	0.00108	2.859
Canadian National	SR Notes		4.500	2043	127.63	\$ 250,000,000	3.53%	2.78%	0.01%	A	\$ 319,075,000	127.63%		11,250,000	0.000093	0.00106	2.821
Canadian National	SR Notes		3.200	2046	110.12	\$ 650,000,000	2.91%	2.63%	0.02%	A	\$ 715,780,000	110.12%		20,800,000	0.000230	0.00260	2.644
Canadian National	SR Notes		3.650	2048	117.95	\$ 600,000,000	3.09%	2.69%	0.02%	A	\$ 707,700,000	117.95%		21,900,000	0.000217	0.00246	2.697
Canadian National	SR Notes		4.450	2049	133.95	\$ 650,000,000	3.32%	2.69%	0.02%	A	\$ 870,675,000	133.95%		28,925,000	0.000235	0.00266	2.692
Canadian National	SR Notes		2.450	2050	96.58	\$ 600,000,000	2.54%	2.62%	0.02%	A	\$ 579,480,000	96.58%		14,700,000	0.000211	0.00239	2.618
16			1600	sum	2030.07	\$ 6,575,000,000	Percent of 126.88%		0.14%		\$ 8,225,912,500	125.11%	4.59%	\$ 301,480,000		1.624%	
CSX Corp	Fixed Rt		3.700	2023	109.34	\$ 500,000,000	3.38%	-2.34%	-0.02%	BBB+	\$ 546,700,000	109.34%		18,500,000	-0.000157	-0.00078	0.091
CSX Corp	Fixed Rt		3.400	2024	109.45	\$ 550,000,000	3.11%	-0.36%	0.00%	BBB+	\$ 601,975,000	109.45%		18,700,000	-0.000026	-0.00013	0.444
CSX Corp	Fixed Rt		3.350	2025	111.23	\$ 600,000,000	3.01%	0.13%	0.00%	BBB+	\$ 667,380,000	111.23%		20,100,000	0.000011	0.00005	0.788
CSX Corp			2.600	2026	109.05	\$ 700,000,000	2.38%	0.56%	0.01%	BBB+	\$ 763,350,000	109.05%		18,200,000	0.000052	0.00026	0.9
CSX Corp			3.250	2027	112.61	\$ 850,000,000	2.89%	0.89%	0.01%	BBB+	\$ 957,185,000	112.61%		27,625,000	0.000102	0.00050	1.091
CSX Corp			3.800	2028	115.15	\$ 800,000,000	3.30%	1.35%	0.01%	BBB+	\$ 921,200,000	115.15%		30,400,000	0.000145	0.00071	1.453
CSX Corp	MTN Ser C		6.800	2028	134.62	\$ 200,000,000	5.05%	1.23%	0.00%	BBB+	\$ 269,240,000	134.62%		13,600,000	0.000033	0.00016	1.998
CSX Corp			4.250	2029	119.22	\$ 350,000,000	3.56%	1.52%	0.01%	BBB+	\$ 417,270,000	119.22%		14,875,000	0.000071	0.00035	1.629
CSX Corp	SR Notes		2.400	2030	106.70	\$ 400,000,000	2.25%	1.55%	0.01%	BBB+	\$ 426,800,000	106.70%		9,600,000	0.000083	0.00041	1.579
CSX Corp	NOTES	Z100	6.000	2036	143.49	\$ 400,000,000	4.18%	2.41%	0.01%	BBB+	\$ 573,960,000	143.49%		24,000,000	0.000129	0.00064	2.599
CSX Corp	NOTES	Z100	6.150	2037	143.20	\$ 700,000,000	4.29%	2.70%	0.03%	BBB+	\$ 1,002,400,000	143.20%		43,050,000	0.000254	0.00125	2.814
CSX Corp	Fixed Rt nts		6.220	2040	148.63	\$ 660,000,000	4.18%	2.81%	0.02%	BBB+	\$ 980,958,000	148.63%		41,052,000	0.000249	0.00123	2.901
CSX Corp	NOTES		5.500	2041	138.98	\$ 550,000,000	3.96%	2.86%	0.02%	BBB+	\$ 764,390,000	138.98%		30,250,000	0.000211	0.00104	2.889
CSX Corp	NOTES		4.750	2042	128.38	\$ 600,000,000	3.70%	2.90%	0.02%	BBB+	\$ 770,280,000	128.38%		28,500,000	0.000233	0.00115	2.92
CSX Corp			4.400	2043	123.26	\$ 300,000,000	3.57%	2.93%	0.01%	BBB+	\$ 369,780,000	123.26%		13,200,000	0.000118	0.00058	2.937
CSX Corp	NOTES		4.100	2044	117.20	\$ 800,000,000	3.50%	3.03%	0.03%	BBB+	\$ 937,600,000	117.20%		32,800,000	0.000326	0.00161	3.042
CSX Corp			3.800	2046	115.08	\$ 800,000,001	3.30%	2.93%	0.03%	BBB+	\$ 920,640,001	115.08%		30,400,000	0.000315	0.00155	2.948
CSX Corp			4.750	2048	131.38	\$ 650,000,000	3.62%	3.01%	0.03%	BBB+	\$ 853,970,000	131.38%		30,875,000	0.000263	0.00130	3.047
CSX Corp			4.300	2048	123.53	\$ 850,000,000	3.48%	3.00%	0.03%	BBB+	\$ 1,050,005,000	123.53%		36,550,000	0.000342	0.00169	3.007
CSX Corp			4.500	2049	107.26	\$ 600,000,000	4.20%	4.06%	0.03%	BBB+	\$ 643,560,000	107.26%		27,000,000	0.000327	0.00161	2.967
CSX Corp	SR Notes		3.800	2050	116.65	\$ 500,000,000	3.26%	2.93%	0.02%	BBB+	\$ 583,250,000	116.65%		19,000,000	0.000197	0.00097	2.937
CSX Corp	FR SR Note		3.950	2050	120.99	\$ 600,000,000	3.26%	2.86%	0.02%	BBB+	\$ 725,940,000	120.99%		23,700,000	0.000231	0.00114	2.872
CSX Corp	SR Notes		2.500	2051	92.92	\$ 500,000,000	2.69%	2.86%	0.02%	BBB+	\$ 464,600,000	92.92%		12,500,000	0.000192	0.00095	2.851
CSX Corp	SR Notes		4.500	2054	128.34	\$ 450,000,000	3.51%	3.10%	0.02%	BBB+	\$ 577,530,000	128.34%		20,250,000	0.000188	0.00092	3.118
CSX Corp	SR Notes		4.250	2066	125.42	\$ 600,000,002	3.39%	3.18%	0.03%	BBB+	\$ 752,520,003	125.42%		25,500,000	0.000256	0.00126	3.185
CSX Corp	SR Notes		4.650	2068	133.35	\$ 600,000,003	3.49%	3.25%	0.03%	BBB+	\$ 800,100,004	133.35%		27,900,000	0.000262	0.00129	3.254
26			2600	sum	3165.43	\$ 15,110,000,006	% of book 121.75%		0.44%		\$ 18,342,583,008	121.39%	4.22%	\$ 638,127,000		2.172%	
Norfolk Southern	SR NTS		3.000	2022	102.44	\$ 600,000,000	2.93%	-1.81%	-0.01%	BBB+	\$ 614,640,000	102.44%		18,000,000	-0.000146	-0.00069	0.242
Norfolk Southern	Notes		2.903	2023	103.23	\$ 586,000,000	2.81%	0.73%	0.01%	BBB+	\$ 604,927,800	103.23%		17,011,580	0.000057	0.00027	1.045
Norfolk Southern			3.850	2024	109.10	\$ 400,000,000	3.53%	0.20%	0.00%	BBB+	\$ 436,400,000	109.10%		15,400,000	0.000011	0.00005	0.432
Norfolk Southern			3.650	2025	111.93	\$ 300,000,000	3.26%	0.22%	0.00%	BBB+	\$ 335,790,000	111.93%		10,950,000	0.000009	0.00004	0.825
Norfolk Southern	Notes	Z100	5.590	2025	118.58	\$ 367,000,000	4.71%	0.25%	0.00%	BBB+	\$ 435,188,600	118.58%		20,515,300	0.000012	0.00006	1.114
Norfolk Southern			2.900	2026	109.81	\$ 600,000,000	2.64%	0.68%	0.01%	BBB+	\$ 658,860,000	109.81%		17,400,000	0.000055	0.00026	0.925
Norfolk Southern			3.150	2027	111.68	\$ 799,999,999	2.82%	0.96%	0.01%	BBB+	\$ 893,439,999	111.68%		25,200,000	0.000103	0.00049	1.148
Norfolk Southern	Notes	Z100	7.800	2027	138.88	\$ 800,000,000	5.62%	0.59%	0.01%	BBB+	\$ 1,111,040,000	138.88%		62,400,000	0.000064	0.00030	1.313
Norfolk Southern			3.800	2028	115.49	\$ 400,000,000	3.29%	1.30%	0.01%	BBB+	\$ 461,960,000	115.49%		15,200,000	0.000070	0.00033	1.528
Norfolk Southern			2.550	2029	106.83	\$ 400,000,000	2.39%	1.58%	0.01%	BBB+	\$ 427,320,000	106.83%		10,200,000	0.000085	0.00040	1.681
Norfolk Southern	Notes	Z100	5.640	2029	128.50	\$ 350,000,000	4.39%	1.58%	0.01%	BBB+	\$ 449,750,000	128.50%		19,740,000	0.000074	0.00035	1.900
Norfolk Southern	SR Notes	Z100	7.250	2031	139.46	\$ 700,000,000	5.20%	2.53%	0.02%	BBB+	\$ 976,220,000	139.46%		50,750,000	0.000237	0.00112	2.086
Norfolk Southern	Notes	Z100	7.050	2037	153.39	\$ 750,000,000	4.60%	2.77%	0.03%	BBB+	\$ 1,150,425,000	153.39%		52,875,000	0.000279	0.00132	2.929
Norfolk Southern	Notes		4.837	2041	131.43	\$ 596,000,000	3.68%	2.74%	0.02%	BBB+	\$ 783,322,800	131.43%		28,828,520	0.000219	0.00104	2.818
Norfolk Southern	SR NTS		3.950	2042	11												

Norfolk Southern	SR Notes		3.155	2055	105.43	\$ 799,996,000	2.99%	2.90%	0.03%	BBB+	\$ 843,435,783	105.43%		25,239,874	0.000311	0.00147	2.902
Norfolk Southern	Notes	Z100	7.900	2097	180.56	\$ 350,000,000	4.38%	4.29%	0.02%	BBB+	\$ 631,960,000	180.56%		27,650,000	0.000202	0.00095	4.297
Norfolk Southern	FR SR Notes	Z100	6.000	2105	127.30	\$ 550,000,000	4.71%	4.69%	0.03%	BBB+	\$ 700,150,000	127.30%		33,000,000	0.000346	0.00164	4.692
Norfolk Southern	SR NOTES		5.100	2118	130.46	\$ 600,000,000	3.91%	3.89%	0.03%	BBB+	\$ 782,760,000	130.46%		30,600,000	0.000313	0.00148	3.887
28			2800	sum	3407.25	\$ 15,748,158,999	% of book	121.69%	0.46%		\$ 19,128,457,623	121.46%	4.53%	\$ 713,867,273		2.189%	
Union Pacific Corp			2.950	2022	102.85	\$ 500,000,000	2.87%	-2.64%	-0.02%	A-	\$ 514,250,000	102.85%		14,750,000	-0.000177	-0.00049	0.237
Union Pacific Corp	NOTES		4.163	2022	104.60	\$ 750,000,000	3.98%	-4.71%	-0.05%	A-	\$ 784,500,000	104.60%		31,222,500	-0.000474	-0.00132	0.241
Union Pacific Corp			2.750	2023	104.44	\$ 325,000,000	2.63%	-0.20%	0.00%	A-	\$ 339,430,000	104.44%		8,937,500	-0.000009	-0.00002	0.421
Union Pacific Corp			3.500	2023	106.97	\$ 650,000,000	3.27%	-1.08%	-0.01%	A-	\$ 695,305,000	106.97%		22,750,000	-0.000095	-0.00026	0.371
Union Pacific Corp			2.950	2023	104.29	\$ 300,000,000	2.83%	0.09%	0.00%	A-	\$ 312,870,000	104.29%		8,850,000	0.000004	0.00001	0.387
Union Pacific Corp			3.750	2024	109.76	\$ 400,000,000	3.42%	-0.14%	0.00%	A-	\$ 439,040,000	109.76%		15,000,000	-0.000008	-0.00002	0.300
Union Pacific Corp			3.150	2024	107.86	\$ 500,000,000	2.92%	0.01%	0.00%	A-	\$ 539,300,000	107.86%		15,750,000	0.000000	0.00000	0.481
Union Pacific Corp			3.646	2024	108.99	\$ 439,192,000	3.35%	0.05%	0.00%	A-	\$ 478,675,361	108.99%		16,012,940	0.000003	0.00001	0.367
Union Pacific Corp			3.750	2025	112.66	\$ 500,000,000	3.33%	0.12%	0.00%	A-	\$ 563,300,000	112.66%		18,750,000	0.000008	0.00002	0.727
Union Pacific Corp	FR Note		3.250	2025	110.45	\$ 500,000,000	2.94%	0.25%	0.00%	A-	\$ 552,250,000	110.45%		16,250,000	0.000017	0.00005	0.753
Union Pacific Corp			2.750	2026	108.80	\$ 500,000,000	2.53%	0.75%	0.01%	A-	\$ 544,000,000	108.80%		13,750,000	0.000051	0.00014	0.874
Union Pacific Corp			3.000	2027	111.33	\$ 500,000,000	2.69%	0.88%	0.01%	A-	\$ 556,650,000	111.33%		15,000,000	0.000059	0.00016	1.025
Union Pacific Corp	SR NOTES		2.150	2027	106.64	\$ 500,000,000	2.02%	0.91%	0.01%	A-	\$ 533,200,000	106.64%		10,750,000	0.000061	0.00017	0.973
Union Pacific Corp	Deb	NC	3.950	2028	116.94	\$ 1,500,000,000	3.38%	1.22%	0.02%	A-	\$ 1,754,100,000	116.94%		59,250,000	0.000246	0.00069	1.501
Union Pacific Corp			3.700	2029	114.97	\$ 1,000,000,000	3.22%	1.57%	0.02%	A-	\$ 1,149,700,000	114.97%		37,000,000	0.000211	0.00059	1.648
Union Pacific Corp	Deb	Z100	6.625	2029	136.47	\$ 600,000,000	4.85%	1.46%	0.01%	A-	\$ 818,820,000	136.47%		39,750,000	0.000117	0.00033	1.713
Union Pacific Corp	SR NOTES		2.400	2030	105.95	\$ 750,000,000	2.27%	1.64%	0.02%	A-	\$ 794,625,000	105.95%		18,000,000	0.000166	0.00046	1.665
Union Pacific Corp			5.375	2033	132.36	\$ 200,000,000	4.06%	2.17%	0.01%	A-	\$ 264,720,000	132.36%		10,750,000	0.000058	0.00016	2.336
Union Pacific Corp	SR NOTES	Z100	6.250	2034	141.47	\$ 250,000,000	4.42%	2.38%	0.01%	A-	\$ 353,675,000	141.47%		15,625,000	0.000080	0.00022	2.556
Union Pacific Corp			3.375	2035	112.75	\$ 450,000,000	2.99%	2.27%	0.01%	A-	\$ 507,375,000	112.75%		15,187,500	0.000137	0.00038	2.271
Union Pacific Corp			3.600	2037	112.73	\$ 500,000,000	3.19%	2.59%	0.02%	A-	\$ 563,650,000	112.73%		18,000,000	0.000174	0.00048	2.625
Union Pacific Corp	Deb		6.150	2037	147.03	\$ 250,000,000	4.18%	2.46%	0.01%	A-	\$ 367,575,000	147.03%		15,375,000	0.000083	0.00023	2.596
Union Pacific Corp			4.375	2038	121.76	\$ 750,000,000	3.59%	2.72%	0.03%	A-	\$ 913,200,000	121.76%		32,812,500	0.000274	0.00076	2.688
Union Pacific Corp			3.550	2039	113.08	\$ 500,000,000	3.14%	2.61%	0.02%	A-	\$ 565,400,000	113.08%		17,750,000	0.000175	0.00049	2.763
Union Pacific Corp			5.780	2040	105.73	\$ 375,890,000	5.47%	5.29%	0.03%	A-	\$ 397,428,497	105.73%		21,726,442	0.000267	0.00074	5.329
Union Pacific Corp	SR NOTES		4.750	2041	132.43	\$ 500,000,000	3.59%	2.61%	0.02%	A-	\$ 662,150,000	132.43%		23,750,000	0.000175	0.00049	2.686
Union Pacific Corp			4.300	2042	118.58	\$ 300,000,000	3.63%	3.07%	0.01%	A-	\$ 355,740,000	118.58%		12,900,000	0.000124	0.00034	3.085
Union Pacific Corp			4.250	2043	115.74	\$ 325,000,000	3.67%	3.22%	0.01%	A-	\$ 376,155,000	115.74%		13,812,500	0.000141	0.00039	3.234
Union Pacific Corp	Fixed Rate		4.750	2043	125.96	\$ 500,000,000	3.77%	3.08%	0.02%	A-	\$ 629,800,000	125.96%		23,750,000	0.000207	0.00058	3.136
Union Pacific Corp	Fixed Rate		4.821	2044	125.20	\$ 700,000,000	3.85%	3.23%	0.03%	A-	\$ 876,400,000	125.20%		33,747,000	0.000303	0.00084	3.234
Union Pacific Corp	Fixed Rate		4.050	2045	116.46	\$ 500,000,000	3.48%	3.06%	0.02%	A-	\$ 582,300,000	116.46%		20,250,000	0.000205	0.00057	3.082
Union Pacific Corp	SR NOTES		4.150	2045	118.50	\$ 350,000,000	3.50%	3.04%	0.01%	A-	\$ 414,750,000	118.50%		14,525,000	0.000143	0.00040	3.040
Union Pacific Corp	SR NOTES		4.050	2046	116.93	\$ 600,000,000	3.46%	3.06%	0.02%	A-	\$ 701,580,000	116.93%		24,300,000	0.000246	0.00069	3.064
Union Pacific Corp	SR NOTES		3.350	2046	106.72	\$ 300,000,000	3.14%	2.96%	0.01%	A-	\$ 320,160,000	106.72%		10,050,000	0.000119	0.00033	2.967
Union Pacific Corp	SR NOTES		4.000	2047	118.33	\$ 500,000,000	3.38%	2.97%	0.02%	A-	\$ 591,650,000	118.33%		20,000,000	0.000199	0.00055	2.974
Union Pacific Corp	SR NOTES		4.500	2048	127.13	\$ 1,500,000,000	3.54%	3.00%	0.06%	A-	\$ 1,906,950,000	127.13%		67,500,000	0.000605	0.00168	3.025
Union Pacific Corp			4.300	2049	125.51	\$ 1,000,000,000	3.43%	2.94%	0.04%	A-	\$ 1,255,100,000	125.51%		43,000,000	0.000394	0.00110	2.942
Union Pacific Corp	SR NOTES		3.799	2051	117.62	\$ 1,044,261,000	3.23%	2.90%	0.04%	A-	\$ 1,228,259,788	117.62%		39,671,475	0.000407	0.00113	2.916
Union Pacific Corp	SR NOTES		3.875	2055	115.82	\$ 450,000,000	3.35%	3.11%	0.02%	A-	\$ 521,190,000	115.82%		17,437,500	0.000188	0.00052	3.111
Union Pacific Corp	SR NOTES		4.800	2058	130.72	\$ 500,000,000	3.67%	3.33%	0.02%	A-	\$ 653,600,000	130.72%		24,000,000	0.000224	0.00062	3.348
Union Pacific Corp			3.950	2059	119.54	\$ 500,000,000	3.30%	3.07%	0.02%	A-	\$ 597,700,000	119.54%		19,750,000	0.000206	0.00057	3.075
Union Pacific Corp			3.839	2060	117.35	\$ 1,841,766,000	3.27%	3.07%	0.08%	A-	\$ 2,161,312,401	117.35%		70,705,397	0.000758	0.00211	3.069
Union Pacific Corp	SR NOTES		4.375	2065	126.87	\$ 600,000,000	3.45%	3.22%	0.03%	A-	\$ 761,220,000	126.87%		26,250,000	0.000259	0.00072	3.230
Union Pacific Corp	SR NOTES		4.100	2067	119.23	\$ 500,000,000	3.44%	3.28%	0.02%	A-	\$ 596,150,000	119.23%		20,500,000	0.000220	0.00061	3.287
Union Pacific Corp	SR NOTES		3.750	2070	113.96	\$ 750,000,000	3.29%	3.18%	0.03%	A-	\$ 854,700,000	113.96%		28,125,000	0.000320	0.00089	3.183
45 Book Valu	4500			sum	5269.48	\$ 26,751,109,000	% of book	117.10%	0.69%		\$ 31,349,906,047	117.19%	3.97%	\$ 1,063,023,254		1.913%	
Kansas City Southern			3.850	2023	107.19	\$ 199,224,000	3.59%	-0.89%	0.00%	BBB-	\$ 213,548,206	107.19%		7,670,124	-0.000024	-0.00038	1.044
Kansas City Southern			3.000	2023	105.06	\$ 439,123,000	2.86%	-0.36%	0.00%	BBB-	\$ 461,342,624	105.06%		13,173,690	-0.000021	-0.00034	0.472
Kansas City Southern	SR NOTES		3.125	2026	109.86	\$ 250,000,000	2.84%	0.88%	0.00%	BBB	\$ 274,650,000	109.86%		7,812,500	0.000030	0.00047	1.109
Kansas City Southern			2.875	2029	107.82	\$ 425,000,000	2.67%	1.75%	0.01%	BBB	\$ 458,235,000	107.82%		12,218,750	0.000100	0.00159	1.875
Kansas City Southern	SR NOTES		4.300	2043	116.20	\$ 448,651,000	3.70%	3.24%	0.02%	BBB	\$ 521,332,462	116.20%		19,291,993	0.000195	0.00310	3.255
Kansas City Southern	SR NOTES		4.300	2043	99.53	\$ 450,000,000	4.32%	4.33%	0.03%	BBB-	\$ 447,885,000	99.53%		19,350,000	0.000262	0.00416	4.333
Kansas City Southern	SR NOTES		4.950	2045	113.77	\$ 500,000,000	4.35%	4.03%	0.03%	BBB-	\$ 568,850,000	113.77%		24,750,000	0.000271	0.00430	4.503
Kansas City Southern	SR NOTES		4.950	2045	127.41	\$ 499,165,000	3.89%	3.26%	0.02%	BBB	\$ 635,986,127	127.41%		24,708,668	0.000219	0.00347	3.290
Kansas City Southern			4.700	2048	122.42	\$ 500,000,000	3.84%	3.40%	0.02%	BBB	\$ 612,100,000	122.42%		23,500,000	0.000228	0.00363	3.414
Kansas City Southern	SR NOTES		3.500	2050	108.15	\$ 550,000,000	3.24%	3.07%	0.02%	BBB	\$ 594,825,000	108.15%		19,250,000	0.000227	0.00360	3.071
Kansas City Southern			4.200	2069	112.93	\$ 425,000,000	3.72%	3.63%	0.02%	BBB	\$ 479,952,500	112.93%		17,850,000	0.000207	0.00329	3.630
11 Book Valu	1100			sum	1230.34	\$ 4,686,163,000	% of book	111.85%	0.17%		\$ 5,268,706,918	112.43%	4.05%	\$ 189,575,725		2.691%	
Canadian Pacific	Deb (foreign)	NC	4.500	2022	103.87	\$ 250,000,000	4.33%	-3.06%	-0.01%	AA-	\$ 259,675,000	103.87%		11,250,000	-0.000103	-0.00137	0.323
Canadian Pacific	SR NOTES		4.450	2023	107.29	\$ 350,000,000	4.15%	-0.39%	0.00%	AA-	\$ 375,515,000	107.29%		15,575,000	-0.000018	-0.00024	0.445
Canadian Pacific	SR NOTES		2.900	2025	108.22	\$ 700,000,000	2.68%	0.52%	0.00%	AA-	\$ 757,540,000	108.22%		20,300,000			

Canadian Pacific	SR NOTES	5.950	2037	144.13	\$	450,000,000	4.13%	2.48%	0.02%	AA-	\$	648,585,000	144.13%		26,775,000	0.000150	0.00200	2.603
Canadian Pacific	SR NOTES	5.750	2042	142.84	\$	250,000,000	4.03%	2.94%	0.01%	AA-	\$	357,100,000	142.84%		14,375,000	0.000099	0.00131	2.985
Canadian Pacific	SR NOTES	4.800	2045	136.90	\$	550,000,000	3.51%	2.67%	0.02%	AA-	\$	752,950,000	136.90%		26,400,000	0.000197	0.00262	2.699
Canadian Pacific	SR NOTES	6.125	2115	113.93	\$	900,000,000	5.38%	5.37%	0.06%	AA-	\$	1,025,370,000	113.93%		55,125,000	0.000649	0.00863	3.63
13 Book Value		1300	sum	1604.29	\$	5,600,000,000	% of book	123.41%	0.15%		\$	6,807,005,000	121.55%	4.70%	263,012,500			1.976%

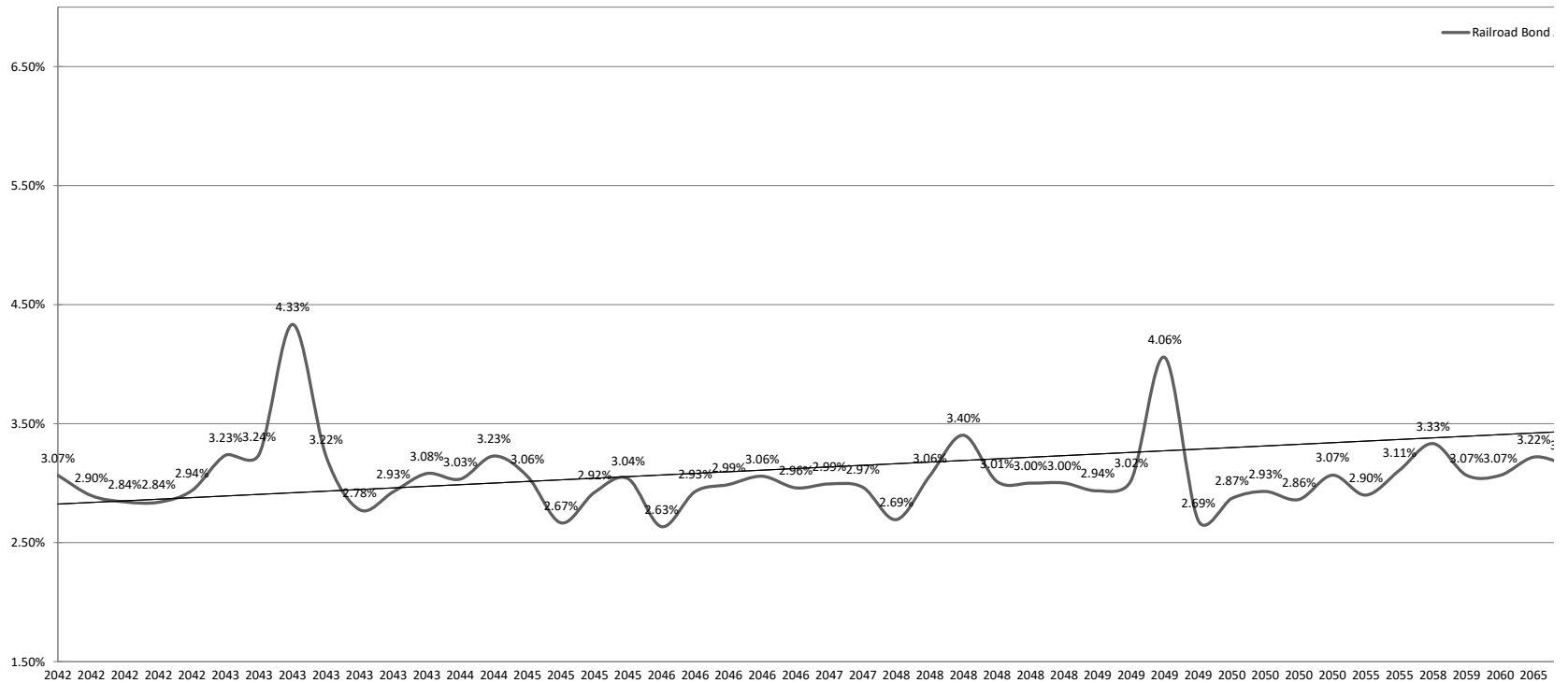
Total \$ 74,470,431,005.00 **Total \$ 89,122,571,095.34** **119.68%** **4.26%** **\$ 3,169,085,752** **2.052%** **2.094%** **2.228**

This includes short term. For 20+ year maturities see below

Source: Finra

Embedded debt rate 4.26%
Weighted average yield to maturity 2.05%
Debt service / Market value 3.56%

20+ Year, All Ratings, Railroad Bond Analysis



12/31/2020

Railroad Bond Analysis

Company	type	Call	coupon	maturity	Price	Issued / Book	current yield	yield to matu	Weighted Ave Rating	Mkt Val	Mkt : Book	Embedded Rat	Debt Service	WAYTM	WAYTM	Finra YTM
Union Pacific Corp			4.300	2042	118.58	\$ 300,000,000	3.626%	3.07%	0.01% A-	\$ 355,740,000	118.58%		12,900,000	0.000120612	0.000340003	3.085
CSX Corp	NOTES		4.750	2042	128.38	\$ 600,000,000	3.70%	2.90%	0.02% BBB+	\$ 770,280,000	128.38%		28,500,000	0.000233	0.00115	2.92
Norfolk Southern	SR NTS		3.950	2042	117.03	\$ 600,000,000	3.38%	2.84%	0.02% BBB+	\$ 702,180,000	117.03%		23,700,000	0.000229	0.00108	2.870
Canadian National	SR Notes		3.500	2042	110.16	\$ 250,000,000	3.18%	2.84%	0.01% A	\$ 275,400,000	110.16%		8,750,000	0.000095	0.00108	2.859
Canadian Pacific	SR NOTES		5.750	2042	142.84	\$ 250,000,000	4.03%	2.94%	0.01% AA-	\$ 357,100,000	142.84%		14,375,000	0.000096	0.00131	2.985
Norfolk Southern	SR NTS		4.800	2043	123.98	\$ 500,000,000	3.87%	3.23%	0.02% BBB+	\$ 619,900,000	123.98%		24,000,000	0.000217	0.00103	3.264

Kansas City Southern	SR NOTES	4.300	2043	116.20	\$	448,651,000	3.70%	3.24%	0.02%	BBB	\$	521,332,462	116.20%		19,291,993	0.000195	0.00310	3.255
Kansas City Southern	SR NOTES	4.300	2043	99.53	\$	450,000,000	4.32%	4.33%	0.03%	BBB-	\$	447,885,000	99.53%		19,350,000	0.000262	0.00416	4.333
Union Pacific Corp		4.250	2043	115.74	\$	325,000,000	3.67%	3.22%	0.01%	A-	\$	376,155,000	115.74%		13,812,500	0.000137	0.00039	3.234
Canadian National	SR Notes	4.500	2043	127.63	\$	250,000,000	3.53%	2.78%	0.01%	A	\$	319,075,000	127.63%		11,250,000	0.000093	0.00106	2.821
CSX Corp		4.400	2043	123.26	\$	300,000,000	3.57%	2.93%	0.01%	BBB+	\$	369,780,000	123.26%		13,200,000	0.000118	0.00058	2.937
Union Pacific Corp	Fixed Rate	4.750	2043	125.96	\$	500,000,000	3.771%	3.08%	0.02%	A-	\$	629,800,000	125.96%	0.000202013	23,750,000	0.000569471	0.000569471	3.136
CSX Corp	NOTES	4.100	2044	117.20	\$	800,000,000	3.50%	3.03%	0.03%	BBB+	\$	937,600,000	117.20%		32,800,000	0.000326	0.00161	3.042
Union Pacific Corp	Fixed Rate	4.821	2044	125.20	\$	700,000,000	3.85%	3.23%	0.03%	A-	\$	876,400,000	125.20%		33,747,000	0.000296	0.00084	3.234
Union Pacific Corp	Fixed Rate	4.050	2045	116.46	\$	500,000,000	3.478%	3.06%	0.02%	A-	\$	582,300,000	116.46%		20,250,000	0.00020496	0.000565193	3.082
Canadian Pacific	SR NOTES	4.800	2045	136.90	\$	550,000,000	3.51%	2.67%	0.02%	AA-	\$	752,950,000	136.90%		26,400,000	0.000197	0.00262	2.699
Norfolk Southern	FR SR Note	4.450	2045	125.71	\$	500,000,000	3.54%	2.92%	0.02%	BBB+	\$	628,550,000	125.71%		22,250,000	0.000196	0.00093	2.942
Union Pacific Corp	SR NOTES	4.150	2045	118.50	\$	350,000,000	3.502%	3.04%	0.01%	A-	\$	414,750,000	118.50%	0.000139404	14,525,000	0.000392976	0.000392976	3.04
Canadian National	SR Notes	3.200	2046	110.12	\$	650,000,000	2.91%	2.63%	0.02%	A	\$	715,780,000	110.12%		20,800,000	0.000230	0.00260	2.644
CSX Corp		3.800	2046	115.08	\$	800,000,001	3.30%	2.93%	0.03%	BBB+	\$	920,640,001	115.08%		30,400,000	0.000315	0.00155	2.948
Norfolk Southern	FR SR Note	4.650	2046	128.58	\$	600,000,000	3.62%	2.99%	0.02%	BBB+	\$	771,480,000	128.58%		27,900,000	0.000241	0.00114	2.992
Union Pacific Corp	SR NOTES	4.050	2046	116.93	\$	600,000,000	3.464%	3.06%	0.02%	A-	\$	701,580,000	116.93%	0.000240613	24,300,000	0.000678282	0.000678282	3.064
Union Pacific Corp	SR NOTES	3.350	2046	106.72	\$	300,000,000	3.14%	2.96%	0.01%	A-	\$	320,160,000	106.72%		10,050,000	0.000116	0.00033	2.967
Norfolk Southern		3.942	2047	116.75	\$	749,169,000	3.38%	2.99%	0.03%	BBB+	\$	874,654,808	116.75%		29,532,242	0.000301	0.00142	3.013
Union Pacific Corp	SR NOTES	4.000	2047	118.33	\$	500,000,000	3.38%	2.97%	0.02%	A-	\$	591,650,000	118.33%		20,000,000	0.000194	0.00055	2.974
Canadian National	SR Notes	3.650	2048	117.95	\$	600,000,000	3.09%	2.69%	0.02%	A	\$	707,700,000	117.95%		21,900,000	0.000217	0.00246	2.697
Norfolk Southern		4.150	2048	119.55	\$	500,000,000	3.47%	3.06%	0.02%	BBB+	\$	597,750,000	119.55%		20,750,000	0.000206	0.00097	3.068
Kansas City Southern		4.700	2048	122.42	\$	500,000,000	3.84%	3.40%	0.02%	BBB	\$	612,100,000	122.42%		23,500,000	0.000228	0.00363	3.414
CSX Corp		4.750	2048	131.38	\$	650,000,000	3.62%	3.01%	0.03%	BBB+	\$	853,970,000	131.38%		30,875,000	0.000263	0.00130	3.047
CSX Corp		4.300	2048	123.53	\$	850,000,000	3.48%	3.00%	0.03%	BBB+	\$	1,050,005,000	123.53%		36,550,000	0.000342	0.00169	3.007
Union Pacific Corp	SR NOTES	4.500	2048	127.13	\$	1,500,000,000	3.540%	3.00%	0.06%	A-	\$	1,906,950,000	127.13%		67,500,000	0.000590349	0.00166418	3.025
Union Pacific Corp		4.300	2049	125.51	\$	1,000,000,000	3.426%	2.94%	0.04%	A-	\$	1,255,100,000	125.51%	0.000384924	43,000,000	0.000384924	0.001085091	2.942
Norfolk Southern		4.100	2049	119.92	\$	400,000,000	3.42%	3.02%	0.02%	BBB+	\$	479,680,000	119.92%		16,400,000	0.000162	0.00077	3.033
CSX Corp		4.500	2049	107.26	\$	600,000,000	4.20%	4.06%	0.03%	BBB+	\$	643,560,000	107.26%		27,000,000	0.000327	0.00161	2.967
Canadian National	SR Notes	4.450	2049	133.95	\$	650,000,000	3.32%	2.69%	0.02%	A	\$	870,675,000	133.95%		28,925,000	0.000235	0.00266	2.692
Norfolk Southern	SR Notes	3.050	2050	103.43	\$	800,000,000	2.95%	2.87%	0.03%	BBB+	\$	827,440,000	103.43%		24,400,000	0.000309	0.00146	2.874
CSX Corp	SR Notes	3.800	2050	116.65	\$	500,000,000	3.26%	2.93%	0.02%	BBB+	\$	583,250,000	116.65%		19,000,000	0.000197	0.00097	2.937
CSX Corp	FR SR Note	3.950	2050	120.99	\$	600,000,000	3.26%	2.86%	0.02%	BBB+	\$	725,940,000	120.99%		23,700,000	0.000231	0.00114	2.872
Kansas City Southern	SR NOTES	3.500	2050	108.15	\$	550,000,000	3.24%	3.07%	0.02%	BBB	\$	594,825,000	108.15%		19,250,000	0.000227	0.00360	3.071
Canadian National	SR Notes	2.450	2050	96.58	\$	600,000,000	2.54%	2.62%	0.02%	A	\$	579,480,000	96.58%		14,700,000	0.000211	0.00239	2.618
CSX Corp	SR Notes	2.500	2051	92.92	\$	500,000,000	2.69%	2.86%	0.02%	BBB+	\$	464,600,000	92.92%		12,500,000	0.000192	0.00095	2.851
Union Pacific Corp	SR NOTES	3.799	2051	117.62	\$	1,044,261,000	3.230%	2.90%	0.04%	A-	\$	1,228,259,788	117.62%	0.000397387	39,671,475	0.000397387	0.001120225	2.916
Norfolk Southern		4.050	2052	119.44	\$	749,994,000	3.39%	3.06%	0.03%	BBB+	\$	895,792,834	119.44%		30,374,757	0.000308	0.00146	3.073
CSX Corp	SR Notes	4.500	2054	128.34	\$	450,000,000	3.51%	3.10%	0.02%	BBB+	\$	577,530,000	128.34%		20,250,000	0.000188	0.00092	3.118
Norfolk Southern	SR Notes	3.155	2055	105.43	\$	799,996,000	2.99%	2.90%	0.03%	BBB+	\$	843,435,783	105.43%		25,239,874	0.000311	0.00147	2.902
Union Pacific Corp	SR NOTES	3.875	2055	115.82	\$	450,000,000	3.346%	3.11%	0.02%	A-	\$	521,190,000	115.82%	0.000183425	17,437,500	0.000183425	0.00051707	3.111
Union Pacific Corp	SR NOTES	4.800	2058	130.72	\$	500,000,000	3.672%	3.33%	0.02%	A-	\$	653,600,000	130.72%	0.000218523	24,000,000	0.000218523	0.000616011	3.348
Union Pacific Corp		3.950	2059	119.54	\$	500,000,000	3.30%	3.07%	0.02%	A-	\$	597,700,000	119.54%		19,750,000	0.000201	0.00057	3.075
Union Pacific Corp		3.839	2060	117.35	\$	1,841,766,000	3.271%	3.07%	0.07%	A-	\$	2,161,312,401	117.35%	0.000740312	70,705,397	0.000740312	0.002086921	3.069
Union Pacific Corp	SR NOTES	4.375	2065	126.87	\$	600,000,000	3.448%	3.22%	0.03%	A-	\$	761,220,000	126.87%	0.000253251	26,250,000	0.000253251	0.000713909	3.23
CSX Corp	SR Notes	4.250	2066	125.42	\$	600,000,002	3.39%	3.18%	0.03%	BBB+	\$	752,520,003	125.42%		25,500,000	0.000256	0.00126	3.185
Union Pacific Corp	SR NOTES	4.100	2067	119.23	\$	500,000,000	3.439%	3.28%	0.02%	A-	\$	596,150,000	119.23%	0.000215095	20,500,000	0.000215095	0.000606349	3.287
CSX Corp	SR Notes	4.650	2068	133.35	\$	600,000,003	3.49%	3.25%	0.03%	BBB+	\$	800,100,004	133.35%		27,900,000	0.000262	0.00129	3.254
Kansas City Southern		4.200	2069	112.93	\$	425,000,000	3.72%	3.63%	0.02%	BBB	\$	479,952,500	112.93%		17,850,000	0.000207	0.00329	3.630
Union Pacific Corp	SR NOTES	3.750	2070	113.96	\$	750,000,000	3.291%	3.18%	0.03%	A-	\$	854,700,000	113.96%	0.000312897	28,125,000	0.000312897	0.000882048	3.183
Norfolk Southern	Notes Z100	7.900	2097	180.56	\$	350,000,000	4.38%	4.29%	0.02%	BBB+	\$	631,960,000	180.56%		27,650,000	0.000202	0.00095	4.297
Norfolk Southern	FR SR Note Z100	6.000	2105	127.30	\$	550,000,000	4.71%	4.69%	0.03%	BBB+	\$	700,150,000	127.30%		33,000,000	0.000346	0.00164	4.692
Canadian Pacific	SR NOTES	6.125	2115	113.93	\$	900,000,000	5.38%	5.37%	0.06%	AA-	\$	1,025,370,000	113.93%		55,125,000	0.000649	0.00863	3.63
Norfolk Southern	SR NOTES	5.100	2118	130.46	\$	600,000,000	3.91%	3.89%	0.03%	BBB+	\$	782,760,000	130.46%		30,600,000	0.000313	0.00148	3.887

Total \$ **35,383,837,006** **Total** \$ **42,449,850,583** **119.97%** **4.23%** \$ **1,495,712,738** **2.052%** **2.094%** **3.124**

Source: Finra

Embedded debt rate **4.23%**
Weighted average yield to maturity **2.05%**
Debt service / Market value **3.52%**
Finra YTM **3.12%**
SAY **3.50%**

DATA INPUT

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

RAILROADS

Instructions: Data entered on this page will flow to the applicable worksheets.

Guideline Companies		Current Year										Next Year	
		Stock Price 12/31/2020	Beta levered	Revenues Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Per Share	Book Value	Common Shares	Long-Term Debt	Operating Margin	Revenues Per Share	Cash Flow Per Share
Name	Ticker	Yahoo	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL
Union Pacific Corp.	UNP	\$208.22	1.10	\$ 29.60	\$ 11.05	\$ 7.80	\$ 3.88	\$ 23.90	673,868	\$ 26,080,000,000	50.0%	\$ 32.75	\$ 12.50
Norfolk Southern Corp.	NSC	\$236.65	1.15	\$ 38.85	\$ 12.70	\$ 9.17	\$ 3.76	\$ 60.30	253,985	\$ 12,634,000,000	46.0%	\$ 43.80	\$ 15.10
CSX Corp.	CSX	\$90.75	1.10	\$ 13.95	\$ 5.25	\$ 3.61	\$ 1.04	\$ 15.40	764,774	\$ 16,121,000,000	52.0%	\$ 15.85	\$ 6.25
Kansas City Southern	KSU	\$204.13	1.10	\$ 28.80	\$ 10.85	\$ 7.00	\$ 1.60	\$ 46.75	93,601	\$ 3,765,300,000	52.0%	\$ 32.85	\$ 12.45
Canadian National	CNI	\$109.85	0.85	\$ 14.45	\$ 5.60	\$ 4.00	\$ 1.75	\$ 20.55	710,200	\$ 9,815,000,000	47.0%	\$ 16.65	\$ 6.50
Canadian Pacific	CP	\$346.69	1.00	\$ 44.00	\$ 17.30	\$ 13.35	\$ 2.61	\$ 46.65	134,500	\$ 6,800,000,000	49.0%	\$ 48.45	\$ 19.40

Value Line Issue: [November 20, 2020](#)

The harmonic mean is the preferable method for averaging multiples, such as the price/earning ratio, in which price is in the numerator. If these ratios are averaged using an arithmetic mean (a common error), High data points are given greater weights than low data points.

The harmonic mean, on the other hand, gives equal weight to each data point

Note:

Canadian Exchange Rate: **0.7600**

Value Line figures are all values in US dollars.

						Year 5								Revenues
Earnings Per Share	Dividends Per Share	Common Shares	% Return on Shareholders' Equity	% Retained to Common Equity	All Dividends to Net Profits	Revenues Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Per Share	Common Shares	% Return on Shareholders' Equity	% Retained to Common Equity	All Dividends to Net Profits	2021-2025
VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL
\$ 9.20	\$ 4.20	635,000	39.5%	21.5%	46.0%	\$ 42.90	\$ 17.75	\$ 13.45	\$ 4.80	590,000	41.5%	27.0%	36.0%	6.00%
\$ 11.35	\$ 4.12	245,000	18.0%	11.0%	36.0%	\$ 56.15	\$ 21.25	\$ 15.75	\$ 4.75	227,000	24.0%	16.5%	30.0%	5.50%
\$ 4.35	\$ 1.20	725,000	28.0%	20.5%	28.0%	\$ 19.70	\$ 8.00	\$ 5.70	\$ 1.40	660,000	36.5%	27.5%	25.0%	5.50%
\$ 8.30	\$ 1.76	89,000	17.0%	13.5%	21.0%	\$ 43.70	\$ 17.05	\$ 11.75	\$ 2.16	83,000	18.0%	15.0%	19.0%	8.00%
\$ 4.75	\$ 1.84	695,000	21.0%	13.0%	39.0%	\$ 23.60	\$ 9.45	\$ 7.25	\$ 2.20	635,000	23.5%	16.0%	29.0%	8.00%
\$ 15.00	\$ 2.88	130,000	29.5%	24.0%	19.0%	\$ 61.65	\$ 25.40	\$ 20.00	\$ 4.00	120,000	28.0%	22.5%	20.0%	7.50%

Cash Flow	Earnings	Dividends	Income	Balance Sheet					Cash Flow	
2021-2025	2021-2025	2021-2025	Operating Income	Current Assets	PP & E Gross	Current Liabilities	Long Term Debt	Intangibles (excluding Goodwill)	Depreciation & Amortization	Net Share Repurchases
VL	VL	VL	M*	M*	M*	M*	M*	M*	M*	10-K
9.00%	10.50%	7.50%	\$ 7,834,000,000	\$ 4,214,000,000	\$ 77,030,000,000	\$ 4,173,000,000	\$ 25,660,000,000	\$ -	\$ 2,210,000,000	\$ 3,705,000,000
8.50%	10.50%	8.00%	\$ 3,566,000,000	\$ 2,318,000,000	\$ 43,330,000,000	\$ 2,160,000,000	\$ 12,102,000,000	\$ -	\$ 1,154,000,000	\$ 1,400,000,000
7.50%	9.00%	8.00%	\$ 4,362,000,000	\$ 4,441,000,000	\$ 46,002,000,000	\$ 2,019,000,000	\$ 16,304,000,000	\$ -	\$ 1,383,000,000	\$ 867,000,000
10.00%	11.50%	7.00%	\$ 1,034,000,000	\$ 626,000,000	\$ 11,832,000,000	\$ 476,000,000	\$ 3,764,000,000	\$ 110,000,000	\$ 358,000,000	\$ 888,900,000
8.50%	9.50%	7.50%	\$ 4,385,960,000	\$ 2,357,520,000	\$ 41,759,720,000	\$ 2,488,240,000	\$ 9,116,960,000	\$ 110,200,000	\$ 1,207,640,000	\$ 288,040,000
9.00%	10.50%	13.50%	\$ 2,596,920,000	\$ 1,003,960,000	\$ 22,318,920,000	\$ 2,016,280,000	\$ 6,524,600,000	\$ 28,120,000	\$ 592,040,000	\$ 1,122,520,000

Fair Value	Carrying Value	Operating Lease	ROE	All Div'ds to Net Prof
Debt	Debt	Rent	5 yr	5 yr
10-k	10-k	10-k	VL	VL
\$ 28,970,000,000	\$ 26,729,000,000	\$ 410,000,000	41.5%	36%
\$ 16,664,000,000	\$ 12,681,000,000	\$ 160,000,000	24.0%	30%
\$ 21,076,000,000	\$ 16,705,000,000	\$ 82,000,000	36.5%	25%
\$ 4,368,600,000	\$ 3,770,800,000	\$ 30,800,000	18.0%	19%
\$ 12,194,960,000	\$ 9,752,320,000	\$ 199,880,000	23.5%	29%
\$ 8,813,720,000	\$ 6,802,760,000	\$ 93,480,000	28.0%	20%

SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

RAILROADS

Company	Ticker	Stock Price	2020		2021		2020		2021	
			Actual Earnings Ratio (EPS/P)		Projected Earnings Ratio (PEPS/P)		Cash Flow Ratio (CF/P)		Projected Cash Flow Ratio (PCF/P)	
Union Pacific Corp.	UNP	208.22	7.80	3.75%	9.20	4.42%	11.05	5.31%	12.50	6.00%
Norfolk Southern Corp.	NSC	236.65	9.17	3.87%	11.35	4.80%	12.70	5.37%	15.10	6.38%
CSX Corp.	CSX	90.75	3.61	3.98%	4.35	4.79%	5.25	5.79%	6.25	6.89%
Kansas City Southern	KSU	204.13	7.00	3.43%	8.30	4.07%	10.85	5.32%	12.45	6.10%
Canadian National	CNI	109.85	4.00	3.64%	4.75	4.32%	5.60	5.10%	6.50	5.92%
Canadian Pacific	CP	346.69	13.35	3.85%	15.00	4.33%	17.30	4.99%	19.40	5.60%
		Mean		3.75%		4.45%		5.31%		6.15%
		Median		3.80%		4.37%		5.31%		6.05%
		Max		3.98%		4.80%		5.79%		6.89%
		Min		3.43%		4.07%		4.99%		5.60%
		stdev		0.00		0.00		0.00		0.00
		cov		0.05		0.06		0.05		0.07
		harmean		3.74%		4.44%		5.30%		6.12%
Source:		Say		3.75%		4.50%		5.25%		6.00%

Actual earnings: Value Line / Q4 Year End stock price

Estimated Earnings: Value Line / Q4 Year End stock price

Actual Cash Flow: Value Line / Q4 Year End stock price

Estimated Cash Flow: Value Line / Q4 Year End stock price

IMPLIED PREMIUMS FOR US MARKET

Updated January 5, 2021

Source: <http://pages.stern.nyu.edu/~adamodar/>

These implied premiums are calculated using the S&P 500.

Year	Earnings Yield	Dividend Yield	S&P 500	Earnings*	Dividends*	Dividends + Buybacks	% Change in Earnings	% Change in Dividends	T.Bill Rate	F.Bond Rate	Bond-Bill	Boothed Growth	Premium	Analyst Growth Estimate	Implied Premium (FC)	Implied Premium
1960	5.34%	3.41%	58.11	3.10	1.98				2.66%	2.76%	0.10%	2.45%				
1961	4.71%	2.85%	71.55	3.37	2.04		8.60%	2.91%	2.13%	2.35%	0.22%	2.41%	2.92%			2.92%
1962	5.81%	3.40%	63.1	3.67	2.15		8.79%	5.21%	2.73%	3.85%	1.12%	4.05%	3.56%			3.56%
1963	5.51%	3.13%	75.02	4.13	2.35		12.75%	9.45%	3.12%	4.14%	1.02%	4.96%	3.38%			3.38%
1964	5.62%	3.05%	84.75	4.76	2.58		15.23%	10.08%	3.54%	4.21%	0.67%	5.13%	3.31%			3.31%
1965	5.73%	3.06%	92.43	5.30	2.83		11.20%	9.42%	3.93%	4.65%	0.72%	5.46%	3.32%			3.32%
1966	6.74%	3.59%	80.33	5.41	2.88		2.23%	1.96%	4.76%	4.64%	-0.12%	4.19%	3.68%			3.68%
1967	5.66%	3.09%	96.47	5.46	2.98		0.85%	3.37%	4.21%	5.70%	1.49%	5.25%	3.20%			3.20%
1968	5.51%	2.93%	103.86	5.72	3.04		4.81%	2.09%	5.21%	6.16%	0.95%	5.32%	3.00%			3.00%
1969	6.63%	3.52%	92.06	6.10	3.24		6.66%	6.49%	6.58%	7.88%	1.30%	7.55%	3.74%			3.74%
1970	5.98%	3.46%	92.15	5.51	3.19		-9.72%	-1.61%	6.53%	6.50%	-0.03%	4.78%	3.41%			3.41%
1971	5.46%	3.10%	102.09	5.57	3.16		1.15%	-0.74%	4.39%	5.89%	1.50%	4.57%	3.09%			3.09%
1972	5.23%	2.70%	118.05	6.17	3.19		10.76%	0.71%	3.84%	6.41%	2.57%	5.21%	2.72%			2.72%
1973	8.16%	3.70%	97.55	7.96	3.61		28.93%	13.24%	6.93%	6.90%	-0.03%	8.30%	4.30%			4.30%
1974	13.64%	5.43%	68.56	9.35	3.72		17.48%	3.14%	8.00%	7.40%	-0.60%	6.42%	5.59%			5.59%
1975	8.55%	4.14%	90.19	7.71	3.73		-17.54%	0.30%	5.80%	7.76%	1.96%	5.99%	4.13%			4.13%
1976	9.07%	3.93%	107.46	9.75	4.22		26.39%	13.10%	5.08%	6.81%	1.73%	8.19%	4.55%			4.55%
1977	11.43%	5.11%	95.1	10.87	4.86		11.53%	15.07%	5.12%	7.78%	2.66%	9.52%	5.92%			5.92%
1978	12.11%	5.39%	96.11	11.64	5.18		7.07%	6.60%	7.18%	9.15%	1.97%	8.48%	5.72%			5.72%
1979	13.48%	5.53%	107.94	14.55	5.97		25.01%	15.23%	10.38%	10.33%	-0.05%	11.70%	6.45%			6.45%
1980	11.04%	4.74%	135.76	14.99	6.44		3.01%	7.81%	11.24%	12.43%	1.19%	11.01%	5.03%			5.03%
1981	12.39%	5.57%	122.55	15.18	6.83		1.31%	6.08%	14.71%	13.98%	-0.73%	11.42%	5.73%			5.73%
1982	9.83%	4.93%	140.64	13.82	6.93		-8.95%	1.58%	10.54%	10.47%	-0.07%	7.96%	4.90%			4.90%
1983	8.06%	4.32%	164.93	13.29	7.12		-3.84%	2.76%	8.80%	11.80%	3.00%	9.09%	4.31%			4.31%
1984	10.07%	4.68%	167.24	16.84	7.83		26.69%	9.85%	9.85%	11.51%	1.66%	11.02%	5.11%			5.11%
1985	7.42%	3.88%	211.28	15.68	8.20		-6.91%	4.74%	7.72%	8.99%	1.27%	7.89%	4.03%	6.75%		3.84%
1986	5.96%	3.38%	242.17	14.43	8.19		-7.93%	-0.15%	6.16%	7.22%	1.06%	5.54%	3.36%	6.96%		3.58%
1987	6.49%	3.71%	247.08	16.04	9.17		11.10%	11.99%	5.47%	8.86%	3.39%	9.66%	4.18%	8.58%		3.99%
1988	8.20%	3.68%	277.72	24.12	10.22		50.42%	11.49%	6.35%	9.14%	2.79%	9.76%	4.12%	7.67%		3.77%
1989	6.80%	3.32%	353.4	24.32	11.73		0.83%	14.80%	8.37%	7.93%	-0.44%	9.58%	3.85%	7.46%		3.51%
1990	6.58%	3.74%	330.22	22.65	12.35		-6.87%	5.26%	7.81%	8.07%	0.26%	7.39%	3.92%	7.19%		3.89%
1991	4.58%	3.11%	417.09	19.30	12.97		-14.79%	5.03%	7.00%	6.70%	-0.30%	6.34%	3.27%	7.81%		3.48%
1992	4.16%	2.90%	435.71	20.87	12.64		8.13%	-2.59%	5.30%	6.68%	1.38%	4.67%	2.83%	9.83%		3.55%
1993	4.25%	2.72%	466.45	26.90	12.69		28.89%	0.41%	3.50%	5.79%	2.29%	4.73%	2.74%	8.00%		3.17%
1994	5.89%	2.91%	459.27	31.75	13.36		18.03%	5.34%	5.00%	7.82%	2.82%	7.23%	3.06%	7.17%		3.55%
1995	5.74%	2.30%	615.93	37.70	14.17		18.74%	6.00%	3.50%	5.57%	2.07%	5.65%	2.44%	6.50%		3.29%
1996	4.83%	2.01%	740.74	40.63	14.89		7.77%	5.10%	5.00%	6.41%	1.41%	6.13%	2.11%	7.92%		3.20%
1997	4.08%	1.60%	970.43	44.09	15.52		8.52%	4.25%	5.35%	5.74%	0.39%	5.45%	1.67%	8.00%		2.73%
1998	3.11%	1.32%	1229.23	44.27	16.20		0.41%	4.37%	4.33%	4.65%	0.32%	4.60%	1.38%	7.20%		2.26%
1999	3.07%	1.14%	1469.25	51.68	16.71		16.74%	3.16%	5.37%	6.44%	1.07%	5.75%	1.20%	12.50%		2.05%
2000	3.94%	1.23%	1320.28	56.13	16.27		8.61%	-2.65%	5.73%	5.11%	-0.62%	3.71%	1.65%	12.00%		2.87%
2001	3.85%	1.37%	1148.09	38.85	15.74	30.08	-30.79%	-3.24%	1.80%	5.05%	3.25%	3.56%	1.73%	10.30%		3.62%
2002	5.23%	1.83%	879.82	46.04	16.08	29.83	18.51%	2.15%	1.20%	3.81%	2.61%	3.57%	2.29%	8.00%		4.10%
2003	4.87%	1.61%	1111.91	54.69	17.88	31.58	18.79%	11.19%	1.00%	4.25%	3.25%	5.35%	2.12%	11.00%		4.74%
2004	5.58%	1.60%	1211.92	67.68	19.407	40.60	23.75%	8.54%	2.18%	4.22%	2.04%	4.90%	2.02%	8.50%		3.65%
2005	5.47%	1.79%	1248.29	76.45	22.38	61.17	12.96%	15.32%	4.31%	4.39%	0.08%	6.16%	2.20%	8.00%		4.08%
2006	6.18%	1.77%	1418.3	87.72	25.05	73.16	14.74%	11.93%	4.88%	4.70%	-0.18%	5.93%	1.97%	12.50%		4.16%
2007	5.62%	1.89%	1468.36	82.54	27.73	95.36	-5.91%	10.70%	3.31%	4.02%	0.71%	5.03%	2.06%	5.00%		4.37%
2008	7.24%	3.11%	903.25	65.39	28.05	67.52	-20.78%	1.15%	1.59%	2.21%	0.62%	2.11%	4.05%	4.00%		6.43%
2009	5.35%	2.00%	1115.10	59.65	22.31	37.43	-8.78%	-20.46%	0.14%	3.84%	3.70%	0.28%	2.60%	7.20%		4.36%
2010	6.65%	1.84%	1257.64	83.66	23.12	55.53	40.25%	3.63%	0.13%	3.29%	3.16%	3.33%	2.24%	6.95%		6.09%
2011	7.72%	2.07%	1257.60	97.05	26.02	71.28	16.01%	12.54%	0.03%	1.88%	1.85%	2.75%	2.71%	7.18%		8.34%
2012	7.18%	2.13%	1426.19	102.47	30.44	75.90	5.58%	16.99%	0.05%	1.76%	1.71%	2.93%	2.47%	5.27%		5.78%
2013	5.81%	1.96%	1848.36	107.45	36.28	88.13	4.86%	19.19%	0.07%	3.04%	2.97%	5.01%	2.03%	4.28%		4.96%
2014	5.49%	1.92%	2058.90	113.01	39.44	101.98	5.17%	8.71%	0.05%	2.17%	2.12%	2.77%	2.24%	5.58%		5.78%
2015	5.20%	2.11%	2043.94	106.32	43.16	106.10	-5.92%	9.43%	0.21%	2.27%	2.06%	2.96%	2.46%	5.51%		5.16%
2016	4.86%	2.01%	2238.83	108.86	45.03	108.67	2.39%	4.33%	0.51%	2.45%	1.94%	2.64%	2.41%	5.54%		5.69%
2017	4.67%	1.86%	2673.61	124.94	49.73	108.28	14.77%	10.44%	1.39%	2.41%	1.02%	3.22%	2.36%	7.05%		5.08%
2018	5.92%	2.14%	2506.85	148.34	53.61	136.65	18.73%	7.80%	2.37%	2.68%	0.31%	3.24%	2.50%	4.12%		5.96%
2019	5.03%	1.82%	3230.78	162.35	58.80	150.50	9.44%	9.68%	1.55%	1.92%	0.37%	2.57%		3.96%		5.20%
2020	3.68%	1.51%	3756.07	138.12	56.70	127.78	-14.92%	-3.57%	0.09%	0.93%	0.84%	0.74%	1.65%	5.42%		4.72%

* Earnings and dividends numbers each year reflect the estimated numbers as of the end of the year. These numbers get updated later in the year but I do not update the numbers in this spreadsheet

**2021 Multistage Earnings Growth Model
Railroad Industry**

Company Ticker 3.80% GDP
22.9 Industry P/E
27.0% Target Dividend Payout Ratio (All dividends to net profit)
26.0% Target ROE

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		69.03%	30.97%	7.80		stock price =	(208.22)
1	17.95%	47.20%	52.80%	9.20	4.86		4.86
2	12.27%	42.04%	57.96%	10.33	5.99		5.99
3	10.93%	37.90%	62.10%	11.46	7.12		7.12
4	9.85%	34.50%	65.50%	12.59	8.24		8.24
5	8.97%	30.52%	69.48%	13.72	9.53		9.53
6	7.94%	26.55%	73.45%	14.80	10.87		10.87
7	6.90%	22.57%	77.43%	15.83	12.25		12.25
8	5.87%	18.59%	81.41%	16.76	13.64		13.64
9	4.83%	14.62%	85.38%	17.57	15.00		15.00
10	3.80%	14.62%	85.38%	18.23	15.57	432.88	448.45
11+	3.80%	14.62%	85.38%	18.93	16.16		

Value Line Dividends Growth Rate **IRR = 10.92%**

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		91.44%	8.56%	9.17		stock price =	(236.65)
1	23.77%	47.20%	52.80%	11.35	5.99		5.99
2	12.27%	42.04%	57.96%	12.74	7.39		7.39
3	10.93%	37.90%	62.10%	14.14	8.78		8.78
4	9.85%	34.50%	65.50%	15.53	10.17		10.17
5	8.97%	30.52%	69.48%	16.92	11.76		11.76
6	7.94%	26.55%	73.45%	18.26	13.42		13.42
7	6.90%	22.57%	77.43%	19.53	15.12		15.12
8	5.87%	18.59%	81.41%	20.67	16.83		16.83
9	4.83%	14.62%	85.38%	21.67	18.50		18.50
10	3.80%	14.62%	85.38%	22.49	19.21	534.04	553.25
11+	3.80%	14.62%	85.38%	23.35	19.94		

Value Line Dividends Growth Rate **IRR = 11.96%**

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		78.84%	21.16%	\$ 3.61		stock price =	(90.75)
1	20.50%	39.58%	60.42%	4.35	2.63		2.63
2	10.29%	35.88%	64.12%	4.80	3.08		3.08
3	9.33%	32.82%	67.18%	5.25	3.52		3.52
4	8.53%	30.24%	69.76%	5.69	3.97		3.97
5	7.86%	27.12%	72.88%	6.14	4.48		4.48
6	7.05%	23.99%	76.01%	6.57	5.00		5.00
7	6.24%	20.87%	79.13%	6.98	5.53		5.53
8	5.42%	17.74%	82.26%	7.36	6.06		6.06
9	4.61%	14.62%	85.38%	7.70	6.58		6.58
10	3.80%	14.62%	85.38%	7.99	6.83	189.80	196.63
11+	3.80%	14.62%	85.38%	8.30	7.09		

Value Line Dividends Growth Rate **IRR = 11.24%**

Kansas City Southern KSU								
Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow	
0		71.43%	28.57%	\$ 7.00		stock price =	(204.13)	
1	18.57%	52.46%	47.54%	8.30	3.95		3.95	
2	13.64%	46.17%	53.83%	9.43	5.08		5.08	
3	12.00%	41.22%	58.78%	10.56	6.21		6.21	
4	10.72%	37.23%	62.77%	11.70	7.34		7.34	
5	9.68%	32.71%	67.29%	12.83	8.63		8.63	
6	8.50%	28.18%	71.82%	13.92	10.00		10.00	
7	7.33%	23.66%	76.34%	14.94	11.40		11.40	
8	6.15%	19.14%	80.86%	15.86	12.82		12.82	
9	4.98%	14.62%	85.38%	16.65	14.21		14.21	
10	3.80%	14.62%	85.38%	17.28	14.75	410.26	425.02	
11+	3.80%	14.62%	85.38%	17.94	15.32			

Value Line Dividends Growth Rate IRR = 10.36%

Canadian National CNI								
Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow	
0		72.12%	27.88%	4.00		stock price =	(109.85)	
1	18.75%	42.08%	57.92%	4.75	2.75		2.75	
2	10.94%	37.93%	62.07%	5.27	3.27		3.27	
3	9.86%	34.53%	65.47%	5.79	3.79		3.79	
4	8.98%	31.68%	68.32%	6.31	4.31		4.31	
5	8.24%	28.27%	71.73%	6.83	4.90		4.90	
6	7.35%	24.86%	75.14%	7.33	5.51		5.51	
7	6.46%	21.44%	78.56%	7.80	6.13		6.13	
8	5.58%	18.03%	81.97%	8.24	6.75		6.75	
9	4.69%	14.62%	85.38%	8.63	7.37		7.37	
10	3.80%	14.62%	85.38%	8.95	7.65	212.58	220.22	
11+	3.80%	14.62%	85.38%	9.29	7.94		7.94	

Value Line Dividends Growth Rate IRR = 10.18%

Canadian Pacific CP								
Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow	
0		47.54%	52.46%	13.35		stock price =	(346.69)	
1	12.36%	47.20%	52.80%	15.00	7.92		7.92	
2	12.27%	42.04%	57.96%	16.84	9.76		9.76	
3	10.93%	37.90%	62.10%	18.68	11.60		11.60	
4	9.85%	34.50%	65.50%	20.52	13.44		13.44	
5	8.97%	30.52%	69.48%	22.36	15.54		15.54	
6	7.94%	26.55%	73.45%	24.14	17.73		17.73	
7	6.90%	22.57%	77.43%	25.80	19.98		19.98	
8	5.87%	18.59%	81.41%	27.32	22.24		22.24	
9	4.83%	14.62%	85.38%	28.64	24.45		24.45	
10	3.80%	14.62%	85.38%	29.73	25.38	705.78	731.16	
11+	3.80%	14.62%	85.38%	30.86	26.35			

Value Line Dividends Growth Rate IRR = 10.66%