



**2022 Capitalization Rate Study  
Railroads**

*FINAL*

*Completed: April 21, 2022*

**MONTANA DEPARTMENT OF REVENUE**

**Yield Capitalization Rate Conclusion**

**Industry: Railroads**

**2022 Assessment Year**

**Capital Structure <sup>[1]</sup>**

Equity	<b>80.00%</b>
Debt	<b>20.00%</b>

**Equity Cost of Capital**

		<b>Weighting</b>
Capital Asset Pricing Model - Ex Post <sup>[2]</sup>	10.15%	35%
Capital Asset Pricing Model - Ex Ante <sup>[2]</sup>	8.44%	35%
3 Stage Dividend Discount Model - Dividends <sup>[3]</sup>	7.50%	15%
3 Stage Dividend Discount Model - Earnings <sup>[3]</sup>	7.45%	15%
Weighted Average	<u>8.75%</u>	100%
Selected Cost of Equity	<b><u>8.75%</u></b>	

**Debt Cost of Capital**

		<b>Weighting</b>
Aa - Mergent's - Avg. YTM of Aa Rated Corporate Bonds <sup>[4]</sup>	2.82%	33%
A - Mergent's - Avg. YTM of A Rated Corporate Bonds <sup>[4]</sup>	3.04%	33%
Baa - Mergent's - Avg. YTM of Baa Rated Corporate Bonds <sup>[4]</sup>	3.37%	33%
Ba - Avg of MTDOR Study, Bloomberg and Capital IQ <sup>[5]</sup>	5.31%	0%
B - Avg of MTDOR Study, Bloomberg and Capital IQ <sup>[5]</sup>	7.81%	0%
Weighted Average	<u>3.08%</u>	100%
Selected Cost of Debt	<b><u>3.08%</u></b>	

**Weighted Average Cost of Capital (WACC)**

<b>Source of Capital</b>	<b>Capital Structure</b>	<b>Cost of Capital</b>	<b>Marginal Tax Rate</b>	<b>After-tax Cost of Capital</b>	<b>Weighted Cost</b>
Equity	80.00%	8.75%		8.75%	7.00%
Debt	20.00%	3.08%	24.00%	2.34%	0.47%
<b>WACC</b>	<b>100.00%</b>				<b>7.47%</b>
<b>WACC (Rounded)</b>					<b>7.50%</b>

Notes

[1] From worksheet: Capital Structure

[2] From worksheet: Capital Asset Pricing Model Summary

[3] From worksheet: Yield Equity Summary

[4] January 2022, Mergent Bond Record

[5] Average corporate bond yields from: Montana Department of Revenue High Yield Debt Study and Kroll Capitalization Rate Study.

**MONTANA DEPARTMENT OF REVENUE**

**Direct Capitalization Rate Conclusion**

**Industry: Railroads**

**2022 Assessment Year**

**Capital Structure <sup>[1]</sup>**

Equity	<b>80.00%</b>
Debt	<b>20.00%</b>

**Equity Capitalization Rate <sup>[2]</sup>**

NOI After-tax	<b>4.40%</b>
GCF	<b>5.35%</b>

**Debt Capitalization Rate <sup>[3]</sup>**

Calculated Current Yield	<b>3.65%</b>
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**NOI After-tax Direct Capitalization Rate**

Source of Capital	Capital Structure	Capitalization Rate	Marginal Tax Rate	After-tax Capitalization Rate	Weighted Capitalization Rate
Equity	80.00%	4.40%		4.40%	3.52%
Debt	20.00%	3.65%	24.00%	2.77%	0.55%
<b>Total</b>	<b>100.00%</b>				<b>4.07%</b>
<b>Total (Rounded)</b>					<b>4.10%</b>

**GCF Direct Capitalization Rate**

Source of Capital	Capital Structure	Capitalization Rate	Marginal Tax Rate	After-tax Capitalization Rate	Weighted Capitalization Rate
Equity	80.00%	5.35%		5.35%	4.28%
Debt	20.00%	3.65%	24.00%	2.77%	0.55%
<b>WACC</b>	<b>100.00%</b>				<b>4.83%</b>
<b>Total (Rounded)</b>					<b>4.85%</b>

Notes:

- [1] From worksheet: Capital Structure
- [2] From worksheet: Direct Equity Summary
- [3] From worksheet: Calculated Current Yield

**MONTANA DEPARTMENT OF REVENUE**

**Selection of Guideline Companies**

**Industry: Railroads**

**2022 Assessment Year**

**Screening Requirements:**

The universe of companies is all companies listed in Value Line under the Railroad industry.

Companies were then selected using the following screening criteria:

1. Primarily provides rail, intermodal transportation, and rail-to-truck transload services.
2. Actively traded on an American exchange.
3. Headquartered / incorporated in the United States
4. No significant merger & acquisition activity during the year.

<b>Company Ticker</b>	<b>Primarily provide rail services</b>	<b>Actively Traded on an American Exchange</b>	<b>Headquartered/ Incorporated in the U.S.</b>	<b>Consider as Potential Guideline Company</b>	<b>Not Engaged in Material M&amp;A Activity</b>	<b>Use as Guideline Company</b>	<b>Note</b>
CNI			No				
CP			No				
CSX	Yes	Yes	Yes	Yes	Yes	Yes	
GATX	No						
GBX	No						
KSU					No		[1]
NSC	Yes	Yes	Yes	Yes	Yes	Yes	
RAIL	No						
TRN	No						
UNP	Yes	Yes	Yes	Yes	Yes	Yes	
USDP	No						
WAB	No						

[1] KSU is awaiting regulatory approval for its merger with CP

**MONTANA DEPARTMENT OF REVENUE**

Support for Capital Structure

Industry: Railroads

2022 Assessment Year

(\$ and Shares Outstanding In Millions, Except Per Share Amounts)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Ticker	Company	Industry Group	Financial Strength	Shares Outstanding	End of Year Closing Stock Price	MV Common Stock	MV Preferred Stock	MV Long Term Debt	PV of Operating Leases	Total Common, Preferred, LT Debt, & Op Leases	% Common	% Preferred	% Debt & Op Leases	
		<i>Value Line</i>	<i>Value Line</i>	<i>10-K</i>	<i>Yahoo</i>	<i>ExF</i>		<i>10-K</i>	<i>10-K</i>	<i>10-K</i>	<i>G+H+I+J</i>	<i>G/K</i>	<i>H/K</i>	<i>(I+J)/K</i>
							<i>[Note 1]</i>	<i>[Note 2]</i>						
CSX	CSX Corp.	RAILROAD	B++	2,202	37.60	82,787	0	19,439	542	102,768	81%	0%	19%	
NSC	Norfolk Southern	RAILROAD	A+	240	297.71	71,499	0	17,033	413	88,945	80%	0%	20%	
UNP	Union Pacific	RAILROAD	A++	639	251.93	160,943	0	32,929	1,759	195,631	82%	0%	18%	
<b>All Companies</b>						315,229	0	69,401	2,714	387,344	<b>81%</b>	<b>0%</b>	<b>19%</b>	
<b>Average</b>											<b>81%</b>	<b>0%</b>	<b>19%</b>	
<b>Median</b>											<b>81%</b>	<b>0%</b>	<b>19%</b>	
High											82%	0%	20%	
Low											80%	0%	18%	
<b>Selected</b>											<b>80%</b>		<b>20%</b>	

Notes

[1] Market value of preferred stock assumed to equal book value

[2] Market value of debt is fair value of long term debt from 10-K notes

**MCA 15-1-210, rationale for changes to guideline companies:**

2022 - KSU removed for merger activity

		<u>Median</u>	
Current Year	81%	0%	19%
Prior Year	79%	0%	21%
2 Years Prior	78%	0%	22%
3 Year Average	79%	0%	21%

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**MONTANA DEPARTMENT OF REVENUE**

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Capital Asset Pricing Model (CAPM)

Industry: Railroads

2022 Assessment Year

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$$k_e = R_f + \beta \times ERP$$

		<i>Ex Post</i>	<i>Ex Ante</i>
$k_e =$	Cost of Equity	<b>10.15%</b>	<b>8.44%</b>
$R_f =$	Risk Free Rate	1.94%	1.94%
$\beta =$	Beta	1.10	1.10
$ERP =$	Equity Risk Premium ( $R_m - R_f$ )	7.46%	5.91%
$R_m =$	Market Rate of Return	9.40%	7.85%

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**Risk Free Rate Measures ( $R_f$ ):**

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The Value Line Investment Survey: Selection & Opinion<sup>[1]</sup>

January 7, 2022 Page 2089

Selected Yields on Taxable U.S. Treasury Securities as of 12/27/21

10-year	1.48%
30-year	1.88%

Federal Reserve Statistical Release<sup>[2]</sup>

U.S. government securities, Treasury constant maturities, Nominal, December 31, 2021

10-year	1.52%
20-year	1.94%
30-year	1.90%

<b>Risk Free Rate Selected</b>	<b>1.94%</b>
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Notes

[1] "Value Line Selection & Opinion", Value Line (January 7, 2022)

[2] <https://www.federalreserve.gov/datadownload/Choose.aspx?rel=H.15>

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**Ex Post - Equity Risk Premium Measures ( $ERP = R_m - R_f$ )**

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Duff & Phelps, 2022 Cost of Capital Navigator

		<u><math>R_m</math></u>	<u><math>R_f</math></u>	<u>ERP</u>
ERP "Historical" - <i>Ex Post</i>	<i>Arithmetic Avg.</i>	9.40%	1.94%	7.46%
ERP "Supply-side" - <i>Ex Post</i>	<i>Arithmetic Avg.</i>	8.16%	1.94%	6.22%
<b>Ex Post Equity Risk Premium Selected</b>		<b>9.40%</b>	<b>1.94%</b>	<b>7.46%</b>

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**MONTANA DEPARTMENT OF REVENUE**

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Capital Asset Pricing Model (CAPM)

Industry: Railroads

2022 Assessment Year

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$$k_e = R_f + \beta \times ERP$$

**Ex Ante - Equity Risk Premium Measures (ERP = Rm - Rf)**

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DOR 3 Stage Dividend Growth Model, S & P 500, See Exhibit

	<u>R<sub>m</sub></u>	<u>R<sub>f</sub></u>	<u>ERP</u>
ERP - <i>Ex Ante</i>	8.05%	1.94%	6.11%

Duff & Phelps, 2022 Cost of Capital Navigator

	<u>R<sub>m</sub></u>	<u>R<sub>f</sub></u>	<u>ERP</u>
ERP "Conditional" - <i>Ex Ante</i>	8.00%	2.50%	5.50%

Damodaran Implied ERP (Jan 5, 2022)

	<u>R<sub>m</sub></u>	<u>R<sub>f</sub></u>	<u>ERP</u>
Implied Premium (FCFE) - <i>Ex Ante</i>	5.76%	1.52%	4.24%
Implied Premium (FCFE with sustainable payout) - <i>Ex Ante</i>	6.42%	1.52%	4.90%

	<u>R<sub>m</sub></u>	<u>R<sub>f</sub></u>	<u>ERP</u>
<u>Average</u>	7.06%		5.19%
<u>Median</u>	7.21%		5.20%
<u>High</u>	8.05%		6.11%
<u>Low</u>	5.76%		4.24%

<b>Equity Risk Premium Selected</b>	<b><u>7.85%</u></b>	<b><u>1.94%</u></b>	<b><u>5.91%</u></b>
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**MONTANA DEPARTMENT OF REVENUE**

**Support for Beta Selection in CAPM**

**Industry: Railroads**

**2022 Assessment Year**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>Ticker</b>	<b>Company</b>	<b>Industry Group</b>	<b>Financial Strength</b>	<b>Beta</b>
		<i>Value Line</i>	<i>Value Line</i>	<i>Value Line</i>
CSX	CSX Corp.	RAILROAD	B++	1.05
NSC	Norfolk Southern	RAILROAD	A+	1.10
UNP	Union Pacific	RAILROAD	A++	1.10
<b>Average</b>				<b>1.08</b>
<b>Median</b>				<b>1.10</b>
High				1.10
Low				1.05
<b>Selected</b>				<b>1.10</b>



**MONTANA DEPARTMENT OF REVENUE**

Inflation & Real Growth

Industry: Railroads

2022 Assessment Year

A	B	C	D	Nominal Growth	
				E	F
Source Description	Inflation (CPI)	Real Growth (GDP)	Nominal Growth	Low	High
Livingston Survey <sup>[1]</sup>	2.44%	2.21%	4.65%		
Survey of Professional Forecasters <sup>[2]</sup>	2.49%	2.25%	4.74%		
Congressional Budget Office <sup>[3]</sup>					
<b>Average</b>	<b>2.47%</b>	<b>2.23%</b>	<b>4.70%</b>		
<b>Median</b>	<b>2.47%</b>	<b>2.23%</b>	<b>4.70%</b>		
High	2.49%	2.25%	4.74%		
Low	2.44%	2.21%	4.65%		
<b>Selected</b>	<b>2.45%</b>	<b>2.25%</b>	<b>4.70%</b>	<b>4.65%</b>	<b>4.74%</b>

Inflationary Trend Factors						
Year	Dec. CPI-U Index	Percent Change From Previous	Dec. to Dec. Conversion Factor	Annual Avg. CPI-U Index	Percent Change From Previous	Annual Conversion Factor
	<i>Note [5]</i>	<i>Note [6]</i>	<i>Note [7]</i>	<i>Note [5]</i>	<i>Note [6]</i>	<i>Note [7]</i>
2011	225.672	2.9%	1.2354	224.939	3.1%	1.2046
2012	229.601	1.7%	1.2143	229.594	2.0%	1.1802
2013	233.049	1.5%	1.1963	232.957	1.4%	1.1632
2014	234.812	0.8%	1.1873	236.736	1.6%	1.1446
2015	236.525	0.7%	1.1787	237.017	0.1%	1.1433
2016	241.432	2.0%	1.1548	240.007	1.2%	1.1290
2017	246.524	2.1%	1.1309	245.120	2.1%	1.1055
2018	251.233	1.9%	1.1097	251.107	2.4%	1.0791
2019	256.974	2.2%	1.0849	255.657	1.8%	1.0599
2020	260.474	1.3%	1.0704	258.811	1.2%	1.0470
2021	278.802	6.6%	1.0000	270.970	4.5%	1.0000

Notes

[1] Federal Reserve Bank of Philadelphia The Livingston Survey December 17, 2021 Table 3 Inflation Rate and Real GDP mean

<https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey>

[2] Federal Reserve Bank of Philadelphia Survey of Professional Forecasters February 11, 2022 Table 8 and Table 9 Average over next 10-Year mean

<https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/survey-of-professional-forecasters>

[3] Not available at study date

<https://www.cbo.gov/about/products/budget-economic-data#4>

[5] Historical Consumer Price Index for All Urban Consumers (CPI-U): U.S. city average, all items, index averages (1982-84=100, unless otherwise noted)

<https://www.bls.gov/cpi/tables/supplemental-files/historical-cpi-u-202001.pdf>

[6] (Row year - Previous Year) / Row Year

[7] Most current year / Row year

**MONTANA DEPARTMENT OF REVENUE**

**3 Stage Dividend Discount Model (DDM)**

**Industry: Railroads**

**2022 Assessment Year**

$$k_e = (D_1 / P_0) + g$$

$k_e$  = Cost of Equity

$D_1$  = Expected Dividend

$P_0$  = Current Price Per Share

$g$  = Sustainable Long-Term Growth

A	B	C	D	E	F	G	H	I
Ticker	Company	2021 Year End Stock Price	2022 Est Div'ds Decl'd per sh	Expected Equity Payout Yield	Sustainable Long-Term Growth Rate <sup>[1]</sup>	Sustainable Long-Term Growth Rate <sup>[1]</sup>	Cost of Equity Dividend Growth	Cost of Equity Earnings Growth
		<i>Yahoo</i>	<i>Value Line</i>	<i>D/C</i>	<i>Dividends</i>	<i>Earnings</i>	<i>E+F</i>	<i>E+G</i>
		$P_0$	$D_1$	$D_1/P_0$	$g$	$g$	$k_e$	$k_e$
CSX	CSX Corp.	37.60	0.40	1.06%	7.48%	6.77%	8.54%	7.83%
NSC	Norfolk Southern	297.71	4.58	1.54%	5.67%	5.64%	7.21%	7.18%
UNP	Union Pacific	251.93	4.40	1.75%	4.98%	5.60%	6.72%	7.35%
<b>Average</b>							<b>7.49%</b>	<b>7.45%</b>
<b>Median</b>							<b>7.21%</b>	<b>7.35%</b>
High							8.54%	7.83%
Low							6.72%	7.18%
<b>Selected</b>							<b>7.50%</b>	<b>7.45%</b>

Notes

[1] From worksheet: DDM Sustainable Long-Term Growth

**MONTANA DEPARTMENT OF REVENUE**

Support for DDM - Short Term Growth Rate Calculations

Industry: Railroads

2022 Assessment Year

A	B	C	D	E	F	G
Ticker	Company	End of Year Closing Stock Price	Div'ds Decl'd per sh 2022 Est	Expected Dividend Yield	Div'ds Decl'd per sh 2024-2026 Est	Short-Term Growth Rate
		<i>Yahoo</i>	<i>Value Line</i>	<i>D / C</i>	<i>Value Line</i>	<i>Note [1]</i>
CSX	CSX Corp.	37.60	0.40	1.06%	0.60	14.47%
NSC	Norfolk Southern	297.71	4.58	1.54%	5.80	8.19%
UNP	Union Pacific	251.93	4.40	1.75%	5.20	5.73%

A	B	C	D	E
Ticker	Company	Earnings per share 2022 Est	Earnings per share 2024-2026 Est	Short-Term Growth Rate
		<i>Value Line</i>	<i>Value Line</i>	<i>Note [1]</i>
CSX	CSX Corp.	1.75	2.50	12.62%
NSC	Norfolk Southern	13.85	17.50	8.11%
UNP	Union Pacific	11.60	14.50	7.72%

Notes

[1] 4 year compound annual growth rate (CAGR) - 3 periods

**MONTANA DEPARTMENT OF REVENUE**

**Support for DDM - Sustainable Long Term Growth**

**Industry: Railroads**

**2022 Assessment Year**

Dividend Growth Rate									Stage 1				
Ticker	Company	Year End Stock Price	Expected Short-Term Dividend Growth Rate	Expected Long-Term Growth Rate	Expected Dividend Yield	Internal Rate of Return	Implied Sustainable Long-Term Growth Rate (g)	Initial Investment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>
		Yahoo	Note [1]	Note [2]	$D_1/P_0$	$K_e = IRR \text{ of } D_1:D_{500}$	$g = IRR - Div. \text{ Yield}$						
CSX	CSX Corp.	37.60	14.47%	4.70%	1.06%	8.54%	7.48%	(37.60)	0.40	0.46	0.52	0.60	0.69
NSC	Norfolk Southern	297.71	8.19%	4.70%	1.54%	7.21%	5.67%	(297.71)	4.58	4.96	5.36	5.80	6.28
UNP	Union Pacific	251.93	5.73%	4.70%	1.75%	6.72%	4.98%	(251.93)	4.40	4.65	4.92	5.20	5.50

Earnings Growth Rate									Stage 1				
Ticker	Company	Year End Stock Price	Expected Short-Term Earnings Growth Rate	Expected Long-Term Growth Rate	Expected Dividend Yield	Internal Rate of Return	Implied Sustainable Long-Term Growth Rate (g)	Initial Investment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>
		Yahoo	Note [1]	Note [2]	$D_1/P_0$	$K_e = IRR \text{ of } D_1:D_{500}$	$g = IRR - Div. \text{ Yield}$						
CSX	CSX Corp.	37.60	12.62%	4.70%	1.06%	7.83%	6.77%	(37.60)	0.40	0.45	0.51	0.57	0.64
NSC	Norfolk Southern	297.71	8.11%	4.70%	1.54%	7.18%	5.64%	(297.71)	4.58	4.95	5.35	5.79	6.26
UNP	Union Pacific	251.93	7.72%	4.70%	1.75%	7.35%	5.60%	(251.93)	4.40	4.74	5.11	5.50	5.92

Notes

[1] From worksheet: DDM Short Term Growth Rate Calculations

[2] From worksheet: Inflation & Real Growth

**MONTANA DEPARTMENT OF REVENUE**

Support for DDM - Sustainable Long Term Growth

Industry: Railroads

2022 Assessment Year

Dividend	Stage 2															Stage 3		
Ticker	D <sub>6</sub>	D <sub>7</sub>	D <sub>8</sub>	D <sub>9</sub>	D <sub>10</sub>	D <sub>11</sub>	D <sub>12</sub>	D <sub>13</sub>	D <sub>14</sub>	D <sub>15</sub>	D <sub>16</sub>	D <sub>17</sub>	D <sub>18</sub>	D <sub>19</sub>	D <sub>20</sub>	D <sub>21</sub>	D <sub>22</sub>	D <sub>500</sub>
CSX	0.78	0.89	1.01	1.15	1.31	1.49	1.70	1.93	2.20	2.51	2.85	3.25	3.70	4.21	4.79	5.01	5.25	17,969,418,821
NSC	6.77	7.31	7.90	8.52	9.20	9.93	10.72	11.58	12.50	13.49	14.57	15.73	16.98	18.33	19.79	20.72	21.69	74,269,469,973
UNP	5.81	6.14	6.48	6.85	7.24	7.65	8.08	8.54	9.02	9.53	10.07	10.64	11.24	11.88	12.55	13.14	13.76	47,111,811,300

Earnings	Stage 2															Stage 3		
Ticker	D <sub>6</sub>	D <sub>7</sub>	D <sub>8</sub>	D <sub>9</sub>	D <sub>10</sub>	D <sub>11</sub>	D <sub>12</sub>	D <sub>13</sub>	D <sub>14</sub>	D <sub>15</sub>	D <sub>16</sub>	D <sub>17</sub>	D <sub>18</sub>	D <sub>19</sub>	D <sub>20</sub>	D <sub>21</sub>	D <sub>22</sub>	D <sub>500</sub>
CSX	0.72	0.81	0.91	1.02	1.14	1.28	1.43	1.60	1.80	2.02	2.26	2.53	2.84	3.18	3.57	3.74	3.91	13,393,131,250
NSC	6.75	7.28	7.86	8.47	9.14	9.86	10.64	11.48	12.38	13.36	14.41	15.55	16.77	18.10	19.52	20.44	21.40	73,274,893,254
UNP	6.37	6.85	7.36	7.92	8.51	9.15	9.84	10.58	11.38	12.23	13.15	14.14	15.21	16.35	17.58	18.41	19.27	65,982,591,488

**MONTANA DEPARTMENT OF REVENUE**

Support for Yield Capitalization Rate - Debt Rating

Industry: Railroads

2022 Assessment Year

A	B	C	D	E	F
Ticker	Company	Industry Group	Financial Strength	Moody's Long Term Rating	Yield to Maturity
		<i>Value Line</i>	<i>Value Line</i>	<i>Moodys.com</i>	
CSX	CSX Corp.	RAILROAD	B++	Baa1	3.37%
NSC	Norfolk Southern	RAILROAD	A+	A3	3.04%
UNP	Union Pacific	RAILROAD	A++	Aa3	2.82%
<b>Average</b>					<b>3.08%</b>
<b>Median</b>					<b>3.04%</b>
High					3.37%
Low					2.82%
<b>Selected</b>					<b>3.08%</b>

**MONTANA DEPARTMENT OF REVENUE**

Support for Direct Capitalization - Equity Capitalization Rates

Industry: Railroads

2022 Assessment Year

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Ticker	Company	End of Year Closing Stock Price	VL Historic EPS	VL Est EPS	VL Historic P/E Ratio	VL Est P/E Ratio	Ke Estimate - Earnings (Hist. P/E)	Ke Estimate - Earnings (Est. P/E)	VL Historic Cash Flow Per Share	VL Est Cash Flow Per Share	VL Historic P/CF Ratio	VL Est P/CF Ratio	Ke Estimate - Cash Flow (Hist. P/CF)	Ke Estimate - Cash Flow (Est. P/CF)	Market Value of Equity	Book Value of Equity	MTBR
		<i>Yahoo</i>	<i>Value Line</i>	<i>Value Line</i>	<i>C/D</i>	<i>C/E</i>	<i>1/F</i>	<i>1/G</i>	<i>Value Line</i>	<i>Value Line</i>	<i>C/J</i>	<i>C/K</i>	<i>1/L</i>	<i>1/M</i>	<i>Price x Shrs</i>	<i>Value Line</i>	<i>P/Q</i>
CSX	CSX Corp.	37.60	1.56	1.75	24.10	21.49	4.15%	4.65%	1.81	2.25	20.77	16.71	4.81%	5.98%	82,787	13,101	6.32
NSC	Norfolk Southern	297.71	12.12	13.85	24.56	21.50	4.07%	4.65%	13.99	17.25	21.28	17.26	4.70%	5.79%	71,499	14,791	4.83
UNP	Union Pacific	251.93	9.95	11.50	25.32	21.91	3.95%	4.56%	11.49	13.80	21.93	18.26	4.56%	5.48%	160,943	16,958	9.49
<b>Average</b>					<b>24.66</b>	<b>21.63</b>	<b>4.06%</b>	<b>4.62%</b>			<b>21.33</b>	<b>17.41</b>	<b>4.69%</b>	<b>5.75%</b>			<b>6.88</b>
<b>Median</b>					<b>24.56</b>	<b>21.50</b>	<b>4.07%</b>	<b>4.65%</b>			<b>21.28</b>	<b>17.26</b>	<b>4.70%</b>	<b>5.79%</b>			<b>6.32</b>
High					25.32	21.91	4.15%	4.65%			21.93	18.26	4.81%	5.98%			9.49
Low					24.10	21.49	3.95%	4.56%			20.77	16.71	4.56%	5.48%			4.83
<b>Selected</b>							<b>4.40%</b>						<b>5.35%</b>				<b>6.32</b>

**MONTANA DEPARTMENT OF REVENUE**

Support for Direct Capitalization - Debt Capitalization Rate

Industry: Railroads

2022 Assessment Year

(\$ in Millions)

A	B	C	D	E	F	G	H	I	J
Ticker	Company	Current Year Interest Exp.	Previous Year MV LT Debt	Previous Year BV LT Debt	Current Year MV LT Debt	Current Year BV LT Debt	Average MV LT Debt	Current Yield	MTBR
	<i>Source</i>	<i>10-K</i>	<i>10-K</i>	<i>10-K</i>	<i>10-K</i>	<i>10-K</i>	<i>(D+F)/2</i>	<i>(C/H)</i>	<i>(F/G)</i>
CSX	CSX Corp.	722	21,076	16,705	19,439	16,366	20,258	3.56%	1.19
NSC	Norfolk Southern	646	16,664	12,681	17,033	13,840	16,849	3.83%	1.23
UNP	Union Pacific	1,157	31,829	26,729	32,929	29,729	32,379	3.57%	1.11
<b>All Companies</b>		2,525			69,401	59,935	69,485	<b>3.63%</b>	<b>1.16</b>
<b>Average</b>								<b>3.66%</b>	<b>1.18</b>
<b>Median</b>								<b>3.57%</b>	<b>1.19</b>
High								3.83%	1.23
Low								3.56%	1.11
<b>Selected</b>								<b>3.65%</b>	<b>1.18</b>



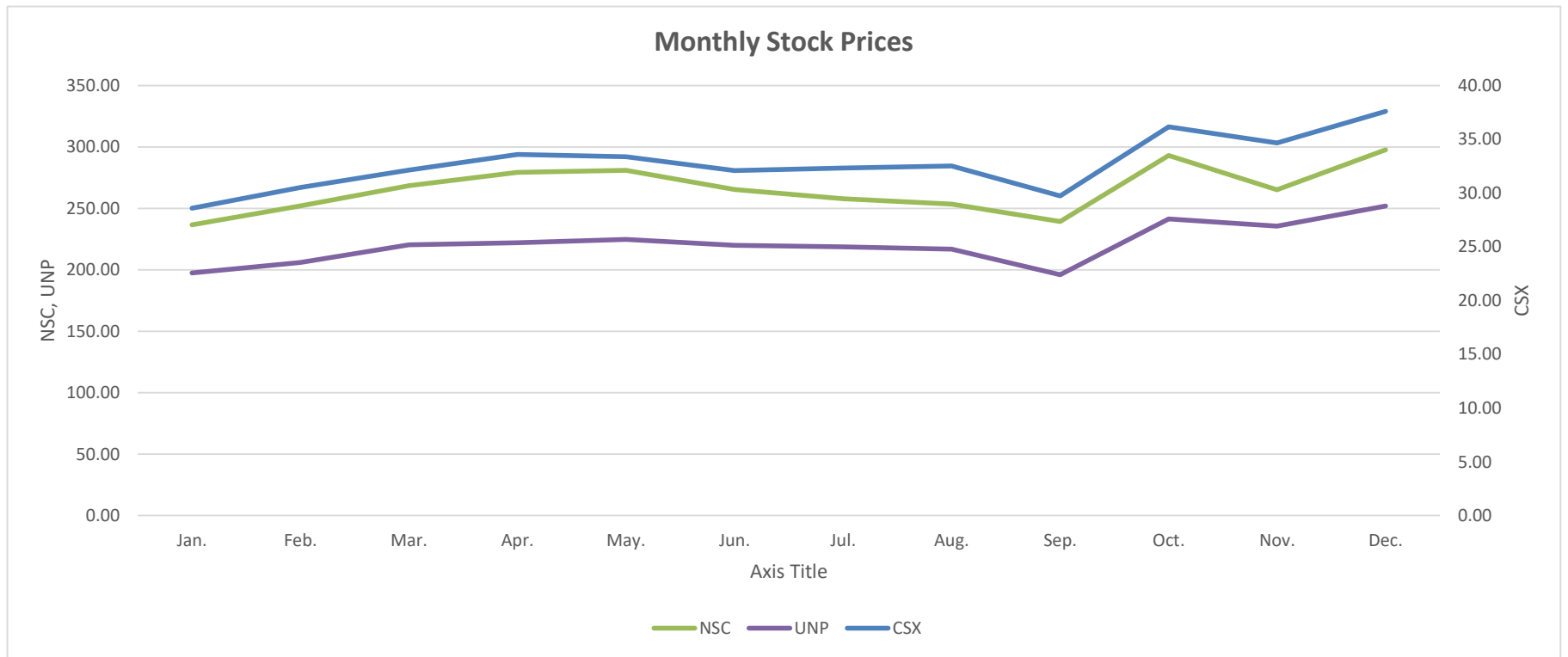
**MONTANA DEPARTMENT OF REVENUE**

Support of Stock Price - From YAHOO Finance

Industry: Railroads

2022 Assessment Year

		End of Period Closing Stock Price											
1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	B	C	D	E	F	G	H	I	J	K	L	M	N
Ticker	Company	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
CSX	CSX Corp.	28.59	30.52	32.14	33.58	33.37	32.08	32.32	32.53	29.74	36.17	34.66	37.60
NSC	Norfolk Southern	236.62	252.06	268.52	279.24	280.90	265.41	257.83	253.54	239.25	293.05	265.27	297.71
UNP	Union Pacific	197.47	205.96	220.41	222.09	224.73	219.93	218.76	216.84	196.01	241.40	235.64	251.93



**MONTANA DEPARTMENT OF REVENUE**

**Maintenance Capital Expenditures Estimate Based on Guideline Companies**

**Industry: Railroads**

**2022 Assessment Year**

(\$ In Millions)

1	2		3	4	5	6	7	8	9	10	11
A	B	C	D	E	F	G	H	I	J	K	L
Ticker	Company	Inflation	PP&E, Gross	PP&E, Gross	Average	Depreciation	Average			Replacement	RC as % of
					PP&E	Expense	Life of		Cost (RC)	Depreciation	
				Current Year	Previous Year		Current Year	Note [1]	Note [1]	Note [1]	
		MTDOR (CPI)	10-K, Notes	10-K, Notes	(D+E)/2	10-K	F/G	C*H	1/(1+C)^H	G*I/(1-J)	K/G
CSX	CSX Corp.	2.45%	46,505	45,530	46,018	1,420	32	0.79	0.46	2,074	146.06%
NSC	Norfolk Southern	2.45%	43,684	43,330	43,507	1,181	37	0.90	0.41	1,807	152.97%
UNP	Union Pacific	2.45%	77,275	75,420	76,348	2,208	35	0.85	0.43	3,299	149.42%
<b>Average</b>											149.48%
<b>Median</b>											149.42%
High											152.97%
Low											146.06%
<b>Selected</b>											<b>149.50%</b>

Notes:

[1] Cornell, B. & Gerger, R. (2017). Estimating Terminal Values with Inflation: The Inputs Matter-It Is Not a Formulaic Exercise. *Business Valuation Review*, Volume 36, Number 4, 117-123.