

# COST OF CAPITAL STUDY

**YIELD CAPITALIZATION**  
**2022 ASSESSMENT YEAR**

APPENDIX C

## WIRELESS

<b>EQUITY RATE</b>						<b>9.75%</b>	
<b>CAPITAL ASSET PRICING MODEL</b>							PAGE
	CAPM Ex Ante		4.80%				6
<b>DIVIDEND GROWTH MODELS (Single Stage)</b>							
	Value Line, based on Dividends Growth		9.50%				7
	Value Line, based on Earnings Growth		11.25%				8
	Value Line, based on Return on Equity		12.50%				9
<b>FCFE GROWTH MODEL (Multi Stage)</b>							10
					<b>RANGE</b>	4.795% - 12.5%	
<b>DEBT RATE</b>						<b>3.90%</b>	11
<b>SECURED DEBT (LEASE) RATE</b>						<b>2.80%</b>	11
<b>MARKET CAPITAL STRUCTURE</b>							
	Equity	55%	x	9.75%	=	5.36%	3
	Debt	45%	x	3.90%	=	1.76%	3
	Marginal Tax Rate	24%	=	(1-.24)	x	1.76%	3
<b>WEIGHTED AVERAGE COST OF CAPITAL</b>						<b>6.7%</b>	

rounded

## SUPPORT FOR GUIDELINE COMPANIES

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

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Capital Structure at Book Value

Company	Ticker	Beta	Fin'l Strength	Operting Margin	Trailing P/E Ratio	Div'd Yield	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
AT&T Inc	T	0.80	A	13.1%	7.8	8.63%	161,143,643,520	9.0%	-	0.0%	152,820,000,000	48.7%	313,963,643,520
Verizon	VZ	0.60	A++	16.9%	9.9	4.99%	65,276,147,650	31.3%	-	0.0%	143,425,000,000	68.7%	208,701,147,650
US Cellular	USM	0.75	B+	18.5%	15.5	0.00%	4,547,134,200	62.5%	-	0.0%	2,728,000,000	37.5%	7,275,134,200
T-Mobile	TMUS	0.75	B+	30.6%	38.9	0.00%	69,110,667,480	48.7%	-	0.0%	72,831,000,000	51.3%	141,941,667,480
<b>Mean</b>		<b>0.73</b>	<b>B+</b>	<b>20%</b>	<b>18.0</b>	<b>3.40%</b>	<b>75,019,398,213</b>	<b>37.9%</b>		<b>0.0%</b>	<b>92,951,000,000</b>	<b>51.6%</b>	
<b>Weighted Mean</b>							<b>300,077,592,850</b>	<b>44.7%</b>	<b>-</b>	<b>0.00%</b>	<b>371,804,000,000</b>	<b>55.3%</b>	<b>671,881,592,850</b>
<b>Median</b>		<b>0.75</b>			<b>12.7</b>	<b>2.49%</b>		<b>40.0%</b>		<b>0.0%</b>		<b>50.0%</b>	
<b>Std Dev</b>		<b>0.09</b>				<b>4.20%</b>		<b>23.1%</b>		<b>0.0%</b>		<b>12.9%</b>	
<b>Coeff Var</b>		<b>0.12</b>				<b>123.45%</b>		<b>61.0%</b>		<b>0.0%</b>		<b>25.1%</b>	
<b>Max</b>		<b>0.80</b>				<b>8.63%</b>		<b>62.5%</b>		<b>0.0%</b>		<b>68.7%</b>	
<b>Min</b>		<b>0.60</b>				<b>0.00%</b>		<b>9.0%</b>		<b>0.0%</b>		<b>37.5%</b>	
<b>Harmonic Mean</b>		<b>0.72</b>						<b>22.27%</b>				<b>49.23%</b>	

Say **0.75**

**SUPPORT FOR CAPITAL STRUCTURE  
MARKET VALUE**

WASHINGTON STATE DEPARTMENT OF REVENUE

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Capital Structure at Market Value

Company	Ticker	Stock Price	Common Shares	Common Stock	%	Preferred Stock	%	Debt	%	Total Debt & Equity
AT&T Inc	T	24.11	7,142,892,000	172,215,126,120	45.7%	-	0.0%	204,851,000,000	54.3%	377,066,126,120
Verizon	VZ	51.34	4,197,823,000	215,516,232,820	56.0%	-	0.0%	169,205,000,000	44.0%	384,721,232,820
US Cellular	USM	31.52	85,876,000	2,706,811,520	47.4%	242,170	0.0%	2,999,000,000	52.6%	5,706,053,690
T-Mobile	TMUS	115.98	1,249,289,000	144,892,538,220	64.9%		0.0%	78,330,000,000	35.1%	223,222,538,220
			<b>Mean</b>		<b>53.5%</b>		<b>0.0%</b>		<b>46.5%</b>	
			<b>Weighted Mean</b>	<b>535,330,708,680</b>	<b>54.0%</b>	<b>242,170</b>	<b>0.00%</b>	<b>455,385,000,000</b>	<b>46.0%</b>	<b>990,715,950,850</b>
			<b>Median</b>		<b>51.7%</b>		<b>0.00%</b>		<b>48.3%</b>	
			<b>Harmonic Mean</b>		<b>52.5%</b>		<b>2%</b>		<b>45.1%</b>	
			<b>Std Dev</b>		<b>8.8%</b>		<b>0.00%</b>		<b>8.8%</b>	
			<b>Coeff Var</b>		<b>16.5%</b>		<b>200.00%</b>		<b>19.0%</b>	
			<b>Max</b>		<b>64.9%</b>		<b>0.0%</b>		<b>54.3%</b>	
			<b>Min</b>		<b>45.7%</b>		<b>0.0%</b>		<b>35.1%</b>	

Source:

Stock Price: Yahoo

Market Value Debt: Bond Analysis

**Say**

**55%**

**0%**

**45%**

# SUPPORT FOR MARKET MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE

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WIRELESS

Company	Ticker	Stock Price	Revenues	Multiple	Cash Flow	Multiple	Earnings	Multiple	Book Value	Multiple
AT&T Inc	T	24.11	23.65	1.0	6.26	3.9	3.04	7.9	22.56	1.1
Verizon	VZ	51.34	31.83	1.6	9.15	5.6	5.40	9.5	15.55	3.3
US Cellular	USM	31.52	47.99	0.66	9.70	3.2	1.77	17.8	52.95	0.6
T-Mobile	TMUS	115.98	64.13	1.8	16.30	7.1	3.17	36.6	55.32	2.10
		<b>Mean</b>		<b>1.3</b>		<b>5.0</b>		<b>18.0</b>		<b>1.8</b>
		<b>Median</b>		<b>1.3</b>		<b>4.7</b>		<b>13.7</b>		<b>1.6</b>
		<b>Harmonic Mean</b>		<b>1.1</b>		<b>4.5</b>		<b>12.7</b>		<b>1.2</b>
		<b>Max</b>		<b>1.8</b>		<b>7.1</b>		<b>36.6</b>		<b>3.3</b>
		<b>Min</b>		<b>0.66</b>		<b>3.2</b>		<b>7.9</b>		<b>0.60</b>
		<b>Std Dev</b>		<b>0.5</b>		<b>1.8</b>		<b>13.2</b>		<b>1.2</b>
		<b>Coefficient of Variation</b>		<b>0.4</b>		<b>0.4</b>		<b>0.7</b>		<b>0.7</b>
		<b>Harmonic Mean</b>		<b>1.1</b>		<b>4.5</b>		<b>12.7</b>		<b>1.2</b>
		<b>Percentile .25</b>		<b>0.9</b>		<b>3.7</b>		<b>9.1</b>		<b>1.0</b>
		<b>Percentile .75</b>		<b>1.7</b>		<b>6.0</b>		<b>22.5</b>		<b>2.4</b>
		<b>Say</b>		<b>1.25</b>		<b>4.50</b>		<b>13.00</b>		<b>1.50</b>

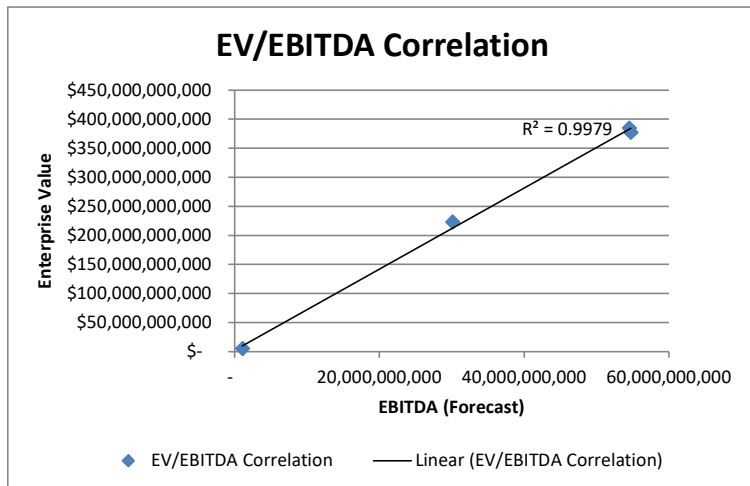
# ENTERPRISE VALUE MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

WIRELESS

Guideline Companies	Ticker	Enterprise Value	EBITDA	EV / EBITDA		One Year Cash Flow Rate Change VL		EBITDA	EV / EBITDA	Revenue	EV/Sales	Cash Flow	Debt Service	EV / CF
				historic	historic	forecast	forecast							
AT&T Inc	T	\$ 377,066,126,120	51,113,000,000	7.38	7.0%	54,705,607,029	6.89	177,394,500,000	2.13	47,637,000,000	7,989,189,000	6.78		
Verizon	VZ	\$ 384,721,232,820	53,902,000,000	7.14	1.1%	54,491,092,896	7.06	136,429,247,500	2.82	38,850,000,000	6,598,995,000	8.46		
US Cellular	USM	\$ 5,004,053,690	1,050,000,000	4.77	2.6%	1,077,061,856	4.65	4,263,743,400	1.17	845,750,000	116,961,000	5.20		
T-Mobile	TMUS	\$ 223,222,538,220	29,196,000,000	7.65	3.1%	30,091,582,822	7.42	81,078,856,100	2.75	21,168,000,000	3,054,870,000	9.22		
	<b>Mean</b>						<b>6.50</b>		<b>2.22</b>			<b>7.41</b>		
	<b>Median</b>						<b>6.98</b>		<b>2.44</b>			<b>7.62</b>		
	<b>Max</b>						<b>7.42</b>		<b>2.82</b>			<b>9.22</b>		
	<b>Min</b>						<b>4.65</b>		<b>1.17</b>			<b>5.20</b>		
	<b>Std Dev</b>						<b>1.26</b>		<b>0.76</b>			<b>1.79</b>		
	<b>Coefficient of Variation</b>						<b>0.19</b>		<b>0.34</b>			<b>0.24</b>		
	<b>Harmonic Mean</b>						<b>6.28</b>		<b>1.96</b>			<b>7.06</b>		
	<b>Say</b>						<b>6.50</b>		<b>2.25</b>			<b>7.25</b>		



5.75 put in income direct excluding IPP

7.25 put in income direct including IPP

### Forecast EV/EBITDA By Rank

Guideline Companies	EV/EBITDA forecast	
US Cellular	4.65	5.77 Low Average
AT&T Inc	6.89	5.77 Low Median
Verizon	7.06	5.75 Say
T-Mobile	7.42	7.24 Average
		7.24 Median
		7.25 Say

**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT  
CAPITAL ASSET PRICING MODEL**

WASHINGTON STATE DEPARTMENT OF REVENUE  
2022 ASSESSMENT YEAR  
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**Ex Ante**  
**Ke = Rf + B (Rp)**

**Ke = Cost of Equity** **4.80%**

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Rm =	rate of return	5.76%
Rf =	risk free rate	1.90%
Rp =	risk premium	3.86%
B =	Beta	0.75

**Rp = Risk Premium** **3.86%**

to above

<b>Shannon Pratt and Roger Grabowski</b>	3.5 - 6%	
Cost of Capital, Applications and Examples, Fifth Edition, 2014		
<b>Dr. Aswath Damodaran</b>	4.24%	chart page 15
<a href="http://pages.stern.nyu.edu/~adamodar/">http://pages.stern.nyu.edu/~adamodar/</a>	3.86%	adjusted for Rf
2021 Implied Premium		
<b>Federal Reserve Bank of Richmond</b>	8.70%	10 year expected real return
The CFO Survey, 4th Quarter 2021	7.18%	95% Interval 10 year expected
<a href="https://www.richmondfed.org/cfosurvey">https://www.richmondfed.org/cfosurvey</a>	1.52%	adjusted for Rf
		Rf rate used in survey

**Rf = Risk Free Rate** **1.90%**

**Value Line Investment Survey, Selected Yields January 7, 2022, page 2089**  
as of 12-27-21

US Treasury Securities year end data		
5 year	1.26%	
10 year	1.48%	
30 year	1.88%	
30 year Zero	1.90%	

**Federal Reserve Statistical Release (<http://www.federalreserve.gov/Releases/H15/Current/>)**  
As of 12-31-21

Treasury Constant Maturities		
5 year	1.26%	
10 year	1.52%	
20 year	1.94%	
30 year	1.90%	
20 year TIPS	-0.63%	
30 year TIPS	-0.44%	

TIPS inflation indication

**Inflation** **2.34%**

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**Federal Reserve Statistical Release (<http://www.federalreserve.gov/Releases/H15/Current/>)**  
As of 12-31-21

Inflation Indication from Treasury Inflation-Protected Securities		
20 year	2.57%	
30 year	2.34%	

Federal Reserve Bank of Philadelphia

The Livingston Survey December 17, 2021, page 8		
Inflation median (measured by the CPI) over next 10 years	2.40%	
<a href="https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey">https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey</a>		

**Gross Domestic Product (GDP)** **4.14%**

**Federal Reserve Projected Long Run Real GDP Growth**

Median Projection Value From Dec 15, 2021 Report, page 2	1.80%
<a href="https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20211215.pdf">https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20211215.pdf</a>	

**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%
<a href="https://www.cbo.gov/system/files/2021-02/56970-OL">https://www.cbo.gov/system/files/2021-02/56970-OL</a>	2026-2031 1.70%

**Federal Reserve Bank of Philadelphia**

The Livingston Survey December 17, 2021, page 8	
Median Annual Average Real GDP Growth Rate for Next 10 Years	2.10%
<a href="https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey">https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey</a>	

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

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

WIRELESS

**Based on Dividend Growth**

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

Ke = Cost of Equity  
 D1 = Expected Dividends  
 P0 = Current Stock Price  
 GD = Sustainable Growth -- Dividend  
 assumption Sustainable growth can not exceed inflation plus real GDP

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Dividend Growth (GD) VL	Ke	Forecast Dividend Growth	Ke Forecast Growth	Sustainable Dividend Growth	Ke Sustainable Growth
AT&T Inc	T	24.11	2.08	8.63%	-10.00%				4.14%	12.77%
Verizon	VZ	51.34	2.56	4.99%	2.00%	6.99%	2.10%	7.09%	2.10%	7.09%
US Cellular	USM	31.52	0.00		0.00%				4.14%	
T-Mobile	TMUS	115.98	0.00		0.00%				4.14%	
				<b>Mean</b>	<b>6.81%</b>	<b>6.99%</b>				<b>9.93%</b>
				<b>Median</b>	<b>6.81%</b>	<b>6.99%</b>				<b>9.93%</b>
				<b>Harmonic Mean</b>	<b>6.32%</b>	<b>6.99%</b>				<b>9.12%</b>
				<b>Std Dev</b>	<b>2.57%</b>					<b>4.01%</b>
				<b>Coeff Var</b>	<b>37.82%</b>					<b>40.44%</b>
				<b>Max</b>	<b>8.63%</b>	<b>6.99%</b>				<b>12.77%</b>
				<b>Min</b>	<b>4.99%</b>	<b>6.99%</b>				<b>7.09%</b>

Source: Value Line Projections 15-17 to 21-23

**7.00%**

**9.50%**

**Say**

**9.50%**  
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**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT  
DIVIDEND GROWTH MODEL**

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

WIRELESS

**Based on Earnings Growth**

$$K_e = (D_1 / P_0) + G$$

- Ke = Cost of Equity
- D1 = Expected Dividends
- P0 = Current Stock Price
- G = Sustainable Growth -- Earnings

assumption: Sustainable growth can not exceed inflation plus real GDP

Company	Ticker	Stock Price (Po)	Expected Earnings (D1)	Yield (D1/Po)	Earnings Growth (G) VL	Ke	Forecast Earnings Growth	Ke Forecast Growth	Sustainable Earnings Growth	Ke Sustainable Growth
AT&T Inc	T	24.11	3.20	13.27%	3.00%	16.27%	3.23%	16.51%	3.23%	16.51%
Verizon	VZ	51.34	5.50	10.71%	3.00%	13.71%	3.23%	13.95%	3.23%	13.95%
US Cellular	USM	31.52	1.85	5.87%	2.00%	7.87%	2.10%	7.97%	2.10%	7.97%
T-Mobile	TMUS	115.98	3.55	3.06%	7.50%	10.56%	9.06%	12.12%	4.14%	7.20%
<b>Mean</b>						<b>12.10%</b>				<b>11.41%</b>
<b>Median</b>						<b>12.14%</b>				<b>10.96%</b>
<b>Harmonic Mean</b>						<b>11.23%</b>				<b>10.09%</b>
<b>Std Dev</b>						<b>3.66%</b>				<b>4.54%</b>
<b>Coeff Var</b>						<b>30.27%</b>				<b>39.84%</b>
<b>Max</b>						<b>16.27%</b>				<b>16.51%</b>
<b>Min</b>						<b>7.87%</b>				<b>7.20%</b>

Source: Value Line Projections 15-17 to 21-23

**11.50%**

**10.75%**

**Say**

**11.25%**

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# SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

WIRELESS

## 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 Dividend (D1)	Dividend Yield (D1/Po)	b (1-payout ratio)	ROE	Growth (G) (b*ROE)	Ke Dividends	Expected Earnings (E1)	Ke Earnings
AT&T Inc	T	24.11	2.08	8.63%	40.0%	13.27%	5.309%	13.94%	3.20	18.58%
Verizon	VZ	51.34	2.56	4.99%	53.0%	10.71%	5.678%	10.66%	5.50	16.39%
US Cellular	USM	31.52	0.00		100.0%	5.87%	5.869%		1.85	11.74%
T-Mobile	TMUS	115.98	0.00		100.0%	3.06%	3.061%		3.55	6.12%
<b>Mean</b>								<b>12.30%</b>		<b>13.21%</b>
<b>Median</b>								<b>12.30%</b>		<b>14.06%</b>
<b>Harmonic Mean</b>								<b>12.08%</b>		<b>11.01%</b>
<b>Std Dev</b>								<b>2.31%</b>		<b>5.52%</b>
<b>Coeff Var</b>								<b>18.81%</b>		<b>41.78%</b>
<b>Max</b>								<b>13.94%</b>		<b>18.58%</b>
<b>Min</b>								<b>10.66%</b>		<b>6.12%</b>
								<b>12.25%</b>		<b>12.50%</b>

Say

**12.50%**

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

Washington State Department of Revenue  
2022 ASSESSMENT YEAR

## Based on Earnings Growth

$$K_e = (FCFE / P) + G$$

$K_e$  = Cost of Equity

FCFE = Free Cash Flow to Equity

P = Current Price

G = Sustainable Growth

Company	Ticker	Stock Price	Expected Earnings	P/E	Payout Ratio	ROE	$K_e$
AT&T Inc	T	24.11	3.20	7.53	60.00%	14.50%	15.35%
Verizon	VZ	51.34	5.50	9.33	47.00%	38.00%	12.87%
US Cellular	USM	31.52	1.85	17.04	0.00%	3.50%	4.99%
T-Mobile	TMUS	115.98	3.55	32.67	0.00%	6.00%	6.57%
<b>Mean</b>				<b>16.64</b>	<b>26.75%</b>	<b>15.50%</b>	<b>9.95%</b>
<b>Harmonic Mean</b>				<b>12.15</b>		<b>7.30%</b>	<b>8.08%</b>
<b>Median</b>				<b>13.19</b>	<b>23.50%</b>	<b>10.25%</b>	<b>9.72%</b>
<b>Max</b>				<b>32.67</b>	<b>60.00%</b>	<b>38.00%</b>	<b>15.35%</b>
<b>Min</b>				<b>7.53</b>	<b>0.00%</b>	<b>3.50%</b>	<b>4.99%</b>
<b>Std Dev</b>				<b>11.45</b>	<b>31.34%</b>	<b>15.72%</b>	<b>4.96%</b>
<b>Coefficient of Variation</b>				<b>0.69</b>	<b>117.16%</b>	<b>101.43%</b>	<b>49.83%</b>
<b>Say</b>							<b>9.50%</b>

# SUPPORT FOR DEBT RATING AND DEBT YIELD RATE

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

WIRELESS

Company	Ticker	Mergent's Ratings	S&P Ratings	WAYTM	S&P YTM (avg)	Mergent's Ratings	S&P Ratings	Mergent's	S&P	
AT&T Inc	T	Baa2	BBB	3.34%	3.36%	11	11	Aaa1	AAA+	1
Verizon	VZ	Baa1	BBB+	2.76%	3.07%	10	10	Aaa2	AAA	2
US Cellular	USM	Ba2	BB	6.70%	5.32%	13	14	Aaa3	AAA-	3
T-Mobile	TMUS		BB+	2.73%	4.37%		13	Aa1	AA+	4
<b>Overall Average Debt Rating</b>		<b>Baa2</b>	<b>BBB-</b>	<b>3.88%</b>	<b>3.34%</b>	<b>11.3</b>	<b>12.0</b>	Aa2	AA	5

All issues 20+ year maturities

<b>Guideline Companies, All Ratings</b>	<b>3.07%</b>	<b>3.90%</b>
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bond analysis page 12

Aa3	AA-	6
A1	A+	7
A2	A	8
A3	A-	9
Baa1	BBB+	10
Baa2	BBB	11
Baa3	BBB-	12
Ba1	BB+	13
Ba2	BB	14
Ba3	BB-	15
B1	B+	16
B2	B	17
B3	B-	18
Caa1	CCC+	19
Caa2	CCC	20

Mergent's Bond Record January 2022				
Corporate	Aaa	Aa	A	Baa
October	2.68%	2.86%	3.02%	3.35%
November	2.62%	2.77%	2.95%	3.28%
December	2.71%	2.82%	3.04%	3.37%
<b>4th Qtr Average</b>	<b>2.67%</b>	<b>2.82%</b>	<b>3.00%</b>	<b>3.33%</b>
<b>2021 Average</b>	<b>2.30%</b>	<b>2.49%</b>	<b>2.80%</b>	<b>3.30%</b>
Public Utilities	Aaa	Aa	A	Baa
October		2.99%	3.09%	3.32%
November		2.91%	3.02%	3.25%
December		3.01%	3.13%	3.36%
<b>4th Qtr Average</b>		<b>2.97%</b>	<b>3.08%</b>	<b>3.31%</b>
<b>2021 Average</b>		<b>2.64%</b>	<b>2.86%</b>	<b>3.16%</b>
Industrials	Aaa	Aa	A	Baa
October	2.68%	2.73%	2.96%	3.38%
November	2.62%	2.63%	2.95%	3.37%
December	2.71%	2.62%	2.95%	3.37%
<b>4th Qtr Average</b>	<b>2.67%</b>	<b>2.66%</b>	<b>2.95%</b>	<b>3.37%</b>
<b>2021 Average</b>	<b>2.30%</b>	<b>2.33%</b>	<b>2.73%</b>	<b>3.43%</b>

<b>Debt Yield Rate</b>	<b>3.90%</b>
<b>Cost of Secured Debt (Operating Lease ) Rate</b>	<b>2.80%</b>

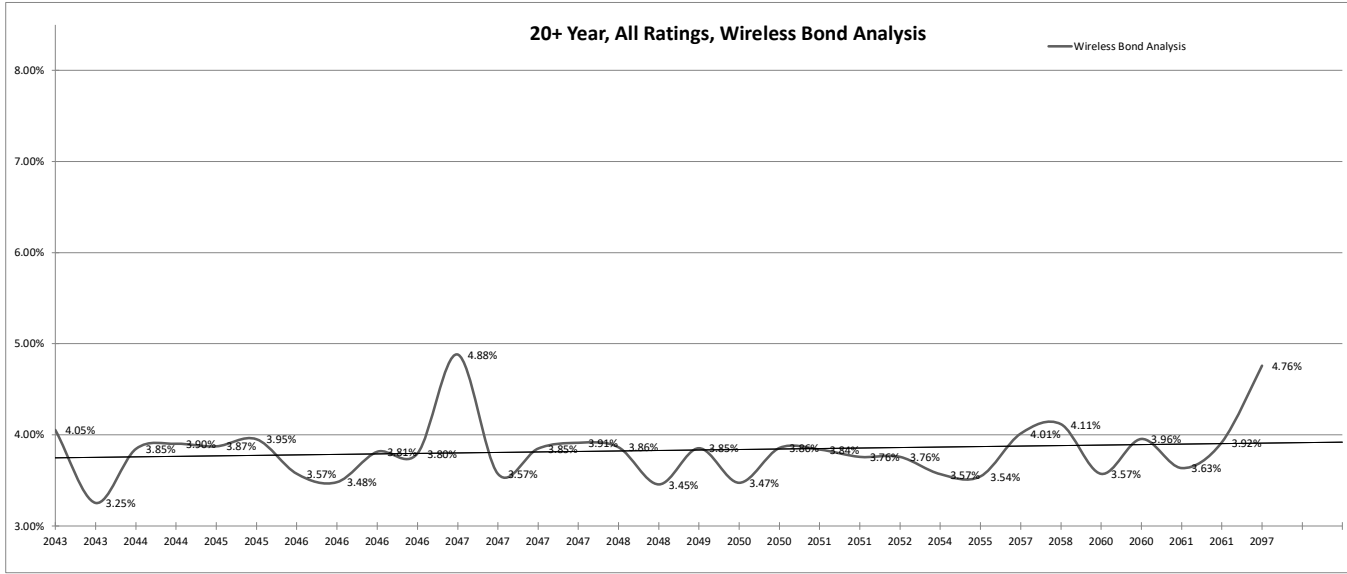
to page 1



Verizon Communications	Fix Rt Sr Nt	3,376	2025	104.81	4,403,544,000	3.22%	1.94%	0.03%	BBB+	\$	4,615,354,466	104.81%	148,663,645	0.00032061	0.0642%	1.74	
Verizon Communications	sr notes	1,450	2026	97.72	2,750,000,000	1.48%	1.98%	0.02%	BBB+	\$	2,687,300,000	97.72%	39,875,000	0.00020470	0.0410%	2.028	
Verizon Communications	Fix Rt Sr Nt	2,625	2026	102.30	2,250,000,000	2.57%	2.08%	0.02%	BBB+	\$	2,301,750,000	102.30%	59,062,500	0.00017589	0.0352%	2.092	
Verizon Communications	Fix Rt Sr Nt	4,125	2027	108.47	3,250,000,000	3.80%	2.46%	0.03%	BBB+	\$	3,525,275,000	108.47%	134,062,500	0.00029982	0.0601%	2.358	
Verizon Communications	sr notes	3,000	2027	103.20	750,000,000	2.91%	2.37%	0.01%	BBB+	\$	774,000,000	103.20%	22,500,000	0.00006674	0.0134%	2.314	
Verizon Communications	sr notes	2,100	2028	98.04	3,000,000,000	2.14%	2.43%	0.03%	BBB+	\$	2,941,200,000	98.04%	63,000,000	0.00027337	0.0548%	2.446	
Verizon Communications	Fix Rt Sr Nt	4,329	2028	110.43	4,230,411,000	3.92%	2.57%	0.04%	BBB+	\$	4,671,642,867	110.43%	183,134,482	0.00040719	0.0816%	2.606	
Verizon Communications	Fix Rt Sr Nt	3,875	2029	107.90	1,000,000,000	3.59%	2.70%	0.01%	BBB+	\$	1,079,000,000	107.90%	38,750,000	0.00010117	0.0203%	2.595	
Verizon Communications	sr notes	1,680	2030	91.77	1,144,945,000	1.83%	2.78%	0.01%	BBB+	\$	1,050,716,027	91.77%	19,235,076	0.00011940	0.0239%	2.716	
Verizon Communications	DEB	7,750	2030	138.13	5,000,000,000	5.61%	2.68%	0.05%	BBB+	\$	6,906,500,000	138.13%	387,500,000	0.00050169	0.1005%	2.837	
Verizon Communications	sr notes	1,750	2031	91.74	2,250,000,000	1.91%	2.75%	0.02%	BBB+	\$	2,064,150,000	91.74%	39,375,000	0.00023205	0.0615%	2.798	
Verizon Communications	sr notes	2,550	2031	97.90	4,250,000,000	2.60%	2.80%	0.04%	BBB+	\$	4,160,750,000	97.90%	108,375,000	0.00044710	0.1184%	2.812	
Verizon Communications	sr notes	7,375	2032	132.64	500,000,000	5.560%	3.59%	0.01%	BBB+	\$	663,200,000	132.64%	36,875,000	0.00006731	0.0178%	3.524	
Verizon Communications	Notes	Z100	7,750	2032	134.02	400,000,000	5.78%	3.77%	0.01%	BBB+	\$	536,080,000	134.02%	31,000,000	0.00005652	0.0113%	3.757
Verizon Communications	Fix Rt Sr Nt	4,500	2033	113.36	3,000,000,000	3.97%	3.10%	0.03%	BBB+	\$	3,400,800,000	113.36%	135,000,000	0.00034893	0.0699%	3.111	
Verizon Communications	sr notes	5,125	2033	112.89	350,000,000	4.540%	3.73%	0.00%	BBB+	\$	395,115,000	112.89%	17,937,500	0.00004892	0.0130%	3.724	
Verizon Communications	Fix Rt Nt	6,400	2033	127.64	6,000,000,000	5.01%	3.45%	0.08%	BBB+	\$	7,658,400,000	127.64%	384,000,000	0.00077591	0.1554%	3.486	
Verizon Communications	Fix Rt Nt	4,400	2034	112.60	2,500,000,000	3.91%	3.16%	0.03%	BBB+	\$	2,815,000,000	112.60%	110,000,000	0.00029666	0.0594%	3.151	
Verizon Communications	Fix Rt Nt	5,050	2034	114.50	1,250,000,000	4.41%	3.59%	0.02%	BBB+	\$	1,431,250,000	114.50%	63,125,000	0.00016891	0.0337%	3.543	
Verizon Communications	Notes	Z100	5,850	2035	128.20	1,500,000,000	4.56%	3.24%	0.02%	BBB+	\$	1,923,000,000	128.20%	87,750,000	0.00018218	0.0365%	3.267
Verizon Communications	Fix Rt Nt	4,272	2036	112.28	2,867,000,000	3.80%	3.20%	0.03%	BBB+	\$	3,219,067,600	112.28%	122,478,240	0.00034412	0.0699%	3.175	
Verizon Communications	Fix Rt Nt	5,250	2037	124.31	3,000,000,000	4.22%	3.23%	0.04%	BBB+	\$	3,729,300,000	124.31%	157,500,000	0.00036360	0.0728%	3.208	
Verizon Communications	Notes	z100	6,250	2037	129.67	3,000,000,000	4.82%	3.70%	0.01%	BBB+	\$	972,525,000	129.67%	46,875,000	0.00010409	0.0209%	3.679
Verizon Communications	Notes	z100	6,400	2038	130.27	1,750,000,000	4.91%	3.88%	0.03%	BBB+	\$	2,279,725,000	130.27%	112,000,000	0.00025476	0.0510%	3.852
Verizon Communications	Notes	6,900	2038	140.72	1,250,000,000	4.90%	3.59%	0.02%	BBB+	\$	1,759,000,000	140.72%	86,250,000	0.00016818	0.0337%	3.868	
Verizon Communications	Notes	7,350	2039	138.74	1,000,000,000	5.30%	4.18%	0.02%	BBB+	\$	1,387,400,000	138.74%	73,500,000	0.00016692	0.0314%	4.169	
Verizon Communications	Notes	8,950	2039	170.93	1,250,000,000	5.24%	3.47%	0.02%	BBB+	\$	2,136,625,000	170.93%	111,875,000	0.00016283	0.0326%	3.496	
Verizon Communications	Sr Notes	2,650	2040	89.47	3,000,000,000	2.96%	3.43%	0.04%	BBB+	\$	2,684,100,000	89.47%	79,500,000	0.00038571	0.0773%	3.414	
Verizon Communications	Sr Notes	3,400	2041	99.11	3,750,000,000	3.43%	3.46%	0.05%	BBB+	\$	3,716,625,000	99.11%	127,500,000	0.00048714	0.0976%	3.464	
Verizon Communications	Notes	4,750	2041	116.75	750,000,000	4.07%	3.55%	0.01%	BBB+	\$	875,625,000	116.75%	35,625,000	0.00009973	0.0200%	3.561	
Verizon Communications	Notes	6,000	2041	130.95	1,000,000,000	4.58%	3.74%	0.01%	BBB+	\$	1,309,500,000	130.95%	60,000,000	0.00014015	0.0281%	3.727	
Verizon Communications	Notes	3,850	2042	104.82	1,250,000,000	3.67%	3.52%	0.02%	BBB+	\$	1,310,250,000	104.82%	48,125,000	0.00016484	0.0330%	3.515	
Verizon Communications	Fix Rt Nt	6,550	2043	150.42	15,000,000,000	4.35%	3.25%	0.18%	BBB+	\$	22,563,000,000	150.42%	982,500,000	0.00183032	0.3666%	3.278	
Verizon Communications	Fix Rt Nt	4,125	2046	108.96	1,500,000,000	3.79%	3.57%	0.02%	BBB+	\$	1,634,400,000	108.96%	61,875,000	0.00020086	0.0402%	3.574	
Verizon Communications	Notes	4,862	2046	122.54	4,500,000,000	3.97%	3.48%	0.06%	BBB+	\$	5,514,300,000	122.54%	218,790,000	0.00058730	0.1176%	3.488	
Verizon Communications	Fix Rt Gbl Nt	4,900	2047	100.26	207,017,000	4.89%	4.88%	0.00%	BBB	\$	207,555,244	100.26%	10,143,833	0.00003791	0.0100%	3.937	
Verizon Communications	FR Sr Nt	5,500	2047	131.91	1,500,000,000	4.17%	3.57%	0.02%	BBB+	\$	1,978,650,000	131.91%	82,500,000	0.00020098	0.0403%	3.566	
Verizon Communications	Sr Notes	4,522	2048	118.34	5,000,000,000	3.82%	3.45%	0.06%	BBB+	\$	5,917,000,000	118.34%	226,100,000	0.00064780	0.1298%	3.461	
Verizon Communications	Sr Notes	2,875	2050	89.30	2,750,000,000	3.22%	3.47%	0.04%	BBB+	\$	2,455,750,000	89.30%	79,062,500	0.00035814	0.0177%	3.465	
Verizon Communications	Fix Rt Nt	5,012	2054	127.56	5,500,000,000	3.93%	3.57%	0.07%	BBB+	\$	7,015,800,000	127.56%	275,660,000	0.00073565	0.1474%	3.573	
Verizon Communications	Fix Rt Notes	4,672	2055	121.92	5,500,000,000	3.83%	3.54%	0.07%	BBB+	\$	6,705,600,000	121.92%	256,960,000	0.00073104	0.1464%	3.542	
Verizon Communications	Sr Notes	3,000	2060	88.17	2,000,000,000	3.40%	3.57%	0.03%	BBB+	\$	1,763,400,000	88.17%	60,000,000	0.00026779	0.0536%	3.586	
Verizon Communications		3,700	2061	101.36	3,500,000,000	3.65%	3.63%	0.05%	BBB+	\$	3,547,600,000	101.36%	129,500,000	0.00047712	0.0956%	3.634	

46	4600	sum	5,299.92	133,102,917,000	Percent of book	115.22%	1.35%		156,396,906,204	117.50%	4.70%	6,259,415,287	2.76%		
		Total		266,624,887,000				Total	\$ 307,326,395,054.70	115.27%	4.93%	\$ 13,133,837,895	3.066%	3.708%	3.336
Source: FINRA													This includes short term. For 20+ year maturities see below		
									Embedded debt rate			4.926%			
									Weighted average yield to maturity			3.066%			
									Debt service / Market value			4.274%			

20+ Year, All Ratings, Wireless Bond Analysis



12/31/2021

Wireless Bond Analysis

Company	type	Call	coupon	maturity	Price 12/16	Issued / Book	current yield	yield to maturity	Weighted Ave Rating	Mkt Val	Mkt : Book	Embedded Ra Debt Service	WAYTM	WAYTM	Finra YTM
AT&T Inc	Fix Rt Nt		5.350	2043	118.36	436,339,000	4.52%	4.05%	0.01% BBB	\$ 516,450,840	118.36%	23,344,137	0.00021030	0.0210%	4.073
Verizon Communications	Fix Rt Nt		6.550	2043	150.42	15,000,000,000	4.354%	3.25%	0.18% BBB+	\$ 22,563,000,000	150.42%	982,500,000	0.00580138	0.5801%	3.278
AT&T Inc	Fix Rt Nt		4.650	2044	111.96	470,656,000	4.153%	3.85%	0.01% BBB	\$ 526,946,458	111.96%	21,885,504	0.00021519	0.0215%	3.836
AT&T Inc	Fix Rt Nt		4.800	2044	113.31	2,000,000,000	4.236%	3.90%	0.03% BBB	\$ 2,266,200,000	113.31%	96,000,000	0.00092739	0.0927%	3.89
AT&T Inc	Fix Rt Nt		4.350	2045	107.27	3,044,000,000	4.055%	3.87%	0.04% BBB	\$ 3,265,298,800	107.27%	132,414,000	0.00140158	0.1402%	3.868
AT&T Inc	Fix Rt Nt		4.850	2045	113.58	795,686,000	4.270%	3.95%	0.01% BBB	\$ 903,740,159	113.58%	38,590,771	0.00037384	0.0374%	3.945
Verizon Communications	Fix Rt Nt		4.125	2046	108.96	1,500,000,000	3.786%	3.57%	0.02% BBB+	\$ 1,634,400,000	108.96%	61,875,000	0.00063663	0.0637%	3.574
Verizon Communications	Notes		4.862	2046	122.54	4,500,000,000	3.985%	3.48%	0.06% BBB+	\$ 5,514,300,000	122.54%	218,790,000	0.00186151	0.1862%	3.488
AT&T Inc	Fix Rt Nt		4.750	2046	114.74	3,500,000,000	4.140%	3.81%	0.05% BBB	\$ 4,015,900,000	114.74%	166,250,000	0.00158672	0.1587%	3.803
AT&T Inc	Fix Rt Nt		5.150	2046	121.36	1,749,602,000	4.244%	3.80%	0.02% BBB	\$ 2,123,316,987	121.36%	90,104,503	0.00078943	0.0789%	3.796
Verizon Communications	Fix Rt Gbl Nt		4.900	2047	100.26	207,017,000	4.887%	4.88%	0.00% BBB	\$ 207,555,244	100.26%	10,143,833	0.00012014	0.0120%	3.937
Verizon Communications	FR Sr Nt		5.500	2047	131.91	1,500,000,000	4.170%	3.57%	0.02% BBB+	\$ 1,978,650,000	131.91%	82,500,000	0.00063704	0.0637%	3.566
AT&T Inc	Fix Rt Gbl Nt		5.450	2047	125.69	2,000,000,000	4.336%	3.85%	0.03% BBB	\$ 2,513,800,000	125.69%	109,000,000	0.00091548	0.0915%	3.828
AT&T Inc	Fix Rt Sr Nt		5.650	2047	127.73	1,500,000,000	4.423%	3.91%	0.02% BBB	\$ 1,915,950,000	127.73%	84,750,000	0.00069757	0.0698%	3.886
AT&T Inc	Fix Rt Sr Nt		4.500	2048	110.45	4,498,000,000	4.074%	3.86%	0.07% BBB	\$ 4,968,041,000	110.45%	202,410,000	0.00206561	0.2066%	3.854
Verizon Communications	Sr Notes		4.522	2048	118.34	5,000,000,000	3.821%	3.45%	0.06% BBB+	\$ 5,917,000,000	118.34%	226,100,000	0.00205326	0.2053%	3.461
AT&T Inc	FR Global Notes		4.550	2049	111.68	2,494,000,000	4.074%	3.85%	0.04% BBB	\$ 2,785,299,200	111.68%	113,477,000	0.00114257	0.1143%	3.845
Verizon Communications	Sr Notes		2.875	2050	89.30	2,750,000,000	3.219%	3.47%	0.04% BBB+	\$ 2,455,750,000	89.30%	79,062,500	0.00113516	0.1135%	3.465
AT&T Inc	FR Global Notes		5.150	2050	122.16	1,694,666,000	4.216%	3.86%	0.02% BBB	\$ 2,070,203,986	122.16%	87,275,299	0.00077665	0.0777%	3.839
T-Mobile			3.300	2051	90.59	3,000,000,000	3.643%	3.84%	0.04% BBB-	\$ 2,717,700,000	90.59%	99,000,000	0.00136892	0.1369%	3.84
AT&T Inc	SR Notes		3.650	2051	98.08	3,000,000,000	3.721%	3.76%	0.04% BBB	\$ 2,942,400,000	98.08%	109,500,000	0.00134052	0.1341%	3.759
AT&T Inc	SR Notes		3.300	2052	91.80	2,250,000,000	3.595%	3.78%	0.03% BBB	\$ 2,065,500,000	91.80%	74,250,000	0.00100468	0.1005%	3.758
Verizon Communications	Fix Rt Nt		5.012	2054	127.56	5,500,000,000	3.929%	3.57%	0.07% BBB+	\$ 7,015,800,000	127.56%	275,660,000	0.00233171	0.2332%	3.573
Verizon Communications	Fix Rt Notes		4.672	2055	121.92	5,500,000,000	3.832%	3.54%	0.07% BBB+	\$ 6,705,600,000	121.92%	256,960,000	0.00231710	0.2317%	3.542
AT&T Inc	FR Global Notes		5.700	2057	131.63	1,000,000,000	4.330%	4.01%	0.02% BBB	\$ 1,316,300,000	131.63%	57,000,000	0.00047710	0.0477%	4.003
AT&T Inc	FR Global Notes		5.300	2058	122.20	643,706,000	4.337%	4.11%	0.01% BBB	\$ 786,608,732	122.20%	34,116,418	0.00031485	0.0315%	4.113
Verizon Communications	Sr Notes		3.000	2060	88.17	2,000,000,000	3.40%	3.57%	0.03% BBB+	\$ 1,763,400,000	88.17%	60,000,000	0.00084880	0.0849%	3.586
AT&T Inc	SR Notes		3.850	2060	97.93	1,500,000,000	3.931%	3.96%	0.02% BBB	\$ 1,468,950,000	97.93%	57,750,000	0.00070535	0.0705%	3.585
Verizon Communications	SR Notes		3.700	2061	101.36	3,500,000,000	3.65%	3.63%	0.05% BBB+	\$ 3,547,600,000	101.36%	129,500,000	0.00151227	0.1512%	3.634
AT&T Inc	SR Notes		3.500	2061	91.68	1,500,000,000	3.818%	3.92%	0.02% BBB	\$ 1,375,200,000	91.68%	52,500,000	0.00069855	0.0699%	3.918
AT&T Inc	FR Global Notes		7.120	2097	148.10	85,856,000	4.808%	4.76%	0.00% BBB	\$ 127,152,736	148.10%	6,112,947	0.00004858	0.0049%	4.762

Total 84,119,528,000 Total \$ 99,974,014,142 118.85% 4.80% \$ 4,038,821,912 3.632% 3.80

Source: FNRA

Embedded debt rate 4.8013%  
 Weighted average yield to maturity 3.6316%  
 Debt service / Market value 4.0399%  
 Finra YTM 3.80%  
 SAY 3.90%

## DATA INPUT

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

WIRELESS

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

Guideline Companies		Current Year														
		Stock Price 12/31/2021	Beta levered	Revenues Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Per Share	Book Value	Common Shares	Long-Term Debt	Capital Spending per share	Trailing P/E Ratio	Average Annual Dividend Yield	Operating Margin	Income Tax Rate	% Return on Shareholders' Equity
Name	Ticker	Yahoo	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	
AT&T Inc	T	\$24.11	0.80	\$ 23.65	\$ 6.26	\$ 3.04	\$ 2.08	\$ 22.56	7,142,892	\$152,820,000,000	\$ 2.31	7.80	7.40	13.1%	15.1%	13.3%
Verizon	VZ	\$51.34	0.60	\$ 31.83	\$ 9.15	\$ 5.40	\$ 2.52	\$ 15.55	4,197,823	\$143,425,000,000	\$ 4.40	9.90	4.50	16.9%	23.1%	38.0%
US Cellular	USM	\$31.52	0.75	\$ 47.99	\$ 9.70	\$ 1.77	\$ -	\$ 52.95	85,876	\$ 2,728,000,000	\$ 8.43	15.50	n/a	18.5%	11.0%	3.4%
T-Mobile	TMUS	\$115.98	0.75	\$ 64.13	\$ 16.30	\$ 3.17	\$ -	\$ 55.32	1,249,289	\$ 72,831,000,000	\$ 9.87	38.90	n/a	30.6%	13.2%	5.8%

Value Line March 11, 2022

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:

Value Line figures are all values in US dollars.

Forecast % Change

Projected (Next Year)											Dividends	Earnings	Cash Flow	Revenue	Income	Balance Sheet
Revenues Per Share	Cash Flow Per Share	Earnings Per Share	Dividends	Bk Value	Common Shares	Capital Spending per share	% Return on Shareholders' Equity	% Retained to Common Equity	All Dividends to Net Profits	Market to Book	2022-2026	2022-2026	2022-2026	2022-2026	Operating Income	Current Assets
VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	M*	M*
\$ 24.95	\$ 6.70	\$ 3.20	\$ 2.08	23.60	7,110,000	2.80	14.5%	6.0%	60.0%	114.4%	-10.00	3.00	1.50	1.50	\$28,251,000,000	\$ 59,997,000,000
\$ 32.50	\$ 9.25	\$ 5.50	\$ 2.56	15.85	4,200,000	4.45	38.0%	38.0%	47.0%	113.1%	2.00	3.00	0.50	2.00	\$32,448,000,000	\$ 36,728,000,000
\$ 49.65	\$ 9.95	\$ 1.85	\$ -	54.10	85,000	8.90	3.5%	3.5%	0.0%	107.8%	0.00	2.00	1.00	2.50	\$ 191,000,000	\$ 1,605,000,000
\$ 64.90	#####	\$ 3.55	\$ -	59.50	1,260,000	9.90	6.0%	6.0%	0.0%	105.6%	0.00	7.50	5.50	3.00	\$ 6,892,000,000	\$ 20,891,000,000



				Cash Flow		Fair Value	Carrying Value	Current Maturity	ROE	All Div'ds to Net Prof
PP & E Gross	Current Liabilities	Long Term Debt	Intangibles (excl. Goodwill)	Depreciation & Amortization	Share Repurchase	Debt	Debt	Rent expense	5 yr	5 yr
M*	M*	M*	M*	M*	M*	10-K	10-k	10-K	VL	VL
\$ 353,668,000,000	\$ 85,588,000,000	\$ 152,820,000,000	\$ 159,493,000,000	\$ 22,862,000,000	\$ 202,000,000	\$ 204,851,000,000	\$ 179,107,000,000	\$ 5,793,000,000	12.5%	58%
\$ 317,780,000,000	\$ 47,160,000,000	\$ 143,425,000,000	\$ 159,296,000,000	\$ 16,206,000,000	\$ -	\$ 169,205,000,000	\$ 149,543,000,000	\$ 5,248,000,000	40.0%	49%
\$ 10,015,000,000	\$ 903,000,000	\$ 2,728,000,000	\$ 4,088,000,000	\$ 678,000,000	\$ 47,000,000	\$ 2,999,000,000	\$ 2,781,000,000	\$ 181,000,000	4.0%	
\$ 119,902,000,000	\$ 23,499,000,000	\$ 68,570,000,000	\$ 97,339,000,000	\$ 16,383,000,000	\$ 316,000,000	\$ 78,330,000,000	\$ 74,146,000,000	\$ 5,921,000,000	7.0%	

15.9% 53.5%  
8.0% 53.1%  
9.8% 53.5%

# SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

WIRELESS

Company	Ticker	Stock Price	2021		2022		2021		2022	
			Actual Earnings Ratio (EPS/P)		Projected Earnings Ratio (PEPS/P)		Cash Flow Ratio (CF/P)		Projected Cash Flow Ratio (PCF/P)	
AT&T Inc	T	24.11	3.04	12.61%	3.20	13.27%	6.26	25.96%	6.70	27.79%
Verizon	VZ	51.34	5.40	10.52%	5.50	10.71%	9.15	17.82%	9.25	18.02%
US Cellular	USM	31.52	1.77	5.62%	1.85	5.87%	9.70	30.77%	9.95	31.57%
T-Mobile	TMUS	115.98	3.17	2.73%	3.55	3.06%	16.30	14.05%	16.80	14.49%
	<b>Mean</b>			<b>7.87%</b>		<b>8.23%</b>		<b>22.15%</b>		<b>22.96%</b>
	<b>Median</b>			<b>8.07%</b>		<b>8.29%</b>		<b>21.89%</b>		<b>22.90%</b>
	<b>Max</b>			<b>12.61%</b>		<b>13.27%</b>		<b>30.77%</b>		<b>31.57%</b>
	<b>Min</b>			<b>2.73%</b>		<b>3.06%</b>		<b>14.05%</b>		<b>14.49%</b>
	<b>stdev</b>			<b>4.51%</b>		<b>4.61%</b>		<b>7.60%</b>		<b>8.03%</b>
	<b>cov</b>			<b>57.28%</b>		<b>56.08%</b>		<b>34.30%</b>		<b>34.99%</b>
	<b>harmean</b>			<b>5.57%</b>		<b>6.01%</b>		<b>20.17%</b>		<b>20.81%</b>
	<b>Say</b>			<b>6.00%</b>		<b>7.00%</b>		<b>20.50%</b>		<b>21.00%</b>

Source:

Actual earnings: Value Line

Estimated Earnings: Value Line

Actual Cash Flow: Value Line

Estimated Cash Flow: Value Line

# 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	T.Bond Rate	Bond-Bill	Smoothed Growth	Implied Premium	Analyst Growth Estimate	Implied Premium (FCFE)	Implied Premium	ERP/Riskfree Rate
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%				1.24
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%				0.92
1963	5.51%	3.13%	75.02	4.13	2.35		12.75%	9.00%	3.12%	4.14%	1.02%	4.96%	3.38%				0.82
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%				0.79
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%				0.71
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%				0.79
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%				0.56
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%				0.49
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%				0.47
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%				0.52
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%				0.52
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%				0.42
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%				0.62
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%				0.76
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%				0.53
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%				0.67
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%				0.76
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%				0.63
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%				0.62
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%				0.40
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%				0.41
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%				0.47
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%				0.37
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%				0.44
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%			0.43
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%			0.50
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%			0.45
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%			0.41
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%			0.44
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%			0.48
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%			0.52
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%			0.53
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%			0.55
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%			0.45
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%			0.59
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%			0.50
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%			0.48
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%			0.49
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%			0.32
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%			0.56
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%		2.91%	0.72
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%	1.08
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%		3.69%	0.87
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%		4.86%	0.86
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%	0.93
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%	0.89
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%	1.09
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%	2.91
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%	1.14
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%		5.20%	1.58
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%		6.01%	3.20
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%	3.28
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%	1.63
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%	2.66
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%		6.12%	2.70
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%	2.32
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%	2.11
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%	2.22
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%		5.06%	2.71
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%	4.72%		4.94%	5.08
2021	4.33%	1.24%	4766.18	206.38	59.20	147.24	47.67%	4.41%	0.06%	1.51%	1.45%	1.71%	1.72%	6.47%		4.24%	2.81

\* 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, since I would not have had access to them at

## 2022 Multi Stage Earnings Growth Model

Wireless Industry

4.14% GDP

12.7 Median Trailing Industry P/E

53.5% Average Target Dividend Payout Ratio (All dividends to net profit)

9.8% Average Target ROE

AT&T  
T

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		53.98%	46.02%	<b>3.04</b>		stock price =	-24.11
1	5.26%	116.19%	-16.19%	<b>3.20</b>	-0.52		-0.52
2	11.33%	104.36%	-4.36%	3.56	-0.16		-0.16
3	10.18%	94.72%	5.28%	3.93	0.21		0.21
4	9.24%	86.72%	13.28%	4.29	0.57		0.57
5	8.45%	77.87%	22.13%	<b>4.65</b>	1.03		1.03
6	7.59%	69.01%	30.99%	5.00	1.55		1.55
7	6.73%	60.16%	39.84%	5.34	2.13		2.13
8	5.87%	51.31%	48.69%	5.65	2.75		2.75
9	5.00%	42.46%	57.54%	5.94	3.42		3.42
10	4.14%	42.46%	57.54%	6.18	3.56	81.75	85.31
11+	4.14%	42.46%	57.54%	6.44	3.70		

Value Line Earnings Growth Rate Ke = 15.35%

Verizon

VZ

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		18.99%	81.01%	<b>5.40</b>		stock price =	-51.34
1	1.85%	2.33%	97.67%	<b>5.50</b>	5.37		5.37
2	0.23%	2.33%	97.67%	5.51	5.38		5.38
3	0.23%	2.32%	97.68%	5.53	5.40		5.40
4	0.23%	2.32%	97.68%	5.54	5.41		5.41
5	0.23%	10.34%	89.66%	<b>5.55</b>	4.98		4.98
6	1.01%	18.37%	81.63%	5.61	4.58		4.58
7	1.79%	26.40%	73.60%	5.71	4.20		4.20
8	2.57%	34.43%	65.57%	5.85	3.84		3.84
9	3.36%	42.46%	57.54%	6.05	3.48		3.48
10	4.14%	42.46%	57.54%	6.30	3.63	83.33	86.95
11+	4.14%	42.46%	57.54%	6.56	3.78		

Value Line Earnings Growth Rate Ke = 12.87%

US Cellular

USM

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		0.46%	99.54%	<b>1.77</b>		stock price =	-31.52
1	4.52%	0.07%	99.93%	<b>1.85</b>	1.85		1.85
2	0.68%	0.07%	99.93%	1.86	1.86		1.86
3	0.67%	0.07%	99.93%	1.88	1.87		1.87
4	0.67%	0.07%	99.93%	1.89	1.89		1.89
5	0.66%	0.14%	99.86%	<b>1.90</b>	1.90		1.90
6	1.36%	0.21%	99.79%	1.93	1.92		1.92
7	2.05%	0.28%	99.72%	1.97	1.96		1.96
8	2.75%	0.35%	99.65%	2.02	2.01		2.01
9	3.44%	42.46%	57.54%	2.09	1.20		1.20
10	4.14%	42.46%	57.54%	2.18	1.25	28.77	30.02
11+	4.14%	42.46%	57.54%	2.27	1.30		

Value Line Earnings Growth Rate Ke = 4.99%

T-Mobile TMUS		Growth	Reinvestment	Payout	Earnings	FCFE	Terminal	Cash
Year	Rate	Rate	Ratio				Value	Flow
0		1.23%	98.77%	<b>3.17</b>			stock price =	-115.98
1	11.99%	2.49%	97.51%	<b>3.55</b>	3.46			3.46
2	24.30%	2.00%	98.00%	4.41	4.32			4.32
3	19.55%	1.68%	98.32%	5.28	5.19			5.19
4	16.35%	1.44%	98.56%	6.14	6.05			6.05
5	14.05%	1.24%	98.76%	<b>7.00</b>	6.91			6.91
6	12.07%	1.03%	98.97%	7.84	7.76			7.76
7	10.09%	0.83%	99.17%	8.64	8.56			8.56
8	8.11%	0.63%	99.37%	9.34	9.28			9.28
9	6.12%	42.46%	57.54%	9.91	5.70			5.70
10	4.14%	42.46%	57.54%	10.32	5.94	136.46		142.40
11+	4.14%	42.46%	57.54%	10.75	6.18			

Value Line Earnings Growth Rate

Ke = 6.57%

Average 9.95%

**Median** 9.72%