



# COST OF CAPITAL STUDY

**YIELD CAPITALIZATION  
2022 ASSESSMENT YEAR**

APPENDIX C

## TELECOMMUNICATIONS

<b>EQUITY RATE</b>						<b>8.00%</b>	
<b>CAPITAL ASSET PRICING MODEL</b>							PAGE
	CAPM Ex Ante		5.2%				6
<b>DIVIDEND GROWTH MODELS</b>							
	Value Line, based on Dividends Growth		7.25%				7
	Value Line, based on Earnings Growth		7.50%				8
	Value Line, based on Return on Equity		8.00%				10
				<b>RANGE</b>	5.2-8.0%		
<b>DEBT RATE</b>						<b>3.50%</b>	11
<b>SECURED DEBT (LEASE) RATE</b>						<b>2.80%</b>	11
<b>MARKET CAPITAL STRUCTURE</b>							
	Equity	60%	x	8.00%	=	4.80%	3
	Debt	40%	x	3.50%	=	1.40%	3
	Marginal Tax Rate	24%	=	(1-.024)	x	1.40%	<u>1.06%</u>

**WEIGHTED AVERAGE COST OF CAPITAL** **5.9%**

rounded

**SUPPORT FOR GUIDELINE COMPANIES**

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

TELECOMMUNICATIONS

Capital Structure at Book Value

Company	Ticker	Beta	Fin'l Strength	Price Stability	Growth Persist	Earnings Predict	P/E Ratio	Div'd Yield	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
AT&T Inc	t	0.80	A	100	10	95	7.8	8.80%	161,078,400,000	48.5%	-	0.0%	170,768,000,000	51.5%	331,846,400,000
ATN International Inc	atni	0.80	B++	45	30	30	87.7	2.00%	599,721,452	57.7%	-	0.0%	439,696,000	42.3%	1,039,417,452
Alice USA, Inc	atus	1.00	B	35	35	30	5.4	nil		nmf		nmf		nmf	
BCE Inc	bce	0.90	B++	100	10	95	20.7	5.50%	13,176,933,000	37.5%	3,162,000,000	9.0%	18,758,102,767	53.4%	35,097,035,767
Cable One	cabo	0.95	B++	80	90	90	30.7	0.80%	1,792,845,473	31.6%		0.0%	3,887,511,000	68.4%	5,680,356,473
Charter Communication	chtr	0.85	B++	85	90	15	24.2	nil	14,050,772,136	13.3%		0.0%	91,561,000,000	86.7%	105,611,772,136
Comcast Corp	cmcsa	0.80	A+	100	85	90	14.4	2.30%	96,104,482,890	50.3%		0.0%	94,850,000,000	49.7%	190,954,482,890
Lumen Technologies Int'l	lumn	0.95	B	45	5	70	5.4	9.70%	11,841,895,000	29.0%		0.0%	28,982,000,000	71.0%	40,823,895,000
Shenandoah Telecom	shen	nmf	B	nmf	nmf	nmf	nmf	0.40%	642,055,120	91.9%		0.0%	56,624,000	8.1%	698,679,120
Telus Corp	tu	0.70	B++	100	50	85	33.3	4.30%	11,945,533,597	41.7%		0.0%	16,681,600,000	58.3%	28,627,133,597
Verizon Communication	vz	0.60	A++	100	25	100	9.9	4.80%	65,276,157,944	30.2%		0.0%	150,868,000,000	69.8%	216,144,157,944
<b>Mean</b>		<b>0.84</b>	<b>B++</b>	<b>79</b>	<b>43</b>	<b>70</b>	<b>24.0</b>	<b>4.29%</b>	<b>37,650,879,661</b>	<b>43.2%</b>		<b>0.9%</b>	<b>57,685,253,377</b>	<b>55.9%</b>	
<b>Weighted Mean</b>									<b>376,508,796,612</b>	<b>39.4%</b>	<b>3,162,000,000</b>	<b>0.3%</b>	<b>576,852,533,767</b>	<b>60.3%</b>	<b>956,523,330,379</b>
<b>Median</b>		<b>0.83</b>		<b>93</b>	<b>33</b>	<b>88</b>	<b>18</b>	<b>4.30%</b>		<b>39.6%</b>		<b>0.0%</b>		<b>55.9%</b>	
<b>Trimmed Mean</b>		<b>0.84</b>		<b>82</b>	<b>42</b>	<b>73</b>	<b>18</b>	<b>4.07%</b>		<b>40.8%</b>		<b>0.0%</b>		<b>58.0%</b>	
<b>Max</b>		<b>1.00</b>		<b>100</b>	<b>90</b>	<b>100</b>	<b>88</b>	<b>9.70%</b>		<b>91.9%</b>		<b>9.0%</b>		<b>86.7%</b>	
<b>Min</b>		<b>0.60</b>		<b>35</b>	<b>5</b>	<b>15</b>	<b>5</b>	<b>0.40%</b>		<b>13.3%</b>		<b>0.0%</b>		<b>8.1%</b>	
<b>Say</b>		<b>0.85</b>								<b>40%</b>		<b>0.0%</b>		<b>60%</b>	<b>100%</b>

**SUPPORT FOR CAPITAL STRUCTURE  
MARKET VALUE**

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

TELECOMMUNICATIONS

Capital Structure at Market Value

Company	Ticker	Stock Close	Common Shares	Common Stock	%	Preferred Stock	%	Long Term Debt (FV)	%	Total Debt & Equity
AT&T Inc	t	24.11	7,140,000,000	172,145,921,220	45.9%	-	0.0%	203,098,000,000	54.1%	375,243,921,220
ATN International Inc	atni	39.95	15,823,785	632,160,227	56.8%	-	0.0%	481,620,000	43.2%	1,113,780,227
Altice USA, Inc	atus	16.18	454,624,259	7,355,820,511	21.4%	-	0.0%	26,950,358,000	78.6%	34,306,178,511
BCE Inc	bce	52.04	908,754,000	47,291,559,069	66.3%	3,162,000,000	4.4%	20,833,201,581	29.2%	71,286,760,650
Cable One	cabo	1,763.45	6,045,473	10,660,889,066	73.5%	-	0.0%	3,851,834,000	26.5%	14,512,723,066
Charter Communications Inc	chtr	651.97	172,741,236	112,622,098,625	53.1%	-	0.0%	99,641,000,000	46.9%	212,263,098,625
Comcast Corp	cmcsa	50.08	4,533,230,325	227,033,331,801	67.5%	-	0.0%	109,300,000,000	32.5%	336,333,331,801
Lumen Technologies Inc	lumn	12.55	1,023,500,000	12,844,925,000	30.3%	-	0.0%	29,568,000,000	69.7%	42,412,925,000
Shenandoah Telecom	shen	25.50	49,965,379	1,274,117,165	95.7%	-	0.0%	56,624,000	4.3%	1,330,741,165
Telus Corp	tu	23.57	1,370,000,000	32,290,900,000	64.5%	-	0.0%	17,807,200,000	35.5%	50,098,100,000
Verizon Communications	vz	51.34	4,197,823,662	215,522,257,101	55.8%	-	0.0%	170,530,000,000	44.2%	386,052,257,101
			<b>Mean</b>		<b>57.3%</b>		<b>0.4%</b>		<b>42.3%</b>	
			<b>Weighted Mean</b>	<b>839,673,979,784</b>	<b>55.1%</b>	<b>3,162,000,000</b>	<b>0.21%</b>	<b>682,117,837,581</b>	<b>44.7%</b>	<b>1,524,953,817,365</b>
			<b>Median</b>		<b>56.8%</b>		<b>0.00%</b>		<b>43.2%</b>	
			<b>Trimmed Mean</b>		<b>57.1%</b>		<b>0.0%</b>		<b>42.4%</b>	
			<b>Max</b>		<b>95.7%</b>		<b>4.4%</b>		<b>78.6%</b>	
			<b>Min</b>		<b>21.4%</b>		<b>0.0%</b>		<b>4.3%</b>	
			<b>Say</b>		<b>60%</b>		<b>0%</b>		<b>40%</b>	<b>100%</b>

Source:

Stock Price: Yahoo

Market Value Debt: Fair Value 10k

**SUPPORT FOR MARKET MULTIPLES**

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

TELECOMMUNICATIONS

Company	Ticker	Stock Close	Revenues	Multiple	Cash Flow	Multiple	Earnings	Multiple	Divds Decld	Multiple	Captl Spend	Multiple	Book Value	Multiple
AT&T Inc	t	24.11	23.65	1.0	6.26	3.9	3.04	7.9	2.08	11.6	2.31	10.4	22.56	1.1
ATN International Inc	atni	39.95	38.00	1.1	7.25	5.5	0.38	105.1	0.68	58.8	6.10	6.5	37.90	1.1
Altice USA, Inc	atus	16.18	22.19	0.7	6.15	2.6	2.14	7.6	nil		2.70	6.0	(1.80)	
BCE Inc	bce	52.04	20.40	2.6	6.65	7.8	2.52	20.7	2.80	18.6	4.20	12.4	14.50	3.6
Cable One	cabo	1,763.45	265.59	6.6	104.34	16.9	46.49	37.9	10.50	167.9	64.82	27.2	296.56	5.9
Charter Communications	chtr	651.97	299.19	2.2	81.04	8.0	24.47	26.6	nil		44.20	14.8	81.34	8.0
Comcast Corp	cmcsa	50.08	25.67	2.0	5.84	8.6	3.23	15.5	0.98	51.1	2.24	22.4	21.20	2.4
Lumen Technologies Inc	lumn	12.55	19.23	0.7	5.91	2.1	1.91	6.6	1.00	12.6	2.83	4.4	11.57	1.1
Shenandoah Telecom	shen	23.50	4.91	5.2	1.36	18.8	0.26	98.1	0.07	364.3	3.20	8.0	12.85	2.0
Telus Corp	tu	23.57	9.96	2.4	2.61	9.0	0.76	31.1	0.99	23.9	1.79	13.2	8.72	2.7
Verizon Communications	vz	51.34	31.83	1.6	9.15	5.6	5.40	9.5	2.52	20.4	4.40	11.7	15.55	3.3
				<b>Mean</b>	<b>2.4</b>	<b>8.1</b>		<b>33.3</b>		<b>81.0</b>		<b>12.4</b>		<b>3.1</b>
				<b>Median</b>	<b>2.0</b>	<b>7.8</b>		<b>20.7</b>		<b>23.9</b>		<b>11.7</b>		<b>2.5</b>
				<b>Trimmed Mean</b>	<b>2.1</b>	<b>7.6</b>		<b>28.3</b>		<b>50.5</b>		<b>11.7</b>		<b>2.8</b>
				<b>Max</b>	<b>6.6</b>	<b>18.8</b>		<b>105.1</b>		<b>364.3</b>		<b>27.2</b>		<b>8.0</b>
				<b>Min</b>	<b>0.7</b>	<b>2.1</b>		<b>6.6</b>		<b>11.6</b>		<b>4.4</b>		<b>1.1</b>
				<b>Std Dev</b>	<b>1.9</b>	<b>5.4</b>		<b>35.3</b>		<b>117.0</b>		<b>7.0</b>		<b>2.3</b>
				<b>Coefficient of Variation</b>	<b>0.8</b>	<b>0.7</b>		<b>1.1</b>		<b>1.4</b>		<b>0.6</b>		<b>0.7</b>
				<b>Harmonic Mean</b>	<b>1.5</b>	<b>5.3</b>		<b>14.8</b>		<b>25.3</b>		<b>9.5</b>		<b>2.0</b>
				<b>Percentile .25</b>	<b>1.0</b>	<b>4.7</b>		<b>8.7</b>		<b>18.6</b>		<b>7.3</b>		<b>1.3</b>
				<b>Percentile .75</b>	<b>2.5</b>	<b>8.8</b>		<b>34.5</b>		<b>58.8</b>		<b>14.0</b>		<b>3.5</b>
				<b>Say</b>	<b>1.50</b>	<b>5.50</b>		<b>15.00</b>		<b>24.00</b>		<b>10.00</b>		<b>2.00</b>

**ENTERPRISE VALUE MULTIPLES**

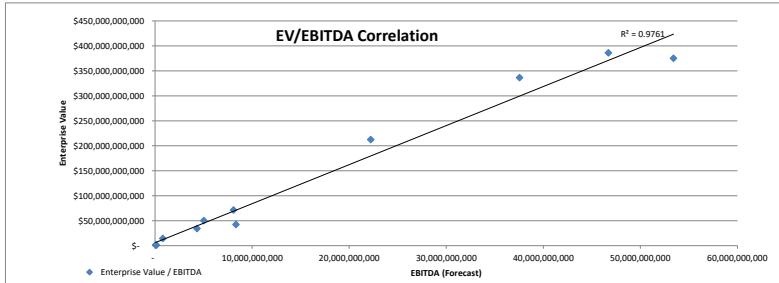
WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

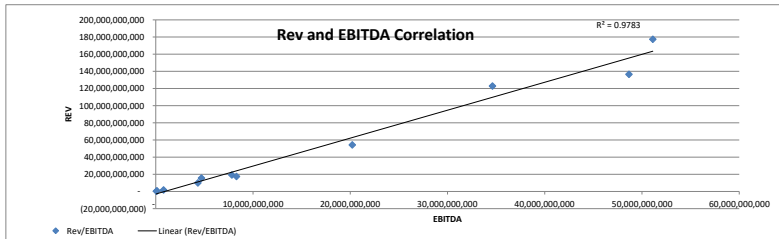
TELECOMMUNICATIONS

Guideline Companies	Ticker	EV	EBITDA	EBITDA	EV / EBITDA	EV / EBITDA	Annual Change Rate	EBITDA	EV / EBITDA	Sales (Revenue)	EV / Sales	CF	Debt Service	EV / CF
			historic	historic M*	historic	historic M*	CF	forecast	forecast	forecast		forecast		
AT&T Inc	t	\$ 375,243,921,220	51,113,000,000	46,209,000,000	7.34	8.12	4.50%	53,413,085,000	7.03	177,394,500,000	2.12	47,637,000,000	7,108,430,000	6.85
ATN International Inc	atni	\$ 111,378,027	139,047,000	139,047,000	8.63	8.63	8.00%	139,370,760	7.99	705,165,000	3.58	144,690,000	16,356,700	6.89
Alice USA, Inc	atus	\$ 34,306,178,511	4,328,955,000	4,427,251,000	7.92	7.75		4,328,955,000	7.92	9,901,250,000	3.48	2,469,750,000	943,262,530	10.05
BCE Inc	bca	\$ 71,286,760,650	7,820,553,360	7,820,553,360	9.12	9.12	3.50%	8,094,272,727	8.81	19,253,750,000	3.70	6,296,250,000	729,162,055	10.15
Cable One	cabo	\$ 14,512,723,066	893,476,000	839,325,000	18.06	17.29		803,425,000	18.06	1,750,125,000	8.29	679,900,000	134,814,190	17.81
Charter Communications Inc	chtr	\$ 212,263,098,625	20,200,000,000	20,630,000,000	10.51	10.29	10.00%	22,220,000,000	9.55	54,200,000,000	3.92	14,656,000,000	3,487,435,000	11.70
Comcast Corp	cmcsa	\$ 336,333,331,801	34,621,000,000	34,708,000,000	9.71	9.69	8.50%	37,563,785,000	8.85	122,904,250,000	2.74	28,003,500,000	3,825,500,000	10.57
Lumen Technologies Inc	lumn	\$ 42,412,925,000	8,394,000,000	8,424,000,000	5.11	5.03	0.50%	8,249,520,000	5.08	17,500,000,000	2.42	4,900,000,000	1,034,880,000	7.15
Shenandoah Telecom	shan	\$ 1,330,741,165	60,489,000	65,726,000	22.00	20.25	10.50%	66,840,345	19.91	265,000,000	5.02	72,000,000	1,981,840	17.87
Telus Corp	tu	\$ 50,098,100,000	4,702,400,000	4,855,200,000	10.65	10.32	7.00%	5,031,568,000	9.96	15,561,000,000	3.22	3,876,600,000	623,252,000	11.13
Verizon Communications	vz	\$ 386,052,237,101	48,654,000,000	48,380,000,000	7.93	7.98	-4.00%	46,707,840,000	8.27	136,500,000,000	2.83	38,850,000,000	5,968,550,000	8.61
<b>Mean</b>					<b>10.64</b>	<b>10.41</b>	<b>5.39%</b>		<b>10.14</b>		<b>3.57</b>		<b>10.80</b>	
<b>Median</b>					<b>9.12</b>	<b>9.12</b>	<b>7.00%</b>		<b>8.81</b>		<b>3.22</b>		<b>10.15</b>	
<b>Trimmed Mean</b>					<b>9.99</b>	<b>9.91</b>	<b>6.00%</b>		<b>9.62</b>		<b>3.27</b>		<b>10.45</b>	
<b>Max</b>					<b>22.00</b>	<b>20.25</b>	<b>10.50%</b>		<b>19.91</b>		<b>8.29</b>		<b>17.87</b>	
<b>Min</b>					<b>5.11</b>	<b>5.03</b>	<b>-4.00%</b>		<b>5.08</b>		<b>1.58</b>		<b>6.85</b>	
<b>Std Dev</b>					<b>4.98</b>	<b>4.43</b>	<b>0.05</b>		<b>4.58</b>		<b>1.83</b>		<b>3.87</b>	
<b>Coefficient of Variation</b>					<b>0.47</b>	<b>0.43</b>	<b>0.89</b>		<b>0.45</b>		<b>0.51</b>		<b>0.36</b>	
<b>Harmonic Mean</b>					<b>9.15</b>	<b>9.12</b>	<b>2.59%</b>		<b>8.82</b>		<b>2.99</b>		<b>9.76</b>	
<b>Say</b>					<b>9.25</b>	<b>9.25</b>	<b>3.09%</b>		<b>9.00</b>		<b>3.00</b>		<b>9.75</b>	

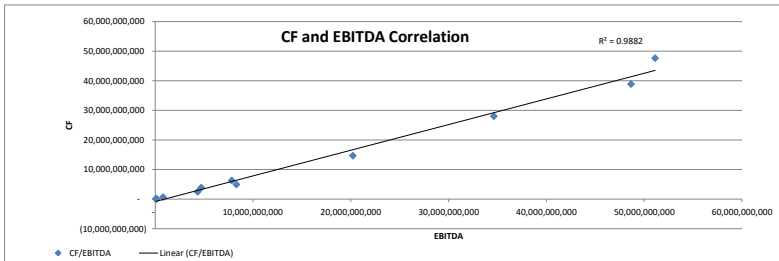
EBITDA from Morningstar  
Morningstar data page



Guideline Companies	EV/EBITDA	forecast
Lumen Technologies Inc	7.03	5.08
AT&T Inc	7.03	7.03
Alice USA, Inc	7.92	7.92
ATN International Inc	7.99	7.99
Verizon Communications	8.27	8.27
BCE Inc	8.81	8.81
Comcast Corp	8.95	8.95
Charter Communications Inc	9.55	9.55
Telus Corp	9.96	9.96
Cable One	18.06	18.06
Shenandoah Telecom	19.91	19.91
<b>Low Average</b>	<b>7.52</b>	
<b>Low Median</b>	<b>7.96</b>	
<b>Say</b>	<b>7.50</b>	
<b>High Average</b>	<b>13.29</b>	
<b>High Median</b>	<b>9.96</b>	
<b>Say</b>	<b>11.00</b>	



Guideline Companies	EV/Sales
ATN International Inc	1.58
AT&T Inc	2.12
Lumen Technologies Inc	2.42
Comcast Corp	2.74
Verizon Communications	2.83
Telus Corp	3.22
Alice USA, Inc	3.46
BCE Inc	3.70
Charter Communications Inc	3.92
Shenandoah Telecom	5.02
Cable One	8.29
<b>Low Average</b>	<b>2.48</b>
<b>Low Median</b>	<b>2.58</b>
<b>Say</b>	<b>2.50</b>
<b>High Average</b>	<b>4.88</b>
<b>High Median</b>	<b>3.92</b>
<b>Say</b>	<b>4.00</b>



Guideline Companies	EV/CF
AT&T Inc	6.85
ATN International Inc	6.89
Lumen Technologies Inc	7.15
Verizon Communications	8.61
Alice USA, Inc	10.05
BCE Inc	10.15
Comcast Corp	10.57
Telus Corp	11.13
Charter Communications Inc	11.70
Cable One	17.81
Shenandoah Telecom	17.87
<b>Low Average</b>	<b>8.28</b>
<b>Low Median</b>	<b>7.88</b>
<b>Say</b>	<b>8.00</b>
<b>High Average</b>	<b>13.62</b>
<b>High Median</b>	<b>11.70</b>
<b>Say</b>	<b>12.00</b>

# SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT CAPITAL ASSET PRICING MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

TELECOMMUNICATIONS

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

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**Ke = Cost of Equity** **5.2%**

to page 1

Rm =	rate of return	5.76%
Rf =	risk free rate	1.90%
Rp =	risk premium	3.86%
B =	Beta	0.85

page 2

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

to above

<b>Shannon Pratt and Roger Grabowski</b>	3.5 - 6%	
Cost of Capital, Applications and Examples, Third Edition, 2008, Page 113		
<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		

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

to above

**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	<del>-0.63%</del> 2.57%
	30 year TIPS	<del>-0.44%</del> 2.34%
		TIPS inflation indication

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**Inflation** **2.34%**

to appraisal template

**The Livingston Survey December 17, 2021, page 4, 8**

Inflation median (measured by the Consumer Price Index) over next 10 years	2.40%
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**Gross Domestic Product (GDP) Nominal** **4.14%**

real GDP + inflation est

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

Median Projection Value From Dec 15, 2021 Report	1.80%
<a href="https://www.federalreserve.gov/monetarypolicy/files/fomcprojtbl20211215.pdf">https://www.federalreserve.gov/monetarypolicy/files/fomcprojtbl20211215.pdf</a>	

**Congressional Budget Office Real GDP Economic Projections**

<i>*last year's data</i> 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-Outlook.pdf">https://www.cbo.gov/system/files/2021-02/56970-Outlook.pdf</a>	1.70%

**Federal Reserve Bank of Philadelphia**

The Livingston Survey, December 17, 2021, page 8	
Average Annual 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  
TELECOMMUNICATIONS

## Based on Dividend Growth

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

Ke = Cost of Equity  
D1 = Expected Dividends  
Po = Current Price  
G = Sustainable Growth  
Adj G assumption: Sustainable g can not exceed inflation plus real GDP. Minimum g inflation

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Dividend Growth (G)	Ke	Sustainable Dividend Growth	Ke (Sus)
AT&T Inc	t	24.11	2.08	8.63%	-10.00%	nmf	2.34%	10.97%
ATN International Inc	atni	39.95	0.68	1.70%	2.50%	4.20%		4.20%
Altice USA, Inc	atus	16.18	nil					
BCE Inc	bce	52.04	2.93	5.63%	4.00%	9.63%		9.63%
Cable One	cabo	1,763.45	11.50	0.65%	6.50%	7.15%	4.14%	4.79%
Charter Communications Inc	chtr	651.97	nil					
Comcast Corp	cmcsa	50.08	1.08	2.16%	9.00%	11.16%	4.14%	6.30%
Lumen Technologies Inc	lumn	12.55	1.00	7.97%	-5.50%	2.47%	2.34%	10.31%
Shenandoah Telecom	shen	25.50	0.09	0.35%	-9.50%	nmf	2.34%	2.69%
Telus Corp	tu	23.57	1.06	4.51%	7.00%	11.51%	4.14%	8.65%
Verizon Communications	vz	51.34	2.56	4.99%	2.00%	6.99%	2.34%	7.33%
						<b>7.59%</b>	<b>Mean</b>	<b>7.21%</b>
						<b>7.15%</b>	<b>Median</b>	<b>7.33%</b>
						<b>7.90%</b>	<b>Trimmed Mean</b>	<b>7.32%</b>
						<b>11.51%</b>	<b>Max</b>	<b>10.97%</b>
						<b>2.47%</b>	<b>Min</b>	<b>2.69%</b>

Source: Value Line Projections 19-21 to 25-27

**7.50%**  
**Say** **7.25%** **7.25%**

# SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE  
2022 ASSESSMENT YEAR  
TELECOMMUNICATIONS

## Based on Earnings Growth

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

Ke = Cost of Equity  
D1 = Expected Dividends  
Po = Current Price  
G = Sustainable Growth  
Adj G assumption: Sustainable g can not exceed inflation plus real GDP. Minimum g inflation

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Earnings Growth (G)	Ke	Sustainable Earnings Growth	Ke (Sus)	
AT&T Inc	t	24.11	2.08	8.63%	3.00%	11.63%		8.63%	
ATN International Inc	atni	39.95	0.68	1.70%	35.00%	36.70%	4.14%	5.84%	
Altice USA, Inc	atus	16.18	nil						
BCE Inc	bce	52.04	2.93	5.63%	3.50%	9.13%		9.13%	
Cable One	cabo	1,763.45	11.50	0.65%	10.00%	10.65%	4.14%	4.79%	
Charter Communications Inc	chtr	651.97	nil						
Comcast Corp	cmcsa	50.08	1.08	2.16%	9.50%	11.66%	4.14%	6.30%	
Lumen Technologies Inc	lumn	12.55	1.00	7.97%	3.50%	11.47%		11.47%	
Shenandoah Telecom	shen	25.50	0.09	0.35%	2.00%	2.35%	2.34%	2.69%	
Telus Corp	tu	23.57	1.06	4.51%	15.00%	19.51%	4.14%	8.65%	
Verizon Communications	vz	51.34	2.56	4.99%	3.00%	7.99%		7.99%	
						<b>13.45%</b>	<b>Trimmed Mean</b>	<b>7.28%</b>	
						<b>11.47%</b>		<b>Median</b>	<b>7.99%</b>
						<b>11.72%</b>		<b>Max</b>	<b>11.47%</b>
						<b>36.70%</b>		<b>Min</b>	<b>2.69%</b>
						<b>2.35%</b>			
						<b>11.50%</b>		<b>7.50%</b>	
						<b>Say</b>			

Source: Value Line Projections 19-21 to 25-27



# SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE  
2022 ASSESSMENT YEAR  
TELECOMMUNICATIONS

## Based on Earnings Growth

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

Ke = Cost of Equity  
D1 = Expected Dividends  
Po = Current Price  
G = Sustainable Growth  
Adj G assumption: Sustainable g can not exceed inflation plus real GDP. Minimum g inflation

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Earnings Growth (G)	Ke	Sustainable Earnings Growth	Ke (Sus)
AT&T Inc	t	24.11	2.08	8.63%	3.66%	12.29%		12.29%
ATN International Inc	atni	39.95	0.68	1.70%	20.00%	21.70%	4.14%	5.84%
Altice USA, Inc	atus	16.18	nil					
BCE Inc	bce	52.04	2.93	5.63%	5.23%	10.86%	4.14%	9.77%
Cable One	cabo	1,763.45	11.50	0.65%	10.90%	11.55%	4.14%	4.79%
Charter Communications Inc	chtr	651.97	nil					
Comcast Corp	cmcsa	50.08	1.08	2.16%	14.31%	16.47%	4.14%	6.30%
Lumen Technologies Inc	lumn	12.55	1.00	7.97%	-19.70%	nmf	2.34%	10.31%
Shenandoah Telecom	shen	25.50	0.09	0.35%	24.40%	24.75%	4.14%	4.49%
Telus Corp	tu	23.57	1.06	4.51%	7.77%	12.28%	4.14%	8.65%
Verizon Communications	vz	51.34	2.56	4.99%	2.88%	7.87%		7.87%
						<b>14.72%</b>	<b>Trimmed Mean</b>	<b>7.81%</b>
						<b>12.29%</b>		<b>7.87%</b>
						<b>14.19%</b>		<b>7.65%</b>
						<b>24.75%</b>		<b>12.29%</b>
						<b>7.87%</b>		<b>4.49%</b>

Source: Yahoo Finance 5 year growth est

**12.50%**  
**Say** **7.75%** **7.75%**

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

WASHINGTON STATE DEPARTMENT OF REVENUE  
2022 ASSESSMENT YEAR  
TELECOMMUNICATIONS

Based on Return on Equity

**Ke = (D1 / Po) + G**  
**Ke** = Cost of Equity  
**D1** = Expected Dividends  
**E1** = Expected Earnings  
**Po** = Current Price  
**G** = Sustainable Growth  
**b** = Retained Earnings % (plowback) (1 - payout ratio)  
**ROE** = Return on Equity  
 Adj G assumption: Sustainable g can not exceed inflation plus real GDP. Minimum g inflation

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	b (1-payout ratio)	ROE book	Proj Earnings (E1)	=ROE market	mk:bk	=ROE market	Growth (b*ROE)	Growth (b*ROE)	Growth (b*ROE) book	Ke	Sustainable Reinvestment Growth	Ke (Sus)
AT&T Inc	t	24.11	2.08	8.63%	32.0%	14.50%	3.20	13.27%	1.07	13.57%	4.25%	4.3%	4.64%	12.87%	4.14%	12.77%
ATN International Inc	atni	39.95	0.68	1.70%		1.50%	0.35	0.88%	1.05	1.42%						
Altice USA, Inc	atus	16.18	nil				1.40	8.65%	(8.99)	nmf						
BCE Inc	bce	52.04	2.93	5.63%	-9.0%	20.00%	2.65	5.09%	3.59	5.57%	-0.46%	-0.5%	-1.80%	5.17%	2.34%	7.97%
Cable One	cabo	1,763.45	11.50	0.65%	78.0%	18.50%	52.25	2.96%	5.95	3.11%	2.31%	2.4%	14.43%	2.96%	2.34%	2.99%
Charter Communications II	chtr	651.97	nil			46.00%	31.00	4.75%	8.02	5.74%						
Comcast Corp	cmcsa	50.08	1.08	2.16%	70.0%	15.50%	3.55	7.09%	2.36	6.56%	4.96%	4.6%	10.85%	7.12%	4.14%	6.30%
Lumen Technologies Inc	lumn	12.55	1.00	7.97%	47.0%	13.00%	1.50	11.95%	1.08	11.98%	5.62%	5.6%	6.11%	13.59%	4.14%	12.11%
Shenandoah Telecom	shen	25.50	0.09	0.35%		2.50%	0.35	1.37%	1.98	1.26%						
Telus Corp	tu	23.57	1.06	4.51%	20.0%	9.00%	0.84	3.56%	2.70	3.33%	0.71%	0.7%	1.80%	5.23%	2.34%	6.85%
Verizon Communications	vz	51.34	2.56	4.99%	52.0%	38.00%	5.50	10.71%	3.30	11.51%	5.57%	6.0%	19.76%	10.56%	4.14%	9.13%
														<b>8.21%</b>	<b>Mean</b>	<b>8.30%</b>
														<b>7.12%</b>	<b>Median</b>	<b>7.97%</b>
														<b>8.19%</b>	<b>Trimmed Mean</b>	<b>8.47%</b>
														<b>13.59%</b>	<b>Max</b>	<b>12.77%</b>
														<b>2.96%</b>	<b>Min</b>	<b>2.99%</b>
														<b>8.00%</b>		<b>8.00%</b>

# SUPPORT FOR DEBT RATING AND DEBT YIELD RATE

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

TELECOMMUNICATIONS

Company	Ticker	Mergent's Ratings	S&P Ratings	WAYTM
AT&T Inc	t		BBB	3.47%
ATN International Inc	atni			
Altice USA, Inc	atus		BB	4.97%
BCE Inc	bce		BBB+	3.12%
Cable One	cabo		BB	
Charter Communications Inc	chtr		BB+	3.94%
Comcast Corp	cmcsa		A-	2.91%
Lumen Technologies Inc	lumn		BB	6.69%
Shenandoah Telecom	shen			
Telus Corp	tu		BBB+	2.98%
Verizon Communications	vz	Baa1	BBB+	2.99%
<b>Overall Average Debt Rating</b>		<b>Baa1</b>	<b>BBB-</b>	<b>3.88%</b>

bond analysis, A-BBB- bonds

	All issues	20+ year maturities
<b>Guideline Companies, All Ratings</b>	<b>3.30%</b>	<b>3.50%</b>

bond analysis page 12

## Mergent's Bond Record January 2022, page 90

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>2.71%</b>	<b>2.85%</b>	<b>3.04%</b>	<b>3.40%</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>2.79%</b>	<b>3.11%</b>	<b>3.36%</b>
Industrials	Aaa	Aa	A	Baa
October	2.68%	2.73%	2.96%	3.38%
November	2.62%	2.63%	2.88%	3.30%
December	2.71%	2.62%	2.95%	3.37%
<b>4th Qtr Average</b>	<b>2.67%</b>	<b>2.66%</b>	<b>2.93%</b>	<b>3.35%</b>
<b>2021 Average</b>	<b>2.71%</b>	<b>2.73%</b>	<b>2.98%</b>	<b>3.43%</b>

**Debt Yield Rate** **3.50%**

**Secured Debt (Lease) Rate** based on Aa rate **2.80%**

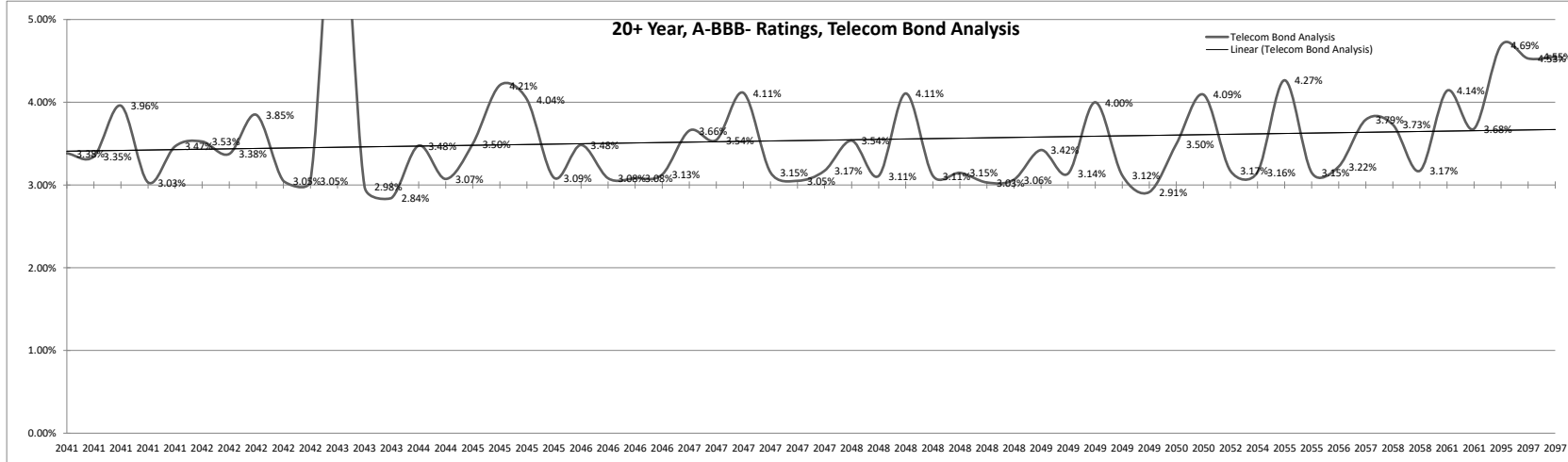
to page 1

Table with columns: Company, type, Call, coupon, maturity, Price 12/21, Issued / Book, current yield, yield to maturity, Weighted Ave Rating, Mkt Val, Mkt : Book, Embedded Rat, Debt Service, WAYTM, WAYTM, YTM. Rows include various telecom companies like Bell South, CenturyLink, Charter, and Comcast with detailed bond specifications and financial metrics.

Telus	Sr unsecured note	4,600	2048	127.61	\$	750,000,000	3.60%	3.03%	0.01%	Baa1	\$	957,075,000	127.61%	\$	34,500,000	0.000119080	0.01818041	3.07	
Telus	Sr unsecured note	4,300	2049	125.33	\$	500,000,000	3.43%	2.91%	0.01%	Baa1	\$	626,650,000	125.33%	\$	21,500,000	0.000076365	0.01165896	2.93	
	<b>2 Book Value</b>	<b>200</b>	<b>sum</b>	<b>252.94</b>	<b>\$</b>	<b>1,250,000,000</b>	<b>Percent of book</b>	<b>126.47%</b>	<b>0.02%</b>		<b>\$</b>	<b>1,583,725,000</b>	<b>126.70%</b>	<b>4.48%</b>	<b>\$</b>	<b>56,000,000</b>	<b>2.984%</b>		
Verizon Communications	Sr unsec note	2,987	2056	95.2	\$	4,498,814,000	3.14%	3.22%	0.08%	BBB+	\$	4,282,870,928	95.20%		134,378,574	0.000759865	0.001918889	3.22	
Verizon Communications	Sr unsec note	3,700	2061	100.42	\$	3,500,000,000	3.68%	3.68%	0.07%	BBB+	\$	3,514,700,000	100.42%		129,500,000	0.000674797	0.001704068	3.3	
Verizon Communications	fx rt Notes	4,672	2055	130.7	\$	5,500,000,000	3.57%	3.15%	0.09%	BBB+	\$	7,188,500,000	130.70%		256,960,000	0.000807620	0.002292014	3.17	
Verizon Communications	fx rt Notes	5,012	2054	136.72	\$	5,500,000,000	3.67%	3.16%	0.09%	BBB+	\$	7,519,600,000	136.72%		275,660,000	0.000909430	0.002296585	3.19	
Verizon Communications	sr rt	4,522	2048	125.53	\$	5,000,000,000	3.60%	3.06%	0.08%	BBB+	\$	6,276,500,000	125.53%		226,100,000	0.000802928	0.002027637	3.11	
Verizon Communications	fx rt Notes	5,500	2047	139.24	\$	1,500,000,000	3.95%	3.17%	0.02%	BBB+	\$	2,088,600,000	139.24%		82,500,000	0.000249326	0.000629622	3.22	
Verizon Communications	rt	4,862	2046	129.46	\$	4,500,000,000	3.76%	3.08%	0.07%	BBB+	\$	5,825,700,000	129.46%		218,790,000	0.000728658	0.001835032	3.14	
Verizon Communications	fx rt Notes	4,125	2046	116.44	\$	1,500,000,000	3.54%	3.13%	0.02%	BBB+	\$	1,746,600,000	116.44%		61,875,000	0.000245763	0.000620625	3.16	
Verizon Communications	fx rt Notes	6,550	2043	156.98	\$	15,000,000,000	4.17%	2.84%	0.22%	BBB+	\$	23,547,000,000	156.98%		982,500,000	0.00235167	0.005644474	2.97	
Verizon Communications	Notes	3,860	2042	111.58	\$	1,250,000,000	3.45%	3.05%	0.02%	BBB+	\$	1,394,750,000	111.58%		48,125,000	0.000199860	0.000505010	3.08	
Verizon Communications	fixed rate notes	4,750	2041	124.07	\$	750,000,000	3.83%	3.03%	0.01%	BBB+	\$	930,525,000	124.07%		35,625,000	0.000119120	0.000300814	3.11	
Verizon Communications	fixed rate notes	6,000	2041	134.17	\$	1,000,000,000	4.47%	3.47%	0.02%	BBB+	\$	1,341,700,000	134.17%		60,000,000	0.000481666	0.000458763	3.54	
Verizon Communications	Notes	7,350	2039	148.95	\$	1,000,000,000	4.93%	3.42%	0.02%	BBB+	\$	1,489,500,000	148.95%		73,500,000	0.000179158	0.000452429	3.54	
Verizon Communications	Sr unsec note	4,812	2039	125.38	\$	1,706,297,000	3.84%	2.86%	0.03%	BBB+	\$	2,139,355,179	125.38%		82,107,012	0.000255782	0.000645928	2.92	
Verizon Communications	Notes	6,400	2038	137.00	\$	1,750,000,000	4.67%	3.31%	0.03%	BBB+	\$	2,397,500,000	137.00%		112,000,000	0.000303520	0.000766480	3.40	
Verizon Communications	Notes	6,900	2038	142.48	\$	1,250,000,000	4.84%	3.34%	0.02%	BBB+	\$	1,781,000,000	142.48%		86,250,000	0.000218999	0.000553038	3.47	
Verizon Communications	Notes	6,250	2037	134.95	\$	750,000,000	4.63%	3.20%	0.01%	BBB+	\$	1,012,125,000	134.95%		46,875,000	0.000125748	0.000317551	3.31	
Verizon Communications	fx rt Notes	5,250	2037	130.14	\$	3,000,000,000	4.03%	2.71%	0.04%	BBB+	\$	3,904,200,000	130.14%		157,500,000	0.000425822	0.001075329	2.80	
Verizon Communications	fx rt Notes	4,272	2036	118.06	\$	2,867,000,000	3.62%	2.66%	0.04%	BBB+	\$	3,384,780,200	118.06%		122,478,240	0.000399900	0.001098988	2.72	
Verizon Global Funding	Notes	5,850	2035	134.36	\$	1,000,000,000	4.35%	2.80%	0.01%	BBB+	\$	1,343,600,000	134.36%		58,500,000	0.000186204	0.000343503	2.81	
Verizon Communications	fx rt Notes	5,050	2034	121.05	\$	1,250,000,000	4.17%	2.87%	0.02%	BBB+	\$	1,513,125,000	121.05%		63,125,000	0.000188273	0.000475447	2.86	
Verizon Communications	fx rt Notes	4,400	2034	116.43	\$	2,500,000,000	3.78%	2.72%	0.04%	BBB+	\$	2,910,750,000	116.43%		110,000,000	0.000359961	0.000898910	2.81	
Verizon Communications	fx rate nt	6,400	2033	134.32	\$	6,000,000,000	4.76%	2.62%	0.08%	BBB+	\$	8,059,200,000	134.32%		384,000,000	0.000823423	0.002079393	2.92	
Verizon Communications	fx rt Notes	4,500	2033	117.65	\$	3,000,000,000	3.82%	2.53%	0.04%	BBB+	\$	3,538,500,000	117.65%		135,000,000	0.000397988	0.001005041	2.69	
	<b>24 Book Val</b>	<b>2400</b>	<b>sum</b>	<b>3061.58</b>	<b>\$</b>	<b>75,572,111,000</b>	<b>Percent of book</b>	<b>127.57%</b>	<b>1.18%</b>		<b>\$</b>	<b>99,130,681,307</b>	<b>131.17%</b>	<b>5.22%</b>	<b>\$</b>	<b>3,943,349,826</b>	<b>2.986%</b>		
	<b>Total</b>				<b>\$</b>	<b>190,845,458,000</b>					<b>\$</b>	<b>242,131,455,792.60</b>	<b>126.88%</b>	<b>5.25%</b>	<b>\$</b>	<b>10,016,468,907</b>	<b>3.30%</b>	<b>3.884%</b>	<b>3.556</b>

Source: FINRA, February 2022, 2021 Yr End Prices

Embedded debt rate 5.2486%  
 Weighted average yield to maturity 3.3010%  
 Debt service / Market value 4.1368%





**DATA INPUT**

WASHINGTON STATE DEPARTMENT OF REVENUE  
 2022 ASSESSMENT YEAR  
 TELECOMMUNICATIONS

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

Guideline Companies		Stock Price	Revenues	Cash Flow	Earnings	Dividends	Capital Spending	Bk Value	Common	Calculated Debt	Wtd Avg YTM	Payout Ratio	Payout Ratio	ROE	Timeliness	Safety	Technical	Income Tax Rate	Return on Total Capital	CF growth	
Name	Ticker	(YE Adj Close)	Per Share	Per Share	Per Share	Per Share	per share	Stock	Shares	mk to bk		calculated	V L	V L	VL	VL	VL	VL	VL	VL	
AT&T Inc	t	24.11	23.65	6.26	3.04	2.08	2.31	22.56	7,140,000,000	125.39%	3.47%	68%	68%	13.6%		2			15.1%	8.00%	1.5%
ATN International Inc	atni	39.95	38.00	7.25	0.38	0.68	6.10	37.90	15,823,785	109.53%		179%	nmf	1.3%	5	3	3	nmf	1.30%	9.0%	
Altice USA, Inc	atus	16.18	22.19	6.15	2.14	nil	2.70	(1.80)	454,624,259	97.20%	4.97%	nil	nmf		3	3	3	22.6%	6.50%	11.0%	
BCE Inc	bce	52.04	20.40	6.65	2.52	2.80	4.20	14.50	908,754,000	122.31%	3.12%	111%	109%	19.0%	5	2	2	25.0%	9.00%	3.5%	
Cable One	cabo	1,763.45	265.59	104.34	46.49	10.50	64.82	296.56	6,045,473	99.08%		23%	22%	16.3%	5	2	4	13.6%	6.20%	8.0%	
Charter Communications Inc	chtr	651.97	299.19	81.04	24.47	nil	44.20	81.34	172,741,236	124.49%	3.94%	nil	33.1%		1	2	5	16.7%	6.50%	12.5%	
Comcast Corp	cmcsa	50.08	25.67	5.84	3.23	0.98	2.24	21.20	4,533,230,325	126.16%	2.91%	30%	30%	15.7%	1	1	4	24.3%	8.90%	7.5%	
Lumen Technologies Inc	lumn	12.55	19.23	5.91	1.91	1.00	2.83	11.57	1,023,500,000	110.06%	6.69%	52%	53%	17.2%		3		24.7%	7.10%	nmf	
Shenandoah Telecom	shen	25.50	4.91	1.36	0.26	0.07	3.20	12.85	49,965,379	100.00%		27%	nmf	2.0%		3		nmf	2.00%	-4.5%	
Telus Corp	tu	23.57	9.96	2.61	0.76	0.99	1.79	8.72	1,370,000,000	126.70%	2.98%	130%	80%	8.6%	4	2	4	25.5%	5.20%	10.0%	
Verizon Communications	vz	51.34	31.83	9.15	5.40	2.52	4.40	15.55	4,197,823,662	131.17%	2.99%	47%	48%	38.0%	3	1	4	23.1%	13.00%	0.5%	
Value Line March 11, 2022	Yahoo	Value Line	Value Line	Value Line	Value Line	Value Line	Value Line	Value Line	Value Line	Bond analysis	Bond analysis	calculated	Value Line	Value Line				21%	6.70%	5.90%	
										115.65%									6.50%	7.75%	
										126.88%									6.60%	6.38%	
										126.88%		74%	59%	16.5%					<b>6.50%</b>	<b>6.0%</b>	
										120.44%		46.9%	45.2%	5.7%					4.41%		
																			0.032		
																			0.485		

2022 Forecast						Forecast Dividends % Change						Forecast Earnings % Change						Forecast Cash Flow % Change						
Revenues	CF	Earnings	Dividends	Common	P/E	2022	2023	2024	2025	2026	2027	2022	2023	2024	2025	2026	2027	2022	2023	2024	2025	2026	2027	
VL	VL	VL	VL	Shares	calc	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL
24.95	6.70	3.20	2.08	7,110,000,000	7.53	4	4.5	4.5	4.5	2.5	2.5	5.5	7	5.5	5.5	2.5	1.5	4.5	4.5	4.5	4.5	3.5	2	1
44.35	9.10	0.35	0.68	15,900,000	114.14	5.5	-6	-4	-4	2.5	2.5	10.5	14	16	29	46	40.5	8	9.5	4.5	7	11	10	
22.25	5.55	1.40	nil	445,000,000	11.56											44.5	40				9	12	11	
21.10	6.90	2.65	2.93	912,500,000	19.64	4	4	4	4	4.5	4.5	4	5	4.5	3	3.5	3.5	3.5	5.5	5.5	4	3.5	3.5	
269.25	104.60	52.25	11.50	6,500,000	33.75		11.5	9.5	7.5	6.5	6.5		13	15	11.5	11.5	10		10.5	10.5	7	7.5	8	
338.75	91.60	31.00	nil	160,000,000	21.03							26	19.5	17.5	34	27.5	29.5	10	10	9.5	9.5	11	12.5	
27.65	6.30	3.55	1.08	4,445,000,000	14.11	8	12	11	8.5	9	10	11	12.5	13.5	8.5	11	10.5	8.5	9.5	9.5	6.5	7.5	8	
17.50	4.90	1.50	1.00	1,000,000,000	8.37	-8.5	-9.5	-12	-9	-5.5	-5.5	6.5	2.5	1	2.5	3.5	4.5	0.5	-0.5	0.5	2.5	0.5	2.5	
5.30	1.45	0.35	0.09	50,000,000	72.86	6.5	6	7.5	8.5	5	-10	10	10	20.5	19.5	6.5	6.5	10.5	7	7.5	6	-7.5	-5.5	
11.40	2.84	0.84	1.06	1,365,000,000	28.06	8	7	7	7	7	7	9	8.5	7.5	9	13	13	7	7.5	7	8	10	10	
32.50	9.25	5.50	2.56	4,200,000,000	9.33	2	2	2	2	2	2	2	4.5	4	4	2.5	2.5	-4	-3.5	2	1.5	0.5	0.5	

**avg** 30.94  
**med** 19.64  
**trimmed** 24.30  
**max** 114.14  
**min** 7.53  
**std** 33.32



Forecast Revenue % Change						Income		Balance Sheet						Cash Flow	Fair Value	
2022	2023	2024	2025	2026	2027	Operating Income		Current Assets		PP & E Gross	Intang	Current Liabilities	Long Term Debt	curr long term debt	Depreciation & Amortization	Debt
VL	VL	VL	VL	VL	VL	M*	M*	M*	M*	M*	M*	M*	M*	M*	M*	10-K
2	1	1	2.5	1.5	1.5	28,251,000,000	46,209,000,000	<b>59,997,000,000</b>	353,668,000,000	179,016,000,000	<b>85,588,000,000</b>	174,081,000,000	9,189,000,000	#####	203,098,000,000	
7.5	7.5	3.5	5	11	10.5	18,541,000	129,047,000	<b>232,617,000</b>	1,866,935,000	158,060,000	<b>220,944,000</b>	448,978,000	25,486,000	110,506,000	481,620,000	
						2,541,803,000	4,427,251,000	<b>789,634,000</b>	13,705,443,000	20,469,505,000	<b>2,735,119,000</b>	25,866,673,000	917,313,000	1,787,152,000	26,950,358,000	
1.5	2	2	0.5	2	2	4,177,075,099	7,820,553,360	<b>4,899,604,743</b>	64,864,031,621	17,479,051,383	<b>7,203,952,569</b>	18,758,102,767		3,643,478,261	20,833,201,581	
	6	8.5	5	3.5	3.5	464,401,000	839,325,000	<b>500,953,000</b>	3,747,049,000	3,018,830,000	<b>269,075,000</b>	3,808,598,000	44,470,000	339,025,000	3,851,834,000	
12.5	10	11	7.5	9	10.5	10,855,000,000	20,630,000,000	<b>3,566,000,000</b>	68,563,000,000	85,586,000,000	<b>12,458,000,000</b>	88,564,000,000	3,266,000,000	9,345,000,000	99,641,000,000	
10	7.5	9	6.5	7.5	7.5	20,817,000,000	34,708,000,000	<b>24,807,000,000</b>	109,658,000,000	129,296,000,000	<b>29,348,000,000</b>	92,718,000,000	2,132,000,000	13,804,000,000	109,300,000,000	
-1	-3.5	-2.5	-0.5	-2	-0.5	4,285,000,000	8,424,000,000	<b>11,536,000,000</b>	40,166,000,000	22,134,000,000	<b>7,169,000,000</b>	27,428,000,000	1,939,000,000	4,019,000,000	29,568,000,000	
9.5	5	5	4.5	-5.5	-5.5	5,283,000	65,726,000	<b>166,367,000</b>	1,084,647,000	114,013,000	<b>67,290,000</b>	53,306,000	3,318,000	55,206,000	56,624,000	
5.5	5.5	7	4	5	5	2,129,600,000	4,855,200,000	<b>4,025,600,000</b>	34,244,000,000	18,118,400,000	<b>6,618,400,000</b>	14,340,000,000	2,341,600,000	2,572,800,000	17,807,200,000	
0.5	1.5	1.5	2	2.5	2.5	32,448,000,000	48,380,000,000	<b>36,728,000,000</b>	317,780,000,000	176,104,000,000	<b>47,160,000,000</b>	144,350,000,000	7,843,000,000	16,206,000,000	170,530,000,000	

1,009,347,105,621

74,744,167,261

682,117,837,581

## AVERAGE FOURTH QUARTER STOCK PRICE

WASHINGTON STATE DEPARTMENT OF REVENUE

2022 ASSESSMENT YEAR

TELECOMMUNICATIONS

								<b>12/31/2021</b>
								<b>Adj Close</b>
ATT	T							
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	24.72	24.83	24.57	24.6	24.11007	45021200		<b>24.11</b>
CenturyLink LUMN								
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	12.68	12.86	12.54	12.55	12.55	6001600		<b>12.55</b>
Comcast CMCSA								
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	50.79	51.29	50.29	50.33	50.08202	12345400		<b>50.08</b>
Verizon VZ								
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	52.2	52.31	51.88	51.96	51.34143	15911400		<b>51.34</b>
Telus TU								
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	23.38	23.61	23.38	23.57	23.57	893500		<b>23.57</b>
BCE BCE								
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	51.75	52.2	51.75	52.04	52.04	712800		<b>52.04</b>
Altice USA, In ATUS								
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	16.52	16.72	16.16	16.18	16.18	2823700		<b>16.18</b>
ATN International ATNI								
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	39.94	41.04	39.72	39.95	39.95	22600		<b>39.95</b>
CHTR								
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	655.76	660.45	650.65	651.97	651.97	789400		<b>651.97</b>
Cable One, In CABO								
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	1767.22	1784.37	1763.45	1763.45	1763.45	18000		<b>1763.45</b>
Shenandoah TSHEN								
Date	Open	High	Low	Close	Adj Close	Volume		
12/31/2021	25.76	26.24	25.36	25.5	25.5	287100		<b>25.50</b>

Source:

finance.yahoo.com

Historical Stock Quotes

02/08/2022

# IMPLIED PREMIUMS FOR US MARKET

Updated January 5, 2022

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

Year	Earnings Yield	Dividend Yield	S&P 500	Earnings*	Dividends*	Ends + Buybacks	Increase in Earnings	Increase in Divid.	T.Bill Rate	T.Bond Rate	Bond-Bill	Uncovered Growth	Premium	Net Growth	Expected Premium	Implied Premium	ERP/Riskfree
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%		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%		3.56%		0.92
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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		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%		4.31%		0.37
1984	10.07%	4.68%	167.24	16.84	7.83		26.69%	9.85%	8.85%	11.51%	1.66%	11.02%	5.11%		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%	3.84%		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%	3.58%		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%	3.99%		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%	3.77%		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%	3.51%		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%	3.89%		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%	3.48%		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%	3.55%		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%	3.17%		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%	3.55%		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%	3.29%		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%	3.20%		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%	2.73%		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%	2.26%		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%	2.05%		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%	2.87%		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%	3.62%	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%	4.73%	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%	4.74%	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%	3.65%	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%	5.22%	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%	6.12%	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%	4.59%	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%	6.92%	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%	4.64%	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%	6.09%	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%	8.34%	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%	7.30%	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%	4.99%	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%	5.48%	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%	5.16%	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%	4.50%	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%	4.75%	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%	5.55%	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%	2.03%	3.96%	5.20%	5.06%	2.71
2020	3.72%	1.51%	3756.07	139.76	56.70	127.78	-13.91%	-3.57%	0.09%	0.93%	0.84%	0.74%	1.65%	5.42%	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%	4.90%	2.81

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