

COST OF CAPITAL STUDY

YIELD CAPITALIZATION
2017 ASSESSMENT YEAR

APPENDIX C

WIRELESS

EQUITY RATE		8.75%			
CAPITAL ASSET PRICING MODEL			PAGE		
CAPM Ex Ante	8.25%		6		
DIVIDEND GROWTH MODELS					
Value Line, based on Dividends Growth	7.75%		7		
Value Line, based on Earnings Growth	9.50%		8		
Value Line, based on Return on Equity	8.00%		9		
	RANGE	7.75% - 9.5%			
DEBT RATE		5.00%	10		
SECURED DEBT (LEASE) RATE		4.00%	10		
MARKET CAPITAL STRUCTURE					
Equity	65%	x 8.75%	= 5.69%	3	
Debt	35%	x 5.00%	= 1.75%	3	
Marginal Tax Rate	38%	= (1-.038)	x 1.75%	<u>1.09%</u>	3
WEIGHTED AVERAGE COST OF CAPITAL		6.8%			

rounded

SUPPORT FOR GUIDELINE COMPANIES

WASHINGTON STATE DEPARTMENT OF REVENUE

2017 ASSESSMENT YEAR

WIRELESS

Capital Structure at Book Value

Company	Ticker	Beta	Fin'l Strength	Operting Margin	Trailing P/E	Div'd Yield	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
AT&T Inc	T	0.75	A++	16.8%	14.7	4.66%	123,208,520,000	49.9%	-	0.0%	123,509,000,000	50.1%	246,717,520,000
Verizon Communications	VZ	0.75	A++	22.5%	12.8	4.39%	16,306,924,000	13.1%	-	0.0%	108,379,000,000	86.9%	124,685,924,000
Sprint Corp	S	1.35	C++	28.5%	nmf	0.00%	19,138,401,600	39.5%	-	0.0%	29,268,000,000	60.5%	48,406,401,600
US Cellular	USM	1.05	B+	11.5%	nmf	0.00%	3,634,082,670	68.5%	-	0.0%	1,670,000,000	31.5%	5,304,082,670
T-Mobile	TMUS	1.00	B+	25.0%	57.6	0.00%	18,248,027,750	39.6%	20,000,000	0.0%	27,786,000,000	60.3%	46,054,027,750
Mean		0.98	B++	21%	28.4	1.81%	36,107,191,204	42.1%		0.0%	58,122,400,000	57.9%	
Weighted Mean					14.7		180,535,956,020	38.3%	20,000,000	0.00%	290,612,000,000	61.7%	471,167,956,020
Median		1.00				0.00%		39.6%		0.0%		60.3%	
Std Dev		0.25				2.48%		20.1%		0.0%		20.1%	
Coeff Var		0.25				137.03%		47.7%		2.236068		34.7%	
Max		1.35				4.66%		68.5%		0.0%		86.9%	
Min		0.75				0.00%		13.1%		0.0%		31.5%	
Harmonic Mean		0.93						30.94%				51.89%	

Say **1.00**

**SUPPORT FOR CAPITAL STRUCTURE
MARKET VALUE**

WASHINGTON STATE DEPARTMENT OF REVENUE
2017 ASSESSMENT YEAR
WIRELESS

Capital Structure at Market Value

Company	Ticker	Stock Price	Common Shares	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
AT&T Inc	T	42.04	6,142,000,000	258,209,680,000	66.5%	-	0.0%	129,857,700,000	33.5%	388,067,380,000
Verizon Communications	VZ	52.80	4,076,731,000	215,251,396,800	64.5%	-	0.0%	118,534,000,000	35.5%	333,785,396,800
Sprint Corp	S	8.42	3,987,167,000	33,571,946,140	53.4%	-	0.0%	29,268,000,000	46.6%	62,839,946,140
US Cellular	USM	43.72	84,849,000	3,709,598,280	69.0%	-	0.0%	1,670,000,000	31.0%	5,379,598,280
T-Mobile	TMUS	57.51	826,825,000	47,550,705,750	62.9%	20,000,000	0.0%	28,013,000,000	37.1%	75,583,705,750
			Mean		63.3%		0.0%		36.7%	
			Weighted Mean	558,293,326,970	64.5%	20,000,000	0.00%	307,342,700,000	35.5%	865,656,026,970
			Median		64.5%		0.00%		35.5%	1.000
			Harmonic Mean		62.8%		#NUM!		36.0%	
			Std Dev		5.9%		0.01%		5.9%	
			Coeff Var		9.4%		223.61%		16.2%	
			Max		69.0%		0.0%		46.6%	
			Min		53.4%		0.0%		31.0%	

Source:

Stock Price: Yahoo

Market Value Debt: Bond Analysis

Target

65%

0%

35%

SUPPORT FOR MARKET MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE

2017 ASSESSMENT YEAR

WIRELESS

Company	Ticker	Stock Price	Revenues	Multiple	Cash Flow	Multiple	Earnings	Multiple	Book Value	Multiple
AT&T Inc	T	42.04	26.68	1.6	7.07	5.9	2.84	14.8	20.06	2.1
Verizon Communications	VZ	52.80	30.90	1.7	5.80	9.1	3.87	13.6	4.00	13.2
Sprint Corp	S	8.42	8.35	1.0	1.65	5.1	(0.40)		4.80	1.75
US Cellular	USM	43.72	46.42	0.94	7.75	5.6	0.56	78.1	42.83	1.0
T-Mobile	TMUS	57.51	45.07	1.3	8.63	6.7	1.08	53.3	22.07	2.61
		Mean		1.3		6.5		39.9		4.1
		Median		1.3		5.9		34.0		2.1
		Harmonic Mean		1.2		6.2		23.2		2.0
		Max		1.7		9.1		78.1		13.2
		Min		0.94		5.1		13.6		1.02
		Std Dev		0.3		1.6		31.4		5.1
		Coefficient of Variation		0.3		0.2		0.8		1.2
		Harmonic Mean		1.2		6.2		23.2		2.0
		Percentile .25		1.0		5.6		14.5		1.8
		Percentile .75		1.6		6.7		59.5		2.6
		Say		1.50		7.00				2.50

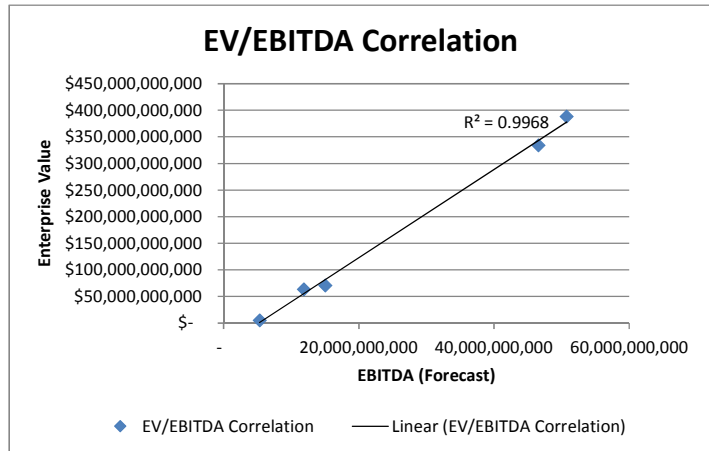
ENTERPRISE VALUE MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE

2017 ASSESSMENT YEAR

WIRELESS

Guideline Companies	Ticker	Enterprise Value	EBITDA	EV / EBITDA	One Year Cash Flow Rate	EBITDA	EV / EBITDA	Revenue	EV/Sales	Cash Flow	Debt Service	EV / CF
					Change VL							
			historic	historic	forecast	forecast	forecast	Forecast	Forecast	Forecast	Forecast	
AT&T Inc	T	\$ 388,067,380,000	50,194,000,000	7.73	1.1%	50,761,966,054	7.64	166,087,000,000	2.34	43,901,000,000	6,492,885,000	7.70
Verizon Communications	VZ	\$ 333,785,396,800	46,587,000,000	7.16	0.0%	46,587,000,000	7.16	131,474,574,750	2.54	23,490,000,000	5,926,700,000	11.35
Sprint Corp	S	\$ 62,839,946,140	10,298,000,000	6.10	15.2%	11,858,303,030	5.30	34,488,994,550	1.82	7,647,500,000	1,463,400,000	6.90
US Cellular	USM	\$ 4,539,598,280	5,363,943,000	0.85	-0.6%	5,329,336,916	0.85	3,920,023,800	1.16	646,800,000	83,500,000	6.22
T-Mobile	TMUS	\$ 70,388,705,750	12,845,000,000	5.48	17.0%	15,032,966,396	4.68	39,604,917,500	1.78	8,332,500,000	1,400,650,000	7.23
Mean							5.13		1.93			7.88
Median							5.30		1.82			7.23
Max							7.64					
Min							0.85					
Std Dev							2.69					
Coefficient of Variation							0.52					
Harmonic Mean							2.71					
Say							5.25		2.00			7.55



4.50 put in income direct excluding IPP
 5.25 put in income direct including IPP

Forecast EV/EBITDA By Rank

Guideline Companies	EV/EBITDA forecast	
US Cellular	0.85	3.61 Low Average
T-Mobile	4.68	
Sprint Corp	5.30	4.50 Say
Verizon Communications	7.16	5.13 Average
AT&T Inc	7.64	
		5.30 Median
		5.25 Say

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT CAPITAL ASSET PRICING MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE

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WIRELESS

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

Ke = Cost of Equity **8.25%**

	Rm =	rate of return	8.25%	
	Rf =	risk free rate	3.00%	
	Rp =	risk premium	5.25%	
	B =	Beta	1.00	page 7

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Rp = Risk Premium **5.25%**

Shannon Pratt and Roger Grabowski	3.5 - 6%	
Cost of Capital, Applications and Examples, Third Edition, 2008, Page 113		
Dr. Aswath Damodaran	5.69%	chart page 16
http://pages.stern.nyu.edu/~adamodar/ 2016 Implied Premium	5.14%	adjusted for Rf
John Graham & Campbell Harvey	5.70%	10 year expected rea
Duke CFO magazine Global Business Outlook survey - U.S.	2.23%	Rf rate used in
4th Qtr 2016	4.93%	adjusted for Rf

to above

Rf = Risk Free Rate **3.00%**

to above

US Department of the Treasury

Long Term (20 years) US Treasury Bond Yield	2.79%
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as of 12-30-16

Value Line Investment Survey, Selected Yields January 6, 2017, page 3197

as of 12-28-16

US Treasury Securities year end data	
5 year	2.00%
10 year	2.51%
30 year	3.09%
30 year Zero	3.17%

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

January 4, 2017 as of 12-30-16

Treasury Constant Maturities	
5 year	1.93%
10 year	2.45%
20 year	2.79%
30 year	3.06%
20 year TIPS	0.82%
30 year TIPS	0.99%

TIPS inflation indication

Inflation **2.00%**

to appraisal template

Value Line Investment Survey, Economic Series January 6, 2017, page 1500

Consumer Price Index Annual Rate of Change 2019-2021	2.50%
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Federal Reserve Bank of Philadelphia

The Livingston Survey, December 9, 2016	Table 3
Inflation median (measured by the CPI) over next 10 years	2.30%
https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey	

Gross Domestic Product (GDP) **3.80%**

Federal Reserve Projected Long Run Real GDP Growth

Median Projection Value From Dec 14, 2016 Report	1.80%
http://www.federalreserve.gov/monetarypolicy/fomccalendars.htm	

Congressional Budget Office Real GDP Economic Projections

The Budget and Economic Outlook 2017-2027	Table C-1, pg 126
Average Percentage Change From Year To Year	2017-2021 1.86%
http://www.cbo.gov/publication/52370	2022-2027 1.90%

Federal Reserve Bank of Philadelphia

The Livingston Survey, December 9, 2016	pg 4
Average Annual Real GDP Growth Rate for Next Ten Years	2.20%
https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey	

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE
2017 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	Ke Multistage
AT&T Inc	T	42.04	1.96	4.66%	4.50%	9.16%	4.42%	9.08%	3.80%	8.46%	8.60%
Verizon Communications	VZ	52.80	2.32	4.39%	2.00%	6.39%	2.10%	6.50%	2.10%	6.50%	6.76%
Sprint Corp	S	8.42	0.00								
US Cellular	USM	43.72	0.00								
T-Mobile	TMUS	57.51	0.00								
			Mean	4.53%		7.78%				7.48%	7.68%
			Median	4.53%		7.78%				7.48%	7.68%
			Harmonic Mean	4.52%		7.53%				7.35%	7.57%
			Std Dev	0.19%		1.96%				1.39%	1.30%
			Coeff Var	4.19%		25.17%				18.58%	16.94%
			Max	4.66%		9.16%				8.46%	8.60%
			Min	4.39%		6.39%				6.50%	6.76%

Source: Value Line Projections 13-15 to 19-21

8.00%

7.50%

7.75%

Say

7.75%

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

WASHINGTON STATE DEPARTMENT OF REVENUE
2017 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	Ke Multistage *
AT&T Inc	T	42.04	2.95	7.02%	5.50%	12.52%	6.31%	13.33%	3.80%	10.82%	8.07%
Verizon Communications	VZ	52.80	3.90	7.39%	3.00%	10.39%	3.23%	#REF!	3.23%	10.62%	8.54%
Sprint Corp	S	8.42	-0.25		0.00%				3.80%		nmf
US Cellular	USM	43.72	0.30	0.69%	2.00%				3.80%	4.49%	nmf
T-Mobile	TMUS	57.51	1.85	3.22%	0.00%	3.22%	0.00%	3.22%	0.00%	3.22%	2.73%
Mean						8.71%				7.29%	6.45%
Median						10.39%				7.55%	8.07%
Harmonic Mean						6.16%				5.55%	4.94%
Std Dev						4.87%				4.00%	3.23%
Coeff Var						55.96%				54.90%	50.06%
Max						12.52%				10.82%	8.54%
Min						3.22%				3.22%	2.73%

Source: Value Line Projections 13-15 to 19-21

10.50%

8.00%

Say

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

WASHINGTON STATE DEPARTMENT OF REVENUE
2017 ASSESSMENT YEAR
WIRELESS

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)
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	42.04	1.96	4.66%	34.0%	7.02%	2.386%	7.05%	2.95	9.40%	
Verizon Communications	VZ	52.80	2.32	4.39%	32.0%	7.39%	2.364%	6.76%	3.90	9.75%	
Sprint Corp	S	8.42	0.00		100.0%	-2.97%	-2.969%		(0.25)		
US Cellular	USM	43.72	0.00		100.0%	0.69%	0.686%		0.30		
T-Mobile	TMUS	57.51	0.00		97.0%	3.22%	3.120%		1.85	6.34%	
								Mean	6.90%		8.50%
								Median	6.90%		9.40%
								Harmonic Mean	6.90%		8.18%
								Std Dev	0.21%		1.88%
								Coeff Var	2.98%		22.11%
								Max	7.05%		9.75%
								Min	6.76%		6.34%
									7.00%		9.00%

Say **8.00%**
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SUPPORT FOR DEBT RATING AND DEBT YIELD RATE

WASHINGTON STATE DEPARTMENT OF REVENUE

2017 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	Baa1	BBB+	3.99%	4.07%	10	10	Aaa1	AAA+	1
Verizon Communications	VZ	Baa1	BBB+	3.07%	3.57%	10	10	Aaa2	AAA	2
Sprint Corp	S	Caa1	B	4.98%	5.42%	19	17	Aaa3	AAA-	3
US Cellular	USM		BB	6.70%	6.81%		14	Aa1	AA+	4
T-Mobile	TMUS	Ba3	BB			15	14	Aa2	AA	5
#REF!	#REF!		BBB+				10			
#REF!	#REF!		BBB-				12			
#REF!	#REF!	Baa1	BBB+	#REF!	#REF!	10	10			
Overall Average Debt Rating		Baa3	Baa3	4.69%		12.8	12.1	Aa3	AA-	6

bond analysis, A-BBB bonds

4.07%

All issues 20+ year maturities

Guideline Companies, All Ratings	3.66%	5.00%
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bond analysis page 12

Mergent's Bond Record January 2017, page 201

Corporate	Aaa	Aa	A	Baa
October	3.51%	3.61%	3.78%	4.38%
November	3.86%	3.94%	4.11%	4.71%
December	4.06%	4.12%	4.28%	4.83%
4th Qtr Average	3.81%	3.89%	4.06%	4.64%
Public Utilities	Aaa	Aa	A	Baa
October		3.59%	3.77%	4.34%
November		3.91%	4.08%	4.64%
December		4.11%	4.27%	4.79%
4th Qtr Average		3.87%	4.04%	4.59%
Industrials	Aaa	Aa	A	Baa
October	3.51%	3.63%	3.79%	4.40%
November	3.86%	3.97%	4.14%	4.77%
December	4.06%	4.13%	4.29%	4.85%
4th Qtr Average	3.81%	3.91%	4.07%	4.67%

Debt Yield Rate 5.00%

Cost of Secured Debt (Operating Lease) Rate 4.00%

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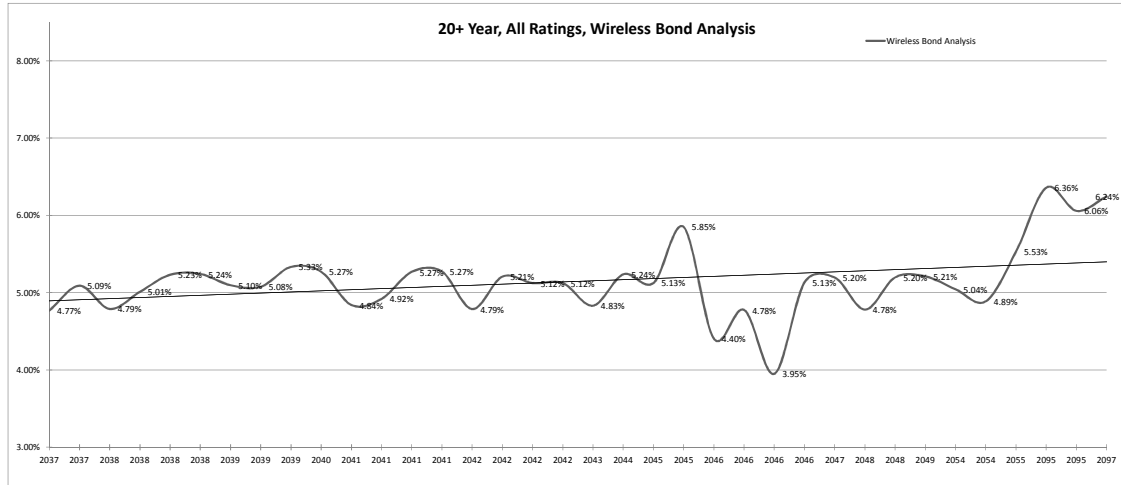
A1	A+	7
A2	A	8
A3	A-	9
Baa1	BBB+	10
Baa2	BBB	11
Baa3	BBB-	12
Ba1	BB+	13
Ba2	BB	14
Ba3	BB-	15
B1	B+	16
B2	B	17
B3	B-	18
Caa1	CCC+	19
Caa2	CCC	20

Wireless Bond Analysis

Company	type	Call	coupon	maturity	Price 12/31/16	Issued / Book	current yield	yield to maturity	Weighted A Rating	Mkt Val	Mkt : Book	Embedded f	Debt Service	WAYTM	WAYTM	S&P YTM	
AT&T Inc	Global Notes		1.600	2017	100.02	1,000,000,000	1.600%	1.64%	0.01% BBB-	\$ 1,000,200,000	100.02%		16,000,000	0.0006102	0.0141%	0.000	
AT&T Inc	Global Notes		1.400	2017	99.82	2,000,000,000	1.403%	1.04%	0.01% BBB-	\$ 1,996,400,000	99.82%		28,000,000	0.0007731	0.0179%	1.57	
AT&T Inc	Global Notes		1.700	2017	100.13	1,150,000,000	1.698%	1.96%	0.01% BBB-	\$ 1,151,495,000	100.13%		19,550,000	0.0008391	0.0194%	0.00	
AT&T Inc	Fixed Rate		2.375	2018	100.88	1,600,000,000	2.354%	0.61%	0.00% BBB-	\$ 1,614,080,000	100.88%		38,000,000	0.0003813	0.0063%	1.93	
AT&T Inc	Global Note <100		5.500	2018	103.98	2,500,000,000	5.290%	-2.14%	0.00% BBB-	\$ 2,597,000,000	103.98%		137,500,000	0.00019892	-0.0498%	1.56	
AT&T Inc	Global Note <100		5.600	2018	105.04	1,000,000,000	5.331%	-1.41%	-0.02% BBB-	\$ 1,050,400,000	105.04%		56,000,000	0.00015492	-0.0358%	0.52	
AT&T Inc	Global Notes		2.300	2019	100.23	1,850,000,000	2.292%	2.07%	0.01% BBB-	\$ 1,856,105,000	100.23%		10,000,000	0.00014277	-0.0300%	2.12	
AT&T Inc	Global Notes		5.875	2019	109.34	942,000,000	5.378%	-0.26%	0.00% BBB-	\$ 1,029,040,800	109.24%		55,342,500	0.00009027	-0.0021%	2.63	
AT&T Inc	Global Notes		5.800	2019	107.76	2,500,000,000	5.350%	0.77%	0.00% BBB-	\$ 2,450,300,000	107.76%		130,500,000	0.00006409	-0.0149%	1.95	
AT&T Inc	Nt Fltg Rate		1.767	2020	100.54	750,000,000	1.758%	1.55%	0.00% BBB-	\$ 754,050,000	100.54%		13,252,500	0.0004311	0.0100%	0.00	
AT&T Inc	Global Notes		5.200	2020	107.44	1,154,000,000	4.840%	2.11%	0.01% BBB-	\$ 1,239,857,600	107.44%		60,008,000	0.00090973	0.0210%	2.59	
AT&T Inc	Global Notes		2.450	2020	99.19	3,000,000,000	2.470%	0.03%	0.00% BBB-	\$ 2,975,700,000	99.19%		73,500,000	0.00031139	0.00719%	2.66	
AT&T Inc	Global Notes		2.800	2021	99.10	2,000,000,000	2.825%	3.08%	0.02% BBB-	\$ 1,982,000,000	99.10%		56,000,000	0.00022892	0.0528%	3.05	
AT&T Inc	Global Notes		4.600	2021	105.64	928,000,000	4.354%	2.88%	0.01% BBB-	\$ 980,339,200	105.64%		42,688,000	0.00009655	0.0221%	3.07	
AT&T Inc	Global Notes		5.000	2021	107.42	1,430,000,000	4.655%	2.75%	0.01% BBB-	\$ 1,536,106,000	107.42%		71,500,000	0.00014617	0.0338%	3	
AT&T Inc	Global Notes		3.875	2021	103.10	1,500,000,000	3.758%	2.93%	0.02% BBB-	\$ 1,546,500,000	103.10%		58,125,000	0.00016352	0.0378%	3.2	
AT&T Inc	Fix Rt Nt		4.450	2021	105.62	1,250,000,000	4.213%	2.74%	0.01% BBB-	\$ 1,320,250,000	105.62%		56,625,000	0.00012761	0.0295%	2.94	
AT&T Inc	Global Notes		3.800	2022	102.35	1,415,000,000	3.713%	3.22%	0.02% BBB-	\$ 1,446,252,500	102.35%		53,770,000	0.00017007	0.0390%	3.28	
AT&T Inc	0 cpm sr note		2.000	2022	79.69	1,030,000,000	0.000%	5.17%	0.02% BBB-	\$ 820,807,000	79.69%		82,000,000	0.00019828	0.0458%	3.85	
AT&T Inc	Global Notes		2.625	2022	95.70	1,500,000,000	2.743%	3.68%	0.02% BBB-	\$ 1,435,500,000	95.70%		39,375,000	0.00020533	0.0474%	3.43	
AT&T Inc	Fix Rt Sr Note		3.000	2022	97.99	2,750,000,000	3.062%	3.49%	0.04% BBB-	\$ 2,694,725,000	97.99%		82,500,000	0.00035711	0.0825%	3.37	
AT&T Inc	Global Notes		3.000	2022	98.96	1,850,000,000	3.035%	3.28%	0.02% BBB-	\$ 1,828,910,000	98.96%		55,500,000	0.00022552	0.0521%	3.24	
AT&T Inc	Global Notes		3.600	2023	100.60	2,600,000,000	3.579%	3.48%	0.03% BBB-	\$ 2,615,600,000	100.60%		93,600,000	0.00033645	0.0777%	3.49	
AT&T Inc	Fix Rt Nt		4.450	2024	103.97	1,208,000,000	4.280%	3.75%	0.02% BBB-	\$ 1,255,957,600	103.97%		53,756,000	0.00016855	0.0389%	3.79	
AT&T Inc	Fix Rt Nt		3.900	2024	100.85	1,000,000,000	3.867%	3.75%	0.01% BBB-	\$ 1,008,500,000	100.85%		39,000,000	0.00013952	0.0322%	3.75	
AT&T Inc	Fix Rt Sr Nt		3.950	2025	99.88	1,161,000,000	3.955%	3.97%	0.02% BBB-	\$ 1,159,606,800	99.88%		45,859,500	0.00017143	0.0396%	3.98	
AT&T Inc	Fix Rt Sr Nt		3.900	2025	99.88	1,161,000,000	3.955%	3.97%	0.02% BBB-	\$ 1,159,606,800	99.88%		45,859,500	0.00017143	0.0396%	3.98	
AT&T Corp	Fix Rt Sr Nt		4.125	2026	100.93	2,650,000,000	4.087%	3.99%	0.04% BBB-	\$ 2,674,645,000	100.93%		109,312,500	0.00039375	0.0909%	4	
AT&T Corp	Fix Rt Nt <100		6.500	2029	111.52	8,000,000,000	5.829%	5.15%	0.15% BBB-	\$ 8,921,600,000	111.52%		520,000,000	0.00153215	0.1553%	5.2	
AT&T Corp	sr notes <100		8.250	2031	138.44	2,750,000,000	5.959%	4.41%	0.05% BBB-	\$ 3,807,100,000	138.44%		226,875,000	0.0045126	0.1042%	4.64	
AT&T Corp	sr notes <100		8.250	2031	144.80	2,750,000,000	5.698%	3.91%	0.04% BBB-	\$ 3,982,000,000	144.80%		226,875,000	0.00040051	0.0925%	4.37	
AT&T Wireless	sr notes		8.750	2031	114.27	2,500,000,000	6.142%	4.49%	0.04% BBB-	\$ 2,945,750,000	114.27%		218,750,000	0.0041738	0.1091%	4.4	
AT&T Inc	sr notes		4.500	2035	96.02	2,500,000,000	4.687%	4.84%	0.05% BBB-	\$ 2,400,500,000	96.02%		112,500,000	0.00045039	0.1040%	4.83	
AT&T Inc	Fix Rt Nt <100		6.800	2036	121.00	1,500,000,000	5.620%	5.03%	0.03% BBB-	\$ 1,815,000,000	121.00%		102,000,000	0.00028068	0.0648%	5.05	
AT&T Inc	Global Note <100		6.500	2037	117.18	2,000,000,000	5.547%	5.09%	0.04% BBB-	\$ 2,343,600,000	117.18%		130,000,000	0.00037874	0.0875%	5.15	
AT&T Inc	Global Note <100		6.300	2038	113.24	2,750,000,000	5.563%	5.23%	0.05% BBB-	\$ 3,114,100,000	113.24%		173,250,000	0.00053527	0.1238%	5.25	
AT&T Inc	Global Note <100		6.400	2038	114.34	1,250,000,000	5.597%	5.24%	0.02% BBB-	\$ 1,429,250,000	114.34%		80,000,000	0.00024378	0.0563%	5.25	
AT&T Inc	Global Notes		6.550	2039	115.34	2,250,000,000	5.679%	5.33%	0.04% BBB-	\$ 2,595,150,000	115.34%		147,375,000	0.00044649	0.1031%	5.34	
AT&T Inc	Global Notes		6.000	2040	109.48	1,234,000,000	5.480%	5.27%	0.02% BBB-	\$ 1,350,983,200	109.48%		74,040,000	0.00024198	0.0559%	5.29	
AT&T Inc	Fix Rt Sr Nt		6.375	2041	114.71	984,000,000	5.557%	5.27%	0.02% BBB-	\$ 1,128,746,400	114.71%		62,730,000	0.00019289	0.0445%	5.27	
AT&T Inc	Fix Rt Sr Nt		6.414	2041	107.69	2,000,000,000	5.252%	5.47%	0.04% BBB-	\$ 2,072,850,000	107.69%		111,000,000	0.00039621	0.0901%	5.27	
AT&T Inc	Fix Rt Sr Nt		5.150	2042	99.20	1,209,000,000	5.192%	5.12%	0.02% BBB-	\$ 1,199,328,000	99.20%		62,263,500	0.00023428	0.0541%	5.2	
AT&T Inc	Fix Rt Nt		4.300	2042	88.65	1,834,000,000	4.851%	5.12%	0.03% BBB-	\$ 1,625,814,000	88.65%		78,862,000	0.00034960	0.0807%	5.1	
AT&T Inc	FR partially		4.300	2042	88.65	1,956,000,000	4.851%	5.12%	0.04% BBB-	\$ 1,733,994,000	88.65%		84,108,000	0.00037286	0.0861%	4.1	
AT&T Inc	Fix Rt Nt		4.000	2044	95.12	2,000,000,000	5.12%	5.12%	0.00% BBB-	\$ 2,000,000,000	95.12%		98,000,000	0.00039874	0.0907%	5.23	
AT&T Inc	Fix Rt Nt		4.350	2045	88.69	3,044,000,000	4.90%	5.13%	0.06% BBB-	\$ 2,699,723,600	88.69%		132,414,000	0.00058051	0.1340%	5.11	
AT&T Inc	Fix Rt Nt		4.750	2046	94.32	3,500,000,000	5.04%	5.13%	0.07% BBB-	\$ 3,301,200,000	94.32%		166,250,000	0.00066848	0.1544%	5.12	
AT&T Inc	Fix Rt Sr Nt		5.650	2047	106.78	1,500,000,000	5.29%	5.20%	0.03% BBB-	\$ 1,601,700,000	106.78%		84,750,000	0.00028996	0.0670%	5.2	
AT&T Inc	FR Global Notes		5.500	2048	89.43	4,500,000,000	5.03%	5.20%	0.09% BBB-	\$ 4,024,350,000	89.43%		202,500,000	0.00087029	0.2010%	5.2	
AT&T Inc	FR Global Notes		4.500	2049	93.91	2,500,000,000	4.650%	5.05%	0.05% BBB-	\$ 2,247,250,000	93.91%		113,750,000	0.00049458	0.1149%	5.12	
Bell South Capital Funding	deb	NC	6.040	2026	106.19	300,000,000	5.69%	5.12%	0.01% BBB-	\$ 315,870,000	106.19%		18,120,000	0.00005718	0.0132%	5.22	
Bell South Capital Funding	deb	NC	7.875	2030	125.19	1,000,000,000	6.29%	5.10%	0.02% BBB-	\$ 1,251,900,000	125.19%		78,750,000	0.00018975	0.0438%	5.17	
Bell South Capital Funding	deb	Z100	7.120	2039	113.90	500,000,000	6.25%	6.24%	0.01% BBB-	\$ 569,500,000	113.90%		36,600,000	0.00011617	0.0268%	6.25	
Bell South Corp	Gl. SR Note		6.875	2031	117.60	750,000,000	5.85%	5.05%	0.01% BBB-	\$ 882,000,000	117.60%		51,562,500	0.00014079	0.0325%	5.16	
Bell South Corp	Global Note		6.500	2100	103.84	700,000,000	6.49%	5.67%	0.01% BBB-	\$ 724,220,000	103.84%		42,000,000	0.00014788	0.0347%	5.69	
Bell South Corp	Global Note		6.550	2034	109.38	700,000,000	5.99%	5.66%	0.01% BBB-	\$ 765,660,000	109.38%		45,850,000	0.00014741	0.0340%	5.71	
Bell South	Telecommunications	deb	NC	7.000	2025	119.67	300,000,000	5.85%	3.92%	0.00% BBB-	\$ 359,010,000	119.67%		21,000,000	0.00004377	0.0101%	4.42
Bell South	Telecommunications	deb	NC	7.000	2025	118.87	500,000,000	5.89%	4.03%	0.01% NR	\$ 594,350,000	118.87%		35,000,000	0.00007504	0.0173%	4.42
Bell South																	

Verizon Communications	Fix Rf Nt		5,150	2023	110.57	11,000,000,000	4.66%	3.03%	0.12%	BBB+	\$	12,162,700,000	110.57%		566,500,000	0.00124181	0.2658%	3.48
Verizon Communications	Fix Rf Nt		3,500	2024	99.67	2,500,000,000	3.51%	3.56%	0.03%	BBB-	\$	2,491,750,000	99.67%		87,500,000	0.00033091	0.0708%	3.59
Verizon Communications	Fix Rf Nt		4,150	2024	104.49	1,250,000,000	3.97%	3.37%	0.02%	BBB+	\$	1,306,125,000	104.49%		51,875,000	0.00015669	0.0335%	3.46
Verizon Communications	Fix Rf Nt		6,400	2033	120.65	6,000,000,000	5.30%	4.52%	0.10%	BBB-	\$	7,239,000,000	120.65%		384,000,000	0.00100863	0.2159%	4.66
Verizon Communications	Fix Rf Nt		4,400	2034	98.69	2,500,000,000	4.46%	4.51%	0.04%	BBB+	\$	2,467,250,000	98.69%		110,000,000	0.00041987	0.0899%	4.56
Verizon Communications	Fix Rf Nt		5,050	2034	105.30	1,250,000,000	4.80%	4.59%	0.02%	BBB-	\$	1,316,250,000	105.30%		63,125,000	0.00021323	0.0456%	4.62
Verizon Communications	Notes		4,272	2036	105.01	2,869,000,000	4.07%	3.89%	0.04%	BBB-	\$	3,012,736,900	105.01%		122,563,680	0.00041491	0.0868%	3.9
Verizon Communications	Fix Rf Nt		4,272	2036	95.71	2,867,000,000	4.46%	4.62%	0.05%	NR	\$	2,744,005,700	95.71%		122,478,240	0.00049300	0.1055%	4.64
Verizon Communications	Notes	z100	6,250	2037	118.56	750,000,000	5.27%	4.77%	0.01%	BBB-	\$	889,200,000	118.56%		46,875,000	0.00013302	0.0285%	4.81
Verizon Communications	Notes	z100	6,400	2038	120.74	1,750,000,000	5.30%	4.79%	0.03%	BBB-	\$	2,112,950,000	120.74%		112,000,000	0.00031182	0.0668%	4.83
Verizon Communications	Notes		6,900	2038	123.86	1,250,000,000	5.57%	5.01%	0.02%	BBB-	\$	1,548,250,000	123.86%		86,250,000	0.00023304	0.0499%	5.06
Verizon Communications	Notes		7,350	2039	129.03	1,000,000,000	5.70%	5.10%	0.02%	BBB-	\$	1,290,300,000	129.03%		73,500,000	0.00018961	0.0406%	5.15
Verizon Communications	Notes		8,950	2039	149.99	1,250,000,000	5.97%	5.08%	0.02%	BBB-	\$	1,874,875,000	149.99%		111,875,000	0.00029608	0.0505%	5.15
Verizon Communications	Notes		4,750	2041	98.74	750,000,000	4.81%	4.84%	0.01%	BBB-	\$	740,550,000	98.74%		35,625,000	0.00013508	0.0289%	4.87
Verizon Communications	Notes		6,000	2041	114.85	1,000,000,000	5.22%	4.92%	0.02%	BBB-	\$	1,148,500,000	114.85%		60,000,000	0.00018304	0.0392%	4.95
Verizon Communications	Notes		3,850	2042	86.65	1,250,000,000	4.44%	4.79%	0.02%	BBB-	\$	1,083,125,000	86.65%		48,125,000	0.00022652	0.0477%	4.83
Verizon Communications	Fix Rf Nt		6,550	2043	124.89	15,000,000,000	5.24%	4.83%	0.27%	BBB-	\$	18,733,500,000	124.89%		982,500,000	0.00269625	0.5772%	4.9
Verizon Communications	Fix Rf Nt		4,862	2046	101.32	4,499,000,000	4.80%	4.78%	0.08%	NR	\$	4,558,386,800	101.32%		218,741,380	0.00079945	0.1711%	4.81
Verizon Communications	Notes		4,862	2046	115.43	4,500,000,000	4.21%	3.95%	0.07%	NR	\$	5,194,350,000	115.43%		218,790,000	0.00066134	0.1416%	3.98
Verizon Communications	Notes		4,522	2048	95.89	5,000,000,000	4.72%	4.78%	0.09%	BBB-	\$	4,794,500,000	95.89%		226,100,000	0.00088932	0.1904%	4.81
Verizon Communications	Fix Rf St Nt		5,010	2054	99.47	5,474,000,000	5.04%	5.04%	0.10%	NR	\$	5,444,987,800	99.47%		274,247,400	0.00102693	0.2198%	5.07
Verizon Communications	Fix Rf Nt		5,010	2054	102.05	5,500,000,000	4.91%	4.89%	0.10%	NR	\$	5,612,750,000	102.05%		275,550,000	0.00100029	0.2141%	4.89
Verizon Communications	Notes		4,672	2055	86.51	5,500,000,000	5.40%	5.53%	0.11%	BBB-	\$	4,758,050,000	86.51%		256,960,000	0.00113208	0.2423%	0
Verizon Global Funding	DEB		7,750	2030	135.26	5,000,000,000	5.73%	4.09%	0.08%	BBB-	\$	6,763,000,000	135.26%		387,500,000	0.00076095	0.1629%	4.38
Verizon Global Funding	Notes	Z100	7,750	2032	130.71	400,000,000	5.93%	4.77%	0.01%	BBB-	\$	522,840,000	130.71%		31,000,000	0.00007096	0.0152%	5
Verizon Global Funding	Notes	Z100	5,850	2035	114.20	1,500,000,000	5.12%	4.65%	0.03%	BBB-	\$	1,715,000,000	114.20%		87,750,000	0.00025931	0.0555%	4.78
		47	4700	sum	5,129.51	125,561,000,000	Percent of book	109.14%	1.44%			137,184,287,700	109.26%	5.12%	6,428,519,450		3.07%	
				Total		268,789,000,000					Total \$	288,560,353,900	107.36%	5.36%	\$ 14,394,681,450	0.03662334	4.6855%	4.072
															This includes short term. For 20+ year maturities see below			
															Embedded debt rate	5.3554%		
															Weighted average yield to maturity	3.6623%		
															Debt service / Market value	4.9884%		

Source: Standard & Poor's Bond Guide, January 2017, 2016 Yr End Prices



01/31/2017

Wireless Bond Analysis

Company	type	Call	coupon	maturity	Price 12/16	Issued / Book	current yield	yield to maturity	Weighted Aver Rating	Mkt Val	Mkt / Book	Embedded Rab Debt Service	WAYTM	WAYTM	S&P YTM
Verizon Communications	Notes	≥100	6.250	2037	118.56	750,000,000	5.27%	4.77%	0.01% BBB-	\$ 889,200,000	118.56%	46,875,000	0.00013302		0.0285%
AT&T Inc	Global Note	≥100	6.500	2037	117.18	2,000,000,000	5.55%	5.09%	0.04% BBB-	\$ 2,343,600,000	117.18%	112,000,000	0.00031182		0.0668%
Verizon Communications	Notes	≥100	6.400	2038	120.74	1,750,000,000	5.301%	4.79%	0.03% BBB+	\$ 2,112,950,000	120.74%	86,250,000	0.00023304		0.0499%
Verizon Communications	Notes	≥100	6.900	2038	123.86	1,250,000,000	5.57%	5.01%	0.02% BBB+	\$ 1,548,250,000	123.86%	73,500,000	0.00018961		0.0406%
AT&T Inc	Global Note	≥100	6.300	2038	113.24	2,750,000,000	5.56%	5.23%	0.05% BBB-	\$ 3,114,100,000	113.24%	111,875,000	0.00023608		0.0505%
AT&T Inc	Global Note	≥100	6.400	2038	114.04	1,250,000,000	5.60%	5.24%	0.02% BBB-	\$ 1,429,250,000	114.04%	35,625,000	0.00013508		0.0289%
Verizon Communications	Notes	≥100	7.350	2039	129.03	1,000,000,000	5.70%	5.10%	0.02% BBB-	\$ 1,290,300,000	129.03%	60,000,000	0.00018304		0.0392%
Verizon Communications	Notes	≥100	8.950	2039	149.99	1,250,000,000	5.967%	5.08%	0.02% BBB-	\$ 1,874,875,000	149.99%	48,125,000	0.0002262		0.0477%
AT&T Inc	Global Notes	≥100	6.550	2039	115.34	2,250,000,000	5.68%	5.33%	0.04% BBB-	\$ 2,595,150,000	115.34%	982,500,000	0.00269625		0.5772%
AT&T Inc	Global Notes	≥100	6.000	2040	109.48	1,234,000,000	5.48%	5.27%	0.02% BBB-	\$ 1,350,983,200	109.48%	218,741,380	0.00079945		0.1711%
Verizon Communications	Notes	≥100	4.750	2041	98.74	750,000,000	4.811%	4.84%	0.01% BBB-	\$ 740,550,000	98.74%	218,790,000	0.00066134		0.1416%
Verizon Communications	Notes	≥100	6.000	2041	114.85	1,000,000,000	5.22%	4.92%	0.02% BBB-	\$ 1,148,500,000	114.85%	226,100,000	0.00088932		0.1904%
AT&T Inc	Fix Rt Sr Nt		6.375	2041	114.71	984,000,000	5.56%	5.27%	0.02% BBB-	\$ 1,128,746,400	114.71%	274,247,400	0.00102683		0.2198%
AT&T Inc	Fix Rt Nt		5.550	2041	103.69	2,000,000,000	5.35%	5.27%	0.04% BBB-	\$ 2,073,800,000	103.69%	275,550,000	0.00100029		0.2141%
Verizon Communications	Notes	≥100	3.850	2042	86.65	1,250,000,000	4.44%	4.79%	0.02% BBB-	\$ 1,083,125,000	86.65%	258,960,000	0.00113208		0.2423%
AT&T Inc	Fix Rt Sr Nt		5.150	2042	99.20	1,209,000,000	5.19%	5.21%	0.02% BBB-	\$ 1,199,328,000	99.20%	130,000,000	0.00037874		0.0875%
AT&T Inc	Fix Rt Nt		4.300	2042	88.65	1,834,000,000	4.85%	5.12%	0.03% BBB-	\$ 1,625,841,000	88.65%	173,250,000	0.00053527		0.1236%
AT&T Inc	FR partially		4.300	2042	88.65	1,956,000,000	4.85%	5.12%	0.04% BBB-	\$ 1,733,994,000	88.65%	80,000,000	0.00024378		0.0563%
Verizon Communications	Fix Rt Nt		6.550	2043	124.89	15,000,000,000	5.245%	4.83%	0.27% BBB-	\$ 18,733,500,000	124.89%	147,375,000	0.00044849		0.1031%
AT&T Inc	Fix Rt Nt		4.800	2044	93.90	2,000,000,000	5.12%	5.24%	0.04% BBB-	\$ 1,878,000,000	93.90%	74,040,000	0.00024198		0.0559%
AT&T Inc	Fix Rt Nt		4.350	2045	88.69	3,044,000,000	4.90%	5.13%	0.06% BBB-	\$ 2,699,723,600	88.69%	62,730,000	0.00019289		0.0445%
Bell South															
Telecommunications	deb	NC	5.850	2045	100.01	300,000,000	5.85%	5.85%	0.01% BBB-	\$ 300,030,000	100.01%	111,000,000	0.00039231		0.0906%
Telus	Fix Rt Nt		4.400	2046	99.93	500,000,000	4.40%	4.40%	0.01% BBB-	\$ 499,650,000	99.93%	22,000,000	0.00001933		4.40%
Verizon Communications	Fix Rt Nt		4.862	2046	101.32	4,499,000,000	4.80%	4.78%	0.08% NR	\$ 4,558,386,800	101.32%	62,263,500	0.00023428		0.0541%
Verizon Communications	Notes	≥100	4.862	2046	115.43	4,500,000,000	4.21%	3.95%	0.07% NR	\$ 5,194,350,000	115.43%	78,862,000	0.00034960		0.0807%
AT&T Inc	Fix Rt Nt		4.750	2046	94.32	3,500,000,000	5.04%	5.13%	0.07% BBB-	\$ 3,301,200,000	94.32%	84,108,000	0.00037286		0.0861%
AT&T Inc	Fix Rt Sr Nt		5.650	2047	106.78	1,500,000,000	5.29%	5.20%	0.03% BBB-	\$ 1,601,700,000	106.78%	96,000,000	0.00038974		0.0900%
Verizon Communications	Notes	≥100	4.522	2048	95.89	5,000,000,000	4.716%	4.78%	0.09% BBB-	\$ 4,794,500,000	95.89%	132,414,000	0.00058051		0.1340%
AT&T Inc	FR Global Notes		4.500	2048	89.43	4,500,000,000	5.03%	5.20%	0.09% BBB-	\$ 4,024,350,000	89.43%	166,250,000	0.00066848		0.1544%
AT&T Inc	FR Global Notes		4.550	2049	89.89	2,500,000,000	5.06%	5.21%	0.05% BBB-	\$ 2,247,250,000	89.89%	84,750,000	0.00028996		0.0670%
Verizon Communications	Fix Rt Sr Nt		5.010	2054	99.47	5,474,000,000	5.037%	5.04%	0.10% NR	\$ 5,444,987,800	99.47%	202,500,000	0.00087029		0.2010%
Verizon Communications	Fix Rt Nt		5.010	2054	102.05	5,500,000,000	4.91%	4.89%	0.10% NR	\$ 5,612,750,000	102.05%	113,750,000	0.00048458		0.1119%
Verizon Communications	Notes	≥100	4.672	2055	86.51	5,500,000,000	5.40%	5.53%	0.11% BBB-	\$ 4,758,050,000	86.51%	35,600,000	0.00011617		0.0268%
Bell South															
Telecommunications	deb	NC	6.650	2095	104.54	500,000,000	6.36%	6.36%	0.01%	\$ 522,700,000	104.54%	17,550,000	0.00006528		0.0151%
Bell South															
Telecommunications	deb	NC	7.000	2095	115.39	500,000,000	6.07%	6.06%	0.01% BBB-	\$ 576,950,000	115.39%	33,250,000	0.00011829		0.0273%
Bell South Capital Funding	deb	Z100	7.120	2097	113.90	500,000,000	6.25%	6.24%	0.01% BBB-	\$ 569,500,000	113.90%	35,000,000	0.00011269		0.0260%
Total						91,284,000,000				Total \$ 96,586,120,800	105.82%	5.44% \$ 4,869,831,280 \$	0.017016013	0.2264%	4.86

Source: Standard & Poor's Bond Guide, January 2017, 2016 Yr End Prices

Embedded debt rate 5.4444%
 Weighted average yield to maturity 5.1491%
 Debt service / Market value 4.95%
 S&P YTM 4.95%
 SAY

DATA INPUT

WASHINGTON STATE DEPARTMENT OF REVENUE

2017 ASSESSMENT YEAR

WIRELESS

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

Current Year (2016)

Current Year (2016)

Guideline Companies		Stock Price	Beta	Revenues	Cash Flow	Earnings	Dividends	Bk Value	Common	Long-Term Debt	Capital Spending per share	Trailing P/E Ratio	Average Annual Dividend Yield	Operating Margin
Name	Ticker	(adj YE Close)		Per Share	Per Share	Per Share	Per Share	Stock	Shares		per share	VL	VL	VL
AT&T Inc	T	\$42.04	0.75	\$ 26.68	\$ 7.07	\$ 2.84	\$ 1.92	\$ 20.06	6,142,000	\$ 113,681,000,000	\$ 3.50	14.70	4.90	n/a
Verizon Communications	VZ	\$52.80	0.75	\$ 30.90	\$ 5.80	\$ 3.87	\$ 2.29	\$ 4.00	4,076,731	\$ 105,433,000,000	\$ 4.18	12.80	4.50	n/a
Sprint Corp	S	\$8.42	1.35	\$ 8.35	\$ 1.65	\$ (0.40)	\$ -	\$ 4.80	3,987,167	\$ 30,759,000,000	\$ 0.95	nmf	n/a	28.5%
US Cellular	USM	\$43.72	1.05	\$ 46.42	\$ 7.75	\$ 0.56	\$ -	\$ 42.83	84,849	\$ 1,618,000,000	\$ 5.20	nmf	n/a	11.5%
T-Mobile	TMUS	\$57.51	1.00	\$ 45.07	\$ 8.63	\$ 1.08	\$ -	\$ 22.07	826,825	\$ 30,053,000,000	\$ 5.69	57.60	n/a	25.0%

Value Line December 18, 2016 Yahoo Value Line Value Line Value Line Value Line Value Line Value Line Value Line Value Line Value Line Value Line 13.750

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

high data points are given greater weights than low data points.

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

Note:
Canadian Exchange Rate per Value Line is .75 for 2016.

Value Line figures are all values in US dollars.

Income Tax Rate	% Return on Shareholders' Equity	Projected (2017)					Projected (2017)					Forecast Dividends % Change				
		Revenues	Cash Flow	Earnings	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	2017	2018	2019	2020
VL	V L	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	Calc Debt	VL	VL	VL	VL
32.7%	14.3%	\$ 27.05	\$ 7.15	\$ 2.95	\$ 1.96	21.00	6,140,000	3.60	14.0%	4.5%	66.0%	103.9%	4.00	4.00	4.00	4.00
32.5%	13.0%	\$ 32.25	\$ 5.80	\$ 3.90	\$ 2.32	4.00	4,050,000	4.20	nmf	48.0%	68.0%	110.6%	2.00	2.00	2.00	2.00
nmf	6.0%	\$ 8.65	\$ 1.90	\$ (0.25)	\$ -	4.70	4,025,000	1.10	N/A	N/A	0.0%	87.0%	0.00	0.00	0.00	0.00
40.2%	3.5%	\$ 46.20	\$ 7.70	\$ 0.30	\$ -	43.45	84,000	5.95	0.5%	0.5%	0.0%	99.6%	0.00	0.00	0.00	0.00
40.9%	13.5%	\$ 47.90	\$ 10.10	\$ 1.85	\$ -	24.25	825,000	5.95	8.0%	8.0%	3.0%	106.5%	0.00	0.00	0.00	0.00

67.0%

10.1%

		Forecast Earnings % Change						Forecast Cash Flow % Change						Forecast Revenue % Change						Income		Balance Sheet	
2021	2022	2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022	Operating Income		Current Assets	
VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	M*	M*	
4.00	4.00	5.50	5.50	5.50	5.50	5.50	5.50	4.50	4.50	4.50	4.50	4.50	4.50	2.50	2.50	2.50	2.50	2.50	2.50	\$	24,347,000,000	\$	38,369,000,000
2.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00	nmf	nmf	nmf	nmf	nmf	nmf	2.00	2.00	2.00	2.00	2.00	2.00	\$	27,059,000,000	\$	26,395,000,000
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.50	14.50	14.50	14.50	14.50	14.50	1.00	1.00	1.00	1.00	1.00	1.00	\$	310,000,000	\$	6,833,000,000
0.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	2.50	2.50	2.50	2.50	2.50	\$	(3,000,000)	\$	1,558,000,000
0.00	0.00							11.00	11.00	11.00	11.00	11.00	11.00	5.00	5.00	5.00	5.00	5.00	5.00	\$	3,802,000,000	\$	14,217,000,000

			Cash Flow	Fair Value	Carrying Value	Current Maturity	Balance Sheet
PP & E Gross	Current Liabilities	Long Term Debt	Depreciation & Amortization	Debt	Debt	Rent expense	Intangibles (excl. Goodwill)
M*	M*	M*	10-K	10-K	10-k	10-K	M*
\$ 319,648,000,000	\$ 50,576,000,000	\$ 113,681,000,000	\$ 25,847,000,000	\$ 129,857,700,000	\$ 124,972,000,000	\$ 4,482,000,000	\$ 131,103,000,000
\$ 232,215,000,000	\$ 30,340,000,000	\$ 105,433,000,000	\$ 15,928,000,000	\$ 118,534,000,000	\$ 107,128,000,000	\$ 3,600,000,000	\$ 95,570,000,000
\$ 29,989,000,000	\$ 11,963,000,000	\$ 33,958,000,000	\$ 7,088,000,000	\$ 29,268,000,000	\$ 33,645,000,000	\$ 2,900,000,000	\$ 44,542,000,000
\$ 7,712,000,000	\$ 718,000,000	\$ 1,618,000,000	\$ 5,242,000,000	\$ 1,670,000,000	\$ 1,677,000,000	\$ 124,943,000	\$ 1,886,000,000
\$ 45,722,000,000	\$ 9,022,000,000	\$ 27,432,000,000	\$ 6,243,000,000	\$ 28,013,000,000	\$ 26,315,000,000	\$ 2,800,000,000	\$ 27,390,000,000

SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

WASHINGTON STATE DEPARTMENT OF REVENUE

2017 ASSESSMENT YEAR

WIRELESS

Company	Ticker	Stock Price	2016		2017		2016		2017	
			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	42.04	2.84	6.76%	2.95	7.02%	7.07	16.82%	7.15	17.01%
Verizon Communications	VZ	52.80	3.87	7.33%	3.90	7.39%	5.80	10.98%	5.80	10.98%
Sprint Corp	S	8.42	(0.40)		(0.25)		1.65	19.60%	1.90	22.57%
US Cellular	USM	43.72	0.56	1.28%	0.30	0.69%	7.75	17.73%	7.70	17.61%
T-Mobile	TMUS	57.51	1.08	1.88%	1.85	3.22%	8.63	15.01%	10.10	17.56%
		Mean		4.31%		4.58%		16.03%		17.15%
		Median		4.32%		5.12%		16.82%		17.56%
		Max		7.33%		7.39%		19.60%		22.57%
		Min		1.28%		0.69%		10.98%		10.98%
		stdev		3.17%		3.21%		3.27%		4.12%
		cov		73.58%		70.05%		20.39%		24.00%
		harmean		2.50%		1.95%		15.40%		16.24%
		Say		5.50%		5.50%		14.50%		15.75%

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, 2016.

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

Year	Earnings Yield	Dividend Yield	S&P 500	Earnings*	Dividends*	Change in Earnings	Change in Dividends	T.Bill Rate	T.Bond Rate	Bond-Bill	Boothed Growth	Implied Premium (DDM)	Real Growth Est.	Implied Premium (FCFE)	ERP/Riskfree Rate
1960	5.34%	3.41%	58.11	3.10	1.98			0.0266	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%	7.40%	8.00%	-0.00%	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%	9.85%	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	-30.79%	-3.24%	1.80%	5.05%	3.25%	3.56%	1.73%	10.30%	3.62%	0.72
2002	5.23%	1.83%	879.82	46.04	16.08	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	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	23.75%	8.54%	2.18%	4.22%	2.04%	4.90%	2.02%	8.50%	3.65%	0.86
2005	5.47%	1.79%	1248.29	76.45	22.38	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	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	-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	-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	-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	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	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	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	4.86%	19.19%	0.07%	3.04%	2.97%	5.01%	2.03%	4.28%	4.96%	1.63

2014	5.57%	1.87%	2058.90	114.74	38.57	6.78%	6.31%	0.05%	2.17%	2.12%	2.55%	2.24%	5.58%	5.78%	2.66
2015	5.20%	2.11%	2043.94	106.32	43.16	-5.92%	9.43%	0.21%	2.27%	2.06%	2.96%	2.46%	5.51%	6.12%	2.70