

**BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS**

In the Matter of the Application and	)	
Request of Craw-Kan Telephone	)	
Cooperative, Inc. for an Increase in its	)	Docket No.
Cost-Based Kansas Universal Service	)	22-CRKT-087-KSF
Fund Support	)	

DIRECT TESTIMONY

PREPARED BY

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UTILITIES DIVISION

KANSAS CORPORATION COMMISSION

December 15, 2021

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1 **Q. Please state your name and business address.**

2 A. Adam H. Gatewood, 1500 Arrowhead Road, Topeka, Kansas 66604.

3 **Q. Who is your employer and what is your title?**

4 A. I am a Senior Managing Financial Analyst for the Kansas Corporation Commission
5 (Commission).

6 **Q. What is your educational and professional background?**

7 A. I graduated from Washburn University with a B.A. in Economics in 1987 and a Masters of

1 Business Administration in 1996. I have filed testimony on cost of capital, capital structure,
2 and related issues before the Commission in more than 130 proceedings. I have also filed
3 cost of capital testimony before the Federal Energy Regulatory Commission in natural gas
4 pipeline and electric transmission revenue requirement complaint dockets.

5 **Q. What is the purpose of your testimony?**

6 A. My testimony contains Staff's rate of return (ROR) for Craw-Kan Telephone Cooperative,
7 Inc. (CrawKan or Applicant). The rate of return is an input to Staff's revenue requirement
8 study that determines CrawKan's Kansas Universal Service Fund (KUSF) annual support.

9 **Executive Summary**

10 **Q. Please summarize your recommendation?**

11 A. I recommend that the Commission adopt an allowed return (ROR) of 6.52% for the purpose
12 of setting CrawKan's KUSF revenue requirement that incorporates a 9.60% return on equity
13 and a 60% equity ratio; as opposed to its actual equity ratio of 69.53%.

Staff Cost of Capital Recommendation Craw-Kan Telephone Coop 22-CRKT-087-KSF			
	Weight	Cost	Weighted Avg Cost
Equity	60%	9.60%	5.76%
Debt	40%	1.89%	0.76%
Rate of Return			6.52%

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15 **Q. Please summarize CrawKan's rate of return request.**

- 1 A. CrawKan requests the Commission grant it an ROR equal to the 9.75% ROR authorized by
 2 the Federal Communications Commission (FCC) to calculate federal high-cost support;¹
 3 Section 7 of CrawKan's Application does not state a specific ROE, just a 9.75% ROR.

Rate of Return Requested By Craw-Kan Telephone Coop 22-CRKT-087-KSF				
	Balance	Weight	Cost	Weighted Avg Cost
Equity	\$ 72,331,852	69.53%		
Debt	\$ 31,698,826	30.47%	1.89%	
	\$ 104,030,678			
Craw-Kan Requested ROR				9.75%
Source: Section 7; Schedule 1 of Application				
Requested ROR based on FCC authorized ROR effective July 1, 2021				

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- 5 Given CrawKan's capital structure and actual cost of debt, I estimate that CrawKan's
 6 requested ROR embodies an ROE of about a 13.19%; a return that is far above returns
 7 granted by this Commission in KUSF dockets.

Effective Rate of Return Requested by Craw-Kan Telephone Coop 22-CRKT-087-KSF				
		Weight	Cost	Weighted Avg Cost
Equity	\$ 72,331,852	69.53%	13.19%	9.174%
Debt	\$ 31,698,826	30.47%	1.89%	0.576%
	\$ 104,030,678		Rate of Return	9.75%
Source: Section 7; Schedule 1 of Application; Annual Report				

8

- 9 Staff has consistently argued that the FCC's generic ROR does not meet the cost-based
 10 standard that this Commission applies when setting revenue requirements for KUSF

¹ Connect America Fund, WC Docket No. 10-90, Rate of Return Order, March 23, 2016.

1 support. Because the FCC's ROR does not differentiate between costs of debt and equity
2 capital that is employed by a specific RLEC, it does not recognize the cost savings that can
3 result from utilizing debt capital. Nor does the FCC's ROR reflect the current capital
4 markets as the FCC issued the Order in July of 2016. A review of the FCC's Order indicates
5 that the 10.75% ROR set by the FCC for 2017 (dropping to 10.00% in 2020 and 9.75% in
6 2021) incorporates an ROE greater than the cost of equity set by this Commission (and
7 virtually all regulatory bodies) since the early 2000s. By some measures, the FCC's generic
8 allowed ROR would result in an ROE in excess of 14.00% largely because it does not
9 recognize an RLEC's actual cost of debt.²

10 The FCC Report & Order indicates that it is ratcheting down the Authorized ROR each year
11 from 2016 through 2021. The Authorized ROR for 2021 is 9.75%. Based on all of the cost
12 of capital studies I have prepared from 2016 to the present, the FCC's annual reduction has
13 not kept pace with the market reductions in the cost of capital. Thus, I surmise that the
14 excessive return on equity discussed in footnote 2 continues even as the Authorized ROR
15 has ratcheted down to 9.75%.

² Report and Order, Order and Order on Reconsideration, and Further Notice of Proposed Rulemaking In the Matter of Connect America Fund ETC Annual Reports and Certifications Developing a Unified Inter-carrier Compensation Regime (WC Docket No. 10-90; WC Docket No. 14-58; and CC Docket No. 01-92) Released March 30, 2016. See paragraph 322.

322. We note that the WACC is supposed to compensate equity holders and debtholders who provide the funds used to finance the firm's assets. Given a rate of return set equal to 9.75 percent, an average capital structure based on our estimates of 54.34 percent debt, and a cost of debt based on our estimates of 5.87 percent, the implied cost of equity is 14.37 percent. We find that not only is the WACC of 9.75 percent high enough adequately to compensate the firm's debtholders, but the implied rate of return on equity also provides equity holders with the opportunity to earn a reasonable rate of return on their investment. As support for our finding that a 9.75 percent rate of return is reasonable, we examine some benchmarks.

Phase in of Authorized RoR Reduction From 11.25% to 9.75%		
Effective Date of Rate of Return	Authorized Rate of Return	
2016	11.00%	*Authorized rate of return is set at 9.75% and phased in over time
2017	10.75%	
2018	10.50%	
2019	10.25%	*9.75% WACC embodies a 5.87% cost of debt 14.37% ROE with a 54.34% debt ratio
2020	10.00%	
2021	9.75%	
FCC Report and Order and Order on Reconsideration, and Further Notice of Proposed Rulemaking; March 30, 2016 FCC 16-33; para 319-326		

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CrawKan's requested rate of return has no link to returns available in the capital markets or its actual cost of debt. Therefore, it fails to conform to the Commission's established practice and fails the basic principles set out in the key legal decisions rendered by the U.S. Supreme Court, commonly referred to as the "Hope and Bluefield" decisions that are the cornerstone to establishing a fair return.³ For these reasons, the Commission should reject the FCC ROR for CrawKan, as it has in all past KUSF Dockets.

³ Bluefield Water Works & Improvement Company v. Public Service Commission of West Virginia, 262 U.S. 679, 692-3 (1923). (Bluefield)

Federal Power Commission v. Hope Natural Gas Company, 320 U.S. 591, 603 (1944). 603 [8] [9] The rate-making process under the Act, i.e., the fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests. Thus, we stated in the Natural Gas Pipeline Co. case that 'regulation does not insure that the business shall produce net revenues.' But such considerations aside, the investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view, it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. By that standard, the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. The conditions under which more or less might be allowed are not important here. Nor is it important to this case to determine the various permissible ways in which any rate base on which the return is computed might be arrived at. For we are of the view that the end result in this case cannot be condemned under the Act as unjust and unreasonable from the investor or company viewpoint. (Hope)

1 **Q. Does Staff have any additional concerns surrounding this issue?**

2 A. The Kansas Legislature established a cap on aggregate annual KUSF support to RLECs.
3 Therefore applying the FCC ROR to KUSF support calculations could cause a substantial
4 shift in support dollars among the Kansas RLECs, transferring support dollars to those
5 RLECs with the greatest leverage in their capital structures and away from RLECs with
6 balanced, conservative capital structures. It is Staff's opinion that such an outcome is far
7 from desirable for most stakeholders to the KUSF support system. Staff urges the
8 Commission not to waiver from its past, established practice of rejecting the FCC ROR and
9 instead, looking closely at the RLECs' actual capital costs.

10 **How Does Setting KUSF Support Levels Differ From a Rate Case**

11 **Q. How do KUSF Dockets in which the Commission is setting the level of KUSF support**
12 **for a rural local exchange carrier (RLEC) differ from a typical rate case?**

13 A. In a typical rate case, the revenue requirement is only collected from a utility's customers.
14 In determining an RLEC's KUSF support, the Commission is not setting a revenue
15 requirement to determine rates *solely* paid by the RLEC customers; rather, the KUSF
16 support is coming from all Kansans who pay into the KUSF, which transfers money from
17 users of telecommunications services in Kansas to the ratepayers of an RLEC so that they
18 do not have to pay the full cost of those RLEC telephony services. In essence, all Kansans,
19 either directly or indirectly, are paying a portion of the RLECs' revenue requirements. In
20 setting revenue requirements for any rate regulated industry, a regulatory agency has to
21 balance the interests of a regulated entity and the consumer. In this instance, "consumers'

1 interests” encompass all who contribute to the KUSF support mechanism.

2 **Q. When establishing a reasonable rate of return for RLECs in KUSF Dockets, are there**
3 **unique issues that the Commission should be aware of that are not present in gas and**
4 **electric rate cases?**

5 A. Yes, there are challenges in estimating the allowed returns for these KUSF Dockets that are
6 not present in rate cases for gas and electric utilities; issues that have been present for policy
7 makers for more than a decade and expected to continue in future. In KUSF Dockets, we
8 are estimating the capital costs associated with providing a very narrow set of
9 telecommunications services.⁴ The foremost challenging issue is a lack of publicly traded
10 companies whose primary business is the provision of land-line telephony services in rural
11 areas. Of the few companies that do provide land-line services to rural areas, that segment
12 of their operations is a small percent of their total revenues and earnings. As a result of this
13 limited exposure to RLEC services, investors do not evaluate those companies based on the
14 risks associated with providing RLEC services, but instead, the risks and growth potential
15 of providing other telecommunications services such as cellular, internet, and cable
16 television. Despite these difficulties, it is possible to estimate the cost of equity for
17 companies providing RLEC services, with the caveat the stakeholders in this process have
18 to accept a less precise estimate than we would otherwise have if we had access to a robust
19 proxy group for the analysis. This data limitation creates a challenge and it is a matter of

⁴In Kansas, Universal Service is defined by K.S.A. 66-1,187(p): "Universal service" means telecommunications services and facilities which include: single party, two-way voice grade calling; stored program controlled switching with vertical service capability; E911 capability; tone dialing; access to operator services; access to directory assistance; and equal access to long distance services."

1 fact that parties must accept. In spite of these challenges, Staff can demonstrate that there
2 is ample evidence that its recommended rate of return meets the legal requirements of a just
3 and reasonable return to CrawKan's members/shareholders.

4 **Q. How did you overcome those challenges?**

5 A. Staff overcomes these challenges by relying on data that reflects long-run, forward-looking
6 returns available in the capital markets applied to financial models like the DCF and CAPM.
7 Seasoned experts in the financial industry universally rely on these two models to evaluate
8 investment opportunities. Staff's analysis reviews the returns investors demand of the broad
9 capital markets and the expectations of institutional investors.

10 **Q. Staff has recommended 9.60% return on equity be used in the recent KUSF support**
11 **calculations. Why has Staff presented the same recommendation in several KUSF**
12 **dockets and again in this Docket for CrawKan?**

13 A. Staff wants to strike a balance between accurately reflecting the prevailing cost of equity
14 capital with applying a return uniformly across the entire group of Kansas RLECs. Thus
15 Staff is willing to recommend a uniform number as long as it is deemed appropriate and
16 supported by rigorous analysis. Based on the market data of the past six months, despite
17 the increased volatility in the markets, I found that the recent 9.60% allowed return on
18 equity is reasonable and should be applied to CrawKan. My analysis demonstrates that a
19 9.60% return on equity provides Crawkan's members/owners a return significantly above
20 that available in fixed income investments and the broad equity market.

Risk-Premium Provided by a 9.60% ROE

Q. How does your recommendation in this Docket compare to those in past KUSF Dockets?

A. The best picture of this comparison is the risk premium, which the allowed ROE provides the RLEC investors, over bond yields that we observe in the capital markets and returns set for other regulated utilities. This table contains the KUSF Dockets of the last nine years beginning in 2012. In these Dockets, Staff's recommendations have been in the range of 9.60% to 10.50%. As a clearer picture of the economy in the post-Global Financial Crisis (GFC) materialized, with slower economic growth rates and lower capital costs, Staff recommended an ROE of 9.60% to 9.75%.

Staff Positions in Recent KUSF Dockets						
Docket	Testimony Date	Company	Equity Ratio	Staff ROE	Baa/BBB Yields*	Resulting Rp**
12-GRHT-633-KSF	10/18/2012	Gorham Telephone Company	29.69%	10.50%	4.27%	6.23%
12-LHPT-875-AUD	12/19/2012	LaHarpe Telephone Company	90.00%	10.00%	4.33%	5.67%
13-CRKT-268-KSF	3/13/2013	Craw-Kan Telephone Cooperative, Inc.	60.00%	10.00%	4.48%	5.52%
13-ZENT-065-AUD	5/17/2013	Zenda Telephone Company, Inc.	Confidential	10.00%	4.42%	5.58%
13-JBNT-437-KSF	5/23/2013	J.B.N. Telephone Company, Inc.	46.50%	9.75%	4.52%	5.23%
13-PLTT-678-KSF	9/24/2013	Peoples Telecommunications, LLC	55.83%	9.75%	5.19%	4.56%
14-WTCT-142-KSF	2/5/2014	Wamego Telecommunications Co.	61.43%	9.60%	4.78%	4.82%
14-S&TT-525-KSF	9/25/2014	S&T Telephone Cooperative, Inc.	54.86%	9.75%	4.45%	5.30%
15-MRGT-097-KSF	1/20/2015	Moundridge Telephone Co.	Confidential	9.75%	3.91%	5.84%
15-TWVT-213-AUD	9/4/2015	Twin Valley Telephone Co.	47.81%	9.75%	4.56%	5.19%
17-RNBT-555-KSF	10/26/2017	Rainbow Telecomm Assoc. Coop	60.00%	9.75%	4.21%	5.54%
19-GNBT-505-KSF	10/11/2019	Golden Belt Telephone Assoc. Cooperative	60.00%	9.60%	3.67%	5.93%
20-UTAT-032-KSF	12/13/2019	United Telephone Association	60.00%	9.60%	3.84%	5.76%
20-BLVT-218-KSF	3/20/2020	Blue Valley Telecommunications, Inc.	60.00%	9.60%	3.78%	5.82%
Average Risk Premium of Recent KUSF Dockets						5.50%
* Yield on Baa/BBB Utility Bonds reported by Value-Line Investment Survey at date of Staff's testimony						
**Risk premium of Staff's ROE Recommendation over the Baa/BBB Utility Bond Yield						

In the far right column is the resulting risk premium provided by the return on equity advocated by Staff in each docket. The risk premium is the Staff recommended ROE minus

1 the average yield on Baa/BBB utility bonds reported each week by Value-Line Investment
2 Survey. For that time period, the risk premium averaged 5.50%. Given the downward trend
3 of bond yields during 2019, 2020, and 2021 an ROE of 9.60% provides CrawKan a risk
4 premium of 6.35%, which is considerably more than the risk premiums of past KUSF
5 Dockets and far greater than those observed in gas and electric rate cases. As a point of
6 comparison, in February of 2020, the Commission granted Atmos Energy Corporation a
7 9.10% ROE which was 5.32% premium over BBB/Baa public utility bonds at the time of
8 Staff's analysis in late-2019.

9 Allowing for a risk premium over less risky debt investments, as Staff has done, is
10 consistent with the principles espoused by the Supreme Court in its *Hope* and *Bluefield*
11 decisions. These types of income producing securities are viewed as alternatives to
12 investments in utility stocks because, like utility stocks, bonds offer stable valuations and
13 higher current income, relative to the equity market. Risk premiums vary over time and
14 across economic and market conditions; thus, there is not a benchmark risk premium or
15 formula that sets a reasonable return on equity at a given interest rate. The Court's decisions
16 makes it clear that a fair and reasonable return for a utility's equity investors must offer the
17 opportunity for investors to earn a premium over less risky investment vehicles. The
18 following table demonstrates that Staff's proposed 9.60% ROE meets that standard in each
19 instance; Staff's recommendation provides a premium ranging from 6.26% to 8.14% over
20 the returns offered by less risky fixed income investments as measured in the current capital
21 markets.

**KCC Staff's Risk Premium Over Fixed Income Yields
Based on a 9.60% Return on Equity**

Monthly Averages	10-Year T-Bond Yield¹	30-Year T-Bond Yield²	Baa Corporate Bond Yield³	BBB/Baa Utility Bond Yield⁴
May, 2021	1.62%	2.32%	3.62%	3.58%
June, 2021	1.53%	2.18%	3.47%	3.37%
July, 2021	1.34%	1.96%	3.26%	3.21%
August, 2021	1.28%	1.92%	3.24%	3.13%
September, 2021	1.34%	1.91%	3.21%	3.16%
October, 2021	1.57%	2.06%	3.35%	3.32%
November, 2021	1.54%	1.93%	3.24%	3.01%
Five Month Average	1.46%	2.04%	3.34%	3.25%

Staff's Risk Premium Over the Average 10-Year Treasury Bond Yield

Staff Recommended Allowed ROE	9.60%
Six Month Average 10-Year Treasury Bond Yield	1.46%
Premium Over Average 10-Year Treasury Bond Yield	8.14%

Staff's Risk Premium Over the Average 30-Year Treasury Bond Yield

Staff Recommended Allowed ROE	9.60%
Six Month Average 30-Year Treasury Bond Yield	2.04%
Premium Over Average 30-Year Treasury Bond Yield	7.56%

Staff's Risk Premium Over the Average BBB/Baa Corporate Bond Yield

Staff Recommended Allowed ROE	9.60%
Six-Month Average BBB/Baa Corporate Bond Yield	3.34%
Premium Over Average BBB/Baa Utility Bond Yield	6.26%

Staff's Risk Premium Over the Average BBB/Baa Utility Bond Yield

Staff Recommended Allowed ROE	9.60%
Six-Month Average BBB/Baa Utility Bond Yield	3.25%
Premium Over Average BBB/Baa Utility Bond Yield	6.35%

Sources:

- 1) Yield on U.S. 10-Year Treasury Bond reported at <https://fred.stlouisfed.org/>
- 2) Yield on U.S. 30-Year Treasury Bond reported at <https://fred.stlouisfed.org/>
- 3) Yield on Baa Corporate Bonds reported at <https://fred.stlouisfed.org/>
- 4) Yield on BBB/Baa Public Utility Bonds; Value-Line Investment Survey, Selections and Opinions

1

2 **Q. For a point of comparison, could you please summarize ROE decisions across the**
3 **country?**

4 **A. There is ample information on the allowed returns granted to gas distribution and electric**
5 **utilities; unfortunately, there is virtually no reporting of the returns granted to local**
6 **exchange carriers across the nation as most telephony services are either deemed**
7 **competitive or operate under some sort of price cap regulation. This comparison to other**

1 rate-of-return regulated industries is helpful as allowed returns on other rate of return
 2 regulated industries have moved in parallel with broad measures of capital costs. Thus, there
 3 have been many opportunities for regulatory commissions to evaluate evidence on
 4 investors' required returns. From this data, it is apparent that regulatory commissions
 5 concluded that capital costs of regulated utilities have trended downward over the past 19
 6 years.

Median Allowed Return on Equity		
Date	Natural Gas	Electric
2000	11.16	11.50
2001	11.00	11.00
2002	11.00	11.28
2003	11.00	10.75
2004	10.50	10.70
2005	10.40	10.35
2006	10.50	10.23
2007	10.20	10.20
2008	10.45	10.30
2009	10.26	10.50
2010	10.10	10.30
2011	10.03	10.17
2012	10.00	10.08
2013	9.72	9.95
2014	9.78	9.78
2015	9.68	9.65
2016	9.50	9.75
2017	9.60	9.60
2018	9.60	9.58
2019	9.70	9.65
2020	9.42	9.45
Source: S&P Market Intelligence; RRA		

7

8 I am not presenting this table to argue that RLEC services are either more or less risky than
 9 gas and electric utility services. Instead, I am using this table to highlight that for rate of
 10 return regulated companies, public service commissions across the country recognize the
 11 decline in capital costs over the past two decades. Decisions by this Commission have
 12 followed the same downward trend.

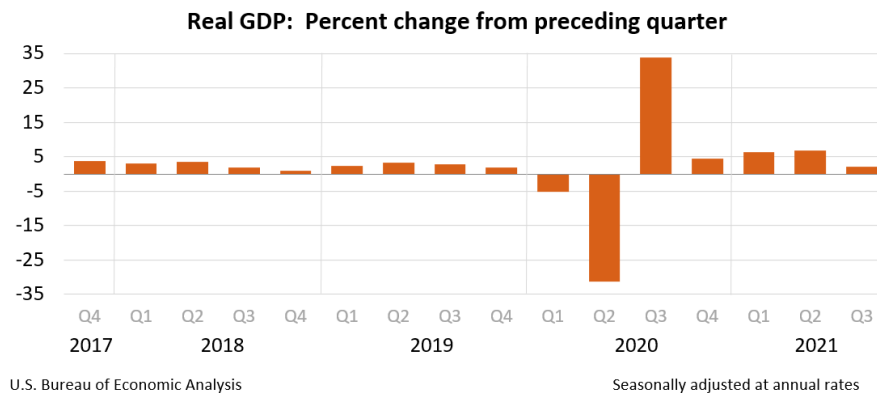
1 **Macro-Economic Environment & Investor Expectations**

2 **Q. Is it necessary for the Commission to create a forecast of the broad economy in order**
3 **to determine a reasonable return for CrawKan?**

4 A. In my opinion, it is not necessary for the Commission to make a forecast of the economy's
5 future or even adopt a specific perspective on the economy's direction when setting an
6 allowed return. This is because the Commission's focus is on the investors' required return,
7 which is a product of the investors' expectations for the economy (not the Commission's
8 expectations). Investors' expectations for the economy are contained within the
9 Commission's cost of capital decision, provided the Commission's decision is based on
10 market-derived data such as current stock prices, interest rates, and other data that conveys
11 investors' outlook for the economy. It is a well-accepted premise that our capital markets
12 are efficient, where investors factor all available information into their decisions to buy and
13 sell debt and equity securities. Those decisions establish the prices that are used in cost of
14 capital analyses. Furthermore, rational, profit-maximizing investors are forward looking.
15 Accordingly, investors incorporate their own forecasts of the economy into their decisions
16 in their best attempt to maximize returns. Therefore, the price and interest rate data
17 incorporates the investors' forecasts for the economy and those expectations are embedded
18 in the investors' required return that we are measuring.

19 **Q. Do you believe the Commission benefits from some discussion of economic forecast**
20 **when setting allowed returns?**

A. Yes, particularly in the wake of the 2020 recession and ongoing pandemic, so as to provide context around the market data that goes into a cost of capital witnesses' analyses. The World Health Organization declared a global pandemic in early March of 2020.⁵ Within the first quarter of 2020, the effects of stay-at-home mandates, closures of businesses in the restaurant, hospitality, entertainment, and travel industries all began to appear in the U.S. real GDP with a 5.1% decline from the previous quarter. This was followed by a record -31.2% decline in the second quarter of 2020.⁶ The decline in real GDP was historic, as was the 33.8% rebound that occurred in third quarter of 2020 as the economy began to reopen. In the recent two quarters, real GDP grew at 6.7% in the second quarter of 2021 and 2.0% in the third quarter. The recent 2.0% reading is more in line with real GDP of the past decade and the long-run forecast for the U.S. economy.⁷

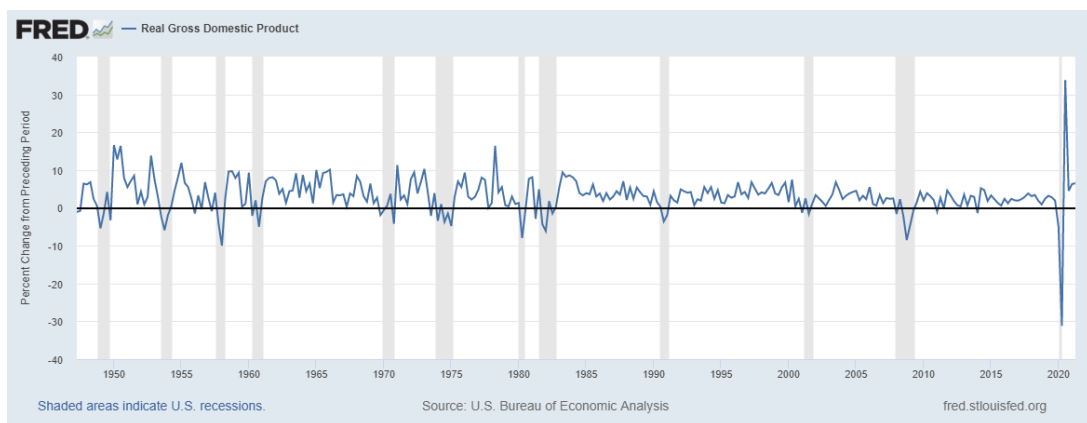


⁵ <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline#event-71>

⁶ Bureau of Economic Analysis, https://www.bea.gov/sites/default/files/2021-07/gdp2q21_adv.pdf

⁷ Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy; Quarterly Projections recorded from <https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>

1 The U.S. economy contracted in two consecutive quarters, the threshold for meeting the
 2 definition of an economic recession; the peak of the expansion occurred in February of 2020
 3 and the trough of the recession in April of 2020.⁸ The trough is only the point in time when
 4 economic growth turns from contraction to expansion. In the second quarter of 2021, U.S.
 5 real GDP output had completely recovered and exceed the pre-pandemic, February 2020
 6 peak.⁹ The 2020 Recession at only two months in length is the shortest on record for
 7 NBER's data that begins in 1860 tracking 34 business cycles. As depicted in the following
 8 chart, it is also the largest quarter to quarter contraction in the U.S. economy since quarterly
 9 data was tracked beginning in 1947.



10
 11 Annual real GDP changes have been tracked since 1930. The 2020 down turn measured at
 12 year end at -3.4% appears less severe given the third quarter rebound and it is far from the
 13 worst full year contraction with 1930 at -8.5%, 1931 at -6.4%, 1932 at -12.9% and 1946 at

⁸ National Bureau of Economic Research (NBER); Business Cycle Dating Analysis, released July 19, 2021; <https://www.nber.org/news/business-cycle-dating-committee-announcement-july-19-2021>

⁹ Bureau of Economic Analysis, Table 1.1.6. Real Gross Domestic Product, Chained Dollars; Revised on: July 29, 2021; www.bea.gov

1 -11.6%.

2 Comments of the Federal Open Market Committee (FOMC) sum up the risk to the economy
3 as being directly dependent on the course of the virus.¹⁰ From June 2020 through November
4 2021 FOMC published statements on the U.S. economy have repeatedly warned of the
5 direct link between the pandemic and the economic recovery by including the phrase, “(t)he
6 path of the economy continues to depend on the course of the virus” in each statement. This
7 is an unprecedented statement by the Federal Reserve, clearly as it has been a consistent
8 message it is a risk that is known to investors. Having already experienced a brief, severe
9 recession caused by the pandemic, investors are well aware of the risks to corporate profits
10 and the broad economy and have factored those risks into their decisions. We know that
11 financial markets are efficient, investors constantly assess and re-assess these risks and price
12 securities accordingly, including the inputs to the CAPM and DCF analyses.

13 **Corporate Structure**

14 **Q. Please describe CrawKan.**

15 A. CrawKan is a Kansas an RLEC organized as a cooperative association serving about 11,000
16 access lines in Anderson, Linn, Bourbon, Allen, Neosho, Crawford, Labette, and Cherokee
17 counties of Kansas.

18 **Q. Is its corporate structure as a cooperative a factor in determining the allowed return?**

¹⁰ <https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>

1 A. It is an important fact, but it does not change the methodology that Staff uses to estimate
2 the allowed return for KUSF support. The decision was made when Staff began the KUSF
3 audits that we would estimate the cost of capital for RLECs organized as cooperatives using
4 data from the financial markets as we do for the investor-owned RLECs. Staff's
5 methodology, which uses market-based financial data to determine the cost of equity in
6 KUSF support calculations, is reasonable because it balances the competing interests of
7 setting the KUSF support at a level that provides affordable services to rural customers,
8 while not burdening the KUSF.

9 Cooperative associations are different from investor-owned public utilities; cooperative
10 associations' not-for-profit status is the underlying difference between the two.
11 Cooperatives are set up for the sole purpose of serving the needs of its members who are its
12 only customers and its only investors. As members, customers are entitled to elect a board
13 to oversee the cooperative. The cooperative's members provide it with equity capital to
14 finance plant and equipment just as investors provide investor-owned utilities with equity
15 capital. The key difference between the two types of organizations lies in the investors'
16 reason for providing equity capital. Common stock holders of investor-owned utilities
17 make the investment because they expect to share in the company's profits. A cooperative's
18 members/customers must provide equity capital to their cooperative associations to finance
19 the plant and equipment that provides them with telephony services.

Standards for a Just & Reasonable Rate of Return

20 Q. What standards should public utility commissions consider when authorizing a rate

1 **of return?**

2 A. The standards for setting a just and reasonable rate of return require that, to be reasonable,
3 the allowed return must reflect the risks associated with an equity investment in the utility.
4 For the allowed return to be in that reasonable range, it must compensate for those added
5 risks while capturing a fair proportion of benefits for consumers. The allowed ROE is best
6 described as the forward-looking discount rate that is necessary to induce equity investors
7 to commit their capital to the enterprise. Standards used to gauge the fairness and
8 reasonableness of an allowed ROE have been stated by courts, as the result of appeals of
9 decisions issued by regulatory agencies. Financial analysts and policy-makers rely on the
10 courts' decisions as a guide in estimating the appropriate cost of capital. The opinions do
11 not articulate precisely how to estimate or model a reasonable cost of capital. Instead, the
12 decisions provide critical questions for policy makers and analysts to consider in
13 determining a reasonable return for a regulated utility. There are several court cases that,
14 as a group, are viewed as the keystone to measuring the adequacy of a utility's allowed
15 return. The earliest of these decisions go back to an era when it was not only the "rate of
16 return" at issue but also the fundamental measurement of the investment in the utility
17 enterprise, commonly referred to as rate base. This is less of an issue today as regulators,
18 utility management, and investors readily accept actual historic-depreciated value as the
19 measure of investment to estimate the value of a utility's rate base (as opposed to
20 reproduction cost or market value). The Court's decision in *Bluefield* addressed both rate

1 base and ROR.¹¹

2 United States Supreme Court decisions state that returns granted to regulated public utilities
3 should: 1) be commensurate with returns on investments of similar risk; 2) be sufficient to
4 assure the financial integrity of the utility under efficient economic management; and 3)
5 change over time with changes in the money market and business conditions.¹² An
6 important take-away from these decisions is that the Supreme Court of the United States
7 has afforded regulatory agencies a significant amount of latitude in establishing an
8 appropriate ROR and ROE for a utility. The Kansas Supreme Court has recognized and
9 follows this body of law.¹³ This Commission has noted this fact in Orders issued in previous
10 dockets.¹⁴

11 **Q. How do financial analysts apply the standards established by the Court?**

12 A. For an allowed ROE to meet the legal standards, the return should be as specific as possible
13 to the utility in question. Financial analysts achieve this goal by analyzing not only the
14 utility in question, when it is possible to do so, but also a proxy group of similarly situated
15 utilities. Treatises on rate of return for public utilities, such as The Cost of Capital – A
16 Practitioner’s Guide, agree that *Bluefield* lays out the four standards for a fair return.

17 1) *Comparable Earnings* – a utility is entitled to a return similar to that
18 being earned by other enterprises with similar risks, but not as high

¹¹ *Bluefield Water Works & Improvement Co. v. Pub. Svc. Comm’n of West Virginia*, 262 U.S. 679, 692-3 (1923).

¹² *Smyth v. Ames*, 169 U.S. 466 (1898); *Wilcox v. Consolidated Gas Co.*, 212 U.S. 19, 48-49 (1909); *Bluefield Water Works & Improvement Company v. Public Service Commission of West Virginia*, 262 U.S. 679, 692-3 (1923); *Federal Power Commission v. Hope Natural Gas Company*, 320 U.S. 591, 603 (1944).

¹³ *Kansas Gas & Elec. Co. v. State Corp. Comm’n*, 239 Kan. 483, 491, 720 P. 2d 1063, 1072 (1986).

¹⁴ Order: 1) Addressing Prudence; 2) Approving Application, in Part; & 3) Ruling on Pending Requests, Docket No. 10-KCPE-415-RTS, November 22, 2010, 37-38.

as those earned by highly profitable or speculative ventures;

2) *Financial Integrity* – a utility is entitled to a return level reasonably sufficient to assure financial soundness;

3) *Capital Attraction* – a utility is entitled to a return sufficient to support its credit and raise capital; and

4) *Changing Level of Returns* – a fair return can change along with economic conditions and capital markets.¹⁵

As a financial analyst formulating rate of return analyses for our state commission, I take from *Bluefield* that the Court requires a rate Order that allows a utility an opportunity to earn a return consistent with the utility's risk profile and consistent with observations in the capital markets. The Court's decision in *Hope*,¹⁶ like that in *Bluefield*, dealt with both valuation of rate base, as well as rate of return on that rate base. With respect to the rate of return, the Court in *Hope* affirmed the four standards set out in *Bluefield*.

Capital Structure

Q. Please describe CrawKan's capital structure presented in Section 7 of its Application.

A. CrawKan reports a capital structure with 69.53% equity. I verified that its equity ratio in

¹⁵ The Cost of Capital – A Practitioner's Guide by David C. Parcell, Prepared for the Society of Utility and Regulatory Financial Analysts, 1997, pp. 3-13 to 3-14.

¹⁶ *Federal Power Comm'n. v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944). "The rate-making process under the Act, i.e., the fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests. Thus, we stated in the Natural Gas Pipeline Co. case that 'regulation does not insure that the business shall produce net revenues.' But such considerations aside, the investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view, it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. By that standard, the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. The conditions under which more or less might be allowed are not important here. Nor is it important to this case to determine the various permissible ways in which any rate base on which the return is computed might be arrived at. For we are of the view that the end result in this case cannot be condemned under the Act as unjust and unreasonable from the investor or company viewpoint."

1 Section 7 accurately depicts CrawKan's actual capitalization.

Rate of Return Requested By Craw-Kan Telephone Coop 22-CRKT-087-KSF				
	Balance	Weight	Cost	Weighted Avg Cost
Equity	\$ 72,331,852	69.53%		
Debt	\$ 31,698,826	30.47%	1.89%	
	\$ 104,030,678			
Craw-Kan Requested ROR				9.75%
Source: Section 7; Schedule 1 of Application				
Requested ROR based on FCC authorized ROR effective July 1, 2021				

2
3 **Q. Did you use CrawKan's actual capital structure to calculate the ROR?**

4 A. No, I did not. Throughout the KUSF investigations, Staff has used an upper limit of 60%
5 in capital structure calculations; Crawkan's actual equity ratio exceeds that threshold.

6 **Q. Why are you recommending something other than the actual capital structure?**

7 A. I did so to balance the interests of the RLEC with the competing interests the public
8 generally. Establishing a subsidy payment out of the KUSF should balance the interests of
9 the RLECs that receive the subsidy and Kansas telephony consumers who fund the subsidy,
10 an act that requires that the revenue requirement be estimated using reasonable and cost-
11 effective inputs. There is no evidence that a high-equity ratio capital structure is cost-
12 effective for an RLEC. CrawKan, like most Kansas RLECs, has access to relatively low
13 cost debt capital; the KUSF subsidy should recognize that RLECs have access to low cost
14 debt capital.

15 **Q. Is Staff recommending that CrawKan's management change its equity ratio?**

1 A. No, absolutely not. Staff's recommendation pertains only to the capital structure used to
2 calculate the KUSF revenue requirement. Staff is not requesting that CrawKan change its
3 capitalization; Staff leaves these types of capitalization decisions to company management.

4 **Q. How did you conclude that a hypothetical capital structure with 60% equity is**
5 **reasonable?**

6 A. Over the course of performing KUSF audits during the past two decades, I have found that
7 an equity ratio of 60% has been the high-end of the range observed for publicly traded
8 telecommunications companies, utilities, and RLECs operating in Kansas. Staff believes
9 the 60% equity ratio provides RLECs with a reasonable return and a reasonable cost
10 structure for the KUSF subsidy while balancing the competing interests of consumers.

11 **Cost of Debt**

12 **Q. What cost of debt do you use in CrawKan's ROR?**

13 A. Staff's recommendation relies on CrawKan's embedded cost of debt of 1.89% detailed in
14 Section 7 of the Application and contained in its annual report filed with the KCC.

15 **Summary of Cost of Equity Models**

16 **Q. Please provide an overview of the methods you relied on to arrive at 9.60% ROE.**

17 A. To estimate the RLEC's cost of equity, I applied the same financial models as I do for
18 regulated natural gas distribution and electric utilities. I applied a discounted cash flow
19 (DCF) analysis and capital asset pricing model (CAPM) to a group of telecommunications

1 companies.

2 **Q. Which models do you believe are the most informative to estimate an RLEC's cost of**
3 **equity capital?**

4 A. I place greater reliance on the CAPM analyses that incorporate long-run, expected returns
5 formulated by institutional investors and money managers. I find these to be most
6 persuasive as these CAPM analyses recognize that market returns and interest rates are
7 expected to be lower in the future than those experienced historically. These forward
8 looking CAPM analyses are also not tied to forecasted earnings growth rates for the proxy
9 group where most of the drivers for earnings growth are not related to traditional land-line
10 services of a rural carrier nor are they subject to short-term market volatility. Because of
11 that, I am placing little weight on the DCF analysis that incorporates forecasted earnings
12 growth of the proxy companies.

Summary of Staff's Cost of Equity Estimates 22-CRKT-087-KSF			
<u>Discounted Cash Flow Analyses</u>		Low	High
Two-Stage Growth DCF Model: Based on the Average of Short-Term Growth Forecasts & Long-Term nGDP Forecasts		10.85%	12.28%
Single-Stage Growth DCF Model: Based on the Long-Term nGDP Forecasts		8.35%	9.78%
<u>Capital Asset Pricing Models</u>		Low	High
		Average	
Based on Historical Return Data, gathered from 1928 to 2019, Reported by Damodaran Online		9.65%	11.24%
Based on Forecasted Return Data, gathered from J.P. Morgan Asset Management Long-Term Capital Market Assumptions (2020 edition)		5.72%	7.19%
Based on Forecasted Return Data, gathered from BlackRock Investments Projected Long-run Returns Market Assumptions - Geometric Returns (2020 edition)		5.97%	7.72%
Based on Forecasted Return Data, gathered from Duff & Phelps Projected Market Risk Premium & Risk Free Return (affirmed September 30, 2019)		6.08%	8.00%
		7.04%	

1

2 **Discussion of Staff's Cost of Equity Analysis**3 **Proxy Group Selection**4 **Q. How did you select a proxy group for your analysis?**

5 A. I began with the FCC proxy group¹⁷ and eliminated companies: 1) that do not pay a
6 dividend; 2) that are not followed by Value Line Investment; and 3) that do not have growth
7 rate estimates reported by Value-Line, YahooFinance or Zacks Research. These screens
8 ensured that the analysis is performed on a group of companies in the relevant industry with

¹⁷ Prescribing the Authorized Rate of Return; Analysis of Methods for Establishing Just and Reasonable Rates for Local Exchange Carriers; Wireline Competition Bureau, Staff Report; WC Docket No. 10-90; May 16, 2013. Appendix I3.

1 publicly available financial data and growth forecasts.

<u>FCC Proxy Group</u>	
Alaska Communications Systems Group	ACS
Alteva	ALTV
AT&T	T
Century Link	CTL
Cincinnati Bell	CBB
Consolidated Communications Holdings	CNSL
FairPoint	FRP
Frontier Communications Corp	FTR
Hawaiian Telecom	HCOM
Hickory Tech Corp	HTCO
Lumos	LMOS
New Ulm	NULM
Shenandoah Telecommunications Co	SHEN
Telephone & Data Systems	TDS
Verizon	VZ
Windstream	WIN
Source: Connect America Fund, WC Docket No. 10-90, Report and Order, May 16, 2016; Appendix I	

2

3 With each passing year since the FCC Staff Report in 2013¹⁸ and related follow up reports,
 4 the number of telecommunications companies that can meet the selection criteria falls.
 5 Several of those in the FCC Proxy Group have merged or eliminated dividends, and that
 6 group is smaller. At this point, there are five companies that meet Staff's selection criteria.

¹⁸ Prescribing the Authorized Rate of Return; Analysis of Methods for Establishing Just and Reasonable Rates for Local Exchange Carriers; Wireline Competition Bureau, Staff Report; WC Docket No. 10-90; May 16, 2013.

KCC Staff Proxy Group

AT&T	T
Lumen Technologies, (formerly, Century Link)	LUMN
Shenandoah Telecommunications Co	SHEN
Telephone & Data Systems	TDS
Verizon	VZ

1

2 Each of the proxy companies provides local exchange services in addition to other services,
3 such as digital subscriber line, broadband internet access, cable television, and wireless. It
4 would be ideal to have a group of companies strictly in the business of providing local
5 exchange services in rural areas; such companies simply do not exist.

6 **Q. Did you search out additional telecommunications companies that were not in the FCC**
7 **Proxy Group?**

8 A. Yes, I have reviewed the telecommunications companies followed by Value-Line and I was
9 unable to find any additional proxy companies that meet the criteria discussed above.

10 **Q Because of these other lines of business and services, do the cost of equity estimates for**
11 **the proxy companies include growth potential that do not apply to RLEC services?**

12 A Yes, each of the proxy companies is engaged in other segments of the telecommunications
13 industry and these services have higher growth rates than services that are under the KUSF
14 umbrella. These other services are provided in a competitive environment. The local wire-
15 line services that most RLECs in Kansas provide do compete against other services, but at
16 the same time, the Kansas RLECs have access to state and federal subsidies to stabilize
17 cash-flows, recover invested capital, and earn their allowed return. Support from the KUSF

1 and USF enable RLECs to recoup costs of providing service and capital investments without
2 raising local rates, thus reducing their risks of recovering capital investments. In addition
3 to these subsidies, a local telephone company that has opted for traditional rate of return
4 regulation in Kansas can file for a revenue adjustment (either through the KUSF or local
5 rates) when it fails to earn its allowed return on capital. Rate of return established revenue
6 streams and regulation are not an option for the business units of the proxy companies
7 operating in a competitive environment, thus making those competitive services riskier than
8 the KUSF supported services.

9 **DCF Analysis**

10 **Q. Please discuss the DCF analysis that you performed.**

11 A. The DCF model is one of the most important and frequently cited tools of regulatory
12 agencies for setting allowed returns because publicly traded regulated utilities exhibit stable
13 forecasted growth rates and regular dividend payments. Unfortunately, that is not the case
14 for the telecommunications industry. Unlike the electric and natural gas distribution
15 industries, the telecommunications growth rates vary widely across companies, as well as
16 across time, from quarter to quarter. This volatility and lack of predictable growth reduces
17 the usefulness of a DCF analysis on this industry.

18 **Q. Does the DCF model meet the legal standards discussed earlier in your testimony?**

19 A. Yes, legal counsel has advised me that a cost of equity estimate derived from the DCF model
20 meets the legal standards discussed in Court decisions. As financial analyst I contend that
21 it does if the model incorporates current information from the capital markets via current

1 stock prices and accurate data that investors use to establish their discount rate. This
2 market-based information ensures the cost of equity estimates evaluate investors' required
3 rate of return or discount rate that reflects the current economic environment.

4 The DCF model is a valuation model used by investors to value different types of
5 investments such as real estate, bonds, and equity securities. The DCF model is a useful
6 tool to value any investment that involves regular, periodic cash flows. The notion of
7 discounting a future receipt of cash back to the present so as to place a price or value on an
8 investment goes back centuries.¹⁹ The premise of the DCF model in the valuation of
9 common stock is that investors determine the value of a company's common stock by
10 discounting its future dividend payments back to the present. The foundation of the DCF
11 model is the process of discounting those future cash flows back to the present at the
12 investors' required return. An investor's required rate of return is risk-sensitive and
13 sensitive to the returns available on investments of comparable risk throughout the global
14 capital markets. In other words, as the risk of the investment increases, so will the investors'
15 required return. A higher required rate of return decreases the present value of the stream
16 of dividends that equates to the price of the stock. So, all other variables being equal,
17 investors price the riskier of two common stocks lower because the cash flows or dividends
18 are discounted back to the present at a higher rate.

19 The form of the DCF model that regulatory agencies are accustomed to seeing is often

¹⁹ The formal presentation of the DCF model as we use it today dates back to the 1930's in Irving Fisher's book: The Theory of Interest and John Burr Williams' 1938 text: The Theory of Investment Value. These two authors expressed the DCF model in modern economic terms.

referred to as the Gordon Growth Model, which is a model that values the security at the present value of a stream of cash flows (dividends) growing at a constant rate into perpetuity. The basic form of this DCF equation is:

$$P_0 = \frac{D_0(1 + g)}{(Ke - g)}$$

where:

P_0 = the value of the common stock or asset

D_0 = the current dividend of the stock or annual cash flow from the asset

g = the annual growth rate of the dividend or cash flow forever

Ke = cost of equity or required rate of return for the stockholders

Or

$$\text{Stock Price} = \text{Annual Dividend} / (\text{Req'd Rate of Return} - \text{Dividend Growth Rate})$$

This is the form of the equation commonly found in texts regarding finance, investments, and asset valuation. Such texts are inclusive of both theory and practical application of the DCF model in utility regulatory settings.

Regulatory agencies responsible for setting rates and revenue requirements want to know the investors' required rate of return or Ke in the equation. So, we solve the equation for that variable. The equation below shows the algebraic isolation of the investors' required rate of return. By isolating investors' required rate of return in the equation, we can estimate it by knowing the stock's dividend yield and the annual dividend growth rate expected by investors. That form of the equation is:

$$Ke = \frac{D_0(1 + g)}{P_0} + g$$

This equation is frequently written out as:

$$\text{Req'd Rate of Return} = (\text{Dividend/Current Stock Price}) + \text{Dividend Growth Rate}$$

or

$$\text{Required Rate of Return} = \text{Dividend Yield} + \text{Dividend Growth Rate}$$

Or as commonly abbreviated by regulatory agencies

$$K_e = y + g$$

Where: y = Dividend Yield
 g = Expected Dividend Growth

Through a handful of inputs, the DCF model distills down to an equation, a complex cognitive process performed by investors to value a security. As with any equation that attempts to model behavior, there are a host of assumptions that come along with it. Those assumptions are:

- K_e corresponds only to the specific stream of future dividends, rather than earnings, and that constitutes the source of value;
- the discount rate (K_e) must exceed the growth rate (g);
- the constant growth rate will continue for an indefinite future;
- investors require the same discount rate (K_e) each year; and
- there is no external financing.

Q. Why is it reasonable to accept these assumptions?

A. The DCF model is attempting to emulate investors' behavior; distilling human behavior into a handful of inputs demands simplifying assumptions. The question becomes whether the assumptions are so contrary to investors' behavior in the real-world that the model output becomes meaningless or illogical. I do not believe the assumptions of the DCF model are contrary to investor behavior and I do not know of any regulatory agency that has dismissed the DCF as being contrary to human behavior. Moreover, there are methods I use to evaluate whether an output falls outside of the realm of reality. For example, the output can be compared with the returns available on other investments such as long-term

1 corporate bonds. There were no observations eliminated using this screen.²⁰

2 **Application of the DCF Model**

3 **Q. How did you calculate the dividend yield (y) component of the DCF model?**

4 A. The dividend yield (y) is the easier of the two components to measure as it is easily
5 observable in daily stock price reports. It is calculated by dividing the stock's annual
6 dividend payment per share by its market price per share. The calculations of the DCF
7 model along with the proxy-company growth forecasts appear in the following tables. The
8 stock prices used in the calculation of the dividend yield appear in Schedule AHG-1. The
9 first table incorporates a growth forecast based on forecasted earnings per share growth
10 rates and forecasted long-run nominal GDP growth. As I discuss later, the instability
11 exhibited in the earnings of these telecommunications companies makes it unwise to place
12 any weight on these DCF results.

²⁰ Staff applies this screen using the interest rates of Baa Utility Bonds and the yields on utility-specific debt shown in the Risk Premium Table. Staff adds 100 basis points to these yields as a minimum risk premium test. Cost of equity observations below this level are eliminated from the average. FERC proceedings apply a similar test for outliers.

The five month average Baa Utility Bond Yield cited in Staff's Risk Premium study was 3.25% + 1.00% minimum risk premium = 4.25% threshold.

Discounted Cash Flow (DCF) Analysis Based on a Two-Stage Growth Estimate 22-CRKT-087-KSF						
		1	2	3	4	5
		Dividend Yields		Growth	DCF Estimated	
		Min	Max	Rate	Required Return	
AT&T	T	6.14%	8.48%	3.72%	9.86%	12.19%
Lumen Tech.	LUMN	6.47%	9.02%	1.46%	7.93%	10.48%
Shenandoah Telecom Co	SHEN	0.28%	0.63%	8.16%	8.44%	8.79%
Telephone & Data Systems	TDS	2.72%	3.95%	17.36%	20.08%	21.31%
Verizon	VZ	4.34%	5.05%	3.59%	7.92%	8.64%
Average of each column		3.99%	5.42%	6.86%	10.85%	12.28%
1) Dividend divided by maximum price observed from May 10, 2021, through November 8, 2021 2) Dividend divided by minimum price observed from May 10, 2021, through November 8, 2021 3) Forecasted long-run growth rate is the average of forecasted 3 to 5 year earnings per share growth and forecasted long-run GDP growth 4) Low-end estimate = col 1 + col 3 5) High-end estimate = col 2 + col 3						

1

2

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5

DCF calculations in this second table utilize forecasted nominal GDP growth as an estimate of long-run growth for the proxy group's dividends. As I discuss later, this view offers a somewhat more realistic expectation of potential growth in earnings and dividends from these telecommunications companies.

Discounted Cash Flow (DCF) Analysis Based on nGDP Growth Forecast of 4.36% 22-CRKT-087-KSF						
		1	2	3	4	5
		Dividend Yields		Growth	DCF Estimated	
		Min	Max	Rate	Required Return	
AT&T	T	6.14%	8.48%	4.36%	10.50%	12.84%
Lumen Tech.	LUMN	6.47%	9.02%	4.36%	10.83%	13.38%
Shenandoah Telecom Co	SHEN	0.28%	0.63%	4.36%	4.64%	4.99%
Telephone & Data Systems	TDS	2.72%	3.95%	4.36%	7.08%	8.31%
Verizon	VZ	4.34%	5.05%	4.36%	8.70%	9.41%
Average of each column		3.99%	5.42%	4.36%	8.35%	9.78%
1) Dividend divided by maximum price observed from May 10, 2021, through November 8, 2021 2) Dividend divided by minimum price observed from May 10, 2021, through November 8, 2021 3) Forecasted long-run growth rate is forecasted long-run growth for U.S. nominal GDP 4) Low-end estimate = col 1 + col 3 5) High-end estimate = col 2 + col 3						

6

1 **Q. What is the source of the dividend information?**

2 A. Historic and current dividend information is easily obtained from public subscription
3 services such as Value-Line and non-subscription services such as YahooFinance and Zacks
4 Research. The DCF model requires a forward-looking dividend payment which is often the
5 current year's dividend payment increased by the forecasted growth rate for next year. I
6 obtained the 2022 forecasted dividend per share information from Value-Line Investment
7 Survey. The Value-Line reports for each of the proxy companies are attached as Schedule
8 AHG-2. The following table details the dividend yield calculations for the proxy group.

Dividend Yields Prices from May 10, 2021, through November 8, 2021 22-CRKT-097-KSF						
		1	2		3	4
		Dividends	Stock Prices			Dividend Yield
		2022	Low	High	Max.	Min.
AT&T	T	\$ 2.08	\$ 24.54	\$ 33.88	8.48%	6.14%
Lumen Tech.	LUMN	\$ 1.00	\$ 11.09	\$ 15.45	9.02%	6.47%
Shenandoah Telecom Co	SHEN	\$ 0.17	\$ 27.16	\$ 61.53	0.63%	0.28%
Telephone & Data Systems	TDS	\$ 0.72	\$ 18.24	\$ 26.51	3.95%	2.72%
Verizon	VZ	\$ 2.57	\$ 50.86	\$ 59.26	5.05%	4.34%
					Range:	9.02% 0.28%
					Average:	5.42% 3.99%
1) 2022 Dividends per Share Forecasted by Value-Line Investment Survey; September 10, 2021 2) Minimum 6 month price observed from May 10, 2021, through November 8, 2021 3) Maximum 6 month price observed from May 10, 2021, through November 8, 2021 4) Maximum dividend yield available in the market from time period 5) Minimum dividend yield available in the market from time period						

Forecasted Growth Rates for the DCF Model

10 **Q. How did you estimate the growth rate in the DCF model?**

11 A. I relied on a combination of short-term and long-term growth forecasts, the same growth

1 forecasts that investors apply to value common stocks. The appropriate growth estimate to
2 use in the DCF model is that which is expected by the market and factored into investors'
3 analyses to estimate stock prices. The growth rate for the RLEC segment of the
4 telecommunications industry is difficult to determine because of the reasons I discussed
5 regarding declining subscribership. The difficulty stems from trying to ascertain what
6 growth estimate investors apply to the dividend stream over a very long time horizon and,
7 in this instance, we are dealing with growth estimates for a specific segment of the
8 telecommunications industry. At the broad level, the industry is growing while this segment
9 of telephony services is not growing; it is contracting. Thus, as best we can ascertain, there
10 is little to no positive growth for earnings and dividends from this narrow sector of the
11 industry.

12 **Q. Where did you obtain the short-term growth rate estimates?**

13 A. For my DCF analysis of the telecommunications service providers, I relied on three sources
14 for projected earnings growth rates: Value-Line Investment Survey, ThomsonFN (formerly
15 known as Institutional Brokers Estimation Service or IBES) reported at YahooFinance.com,
16 and analysts' consensus growth rates reported by Zacks Research. I averaged these earnings
17 growth forecasts together to arrive at a short-term growth estimate of the proxy companies.

18 Value-Line is a respected source for financial analyses, capital market commentary, and
19 financial forecasts of publicly traded stocks. Its forecasts and commentary are readily
20 available to institutional and individual investors. Value-Line's forecasts have been
21 scrutinized in numerous academic studies and demonstrated to be a good source for

1 financial forecasts used in the DCF and similar models. As a result, Value-Line is the most
2 frequently-quoted source for growth forecasts used in regulatory proceedings.

3 ThomsonFN (fka, IBES) is owned by Thomson-Reuters and its five-year growth estimates
4 are reported through YahooFinance and its own web based service. The forecasted growth
5 rates it reports provide a different perspective from Value-Line. These are not growth
6 estimates prepared by ThomsonFN; they are the forecasts of analysts who actively follow
7 the companies. I incorporated ThomsonFN forecasts because these are the product of
8 analysts working for institutional money managers; their decisions and forecasts affect
9 investors' expectations and valuations of a stock's price. Zacks Research, likewise, reports
10 the consensus of analysts' forecasts.

Growth Rate Summary 22-CRKT-087-KSF												
		Value-Line Historic Data				Forecasted Growth Rates						
		Earnings Growth		Dividend Growth		Value Line		IBES	Zacks	Short-run	Long-term	Average
		10 Year	5 Year	10 Year	5 Year	EPS	DPS	EPS	EPS	Average	nGDP	Growth Rate
AT&T	T	4.50%	6.00%	2.00%	2.00%	2.50%	2.50%	3.64%	3.67%	3.08%	4.36%	3.72%
Lumen Tech.	LUMN	-8.50%	-1.00%	1.50%	-6.00%	3.50%	-5.50%	-11.74%	7.98%	-1.44%	4.36%	1.46%
Shenandoah Telecom Co	SHEN	3.00%	-0.50%	6.50%	6.50%	6.50%	5.00%	24.40%		11.97%	4.36%	8.16%
Telephone & Data Systems	TDS	1.50%	15.50%	5.50%	4.00%	1.50%	3.50%	86.08%		30.36%	4.36%	17.36%
Verizon	VZ	7.50%	5.00%	2.50%	2.50%	2.50%	2.00%	3.57%	3.19%	2.82%	4.36%	3.59%
	Min	-8.50%	-1.00%	1.50%	-6.00%	1.50%	-5.50%	-11.74%	3.19%	-1.44%		1.46%
	Max	7.50%	15.50%	6.50%	6.50%	6.50%	5.00%	86.08%	7.98%	30.36%		17.36%
	Mean	1.60%	5.00%	3.60%	1.80%	3.30%	1.50%	21.19%	4.95%	9.36%		6.86%

Columns: 1) - 6) Historic 5 & 10 Year & Forecasted growth rates as reported by Value-Line on September 10, 2021
7) 5-year forecasted annual earnings per share growth rate. Consensus forecasts gathered by Thomson-Reuters (aka I/B/E/S) and reported at YahooFinance on November 15, 2021
8) 5-year forecasted annual earnings per share growth rate. Consensus forecasts gathered by Zacks Investments gathered on November 15, 2021
9) Average of 3 to 5-year forecasted annual growth rates (columns 5 through 9)
Long-term forecasted nominal GDP growth rate. Average of long-term forecasts by the U.S. Energy Information Agency and Social Security Administration Office of the Chief Actuary. SSA-OADSI 2019 Trustee Report
11) Average of short-term and long-term growth rates applied in DCF analysis

12 **Q. Please discuss the importance of the growth rate in the DCF equation.**

13 **A.** The growth rate represents the anticipated annual growth rate in cash-flows that investors

1 expect to receive through dividends from the stock. This is a challenging and contentious
2 issue in a DCF analysis for two reasons. First, it is a key element in the DCF model, or any
3 form of a discounted cash flow analysis, because the growth rate has a one-for-one effect
4 on the required return produced by the model. All other factors being equal, a higher growth
5 rate results in an equally higher cost of equity for the utility. Second, it is highly subjective
6 due to the uncertainty about future earnings and dividends, as well as the economy.

7 **Q Do you believe these short-term, three to five-year earnings growth forecasts are useful**
8 **for estimating the cost of equity for RLECs in Kansas in these KUSF audits?**

9 A I believe these growth estimates are of very limited value in a DCF analysis of RLEC
10 segment of the telecommunications industry. In the broad picture of the
11 telecommunications industry, earnings have been volatile. As you can see in the Value-
12 Line reports in Schedule AHG-2 and the previous table, the proxy group exhibits historic
13 earnings that have gone from strongly negative to forecasts of double-digit positive growth.
14 This volatility does not lend itself to estimating a long-run growth rate necessary for use in
15 DCF analysis.

16 **Q. How do investors estimate the dividend growth rate beyond the three to five-year**
17 **horizon of the short-term growth forecasts?**

18 A. For the long-term perspective of potential growth, investors rely on forecasts of the broad
19 economy as measured by annual changes forecasted for the nation's gross domestic product
20 (GDP). There are sources for long-term growth estimates of this country's GDP that extend

1 out more than 20 years. Academic texts and investment professionals use these forecasts
2 in DCF models as a forecast of potential long-term growth of corporate dividend payments.

3 GDP refers to the market value of all final goods and services produced within a country in
4 a given period. Nominal GDP (nGDP) is that measure of goods and services which includes
5 effects of price changes - better known as inflation. Inflation must be included for our
6 forecast because the DCF analysis is interested in the nominal required return. That is to
7 say, investors' expectations of inflation are contained in their required return. Keep in mind
8 that the "headline" GDP reported in the media is *real* GDP, which is GDP *less* the inflation
9 experienced over the measurement period.

10 **Q. Is there evidence that investors depend on forecasts of GDP growth to value common**
11 **stocks?**

12 A. Yes, academic research has shown that nGDP growth forecasts are an important input to
13 valuation studies because the analyst has to consider whether a company's annual earnings
14 can grow as fast as, or even faster than, the broad economy. In two of his books devoted to
15 the subject of asset valuation, Dr. Aswath Damodaran discusses the nature of a stable
16 growth rate for DCF models.²¹ He argues for viewing nominal economic growth as the
17 absolute maximum when using a stable-growth model, such as the DCF model we are using.

18 "The stable growth rate cannot exceed the growth rate of the
19 economy in which a firm operates, but it can be lower. There is
20 nothing that prevents us from assuming that mature firms will
21 become a smaller part of the economy and it may, in fact, be the more

²¹ Investment Valuation: Tools and Techniques for Determining the Value of Any Asset, 2nd Edition and Damodaran on Valuation: Security Analysis for Investment and Corporate Finance, 2nd Edition.

1 reasonable assumption to make. Note that the growth rate of an
2 economy reflects the contributions of both young, higher growth
3 firms and mature, stable growth firms. If the former grow at a rate
4 much higher than the growth rate of the economy, the latter have to
5 grow at a rate that is lower.” (Damodaran on Valuation: Security
6 Analysis for Investment and Corporate Finance, 2nd edition, Aswath
7 Damodaran, p. 148)

8 “The growth rate of a company cannot be greater than that of the
9 economy but it can be less. Firms can become smaller over time
10 relative to the economy. Thus, even though the cap on the growth
11 rate may be the nominal growth rate of the economy, analysts may
12 use growth rates much lower than this value for individual
13 companies.” (Damodaran on Valuation: Security Analysis for
14 Investment and Corporate Finance, 2nd edition, Aswath Damodaran,
15 p.159)

16 It is worth noting that Professor Damodaran cites the nGDP growth projection as a *ceiling*
17 for long-term growth in most valuation studies. Certainly, there are industries that will
18 exceed the average for a period of time, but even for those industries, such growth cannot
19 continue forever.

20 **Q. Does the view that nGDP growth is a ceiling on long-term earnings growth exist**
21 **outside of academia?**

22 A. Yes, valuation analysts carefully consider the long-run growth rates used to value assets
23 because using an incorrect growth estimate will lead to incorrectly valuing an asset.
24 Institutions directly involved in asset valuation and asset management that apply valuation
25 models to analyze potential acquisition and merger transactions recognize that estimates of
26 firm-specific growth are a driver to the value of an asset; overstating growth would cause a
27 model to overestimate the value of the asset, which would result in an economic loss to the

1 investor. These experts also warn of a ceiling to earnings growth rates as being no more
2 than that of broad economic growth.

3 “Growth rate: Few companies can be expected to grow faster than the
4 economy for long periods. The best estimate is probably the expected long-
5 term rate of consumption growth for the industry’s products, plus inflation.”
6 (Valuation: Measuring and Managing the Value of Companies, Tim Koller,
7 Mark Goedhart, and David Wessels, McKinsey & Co; 4th ed, p. 275.)

8 The following quote from J.P. Morgan Asset Management (JPMAM) addresses the macro
9 or economy-wide measures of profits, and it is consistent with the firm-specific view
10 expressed by asset valuation experts in that analysts must be aware of the forecasted growth
11 rates applied in valuation models and how those growth forecasts comport with broad
12 measures of forecasted economic growth.

13 “One common mistake is to assume that earnings and dividends received by
14 investors can grow in line with—or even in excess of—overall economic
15 growth (GDP) in perpetuity. Granted, it is almost a truism that aggregate
16 earnings must grow at the same pace as the overall economy in the very long
17 run; otherwise, profits would eventually outstrip the size of the entire
18 economy or dwindle to an insignificant share of it. But not all of this
19 earnings growth accrues to existing shareholders. On the contrary, a large
20 portion of economic growth comes from the birth of new enterprises. Some
21 commentators suggest (for example, Bernstein and Arnott, 2003; Cornell,
22 2010) that new enterprises account for more than half of GDP growth in the
23 U.S., while in some rapidly developing economies new enterprises may
24 account for the lion’s share of overall economic growth.”²²

25 Peter L. Bernstein and Robert D. Arnott, referenced in the quote, have both published in
26 peer-reviewed academic journals and books on investment strategy, as well as building
27 careers in the field of asset management and investment strategy. Their research suggests

²² Long-term Capital Market Return Assumptions: 2015 Estimates and Thinking Behind the Numbers, J.P. Morgan Asset Management, p. 25, <https://am.jpmorgan.com/us/institutional/lcmra>

1 that relying on GDP as the long-run growth estimate could actually be overly optimistic.
2 Research by Bernstein and Arnott warns practitioners that a portion of nGDP growth is
3 created by new enterprises and that portion of nGDP growth does not contribute to the
4 earnings growth of existing enterprises.²³ That notion is particularly important when
5 evaluating the wire-line operations of the telecommunications industry because it is
6 growing at a rate far below that of the broad economy.

7 It is clear that the linkage between expected economic growth and the growth potential of
8 corporate earnings and dividends is more than just an academic principle in finance;
9 professional money managers accept the relationship between GDP growth and corporate
10 earnings growth when forming their long-run forecasts.

11 **Q Is there a definitive growth trend for the RLEC industry?**

12 A Yes. For the past 20 years, there is a definitive trend in the growth of land-line
13 subscriptions; that trend is negative, driven by substituting wireless telephone service.²⁴
14 Based on reports and industry research, that trend is likely to continue. I have not found
15 any research material to suggest that land-line growth will be positive or even flat. For
16 example, Standard & Poors had this to say regarding growth expectations in the
17 telecommunications industry and its sub-categories:

18 Under our baseline economic assumptions, while we expect revenues
19 across the telecommunications and cable-TV sectors to be fairly flat

²³ Earnings Growth: The Two Percent Dilution, William J. Bernstein and Robert D. Arnot, Financial Analysts Journal, September/October 2003, pp 47-55.

²⁴ Wireless Substitution: Early Release of Estimates From National Interview Survey, July-December 2018; National Center for Health Statistics, U.S. Department of Health and Human Services; released June 2019, <https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201906.pdf>

1 on an aggregate basis, there are varying prospects for different
2 segments. For the wireline sub-segment, we anticipate generally flat
3 to negative revenue trends as residential voice customers are lost to
4 wireless and to cable competition, and as the pace of new digital
5 subscriber-line (DSL) customer additions wanes. In contrast,
6 prospects for the wireless industry are considerably better and we
7 anticipate that increasing data usage, spurred by the growing
8 proportion of smartphones, should somewhat offset lower voice
9 yields, which, combined with some increase in subscribers, should
10 enable the largest wireless operators to post modest revenue increases
11 in 2012. (p4)

12
13 In marked contrast to a still-growing wireless industry, landline
14 telephone companies continue to see mid-single- to low-double-digit
15 erosion of their residential voice customer base. While some of those
16 losses are to cable telephony, the more important longer term issue for
17 the wireline industry is the continuing, significant loss of voice access
18 lines to wireless substitution, as more customers--especially younger
19 ones--increasingly choose to have only a wireless device. (p6)²⁵
20

21 Standard & Poor's reiterated this sentiment in a 2019 update on the industry: "[i]n wireline,
22 we expect revenues to decline in the mid-single-digit percent area in the U.S. due to the loss
23 of voice access lines to wireless substitution, and broadband customers to cable."²⁶ Thus,
24 the sentiment underlying the substitution of other services for traditional land-line telephony
25 service has been in place and recognized by analysts for the last decade.

26 The capital markets recognize that the traditional wire-line services and the basic telephony
27 services that fall under the KUSF umbrella are not driving the telecommunications
28 industry's growth. This point is important when it comes to applying the DCF models to
29 estimate the required return on equity in KUSF audits, such as we are doing here. In

²⁵ Industry Report Card: U.S. Telecommunications And Cable: Some Islands Of Weakness In A Relatively Stable Sea, Standard & Poors' Ratings Direct on the Global Credit Portal, April 25, 2012;
www.standardandpoors.com/ratingsdirect

²⁶ Industry Top Trends 2019: Telecommunications, Standard & Poors' Ratings, November 15, 2018, p. 6.

1 applying the DCF model, it is vital to review the growth forecasts to make certain that they
2 represent a realistic expectation for the future. Based on the research cited above, we cannot
3 simply apply a forecasted earnings or dividend growth rate of the telecommunications
4 industry or telecommunications companies in the proxy group because that would include
5 the potential of wireless, broadband, and cable television services. Those are not KUSF
6 covered services. And because of these growth expectations, I believe the best information
7 available for a DCF analysis of land-line segment of this industry is a forecast of the broad
8 U.S. economy such as nGDP.²⁷ The rationale for using this estimate in a DCF analysis is
9 that, despite volatility of short-term corporate earnings or dividend forecasts, a mature
10 industry, such as provision of basic telecommunications services, is likely to experience
11 long-term growth *no greater than* that of the general economy, if not lower. The
12 Commission has found that Staff's use of nGDP growth forecasts in the DCF model is
13 reasonable and appropriate.²⁸ In Staff's view, even the nGDP growth forecast could be
14 overly optimistic for landline telephony services given the rate of product substitutions
15 occurring.

16 **Q. How did you estimate long-run nominal GDP growth?**

17 A. I averaged the long-run nGDP forecasts of the Energy Information Agency (EIA) and the
18 Social Security Administration (SSA). The average of these two forecasts composes the
19 long-run growth estimate in the DCF analysis. The nGDP growth forecasts published by

²⁷ nGDP is a measure of the United States' economic output -- the market value of all final goods and services made within the borders of the country in a year and includes the year-to-year effects of general price increases or inflation.

²⁸ Order Setting Annual Cost-Based Kansas Universal Fund Support For LaHarpe Telephone Company, Inc.; June, 26, 2013; Docket No. 12-LHPT-875-AUD; para 20.

1 EIA and SSA are the same sources that I have relied on over the past decade. FERC also
 2 uses these two sources for nGDP estimates. There are other sources shown in the table and
 3 they are slightly lower, but still consistent with the EIA and SSA forecasts.

Nominal GDP Estimates

Energy Information Agency (EIA) 2017 - 2050	4.45%
Congressional Budget Office Long-term Outlook	4.50%
Soc Sec Admin (SSA) OADSI Trustees Report 2020 - 2095	4.09%
Exxon-Mobile 2018 Outlook for Energy 2018 - 2040	4.40%
Average	4.36%

Sources:

EIA Annual Energy Outlook 2021

An Update to the Economic Outlook: 2021-2031; CBO, July 2021

OADSI Trustees Report Office of the Chief Actuary, Table V.B1-V.B2

ExxonMobile 2020 Outlook for Energy

4
 5 **Q What do you believe to be an appropriate estimate of growth for this segment of the**
 6 **telecommunications industry?**

7 A For the services covered by the KUSF and the limited growth expected of those services
 8 provided by the RLEC, I believe the best alternative available for a DCF analysis is using
 9 a forecast of the broad U.S. economy such as nGDP, and even this growth estimate is
 10 likely generous. The rationale for using this estimate in a DCF analysis is that a mature
 11 industry that is in decline, such as provision of basic land-line telecommunications
 12 services, is likely to experience long-term growth no greater than that of the general
 13 economy. Below are two tables of DCF inputs and results. The first table utilizes
 14 forecasted earnings and dividend growth rates for the short-term and forecasted nGDP
 15 growth as a long-run growth estimate. The second table relies only on the nGDP

1 forecasted growth rate, leaving out the volatile short-term growth forecasts.

Discounted Cash Flow (DCF) Analysis Based on a Two-Stage Growth Estimate 22-CRKT-087-KSF						
		1	2	3	4	5
		Dividend Yields		Growth	DCF Estimated	
		Min	Max	Rate	Required Return	
AT&T	T	6.14%	8.48%	3.72%	9.86%	12.19%
Lumen Tech.	LUMN	6.47%	9.02%	1.46%	7.93%	10.48%
Shenandoah Telecom Co	SHEN	0.28%	0.63%	8.16%	8.44%	8.79%
Telephone & Data Systems	TDS	2.72%	3.95%	17.36%	20.08%	21.31%
Verizon	VZ	4.34%	5.05%	3.59%	7.92%	8.64%
Average of each column		3.99%	5.42%	6.86%	10.85%	12.28%
1) Dividend divided by maximum price observed from May 10, 2021, through November 8, 2021 2) Dividend divided by minimum price observed from May 10, 2021, through November 8, 2021 3) Forecasted long-run growth rate is the average of forecasted 3 to 5 year earnings per share growth and forecasted long-run GDP growth 4) Low-end estimate = col 1 + col 3 5) High-end estimate = col 2 + col 3						

2

Discounted Cash Flow (DCF) Analysis Based on nGDP Growth Forecast of 4.36% 22-CRKT-087-KSF						
		1	2	3	4	5
		Dividend Yields		Growth	DCF Estimated	
		Min	Max	Rate	Required Return	
AT&T	T	6.14%	8.48%	4.36%	10.50%	12.84%
Lumen Tech.	LUMN	6.47%	9.02%	4.36%	10.83%	13.38%
Shenandoah Telecom Co	SHEN	0.28%	0.63%	4.36%	4.64%	4.99%
Telephone & Data Systems	TDS	2.72%	3.95%	4.36%	7.08%	8.31%
Verizon	VZ	4.34%	5.05%	4.36%	8.70%	9.41%
Average of each column		3.99%	5.42%	4.36%	8.35%	9.78%
1) Dividend divided by maximum price observed from May 10, 2021, through November 8, 2021 2) Dividend divided by minimum price observed from May 10, 2021, through November 8, 2021 3) Forecasted long-run growth rate is forecasted long-run growth for U.S. nominal GDP 4) Low-end estimate = col 1 + col 3 5) High-end estimate = col 2 + col 3						

3

4 **Q What is your conclusion from the DCF analyses?**

5 **A.** As I discussed in the Executive Summary, I am placing minimal weight on the DCF

1 analyses that contain forecasted earnings and dividend growth rates because those growth
2 rates are volatile and do not reflect growth associated with land-line telephony services.
3 The DCF analyses that relies on long-term growth of the broad economy is somewhat
4 informative as it is indicative of the expected returns on equity securities generally, even
5 though it is not directly tied to RLEC telephony services.

6 **CAPM Analysis**

7 **Q. Please describe the CAPM?**

8 A. The CAPM is an important tool of finance because it offers an explanation of the positive
9 relationship between risk and ROR required by investors.²⁹ It is one of the cornerstone
10 financial models. For example, every merger and acquisition analysis performed by an
11 investment banker involving a Kansas utility has incorporated a CAPM analysis as a critical
12 component of the valuation process. It is appealing to regulators because it meets the legal
13 standards I discussed above, as it can be structured to incorporate current data from the
14 financial markets and the unique risks of the utility in question.

15 $Ke = Rf + \text{Beta} (Rm - Rf)$ or

16 $Ke = Rf + \text{Beta} (Rp)$

17 Where:

18 Ke = required return on equity

19 Rf = return on a risk-free security

20 Rm = an expected return from the market as a whole

21 Rp = risk premium available to investors through purchasing common stocks instead of risk-free
22 securities often calculated as $Rm - Rf$

23 Beta = volatility of the security's or portfolio's return relative to the volatility of the market's return
24 with the market beta equal to 1.0

²⁹ The theoretical support for the CAPM is the work done by Harry Markowitz ("Portfolio Selection," Journal of Finance, March, 1952). W.F. Sharpe added the concept of a risk-free rate of return to the Markowitz model ("A Simplified Model of Portfolio Analysis," Management Science, January, 1963).

1 **Rf**

2 The Rf estimate is the interest rate investors believe represents a riskless return. Although
3 it is a simple concept, the answer is not universally agreed upon. It is widely accepted that
4 a debt instrument issued by the U.S. Government is a risk-free instrument. An investment
5 in U.S. Treasury Bonds is a risk-free investment, if the investor plans to hold it until
6 maturity.

7 **Beta**

8 The beta coefficient measures the volatility of the return earned by the utility's stock relative
9 to the volatility of the returns earned by the broader equity market. The broad equity market
10 is frequently measured using the S&P 500 Index. This measure provides a look at the risk
11 and volatility of a stock relative to other investments. A stock with a beta of 1 is equally as
12 volatile as the market as a whole. A stock with a beta of 0.5 is half as volatile as the market.
13 Value-Line reports that the proxy group has a beta coefficient of 0.86 with a range of 0.65
14 to 1.00.

15 **Rm**

16 Rm is the expected return on the stock market as measured by a broad market index such
17 as the S&P 500. This represents the total return consisting of the price change of the index
18 plus dividends earned for the year.

19 **Rp**

1 The risk premium is the difference between investors' expected return from the stock
2 market and their expected return from the risk-free investment over the same time period.
3 The risk premium is written as $R_m - R_f$. The market return and the risk-free return should
4 be taken from the same time period so as to accurately measure the additional return
5 required by investors to take on the risk of common stocks over the risk-free investment
6 over that forecasted or historic time period. The risk-premium itself is an important topic
7 in financial research as it signals the additional return investors demand when taking of the
8 added risks of investing in equity capital instead of a U.S. Treasury Bond.

9 **Q. Does the CAPM meet the *Hope-Bluefield* legal standards discussed earlier in your**
10 **testimony?**

11 A. Yes, a cost of equity estimate derived from the CAPM meets those legal standards if the
12 model incorporates current information from the capital markets that investors rely on to
13 evaluate investment options. This market-based information ensures the cost of equity
14 estimates evaluate investors' required rate of return or discount rate that reflects the current
15 economic environment. In the CAPM analysis, such information is the expected returns in
16 the broad equity market and the return available on risk free investment vehicles.

17 **Q. Please discuss your CAPM analysis.**

18 A. I took two distinct approaches to the CAPM analysis that are commonly found in both cost
19 of capital studies in regulatory and asset-valuation arenas. I performed one analysis using
20 purely historic measures of returns from the stock and bond markets. The other analyses
21 incorporate forecasted returns on debt and equity capital from three different sources. The

1 results are very different with the two approaches because historic returns on equity capital
2 are drastically higher, 11.64%, compared to forecasted returns of 5.73% to 8.00%. This
3 range reflects the overwhelming evidence that expectations for future returns on capital
4 investments are much lower than those experienced by investors over the past century.
5 Keep in mind that there are several unique and distinct sources for the forecasted returns
6 and none of them are anywhere near the level of historic returns.

Summary of CAPM Findings		
	Low Beta	High Beta
Forecasted Data:		
J.P. Morgan Asset Management	5.72%	7.19%
Black Rock	5.97%	7.72%
Duff & Phelps	6.08%	8.00%
Historic Data:		
Arithmetic Returns	8.99%	11.24%

7

8 Both forms of my CAPM analyses incorporate the high and low beta coefficients observed
9 in the proxy group. The average beta of the proxy group is about 86% of that exhibited by
10 the broad equity market, indicating that telecommunications companies are viewed as
11 slightly less volatile (and less risky) than the broad stock market.

Beta Coefficients		
AT&T	T	0.850
Lumen Tech (Century Link)	CTL	0.950
Shenandoah Telecommunications Co	SHEN	N/A
Telephone & Data Systems	TDS	1.000
Verizon	VZ	0.650
		0.863
Source:		
Value-Line Investment Survey, September 10, 2021		

1

2 **Q. Please describe your forecasted CAPM analyses.**

3 A. For the forecasted CAPM analyses, I obtained forecasts of long-run returns for common
4 equity and U.S. Treasury Bonds from three distinct sources: J.P. Morgan Asset
5 Management (JPMAM); BlackRock Investments (BlackRock); and Duff & Phelps.
6 Combined, JPMAM and BlackRock oversee more than \$8.5 trillion dollars with individual
7 and institutional clients worldwide. Thus, it is reasonable to assume their published
8 forecasts influence the expectations of investors beyond just their own client base. JPMAM
9 and BlackRock each publish annually their views of long-run (more than 15 years) returns
10 available of numerous asset classes. Their respective forecasts are not identical, taken
11 together, they provide a range for long-run returns on asset classes by the largest asset
12 management companies. Although it does not manage investments, Duff & Phelps is a
13 global provider of advisory services to the financial industry and corporations. Those
14 services include forecasts of expected market returns and risk premium.

Summary of Market Returns Used in CAPM Studies	
Forecasted Market Return Published in 2021	
J.P. Morgan	5.73%
Black Rock	7.30%
Duff & Phelps	8.00%
Historic Market Returns 1928-2020	
Arithmetic Returns	11.64%
Geometric Returns	9.79%

1

2 **Q. Please discuss the expected returns on common stocks as forecasted and published by**
3 **asset management companies.**

4 A. I reviewed returns expected on common stocks over the next 10 to 15 years. JPMAM
5 directly manages more than one-trillion dollars of assets making their forecasts an important
6 indicator of the expectations of sophisticated, institutional investment advisors. J.P.
7 Morgan's forecast is not unique; the expectations of other money management firms are
8 similar. In the last three years, these firms maintained relatively low expected returns on
9 common stocks and corporate bonds. This information is an indication that sophisticated
10 institutional investors continue to expect low returns on investments into the future and that
11 has been their expectation for each of the last seven years. The following table shows the
12 10 to 15-year projected returns published by JPMAM for each of the previous seven years;
13 the same time period that Staff has advocated the 9.60% ROE for RLECs.

**J.P. Morgan Asset Management
Long-Term Capital Market
Assumptions
Forecasted 10 to 15 Year
Annual Arithmetic Total Returns**

	Large Companies	Mid-Size Companies
2012	9.69%	11.35%
2013	8.71%	10.23%
2014	8.49%	9.10%
2015	7.60%	8.34%
2016	8.09%	8.54%
2017	7.25%	8.03%
2018	6.41%	6.39%
2019	6.03%	6.79%
2020	6.55%	7.12%
2021	5.13%	5.73%

Source:

<https://am.jpmorgan.com/us/>

1

2 **Q. How is JPMAM data applied to the CAPM analysis?**

3 A. For this CAPM analysis, we are interested in their forecasted returns on common stock in
4 the U.S. and U.S. Treasury Bonds published by JPMAM to establish the expected return for
5 the market. JPMAM publishes 10 to 15-year forecasts of expected returns on dozens of
6 investment asset classes in its annual publication, the Long Term Capital Market Return
7 Assumptions (LTCMRA).³⁰ JPMAM forecasts an annual return on common stocks of

³⁰ J.P. Morgan Asset Management, Long-term Capital Market Return Assumptions, 2021 Edition, J.P. Morgan Asset Management (published October of 2020).

www.jpmorganinstitutional.com/pages/jpmorgan/am/ia/research_and_publications/long-term_capital_market

1 5.73% (the average of its forecasted returns on small companies of 6.33%, mid-sized
2 companies of 5.73%, and large companies of 5.13%). The JPMAM's forecasted returns on
3 common stocks has trended downward over the past decade, generally a product of the
4 increase in stock prices during this bull market. Following the calculations and inputs
5 through the CAPM equation in line 2 of the following table, the forecasted return on a risk-
6 free investment, 10-Year U.S. Treasury Bonds, is subtracted from the expected return on
7 common stocks, resulting in a risk premium of 4.19%. This risk premium is the additional
8 return necessary to induce investors to take on the added risk associated with common
9 stocks over the risk-free investment in a U.S. Treasury Bond. The beta coefficient is applied
10 to the risk premium to ascertain how much of a risk premium is necessary for investors to
11 take on risks of investing in utility stocks as opposed to the risk free U.S. Treasury Bond.

**Capital Asset Pricing Model -- Forecasted Risk Premium
Using Forecasted Market Returns & Treasury Bond Yields
22-CRKT-087-KSF**

		Low Beta	High Beta	Avg Beta
1) Forecasted Returns on Common Stocks		5.73%	5.73%	5.73%
2) Forecasted Total Return on 10-Year T-Bonds	-	1.54%	1.54%	1.54%
3) Equity Risk Premium		4.19%	4.19%	4.19%
4) Beta Coefficient	X	0.65	1.00	0.87
5) Beta Adjusted Risk Premium		2.72%	4.19%	3.65%
6) Forecasted Yield on 10-Year T-Bonds	+	3.00%	3.00%	3.00%
7) For Cost of Equity		5.72%	7.19%	6.65%

-
- 1) Forecasted 10 to 15-year annual arithmetic return on stocks
J.P. Morgan Asset Management, 2021 Edition.
 - 2) Forecasted 10 to 15-year annual arithmetic return on intermediate term
U.S. Government bonds by J.P. Morgan Asset Management, 2021 Edition.
 - 3) Resulting risk premium (1-2).
 - 4) Beta coefficient range of proxy group reported by Value-Line.
 - 5) Row 3 x Row 4 = asset specific risk premium.
 - 6) Forecasted yield on 10-Year U.S. Treasury bonds forecasted by
J.P. Morgan Asset Management, 2021 Edition (page 71).
 - 7) Forecasted cost of equity capital row 5 + row 6.
-

Sources:

J.P. Morgan Asset Management, Long-term Capital Market Return Assumptions,
2021 Edition, J.P. Morgan Asset Management

1

2 The expected risk-free yield of 3.00% forecasted by JPMAM is added to the beta specific
3 risk premium to arrive at the cost of equity for the given beta coefficients of 0.65 to 1.00.

4 The next table applies the same methodology using inputs from BlackRock Investments.
5 These two capital asset pricing models vary with respect to the precise return each projects
6 that is demanded by investors going forward. What is very apparent is that the models from
7 both of these sources project that returns on equity capital in the future will be lower than
8 the historic returns. Their view of lower returns is virtually universally accepted across the
9 investment banking and asset management industry.

**Capital Asset Pricing Model -- Forecasted Risk Premium
Forecasted Market Returns & Treasury Bond Yields
by BlackRock Investments**

		Low Beta	High Beta	Avg Beta
1) Forecasted Returns on Common Stocks		7.30%	7.30%	7.30%
2) Forecasted Total Return on 10+ Year U.S. T-Bonds	-	2.30%	2.30%	2.30%
3) Equity Risk Premium		5.00%	5.00%	5.00%
4) Beta Coefficients of Proxy Group	x	0.65	1.00	0.87
5) Beta Adjusted Risk Premium		3.25%	5.00%	4.35%
6) Forecasted Yield on 10-Year T-Bonds	+	2.72%	2.72%	2.72%
7) Cost of Equity		5.97%	7.72%	7.07%

-
- 1) Forecasted 25-year annual geometric returns on U.S. common stocks (average of large and small capitalization)
 - 2) Forecasted 25-year annual geometric return on intermediate term Treasury bonds
 - 3) Resulting risk premium (1-2)
 - 4) Beta coefficient range of proxy group reported by Value-Line.
 - 5) Proxy Group risks premium
 - 6) Forecasted yield on 10-Year U.S. Treasury bonds published in Survey of Professional Forecasters (Federal Reserve Bank of Philadelphia)
 - 7) Forecasted cost of equity capital row 5 + row 6.
-

Sources:

<https://www.blackrockblog.com/blackrock-capital-markets-assumptions/>
<https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/2018/survq118>

1

2 **Q. What is the third source of data used in the forward looking CAPM analyses?**

3 A. I relied on data published by Duff & Phelps, a global financial services company. Specific
 4 to cost of capital estimation, Duff & Phelps provides forward-looking estimates of an equity
 5 risk premium (ERP) and a risk-free return. Just as in the previous CAPM equations, the
 6 ERP is multiplied by the beta coefficient of the proxy group and that product is added to the
 7 risk-free rate of return to arrive at the cost of capital for those specific assets. As capital
 8 markets change, Duff & Phelps adjusts its ERP and risk-free return estimates; the latest
 9 update was issued on September 30, 2019.

**Capital Asset Pricing Model -- Duff & Phelps' Forecasted Risk Premium
Using Forecasted Market Returns & Treasury Bond Yields**

		Low Beta	High Beta	Avg Beta
1) Duff & Phelps U.S. ERP		5.50%	5.50%	5.50%
2) Beta Coefficient	x	0.65	1.00	0.87
3) Proxy Group Risk Premium		3.58%	5.50%	4.79%
4) Duff & Phelps U.S. Risk-Free Rate of Return	+	2.50%	2.50%	2.50%
5) Proxy Group Cost of Equity		6.08%	8.00%	7.29%

-
- 1) Duff & Phelps U.S. Equity Risk Premium as of September 20, 2021.
 2) Beta coefficient range of proxy group reported by Value-Line.
 3) Resulting risk premium for proxy group (1-2).
 4) Duff & Phelps U.S. Risk-Free Rate of Return as of September 20, 2021.
 5) Forecasted Cost of Equity Range for Proxy Group
-

Sources:

<https://www.duffandphelps.com/insights/publications/valuation-insights/valuation-insights-first-quarter-2021/duff-and-phelps-recommended-us-equity-risk>

1

2 **Q. Does the historic CAPM corroborate the findings of your forecasted CAPM analyses?**

3 A. No, not at all as the cost of equity calculated using purely historical data are significantly
 4 greater than found with the three scenarios using forecasted returns. For the historical
 5 CAPM, I relied on data of returns earned from 1928 through 2020. This outcome is
 6 expected in light of the published research discussed earlier that future returns in the capital
 7 market are unlikely to match those of the past 80 years.

**Capital Asset Pricing Model -- Historic Risk Premium
Based on Historic Arithmetic Risk Premiums
from 1928 to 2020**

	Low Beta	High Beta
1) Total Returns on Common Stocks	11.64%	11.64%
2) Total Return on Government Bonds	- 5.21%	5.21%
3) Resulting Risk Premium	6.43%	6.43%
4) Beta Coefficient	x 0.65	1.00
5) Risk Premium	4.18%	6.43%
6) Historic Yield on Government Bonds	+ 4.81%	4.81%
7) Forecasted Cost of Equity Based on Historic Returns	8.99%	11.24%

- 1) Historic returns on common stocks 1928-2020
 2) Historic returns on intermediate-term government bonds 1928-2020
 3) Resulting risk premium (1-2)
 4) Beta coefficient of the proxy group (Reported by Value-Line)
 5) Row 3 x Row 4 = Asset Specific Risk Premium
 6) Historic year-end yield on intermediate-term government bonds 1928-2020
 7) Forecasted cost of equity capital, row 5 + row 6

Sources: Damodaran Online

http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histretSP.html
 & Value-Line Investment Survey.

1

2 If we rely on purely historic data, we have to assume that certain trends, particularly
 3 economic growth, observed in the past 80 years will continue in the future. It is well
 4 established that the U.S. economy is projected to grow at a slower rate than that experienced
 5 in the past. The projected growth rate is 4.36% compared to the historic growth rate of
 6 5.93%.³¹ Additionally, it would assume that this historical stock market data accurately

**Historic
Nominal GDP (Billion \$'s)**

1928	\$	104.60
2020	\$	20,893.70
5.93%		

Source: Bureau of Economic Analysis
www.bea.gov

31

1 measures the past returns. There is evidence that these frequently-quoted historic returns
2 do not present a complete picture in part due to the beginning period that is often used in
3 the calculation.³² The simple step of beginning the measurement period in 1920's brings
4 questions as to whether the time period represents all of the modern-era securities trading.
5 The beginning years of that time period is the bottom of the Great Depression and market
6 returns for the decade coming out of that event were very high. Whether or not 1920's is
7 the best point in time to begin measuring historic returns, these historic returns are widely
8 reported and frequently referred to in discussions of the capital markets and potential
9 returns. There are well-regarded financial publications that focus solely on this type of
10 historic data and how to apply it in cost of capital studies. Thus, measurements from this
11 time period might influence expectations despite warnings that surround historic economic
12 growth rates and market returns. I have to agree that the historic data is often cited and is
13 part of the cost of capital universe, but I believe it has significant limitations and policy
14 makers should give it only light consideration in their final decision.

15 **Q. Does this conclude your testimony?**

16 **A. Yes.**

³² McQuarrie, Edward F, "The Myth of 1926: How Much Do We Know Long-Term Returns on U.S. Stocks?" The Journal of Investing; Winter 2009, p. 96.

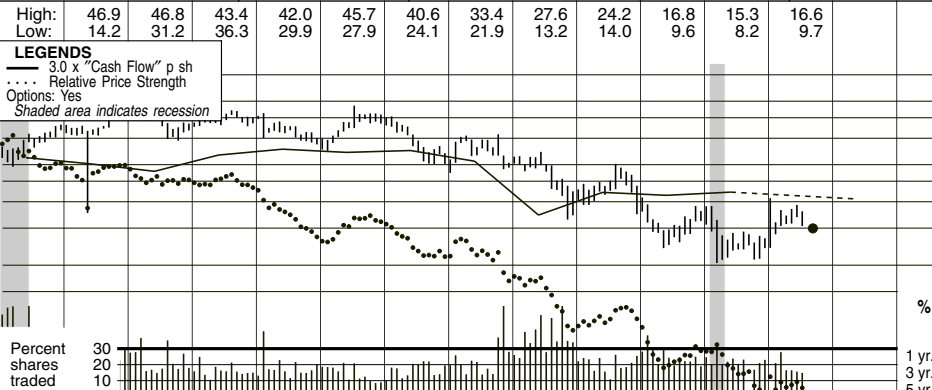
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Schedule AHG-1

Date	AT&T (T)		Lumen Tech (LUMN)		Shenandoah Telecommunications Co (SHEN)		Telephone & Data Systems (TDS)		Verizon (VZ)	
	High	Low	High	Low	High	Low	High	Low	High	Low
5/10/2021	\$ 32.55	\$ 32.22	\$ 14.51	\$ 14.23	\$ 50.97	\$ 49.89	\$ 25.98	\$ 25.39	\$ 59.26	\$ 58.67
5/17/2021	33.88	28.67	14.81	13.99	50.98	49.14	25.83	24.55	59.07	56.35
5/24/2021	30.16	29.23	14.48	13.72	50.90	49.25	25.86	24.71	57.30	56.02
5/31/2021	29.64	29.15	15.00	13.91	51.82	49.46	26.21	25.35	57.37	56.17
6/7/2021	29.35	28.73	15.45	14.71	51.59	49.43	26.51	26.01	57.61	56.79
6/14/2021	29.34	28.41	15.11	13.93	49.80	47.60	25.85	22.60	57.45	55.57
6/21/2021	29.00	28.61	14.18	13.62	50.25	47.88	23.85	22.93	56.78	55.98
6/28/2021	29.35	28.65	14.10	13.53	57.65	48.01	23.44	22.30	56.57	55.76
7/5/2021	29.33	28.09	13.69	13.15	61.53	53.07	23.23	22.11	56.58	55.55
7/12/2021	28.63	28.16	14.41	12.73	54.11	51.52	22.88	21.61	56.79	55.88
7/19/2021	28.35	27.50	13.05	12.28	54.05	51.82	23.17	21.67	56.85	55.31
7/26/2021	28.45	27.86	12.95	12.38	53.67	50.78	23.52	22.23	56.34	55.48
8/2/2021	28.55	27.81	12.78	11.09	53.05	29.02	21.63	18.52	56.26	55.21
8/9/2021	28.26	27.77	12.66	11.64	31.00	30.01	20.65	19.45	55.98	55.00
8/16/2021	28.29	27.43	12.35	11.28	31.21	28.76	20.46	19.23	56.20	55.19
8/23/2021	27.72	26.88	12.43	11.84	31.08	28.80	20.23	19.49	55.71	54.53
8/30/2021	27.87	27.05	12.40	11.81	30.49	29.06	20.73	19.74	55.50	54.58
9/6/2021	27.74	27.16	12.49	11.89	30.71	29.11	20.69	19.49	55.50	54.22
9/13/2021	27.94	27.25	13.02	12.14	30.49	28.70	20.16	19.14	54.98	54.06
9/20/2021	27.43	26.94	13.02	12.50	30.60	29.43	19.64	19.00	54.64	54.01
9/27/2021	27.74	27.01	13.44	12.36	32.55	29.89	19.98	19.20	54.69	53.92
10/4/2021	27.48	26.75	13.13	12.43	32.71	31.30	20.19	19.07	54.85	53.22
10/11/2021	26.77	25.01	12.54	11.83	31.67	30.94	19.77	19.05	53.29	50.86
10/18/2021	26.29	25.27	12.83	11.95	31.59	30.50	19.85	18.99	53.93	51.64
10/25/2021	25.70	25.04	12.44	11.71	30.95	27.16	19.80	18.24	53.20	52.41
11/1/2021	25.58	24.54	14.50	11.83	29.32	27.28	20.57	18.89	53.37	51.20
11/8/2021	25.13	24.58	14.42	13.78	28.80	27.60	20.47	19.50	52.76	51.91
Maximum Price	\$ 33.88		\$ 15.45		\$ 61.53		\$ 26.51		\$ 59.26	
Minimum Price		\$ 24.54		\$ 11.09		\$ 27.16		\$ 18.24		\$ 50.86
Average High	\$ 28.39		\$ 13.56		\$ 41.61		\$ 22.26		\$ 55.88	
Average Low		\$ 27.47		\$ 12.68		\$ 38.35		\$ 21.05		\$ 54.65
Average	\$ 27.93		\$ 13.12		\$ 39.98		\$ 21.66		\$ 55.27	

[illegible]

(A) Diluted earnings. Excludes nonrecurring (losses): '05, (\$0.30); '06, (\$0.45). Next earnings report due late October. (B) Div'ds paid in February, May, August, and November. Includes one-time div'ds: In '03, \$0.25. ■ Div'd reinvestment plan available. (C) Includes good-will: '20: \$135259 mill., \$18.98/sh. (D) In mil-lions. © 2021 Value Line, Inc. All rights reserved. Factual material is obtained from sources believed to be reliable and is provided without warranties of any kind. THE PUBLISHER IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS HEREIN. This publication is strictly for subscriber's own, non-commercial, internal use. No part of it may be reproduced, resold, stored or transmitted in any printed, electronic or other form, or used for generating or marketing any printed or electronic publication, service or product.	Company's Financial Strength A Stock's Price Stability 100 Price Growth Persistence 10 Earnings Predictability 100
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LUMEN TECH. NYSE-LUMN				RECENT PRICE	11.96	P/E RATIO	7.7	(Trailing: 6.6 Median: 20.0)		RELATIVE P/E RATIO	0.40	DIV'D YLD	8.4%	VALUE LINE			
TIMELINESS — Suspended 9/10/21	High: 46.9	46.8	43.4	42.0	45.7	40.6	33.4	27.6	24.2	16.8	15.3	16.6		Target Price Range			
SAFETY 3 Lowered 2/22/13	Low: 14.2	31.2	36.3	29.9	27.9	24.1	21.9	13.2	14.0	9.6	8.2	9.7		2024 2025 2026			
TECHNICAL — Suspended 9/10/21	LEGENDS — 3.0 x "Cash Flow" p sh ... Relative Price Strength Options: Yes Shaded area indicates recession																
BETA .95 (1.00 = Market)																	
18-Month Target Price Range																	
Low-High Midpoint (% to Mid)																	
\$5-\$18 \$12 (-5%)																	
2024-26 PROJECTIONS																	
Price Gain Ann'l Total																	
High Low 20 15 (+65%) 19%																	
Low 15 (+25%) 12%																	
Institutional Decisions																	
4Q2020 1Q2021 2Q2021																	
to Buy 348 344 363																	
to Sell 337 345 285																	
Hld's(000) 825809 815276 836990																	
Percent shares traded																	
30 20 10																	
% TOT. RETURN 7/21																	
THIS STOCK VL ARITH. INDEX																	
1 yr. 40.3 55.5																	
3 yr. -13.4 48.6																	
5 yr. -36.2 95.5																	
© VALUE LINE PUB. LLC 24-26																	
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022																	
18.91 21.61 24.02 25.91 25.59 23.09 24.82 29.37 31.00 31.72 32.92 31.96 16.51 21.70 20.55 18.88 18.00 17.05																	
6.61 7.89 8.21 8.69 8.61 8.07 7.44 8.88 9.47 9.15 9.32 9.59 4.61 5.91 5.71 5.94 5.70 5.50																	
2.49 3.07 3.13 3.37 3.46 3.41 1.07 1.25 1.64 1.36 1.58 2.45 1.58 1.19 1.32 1.67 1.65 1.55																	
.24 .25 .26 1.54 2.80 2.90 2.90 2.90 2.16 2.16 2.16 2.16 2.16 2.16 1.00 1.00 1.00 1.00																	
3.17 2.77 3.01 2.86 2.52 2.83 3.90 4.67 5.22 5.36 5.28 5.45 2.91 2.94 3.33 3.40 3.30 3.35																	
27.54 28.11 31.42 31.55 31.64 31.64 33.67 30.83 29.46 26.42 25.86 24.52 21.97 18.36 12.36 10.18 12.55 12.65																	
131.07 113.25 108.49 100.28 299.19 304.95 618.51 625.66 583.64 568.52 543.80 546.55 1069.2 1080.2 1090.1 1096.9 1110.0 1115.0																	
13.4 12.5 14.5 10.0 8.9 10.9 36.2 31.4 21.3 26.9 19.9 11.4 13.9 15.8 9.6 6.4 6.4 6.4																	
.71 .67 .77 .60 .59 .69 2.27 2.00 1.20 1.42 1.00 .59 .70 .85 .51 .31 .31																	
.7% .7% .6% 4.6% 9.1% 7.8% 7.5% 7.4% 6.2% 5.9% 6.9% 7.7% 9.8% 11.5% 7.9% 9.3%																	
Revenues per sh 18.20																	
"Cash Flow" per sh 5.90																	
Earnings per sh A 1.70																	
Div'ds Decl'd per sh B 1.00																	
Cap'l Spending per sh 3.40																	
Book Value per sh C 13.05																	
Common Shs Outst'g D 1125.0																	
Avg Ann'l P/E Ratio 11.0																	
Relative P/E Ratio .60																	
Avg Ann'l Div'd Yield 5.3%																	
CAPITAL STRUCTURE as of 6/30/21																	
Total Debt \$31169 mill. Due in 5 Yrs \$10000 mill.																	
LT Debt \$28574 mill. LT Interest \$1400 mill.																	
(Total interest coverage: 2.1x) (71% of Cap'l)																	
Pension Assets-12/20 \$10546 mill. Oblig. \$12202 mill.																	
Common Stock 1,105,186,000 shares																	
MARKET CAP: \$13.2 billion (Large Cap)																	
CURRENT POSITION (SMILL.)																	
Cash Assets 1690 406 935																	
Other 3078 2770 2811																	
Current Assets 4768 3176 3746																	
Accts Payable 1724 1134 966																	
Debt Due 2300 2427 2595																	
Other 3234 3073 2949																	
Current Liab. 7258 6634 6510																	
ANNUAL RATES																	
Past 10 Yrs. Past 5 Yrs. Est'd '18-'20 to '24-'26																	
Revenues -2.5% -8.5% -2.0%																	
"Cash Flow" -4.5% -10.0% .5%																	
Earnings -8.5% -1.0% 3.5%																	
Dividends 1.5% -6.0% -5.5%																	
Book Value -5.5% -9.5% NMF																	
Cal-endar																	
QUARTERLY REVENUES (\$ mill.)																	
Mar.31 Jun.30 Sep.30 Dec.31 Full Year																	
2018 5945 5902 5818 5778 23443																	
2019 5647 5578 5606 5570 22401																	
2020 5228 5192 5167 5125 20712																	
2021 5029 4924 5047 5000 20000																	
2022 4825 4700 4700 4775 19000																	
Cal-endar																	
EARNINGS PER SHARE A																	
Mar.31 Jun.30 Sep.30 Dec.31 Full Year																	
2018 .25 .26 .30 .37 1.19																	
2019 .34 .34 .31 .33 1.32																	
2020 .37 .42 .40 .48 1.67																	
2021 .44 .48 .40 .33 1.65																	
2022 .35 .40 .40 .40 1.55																	
Cal-endar																	
QUARTERLY DIVIDENDS PAID B																	
Mar.31 Jun.30 Sep.30 Dec.31 Full Year																	
2017 .540 .540 .540 .540 2.16																	
2018 .540 .540 .540 .540 2.16																	
2019 .250 .250 .250 .250 1.00																	
2020 .250 .250 .250 .250 1.00																	
2021 .250 .250 .250 .250 1.00																	

BUSINESS: Lumen Technologies, Inc. (formerly CenturyLink) is the third-largest telephone company in the U.S. It provides broadband, voice, and wireless services to consumers and businesses across the country. It also offers advanced entertainment services under the CenturyLink, Prism TV, and DIRECTV brands. Acquired Level 3 Communications, 11/17; Verizon wireline assets in Alabama, 7/02;

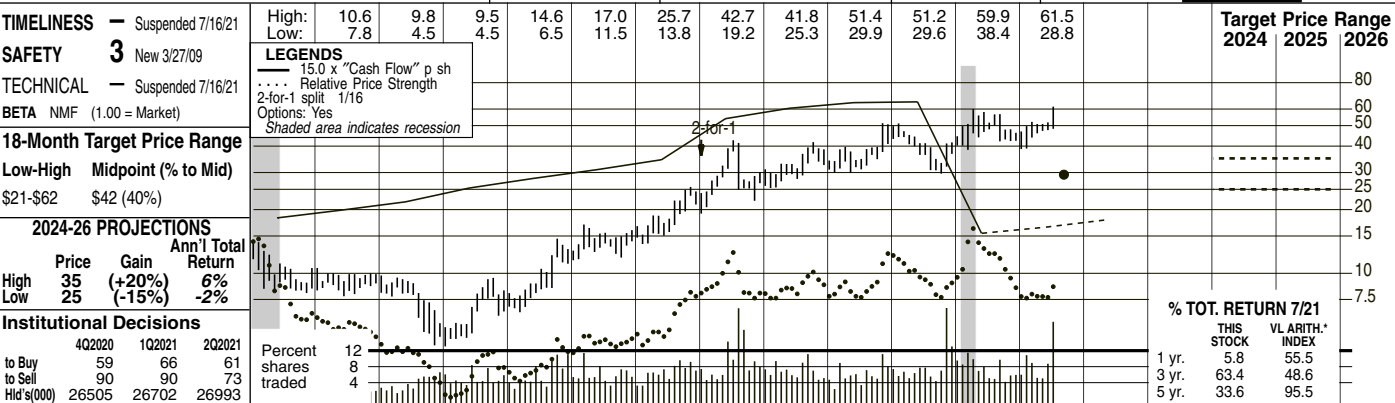
Lumen Technologies will be busy going into next year. The company has been actively transforming its business. Recently, Lumen announced that Apollo Funds will acquire its ILEC (incumbent local exchange carrier) business. The acquirer is expected to purchase ILEC assets in 20 Midwest and Southeast states serving consumers and small businesses, for \$7.5 billion, including a debt assumption of approximately \$1.4 billion. Under the terms, Lumen will retain its ILEC operations in 16 states in the western part of the country. The company will also maintain control of the nonlocal exchange fiber assets in the 20 states. The deal is anticipated to close in 2022. Investors may recall that Lumen signed another definitive agreement with Stonepeak to sell its Latin American business for \$2.7 billion in July. This deal is expected to close during the first half of next year. Through these actions, the company aims to increase its enterprise focus, accelerate the Quantum Fiber deployment, and drive growth in the Lumen platform.

The coming months will likely be tough, but there is good news. Lumen

saw a 5% decline in the second-quarter top line, mainly because the company experienced higher-than-usual demand for voice collaboration and conferencing last year. Therefore, year-over-year comparisons do not paint a complete picture. On a sequential basis, revenue declined 2% due to softness in Business and Mass Market segments. On the bright side, the bottom line increased to \$0.48, versus \$0.42 in the year-ago period, thanks to ongoing cost controls. We expect lower sales to continue in the coming months, albeit with a gradual recovery. Nonetheless, the company should benefit from the increasing demand for faster broadband speeds, enhancing business opportunities for its Quantum Fiber services. Most of the benefits will probably be realized beyond next year. For now, we estimate 2021 and 2022 share earnings will remain on the weaker side.

Shares of Lumen Technologies are unranked for Timeliness due to the pending sales. At the recent quotation, this stock has above-average long-term capital appreciation potential. In addition, the dividend yield (8.4%) is attractive.

Emma Jalees September 10, 2021



2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	© VALUE LINE PUB. LLC	24-26
3.17	3.63	3.00	3.06	3.39	4.10	5.27	6.01	6.43	6.77	7.07	10.94	12.41	12.71	12.76	4.43	4.90	5.40	Revenues per sh	7.20
.72	.97	1.02	1.19	1.22	1.33	1.45	1.69	1.88	2.07	2.30	3.60	4.03	4.29	4.32	1.03	1.10	1.20	"Cash Flow" per sh	2.00
.23	.39	.40	.56	.53	.43	.29	.35	.62	.70	.83	.83	.44	.93	1.10	.05	.20	.30	Earnings per sh ^A	1.00
.08	.08	.14	.15	.16	.17	.17	.17	.18	.24	.24	.25	.26	.27	.29	.34	.15	.17	Div'ds Decl'd per sh ^B	.40
.64	.46	.62	1.39	1.12	1.18	1.57	1.86	2.43	1.41	1.44	3.54	2.97	2.75	2.79	2.42	3.25	3.20	Cap'l Spending per sh	3.00
2.64	2.90	3.21	3.55	3.71	4.00	4.15	4.34	4.87	5.35	5.98	6.05	7.10	8.91	9.45	11.68	14.00	14.50	Book Value per sh	16.00
46.12	46.57	47.02	47.25	47.36	47.53	47.68	47.92	48.08	48.26	48.48	48.94	49.33	49.63	49.67	49.87	50.00	50.00	Common Shs Outst'g ^C	50.00
26.2	19.3	23.2	16.2	18.8	21.1	26.5	19.2	15.5	20.1	22.3	34.1	NMF	39.3	36.1	NMF	Bold figures are Value Line estimates	Avg Ann'l P/E Ratio	30.0	
1.40	1.04	1.23	.97	1.25	1.34	1.66	1.22	.87	1.06	1.12	1.79	NMF	2.12	1.92	NMF		Relative P/E Ratio	1.65	
1.3%	1.1%	1.5%	1.7%	1.6%	1.8%	2.2%	2.5%	1.9%	1.7%	1.3%	.9%	.8%	.7%	.7%	.7%		Avg Ann'l Div'd Yield	1.3%	

CAPITAL STRUCTURE as of 6/30/21				251.1	288.1	308.9	326.9	342.5	535.3	612.0	630.9	633.9	220.8	245	270	Revenues (\$mill)	360
Total Debt \$672.6 mill. Due in 5 Yrs \$672.6 mill.				35.1%	38.2%	37.6%	39.1%	42.3%	38.9%	38.3%	41.2%	40.5%	21.5%	24.0%	25.5%	Operating Margin	32.0%
LT Debt Nil LT Interest Nil																	
No Defined Benefit Pension Plan				55.8	64.4	60.7	65.9	70.7	143.7	177.0	166.4	159.7	48.7	45.0	45.0	Depreciation (\$mill)	50.0
				13.5	16.6	29.6	33.9	40.9	32.4	21.9	46.6	54.9	2.6	10.0	15.0	Net Profit (\$mill)	50.0
Leases, Uncapitalized Annual rentals \$4.1 mill.				44.1%	42.0%	40.2%	39.5%	40.4%	26.6%	9.9%	25.0%	22.7%	NMF	22.0%	22.0%	Income Tax Rate	22.0%
				5.4%	5.8%	9.6%	10.4%	11.9%	6.1%	3.6%	7.4%	8.7%	1.2%	4.0%	5.6%	Net Profit Margin	13.8%
Common Stock 49,965,151 shares as of 7/23/21				8.9	58.3	54.0	69.1	66.8	d2.8	35.3	121.7	91.7	200.6	285	280	Working Cap'l (\$mill)	375
				158.7	230.2	224.3	201.3	178.3	797.2	757.6	749.6	688.5	--	400	350	Long-Term Debt (\$mill)	250
				197.7	207.8	234.3	258.3	289.9	295.9	350.2	442.2	469.4	582.4	700	725	Shr. Equity (\$mill)	800
				5.0%	4.7%	7.4%	8.3%	9.5%	4.1%	3.7%	5.3%	6.0%	.5%	1.0%	2.0%	Return on Total Cap'l	5.0%
MARKET CAP: \$1.5 billion (Mid Cap)				6.8%	8.0%	12.6%	13.1%	14.1%	11.0%	6.3%	10.5%	11.7%	.5%	1.5%	2.0%	Return on Shr. Equity	6.0%
				3.1%	4.4%	9.1%	9.0%	10.3%	7.0%	2.8%	7.6%	8.7%	NMF	.5%	1.0%	Retained to Com Eq	3.5%
CURRENT POSITION 2019 2020 6/30/21 (\$mill)				54%	45%	28%	32%	27%	36%	56%	28%	25%	NMF	76%	56%	All Div'ds to Net Prof	40%

Cash Assets	101.7	195.4	248.8
Receivable	63.5	70.4	63.2
Other	73.8	1142.9	1117.1
Current Assets	239.0	1408.7	1429.1
Accts Payable	40.3	19.6	23.5
Debt Due	31.7	688.5	672.6
Other	75.3	500.0	460.4
Current Liab	147.3	1208.1	1156.5

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '18-'20 to '24-'26
Revenues	11.0%	8.0%	-5.5%
"Cash Flow"	10.0%	9.0%	-7.5%
Earnings	3.0%	-5%	6.5%
Dividends	6.5%	6.5%	5.0%
Book Value	10.5%	13.0%	8.0%

Calendar	QUARTERLY REVENUES (\$ mill.)				Full Year
	Mar.31	Jun.30	Sep.30	Dec.31	
2018	154.2	156.5	158.7	161.5	630.9
2019	158.8	158.9	155.2	161.0	633.9
2020	53.2	54.3	55.2	58.1	220.8
2021	59.7	60.7	62.0	62.6	245.0
2022	65.0	65.0	70.0	70.0	270.0

Calendar	EARNINGS PER SHARE ^A				Full Year
	Mar.31	Jun.30	Sep.30	Dec.31	
2018	.13	.19	.31	.30	.93
2019	.28	.26	.29	.27	1.10
2020	--	d.01	.03	.03	.05
2021	.06	.04	.05	.05	.20
2022	.07	.07	.08	.08	.31

Calendar	QUARTERLY DIVIDENDS PAID ^B				Full Year
	Mar.31	Jun.30	Sep.30	Dec.31	
2017	--	--	--	.26	.26
2018	--	--	--	.27	.27
2019	--	--	--	.29	.29
2020	--	--	--	.34	.34
2021	--	--	--		

BUSINESS: Shenandoah Telecommunications Company (Shentel) is a provider of a broad range of diversified communications services through its high speed, state-of-the-art cable, fiber optic and fixed wireless networks to customers in the Mid-Atlantic U.S. Its services include: broadband internet; video and digital voice; optical Ethernet; wavelength and leasing; and tower colocation leasing.

Shenandoah Communications Company (Shentel) completed the sale of its **Wireless business to T-Mobile**. The \$1.94 billion deal was finalized on July 1st, and Shentel used part of the proceeds to pay off its term loan of \$681 million. The company also returned capital to shareholders in the form of an \$18.75-per-share special dividend. With the Wireless unit now gone, Shentel is focusing on growing its remaining businesses, especially Broadband. In order to secure more growth capital, Shentel entered into a new \$400 million financing facility.

Second-quarter results were in line with expectations. Revenues of \$60.7 million narrowly topped our estimate and climbed nearly 12% year over year. The solid advance was driven by nice growth from the Broadband segment. Revenue generating units rose over 20% from 2020 thanks to strength from the company's *Glo Fiber* and *Beam* businesses. The smaller Tower unit ticked up high single digits, due to an increase in tenants. Meanwhile, earnings of \$0.04 per share fell shy of our target by a penny.

ing. Acq. nTelos Holdings, 5/16. Sold Wireless business, 7/21. Has about 1,139 employees. Off. & dir. own 4.13% of comm. stock; Blackrock, Inc., 15.50%; The Vanguard Group, 10.12% (3/21 Proxy). Chairman, President & CEO: Christopher E. French. Inc.: Virginia. Address: 500 Shentel Way, Edinburg, Virginia 22824. Tel.: 540-984-4141 Internet: www.shentel.com

earnings estimate by a nickel. We are standing pat with our revenue target of \$245 million, as it remains in line with management's guidance. However, increased expenses due in part to the Wireless sale have caused us to drop our bottom-line estimate to \$0.20 per share.

The long-term outlook is solid. Both the *Glo Fiber* and *Beam* units have been adding subscribers at a solid clip within the Mid-Atlantic region lately. We expect that to continue as consumers are seeking higher Internet speeds. Shentel will likely be looking at strategic acquisitions to help boost growth also. All told we expect double-digit annual top-line growth out to 2024-2026

These shares are currently unranked due to the recent Wireless sale and special dividend. From our perspective, this issue is not an appealing investment choice at this time. While we feel there is decent potential for the Broadband business, Shentel shares appear to be richly valued at the recent quotation and are trading well within our 3- to 5-year Target Price Range.

Kevin P O'Sullivan September 10, 2021

(A) Diluted earnings. Excludes gains / (losses) from discontinued operations: '08, (4c); '09, (21c); '10, (2c); '11, (1c); '20, \$2.48; '21, \$0.07. Excludes nonrecurring gain / (loss).

(C) In mill., adj. for split.

Company's Financial Strength	B
Stock's Price Stability	NMF
Price Growth Persistence	NMF
Earnings Predictability	NMF

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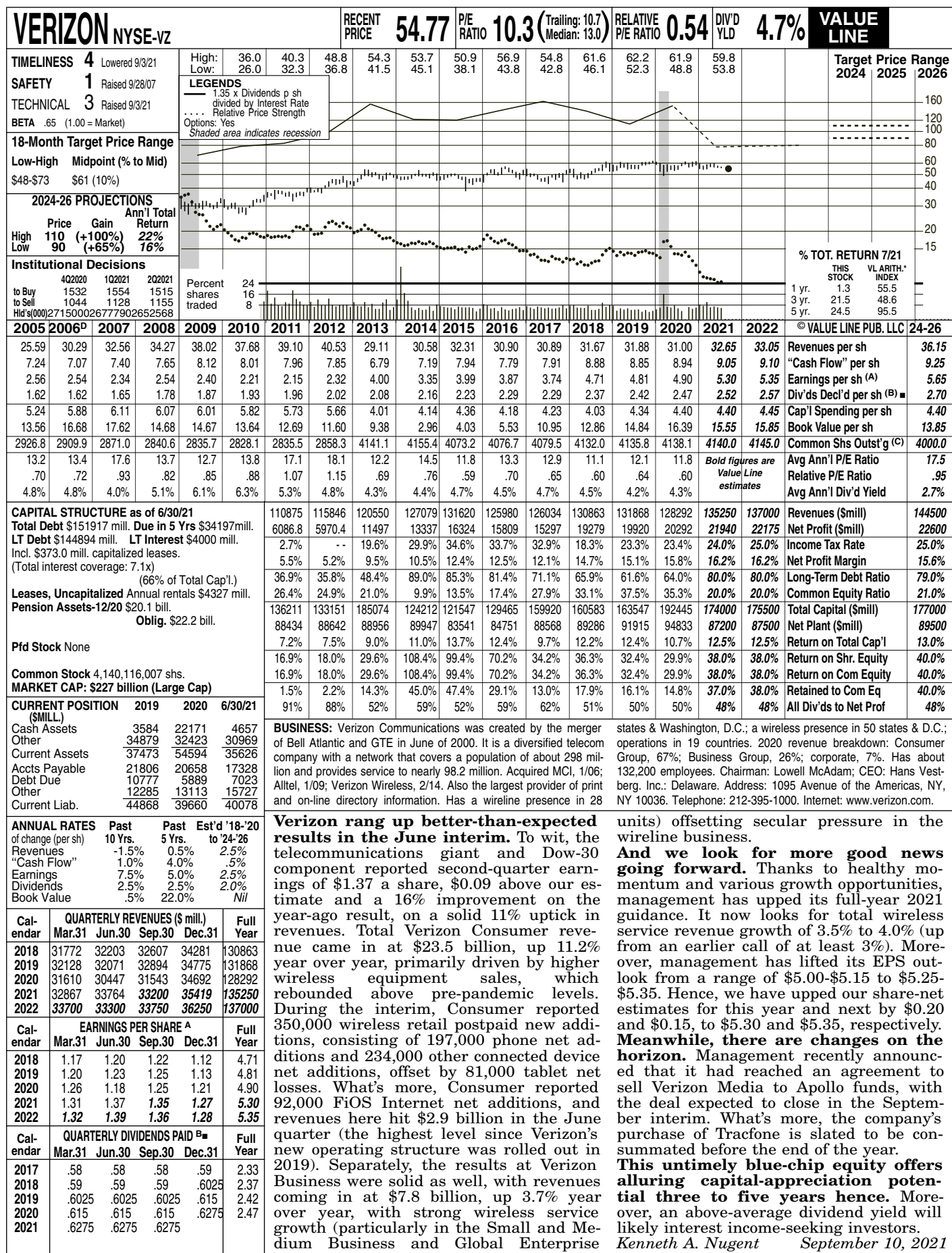
(A) Diluted earnings. Next earnings report early Nov. Year-end eps may not sum due to rounding. Excl. extra. losses/gains: 07, 36¢. (B) Dividends historically paid in late March, June.

Sept., & Dec. ■ Div'd re. plan avail. (5% discount). (C) In millions. Common stock, 1 vote/sh.; Series A, 10 votes/sh.

Company's Financial Strength	B
Stock's Price Stability	50
Price Growth Persistence	20
Earnings Predictability	20

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(A) Based on diluted shares. Excl. n/r gains (losses): '06, (\$0.42). Next earnings report due Oct. 20th. (B) Div'd paid in early Feb., May, Aug. & Nov. (C) Div'd reinv. plan avail. (C) In

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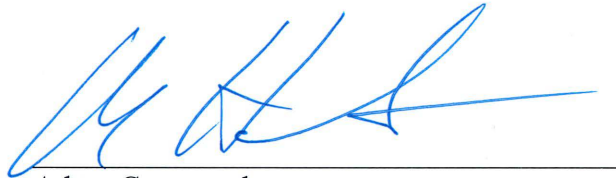
Company's Financial Strength A++
Stock's Price Stability 100
Price Growth Persistence 25
Earnings Predictability 95

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STATE OF KANSAS)
) ss.
COUNTY OF SHAWNEE)

VERIFICATION

Adam Gatewood, being duly sworn upon his oath deposes and states that he is a Managing Financial Analyst for the Utilities Division of the Kansas Corporation Commission of the State of Kansas, that he has read and is familiar with the foregoing *Direct Testimony*, and attests that the statements contained therein are true and correct to the best of his knowledge, information and belief.



Adam Gatewood
Senior Managing Financial Analyst
State Corporation Commission of the
State of Kansas

Subscribed and sworn to before me this 14 day of December, 2021.



Notary Public

My Appointment Expires: 4-28-25



NOTARY PUBLIC - State of Kansas
ANN M. MURPHY
My Appt. Expires 4/28/25

CERTIFICATE OF SERVICE

22-CRKT-087-KSF

I, the undersigned, certify that a true and correct copy of the above and foregoing testimony was electronically mailed this 15th day of December, 2021, to the following:

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