S. HRG. 115–280

THE UNIVERSAL SERVICE FUND AND RURAL BROADBAND INVESTMENT

HEARING

BEFORE THE

SUBCOMMITTEE ON COMMUNICATIONS, TECHNOLOGY, INNOVATION, AND THE INTERNET

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

JUNE 20, 2017

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SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

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WITNESSES

THE UNIVERSAL SERVICE FUND AND RURAL BROADBAND INVESTMENT

TUESDAY, JUNE 20, 2017

U.S. SENATE,
SUBCOMMITTEE ON COMMUNICATIONS, TECHNOLOGY,
INNOVATION, AND THE INTERNET,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Subcommittee met, pursuant to notice, at 9:56 a.m. in room SR–253, Russell Senate Office Building, Hon. Roger Wicker, Chairman of the Subcommittee, presiding.

Present: Senators Wicker [presiding], Schatz, Blunt, Fischer, Heller, Capito, Gardner, Young, Klobuchar, Markey, Peters, Baldwin, Hassan, Cortez Masto, and Nelson.

OPENING STATEMENT OF HON. ROGER F. WICKER, U.S. SENATOR FROM MISSISSIPPI

The CHAIRMAN. Good morning, the Subcommittee will come to order. Today we will examine the Universal Service Fund and its impact on broadband investment in rural America. I'm glad to convene this hearing with Senator Schatz, my good friend.

When Congress passed the Telecommunications Act in 1996, it made clear that all Americans should have access to quality communications services at just, reasonable, and affordable rates. From that time, the Universal Service Fund, established by the FCC, has been a primary mechanism for achieving universal communications service across the country. It has supported the deployment of communications networks to rural and remote geographic areas, and it has provided essential support to build out networks to health care facilities and other institutions that would likely go without service.

In 2011, the FCC significantly reformed parts of the USF program in an attempt to address past shortcomings and inefficiencies, particularly when deploying communications services to high-cost rural areas. Many of these reforms stemmed from economic assumptions and other judgments about how the Commission anticipated funding needs for service in hard-to-reach areas. They also aimed to make support more efficient while modernizing programs and ensuring next generation communication technologies and services reach rural areas.

Despite reforms, challenges within USF persist. These challenges include the program's ability to support meaningful investments into the broadband deployment and conduct necessary maintenance on established networks. As a result, this has left a disparity in the

quality of communications service between urban and rural areas. Inadequate data collection methods are also one of USF's challenges, leading to an inefficient distribution of funds to truly underserved and unserved areas.

To address this issue, I recently joined Senator Manchin in introducing the Rural Wireless Access Act, which has the support of several of my colleagues, including Senator Schatz, Senator Fischer, Senator Klobuchar, Senator Moran, and Senator Peters. This bill would require the FCC to standardize its data collection methods to ensure that USF support is directed to rural communities in Mississippi, Hawaii, Minnesota, and in areas across the Nation that are actually in need.

Reliable data is a critical step toward eliminating inefficiencies within the USF program and fulfilling the statutory goal of universal service. I appreciate the efforts of all the stakeholders involved to improve data collection at the FCC. As these efforts continue, it is important that this data be collected quickly so as not to delay the delivery of essential communications services through programs like Phase 2 of the Mobility Fund to communities in need.

Ensuring the deployment of broadband service to rural health care providers is another critical component of the USF program. Today, Senator Schatz and I will reintroduce the Reaching Underserved Rural Areas to Lead on Telehealth Act. With this bill, several health care providers that offer service predominantly to rural areas would qualify for support under USF's Rural Health Care Program. Mississippi is a leader in telemedicine and is driving the use of innovative technologies to improve the quality, accessibility, and affordability of care. Robust broadband connections, supported through USF, are vital to the adoption of this lifesaving technology.

The importance of our efforts to deliver broadband service to rural areas cannot be understated. Job creation, economic development, and access to digital innovation, such as telemedicine, fully self-driving cars, and smart communities have become increasingly reliant on the presence of high-quality, high-capacity broadband networks. It is imperative for all Americans to have access to the communications services promised by USF programs.

I look forward to hearing from our witnesses today about the state of broadband investment in rural America and how the USF program is affecting the market. I also hope the witnesses will offer recommendations on how the Commission can address inefficiencies within USF to ensure that the economic and digital opportunities afforded by broadband reach our rural communities.

Our witnesses today are Mr. Michael Balhoff, Senior Partner, Charlesmead Advisors; Ms. Shirley Bloomfield, Chief Executive Officer, NTCA-The Rural Broadband Association; Mr. Eric Graham, Senior Vice President, Strategic Relations, of C Spire; and Dr. Karen Rheuban, MD, Director, University of Virginia Center for Telehealth.

I am delighted to have all of these witnesses here today. I now recognize Senator Schatz, my teammate on this subcommittee, for whatever opening statement he chooses to make.

**STATEMENT OF HON. BRIAN SCHATZ,
U.S. SENATOR FROM HAWAII**

Senator SCHATZ. Thank you, Mr. Chairman, for convening this important hearing on USF. USF, as you all know, was created to make sure that all Americans have the security and the opportunities that come with being connected to essential communications networks.

But today it's not enough to have access to voice services; access to broadband is a necessity for people to be able to participate in society. Tasks like applying for a job, accessing government services, or doing homework are now nearly impossible without broadband. And yet too many Americans don't have access to broadband, particularly those living in rural and isolated areas.

In fact, the FCC's yearly broadband report indicates that millions of Americans lack access to high-quality—excuse me—high-speed broadband services. We can't close that divide without USF, which is why the FCC has done a lot of work since 2011 to update USF and refocus it on deploying broadband.

So what's next? First, we have to remain vigilant against waste, fraud, and abuse. The FCC should continue to examine reforms that stress transparency, accountability, and enforcement.

Second, distribution mechanisms within the USF must ensure that support goes where it is needed the most. USF's E-rate and Lifeline programs are critical to bridging the digital gaps that exist for people living in rural and tribal areas as well as those from underserved communities. The programs fund broadband access in libraries and schools, and provide low-income Americans access to opportunities that can lead to a better life.

Another key component of USF is its Rural Health Care Program, which provides support to qualified health providers so they have the broadband service necessary to provide telehealth services. These are crucial services for people who live miles from the closest health care facility and may lack access to specialists.

Finally, as the FCC thinks about the best allocation and use of USF funds, it must take into account the unique circumstances of certain localities. In Hawaii, there are unique geographical and topographical challenges that make delivering broadband very difficult and very costly. For USF to deliver on its promise to connect all people, it has to account for such challenges.

I thank today's witnesses for joining us at this hearing. I thank the Chairman for convening, and I look forward to discussing these important topics.

The CHAIRMAN. Well, thank you very much, Ranking Member Schatz.

Thank you to our distinguished panel for joining us today.

We will begin with Mr. Balhoff. Can you give us about 5 minutes of opening testimony? We'll take your full statement into the record.

STATEMENT OF MICHAEL J. BALHOFF, CFA, SENIOR PARTNER AND COFOUNDER, CHARLESMEAD ADVISORS, LLC

Mr. BALHOFF. Thank you very much, Chairman Wicker, Ranking Member Schatz, and distinguished members of the Subcommittee. I very much appreciate the opportunity to speak to you today re-

garding "The Universal Service Fund and Rural Broadband Investment." I've done a tremendous amount of work over the years, nearly 30 years, focused on this industry as a financial analyst.

I was 16 years at Legg Mason, which is an investment firm based in Baltimore, but we provided published advice across the country and actually internationally. I headed the Equity Research Group there that focused on telecom and technology, and it was widely recognized during that period that we had the foremost practice in rural telephony in the United States. So we were pretty significantly in demand to provide our advice on strategic issues.

I'm now an investment banker at my own firm providing merger and acquisition services again to rural carriers. So our specialized interest is rural telephony.

I have four summary remarks.

First, as you are aware, Universal Service Funding is critically important in assuring a robust and capable telecom network supporting voice and broadband, as you've already mentioned, in rural and high-cost regions. USF or the Connect America Fund, as it is now known, is not a subsidy program, nor is it a tax arising from appropriations; rather, it is a payment system to compensate for real network costs that benefit all users of the domestic network, whether those users are in New York City; or in Vacherie, Louisiana; in Los Angeles; or in Fremont, Idaho. Payment of investment and operating costs across the country, and notably in high-cost rural areas, are dependent, as Congress previously found, on rates paid by all Americans who rely on that universal network.

Second, the level of universal service funding has a direct effect on network investment. I know, and I am not guessing, that carriers in rural regions have sharply curtailed network investment in the wake of the 2011 FCC *Transformation Order*. Among other things, it's reflected in the loans from the lenders to this industry.

So specifically illustrating this, the Rural Utility Service at the Department of Agriculture has been able to place its entire loan allowance each year—that's $906 million—every year through 2011. In the wake of the 2011 transformation order, however, the following year they were able to only place 11.6 percent, where previously they had placed the entirety. And it has not yet risen above 37 percent since that time. This year, it's running around 20 percent. Last year, it was 28 percent.

Illustrating what is happening at many companies, and there are many examples, a board of a large cooperative just told me days ago that it had stopped a $26 million fiber build, affecting 970 miles of fiber, and 6,976 customers, purely and simply, according to the Board, because of the FCC's budget control mechanism. I cannot state strongly enough, the carrier investment in all of my experience, and I know that this is the reality, is driven by available funds, and it's disproportionately harmed by the uncertainty in funding levels.

Third, as I quantify in my written testimony, which is much longer, the FCC has acknowledged that the USF funds available for small rate-of-return carriers for the upcoming year is short by 12.4 percent. I actually state in my written testimony, I believe that understates the shortfall which, under the previous rate-of-re-

turn allowance, would have been 16 percent, and I believe that the number is actually higher, which I describe.

My belief is that it's difficult to square this with Section 254 of the Telecom Act, which legislates that universal service should be sufficient. By definition, it appears to be insufficient.

Fourth, and finally, my testimony also points to what I believe is the greatest USF problem, which Senator Schatz pointed to, in underinvested areas. That is, the largest carriers have strategic commitments to nonrural businesses and are underinvesting in a way that affects the largest number of rural customers across the country.

Based on my nearly 30 years analyzing this industry, I'm here to testify as strongly as I possibly can that the most widespread financial problem in rural America is found in the areas and customers served by the largest carriers. I believe that those large carriers actually are doing something that is responsible, which is that they're deploying their capital in a way that is productive for them. I believe those large carriers, however, are not properly incented to invest in those areas, and as a result, that we need to incent sales of those properties by the large carriers to other carriers.

I'm happy to address any questions that this subcommittee may have. And I thank you for your time.

[The prepared statement of Mr. Balhoff follows:]

PREPARED STATEMENT OF MICHAEL J. BALHOFF, CFA, SENIOR PARTNER AND COFOUNDER, CHARLESMEAD ADVISORS, LLC

Chairman Wicker, Ranking Member Schatz, and distinguished Members of the Commerce Committee. Thank you for inviting me to testify today regarding the "Universal Service Fund and Rural Broadband Investment."

My name is Michael J. Balhoff. I am a senior partner at Charlesmead Advisors, LLC, which is a Baltimore-based investment banking firm that I co-founded with two partners in June 2011. We provide merger-and-acquisition as well as valuation-related services to companies in the telecommunications industry, notably the rural telecommunications industry. I have provided independent financial analysis and advice in the telecommunications industry for nearly 30 years. My education and business background are found in Appendix 1, attached to this testimony.

I would like to address two questions in this hearing.

- The first concerns whether the universal service fund (USF)—more recently known as the "Connect America Fund" (CAF)—is sufficient to support networks and services required in rural regions.
- The second question concerns how to improve the targeting of USF/CAF monies to better achieve the policy goals associated with those programs.

I. IS USF/CAF SUFFICIENT TO SUPPORT NETWORKS AND SERVICES IN RURAL REGIONS?

The simple answer is "no." Setting aside the shortfall for larger price-cap carriers for the moment, I believe that small rate-of-return (RoR) carriers are insufficiently funded, possibly by $260 million annually. I have two comments in support of my response.

A. THE FCC ITSELF ACKNOWLEDGES THAT THE FUND, AS CURRENTLY CONSTITUTED TO SUPPORT SMALLER CARRIERS, DOES NOT HAVE SUFFICIENT FUNDING

The FCC authorizes the actual payments of universal service funding through the Universal Service Administrative Company (USAC). Pursuant to the FCC's March 2016 *Rate of Return Reform Order,* USAC recently released its calculation of a budget-driven reduction in payments to small RoR carriers for Fiscal Year mid-2017 to mid-2018. I summarize the calculation in a table below. The calculation preserves payments to Alaska carriers, to carriers that have chosen to receive Alternative Connect America Cost Model (ACAM) funding (albeit at levels lower than the origi-

nal offer as I will explain below), and to carriers that are eligible for certain intercarrier support.

Because of a cap of $2 billion on annual support for small RoR carriers—a cap set in the 2011 *Transformation Order*—funding for RoR carriers that continue to receive support through rate-of-return mechanisms will be adjusted lower by the full amount of the shortfall.

The $2 billion cap was determined based on 2011 levels of support approved for RoR carriers. To the best of my knowledge, no analysis was performed to determine that $2 billion was sufficient in 2011 or that the funding would be sufficient in future years. I emphasize this important point because the Telecommunications Act of 1996 presents several fundamental principles for the Act, including at Section 254(b)(5) where the law stated that "[t]here should be specific, predictable and *sufficient* Federal and State mechanisms to preserve and advance universal service." (Emphasis added.)

Because the statute mandates that USF should be sufficient, a question has been posed about whether there is a fundamental inconsistency if "sufficiency" was not, and is not, assessed?

As noted above, the shortfall in payments is borne, in this calculation, by the small RoR carriers (those that did not elect the ACAM). Parenthetically, I note that small carriers with specified broadband buildouts to at least 90 percent of their service region *could not* accept the ACAM model and were compelled—due to their successful deployments—to remain under the rate-of-return regime.

The calculated shortfall in available funding for mid-year 2017 to mid-year 2018 results in a $173 million, or a 12.4 percent, RoR reduction in "allowed support" in the upcoming Fiscal Year—2017 to 2018. The shortfall appears to be *prima facie* evidence that the funding level—once assumed appropriate for 2011—is now insufficient for the smaller carriers. This upcoming adjustment follows on the reduction for smaller carriers in the first half of calendar year 2017 when the FCC cut CAF Broadband Loop Support (BLS) by $80 million, again to remain within the 2011-based budget.

The FCC is not simply reducing funding for carriers that remain under rate of return. The FCC-determined "budget" is also affecting ACAM carriers. Even the carriers that accepted the ACAM are not receiving the support offered in the initial proposal last year. The reason is that the ACAM was oversubscribed.[1] As a result, in December 2016, the FCC chose to address the oversubscription by reducing the per-line offer of support by 27 percent, from the $200 per line to $146.10.

I suggest that the FCC itself is effectively stipulating that the 2011-based budget is insufficient and the Transformation Order has prompted the Commission to override the Telecom Act's legislative principle regarding the "sufficiency" of funding.

The rural trade organizations have been advocating what appears to be a reasonable solution, which is that the FCC should fully-fund rate-of-return service territories, both ACAM and CAF BLS. Their estimate is that fully funding ACAM and RoR carriers would require an annual increase of approximately $200–$260 million, which is not a dramatic increase, in my opinion, in light of growing broadband responsibilities.

[1] The FCC reported on December 16, 2016 that 216 rate-of-return carriers submitted letters electing 274 separate offers of ACAM support in 43 states.

Calculate Total Demand 2017-2018		
High Cost Loop Support (+ Safety Net and Safety Valve)	$	573,435,648
Connect America Fund (CAF) Broadband Loop Support + True Up	$	830,789,347
CAF Intercarrier Compensation (CAF-ICC)	$	395,952,660
Alternative Connect America Cost Model (ACAM)	$	328,837,694
Alaska Plan	$	44,413,233
Total Demand	$	2,173,428,582
Except Total Demand cannot exceed $2.0 billion	***$***	***2,000,000,000***
Reconcile by first subtracting CAF-ICC, ACAM, and AK Plan		
CAF-ICC	$	395,952,660
ACAM	$	328,837,694
AK Plan	$	44,413,233
Subtotal	**$**	**1,230,796,413**
Budget for HCLS and CAF BLS RoR Support Mechanisms	$	1,230,796,413
Forecasted HCLS and CAF BLS Amount	$	1,404,224,995
Budget Adjustment Factor		0.876495

Summary of Funding Mechanism		Forecasted		Adjusted to budget
High Cost Loop Support (incliuding Safety Net and Safety Valve)	$	573,435,648	$	502,613,571
CAF Broadband Loop Support (including True Up)	$	830,789,347	$	728,182,842
Sum	**$**	**1,404,224,995**	**$**	**1,230,796,413**
Reduction in RoR HCLS and CAF BLS Support				**12.4%**

B. MY PROFESSIONAL OPINION IS THAT THE FCC WAS MISTAKEN IN REDUCING THE ALLOWED RATE OF RETURN

I will be brief in my second point, in part because I suspect that Congress wants to defer to the FCC in determining the allowed rate of return.

I believe that the FCC was mistaken when it ordered a reduction in the allowed rate of return in March 2016, in great part relying on a report generated by the FCC Staff in May 2013. The allowed rate of return was reduced from 11.25 percent in a transition that is gradually implemented annually through a 25-basis point reduction until the rate settles at 9.75 percent on July 1, 2021. The effect, obviously, is to reduce the potential funding available to small carriers.

I provided a long and carefully-sourced analysis of the Commission Staff's report on which the FCC based its decision.[2] That analysis was filed before the California Public Utilities Commission, in a proceeding in which I represented ten small California carriers. I have attached that long testimony as Appendices 2 (September 2015 prefiled direct testimony) and 3 (March 2016 rebuttal testimony), in the event the Subcommittee wishes to review the issue.

Because I assume the Subcommittee is not interested in technical cost-of-capital theory or capital asset pricing models, I will make a simpler comment about the trends in rural costs of capital, based on my real-world investment banking experience.

Valuations of rural telephone companies have demonstrably collapsed from ten years ago when rural-carrier sales were valued at approximately eight times each dollar of operating cash flow. Since then, the valuations have settled generally between 4.5 and 5.5 times operating cash flow, which means that investors perceive new risks that have caused a startling contraction of 30 percent—40 percent in value. Certain fundamentals of the rural business have not changed significantly in that period as voice lines continue to contract and broadband continues to expand, but other risks have increased including competitive and regulatory developments. The effect is a valuation contraction that is unlikely to reverse in the foreseeable future.

The financial principle is straightforward. When values contract and expected future cash flows are not appreciably changed, the explanation is that the cost of capital—the discount rate applied to those cash flows—is rising.

[2] See Appendix 3, which includes the Balhoff Rebuttal Testimony, California Public Utilities Commission, A. 15–09–005, filed March 11, 2016, notably at pages 63–80.

I note that this analysis is similar to valuing a home in an area where there are demographic changes. You may believe your house should attract a higher value because you are aware of historical values and you can tabulate your actual investment; but, if the neighborhood has changed and other economic factors have created negative pressures, the best indicator of value is the price agreed to by a willing buyer and willing seller. Whatever the FCC may argue from a theoretical point of view—and I disagree with specific elements of those arguments as spelled out in the Appendices—the willing buyers and willing sellers are telling you that the cost of capital for rural carriers is up sharply as reflected in the deeply depressed prices. Respectfully, I represent that the FCC is not correct and is therefore assigning returns on capital that are well below those indicated by the capital markets.

Quite simply, rural carriers are no longer protected, monopoly utilities with governmental oversight and ready access to capital. It is nonsense to suggest that a rural carrier's cost of capital which was 11.25 percent in 1990 (the last time the rate was adjusted before 2011) or in 2001 when the 11.25 percent was reaffirmed, should now be lower when competition, technology and regulatory risks have dramatically increased.

If I am correct, then the shortfall outlined by USAC is not 12.4 percent, but well higher, as is supported in my California testimony.[3] For further perspective, if the FCC had maintained an allowed rate of return at 11.25 percent—and again I believe it has gone higher still—the shortfall for the RoR carriers in the upcoming year would be approximately 16.2 percent, by my calculation. If the rate should be 12.00 percent, then this coming year's shortfall is 21.5 percent.

I state again that I believe that RoR carriers are insufficiently funded.

II. MIGHT THERE BE IMPROVED TARGETING OF THE USF/CAF MONIES TO BETTER ACHIEVE THE POLICY GOALS ASSOCIATED WITH THOSE PROGRAMS?

Yes. I respond again in two parts, one regarding small carriers and the second regarding larger, price-cap carriers.

A. ROR CARRIERS ARE INSUFFICIENTLY FUNDED BUT THE TARGETING APPEARS GENERALLY REASONABLE

The FCC and USAC have generally done a good job in determining *how* the funding is allocated for small RoR carriers—based on investment and operating costs that are carefully tracked. And the FCC models indicate, with some degree of accuracy, that funding levels are too low. I believe that the reason for the shortfall, in part, is the accelerating pace of required upgrades to meet customer needs in a rapidly evolving broadband world, but the systems appear to me at this time to be generally reasonable.

B. MOST RURAL AREAS OF LARGE CARRIERS, PRICE–CAP CARRIERS ARE OFTEN WHERE THE PROBLEMS EXIST

In the 2011 *Transformation Order,* the FCC stated at paragraph 21 that "[m]ore than 83 percent of the approximately 18 million Americans that lack access to residential fixed broadband at or above the Commission's broadband speed benchmark live in areas served by price cap carriers—Bell Operating Companies and other large and mid-sized carriers."

This paragraph is stunning in making two important points. First, the FCC is stating that 15 million Americans lack residential broadband access *in larger-carrier regions.* For perspective, the large price-cap carriers served a total of approximately 60 million lines at that time; it can be inferred that the vast majority of large-carrier rural lines are underinvested, assuming that the large-carrier broadband-capable lines are concentrated in non-rural regions. Second, at most, 17 percent of the underinvested lines are in regions served by smaller carriers, which suggests that the former USF system was working with laudable effectiveness. This second insight of course raises the question about why the new system should further limit support to companies that have been investing successfully to achieve policy goals.

Since the time of the Transformation Order, the FCC has attempted to address this underinvestment problem, notably in large-carrier, price-cap regions. The Commission authorized initiatives such as the Connect America Fund II to offer incremental funding to build out to specified high-cost service locations.

Still, my experience is that very little widespread investment is occurring in rural regions of the large carriers. And the reason, in my opinion, is that many of those

[3] See Appendix 2, which is the prefiled testimony, September 1, 2015, notably at pages 49–71. An analysis of the implied cost of equity arising from transactional data is included from pages 62 to 71.

carriers are focused on more urban, more wireless, more enterprise, and more international opportunities that provide superior opportunity for growth. The failure to invest in rural areas, therefore, may not explained by insufficient capital or insufficient universal service funding in most cases, but by the strategic focus of those larger carriers which is dedicated to other "more productive" businesses.

This is the major "targeting" problem, in my opinion. Large carriers own substantial swaths of rural America, but are not likely to make significant financial commitments in those areas. The largest carriers have major other responsibilities, which are not in rural regions in any state. To illustrate, the table nearby indicates that the large carriers in Mississippi have the greatest number of high-cost rural properties—150,000 in the state—compared with small carriers that serve a total of 67,000 lines in the state.[4] The table summarizes state-by-state how that illustration is the rule rather than the exception as the high-cost locations and extremely high-cost locations where large, price-cap carriers are the providers of service are generally larger than the number of lines served by small carriers (rural local exchange carriers). Again, I contend those smaller carriers are investing in rural America at approximately appropriate levels. If the FCC is right that large carriers are underinvesting—and I think it is correct—then the problem of targeting is not a capital-allocation issue. It is a problem that is explained by the fact that the wrong carriers own those properties.

I believe that there are promising solutions that involve creating appropriate incentives for large carriers to divest underinvested and non-strategic properties to smaller carriers in the state or in nearby states. Further, I believe it is possible to craft solutions that require buyers to invest at levels that assure broadband services at levels that are comparable to those in urban areas. One solution involves forgiving sale-related taxes imposed on the sellers so that the sale prices can contract to acceptable levels—not to reward the seller, but to assure that the buyer can acquire the properties at deep discounts to current market prices and with sufficient financial headroom for greater subsequent investments. Those solutions are under discussion at the present.

[4] USAC at *https://usac.org/hc/rules-and-orders/rate-of-return-reform-order.aspx*. See, also, *https://apps.fcc.gov/edocs_public/attachmatch/DA-15-509A1_Rcd.pdf* and *https://apps.fcc.gov/edocs_public/attachmatch/DA-16-929A1_Rcd.pdf*. Note that the column for large, price-cap carriers includes only FCC-designated high-cost or extremely high-cost locations, not the total number of lines served by the large carriers in the states. The rural local exchange carrier (RLEC) column provides the total number of lines served by RLEC, that is, RoR carriers, in the state.

State	Rural locations: Large carrier HC locations	Rural locations: RoR total lines	Number of carriers: Large carrier	Number of carriers: RLEC
AK	**35,364**	**116,991**	**1**	**15**
AL	135,139	147,915	5	14
AR	**144,651**	**106,737**	**3**	**16**
AZ	**65,065**	**58,026**	**2**	**11**
CA	**290,948**	**76,447**	**5**	**10**
CO	**77,102**	**43,306**	**2**	**19**
CT	2,076	-	2	-
DE	3,422	-	1	-
FL	**91,785**	**36,525**	**6**	**4**
GA	**144,455**	**273,892**	**4**	**22**
HI	13,202	8,090	1	1
IA	**111,196**	**244,661**	**4**	**125**
ID	**34,842**	**54,714**	**2**	**14**
IL	**135,664**	**104,601**	**5**	**36**
IN	**144,015**	**170,449**	**3**	**24**
KS	**89,000**	**140,894**	**3**	**32**
KY	**159,635**	**200,816**	**3**	**12**
LA	**107,832**	**101,302**	**2**	**8**
MA	15,329	4,019	2	2
MD	21,946	7,373	1	1
ME	**40,884**	**96,793**	**1**	**6**
MI	**191,203**	**126,139**	**3**	**22**
MN	**198,065**	**341,056**	**4**	**41**
MO	**305,093**	**130,394**	**4**	**27**
MS	**149,603**	**67,203**	**4**	**9**

State	Rural locations: Large carrier HC locations	Rural locations: RoR total lines	Number of carriers: Large carrier	Number of carriers: RLEC
MT	**46,355**	**121,730**	**2**	**12**
NC	**71,764**	**377,598**	**5**	**12**
ND	12,108	186,937	1	17
NE	**56,238**	**122,870**	**3**	**25**
NH	14,305	54,273	1	5
NJ	6,865	9,467	2	1
NM	**54,229**	**59,925**	**3**	**12**
NV	20,648	35,925	3	8
NY	**145,205**	**136,642**	**4**	**21**
OH	**174,840**	**103,924**	**6**	**26**
OK	**92,737**	**237,036**	**4**	**31**
OR	**69,371**	**86,322**	**2**	**20**
PA	**152,808**	**71,898**	**6**	**14**
RI	864	-	1	-
SC	**52,429**	**555,934**	**4**	**12**
SD	19,688	164,706	1	20
TN	**97,809**	**404,275**	**3**	**13**
TX	**266,640**	**289,094**	**5**	**41**
UT	14,622	98,270	2	9
VA	**145,156**	**114,368**	**3**	**11**
VT	29,345	60,776	1	6
WA	**103,541**	**53,712**	**3**	**13**
WI	**243,729**	**353,709**	**3**	**36**
WV	**101,518**	**19,411**	**1**	**5**
WY	23,884	48,348	1	6

For the purposes of this hearing, I propose that it is critically important to understand the nature of the problem before taking constructive steps toward broadband solutions. It is my testimony today that the major broadband challenge is centered in regions where the carrier-owner has no strategic intent to improve those regions. The solution, therefore, must involve assessing how to incent sales by under-investing carriers to dedicated operators that have the obligation to upgrade in those regions.

III. CONCLUDING REMARKS

I am happy to discuss the shortfall in funding or the reasons that large carriers are generally ill-suited to provide service in rural regions.

Thank you and I look forward to answering your questions.

APPENDIX 1—BIO OF MICHAEL J. BALHOFF, CFA

Michael Balhoff is a Senior Partner and co-founder of Charlesmead Advisors, LLC, and is Managing Partner at Balhoff & Williams, LLC, a professional services firm that provides financial-regulatory consulting and advisory services to companies, investors and policymakers in the communications and energy industries.

Before founding Charlesmead Advisors and the predecessor firm to Balhoff & Williams, Mike headed the Technology and Telecommunications Equity Research Group at Legg Mason and, in the final seven of his sixteen years as a senior analyst at Legg Mason, he covered equities in the incumbent local exchange carrier industry.

Prior to joining Legg Mason in 1989, Mike taught as a graduate and undergraduate teacher. Mike has a doctorate in Canon Law and four master's degrees, including an MBA—concentration finance—from the University of Maryland. He is a CFA charterholder and is a member of the Baltimore Security Analysts Society. Mike has been named in six annual awards as a Wall Street Journal All-Star Analyst for his recommendations on the Telecommunications industry. His coverage of telecommunications, and especially rural telecommunications, was named by Insti-

tutional Investor magazine as the top telecommunications boutique in the country in 2003.

Mike is a Registered Representative of and Securities Products are offered through BA Securities, LLC Member FINRA SIPC. Any testimonial or endorsement may not be representative of the experience of other customers and is no guarantee of future performance or success.

APPENDIX 2—CALIFORNIA PREFILED TESTIMONY OF MICHAEL J. BALOFF, CFA

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Application of Calaveras Telephone Company (U 1004 C) Cal-Ore Telephone Co. (U 1006 C) Ducor Telephone Company (U 1007 C) Foresthill Telephone Company (U 1009 C) Kerman Telephone Co. (U 1012 C) Pinnacles Telephone Co. (U 1013 C) The Ponderosa Telephone Co. (U 1014 C) Sierra Telephone Company, Inc. (U 1016 C) The Siskiyou Telephone Company (U 1017 C) Volcano Telephone Company (U 1019 C) for a Determination of Applicants' Cost of Capital for Ratemaking Purposes	)	Application _____ (Filed September 1, 2015)

PREFILED OPENING TESTIMONY

OF MICHAEL J. BALHOFF

ON BEHALF OF THE APPLICANTS

I. Introduction and Purpose

Q. Please state your name and position for the record.

A. My name is Michael J. Balhoff. I am Managing Partner of Balhoff & Williams, LLC ("B&W"), and my business address is 5850 Waterloo Road, Suite 140, Columbia, Maryland 21045. I am also Senior Partner of Charlesmead Advisors, LLC ("Charlesmead"), and Charlesmead has the same business address as B&W.

Q. What services do B&W and Charlesmead provide?

A. B&W provides advisory services, including financial and regulatory consulting. Our clients are various telecommunications, cable television, and energy companies. B&W previously was known as Balhoff & Rowe, LLC, and then Balhoff, Rowe & Williams, LLC. The firm changed its name to reflect the active partners, but the services of the firm have remained consistent since the company was established in 2004. With two other partners, I also co-founded Charlesmead in June 2010 to provide investment banking services to telecommunications companies. My services in this proceeding are provided through B&W.

Q. Please describe your relevant educational and professional background.

A. I have a doctorate and four masters degrees, including an M.B.A., with a concentration in finance, from the University of Maryland. I am a Chartered Financial Analyst and am a member of the Baltimore Security Analysts Society. During a period of 16 years, I was a senior equity analyst and Managing Director with responsibility for leading the telecommunications and technology sell-side equity research group at Legg Mason Wood Walker, Inc., which was the wholly-owned capital markets division of Legg Mason, Inc. ("Legg Mason"), headquartered in Baltimore, Maryland. In that role, I

staffed and supervised a team of sell-side equity analysts providing research coverage of technology and telecommunications companies. With respect to regulated companies, I supervised and provided research coverage of incumbent local exchange carriers ("ILECs"), long-distance providers, and competitive local exchange carriers. Over the last seven years of my time at Legg Mason, I was also the primary analyst providing research coverage of local exchange telephone companies, including the regional Bell operating companies and publicly-traded rural telephone companies. My practice at Legg Mason was recognized notably for detailed coverage of rural telephony and the specific questions that arise related to the financial effects of regulation on equity securities in that sector. My more extensive resume, including publications, presentations, and testimonies, is included as Exhibit MJB - 1.

Q. On whose behalf are you offering testimony in this proceeding?

A. I am offering testimony on behalf of ten small, rural California ILECs in this proceeding. The rural ILECs are Calaveras Telephone Company, California-Oregon Telephone Co., Ducor Telephone Company, Foresthill Telephone Co., Kerman Telephone Company, Pinnacles Telephone Co., The Ponderosa Telephone Co., Sierra Telephone Company, Inc., The Siskiyou Telephone Company, and Volcano Telephone Company. I understand that the companies generally refer to themselves as the "Independent Small LECs."

Q. What is your relationship with the companies?

A. I have no current relationship with any of these companies except that they have asked me to analyze the appropriate cost of capital for them. Prior to this work, I have not had any relationship with these companies.

Q. Have you appeared before the California Public Utilities Commission ("Commission") in any other proceedings?

A. No, I have not. However, I have provided regulatory testimony concerning telecommunications matters before the Regulatory Commission of Alaska, the Iowa Utilities Board, the Public Utility Commission of Texas, the Vermont Public Service Board, the New Hampshire Public Utilities Commission, and the Maine Public Utilities Commission.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony in this proceeding?

A. I have been asked to provide testimony addressing cost of capital related to the Independent Small LECs in connection with an application to be submitted on September 1, 2015 to this Commission. In D.15-06-048, the Commission ordered the Independent Small LECs to initiate a consolidated proceeding where the issue of Cost of Capital ("COC") would be examined for each carrier.[1] I understand that the results of the COC proceeding are to be applied in the next cycle of General Rate Cases ("GRCs") to take place generally from 2015 through 2019. My testimony is focused on estimating an appropriate cost of capital for application in these rate cases. I will provide recommendations regarding an appropriate cost of equity capital and related cost of capital metrics to aid the CPUC in determining an appropriate Weighted Cost of Capital ("WACC") for each of the companies.

[1] *See* Decision 15-06-048 June 25, 2015 at 20.

Q. What are your specific qualifications for evaluating cost of capital for rural telephone companies?

A. As I explained above, at Legg Mason, I developed a financial specialization in the equities of rural telephone companies in addition to my broader telecommunications coverage. I have given numerous presentations to the National Association of Regulatory Utility Commissioners ("NARUC") and appeared before Congressional and federal agency groups. Most recently, after the Federal Communications Commission's ("FCC") sweeping 2011 reforms of universal service and intercarrier compensation, I was invited to brief the Department of Agriculture's Rural Utilities Service ("RUS"), the White House, the Secretary of Agriculture, and the FCC concerning the financial effects of those policy changes. On the basis of coverage of rural companies, my Legg Mason practice was named by Institutional Investor magazine as the top telecommunications financial analysis boutique in the country in 2003. I was also honored to be named as a Wall Street Journal All-Star Analyst in six annual awards for the performance of my equity recommendations.

Q. Please summarize your professional career after leaving Legg Mason.

A. In 2004, I had the opportunity to co-found a company with Robert Rowe, who was chairman of the Montana Public Service Commission as well as former president of NARUC and former chairman of NARUC's telecommunications committee. The professional focus at Balhoff, Rowe & Williams and at Charlesmead has been on rural telecommunications carriers and services. Our primary work today is investment banking-related as we represent buyers and sellers in the ILEC industry, advising in transactions involving the sales or purchases of entire companies, or advising

regarding transactions involving segments of businesses such as wireless assets, towers, fiber transport, cable television operations and data centers. Our services require us to value telecommunications assets and advise managements and boards of directors regarding strategic opportunities.

Q. What information did you review related to this testimony?

A. I evaluated, among other sources, the procedural record in Commission Rulemaking 11-11-007, prior cases involving cost of capital brought before the Commission, United States Supreme Court decisions related to cost of capital, orders of the FCC concerning rate-of-return matters, cost-of-capital resources related to telephone companies as compiled by Ibbotson/Morningstar[2] and Duff & Phelps,[3] as well as transactional data that we maintain at our firm, Charlesmead Advisors. I have also studied the financial reports of each of the Independent Small LECs, reviewing their capital structure and debt costs, with a focus on the last six years from 2009 through 2014.

[2] In March 2006, Morningstar, Inc. completed its previously announced acquisition of Ibbotson Associates, a leading provider of asset allocation research and services. Ibbotson Associates was founded by Professor Roger Ibbotson in 1977, and expanded over time to compile and publish annual valuation data widely used by the financial community. As of 2014, Morningstar no longer publishes the Ibbotson valuation materials, which, as of 2015, are included in the Duff & Phelps publications. Ibbotson/Morningstar still publishes its *Classic Yearbook* with important financial information in support of valuation professionals. All the Ibbotson and Duff & Phelps cited pages and tables are included in Exhibit MJB - 2.

[3] Duff & Phelps is a respected global valuation and corporate finance advisor focused on services including complex valuation, dispute consulting, M&A and restructuring. The company publishes annual statistical valuation resources that are widely used by the financial community. All the Ibbotson and Duff & Phelps cited pages and tables are included in Exhibit MJB - 2.

Q. Please summarize your testimony.

A. I recommend a cost of capital for the Independent Small LECs to be utilized for ratemaking purposes in the rate case cycle to take place from 2015 through 2019. My testimony is generally divided into the following sections:

- **Approaches in calculating cost of capital.** The initial section of this testimony outlines the theoretical framework for estimating the cost of capital, detailing the standard approaches for calculating a corporate cost of capital, including capital structure, cost of debt and cost of equity. I explain that the use of several cost-of-capital assessment methods in a proceeding such as this one allows the regulator or analyst to arrive at improved confidence that the conclusions are reasonable. Conclusions based on just one methodology or data source are less reliable. I emphasize that determinations of the cost of capital are not slavish applications of one formula or even several formulae, but are judgments arising from testing multiple inputs and thoughtful considerations of industry data. Accordingly, I begin with traditional valuation approaches, using the Buildup Method, which is a variation of the Capital Asset Pricing Model ("CAPM"), with a modification (using an average 1.06 beta based on five ILECs) to make the industry-specific factor better match the Independent Small LECs' industry. I then use several time periods and approaches to assess any variations in the results. Then I test those results based on transactional data to ensure their validity.
- **Industry changes that affect the corporate cost of capital for small ILECs.** The second section emphasizes that the Commission should assess industry

forces to understand how those factors affect the companies and the degree to which those forces impose new and greater financial pressures. An analyst uses historical statistics with the assumption that the future may be like the past, but I explain that assumption should be tested because the future may be riskier or safer than the past, depending on the current or reasonably anticipated risk drivers in a given industry. Valuation and determinations of costs of capital always involve judgment. I provide data and arguments in support of the fact that the industry risks are not less—but demonstrably greater—than they were nearly two decades ago when the Commission settled on a presumptive 10% WACC for the ten Independent Small LECs. I also supply data from real-world mergers and acquisitions ("M&A"), which show that valuations have contracted sharply since the early 2000s, notably over the last five or six years, signaling that the rural ILEC cost of equity has been raised to a significant extent, almost certainly because of adverse changes in an industry undergoing a fundamental transformation from monopoly to competition and from a focus on voice telephony to a focus on broadband services. These data provide the rationale and a compelling confirmation of increased costs of equity over recent years. To be clear, while interest costs have declined recently, there is little question in reviewing the data that the net cost of equity has risen steeply in the last decade.

- **Calculation of an appropriate range and estimate for equity costs.** To calculate a cost of equity, I begin with the well-tested Buildup Method, which is conceptually the same in implementation as the CAPM, both of which are

traditional valuation approaches. Using those methods, and by making appropriate adjustments for equity risk, industry-specific risk, and size risk, I identify an appropriate range for the Independent Small LECs' equity costs. On the basis of the historical data, I estimate that a realistic range for the Independent Small LECs' cost of equity is 17% to 22%, and I recommend 18.5%, which I will show to be a conservative calculation. I also testify that an assessment of industry risks provides the Commission with a high degree of confidence that the cost of equity for the Independent Small LECs is substantially higher than it was eighteen years ago when the Commission set the 10% target WACC. Given the relatively low costs of equity that are often applied in public utility sectors, I recognize that some may initially be skeptical about a 18.5% equity cost estimate, but I am confident that it is reasonable for these companies and appropriate for adoption in this proceeding. If anything, the cost of equity I recommend may be lower than will be required to attract capital for investments in rural telecommunications infrastructure. As I explain above, I rely on multiple methodologies to test and re-test my findings, and then I check the results against M&A data in an approach that is rigorous, intellectually honest, and convincing. In this section, I also provide a summary of other premia that I have chosen not to add to my estimate, including premia for liquidity and marketability risks, in spite of the fact that there is significant authority for including those incremental adjustments. The data and the methodologies demonstrate that my proposed cost of equity in this proceeding is both responsible and conservative.

- **Debt costs.** There is evidence that the Independent Small LECs will have lesser access to debt capital in the future and that debt costs are likely to rise in the future. The average and median costs of debt in 2014 for the seven Independent Small LECs with debt on their balance sheets were 4.5% and 4.8%, respectively. If the Commission wishes to use a target cost of debt to calculate a target WACC, I recommend the use of 5.5% as the cost for forward-looking debt. The interest rate is in line with Sierra Telephone's current cost of debt and less than the 5.6% average for the AAA corporate monthly rate from January 1997 to June 2015. I will provide a full explanation for this recommendation below.
- **Capital structure.** I present the actual capital structures for each of the Independent Small LECs, and report that the 2014 equity ratios averaged 70.1%. The capital structure ratios have remained relatively stable over recent years (*e.g.,* there was a 68% average equity ratio five years ago in 2010). I also offer my opinion about how a hypothetical capital structure might be formulated, if the Commission were to use such an approach. I testify that it is my judgment that the appropriate capital structure is toward the high end of the Commission's 1997 equity ratio "zone of reasonableness," which was previously defined as 60% to 80%. It is my opinion that an imputed capital structure might reasonably incorporate equity percentages between 70% and 80%, particularly as lenders and other investors have become more cautious about the industry. If the Commission chooses to use a target for the companies' cost of capital, I recommend that the Commission use the equity

and debt costs that are presented in this testimony as reasonable. In the event that the Commission seeks to set an overall rate of return for all companies, I have calculated a standardized WACC that assumes a 70% equity ratio (at the low end of the range I believe is reasonable for such a hypothetical figure), a cost of equity of 18.5% and a cost of debt of 5.5%, resulting in a WACC of 14.6%. I test that WACC, using the underlying data and actual transactional prices over the last several years, to provide convincing support for the costs of equity and the proposed WACC that I present in this testimony. I demonstrate that M&A data are the most reliable test of "reasonableness" for valuations and hence for costs of equity, and those data confirm the conservative nature of the estimates that I calculate using the CAPM-related methodologies. The data from these various analyses are compelling and support my conclusions.

III. LEGAL BACKGROUND.

Q. Please briefly summarize the legal precedents regarding equity cost of capital.

A. As a preliminary matter, I want to clarify that I am not an attorney. However, as a financial expert, I am aware of and familiar with the legal precedents that define the legal constraints on state commissions in setting appropriate rates of return for regulated utilities. The Supreme Court of the United States has confirmed well-established legal precedents for defining the allowed fair rate of return in ratemaking proceedings. In *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923) ("*Bluefield*"), the Supreme Court concluded that:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the general part of the country on investments in other business undertakings which are attended by the corresponding risks and uncertainties. . . . The return should be reasonable, sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise money necessary for the proper discharge of its public duties.

In *Federal Power Commission v. Hope Natural Gas Company*, 320 U.S. 391 (1944) ("*Hope*"), which expanded on *Bluefield* and emphasized that a utility's revenues must also cover "capital costs," the Supreme Court further found that:

> 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 attract capital. (Emphasis added.)

In *Duquesne Light Company et al. v. David M. Barasch et al.*, 488 U.S. 299 (1989), the Supreme Court reiterated the standard of *Hope* and *Bluefield* and then added important new guidelines, including "regulatory risk," which is a distinct risk to be recognized by regulators in defining a fair rate of return:

> Admittedly, the impact of certain rates can only be evaluated in the context of the system under which they are imposed. One of the elements always relevant to setting the rate under *Hope* is the return investors expect given the risk of the enterprise. *Id.*, at 603, 64 S.Ct., at 288 ("[R]eturn to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks"); *Bluefield Water Works & Improvement Co. v. Public Service Comm'n of West Virginia*, 262 U.S. 679, 692-693, 43 S.Ct. 675, 679, 67 L.Ed. 1176 (1923) ("A public utility is entitled to such rates as will permit it to earn a return . . . equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by

> corresponding risks and uncertainties"). The risks a utility faces are in large part defined by the rate methodology . . . . Consequently, a State's decision to arbitrarily switch back and forth between methodologies in a way which required investors to bear the risk of bad investments at some times while denying them the benefit of good investments at others would raise serious constitutional questions.

The three standards of fairness related to returns are financial integrity, capital attraction, and comparable earnings, which were reiterated in the Permian Basin Area Rate Cases.[4]

In short, an equity owner in a rate-regulated utility should be allowed the opportunity to earn returns that are comparable with those derived from investments in other businesses that have equivalent risks, with appropriate adjustments for other risks such as regulatory risk. The issue to be determined by the Commission, therefore, is what rate of return is necessary to allow the Independent Small LECs to earn on their investments a return that is commensurate with the risk-adjusted, market-based rate available for other similar investments. My professional opinion is that the current 10% overall rate of return applied in ratemaking for Independent Small LECs should be significantly *raised* to reflect the increased risks since 1997. The remainder of this testimony will develop and support that opinion, relying on relevant data and authoritative sources.

Q. Why should a commission be concerned about ensuring that a utility is assigned a reasonable return on capital?

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[4] *Permian Basin Area Rate Cases*. 390 U.S. 747 (1968). *See also Federal Power Commission v. Memphis Light, Gas & Water Division,* 411 U.S. 458 (1973).

A. A commission should be concerned about what is "fair" to conform with the law as defined by the U.S. Supreme Court (*e.g.,* financial integrity, capital attraction, and comparable earnings). That is, the investors who have dedicated capital to the utility have a right to a return that is legally justified. But, even setting aside the legal standard, a commission that is focused on customer welfare will also recognize that a utility without an appropriate equity return will be at-risk in attracting future capital because no rational investor will commit capital investment if the equity or other returns are insufficient. The rational investor will seek alternative and superior returns in investments other than the utility if expected returns at the utility fall short of market-based rates. To be clear, if the Commission were to assign a return on investment that does not reward an investor for the industry's risk, the outcome is predictable. An insufficient return on investment is likely to result in a redirection of capital away from the utility, not because the investor is a "bad actor," but because the investor should not be expected to act irrationally by committing capital where risk is not properly rewarded.

Federal and California regulators have identified a wide range of broadband deployment goals and continued network investment is needed to meet those goals.[5] However, an improperly low cost of capital could thwart achievement of these objectives. Moreover, an insufficient rate of return could disincent investments necessary to ensure service quality and network reliability in rural areas. In short, if the cost of capital is too low, it will hurt rural consumers and rural communities.

[5] *See FCC 2015 Broadband Report and Notice of Inquiry*, FCC 15-10 (rel. February 4, 2015); Pub. Util Code § 275.6.

IV. BEGINNING THE CALCULATION OF THE COST OF CAPITAL, USING STATISTICAL SOURCES.

A. DETERMINING THE CAPITAL STRUCTURE.

Q. What is involved in calculating an appropriate WACC?

A. Valuation (including estimation of cost of capital) is both an art and a science. Most fundamentally, the process requires judgment, and it must employ data that create a discipline to the process. Estimation of an appropriate rate of return begins with the computation of a WACC that sums the costs of debt and equity, each weighted by its proportion in the real or the hypothetical capital structure of the subject companies. There can be disputes regarding whether to use the market value of debt and make adjustments for the tax effects, but it is more typical to use embedded costs which are the "actual interest obligations, including amortization of discount premium, and expense of the utility's embedded debt outstanding . . . ."[6] Using this latter approach, for example, if the cost of debt is 6.0%, the dividend on outstanding preferred equity is 7.0%, and the cost of common equity is estimated to be 12.0%, while the capital structure includes 5% preferred equity and 70% common equity, the calculated WACC would be as illustrated in Table 1 below.

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[6] Roger A. Morin, *New Regulatory Finance,* Public Utilities Reports, June 1, 2006 (hereafter "Morin"), p. 26; see Exhibit MJB - 2 **Duff & Phelps and Ibbotson source pages cited in the testimony including D&P 2015 A-2 and B-2**
Exhibit MJB - 3.
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Table 1: Illustration of cost of capital based on capital structure

	Cost of capital	Percentage of capital	Allocated cost
Debt	6.00%	25.00%	1.50%
Preferred equity	7.00%	5.00%	0.33%
Common equity	**12.00%**	70.00%	8.40%
WACC			**10.23%**

Q. Please comment on capital structure as it pertains to this proceeding.

A. Evaluating the capital structure of a company involves determining the total capital available to the company and the individual capital components, which may include several kinds of debt or several kinds of equity. The regulator or financial analyst determines the current or average percentage of each component in the total capital structure of the company. It is also possible to use the actual capital structure or a hypothetical capital structure in determining the WACC. However, in regulatory proceedings, I believe that hypothetical structures are often used to better match industry-wide capital structures or to simplify regulatory regimes affecting many utilities or to assure the buildup of equity. A commission may determine that a "fair" price for capital reflects an industry-based average capital structure, even if the equity ratio for a company is relatively low. The rationales for using a hypothetical capital structure rather than the actual structure can be controversial as such a process requires subjective judgment. It is my understanding that the Commission has attempted in the past to arrive at a more generic cost of capital that is forward-looking, and therefore the WACC may not be based strictly on any single company's actual capital structure. I support this goal of determining a cost of capital that is forward-looking, and I believe that it would be unreasonable to use a company's actual structure if such a

structure is inconsistent with forward-looking expectations regarding the appropriate mix of capital sources.

Q. Are you familiar with the Commission's historical approach with respect to capital structure?

A. I understand that the Commission sought in the past to establish a target WACC that allowed for differing capital structures at small telephone companies.[7] In the cases that were decided in 1997, for example, the Commission determined a WACC of 10%, which was deemed to be a reasonable target, and then it tested that WACC by using the actual cost of debt for California ILECs and by evaluating the residual returns (an implied cost of equity) for the Independent Small LECs. The Commission's conclusion at that time was that a WACC of 10% resulted in returns on the Independent Small LECs' actual debt and equity that were within acceptable ranges.[8] The adoption of this overall rate of return allowed companies to manage their own capital resources, while maintaining a reasonable overall cost of capital for ratemaking purposes. *See, e.g.* D.97-04-036, at p. 12 ("[c]onsistent with our treatment of cost of capital for large and mid-size telecommunications companies, and as an incentive for applicant to manage its capital structure, we decline to adopt a specific capital structure.").

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[7] My understanding is that the CPUC resolved cost-of-capital proceedings in 1997 for each of the Independent Small LECs. *See* D.97-04-036 (California-Oregon Telephone Co.); D.97-04-034 (Calaveras Telephone Company); D.97-04-035 (Ducor Telephone Company); D.97-04-032 (Sierra Telephone Company, Inc.); *see also* Res. T-16003 (Kerman); Res. T-16004 (Pinnacles); Res. T-16005 (Ponderosa); Res. T-16006 (Siskiyou); Res. T-16007 (Volcano).

[8] *See, e.g.*, D.97-04-036 (California-Oregon Telephone Co.), p. 9; D.97-04-034 (Calaveras Telephone Company), p. 9; D.97-04-035 (Ducor Telephone Company), p. 9; D.97-04-032 (Sierra Telephone Company, Inc.), p. 9.

B. ESTIMATING THE COST OF DEBT.

Q. Is the cost of debt difficult to determine?

A. For regulatory purposes, the cost of debt is usually the actual cost as specified in the lending documents.[9] However, it is possible to use a different cost of debt, for example, to generalize for an industry or to normalize in a time period when debt costs are assumed to be unsustainably high or low, as I will explain below. In all cases, the regulator or analyst should assess a realistic set of debt costs that are forward-looking. As is well known, the current prices for debt are today at historic low levels, due significantly to the Federal Reserve's ("Fed") bond-buying program; and there is an expectation that those rates will rise as the Fed alters its monetary policy. I will also explain below that debt resources appear to be increasingly *unavailable* to smaller ILECs because the primary lenders to the industry have grown increasingly cautious.[10] For rural ILECs, the effects of greater industry-wide risk combined with lesser availability of debt can shift the capital structure toward a higher percentage of more costly equity or even toward having virtually no debt at all.[11]

Q. Can we simply use the debt costs as reflected in the market today in assessing the debt component to cost of capital?

A. No. Again, the Commission must look for "reasonable" calculations for forward-looking costs, including debt costs. The Fed has engaged in a policy that has driven

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[9] Morin, p. 26.

[10] The challenges including contracting numbers of switched access lines, increasing required capital commitments necessary to meet growing data demand, and regulatory uncertainties including shrinking revenues from access charges and universal service support mechanisms.

[11] The ten Independent Small LECs appear to be maintaining relatively stable capital structures over the last five years. The equity ratios were 70%, on average, in 2014 and generally fall within the range of the zone of reasonableness referenced in the Commission's 1997 rate case decisions (60% to 80% equity).

interest rates to extraordinarily low levels in recent years, with a goal of stimulating growth and investment. However, the Fed's activities are widely regarded as "unsustainable" as reflected in Duff & Phelps' discussion in its 2015 Handbook:

> The yields of U.S. government bonds in certain periods during and after the [financial crisis of 2008] may have been *artificially* repressed, and therefore [are] likely unsustainable. Many market participants will agree that nominal U.S. government bond yields in recent periods have been artificially low. Even members of the Federal Open Market Committee (FOMC) have recently discussed the need to 'normalize' interest rates." (Emphasis in original.) [12]

At a meeting occurring on December 16-17, 2014, the Federal Open Market Committee ("FOMC"), which is a committee of the Federal Reserve Bank, issued a statement, signaling the need to "normalize" federal policy in the future:

> Based on its current assessment, the [FOMC] judges that it *can be patient in beginning to normalize the stance of monetary policy.* The [FOMC] sees this guidance as consistent with its previous statement that it likely will be appropriate to maintain the 0 to ¼ percent target range for the federal funds rate for a *considerable time* following the end of its asset purchase program in October . . . . (Emphasis added by Duff & Phelps.)[13]

In short, it would be unreasonable to use today's unsustainable debt rates as a proxy for future debt costs.

C. ESTIMATING THE COST OF EQUITY.

Q. Why is the process of assessing the appropriate return on equity more challenging than determining the cost of debt?

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[12] 2015 Duff & Phelps Valuation Handbook: Guide to Cost of Capital, Market Results through 2014, (Hoboken, NJ: John Wiley & Sons, Inc., 2015) (hereafter "Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital"), p. 3-3; see Exhibit MJB - 2.

[13] *Id.*

A. Debt has clear legal documentation and interest obligations, and debt can be traded in the public markets, making it possible to achieve a better determination of market-based costs. By contrast, common equity costs cannot be observed directly for privately-held companies.[14] Common equity for the vast majority of rural telephone companies has no documentation or defined obligation that would allow its specific costs to be easily computed. Common equity can be traded publicly, but the Independent Small LECs, like most rural ILECs in the United States, do not have publicly-traded common equity.

Q. How are the costs of preferred equity estimated?

If a company's preferred equity has no defined return, then that security would present the same valuation problem as common equity. If there is a defined return, the cost of preferred equity can be estimated using the dividend on the security. Four of the Independent Small LECs—Pinnacles, Ponderosa, Siskiyou, and Volcano—have preferred equity that is, on average, approximately 2 percent of total capital, and those companies have been paying preferred dividends at a consistent rate, as will be detailed below. I have estimated the cost of those preferred equity securities using the companies' preferred dividend yields, that are 5.0%, 6.0%, 5.5% and 7.0%, respectively.

Q. How does a financial expert typically estimate common equity costs?

A. Most financial experts with whom I have been associated seek to estimate common equity costs using *multiple* valuation methodologies. The goal of the financial

[14] I use the term "common equity" to distinguish from preferred equity, and I include capital contributions and retained earnings as common equity.

professional or the regulator in valuing common equity should be to check and re-check the reasonableness of his or her estimates to ensure that they are accurate and sensible. When I analyzed stocks and published while at Legg Mason, I always employed multiple approaches that included company-specific discounted cash flow ("DCF") models, valuations relative to the value of other companies, and historical data and trends. At Charlesmead, we do the same when we advise companies in our M&A business in connection with sales or acquisitive transactions. In the M&A business, financial advisors virtually always test valuations by studying comparable publicly-traded equities as well as DCFs that assess probable operating performance for each year over the projected five to ten years of the model. Additionally, financial professionals use comparable M&A transactional data to observe valuations and trending in the markets over time. The most responsible approach is to analyze valuation from multiple viewpoints to provide confirmation of the reasonableness of the results generated by the methods chosen..

D. USE OF THE COMMON METHODOLOGIES—DCF AND CAPM.

Q. What are the most commonly-used methodologies to compute equity costs in regulatory proceedings?

A. The most common approaches used in regulatory proceedings today rely on DCF models and on the CAPM, the latter of which is also the basis for the Buildup or Risk Premium Method. The federal allowed rate of return for interstate services, which was last reduced to 11.25% from 12% in 1990, was derived using a constant-growth DCF model to compute equity costs, using data from the Regional Bell Operating

Companies, also known as Regional Holding Companies ("RHCs").[15] In the 1990 represcription order, the FCC clarified at paragraph 35 that the formula for that DCF is:

$$K_e = D/P + G$$

Where:
Ke = Cost of equity
D = Annual dividend on a share of common stock
P = Price of a share of common stock
D/P = Dividend yield on a share of common stock
G = Annual dividend growth rate

The DCF model, as traditionally used by the FCC or state commissions, is based on an assumption of predictable dividends in a stable industry with a predictable growth trend. The formula was assumed to be reliable in 1990. I note that those assumptions are no longer applicable today because the industry is no longer a predictable monopoly with high assurances of receiving returns. Rather, local telecommunications dividends—essentially payments for equity costs—can no longer be assumed to expand at a constant rate nor can they be assumed to be perpetual. Pertinent to this proceeding, I note that the DCF model relies on two other important assumptions. The first is that the price of the equity can be known, which is of course not true for privately-held companies such as the Independent Small LECs, whose equity market value cannot be observed or verified. The second assumption is that there are reliable publicly-traded proxies (the RHCs were assumed to be sufficiently similar to other ILECs in 1990); in that regard, as I explain below, the large dividend-

[15] FCC, *In the Matter of Represcribing the Authorized Rate of Return for Interstate Services of Local Exchange Carriers*, 68 Rad. Reg. 2d (P&F) 771 (F.C.C), 5 FCC Rcd. 7507. 1990 WL 604105, FCC 90-315. *See, e.g.*, Exhibit MJB - 4, pp. 8-9; the Exhibit makes clear that the 1990 estimates of equity costs were derived from data related to very large companies with multi-state operations serving rural and urban areas. As I explain below, these companies had – and continue to have – lower risk profiles than rural telephone companies like the Independent Small LECs.

paying ILECs—the ones that were the basis for the 1990 DCF—are no longer suitably similar to the Independent Small LECs.[16] The simple constant-growth DCF formula, in my opinion, cannot be used for this testimony, and I am unaware of any commission that is using such a formula today.

Q. Are there variants of the DCF model used by financial analysts?

A. As I noted above, financial investors and investment bankers use company-specific DCF models that rely on estimating the individual company's cash flows for each modeled year based on highly-detailed revenue, cost and capital expenditure inputs over a period of time, such as five to ten years. These models involve discounting to the present the estimated future cash flows plus a final-year "terminal value." The FCC and regulatory commissions have used the simpler, constant-growth DCF, and not the detailed discount cash flow model that I describe above.

Q. What is the CAPM?

A. The CAPM is a computation of the expected return on a security, based on concepts derived from the work of Harry Markowitz and the subsequent study of William Sharpe in 1960. The premise underlying this method is that the expected return of a security, or of a portfolio, equals the rate on a risk-free security (generally assumed to be the long-term U.S. Treasury Bond for which the risk of principal loss or failure-to-pay is very low) plus certain other risk-premia to adjust for systematic (market) risk. This approach reflects the overall market risk (the broad market rising or falling), plus adjustments for individual-company risk captured by a "beta," plus adjustments for size (generally called a "size premium"). "Beta" is a factor that is multiplied by the

[16] *Id.* The differences will be identified in the testimony below.

expected market return to adjust for a public company's risk that is determined to be higher or lower (more or less volatile) than the overall market risk.[17] The size premium is founded on the well-established premise that smaller firms present higher risks than larger ones, and it is possible to add other premia as will be discussed below. The CAPM formula defines a theoretical linear relationship between expected return on equity (cost of equity) and risk as:[18]

$$K_e = R_f + (\beta \times RP_m) + RP_s$$

Where:

K_e = Expected return (cost) on equity
R_f = Risk-free rate
β = Beta of the security (statistical volatility v. the market)
RP_m = Equity Risk Premium
RP_s = Size premium

If the expected return on the security does not meet or exceed the required return, then the model suggests that the rational investor will not purchase the equity security in question. She or he will choose to invest money in other investments where the risk-return relationship is more favorable.

Q. What is the Buildup Method?

A. The Buildup Method is an additive Risk Premium approach that relies on CAPM concepts in computing the cost of equity. In reality, it is the CAPM, with the beta calculation divided into two parts: one for the overall market risk (the equity risk premium) and the second for a proxy premium related to the industry (an industry-risk premium). The Buildup Method begins with the risk-free rate and then adds a

[17] A beta of 1.0 equals the market risk, and a beta under 1.0 adjusts the equity risk premium for companies with a volatility in returns that suggests lower-than-market-risk, while, conversely a beta above 1.0 adjusts for volatility that suggests higher-than-market-risk.
[18] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, p. 2-8; see Exhibit MJB - 2.

premium for the estimated overall equity risk in the stock market, plus another adjustment for the relative industry-specific risk, and a further adjustment for a firm size premium. Ibbotson Associates ("Ibbotson") first began publishing buildup industry risk premia in its *Stocks, Bonds, Bill, and Inflation Valuation Edition 2000 Yearbook*. However, since 2015, Duff & Phelps has integrated much of the cost of capital analyses from Ibbotson and Morningstar (which purchased the Ibbotson business) into Duff & Phelps' annual *Valuation Handbook*. Ibbotson/Morningstar also published additional statistics, including industry risk premia, categorized by three- or four-digit Standard Industry Classification ("SIC") codes, which Duff & Phelps now includes in a separate volume, entitled *2015 Valuation Handbook: Industry Cost of Capital*.[19] The incumbent local telecommunications industry is designated as "Telecommunications, except RadioTelephone" with an SIC code of 4813. The formula for the Buildup model is the following:[20]

$$K_e = R_f + RP_m + RP_i + RP_s$$

Where:
K_e = Expected return (cost) on equity
R_f = Risk-free rate
RP_m = Equity risk premium
RP_i = Industry risk premium
RP_s = Size premium

Duff & Phelps also provides a formula that is an alternative to the Buildup Model presented above. In that alternative, a size adjustment that includes the market premium can be added to the risk-free rate. That is, only two variables are added, and those are the risk-free rate and the combination of the size and market premium. I will

[19] Duff & Phelps 2015 Valuation Handbook: Industry Cost of Capital, (Hoboken, NJ: John Wiley & Sons, Inc., 2015).
[20] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, p. 2-8; see Exhibit MJB - 2.

provide that estimate, which further confirms the results of my analysis, although the calculation is relatively crude.

E. USE OF TRANSACTIONAL DATA TO CONFIRM CAPM ESTIMATES.

Q. Are these the primary approaches to assess the cost of capital in regulatory proceedings?

A. In my experience, the CAPM, Buildup and DCF models are the most commonly-used cost-of-capital estimation tools in regulatory proceedings.[21] Before the mid-1960s, the Comparable Earnings approach was used almost exclusively in regulatory valuation exercises, but it was replaced by the DCF after that time.[22] In the investment banking industry, including at our firm, Charlesmead, value (with calculations that rely on cost of equity estimates) is assessed using the CAPM, with adjustments for size or company-specific differences from the industry, and detailed (not the constant growth) DCFs. As I explained earlier, we also rely on two other methodologies that are not typically used in regulatory proceedings, but which help to confirm the validity of our conclusions. Specifically, we assess multiples (ratios) of enterprise value ("EV"), which is defined as equity value plus net debt (total debt less cash and equivalents), divided by cash flows, most often using operating cash flow (earnings before interest, taxes, depreciation and amortization or "EBITDA"). We compile those EV/EBITDA multiples and other ratios from actual transactions, so we can understand the market

[21] There are variations of the CAPM, including the Empirical Capital Asset Pricing Model ("ECAPM"), the Arbitrage Pricing Model ("APM"), and the Fama-French Three-Factor Model. These models rely on similar concepts related to proxy groups and market risk estimations. As I will explain, I believe that the larger "proxy" companies do not sufficiently capture regulatory and small-business risks, and that alternative CAPM-based models do not refine an estimation of those risks.
[22] Morin, page 18.

perception of value and the trends over time.[23] The resultant ratios permit us to "normalize" our comparisons of one transaction with other transactions. We are convinced that the most informative valuation approaches are based on real-world transactions between a knowledgeable buyer and seller. As such, these data provide insights into efficient and real-time assessments of value and risks.

Q. How do you utilize actual transactional data in your analysis?

A. Especially instructive are the insights derived from transactions when companies are bought or sold in their entirety. Transactions provide direct data related to private *and* public companies, large *and* small enterprises, without any control discount. Like all professional financial advisors, Charlesmead tracks M&A data over time to understand the trends and provide appropriate advice to buyers and sellers. Those insights are even more valuable when an industry is undergoing dramatic change, as is happening with companies such as the Independent Small LECs. Dr. Roger Morin, Professor of Finance and author of the oft-cited text, *New Regulatory Finance*, notes the problem with historical models when the future is *not* like the past.

> [S]hifts in growth prospects take some time before they are fully reflected in the historical growth rates. Hence, backward-looking growth and statistical analysis may fail to fully reflect the fact that the risks and growth prospects of utilities have escalated, and may only provide limited evidence that the risk and the cost of capital to these utilities have increased.[24]

It is clear to me that we are in such a period for telecommunications carriers, both large and small ILECs, as these markets are driven by rapidly-shifting customer

[23] The approach is analogous to real-estate metrics such as price per square foot or grocery store labels with price per unit. In the case of ILEC transactions, we assess how much a buyer is willing to pay for one dollar of operating cash flow (EBITDA).
[24] Morin, p. 436.

demand for voice, video, broadband, as well as the ongoing overhauls of regulatory support mechanisms, more limited access to capital, and evolving competitive threats. It is my opinion that the transactional valuations are most instructive and specific as they capture risk that is not fully explained in the CAPM or the Buildup Methods which rely on historical as well as broader and less-specific data sets. To be clear, I believe that the historical data are drawn from a less turbulent time for the industry, which means that the CAPM-based data are inclined to *understate* the cost of an ILEC's equity today. The transactional approach provides a corrective as it is more current information and is based on the concept of "fair value" which involves an arms' length transaction between a "willing buyer and willing seller."[25] Using M&A data, we track rising value (declining risk) over time, stable value (unchanged risk) or deteriorating value (increasing risk). While we rely on these data in our transactional work, I will only use the M&A data in this proceeding to *confirm the findings* derived from the CAPM-based approaches, and *not to establish a baseline cost of equity*.

Q. Are you able to provide data to verify all the transactions in the marketplace?

A. Some, but not all, transactional data are available. Exhibit MJB - 5 provides the publicly-available data related to small ILEC transactions from 2001 to the present. Some of the transactions listed in the Exhibit appear to have higher valuations in recent periods but the ILEC valuations that rely primarily on LEC services—sales of

[25] Ibbotson SBBI 2013 Valuation Yearbook, Market Results for Stocks, Bonds, Bills, and Inflation 1926-2012 (Chicago, IL: Morningstar, Inc., 2013) (hereafter "Ibbotson 2013 Valuation Yearbook"); see Ibbotson 2015 Classic Yearbook Market Results for Stocks, Bonds, Bills and Inflation 1926-2014, (Chicago, IL: Morningstar, Inc., 2015), (hereafter "Ibbotson 2015 Classic Yearbook"), p. 11; "*Fair market value* is defined by IRS Revenue Ruling 59-60 [sec. 2.02] as '. . . the price at which the property would change hands between a willing buyer and a willing seller when the former is not under any compulsion to buy and the latter is not under any compulsion to sell, both parties having reasonable knowledge of relevant facts." (Emphasis in original); see Exhibit MJB - 2.

ILECs without cable TV, wireless, significant fiber transport, or tax benefits—are valued consistently lower over the last several years, in a range today of 4.5 to 5.5 times last-twelve-month EBITDA. I frequently report on the generalized trends and I regularly explain those trends at industry conferences.[26]

Q. Can a valid cost of capital analysis use the cost of equity from the stocks of the publicly-traded ILECs to estimate the capital costs for small ILECs?

A. The analysis can *begin* with data derived from guideline or proxy ILECs, as has been done for many years. However, small ILECs have characteristics that make their risks considerably different from the risks at larger companies, and the differences appear to growing. Accordingly, we cannot rely exclusively on those data. Indeed, the differences between diversified publicly-traded carriers and small private carriers are much larger than when the FCC set the interstate rate of return in 1990.

Q. Please explain the differences between large and small ILECs as it pertains to their investment and market risk.

First, and probably most significantly, the regulatory factors affecting small rural carriers are fundamental to the business of those companies, which have a high proportion of their operations in regions that are uneconomic or less economic than those served by large carriers. Large carriers rely on relatively little or no regulatory support revenues because their businesses are concentrated in denser areas and those carriers provide lesser-regulated or non-regulated products such as wireless, enterprise, and extensive video products. In light of the rural carriers' relative dependence on

[26] *See, e.g.*, Michael J. Balhoff, Slide Presentation: *Emerging Strategic Value Creation,* June 2014, presented at the Georgia Telecommunications Association Conference, Orlando, Florida (hereafter "Georgia Presentation"), slide 7. See Exhibit MJB - 6.

universal service support and intercarrier compensation revenues, regulatory threats to these revenue sources disproportionately increase the risk profiles for these smaller carriers compared with those of larger carriers. Second, the larger carriers are all engaging in significant acquisition activities, based on their financial capacity to acquire other assets and businesses. The purpose of those acquisitions is to generate efficiencies (synergies), which often reduce the target companies' cash operating costs by 20%-30%, and allow for critical diversification of operations. It is important to note that *every* large ILEC is or has been engaged in sweeping acquisitions in transforming the carrier's businesses, made possible by significant size and access to capital.[27] The large ILECs' capacity to mitigate today's operating risks through major acquisitions is a strategic advantage that is not being employed to a meaningful extent by smaller ILECs and is likely not available to smaller ILECs.[28] Finally, large carriers generally have extensive access to publicly-traded equity capital and cost-effective debt capital. The Independent Small LECs do not have public equity and have limited access to cost-effective debt, as will be explained below.

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[27] AT&T Inc., SEC Form 10-K Annual Report 2014. Retrieved from SEC EDGAR website http://www.sec.gov/edgar.shtml, Seq 4, AT&T Inc. 2014 Annual Report, "Other Business Matters," p. 21. Verizon Communications, Inc., SEC Form 10-K Annual Report 2014. Retrieved from SEC EDGAR website http://www.sec.gov/edgar.shtml, Seq 4, Exhibit 13, "Acquisitions and Divestitures," p. 34. CenturyLink, Inc., SEC Form 10-K Annual Report 2014. Retrieved from SEC EDGAR website http://www.sec.gov/edgar.shtml, "Acquisitions," p. 13. Frontier Communications Corporation (2014). Form 10-K Annual Report 2014. Retrieved from SEC EDGAR website http://www.sec.gov/edgar.shtml, "Acquisitions," p. F-12. Windstream (2014). Form 10-K Annual Report 2014. Retrieved from SEC EDGAR website http://www.sec.gov/edgar.shtml. "Strategic Acquisitions," p. 4. Consolidated Communications Holdings, Inc., SEC Form 10-K Annual Report 2014. Retrieved from SEC EDGAR website http://www.sec.gov/edgar.shtml, "Recent Business Developments," p. F-7.

[28] For a summary graphical presentation on the transformation of large ILECs. *see* Georgia Presentation, Exhibit MJB - 6, slides 10-14.

Q. Do valuation professionals typically make adjustments for size of the companies?

A. Yes. Most professionals rely on the data and resources provided by companies such as Morningstar, Inc. (Ibbotson *Stocks, Bonds, Bills, and Inflation* ("SBBI")) and Duff & Phelps, LLC.[29] Both Ibbotson/Morningstar and Duff & Phelps are clear that adjustments should be made for size effects and other risk factors. For example, Duff & Phelps in its *2013 Risk Premium Report* writes:

> Research tells us that the CAPM often misprices risk for certain investments. Specifically, researchers have observed that commonly used methods of measuring risk used in the CAPM (specifically, beta) often understate the risk (and thus understate the required return) for small company stocks. Examination of market evidence shows that within the context of CAPM, beta does not fully explain the difference between small company returns and large company returns. In other words, the historical (observed) excess return of portfolios comprised of smaller companies is greater than the excess return predicted by the CAPM for these portfolios. This 'premium over CAPM' is commonly known as a "beta-adjusted size premium" or simply "size premium".[30]

To be clear, investors *require* a return for smaller companies that exceeds that predicted in the CAPM for larger companies, as proven in the historical studies. This investor behavior cannot be ignored in valuation. Moreover, Duff & Phelps is clear in its *Valuation Handbook*, cited above, that research verifies the existence of a size premium. This premium is appropriately added to the equity return to reflect market-based risk that is greater for smaller companies compared with larger companies. Ibbotson/Morningstar also provides statistics to demonstrate the effect of size on

[29] Ibbotson 2015 Classic Yearbook; Ibbotson 2014 Classic Yearbook, Market Results for Stocks, Bonds, Bills, and Inflation 1926-2013 (Chicago, IL: Morningstar, Inc., 2014)(hereafter "Ibbotson 2014 Classic Yearbook"); Duff & Phelps, 2014 Valuation Handbook, Guide to Cost of Capital (Chicago, IL: Duff & Phelps, LLC, 2014)(hereafter "Duff & Phelps 2014 Guide to Cost of Capital").

[30] Duff & Phelps, *Risk Premium Report 2013* (Chicago, IL: Duff & Phelps, LLC, 2013), p. 60, available at http://www.duffandphelps.com/SiteCollectionDocuments/Reports/(EXCERPT)%202013%20Duff%20Phelps%20Risk%20Premium%20Report.pdf.

returns, and summarizes this relationship with the comment that "[i]f small companies did not provide higher long-term returns, investors would be more inclined to invest in the less risky stocks of large companies."[31]

F. OTHER REASONABLE PREMIA, WHICH ARE NOT USED IN THIS ANALYSIS.

Q. Are there sources justifying adjustments that must be made in calculating the cost of equity other than the size premium cited above?

A. Yes. I will not use any other adjustments in this testimony, but it is important to recognize that there is ample evidence that further adjustments can and possibly should be made. The Internal Revenue Service ("IRS") has issued guidance on valuation over the years, including in its Revenue Ruling 59-60, which provides a framework for valuation of the stock of closely-held corporations or the stock of corporations where market quotations are either lacking or too scarce to be recognized. Morningstar, Inc, in its 2013 Ibbotson/Morningstar *SBBI Valuation Yearbook*, states that Ruling 59-60 "changed the way businesses are valued and is the cornerstone of the valuation process.[32] That Ruling begins with the counsel that an appraiser should:

> . . . maintain a reasonable attitude in recognition of the fact that valuation is not an exact science. A sound valuation will be based upon all the relevant facts, but the elements of common sense,

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[31] Ibbotson 2014 Classic Yearbook, p. 109; see Exhibit MJB - 2.

[32] Ibbotson 2013 Valuation Yearbook, p. 12; see Exhibit MJB - 2. *See also*, Ibbotson 2014 Classic Yearbook, pp. 123-127 in which liquidity-related investing issues are explained, as they require an adjustment because the "premium is the extra return an investor would demand in order to hold a security that cannot costlessly be traded" (p. 124); see Exhibit MJB - 2.

> informed judgment and reasonableness must enter into the process of weighing those facts and determining their aggregate significance.[33]

IRS Revenue Ruling 77-287 recognizes that there are important valuation differences and considerations for small and closely-held companies.[34] Further, various United States Tax Court and Court of Federal Claims cases support the application of discounts or premia arising from illiquidity, lack of marketability, lack of control, and industry risk.[35] In particular, there is substantive support that the cost of equity should include additional premia for illiquid and less-marketable securities.

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[33] IRS Revenue Ruling 59-60, sec. 3.01, available at http://www.aticg.com/Documents/Revenue/RevRule59-60.pdf. See Exhibit MJB - 7.

[34] IRS Revenue Ruling 77-287, available at http://www.aticg.com/Documents/Revenue/RevRule77-287.pdf. See Exhibit MJB - 7. This ruling pertains to discounts that are used for securities that cannot be resold immediately because they are restricted from resale pursuant to Federal securities laws. At Sec. 4.02, the Ruling notes:

> Pursuant to Congressional direction, the SEC undertook an analysis of the purchases, sales, and holding of securities by financial institutions, in order to determine the effect of institutional activity upon the securities market. The study report was published in eight volumes in March 1971. The fifth volume provides an analysis of restricted securities and deals with such items as the characteristics of the restricted securities purchasers and issuers, the size of transactions (dollars and shares), the marketability discounts on different trading markets, and the resale provisions. This research project provides some guidance for measuring the discount in that it contains information, based on the actual experience of the marketplace, showing that, during the period surveyed (January 1, 1966, through June 30, 1969), the amount of discount allowed for restricted securities from the trading price of the unrestricted securities was generally related to the following four factors [earnings, sales, trading market, and resale agreement provisions].

The smaller the sales, according to the SEC study and the IRS Revenue Ruling, the greater the discount.

[35] *See, e.g.*, *Mandelbaum v. Commissioner*, T.C. Memo 1995-255 (June 12, 1995); *Huber v. Commissioner*, T.C. Memo 2006-96; 2006 Tax Ct. Memo LEXIS 97 (May 9, 2006); *Estate of Frazier Jelke III v. Commissioner*, T.C. Memo 2005-131 (May 31, 2005); *Estate of Webster E. Kelley v. Commissioner*, T.C. Memo 2005-235 (Oct. 11, 2005). See the American Institute of Public Accountants, *Statement on Standards for Valuation Services*, para 40, available at (http://www.aicpa.org/InterestAreas/ForensicAndValuation/DownloadableDocuments/SSVS_Full_Version.pdf): "During the course of a valuation engagement, the valuation analyst should consider whether valuation adjustments (discounts or premiums) should be made to a *pre-adjustment* value. Examples of valuation adjustments for valuation of a business, business ownership interest, or security include a *discount for lack of marketability or liquidity* and a *discount for lack of control*." (Emphasis in the original.)

Q. Can you expand on your comments about adjusting for illiquidity or lack of marketability?

A. I will not make any specific adjustments in this testimony for illiquidity or lack of marketability, but I note that the omission of such a premium is a further signal of the conservatism of the estimates in this analysis. Financial professionals have developed a consensus view that cost of capital should be adjusted based on size effects, as explained above. However, *in addition*, there is a convincing case that there should be another premium related to liquidity/marketability. Because the size effect premium is premised on larger or smaller stocks that are marketable *and* liquid, a premium to account for insufficient marketability and liquidity can, and likely should, also be applied. In 2009, the IRS provided a 115-page "Discount for Lack of Marketability: Job Aid for IRS Valuation Professionals" in which the IRS authors, clarifying that the document was not the official position of the IRS, set out the study's purpose "to identify issues around [the discount for lack of marketability or 'DLOM'] and to present techniques to assist valuators in the field [with information] . . . of value not only to our own personnel but also to our valuation customers."[36] The guide does not recommend a specific approach or premium but concludes that the DLOM in the marketplace may be 20% to 25% based on Securities and Exchange ("SEC") studies, approximately the same amount based on tax court rulings.[37] Thus, there is evidence

[36] IRS Engineering/Valuation Program DLOM Team, Discount for Lack of Marketability: Job Aid for IRS Valuation Professionals, September 25, 2009, available at http://www.irs.gov/pub/irs-utl/dlom.pdf, [hereafter "IRS DLOM"], p. 1.

[37] IRS DLOM, p. 77: "Greatest weighting of [SEC-study] transactions occurred within the '15%' and '25%' implied discount groupings. This suggests a most-common discount for lack of marketability of 20%"; p. 80: "the valuator will review the results of several cases such as McCord, Lappo and Peracchio and then base the choice of discount on the discounts accepted by the court in the reviewed

that an adjustment should be made related to both size *and* lack of marketability. It has been my experience that marketability is reduced further in environments where investors find that regulatory obligations are greater than in other jurisdictions and where sales are perceived to be accompanied by more challenging regulatory conditions. While I am convinced that such a discount for lack of marketability likely should be included, *the omission of such a discount makes the inclusion of a size premium even more critical in the calculation of the cost of equity to assure an appropriate return on equity.*

V. INDUSTRY CHANGES THAT AFFECT THE CORPORATE COST OF CAPITAL FOR SMALL ILECS.

Q. Please summarize the major changes in the ILEC industry that have affected the cost of equity for the Independent Small LECs.

A. Over the last 15-20 years, changes have occurred that have dramatically increased risk for ILECs in general and notably for the small, rural ILEC industry, including the carriers involved in this proceeding. The changes can be explained as sequential forces. Technology changes accelerated, increasing the number of competitors. New competitors have forced changes in regulatory systems. And the changed regulations, particularly for ILECs focused on less economic service regions, have created a significant uncertainty among debt and equity investors.

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cases. For example, the range of court discounts might have been from 20% to 25% so the valuator chooses 22.5% with the rationale that his valuation subject
is similar to the subjects under consideration in the cases cited. Judges are sometimes found to adopt this approach as well. The judge will look at McCord with its 20% discount and add a factor of say 3% based on his analysis of the special factors of his case to arrive at a chosen DLOM level of 23%." p. 80: "Wruck found a discount for lack of marketability of 17.6%, Hertzel & Smith found a discount of 13.5% for lack of liquidity or that Bajaj et al determined that the discount for lack of marketability should be 7.23%."
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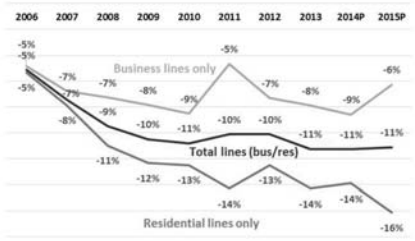
Q. How have technology changes affected the telecommunications marketplace?

A. The pattern is clear that competitors are using new technologies – notably using IP-based and wireless platforms – to target customers in highly-profitable markets and then subsequently adding customers in relatively less profitable markets. As digital technologies developed and wireless has become more pervasively reliable, competitors have been able to attract not only business customers, but also residential customers. Figure 1 and *Figure 2*, below, depict current nationwide data from USTelecom, the major ILEC trade organization, which tracks access line loss and competitive market share.[38] Notably, the competitive losses of voice services have remained significant over time and the "voice" losses are primarily driven by the migration toward wireless service.

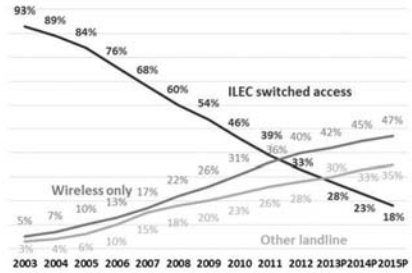
Figure 1: Annual Switched Access Line Loss



[38] Patrick Brogan, *Voice Competition Has Ended ILEC Dominance,* (Washington, DC: US Telecom, April 2014), available at http://www.ustelecom.org/blog/voice-competition-has-ended-ilec-dominance-0.

Source: US Telecom, April 2014.

Figure 2: Share of Nationwide U.S. Households



Source: US Telecom, April 2014.

Q. Is increased competition a positive development as competitors and ILECs offer products more efficiently?

A. Yes, as a general matter, competition is a constructive force that, in the big picture, benefits customers. The competitive thrust into rural America is also positive from a broad policy perspective, but it is notable that competitive gains appear to be concentrated in clustered populated regions or along major roadways where customers can be served economically. It is also notable that competition is significant, even when the markets have not been designated as "competitive" by regulators, because wireless is the primary threat to landline residential voice service, even where it is not

a complete functional substitute.[39] Intermodal competitive threats have meant that rural ILECs are left with an increasingly higher proportion of high-cost and often uneconomic properties along with a Carrier of Last Resort ("COLR") responsibility that requires them to fulfill any reasonable request within their defined service territories. Recent FCC policy has amplified this effect by requiring rural carriers to fulfill all reasonable requests for broadband access at specified download and upload speeds.[40] The result is approximately the same fixed network costs and investments but fewer customers over which to spread those costs.

I generated a study related to this problem, relying on extensive data in Texas.[41] The Texas study evaluated 350,000 access lines, using confidential financial data. Among other conclusions, the study highlighted that without universal service funding, 77% of the rural wire centers generated on average a negative 9.7% return on investment. And 13% of the wire centers generated an average positive return of 2.9% , which was insufficient to justify investment. Finally, 10% of the wire centers generated a 10% return or higher. The conclusion was that, without universal service support funding ("USF"), 90% of the wire centers are candidates to lose service entirely. From a financial perspective, then, *the vast majority of rural wire centers are uneconomic –*

[39] Even where wireless service may not be ubiquitously functional, as I understand is the case in many Independent Small LEC areas, some customers choose wireless services as a substitute for wireline service. This phenomenon makes wireless services a serious threat to the financial stability of a rural telephone company in spite of the fact that the wireless service may be less reliable or not ubiquitously available for customers..

[40] *See FCC Connect America Fund ETC Order*, FCC 14-190 (rel. Dec. 18, 2014) (establishing the 10 Mbps download / 1 Mbps upload standard as a requirement for receipt of federal high-cost support).

[41] Michael J. Balhoff, Robert C. Rowe, and Bradley P. Williams, *Universal Service Funding: Realities of Serving Telecom Customers in High-Cost Regions*, (Columbia, MD: Balhoff & Rowe, 2007), available at http://www.balhoffrowe.com/pdf/USF%20Funding%20Realities%20of%20Serving%20Telecom%20Customers%20in%20High%20Cost%20Regions%207-9-07.pdf.

and would not be served – absent high-cost support. The data in that 2007 report assumed that the ILEC would continue to have intercarrier compensation revenues and margins. This study also relied on the assumption that the universal service system would continue in substantially the same form as it had for the decade preceding 2007. However, the most recent FCC reform in November 2011 has mandated the elimination of terminating access charges by 2020 and implemented a sweeping and evolving set of reforms of the federal universal service system.[42] The import of the 2011 reforms is that the financial outlook for small carriers is today more dire than the cases I studied in 2007, where the situation was already challenging.

Q. Does the rate-of-return regulatory platform or the Independent Small LECs' access to California High Cost Fund A ("CHCF-A") shield the Independent Small LECs from the effects which you describe?

A. The Independent Small LECs are not shielded if there is a failure to determine and set appropriate rates of return. While the rate-of-return regulatory structure should result in a fair opportunity for companies to earn a reasonable rate of return, that opportunity only exists to the extent that the rate structure is set, based on reasonable assumptions. Rate-of-return regulation provides no guarantee that a company will achieve any particular revenue level, and I believe that CHCF-A support is not retroactively increased to remedy revenue shortfalls that carriers may have incurred. Moreover, I

[42] *Connect America Fund,* WC Docket No. 10-90, *A National Broadband Plan for Our Future,* GN Docket No. 09-51, *Establishing Just and Reasonable Rates for Local Exchange Carriers,* WC Docket No. 07-135, *High-Cost Universal Service Support,* WC Docket No. 05-337, *Developing an Unified Intercarrier Compensation Regime,* CC Docket No. 01-92, *Federal-State Joint Board on Universal Service,* CC Docket No. 96-45, *Lifeline and Link-Up,* WC Docket No. 03-109, *Universal Service – Mobility Fund,* WT Docket No. 10-208, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd. 17663 (2011) ("*USF/ICC Transformation Order*").

believe that the Commission has introduced certain high-cost fund reductions from the federal system and applied them to CHCF-A calculations, including the imposition of a "corporate cap" that is designed to disallow companies' corporate expenses. *See* D.14-12-084, at p. 101 (O.P. 3). Further, the CHCF-A program remains under review in R.11-11-007, and the scope of that proceeding could further threaten Independent Small LEC revenue streams. *See* D.14-12-084, at p. 12.[43] Regulatory changes and risks must be taken as a whole in assessing the financial stability of carriers whose service is targeted to customers in a high proportion of less-economic regions.

[43] Notably, this decision defines Phase 2 to include a reconsideration of whether rate of return regulation will continue and other major potential changes to the regulatory structure under which the Independent Small LECs operate. I offer no opinion as to the likelihood of any of these adjustments being made, but their continued consideration underscores the profound uncertainty and associated risk that Independent are experiencing.

Q. Is support for wireline networks less important given the rise of wireless services?

A. No, it would not be correct to say that wireless is the future of all telecommunications. I make this point because the Commission might ask whether it is appropriate to maintain a utility, and hence its cost of capital, if the industry is dying. I do not believe the wireline industry is dying, but rather I believe that it is evolving toward a new core service. I note that customers are today increasingly reliant on broadband, which is now an important service. The FCC's 2011 reforms of USF and intercarrier compensation ("ICC") outlined this migration in its *USF/ICC Transformation Order* cited above. At paragraph 10 of the *USF/ICC Transformation Order*, the FCC stated that it was "modernizing USF and ICC from supporting just voice service to supporting voice and broadband, both fixed and mobile, through IP networks is required by statute."

Broadband is likely to remain primarily a wired service. The FCC reported in 2009 that the average monthly consumption of wired data services was 9 gigabytes ("GB") and the agency expected the average to rise to 15 GB by the end of 2010.[44] The FCC now reports that the average fiber user and average DSL user consumes each month 32 GB and 22 GB of data, respectively.[45] The growth in volume is up over a year ago by 42% and 79%, respectively. Further "proving" the value of the wired broadband network, the two dominant U.S. *wireless* carriers—Verizon and AT&T, Inc. ("AT&T")—have invested, respectively, over $20 billion in FiOS and over $14 billion

[44] FCC, *Broadband Performance, OBI Technical Paper No. 4*, available at http://transition.fcc.gov/national-broadband-plan/broadband-performance-paper.pdf, p. 6.
[45] FCC, *A Report on Consumer Wireline Broadband Performance in the U.S.*, Charts 19 and 20; available at http://www.fcc.gov/measuring-broadband-america/2013/February.

in U-verse.[46] The reason for that huge capital commitment is that the average home or business uses too much bandwidth to be cost-effectively served by a commercial wireless provider at today's rates. Furthermore, a consumer, using today's average wireline volumes, would be required to pay over $200 monthly for commercial *wireless* broadband from Verizon Wireless or AT&T Wireless. Commercial wireless is not today a substitute, and, in my opinion, is not likely to be a price-effective substitute in the foreseeable future in light of the growing demand for broadband bandwidth.

In short, wireless and wireline platforms provide complementary services. Consumers currently rely on data-centric communications services that are growing at a rapid rate, requiring carriers to continue to invest in wireline plant that is not likely to be replaced by commercial wireless services. The federal policy is clear that both wireless and wireline services will be needed and should be supported in rural and low-density regions, as ubiquitous, high-quality wired service will continue to be important, and will likely remain a major policy goal for the foreseeable future.[47]

Q. What do you mean by the statement that investors are more uncertain about the wireline industry than they have been in the past?

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[46] While Verizon and AT&T have slowed or stopped high levels of investment in recent years, the reason relates to the fact that they have completed their buildout in higher density regions, and those companies have apparently determined that certain lower-density regions are too expensive or that there are alternative businesses in which to invest capital to earn superior returns (compared with the low-density regions.)

[47] See *USF/ICC Transformation Order*, para. 10: "Under these circumstances, modernizing USF and ICC from supporting just voice service to supporting voice and broadband, both fixed and mobile, through IP networks is required by statute. The Communications Act directs the Commission to preserve and advance universal service: 'Access to advanced telecommunications and information services should be provided in all regions of the Nation.' It is the Commission's statutory obligation to maintain the USF consistent with that mandate and to continue to support the nation's telecommunications infrastructure in rural, insular, and high-cost areas."

A. Investors are now assigning lower valuations (higher required return on equity) to ILECs and becoming even more cautious in light of the regulatory uncertainty and the changing competitive marketplace. The equity prices of the ILEC-centric carriers, that is, those without major wireless operations, have lagged, as is illustrated in Figure 3. The graphic provides an indexed view beginning in 2000 for the stock prices of CenturyLink (ticker symbol CTL), Frontier (FTR) and Windstream (WIN), and tracking their performance relative to the S&P 500, which is widely used as an index for the overall market.[48] The three carriers are the largest of the publicly-traded ILECs with no wholly-owned wireless business and with extensive service in rural areas. Figure 3 illustrates that, from the low point in the market collapse in 2008, the S&P 500 has sharply outperformed the three ILEC companies, which I believe are approximately representative of investor sentiment about ILECs prior to considering any "size effects" or rural carrier regulatory risks. The stocks of CenturyLink and Windstream have outperformed Frontier's stock, in part because those two carriers have diversified within the last five years into business and data services where investors may be expecting higher growth. Windstream's stock weakened at the end of April 2015, as the company spun-off its operating assets to a real estate investment trust ("REIT") in a sales-leaseback, and investors appear to be uncertain about valuations for the surviving operating company and the REIT. Frontier has the largest percentage of ILEC-only operations and has at least recently slipped below the performance of the other two carriers and that of the S&P 500. It is my conviction that the market has a negative view of the ILEC businesses, and this graphic is illustrative

[48] Standard & Poor's 500, is a widely-used stock market index based on the market capitalizations of 500 large companies having common stock listed on the NYSE or NASDAQ.

of the growing investor caution. The underlying data for the figure are provided in Exhibit MJB - 8.

Figure 3: Indexed equity markets: larger rural carrier v. S&P 500

Source: Yahoo Finance.

Q. Does the transactional market reflect the same caution about the ILEC industry?

A. Yes. The prices paid—expressed as multiples on cash flow (*e.g.*, EV/EBITDA)—to acquire or bid on pure-play[49] ILECs have fallen since 2001 and most notably since 2007.[50] Investors use multiples on cash flow to make it easier to compare one

[49] A "pure-play" ILEC is best defined as an ILEC without significant other non-ILEC services such as major cable or wireless or extensive fiber transport; that is, the ILEC's business is composed primarily of voice and broadband services to residential and business customers.

[50] Multiples are used to provide a better "apples-to-apples" comparison from one transaction to the next. Multiples allow the financial advisor to focus on ratios that indicate how much a buyer is willing to pay, for example, for $1 of revenues or more typically $1 of operating cash flow, regardless of the size of the transaction. So, 8.0x (8 times) the last year's earnings before interest, taxes, depreciation and amortization ("EBITDA") means that an investor is willing to pay $8 for $1 of operating cash flow generated over the last twelve months, because he or she assumes it will be possible to realize a risk-adjusted sufficient return on investment over future periods.

transaction or one valuation with another.[51] In 2001, as detailed in Exhibit MJB - 5, there were three rural ILEC transactions at an average price that was 10.2 times last-twelve-month trailing EBITDA.[52] Figure 4 illustrates more recent, large and medium-sized ILEC transactions since the beginning of 2006, depicting how the pricing trend, based on multiples of EV to EBITDA, has weakened.[53] In the period since the end of 2008, the average purchase price of the seven announced transactions was 5.4 times EBITDA.[54] Because small ILECs do not typically announce sale prices, most of the data remain confidential and we are not able to discuss specific pricing for certain transactions on which we have worked. However, my partners and I have been reporting in our presentations at conferences that the "going rate" for a pure-play ILEC appears to have collapsed to approximately 4.5 to 5.5 times trailing (last full year) EBITDA, which means that the value today is about half the value reflected in the EBITDA multiples realized in 2001 and about 56% to 69% (based on 4.5x and 5.5x

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[51] Multiples are standardizations. In the financial world, multiples are analogous to housing prices per square foot, or, for tires, pounds per square inch. Big homes can be compared with small homes, and inflation in large tires with inflation in small tires.

[52] In 2001, Country Road acquired Saco River (8.5x trailing EBITDA), TDS acquired MCT, Inc. (9.6x), and D&E acquired Conestoga (12.5x).

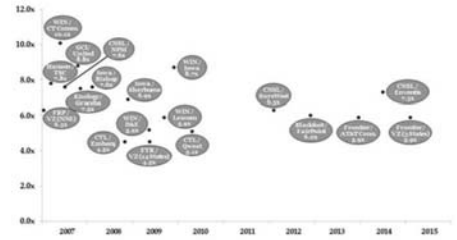
[53] Again, the data are included in Exhibit MJB - 5. The abbreviations include CNSL (Consolidated Communications), CTCO (Commonwealth Telephone), CTL (CenturyTel which became CenturyLink), CZN/FTR (Citizens Communications which became Frontier), D&E (D&E Communications), SNET (Southern New England Telephone which are the Connecticut operations of AT&T), WIN (Windstream), and VZ (Verizon). The green bubbles (FairPoint-Verizon, CenturyTel-Embarq, Frontier-Verizon, and CenturyLink-Qwest) in the graphic were tax-advantaged transactions (Reverse Morris Trusts or stock-for-stock), which means that the sales prices would likely have been somewhat higher if there had been no tax benefits. In the case of several recent transactions, the prices were higher than they might otherwise have been because they included non-ILEC operations that added incremental value (Windstream-Iowa Telecom, Blackfoot-FairPoint, and Consolidated-SureWest, Consolidated-Enventis), which also suggests that the pure ILEC value is lower than the bubble depicts. For example, the Iowa Telecom sale included $130 million in net operating losses, which means that the EV/EBITDA calculation should be adjusted lower.

[54] Charlesmead has tracked 71 transactions in the period announced from the beginning of 2008 to the present, and has provided services related to nine announced ILEC transactions in that period. The publicly-available data are unfortunately scarce, but our public discussions at conferences over the last several years provides corroboration of this testimony.

EBITDA) of the 8.0 times EBITDA value realized on average between 2001 and the end of 2007.[55] To be clear, investors appear to be signaling that there is significantly greater risk today compared with ten years ago or even five years ago, as will be discussed further below.

[55] The most recent transactions are Consolidated Communications' purchase of Enventis which included substantial fiber transport (4,200 miles) and business-centric services (business and broadband account for more than 50% of revenues), providing the reason for the relatively high valuation, and Frontier Communications' proposed purchase of Verizon's operations in three states, including California, where the valuation of 5.9x EV/EBITDA is likely lower as Frontier reports that it is paying 3.7 times EBITDA after excluding avoided (unallocated) costs on Day 1 of the acquisition. The statistics above use Day 1 EBITDA calculations for the Frontier-AT&T transaction (announced Day 1 EV/EBITDA of 4.8x, Frontier's Financial Analyst presentation 12/17/13, slide 3) and for the proposed Frontier-Verizon transaction (Frontier's Financial Analyst presentation, 2/5/15, slide 6); and Enventis is excluded because it is not appropriate to compare a fiber-transport and business-centric company to ILEC-only operations. Illustrating the presentations we have made, I have attached a slide deck projected and distributed June 16, 2014 as part of my keynote for the Georgia Telecom Association; I cited at slide 7 that the appropriate value for ILEC assets was 5.0x trailing EBITDA; see Exhibit MJB - 6.

Figure 4: Reported Multiples on EBITDA for ILEC Acquisitions



Source: Company press releases and filings.

Q. Are there cautionary signs in the debt markets for small ILECs?

A. Yes. Lenders have become more cautious in lending to small ILECs, if the banks are willing to lend at all to the carriers. For example, CoBank ($95 billion in assets), which has been a large lender to rural wireline companies, reports that it is making few loans, almost none of which are principally for infrastructure improvements. CoBank sent a letter to the FCC in 2012 that elucidates its concerns about the current regulatory environment for the financial viability of rural ILECs:

> CoBank is concerned about the negative impact the USF/ICC Transformation Order (the Order) . . . . Unfortunately, we view many of the provisions of the Order . . . as antithetical to that goal. Affordable broadband for all Americans cannot be achieved without increasing the funding spent to support broadband deployment. The rate-of-return regulated Rural Local Exchange Carrier has historically done the lion's share of the work in deploying truly robust broadband in rural America. Instead of trying to find ways to cut and curtail support to these carriers, we continue to believe the Commission's goals would be better served in finding ways to help these carriers continue to succeed in their

> decades-long mission of bringing modern telecommunications services to their subscribers. [56]

Similarly, the RUS, which is part of the Department of Agriculture, has $4.7 billion in principal outstanding for telecom infrastructure loans and the Farm Bill Broadband Loan Program. The RUS has been able to place its full loan portfolio every year that I have been able to track—*until* 2012 (immediately after the FCC's November 2011 Transformation Order) when borrowers were lent only 11.6% of the $690 million that was available. This means that the RUS and/or the borrowers have become more cautious in light of regulatory instability in the industry. Further, of another $736 million available for RUS broadband loans, only 9.4% ($68.9 million) was placed with carriers in 2012.[57] As presented in Table 2, the percentage of available funding placed in 2013 and 2014 improved to 28% and 31%, respectively, but it is still profoundly troublesome that total dollars loaned declined by more than two-thirds from the pre-2012 levels even in the most recent period. Our conversations with companies and with the RUS indicate that the low investment is a combination of caution at the RUS and uncertainty among the companies. In either case, the financial import is similar.

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[56] Letter of Robert F. West to FCC, Marlene H. Dortch, May 18, 2012, available at https://prodnet.www.neca.org/publicationsdocs/wwpdf/0511cobank.pdf.

[57] The United States Department of Agriculture / Rural Development, "The Telecommunications Program," presentation by RUS Deputy Administrator Jessica Zufolo to the National Association of Regulatory Utility Commissioners, Washington, DC, February 2, 2013; see Exhibit MJB - 9, slide 5. See, also, "Vilsack, RUS Meet With Genachowski To Discuss The Need For More Changes In Implementation Of USF-ICC Transformation Order: Warn Of Unintended Consequences And Need For USF-ICC Support To Be Sufficient and Predictable," Independent Telecom Report, Volume 12, Issue 3 (February 18, 2013), pp. 3-5); "In the meeting [with FCC Chairman Julius Genachowski and his staff], [Secretary Vilsack and] USDA officials noted that demands for RUS loans dropped dramatically in 2012. RUS reported "demand" for only 37 percent of the funds that were actually appropriated by Congress. USDA cited the reductions in USF and ICC that will result from the implementation of the FCC's Transformation Order as the reason for the decline in loan applications. Rural carrier advocates have noted that the reduced loan activity reflects the adverse impact of the FCC Order on infrastructure investment and rural community economic development." The figures were also reported in an ex parte filed at the FCC on February 15, 2013. The reconciliation is that the "demand" for loans was reported as 37% according to Secretary Vilsack, but the RUS actually "obligated" the amounts reported by Ms. Zufolo.

Table 2: RUS loan activity to traditional telecommunications

Fiscal year	Loans approved	Amount ($000)	Available funding ($000)	% of available funding
2011	41	689,999	690,000	100.0%
2012	7	79,765	690,000	11.6%
2013	13	196,159	690,000	28.4%
2014	14	213,993	690,000	31.0%
2015 *	13	203,783	690,000	29.5%
Total	**88**	**1,383,699**	**3,450,000**	40.1%

**Approximate as of end of fiscal year, June 2015.*
Source: Rural Utilities Service

As important or possibly more important than the overall trend, it appears that the lower costs of debt are generally unavailable to the small ILECs, based on the comments from CoBank cited above and the statistics of the RUS.

VI. CALCULATION OF AN APPROPRIATE RANGE AND ESTIMATE FOR EQUITY COSTS.

Q. How does the changing ILEC marketplace affect the Independent Small LECs' cost of equity?

A. The federal rate of return was adopted as 11.25% in 1990 and reiterated in the FCC's Multi-Association Group Order of 2001. It is difficult to believe or argue that the appropriate return on equity is lower today. In fact, industry risks are demonstrably greater than ten or twenty or twenty-five years ago, as described in the previous section of this testimony. In 1990, the ILEC industry had monopoly characteristics;

there was ongoing growth in switched minutes of use and in access lines; the carriers had virtually 100% market share across which to manage internal cost-shifting and the high fixed-cost nature of the business; and there was a regulatory safety net that was predictable and well understood.

There is only one change since 1990 that *might* reduce the appropriate return on equity, and that is the lower cost of debt in the last several years, but this factor is far outweighed by the profound countervailing risks of the current environment. Further, with respect to today's debt levels, I note that most observers believe the Fed has been committed to an "unsustainable" approach in manipulating interest rates to low levels, which means that the forward-looking rates are likely to be significantly higher than today's rates.[58] I provide data related to the change in debt costs in a later section of this testimony. However, low interest rates can only be part of a cost of capital calculus if they are *really available* in the future. The evidence for rural carriers points toward increased risks, lesser availability of debt, and the probability of higher interest rates going forward for the general market and for the ILECs, assuming debt capital can even be obtained given the uncertainties affecting the rural telecommunications industry.

Q. How do you derive the specific inputs appropriate for use of the CAPM and the Buildup calculations to be developed in this proceeding?

A. The inputs most commonly used for the CAPM or Buildup Models are drawn from data compiled in annual publications from Ibbotson/Morningstar and from Duff & Phelps. The publications provide statistical information about annual risk-free rates,

[58] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, p. 3-3; see Exhibit MJB - 2.

annual returns on equity for the market as a whole, and returns for specific industries relative to the overall market. Ibbotson/Morningstar has continued to publish its *Classic Yearbook*, but it ceased publishing its *Valuation Handbook* after 2013. The Ibbotson valuation data and analyses are now consolidated into the publications provided by Duff & Phelps, as of 2015. I make reference in this testimony to both sources, which are the principal authoritative resources.

Q. Do you use cost of equity inputs from different periods?

A. Yes. I provide input from several different periods. The approach is consistent with my professional view that multiple methodologies help to test assessments of the costs of equity. The expectations for returns on the "risk-free rate," returns on the equity market and returns on specific industries vary from one period to the next. Inflation may be high or low; the stock market may be depressed or inflated; and the global markets may be affected by turbulence (higher risk) or more peaceful growth (lower risk). We are using inputs from longer periods to reduce the effects of cyclical conditions that may show up in the data. And we assess different periods to compare returns to confirm our findings with respect to a "normalized" expectation of equity returns (costs).

Q. Is it appropriate to use lower risk-free rates from one period and lower market equity returns from another period to create a lower estimate for costs of equity?

A. No. The statistical data compiled by Ibbotson and Duff & Phelps provide information about the equity returns in a period *relative to* the risk-free rate in that same period.[59] The markets expect certain returns in total, which include that period's risk-free rate *and* that period's equity premium. It is not appropriate to use a market equity risk premium derived from one period with a risk-free rate from another period. Again, I provide information for several periods so the Commission can confirm that the estimates are reasonable.

Q. What periods are most appropriate to use in computing the cost of equity for the Independent Small LECs?

A. I begin with the longest period available, which is the Ibbotson data from 1926 to 2014. I also use readily available information in the most recent Duff & Phelps 2015 *Valuation Handbook*, which details inputs for the period from 1963 to 2014, Finally, I use the Ibbotson years 1995 to 2014, which are absorbed into and reported in the Duff & Phelps 2015 *Valuation Handbook*. I provide specific citations to each of these sources in my subsequent testimony. The CAPM/Buildup data are included in Table 3 below. I also present the Duff & Phelps Risk Premium data in the final column for 1963 to 2014. As I will explain below, the Duff & Phelps' Risk Premium approach uses a different size premium, which is more general because it does not include an industry-specific or company-specific adjustment.

[59] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, p. 3-1; "The risk-free rate and the ERP [equity risk premium] are interrelated concepts. All ERP estimates are, by definition, developed *in relation* to the risk-free rate." (Emphasis in original); see Exhibit MJB - 2.

Table 3: Cost of Equity based on CAPM/Buildup Method

	Ibbotson Years 1926-2014	D&P Years 1963-2014	Ibbotson Years 1995-2014	D&P Risk Premium 1963-2014
Risk-free rate	5.07%	6.61%	4.92%	6.61%
Beta	1.06	1.06	1.06	
Equity premium predicted by CAPM				6.67%
Equity risk premium	7.00%	5.05%	6.84%	
Base or market equity cost of capital	**12.07%**	**11.66%**	**11.76%**	**13.28%**
Industry-adjusted premium	0.42%	0.30%	0.41%	
Size premium to CAPM (1963-2014)	5.78%	5.78%	5.78%	8.15%
Total estimated cost of equity	**18.27%**	**17.74%**	**17.95%**	**21.43%**

Q. Why do you refer to the combined CAPM/Buildup rather than to two distinct methods?

A. I refer to the methods collectively because the Buildup Method is derived from the CAPM, both conceptually and in terms of the fundamental inputs. In both methods, there is a risk-free rate, an addition for the necessary market return, and a size premium. The Buildup Method employs beta-like inputs that are included as two buildup figures: a specific market equity risk premium plus an industry-specific risk premium. By contrast, in the CAPM, the use of a beta is a company-specific factor that includes both the market *and* company-specific premium as a single input. The Buildup Method typically adds premia for the risk-free rate plus the general market equity risk premium plus the industry-specific premium plus the size premium to arrive at approximately the same result as the CAPM. I will explain below that the industry-specific premium for the ILEC industry should not be used in our Buildup Method, so, as Duff & Phelps suggests, I included an industry-adjusted premium relying on an average of betas from similar companies. We do not have a beta for the Independent Small LECs, but I use an adjusted premium of 1.06 (average beta of 5 ILECs). If that beta of 1.06 were included in a typical CAPM, the result would have

been precisely the same as that presented in the table above. I am referring in the table to CAPM/Buildup as one and the same in this case because the computations, using the proxy beta, generate the same results.

Q. Please explain the sources for and variations in the risk-free rate.

A. The risk-free rate is based on the yield of the 20-year U.S. treasury bond, which is assumed to be the best credit available over a twenty-year period (expectation that there will be no loss of principal and guaranteed dividend payments). This horizon is appropriate because we are seeking a rate for companies that expect to be in business indefinitely. The risk-free rates used for the 1963-2014 period (6.61%) and 1995-2014 period (4.92%) are drawn from Duff & Phelps' 2015 *Valuation Handbook* and the Ibbotson/Morningstar *2015 Classic Yearbook*, respectively.[60]

Q. Are there differences of opinion about which risk-free rate should be used?

A. Yes. It might be argued—with strong authority—that the appropriate rate is higher than the yield alone. According to this school of thought, the risk-free rate is not simply the yield for the 20-year treasury bond, but also includes inflation as well as maturity risk.[61] In certain years, the underlying bond value is up or down, depending on fluctuations in market-based interest rates, which affect the price for the bonds. So,

[60] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, p. 7-10 to 7-11 reports that from 1963-2014, "the 'historical' average annual long-term equity risk premium is 5.05%. The average annual risk-free rate is 6.61%." See also Ibbotson, 2015 Classic Yearbook, Long-Term Government Bond Yields, A-9, Exhibit MJB - 2; 4.92% is the monthly average for the period.

[61] Shannon Pratt and Roger Grabowski, Cost of Capital: Applications and Examples, Third Ed. (Hoboken, NJ: John Wiley & Sons, Inc., 2008) ("Cost of Capital"), p. 71. "The so-called risk-free rate reflects three components: 1. *Rental rate*. A real return for lending funds over the investment period, thus forgoing consumption for which the funds otherwise could be used. 2. *Inflation*. The expected rate of inflation over the term of the risk-free investment. 3. *Maturity risk or investment rate risk*. . . . the risk that the principal's market value will rise or fall during the period to maturity as a function of changes in the general level of interest rates." This text explains how the 20-year treasury bond can be significantly negative or very high in a given year, as the underlying bond appreciates or depreciates in the period. See Exhibit MJB - 11.

while the expected dividend has been paid in a given period, the market-driven price of the bond fell or appreciated in the year in question compared with the prior year. For example, in 2014, the total return on the 20-year treasury was up 24.5% after being down 11.4% in 2013, primarily due to the movement of market-based interest rates during those years.[62] If I had used the total return for the risk-free rate, Table 3 above would have been replaced by the following table:

Table 4: Alternative cost of equity calculation with total-return-risk-free rate

	Ibbotson Years 1926-2014	D&P Years 1963-2014	Ibbotson Years 1995-2014	D&P Risk Premium 1963-2014
Risk-free rate (2015 Ibbotson Table C-4)	5.70%	7.40%	8.60%	7.40%
Beta	1.06	1.06	1.06	
Equity premium predicted by CAPM				6.67%
Equity risk premium	7.00%	5.05%	6.84%	
Base or market equity cost of capital	**12.70%**	**12.45%**	**15.44%**	**14.07%**
Industry-adjusted premium	0.42%	0.30%	0.41%	
Size premium to CAPM (1963-2014)	5.78%	5.78%	5.78%	7.36%
Size premium above risk-free rate				
Total estimated cost of equity	**18.90%**	**18.53%**	**21.63%**	**21.43%**

I have not used this alternative in my calculations, but point out that this approach is supported by significant authorities. A comparison of this table with the previous table reveals that this alternative computation, which is included immediately above in Table 4, generates higher estimated costs of equity for the first three columns and the same cost of equity for the last column. My choice to avoid using this formulation again highlights the conservative nature of the approach in this testimony.

Q. How did you generate the beta to be used in your calculations?

[62] Ibbotson 2015 Classic Yearbook, Table C-4, pp. 2, 4; see Exhibit MJB - 2. See also Tom Copeland et al., McKinsey & Company, Valuation: Measuring and Managing the Value of Companies (New York: John Wiley & Sons, 1990), p. 192. See Exhibit MJB - 12.

A. Duff & Phelps provides industry-specific adjustments that can be used in the calculation of the Buildup analysis, which is a useful approach when no company-specific beta is available, and such is the case with the Independent Small LECs. The industry-specific adjustment relies on data compiled for SIC codes, which, in this case, is SIC code 4813 (Telephone Communications, except Radiotelephone).[63] The 2015 adjustment for SIC 4813 is recommended to be -1.44%, which would offset the long-term historical equity premium (dropping it lower by 1.44%) because the industry companies in 4813 are perceived, according to the data in Duff & Phelps, as having less risk compared with the overall market. However, Duff & Phelps explains that an analyst can review the companies included in the industry-specific group to determine whether they are truly comparable, and then Duff & Phelps provides a formula for adjusting the industry-specific risk if a "custom" beta is used.[64] The companies included in SIC code 4813, upon review, are very different from the Independent Small LECs, as revealed in a quick glance at the entire list in the footnote below.[65] The companies include CenturyLink, multi-national Cogent which is an Internet Service Provider, and General Communications Inc., which is primarily a cable and

[63] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, pp. 5-12 to 5-22. Ibbotson 2015 Classic Yearbook, Appendix C-4, p. 6. See Exhibit MJB - 2.

[64] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, pp. 5-14 to 5-15; and the adjustment is "(PeerGroupBeta x RP_m) – RP_m"; see Exhibit MJB - 2. In the CAPM table, the adjustment is (1.06 x the equity risk premium) – equity risk premium, which is shown as the "industry-adjusted industry risk premium. Windstream would have been included in our calculation of the industry beta, but the company recently divested its assets, and Value Line now reports Windstream's beta as "NMF".

[65] The company list for SIC 4813 can be downloaded from Duff & Phelps at http://www.duffandphelps.com/SiteCollectionDocuments/Services/Valuation/Cost%20of%20Capital/March%202015_IRP%20Company%20List_vFINAL%206.15.15.pdf. The companies are Alaska Communications Sys., Alteva, AT&T Inc., Cablevision Sys Corp., Centurylink Inc., Cincinnati Bell Inc., Cogent Communications Holdings, Consolidated Communications Holdings Inc., Elephant Talk Communications Inc., Empire District Electric Co., Frontier Communications, Corp., General Communications, Hawaiian Telcom Holdco Inc., Hc2 Holdings Inc, IDT Corp, Level 3 Communications Inc., LICT Corp, New Ulm Telecom Inc., Oteleo Inc., Sprint Corp., Verizon Communications Inc., Windstream Holdings Inc.

wireless company. The listed companies serve multiple states and/or non-U.S. regions, with a variety of businesses including enterprise services, wireless and cable television products. These companies bear no reasonable resemblance to very small, localized, wireline carriers with between 300 and approximately 20,000 customers, such as the Independent Small LECs. Because of the fundamental differences between the SIC Code 4813 proxy group and the Independent Small LECs, I then reviewed reports from Value Line Funds to compile betas for companies that might be relatively more comparable in terms of concentrated ILEC services and relatively smaller size. The companies that are more comparable, in my estimation, are FairPoint Communications, Inc. (Value Line beta of 1.4), Telephone & Data Systems, Inc. (Value Line beta 1.2), NTELOS Holding Corp. (Value Line beta 1.0), Frontier Communications (Value Line beta 0.95) and Consolidated Communications (Value Line beta 0.75).[66] On the basis of the five companies, I used the average beta of 1.06, but believe that the figure is still low for the Independent Small LECs, again because the comparison companies are larger and more diversified, thereby likely resulting in an understated (too low) beta. This underscores the critical need for a size premium, which I will discuss later.

Q. What is the equity risk premium and how do you estimate that premium?

A. The equity risk premium is the difference between what a risk-free investment—generally using the long-term Treasury Bond as a proxy—would generate and what stocks in the market over the same period would produce. Generating a market equity

[66] See Exhibit MJB - 13.

risk premium is a simple exercise in subtraction, taking the total market return or expectation, based on historical data, for equities and subtracting the risk-free rate. The appropriate market premium data are tabulated in studies such as Duff & Phelps 2015 *Valuation Handbook* which builds on the data previously published by Ibbotson/Morningstar. In Exhibit 3.10 of the Duff & Phelps *Valuation Handbook Guide to Cost of Capital*, the Handbook reports that the long-horizon equity risk premium is 7.0%, which is the observed premium from 1926 to the present. For the period from 1963-2014, the equity risk premium is 5.05% as reported by Duff & Phelps. For the period from 1995 to 2014, the premium is 6.84% as also reported by Duff & Phelps.[67]

Q. What size premium should be applied?

A. As Ibbotson/Morningstar did in the past, Duff & Phelps provides two approaches to size premia based on its longer-term observations of data. The size effects can be captured by adding them to CAPM results or to the risk-free rate, using one of two different size premia, each appropriate to the different respective starting points for the analysis. I used the former because the latter approach is less precise, but I also report the latter result below. The data, based on statistics from 1963 to the present, are compiled in the Duff & Phelps 2015 *Valuation Handbook Guide to Cost of Capital* in the Appendices, with Exhibit B-2 providing size premia above the CAPM and with Exhibit A-2 providing size premia over the risk-free rate. I provide the pages from the relevant Appendices in Exhibit MJB - 2. The pages in question divide companies into groupings (portfolios) ranked by size from 1 to 25, with 25 being the smallest.

[67] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, pp. 7-11 and 3-23. See Exhibit MJB - 2. Page 58 of 79

Portfolio 25 in Appendix Exhibit B-2 and in Exhibit A-2 includes companies with an average book value of $65 million, which is larger than any of the Independent Small LECs. I have used the smoothed premium of 5.78% over the CAPM for Portfolio 25 drawn from Duff & Phelps Exhibit 7.3 rather than 10z premium of 11.98% (smallest group in the tenth decile) or the 8.94% (average of the two smallest groups in the tenth decile), further underscoring that my estimate is conservative.[68]

Q. Why did you not use the size premium over the risk-free rate as provided in Appendix Exhibit B-2?

A. For Portfolio 25, the indicated smoothed size premium is 12.49%, which is combined with 6.61% risk-free rate since 1963, resulting in a cost of equity of 19.1%.[69] The estimate is in the middle of the other estimates generated in Table 3, but, in my estimation, is so general and approximate that it is not necessarily helpful in this discussion.

Q. What is the Duff & Phelps Risk Premium?

A. Duff & Phelps provides an analysis of Portfolio 25 stocks, indicating that, since 1995, this group of stocks has generated a total return of 21.43%. This percentage is comprised of the 6.61% risk-free rate and the 6.67% excess return predicted by the CAPM in addition to the size difference, which was 8.15%.[70] As I explained above, this formulation does not make any adjustments for industry-specific risks or company-specific risks, so the inputs and results are more general. The results reflect what actually occurred, providing insight into what might have been expected. The

[68] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, p. 7-10, see Exhibit MJB - 2.
[69] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, see Exhibit MJB - 2.
[70] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, p. 7-11; see Exhibit MJB - 2.

size premium in this case is higher than in the first three scenarios in Table 3, but it is still below the Ibbotson/Morningstar finding that the smallest group should be assigned an 11.98% premium.[71]

Q. Are you concerned about the magnitude of these premia?

A. No. Size premia are standard modifications in CAPM calculations, and they are clearly appropriate for application here.[72] Ibbotson/Morningstar and Duff & Phelps have compiled extensive data to show that very small companies, such as the Independent Small LECs, should have a size premium that is substantially higher than the 5.78% premium that I use above. The tenth decile (grouping of the smallest companies) is subdivided in Duff & Phelps Exhibit 7.3 into four categories, 10w, 10x, 10y, and 10z, with respective size premia of 3.18%, 5.54%, 7.51%, and 11.98%. The Ibbotson/Morningstar 2015 Yearbook provides data in Table C-1.[73] Ibbotson/ Morningstar explains that the smallest sub-category of "10z" includes companies with a market capitalization of up to $96.16 million.[74] At the same time, I have chosen to be conservative and use a premium of 5.78% rather than 11.98%, and have applied this figure to each of the periods being analyzed.

Q. Can you provide the debt and equity information for the Independent Small LECs?

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[71] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, p. 7-10; see Exhibit MJB - 2.
[72] See, e.g., Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, pp. 4-1 to 4-24; see Exhibit MJB - 2.
[73] Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital, p. 7-10, Exhibit 7-3. Ibbotson 2013 Valuation Yearbook Table C-1. See Exhibit MJB - 2.
[74] Ibbotson 2013 Valuation Yearbook, p. 216, Table C-1. See Exhibit MJB - 2.

A. Yes. Table 5 summarizes the debt and equity for each of the Independent Small LECs from 2010 to 2014 based on information that I received from the companies. The book value of all the ten California ILECs is very small, and the largest book value is reported by Siskiyou Telephone, which has $60 million in 2014 book equity, while the average and median values for all the Independent Small LECs are $20.2 million and $14.3 million, respectively; thus, it is apparent that the ten California ILECs fall in the lower half of the "10z" group, for which the indicated size premium is 11.98%.

Table 5: Small LECs total debt and equity 2010-2014 ($)

	2010	2011	2012	2013	2014
Common Equity					
Calaveras	8,474,778	9,104,216	8,842,007	8,513,358	8,513,358
Cal-Ore	13,882,635	14,517,314	15,647,046	16,552,928	17,560,657
Ducor	4,999,962	5,251,571	4,706,568	3,560,678	3,061,029
Foresthill	5,878,103	6,744,103	7,320,103	7,666,103	8,065,319
Kerman	9,953,000	10,835,000	10,802,000	10,802,000	10,967,000
Pinnacles	3,512,226	2,819,751	2,623,554	2,705,413	2,911,150
Ponderosa	26,749,383	26,508,056	31,127,582	36,423,316	38,068,157
Siskiyou	50,805,747	58,305,399	59,897,477	59,914,384	59,602,160
Sierra	38,172,169	37,133,193	33,013,887	39,619,212	31,088,208
Volcano	16,551,253	21,560,425	19,289,744	20,955,729	22,085,190
Average	**17,897,926**	**19,277,903**	**19,326,997**	**20,671,312**	**20,192,223**
Median	**11,917,818**	**12,676,157**	**13,224,523**	**13,677,464**	**14,263,829**
Preferred equity					
Pinnacles	70,000	70,000	70,000	70,000	70,000
Ponderosa	792,720	792,720	792,720	792,720	792,720
Siskiyou	418,000	418,000	418,000	418,000	418,000
Volcano	1,295,250	1,295,250	1,295,250	1,295,250	1,295,250
Average	**643,993**	**643,993**	**643,993**	**643,993**	**643,993**
Median	**605,360**	**605,360**	**605,360**	**605,360**	**605,360**
Debt					
Calaveras	8,004,652	7,301,284	7,180,350	6,446,570	5,659,346
Cal-Ore	-	-	-	-	-
Ducor	3,229,791	3,069,108	2,903,308	2,743,589	2,604,140
Foresthill	8,141,911	10,282,551	9,854,670	10,993,194	9,259,383
Kerman	9,061,177	9,869,591	10,253,699	12,588,721	11,364,864
Pinnacles	-	-	-	-	-
Ponderosa	18,067,143	16,157,886	19,123,394	24,961,238	21,934,990
Siskiyou	-	-	-	-	-
Sierra	23,072,963	20,975,945	18,901,086	16,548,092	14,304,846
Volcano	14,027,900	13,487,505	12,918,209	12,319,170	11,688,418
Average	**8,360,554**	**8,114,387**	**8,113,472**	**8,660,057**	**7,681,599**
Median	**8,073,281**	**8,585,437**	**8,517,510**	**8,719,882**	**7,459,364**

Q. Do you believe that any other adjustments are appropriate?

A. As I explained in a previous section of this testimony, I believe that a good case can be made for assigning a cost to illiquidity to capture the lack of marketability in the equity of the Independent Small LECs. I have little question that this factor is appropriate because small companies generally trade at discounts that reflect a higher

level of risk, as is further corroborated above in the IRS discussions of lack of marketability. Some observers might contend that the small-size premium captures this effect, but the small-size premium pertains to *liquid* securities. In this case, there is an incremental risk as these companies are both small *and* illiquid. I have chosen *not* to use this premium, in spite of the fact that the sources indicate that it is appropriate. The simple calculation, however, would be to take the recommended cost of equity and divide by 0.80 to include the premium, so my recommendation of 18.5% cost of equity would be 23.1% if such a liquidity/marketability premium were to be included (18.5% divided by 0.80).

Q. Do you believe that your cost of equity estimates are realistic given that they include the possibility of overall capital costs that rise as high as the mid-20-percent range?

A. Yes. I have provided multiple periods and methodologies to assess the reasonableness of my findings, as is the practice when I work on M&A transactions. Additionally, to test my findings, I turned to the M&A data, which provide compelling confirmation of reasonableness. In fact, the transactional marketplace reports sharply reduced valuations for small ILECs, which have slipped from approximately 10 times EBITDA in 2001 (based on three transactions with publicly-available data) to 4.5 to 5.5 times EBITDA over the last several years. Taking a longer view, from the beginning of 2001 through the end of 2007, at least 98 transactions involving small ILECs were announced, 20 of which included announcements of public valuation data, as included in Exhibit MJB - 5. The transactional multiple based on EV to EBITDA averaged 8.0x in that period. Assuming no change in the small ILEC industry's absolute level

of debt and the cost of debt (which I believe is a realistic assumption) for industry-wide carriers as of the period when small ILECs were valued at 8.0x (*i.e.*, 2000-2007), this collapse in enterprise value implies that the equity value has fallen very sharply, and the near-total loss of value is absorbed in the market value of equity.[75] The concept is relatively simple. If a house is valued at $1 million and $200,000 is owed to the bank, and then subsequently the house value slips to $500,000 and the same $200,000 is owed to the bank, the residual equity value has fallen from $800,000 to $300,000. Because the debt must be repaid at face value, the equity account bears the entire loss of value in this scenario. This is what I believe is occurring for the Independent Small LECs.

Q. How does a contraction in equity value affect the cost of equity, and does it support your conclusions related to the cost of equity?

A. Before responding, I emphasize that the following assessment is a corroboration of the analyses above, not the central presentation in this testimony. A critic might argue that there is a mixing together of book value and market value. Such an argument misses the larger point, which is that the size of the *relative contraction in value in the marketplace* is a clear indication of the startlingly increased risks in the industry, which is the basis for contending that a higher return on equity is appropriate. To aid

[75] A simplified illustration can illustrate that investors today are not paying the same amount for the same relative levels of cash flows, which means that they are requiring a higher return on equity because of higher perceived risks. The illustration captured in the table assumes that if a small ILEC were valued in 2007 at $100 and had a capital structure with 40% debt ($40 in this illustration), then the original equity was valued at $60. However, a change in enterprise value (debt plus equity) from 8.0x EBITDA to 5.0x EBITDA would mean that the enterprise would be worth 37.5% less today than in 2007. If the value of the debt is unchanged, the equity value would have fallen from $60 to $22.50 (down $37.50) for a loss of 62.5% of its value. Higher risk therefore is translated into higher required returns. The markets are confirming that equity risk is significantly more elevated today compared to perceived risk eight years ago.

in understanding the concept about what has happened to market equity, I have prepared Table 6, below. In the table, I examine the loss in enterprise value (the entire company, which again means net debt and equity) as transactional multiples have fallen over the last 10-15 years and notably since 2007. The table analyzes various equity ratios and various multiple contractions. While the table is complex, it makes important points in verifying the reasonableness of the estimates related to cost of equity.

Table 6: Illustration of the transaction price changes related to equity costs

	R1 Assumed equity ratio	**80%**	**70%**	**60%**
R2	Assumed enterprise value in year 2000	$100.00	$100.00	$100.00
R3	Implied equity value at start in 2000 (R1 x R2)	$80.00	$70.00	$60.00
R4	**Lost enterprise value (EV) from 8.0x EBITDA at start**			
R5	Assuming new EV multiple of 5.0x ((1-(5.0/8.0)) x R2)	$37.50	$37.50	$37.50
R6	Assuming new EV multiple of 5.5x ((1-(5.5/8.0)) x R2)	$31.25	$31.25	$31.25
R7	Assuming new EV multiple of 6.0x ((1-(6.0/8.0)) x R2)	$25.00	$25.00	$25.00
R8	**Net equity value after loss**			
R9	Assuming new EV multiple of 5.0x (R3-R5)	$42.50	$32.50	$22.50
R10	Assuming new EV multiple of 5.5x (R3-R6)	$48.75	$38.75	$28.75
R11	Assuming new EV multiple of 6.0x (R3-R7)	$55.00	$45.00	$35.00
R12	**Assumed original equity cost of capital**	12.00%	12.00%	12.00%
R13	Assuming new EV multiple of 5.0x (1/(R9/R3) x R12)	**22.59%**	**25.85%**	32.00%
R14	Assuming new EV multiple of 5.5x (1/(R10/R3) x R12)	**19.69%**	**21.68%**	25.04%
R15	Assuming new EV multiple of 6.0x (1/(R11/R3) x R12)	17.45%	18.67%	20.57%

Q. Please explain the table.

A. The table addresses the criticism that the estimations of the cost of equity, as presented on the basis of the Ibbotson/Morningstar and Duff & Phelps statistics, rely on data that are somehow distorted or are too theoretical. This table relies on data from arms' length sale transactions in the real world and demonstrates what happens to equity value and the cost of capital for local telecommunications companies such as the Independent Small LECs. As an example, if an entire enterprise was worth $100 in the year 2000 up to 2007, valued at 8.0 times trailing EBITDA, and is now worth 6.0

times EBITDA with no change in the amount of the debt, then the loss of value ($25 in this illustration) is entirely subtracted from the market value of the equity. If the equity ratio was 80%, then one has to subtract $25 from $80, or if the equity ratio was 70%, then the loss of value is $25 from $70, and if the equity ratio was 60%, the loss is $25 from $60. The table demonstrates that if the current multiple is actually 5.5 times EBITDA, then the losses to equity value are greater, and if the current multiple is 5.0 times EBITDA, the losses are greater still.

Q. Should the Commission care about the loss of equity value over this period?

A. In theory, no, but given public policy objectives that the Commission cannot ignore, the answer should be "yes." One could argue that the answer is "no" because all companies incur risk in operating their businesses, and operations always result in capital appreciation or loss of value for the shareholders. These are privately-owned public utilities, so the loss of market equity value is borne by the shareholders and not by the ratepayer or the Commission. But the answer is "yes" in this case because these carriers are responsible for achieving certain public policy objectives and a strong equity position for a utility will better assure access to debt-capital and will reduce the risk associated with operations. Conversely, *loss* of market equity value can reduce access to debt and raise the risk associated with operations. One must only imagine the problem in refinancing a home when the housing market weakens sharply. Lower market equity value in the home reduces or eliminates the homeowner's access to debt capital and may result in higher interest rates. The Independent Small LECs' access to the debt markets and their forwarding-looking debt prices are part of the calculation with respect to WACC, and those factors will have an effect on the costs of equity.

Again, if the Independent Small LECs cannot access capital, the state's universal service and broadband deployment goals will be significantly impaired, and ratepayers will suffer.

Q. Please explain your assessment of how the transactional or M&A data support your findings about the cost of equity for the Independent Small LECs.

A. As the above table indicates, a change in the valuation multiple on EBITDA applied to the enterprise has a direct effect on the market value of equity and an inverse effect on the cost of equity. If a carrier is to achieve a return on invested capital that is fair and comparable with what was earned ten years ago, but the market value of the equity is now depressed, then the relative return (cost of equity) on that market value must increase. I provide Table 7 for perspective on the 1997 Commission decisions and resolutions regarding each of the Independent Small LECs, with the table presenting capital structure, costs of debt and equity at that time.

Table 7: WACC Decisions/Resolutions in 1997 for the Independent Small ILECs

	CPUC Decision	Debt			Equity			Wtd avg
	/ Resolution	Ratio	Cost	Wtd cost	Ratio	Cost	Wtd cost	(WACC)
Calaveras	D97-04-034	29.21%	3.44%	1.00%	70.79%	12.81%	9.07%	10.00%
Cal-Ore	D97-04-036	39.98%	5.40%	2.16%	60.02%	13.06%	7.84%	10.00%
Ducor	D97-04-035	36.67%	5.11%	1.87%	63.33%	12.84%	8.13%	10.00%
Foresthill	D97-04-033	25.00%	5.07%	1.27%	75.00%	11.64%	8.73%	10.00%
Kerman	T-160003	25.00%	5.64%	1.41%	75.00%	11.45%	8.59%	10.00%
Pinnacles	T-160004	25.00%	5.64%	1.41%	75.00%	11.45%	8.59%	10.00%
Ponderosa	T-160005	33.76%	6.04%	2.04%	66.24%	12.02%	7.96%	10.00%
Siskiyou	T-160006	40.53%	6.24%	2.53%	59.47%	12.56%	7.47%	10.00%
Sierra	D97-04-032	20.69%	6.36%	1.32%	79.31%	10.94%	8.68%	10.00%
Volcano	T-160007	48.38%	7.10%	3.43%	51.62%	12.73%	6.57%	10.00%
Average		**32.42%**	**5.60%**	**1.84%**	**67.58%**	**12.15%**	**8.16%**	**10.00%**
Median		**31.49%**	**5.64%**	**1.64%**	**68.52%**	**12.29%**	**8.36%**	**10.00%**

Q. Please use the transactional data to demonstrate how your conclusions are reasonable.

A. The demonstration is straightforward. Today's capital structure of the Independent Small LECs, on average, is approximately the same as in 1997, as the equity ratio falls within the Commission's previously-defined zone of reasonableness which, in 1997, was described as 60% to 80%, and when the cost of equity was, on average, near 12%, as presented in Table 7.[76] In Table 6, above, I then tested my finding of 18.5% using the following base formula: [old cost of equity x old market equity] = [new cost of equity x new market equity]. The calculation attempts to generate an equity return today that is the same as that generated in 1997, again assuming that returns are relatively matched with capital invested. If I assume that the old return on equity should approximately equal the new return, the new cost of equity is derived by an algebraic adjustment to divide the [old cost of equity x old market equity] by the [new market equity] to get the [new cost of equity], as indicated in Table 6. Again, I used 12% as the old cost of equity and the other calculations are spelled out in that table.[77] Taking the top (5.5 times) of today's EV valuation range (assuming 4.5 to 5.5 times EBITDA), the result is that today's cost of equity should rise to 19.7% to offset the loss in equity value if the equity ratio is 80% or to 21.7% if the equity ratio is 70%. Similarly, if we assume the market equity value has fallen to 5.0 times EBITDA (the

[76] As I previously noted, the zone for the equity ratio was set at 60%-80% in the Commission's 1997 rate cases and today's average equity ratio is about 70% for the Independent Small LECs.

[77] It is also consistent with the commentary in each of the 1997 Decisions outlined in the table above, where the Commission explains "Upon consideration, evaluation, and weighting of applicant's and ORA's financial and risk analyses with the above-mentioned observations of mitigated and increased risks, we find that a reasonable equity range for small telephone companies, such as applicant, should be 10.10% to 14.06%." See, e.g., Sierra Telephone, 1997 Cal. PUC LEXIS 1245;, *29, p. 8 of 18. The 12% cost of equity is the approximate midpoint of the low and high values.

mid-point of today's valuation ranges, shaded in the table), then the cost of equity has risen to 22.6% and 25.9% for 80% and 70% equity ratios, respectively. As I explain, I am currently using 5.0 times EBITDA in my conference presentations to ILEC executives and boards, as that figure is the mid-point of valuation for the smaller ILEC industry, so this calculation suggests that the cost of equity has risen above 20%. Once again, I emphasize that this transactional analysis is not intended to be the principal cost of capital methodology, but the analysis is corroborative of my other CAPM and Buildup findings above as it highlights the increased risk in the marketplace.

Q. Please summarize your analysis of the transactional data.

A. The likely fully-valued enterprise value for the Independent Small LECs today is 5.0 times EBITDA, but I have used 5.5 times to be conservative. If I accept that the Commission effectively stipulated in 1997 that a reasonable capital structure was 60% to 80% equity, and I take the mid-point of 70% (consistent with today's capital structure for the Independent Small LECs), the implied equity cost today, using the straightforward calculation in Table 6 is 21.7%.

Q. Should we adjust for the lower interest rates today compared with those ten or fifteen years ago?

A. No. The formula provides for the Commission to input debt costs and determine how to adjust the WACC. Debt costs should have no effect on the calculation of the previous or the current cost of equity (although the practical reality is that the costs of

equity could be expected to rise if the carriers have diminished access to debt).[78] I did review those changes in preparing this testimony, and note that the change in AAA corporate bond rates, using the monthly average of 20-year corporates between January 1997 and December 2000 compared with June 2015, as reported by the Federal Reserve Bank of St. Louis, was about 287 basis points, which would reduce today's WACC by only 86 basis points (change of 287 basis points times 30% debt ratio). But again, this is a separate input and theoretically does not affect the calculation of the equity cost (excluding the effects in increased equity risk).[79]

Q. What are the fundamental points of this analysis?

A. The recent transactional data tell us that the cost of equity capital is sharply higher than it was previously. This is not speculative or theoretical, but demonstrable in the transactional markets. I also believe that there is no sign that valuations will rise, as risks remain significant and competition is growing. This assessment leads me to several important conclusions. First, the figures in the shaded section of Table 6 confirm the direction and demonstrate the reasonableness of the estimates calculated using the Ibbotson/Morningstar and Duff & Phelps statistical information in the earlier CAPM/Buildup analyses. Second, the M&A-based costs of equity are higher because they likely reflect the fact that the Duff & Phelps and Ibbotson/Morningstar analyses relied on historical valuation data that were too conservative or did not include other risk factors, such as the changing ILEC marketplace as well as liquidity and marketability factors. Finally, the table makes a strong point in defense of higher

[78] To be clear, equity investors would logically want a higher return if debt were unavailable to a carrier, as the perceived risk is increased in operating the business.
[79] I have supplied the monthly AAA 20-year corporate bond interest rates from the Federal Reserve Bank of St. Louis in Exhibit MJB - 14.

equity capital-structure ratios, as low equity ratios result in increased risk when market equity values are falling. That is, when market values are falling, the proportion of market equity is also falling relative to debt, which means that the company's debt costs are likely to rise in the future and its operating risk is likely to increase. Thus, I suggest that the Commission consider whether the former zone of reasonableness (60%-80%) should be shifted higher above 70% and likely to 80% to preserve forward-looking access to capital and to manage operating risk.

Q. Please provide data for the capital structure of the Independent Small LECs.

A. I provide the data in the following table about the companies' debt and equity capital structure and the costs of debt.[80]

[80] While the debt ratio is not included in the table, it can be readily calculated as the residual, subtracting the common equity and preferred equity ratios from 100% in the table.

Table 8: Capital structure and cost of debt and preferred equity for Small LECs

	2010	2011	2012	2013	2014
Common equity ratio					
Calaveras	51.43%	55.49%	55.19%	56.91%	60.07%
Cal-Ore	100.00%	100.00%	100.00%	100.00%	100.00%
Ducor	60.75%	63.11%	61.85%	56.48%	54.03%
Foresthill	41.93%	39.61%	42.62%	41.08%	46.55%
Kerman	52.35%	52.33%	51.30%	46.18%	49.11%
Pinnacles	98.05%	97.58%	97.40%	97.48%	97.65%
Ponderosa	58.65%	61.00%	60.98%	58.58%	62.62%
Siskiyou	99.18%	99.29%	99.31%	99.31%	99.30%
Sierra	62.33%	63.90%	63.59%	70.54%	68.49%
Volcano	51.93%	59.32%	57.58%	60.62%	62.98%
Average	**67.66%**	**69.16%**	**68.98%**	**68.72%**	**70.08%**
Median	**59.70%**	**62.06%**	**61.42%**	**59.60%**	**62.80%**
Preferred equity ratio					
Pinnacles	1.95%	2.42%	2.60%	2.52%	2.35%
Ponderosa	1.74%	1.82%	1.55%	1.27%	1.30%
Siskiyou	0.82%	0.71%	0.69%	0.69%	0.70%
Volcano	4.06%	3.56%	3.87%	3.75%	3.69%
Average	**2.14%**	**2.13%**	**2.18%**	**2.06%**	**2.01%**
Median	**1.85%**	**2.12%**	**2.08%**	**1.90%**	**1.83%**
Cost of preferred equity					
Pinnacles	5.00%	5.00%	5.00%	5.00%	5.00%
Ponderosa	6.00%	6.00%	6.00%	6.00%	6.00%
Siskiyou	5.75%	5.75%	5.75%	5.75%	5.75%
Volcano	7.00%	7.00%	7.00%	7.00%	7.00%
Average	**5.94%**	**5.94%**	**5.94%**	**5.94%**	**5.94%**
Median	**5.88%**	**5.88%**	**5.88%**	**5.88%**	**5.88%**
Cost of Debt					
Calaveras	4.66%	4.67%	4.51%	4.51%	4.50%
Cal-Ore					
Ducor	5.10%	5.10%	5.10%	5.10%	5.10%
Foresthill	5.10%	5.08%	5.07%	4.82%	4.77%
Kerman	4.20%	4.10%	3.75%	3.69%	3.66%
Pinnacles					
Ponderosa	4.53%	4.16%	3.42%	3.06%	2.93%
Siskiyou					
Sierra	5.60%	5.58%	5.55%	5.52%	5.53%
Volcano	5.20%	5.20%	5.20%	5.20%	5.20%
Average	**5.11%**	**4.98%**	**4.72%**	**4.59%**	**4.55%**
Median	**5.20%**	**5.20%**	**5.20%**	**5.20%**	**5.20%**

Q. What is the conclusion from your analyses surrounding the required rate of return for Independent Small LECs?

A. I recommend that the Commission take a realistic view of the expected returns on the equity component in determining rates of return. The Commission previously authorized a target WACC of 10%, implying an approximate 12% cost of equity, and assumed an equity ratio in a zone between 60% and 80%.[81] As a result of this study, my best estimate is that equity costs are today in a range between 17.5% and 23.0%, and an more convincing and narrower range is toward the high end, as supported by the M&A data outlined above. I recognize that a cost of equity averaging 18.5% is higher than this Commission has previously adopted, but circumstances have changed, and I am confident that this is reasonable as a forward-looking measurement of cost of equity. I have been conservative in multiple calculations, which likely compound to make the estimate far too low. I note that the average of the four analyses provided in Table 3 is 18.9%, and without the Risk Premium calculation, the average is 18.1%. As a financial analyst, I believe that the data verify that the estimates I have produced are likely understated or at the bottom of a reasonable range.

I summarize the reasons I believe this conclusion is conservative. No liquidity or marketability premium is included. The size premium is 641 basis points lower than the 11.98% recommended by Duff & Phelps for the smallest of companies (appropriate for a 10z grouping into which these companies clearly fall). The beta used in the computation is relatively low at 1.06, as it is drawn from proxies that are all substantially larger, more liquid, more capable of acquisitions, and more

[81] See, e.g., D.97-04-032, p. 5.

diversified. The risk-free rate employed is the lower of the two options (a higher result is generated when using total return on the Treasury). And, the strongest evidence of reasonableness, in my judgment, is the M&A data where I have again been conservative, as my experience leads me to the judgment that the multiple on EBITDA for these companies is likely closer to 5.0 times, which suggests a higher cost of equity than the one I have used. The transactional data indicate that the actual cost of equity is between 19.7% and 25.9%, which is well above 18.5% that I recommend to the Commission here. I assume that the Commission recognizes that risks in this industry are well higher than they were in 1997.

Q. Do you recommend a single target weighted average cost of capital for the Independent Small LECs?

A. I leave that decision to the Commission. My testimony is focused on analyzing the costs of capital, with a greater focus on the question related to the cost of equity. I can recommend 18.5% as a conservative estimate that can be used in a hypothetical structure or it can be used in assessing a specific company's costs of capital. The financial health of each of these companies is important to its customers, and the Commission should continue to assess how the companies are able to cope with important risks many of which are outside their control. In Table 9, I have presented the WACC calculations for each of the Independent Small LECs based on the two-year average of their actual capital structure and the two-year average of their costs of debt. The capital structures of the companies vary significantly, and I believe they may become more conservative in the future as the companies cope with competition, regulatory pressures, and limited access to capital.

Table 9: WACC for each of the Independent Small LECs

	Average 2013/2014						
	Debt ratio	Preferred equity ratio	Common equity ratio	Cost of debt	Cost of preferred equity	Cost of common equity	WACC
Calaveras	41.5%		58.5%	4.5%		18.5%	12.7%
Cal-Ore	0.0%		100.0%			18.5%	18.5%
Ducor	44.7%		55.3%	5.1%		18.5%	12.5%
Foresthill	56.2%		43.8%	4.8%		18.5%	10.8%
Kerman	52.4%		47.6%	3.7%		18.5%	10.7%
Pinnacles	0.0%	2.4%	97.6%		5.0%	18.5%	18.2%
Ponderosa	38.1%	1.3%	60.6%	3.0%	6.0%	18.5%	12.4%
Siskiyou	0.0%	0.7%	99.3%		5.8%	18.5%	18.4%
Sierra	30.5%		69.5%	5.5%		18.5%	14.5%
Volcano	34.5%	3.7%	61.8%	5.2%	5.9%	18.5%	13.4%
Average	**29.8%**	**2.0%**	**69.4%**	**4.5%**	**5.7%**	**18.5%**	**14.2%**
Median	**36.3%**	**1.9%**	**61.2%**	**4.8%**	**5.8%**	**18.5%**	**13.1%**

Q. What are the potential issues that arise in applying the actual debt costs to specific capital structures of the companies?

A. My observation in reviewing Table 9 is that there are widely divergent WACCs in California, the result depending on whether the ILEC has 100% equity, or, for example in the case of Foresthill, where there is an equity ratio of 43.8%. I believe that providing Foresthill with return on capital set at 10.8% could make it difficult to build equity during a challenging time for ILECs, and it is possible that customers may be negatively impacted. The evaluation of the public policy import belongs to the Commission, which I believe could make the determination that a WACC other than the actual WACC, for example for Foresthill, does not harm customers as they are paying the same capital costs as those incurred by customers of other ILECs and such a WACC may help the customer because the carrier will be able to build a stronger financial foundation to serve customers in the future. For companies that fall significantly outside the Commission's previously defined "zone of reasonableness," a hypothetical structure would be appropriate.

Q. What do you recommend if the Commission were choose to use a hypothetical capital structure and establish a target WACC?

A. I would propose that the Commission employ a hypothetical capital structure with approximately 70% to 80% equity. I use 70% in my calculations below. This opinion relies on the Commission's previous adoption of a zone of reasonableness of 60%-80%. It also reflects my conclusion that the market value of equity has fallen and that the companies will increasingly have to rely on book equity ratios that are relatively higher in the future than in the past. In calculating a target WACC, I also assume that the cost of debt will rise, both because we are going to emerge from the artificially-low interest rates in today's markets and because I believe the risk for telephone companies will grow greater in the future. If the Commission were to posit a cost of debt figure as part of a hypothetical capital structure calculation, I recommend that the Commission use a hypothetical debt rate of 5.5% for companies without any actual debt rates. This is above the current median of 5.2% of the Independent Small LECs. However, it is approximately the interest rate that Sierra Telephone currently pays (5.53%), and approximates a rate that might be expected in the future for any of these carriers, although it is very possible the rates will rise higher. Again, this exercise is purely to arrive at a target WACC. Using the figures above and the recommended 18.5% cost of equity, a realistic target WACC is 14.6%.

Figure 5: Calculation of a target WACC

	Capital structure	Cost of Capital	Allocated cost
Debt	30%	5.50%	1.65%
Equity	70%	18.50%	12.95%
Total			**14.60%**

While the target WACC is higher than the current 10.0%, it is consistent with my transactional analysis. That is, the market collapse in ILEC enterprise value from 8.0 times trailing EBITDA to 5.5 times trailing EBITDA converts the former 10% target WACC to 14.5% and if the change is assumed to be from 8.0 to 5.0 times trailing EBITDA, the result is a target WACC of 16.0%. The calculation is 10%*(1/(5.5/8.0)) = 14.5%. or 10%*(1/(5.0/8.0)) = 16.0%.

VII. CONCLUDING COMMENTS.

Q. Do you have any concluding comments?

A. Yes. The U.S. Supreme Court has been clear about a utility's rights to rates that permit a risk-adjusted, market-based return on invested capital. Just as important, the entire rationale for maintaining support and setting appropriate rates of return is focused on ensuring that services are viable today and in the future for customers who live in high-cost regions, consistent with the federal policy articulated in Section 254 of the Telecommunications Act of 1996. If the California goal for near-ubiquitous telecommunications services, including broadband, is to be realized across higher-cost regions, then sound financial mechanisms will be required. The loss of sound financial mechanisms, including the loss of appropriate returns on equity, will likely assure that universal service policies will fail. It is my belief that, if the carriers do not see a way to provide service in a manner that produces appropriate returns on invested capital, the end result will likely be reduced service quality, limited service availability, impaired service reliability, and, in some cases, a withdrawal from service altogether.

This would be harmful or possibly devastating to ratepayers in these regions and likely represent a policy failure for all users of the telephone network.

Q. Does this conclude your testimony?

A. Yes.

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Application of Calaveras Telephone Company (U 1004 C) Cal-Ore Telephone Co. (U 1006 C) Ducor Telephone Company (U 1007 C) Foresthill Telephone Company (U 1009 C) Kerman Telephone Co. (U 1012 C) Pinnacles Telephone Co. (U 1013 C) The Ponderosa Telephone Co. (U 1014 C) Sierra Telephone Company, Inc. (U 1016 C) The Siskiyou Telephone Company U 1017 C) Volcano Telephone Company (U 1019 C) for a Determination of Applicants' Cost of Capital for Ratemaking Purposes	A. 15-09-005 (Filed September 1, 2015)

REBUTTAL TESTIMONY OF MICHAEL J. BALHOFF ON BEHALF OF

CALAVERAS TELEPHONE COMPANY (U 1004 C)
CAL-ORE TELEPHONE CO. (U 1006 C)
DUCOR TELEPHONE COMPANY (U 1007 C)
FORESTHILL TELEPHONE COMPANY (U 1009 C)
KERMAN TELEPHONE CO. (U 1012 C)
PINNACLES TELEPHONE CO. (U 1013 C)
THE PONDEROSA TELEPHONE CO. (U 1014 C)
SIERRA TELEPHONE COMPANY, INC. (U 1016 C)
THE SISKIYOU TELEPHONE COMPANY U 1017 C)
VOLCANO TELEPHONE COMPANY (U 1019 C)
("INDEPENDENT SMALL LECS")

March 11, 2016

REBUTTAL TESTIMONY OF MICHAEL J. BALHOFF

I. INTRODUCTION AND PURPOSE

Q1. Would you please state your name and position for the record.

A. My name is Michael J. Balhoff.

Q2. Are you the same Michael J. Balhoff who provided prefiled opening testimony on September 1, 2015 in this proceeding?

A. Yes, I provided prefiled testimony ("Opening Testimony") on behalf of the Applicants (the "Independent Small LECs").[1]

II. SUMMARY OF REBUTTAL TESTIMONY

Q3. What is the purpose of your rebuttal testimony in this proceeding?

A. This rebuttal testimony addresses misconceptions, errors, and policy concerns raised by the testimony of the Office of Ratepayer Advocates ("ORA") of the California Public Utilities Commission ("Commission" or "CPUC") submitted in this proceeding on February 12, 2016.[2]

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[1] Opening Testimony of Michael J. Balhoff on Behalf of Applicants, Independent Small LECs' Application for a Determination of Applicants' Cost of Capital for Ratemaking Purposes in Proceeding No. A. 15-09-005 ("Balhoff Opening Testimony").

[2] The Office of Ratepayer Advocates, Report and Recommendations on the Cost of Capital for Independent Small Local Exchange Carriers, filed on February 12, 2016 ("ORA Testimony"). I note that ORA's testimony is organized as a

Q4. Please summarize your rebuttal testimony.

A. I organize my response into four sections.

- **Response to ORA Testimony about cost of equity.** My testimony explains that ORA did not provide any meaningful substantive response to my testimony. Rather, ORA provided its opinions about inputs for estimating equity costs and offered no authority or source information for those estimates except for a 2013 report prepared by the FCC Wireline Competition Bureau Staff (the "FCC Staff Report[3]") that has never been adopted or endorsed by the FCC, and which is now nearly three years old. I will show that ORA's reliance on the FCC Staff Report to reject the use of a premium for small companies and the FCC Staff Report's reliance on one citation to a survey article (and no other citation) to justify eliminating such a premium results in an exclusion that is demonstrably wrong for multiple reasons. In particular, the survey article itself reports the finding that there is a size effect among the smallest

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"Report," but ORA offers three separate witnesses, each of whom sponsors discrete parts. For ease of reference, I will refer to the "Report" as ORA's "testimony."

[3] Federal Communications Commission, *Prescribing the Authorized Rate of Return, Analysis of Methods for Establishing Just and Reasonable Rates for Local Exchange Carriers*, DA 13-1111, released May 16, 2013 available at http://www.fcc.gov/document/bureau-releases-rate-return-represcription-staff-report ("FCC Staff Report").

deciles, which include the Independent Small LECs at the bottom of the tenth decile. The Staff's sole source therefore arrives at a conclusion entirely opposite what is proposed in the FCC Staff Report, and that source actually serves to *support my testimony* by *justifying* the inclusion of a premium for size effect in the cost of equity calculation. In my Opening Testimony, I provided analyses based on all the major valuation resources, including data drawn from multiple periods and using multiple approaches. Finally, I corroborated my findings in my Opening Testimony using merger and acquisition data, which was not presented as the basis for my findings, but was presented as an additional verification of those findings. ORA offers no analysis to respond to or attempt to contradict the principal conclusions in my Opening Testimony. ORA's summary dismissal of my testimony relies on sources that can be impeached easily and effectively.

- **Response to ORA Testimony about debt.** My testimony explains that I recommended the use of actual, embedded costs for carriers that have reported debt on their balance sheets, and I recommend that the rates for that actual debt should be supplied in the carriers' rate cases. I do not

recommend imputation of debt or the development of a "forecast" for debt. However, in the event that the Commission chooses to impute debt costs, I proposed a reasonable cost of debt of 5.5%, a rate lower than the AAA cost of debt and slightly below the rate being paid by Sierra Telephone, one of the Independent Small LECs.[4] ORA proposes to use a lower figure (4.53%), computed as the average of the seven Independent Small LECs that report having debt, but in arguing that the carriers have access to inexpensive debt in a range of 2.47%-2.82%, ORA does not explain why all the carriers have higher debt costs than these figures, and five of the seven have costs well higher than the government-subsidized rates that ORA claims are available to the carriers. I testify that rates are rising from the artificially-depressed levels referenced by ORA and the Federal Reserve is currently in the process of easing the controls that are depressing those rates. I also explain that the largest lender to rural carriers, CoBank with $95 billion in assets, has publicly commented on the increased regulatory risks that are dampening the credit markets for small Incumbent Local Exchange Carriers ("ILECs"), meaning that debt is less available for the small carriers.

[4] Balhoff Opening Testimony, p. 10, lines 7-9; Exhibit MJB-14.

CoBank also warns that the allowed rate of return should not be reduced, because such an action—ORA's precise recommendation in this proceeding—will create even greater limitations on credit, and potentially render the industry as "not bankable."

- **Response to ORA Testimony about capital structure.** ORA asks the Commission to rely on the companies' actual capital structures or to possibly reduce the hypothetical equity ratio, but my testimony shows that this approach would overlook current and reasonably foreseeable trends toward more conservative, equity-based balance sheets. Carriers are migrating to a greater reliance on equity because of higher risks attendant to their businesses. Three of the Independent Small LECs have virtually 100% equity ratios and five of the remaining seven companies have improved their equity ratios by an average of 689 basis points from 2010 to 2014. The conservatism related to the companies' capital management practices suggests increasing caution as industry risks rise. Since 1997, the Commission has relied on a hypothetical capital structure, which appears to be a reasonable approach today and, if adopted, should reflect the growing and justifiable

conservatism in an increasingly risky industry, as I explained in my Opening Testimony.

- **Commentary regarding the FCC Staff Report as the FCC considers represcribing the authorized rate of return.** In calculating the cost of equity, ORA relies almost exclusively on the FCC Staff Report, which is a discussion document about potential changes to the allowed rate of return, including allowed equity cost, for rural carriers. The FCC may issue an Order regarding represcription, possibly as early as the first half of 2016, but the FCC Staff Report is an opinion paper from FCC Staff, and is not determinative at this time. Even if the FCC were to rely on the assumptions and data in that FCC Staff Report, this Commission should itself carefully and deliberately consider the issues surrounding cost of capital, which will have profound effects on the long-term welfare of rural California customers. I have demonstrated that the data I have supplied in my Opening Testimony are accurate, fair and financially justified. It is my strong conviction that the FCC Staff's conclusions are demonstrably false, and I stand ready to defend that professional opinion even if the FCC were to accept some or all of the recommendations of its Staff. Specifically, the

FCC Staff used a guideline or so-called proxy group with characteristics significantly different from those of the small rate-of-return ILECs, predetermining that its analysis is unreliable in setting a cost of capital in this proceeding. Further, the FCC Staff used a risk-free rate that was distressed and well lower than any suggested by the major professional valuation services. The FCC Staff also rejected the incorporation of key size and marketability premia, based on an argument that we will show leads to a very different conclusion. The ORA Testimony that is reliant upon the FCC Staff Report leads to an incorrect estimation model.

III. RESPONSE TO ORA TESTIMONY ABOUT RETURN ON EQUITY

Q5. ORA expresses concern that your calculation of the cost of equity is higher by 50% over the implied cost of equity in the 1997 rate case decisions for the Independent Small LECs. How do you respond?

A. As I noted in my Opening Testimony, I understand that my recommendation is significantly higher than the implied cost of

equity range referenced in the 1997 decisions.[5] However, capital markets and ILEC industry dynamics have evolved significantly since the late 1990s, as regulatory, political, and competitive developments have sharply increased the risk profiles of these companies. I urge the Commission to look past ORA's superficial skepticism regarding my proposal, as the proof of its reasonableness lies in its details. I was careful in my testimony to provide the highest-quality sources for data and applications of premia, relying on the most respected resources provided by Ibbotson/Morningstar and Duff & Phelps. I used not one or two, but multiple analytical estimation tools to test and re-test the data, including assessments of data across various historical periods to appropriately smooth any anomalous results.[6] I rejected any estimations that might have been interpreted as aggressive. Specifically, I was conservative by: (i) applying no incremental liquidity or marketability premium; (ii) using a size premium that is 641 basis points lower than the 11.98% recommended by Duff & Phelps for the smallest of companies (appropriate for a 10z grouping into which the Independent Small ILECs clearly fall); (iii) relying on an industry beta that is relatively low at 1.06, as it is drawn from proxies that are all substantially larger, more liquid,

[5] Balhoff Opening Testimony, p. 9, lines 10-13.

[6] Balhoff Opening Testimony, p. 53, Table 3.

more capable of acquisitions, and more diversified; and (iv) using a risk-free rate that is the lower of the two options for each of the periods studied (a higher result is generated when using total return on the Treasury).[7] Finally, I tested the results on the basis of M&A data where I have again been conservative. My experience leads me to the judgment that the appropriate valuation multiple based on enterprise value to earnings before interest, taxes, depreciation and amortization ("EBITDA") for these companies is likely closer to 5.0 times, which suggests a higher cost of equity than the one I used.[8]

Q6. Did ORA provide any sources that directly addressed the data and the premia you provided in your testimony?

A. ORA provides virtually no sourcing for the estimates or the opinions it offers in its testimony. ORA's single source for its Capital Asset Pricing Model ("CAPM") equity risk premium is the FCC Staff Report. I will address in detail the deficiencies in the FCC Staff Report in a later section of this testimony. ORA also reported that it "looked at data collected by Professor Aswath Damordan [sic]," but the detailed company-specific performance

[7] Balhoff Opening Testimony, p. 73, lines 17 ff.

[8] Balhoff Opening Testimony, p. 74, lines 6-8; "The transactional data indicate that the actual cost of equity is between 19.7% and 25.9%, which is well above 18.5% that I recommended."

data are not available for my review.[9] Finally, ORA provides footnote 51, which references four reports as the foundation for its generalized claim that authorized rates of return for other regulated utilities—electric, natural gas, and water—have declined.[10] As I will discuss, these utility sectors are fundamentally different from the industry of the small, rural telephone companies.

Q7. Did ORA provide any substantive data in response to your calculations?

A. ORA provided no substantive sources, except to reference the FCC Staff Report, to which I respond in detail below. ORA gratuitously supplies its views and opinions, but does not address the clear and convincing data compiled from authoritative sources that are presented in my Opening Testimony.

Q8. Does ORA disagree with your general approach to the CAPM?

A. No. ORA relies on a CAPM, which is fundamentally the same as the Build-up Method used in my testimony, but ORA suggests its own inputs that are different from those drawn from the various Ibbotson and Duff & Phelps data.[11] Most surprising, ORA reduces the CAPM to two inputs, which are the forecasted risk-free rate

[9] ORA Testimony, p. 43, lines 12-13.

[10] ORA Testimony, p. 44.

[11] ORA Testimony, p. 36, lines 11-21.

and the equity risk premium.[12] There are no other variables, meaning that ORA recommends that the Independent Small LECs have equity costs that are no different from the equity costs in the general market. This remarkable proposition has never been endorsed by the financial community and has never been supported by a regulatory body, to the best of my knowledge. As the data show, ORA's attempt to equate the equity cost of these companies with the general equity market cannot be correct.

Q9. What risk-free rate does ORA utilize?

A. ORA notes that the ten-year Treasury rate has fallen from 6.68% in 1997 to 3.07% in 2014. Then, ORA proposes to use the most recent reported three-year average rate of 2.91%. ORA provides no citation or authority for its recommended approach, nor does it comment on today's extraordinarily anomalous rate-environment.

Q10. Is the use of 2.91% appropriate?

A. No. As I explained in my Opening Testimony, the risk-free rate and the equity premium should be matched in terms of the time periods from which they are drawn, as is clear in the valuation data provided by Ibbotson or Duff & Phelps.[13] ORA's estimated equity

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[12] ORA Testimony, p. 36, lines 15-18.

[13] Balhoff Opening Testimony, p. 51, lines 4-12; the market expects a total return

premium is apparently based on data from 1928 to 2012, a 76-year period,[14] yet its Treasury rate is drawn from a three-year average. The result is a mismatch that is problematic. Even more troublesome, however, is the fact that ORA's proposed Treasury rate is not a sound data point, as it is drawn from a period in which the rate is at historically low levels and, according to most or all financial experts, is artificially depressed.[15] Using a rate that is at extremely low levels, and demonstrably constrained by the Federal Reserve's interventions, does not provide a good indication of rates that might be projected over extended future periods. It would be just as wrong as if one were to use the 1981 Treasury Bond rate of 13.72% or the five-year Treasury Bond average of 12.09% for 1980 to 1984. Using a short period with extreme data is not appropriate as such an approach leads to intellectually dishonest and unreliable results. ORA's use of these artificially low starting "risk free" rates appears to be opportunistic and is, in my strong opinion, not based on reasoned judgment and informative data.

Q11. How did you determine the appropriate risk-free rate?

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so equity premia must be matched to the risk-free rate.

[14] ORA Testimony, p. 39, lines 9-11; see also FCC Staff Report, p. 27, para. 72.

[15] Balhoff Opening Testimony, p. 19, lines 1 ff.; 2015 Duff & Phelps Valuation Handbook: Guide to Cost of Capital, Market Results through 2014, (Hoboken, NJ: John Wiley & Sons, Inc., 2015) ("Duff & Phelps, 2015 Cost of Capital").

A. I matched the term of the risk-free rate from several periods with the equity market premium drawn from those same periods. I used extended periods to estimate an appropriate risk-free rate, thereby smoothing data that would otherwise be too high or too low in various periods. This is the standard practice in valuations. I also used multiple periods to test the findings. The extended time periods used in my testimony were 1926-2014, 1963-2014 and 1995-2014, and I provided the source data from Ibbotson/Morningstar and from Duff & Phelps, so the Commission can assess so-called "risk-free" rates in different, protracted periods.[16] As I have explained, the valuation-discipline requires evaluating data that eliminate the distortive effects of extreme data points, such as the depressed interest rates reported at the present time. I have sourced the commentary about the Federal Open Market Committee's comments on the artificiality of today's Treasury rates.[17] It is my professional opinion that ORA's approach cannot be viewed as reasonable, which may explain why ORA provides no authorities to affirm its recommendation. My testimony provides the Commission with data, sources, and alternative time periods to justify, test, and confirm the results.

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[16] Balhoff Opening Testimony, p. 52, lines 5-7; p. 54, lines 9-10. Strictly speaking, there is no "risk-free" rate, but the U.S. Treasury is generally regarded as close to "risk-free."

[17] Balhoff Opening Testimony, p. 19, lines 6-22.

ORA has not responded to my supporting authorities nor has it provided any contrary authority, and ORA volunteers a depressed rate from a period different from the period used to calculate the equity premium. These errors are fundamental to ORA's approach and profoundly weaken its estimation of the Independent Small LECs' cost of equity.

Q12. What equity risk premium does ORA propose?

A. ORA cites to the FCC Staff Report and suggests using the Staff's figure of 5.88%, which it states is a figure comparable to the one the CPUC used in 1997; the 5.88% rate is based on the period 1928 to 2012.[18] ORA reports that recent estimates range from 4.51% to 6.21%, but ORA defaults to the FCC Staff Report proposal of 5.88%.[19] My Opening Testimony provides equity premia that were 5.1%, 6.6% and 4.9%, for the periods 1926-2014, 1963-2014 and 1995-2014, respectively, and alternative data using total Treasury returns (yield plus capital appreciation) of 5.7%, 7.4% and 8.6%, respectively, which, to be conservative, were not the basis of my recommendations.[20] Again, ORA does not consider

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[18] ORA Testimony, p. 39, lines 6-13; p. 43, lines 3-4.

[19] ORA Testimony, p. 43, lines 4-6.

[20] Balhoff Opening Testimony, p. 52, lines 5-7; p. 54, lines 9-10. The alternative rates were based on total Treasury returns (yield plus capital appreciation), but, because they generated *higher* equity costs of capital, were not used; this is another example of the conservative nature of my analysis in the Opening

evidence drawn from different time periods and ORA does not respond to the data compiled in my testimony, declining to explain why my findings should be rejected or adjusted. In response, I once again affirm that the data I used were drawn from the most reliable sources and they provide the Commission with alternative and confirmatory data. ORA does not provide a rationale for its figure, except that it relies on the FCC Staff Report, which will be addressed in a later section of my testimony.

Q13. Have you reviewed ORA's Attachment 9, which presents a 6.43% averaged return on equity?

A. Yes. It appears that ORA is attempting to argue that its use of the FCC market premium of 5.88% is reasonable by calculating actual returns on equity ("ROE") over the twelve-month period ended in June 2015 for twelve telecommunications companies listed in Attachment 9.

Q14. Do the data confirm the 5.88% return on equity that ORA is advancing?

A. No. The Attachment is not instructive in any way. Fourteen companies are included in the Attachment, but only twelve are accompanied by a calculated ROE. The data are flawed upon even a cursory examination. Alteva is primarily a software company, with virtually no ILEC cash flow, and the ROE that ORA reported

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Testimony.

was a negative 11.4%. On April 26, 2015, Windstream spun off its assets into a real estate investment trust which began to trade that day as CSAL, so the negative 34.2% ROE resulted from no adjustment being made for the spin-off. Verizon has a book equity that reflects the company's many acquisitions, which distorts the ROE in the Attachment. Frontier has been in the process of acquiring large-ILEC assets, including Verizon's California, Texas and Florida operations, with the result that integration-related expenses skew the ROE. Similarly, Consolidated Communications was recently in the process (closed October 16, 2014) of acquiring and integrating Enventis (the former HickoryTech), meaning that its results in 2015/2014 included acquisition expenses. In short, the table provides data that are not instructive, and they certainly do not support ORA's argument that "[a]ctual earned return on equity at this level suggests that ORA's estimate for return on equity in this proceeding is more reasonable than Mr. Balhoff's."[21]

Q15. Have you reviewed the data that ORA reported that it had "looked at" regarding Professor Damodaran's calculation of ROE?

A. I did not have access to the underlying company-specific performance data because the company-specific performance data are not available in Professor Damodaran's online spreadsheets,

[21] ORA Testimony, p. 42, lines 10-12.

and I understand that this data was not produced by ORA in response to the Independent Small LECs' request for the underlying data collected by Professor Damodaran that ORA reviewed in connection with its Opening Testimony. I note that ORA reported that Professor Aswath Damodaran calculated that Telecommunications Services companies generated an ROE of 8.31% in 2014.[22] A review of the Professor's spreadsheet reveals that he lists global securities, which, when sorted, yields 65 stocks in the U.S. telecommunications services sector, only 16 of which have ILEC businesses. The stocks that are included are so disparate—including equipment, long-haul fiber, cable operators, standalone Voice over Internet Protocol ("VoIP") companies and large conglomerates—that the calculated ROE proves meaningless in the ORA testimony.[23] Without conceding that ORA's citation to Damodaran is instructive or proper, I note that the spread between the Treasury rate proposed by ORA (2.9%) and the generalized reported Damodaran Telecom Services ROE is about 540 basis points ("bps"). Even this crude metric shows the reasonableness of my testimony, which reports equity market premia of 700 bps, 505 bps, and 684 bps, for the three periods

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[22] ORA Testimony, p. 43, lines 13-14.

[23] It is necessary to sort Professor Damodaran's spreadsheet to extract U.S. telecom services companies. See http://www.stern.nyu.edu/~adamodar/pc/datasets/indname.xls.

1926-2014, 1963-2014 and 1995-2014, respectively, and an ILEC beta of 1.06, which is only slightly riskier than the overall market. Another salient problem with the ORA analysis—again noting that it is not possible to review the underlying Damodaran company-specific performance data to assess potential outliers—is that ORA is relying on one single year to "sample" telecommunications services companies' equity returns. As such, the approach employed by ORA is so imprecise that it offers no meaningful insight in this proceeding. Again, to reach accurate results, it is necessary to use a longer period of years in assessing a comparable industry group, consistent with the approach employed in my testimony.

Q16. What is your view regarding ORA's proposal not to use an industry-specific adjustment?

A. ORA is fundamentally arguing that the CAPM should be reduced to a "proposed" risk-free rate and a generic market equity return. ORA proposes to use a very depressed Treasury rate and simply add a low equity risk premium of 5.88%, again employing only two inputs to estimate its so-called "reasonable cost of equity."[24] ORA reveals its fundamentally flawed "logic" when it explains that "[h]olding all other variables fixed, one would expect the cost of equity estimates to be lower when a lower risk-free rate is

[2424] ORA Testimony, p. 3, line 8; p. 38, lines 9-10;

employed in the financial models used to calculate costs of capital."[25] According to ORA's proposal, only the change in the risk-free rate matters, as it is "holding all other variables fixed," meaning that the market return remains essentially the same over the protracted 1928 to 2014 period. ORA does not evaluate any other variables, and believes that it is sufficient to assign the LECs a cost of equity that is the sum of a lower Treasury rate plus a market-wide return—without any premium for industry-specific risk and without an allowance for any other risks. ORA summarily rejects market or company analyses, which is an approach that, to the best of my knowledge, no professional source endorses. In addition, I believe the failure to account for industry-specific risks is inconsistent with the plain language of applicable legal guidance from the United States Supreme Court.

Q17. In what way do you believe ORA's approach to equity risk is inconsistent with applicable Supreme Court guidance?

A. I am not an attorney, but I am familiar with the seminal U.S. Supreme Court cases addressing the legal parameters within which state commissions must examine rate-of-return issues. ORA acknowledges some of these U.S. Supreme Court authorities in its "Cost of Equity" section, but it fails to follow the critical guidance

[25] ORA Testimony, p. 39, lines 15-17.

that is evident in those opinions.[26] The Supreme Court calls for industry-specific assessments, including a consideration of relevant regulatory risks. In *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923) ("Bluefield"), the Court states that a public utility is entitled to such rates that will permit a return "equal to that generally being made at the same time and in the general part of the country on investments *in other business undertakings which are attended by the corresponding risks and uncertainties . . .*" (emphasis added). *Federal Power Commission v. Hope Natural Gas Company*, 320 U.S. 391 (1944), makes a similar point, citing "the return to the equity owner should be *commensurate with returns on investments in other enterprises having corresponding risks*" (emphasis added.) Finally, *Duquesne Light Company et al. v. David M. Barasch et al.*, 488 U.S. 299 (1989), reiterated the standard of *Hope* and *Bluefield* and then added important new factors, including "regulatory risk," noting that a "decision to arbitrarily switch back and forth between methodologies in a way which required investors to bear the risk of bad investments at some times while denying them the benefit of good investments at others would raise serious constitutional questions." From the plain language, these opinions point to a required assessment of industry-specific risks,

[26] ORA Testimony, pp. 34-35.

including risks in a period of significant regulatory change, that should be reflected in cost of equity capital. My experience and my reading of these constitutional rulings lead me to believe that it is not defensible to argue that the Independent Small LECs deserve a return that simply mirrors the overall market return for equity.

Q18. What basis does ORA offer for its rejection of a size premium?

A. ORA devotes a mere twelve lines in its testimony to the size premium, and fails to address the sources and data provided in my Opening Testimony. ORA dismisses the premium with the summary comment that because the Independent Small LECs are rate-regulated, the companies experience no risk that exceeds the overall market risk.[27] ORA supports its view with a single citation to the FCC Staff Report that also did not recommend a size premium.[28] Finally, ORA states, without further explanation, that "even if size was determined to be a relevant factor, it is quite possible that the relatively small size of the ILECs would afford them an opportunity to more nimbly adjust strategy and budgets in response to competitive forces . . ."[29]

Q19. Is it appropriate to dismiss the size premium?

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[27] ORA Testimony, p. 43, lines 14-16.

[28] ORA Testimony, p. 43, lines 16-18; footnote 50.

[29] ORA Testimony, p. 43, lines 18-21.

A. No. Significant research supports the validity of enhanced risk that is either due to, or closely related to, size. That is, a CAPM model that relies only on a risk-free rate and a market equity risk premium is not sufficient to estimate the costs of equity for small companies. Again, ORA cites to the FCC Staff Report.[30] No other justification is provided for ignoring this widely-used factor. I will explain below that the FCC Staff Report on which ORA relies also devotes a mere six lines to the size premium, citing only a single source which is a 25-page survey article in 2011 as the justification for rejecting the premium, and overlooking the article's findings that the size effect is significantly related to illiquidity and concentrated in the three smallest deciles of the market.[31] The Independent Small LECs fall in the *lowest quartile*

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[30] ORA Testimony, p. 40, line 1.

[31] Crain, Michael A., *A Literature Review of the Size Effect* (October 29, 2011), ("Crain") *available at* SSRN: http://ssrn.com/abstract=1710076, pp. 11-12; 15:

> Studies reveal that market liquidity may be an important risk factor underlying firm size. Amihud & Mendelson (1986) examine American stocks from 1961 to 1980 and find that the size effect is linked to liquidity when measured by bid-ask spread. They regress stock returns on CAPM beta, firm size, and bid-ask spread; they find that size is insignificant. But when the bid-ask spread variable is omitted, size is significant. Amihud & Mendelson reason that firm size is a proxy for liquidity. More recently, Amihud (2002) finds market illiquidity effects on returns are significant and stronger in smaller firms. He examines NYSE stocks from 1964 to 1997 by regressing returns on firm size, market liquidity, and other variables. From the findings, he suggests that temporal variations in the size effect are related to changes in market liquidity over time. Further, Pastor & Stambaugh (2003) examine American firms from 1966 to 1999 and find that marketwide liquidity is a factor in explaining returns by adding a liquidity variable to Fama & French's (1993) three-factor model. Since this three-factor model has a

of the smallest decile. The article's author, Michael Crain, devotes Section 6 of his survey to address findings that the size effect is concentrated in the smallest companies.

> Researchers find the size effect, when observed, is concentrated in smaller firms. It seems the size effect is not linear across listed firms. Horowitz et al. (2000a) observe the size effect seems to occur only in smaller listed firms. . . . Since Horowitz et al. replicate the methodology of Fama & French (1992), they argue that the findings of Fama & French are concentrated in very small firms and not across all small firms as Fama & French claim. In another study, Fama & French (2008) observe that the size effect exists in U.S. listed firms but it is strongest among microcap firms using data from 1963 to 2005.[32]

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variable for firm size, Pastor & Stambaugh's study essentially finds marketwide liquidity is important in addition to firm size. Subsequently, Liu (2006) confirms that market liquidity has power in explaining returns by examining U.S. stocks from 1960 to 2003. He illustrates that market liquidity varies significantly over time and, thus, so does investor liquidity risk (Liu 2006, Figure 1). Further, he finds that liquidity subsumes effects due to size (and other factors). In a later study, Chen et al. (2010) examine American stocks from 1972 to 2009 and find the liquidity effect does not completely capture the size effect but that liquidity is highly correlated with firm size. A model without a variable for liquidity might cause the size effect to vary (or, perhaps, even disappear) as market liquidity changes over time. Horowitz et al. (2000a) are implicitly examining the liquidity hypothesis when they find the size effect disappears after a small-cap fund was introduced. That fund provided more access and, thus, liquidity to smaller listed firms. Moreover, Amihud (2002) finds that returns of smaller firms are more sensitive to market illiquidity and that smaller firms have more liquidity risk than larger firms. He asserts that such findings may explain variations of the size effect. Market liquidity changes over time, he contends, due to shifts in sentiment whereby investors sometimes flee to liquidity, which makes large stocks relatively more attractive. Amihud also finds that market liquidity is consistent over time, unlike firm size, as a factor explaining returns.

[32] Crain, p. 15.

Thus, the survey article cited by the FCC Staff in its Report—on which ORA relies—finds that size effects do exist in the smallest firms. The Fama & French study, referenced by Crain, affirms size effects in "microcap" companies which are typically described as companies with market capitalizations of $50 million to $300 million. For perspective, the 2014 average common book equity of the Independent Small LECs is $20.2 million and the median book equity is $14.3 million.[33] The Crain article, therefore, finds the exact opposite of what the FCC and ORA is claiming as that article *justifies* a size premium for companies that are even larger than the Independent Small LECs.

Q20. Does other scholarly research reject the addition of a size premium?

A. No. As I have explained, the widely-accepted approach recommended by valuation experts and scholars applies a size premium to account for increased risks among the smallest companies. Data seeking to quantify the size-effect premium are reflected in seminal valuation reports, such as those released by Ibbotson/Morningstar and Duff & Phelps. In the face of these authorities supporting a size premium and/or related factors such as liquidity, ORA's rejection of the approach is startling. Indeed,

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[33] The largest of the Independent Small LECs is Siskiyou, which reported 2014 book equity of $59.6 million, which is still at the bottom of the microcap range.

even the article referenced by the FCC Staff Report states that the CAPM does not explain the risk associated with all companies, particularly firms that are in the smallest deciles. The survey article considers whether there are other factors that better explain the size effect, and it provides sources with alternative – but confirmatory – explanations for the size effect, which include liquidity and size factors concentrated in the three smallest deciles of the stocks studied. [34] In the final section of his survey, Crain summarizes his article as follows:

> When the size effect is observed, theory suggests that superior returns in smaller firms arise from higher risk in these firms compared to larger firms. Researchers do not claim that size per se is a source of risk that drives superior returns of smaller firms. Instead, firm size may be a proxy for one or more underlying risk factors linked to smaller firms. Such factors could be endogenous or exogenous and explain variations in the size effect. Empirical research suggests one such embedded factor in smaller firms is liquidity risk. Logically, these findings on liquidity seem linked to the emergence of small-cap investment funds in the 1980s. Small-cap funds increase the liquidity of smaller firms and, thus, liquidity risk in these firms ought to be lower on average after these kinds of funds launch. It follows that superior returns of smaller firms should decline when liquidity risk decreases. In addition to the discoveries of the size effect and variations in the effect, two areas of research are related to these findings. First, research shows that when the size effect is observed, it is nonlinear and concentrated in smaller listed firms. One study finds the effect is five times larger in firms in the 20th percentile using

[34] Crain, p. 4, citing a Michou study in 2010.

> NYSE breakpoints for size and only marginal across the remaining larger firms.[35]

In addition to the sources cited in Crain's article, including those referenced in footnote 31, above, the highly-respected valuation experts. Shannon Pratt and Roger Grabowski, dedicate two entire chapters and an appendix to size effect— "Chapter 14: Size Effect," "Chapter 15: Criticism of the Size Effect," and "Appendix 15A: Other Data Issues Regarding the Size Effect"—in their Cost of Capital text.[36] Pratt and Grabowski report that:

> Two results of the *Size Study* [of Ibbotson/Morningstar and Duff & Phelps] seem strikingly similar.
> 1. In spite of the different time period, the size effect results corroborate the Morningstar results that the size effect is empirically observed.
> 2. The results are significantly similar for all eight measures of company size.
>
> Although the market value of common equity has both the highest degree of statistical significance and the steepest slope when regressing average returns against size, all size measures show a high degree of statistical significance. . . .
>
> While there have been many criticisms of the size effect, it continues to be observed in data sources that utilize the CAPM methodology. . . . Studies have shown the limitations of beta as a sole measure of risk. The size premium is an empirically derived correction to the textbook CAPM.[37]

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[35] Crain, pp. 21-22.

[36] Shannon Pratt and Roger Grabowski, *Cost of Capital: Applications and Examples*, Fifth Ed. (Hoboken, NJ: John Wiley & Sons, Inc., 2014), ("Pratt and Grabowski Cost of Capital 2014"), pp. 301-371. See also Shannon Pratt and Roger Grabowski, *Cost of Capital: Applications and Examples*, Third Ed. (Hoboken, NJ: John Wiley & Sons, Inc., 2008) ("Cost of Capital"), pp. 179-223.

[37] Cost of Capital 2008, pp. 207, 219. See also, Pratt and Grabowski Cost of

In this discussion, "beta" is the company or industry adjustment (a single number) multiplied times the CAPM equity premium and the result is added to the "risk-free rate." As I explained in my Opening Testimony, "beta" is a number used in the CAPM to adjust the overall market return to account for the greater or lesser risk associated with a stock or with an industry relative to the overall market risk.[38] Notably, in the quotation above, Pratt and Grabowski state that the use of an industry beta in the CAPM is not sufficient, in the absence of a size premium, which is a view consistent with my experience and my testimony about the necessity for a size-related adjustment. Pratt and Grabowski are criticizing the proposal that the FCC Staff has made—that a risk-free rate plus an industry beta (applied to the equity market return) with no size premium is sufficient. ORA's proposal is even more extreme, as it proposes no size premium *and no industry*

Capital 2014, p. 361, which repeats the last two sentences of the quotation above.

[38] See Balhoff Opening Testimony, pp. 23-24; "beta: is a number that represents statistical volatility that is calculated by performing regressions on stock price changes related to the overall equity market and similar regressions for the stock or industry in question. If the equity market premium is 6% above the risk-free rate, then a stock with a beta of 1.1 is 10% more volatile (riskier) than the overall market and should have an equity premium of 6.6% (1.1 times 6%), and a stock with a beta of 0.9 is 10% less volatile (risky) than the overall market and should have an equity premium of 5.4% (0.9 times 6%). Industry betas are calculated on the basis of the betas of the individual stocks in an industry, which makes industry betas dependent on choosing companies similar to the companies whose equity premia are being studied.

adjustment. ORA's approach contains no citations because, to the best of my knowledge, there are no credible authorities available to support such a methodology.

Q21. Is there evidence that a size premium is appropriate for regulated utilities?

A. Yes. Dr. Roger Morin, who is referenced in more than 20 footnotes in the FCC Staff Report, writes the following in his oft-cited text, *New Regulatory Finance*:[39]

> Investment risk increases as company size diminishes, all else remaining constant. Small companies have very different returns than large ones, and on average they have been higher. The greater risk of small stocks does not fully account for their higher returns over many historical periods. The size phenomenon is well-documented in the finance literature. Empirical studies by Banz (1981) and Reinganum (1981A) have found that investors in small capitalization stocks require higher returns than predicted by the standard CAPM. . . . The relationship between firm size and return cuts across the entire size spectrum but is most evident among companies that have higher returns than larger ones on average. Ibbotson Associates' well-known historical return series publication covering the period 1926 to the present reinforces this evidence (Ibbotson Associates' *2005 Yearbook, Valuation Edition*). To illustrate, the Ibbotson data suggests that under SIC Code 49, *Electric, Gas & Sanitary Services*, the average return for that group over almost an 80-year period was 14.03% for the small-cap company group and 10.86% for the large-cap group, more than a 300-basis point difference. This is true for all industry groups.[40]

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[39] Roger A. Morin, New Regulatory Finance (Vienna, VA: Public Utilities Reports, Inc., 2006) ("Morin").

[40] Morin, pp. 181-182.

Even for utilities that are true monopolies, which the Independent Small LECs are not, Dr. Morin's observed difference in the costs of equity between larger and smaller companies is striking (approximately 300 bps). I am convinced that there should be the addition of a size premium, and the actual difference is larger for companies in a highly competitive market, such as telecommunications, compared with traditional public utility sectors, such as water or energy, where there is essentially no competition.

Q22. Can you respond to ORA's claim that "even if size was determined to be a relevant factor, it is quite possible that the relatively smaller size of the ILECs would afford them an opportunity to more nimbly adjust strategy and budgets in response to competitive forces, changing customer demands, and technological innovations, thereby lowering risk"?[41]

A. Yes. ORA's conclusion is nothing but speculation and is wrong, in my opinion. Small companies have greater risk, particularly in the ILEC industry, which is a high fixed-cost business in which large, long-term investments are necessary. Customer losses often translate to proportionately higher losses of operating cash flows, because the plant does not go away; the result is that operating risk

[41] ORA Testimony, p. 43, line 18 ff.

rises rapidly as competition grows. Greater size permits carriers to spread marginal costs over a large number of customers, and smaller firms are severely disadvantaged in managing their costs. As a result, small carriers require more federal and state support to supplement their investments and operations, while keeping rates within reasonable bounds. Further, small carriers have relatively low diversification of revenues compared with large carriers, and, as in a stock portfolio, diminished diversification results in increased risk. Finally, small carriers have limited access to the capital markets, which creates significantly greater risks. Dr. Morin addresses the greater risk for smaller utilities, effectively responding to ORA.

> Smaller companies are less able to deal with significant events that affect revenues and cash flows than larger companies. For example, the loss of sales from a few large customers would exert a far greater effect on a small company . . . . Presumably, small stocks provided less utility to the investor, and require a higher return.[42]

ORA's statement is not only speculative—and offered without any citation or justification—but it is also contrary to prevailing authority and common sense.

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[42] Morin, p. 187.

Q23. How do you respond to ORA's commentary that since 1997, authorized rates of return for U.S. regulated electric, natural gas, and water utilities have declined?[43]

A. The other U.S-regulated industries—electric, natural gas, and water—have monopoly characteristics that are distinguishable from those in the ILEC industry. ILECs are no longer monopolies, and even rural carriers are affected by increasing competitive pressures. The ILEC industry is challenged by significant capital expenditure pressures due to technology transitions with shorter lives, and, as recent trends in FCC policy amply demonstrate, the ILEC industry is buffeted by regulatory turbulence. These "risks" create a significantly higher uncertainty, and, hence, higher equity cost for ILECs.

Q24. Did you consider ORA's argument regarding the decline in authorized ROEs for regulated utilities since 1997?

A. Yes. While not quantified in ORA's testimony, the 2009 report from Regulatory Research Associates (cited in the ORA testimony at footnote 51), reveals that the average equity returns for electric and gas utilities have declined from 11.34% in 1997 to 10.42% in 2008, that is, by approximately 92 bps over that 12-year period.[44] In that same footnote, ORA also cites an April 2009 slide

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[43] ORA Testimony, p. 44, lines 13-15.

[44] Regulatory Research Associates, *Regulatory Focus*, (January 12, 2009), p. 4.

presentation from Moody's Investors Service ("Moody's"), which tracks what appear to be authorized and realized utility ROEs for the electric industry. At the time of the presentation, the authorized returns were slightly above 10%, while the realized ROEs were graphed at levels approximately 50 bps lower.[45] The February 2013 *Industry Outlook* report from Moody's, also cited in ORA's footnote 51, explains that the stable outlook for the electric and gas sector is the result of a "sustained period of low natural gas prices," a "flight to quality" in the capital markets (when investors are fearful they usually trade out of riskier securities and flee to quality securities that are large, dividend paying and predictable equities or higher-grade debt instruments), and anticipated large capital expenditures that "will contribute to rate base growth."[46] In the 2015 "Capital Market Conditions" article cited by ORA in footnote 51, Dr. Randall Woolridge reports that gas and electric companies have authorized ROEs that have fallen to approximately 9.7% by 2015.[47]

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[45] Moody's Investor's Service, *Estimating the Cost of Capital in Today's Economic & Capital Market Environment*, 41st Financial Forum, Society of Utility and Regulatory Financial Analysts (April 2009), slides 7-8.

[46] Moody's Investor Services, Industry Outlook: US Regulated Utilities (February 6, 2013), p. 1.

[47] J. Randall Woolridge, *Capital Market Conditions, Authorized Utility ROEs, and Hope and Bluefield Standards*, October 22, 2015, p. 7 (Table 1).

Q25. Do these sources support an argument that the Independent Small LECs' equity costs are consistent with those of gas and electric utilities?

A. No. The ORA sources listed in footnote 51 all refer to gas and electric companies that have little or no competition, and which are readily distinguishable from ILECs. Moody's *Industry Outlook* focuses primarily on the costs for natural gas, resulting in reduced expenditures that should enable higher generation profitability. In contrast, today's ILEC profitability and cash flows are shrinking as the carriers work to respond to competitive pressures and regulatory mandates for modern, broadband-capable infrastructure. As an illustration of a telling difference between the utilities cited by ORA and telecommunications carriers, Duff & Phelps in its most recent *Industry Cost of Capital* Handbook indicates that, in 2015, the median cost of equity for the gas and electric industry (SIC code 493) is approximately 240 bps *lower* than the cost of equity for the telecommunications industry (SIC Code 4813), which is a clear sign of the greater risk in the telecommunications industry.[48] So, if Dr. Woolridge is correct that gas and electric utilities should have authorized ROEs of approximately 9.7%, the Duff & Phelps data suggest that the telecommunications services

[48] Duff & Phelps 2015 Valuation Handbook: Industry Cost of Capital, (Hoboken, NJ: John Wiley & Sons, Inc., 2015); unnumbered pages—SIC Codes 493 and 4813.

industry should *start* with ROEs closer to 12.1%, before adding size or liquidity premia for the Independent Small LECs. It is clear that the electric and gas industry is not comparable with the ILEC industry, as the risks for telecommunications carriers are greater than those of monopoly utilities and are becoming arguably even larger as regulatory uncertainties increase.

Q26. Has the CPUC found that there is a difference in risk for smaller utilities compared with larger ones?

A. Yes. In 1997, the CPUC wrote that the Commission "concur[s] that applicant's [Foresthill's] risk is impacted by its small size in relation to the large size of the companies in the study group."[49] However, the Commission did not adopt an explicit size premium, nor did it adopt any specific risk premium, because the CPUC chose to approach setting rates in a different way; that is, it adopted a 10% rate of return for each of the carriers, independent of capital structure or specific costs of debt.

Q27. Does ORA correctly assess the effects of regulation on the risk profiles of the Independent Small LECs?

A. No. ORA fails to acknowledge the significant political and regulatory risks attendant to rural telephone company revenue streams, and ORA wrongly alleges that the companies are

[49] D.97-04-033 (Foresthill), at 20.

"shielded" from risks by virtue of their access to certain federal and state high-cost support.

Q28. Does ORA explain how it believes that universal service programs "shield" the companies from risk?

A. No. ORA simply asserts that "the USF and CHCF-A [California High Cost Fund A] provide known levels of revenue for the Small LECs" and that "revenues derived from revenue requirements adopted in general rate cases . . . are updated annually."[50]

Q29. Do the USF and CHCF-A provide "known levels of revenue" for the Independent Small LECs?

A. No. The federal Universal Service Fund program and the CHCF-A do not guarantee that Independent Small LECs will achieve any particular level of total revenue. The support programs provide important revenue sources for the Independent Small LECs, but Independent Small LECs also depend upon revenue from end users and intercarrier compensation. As one reference point, Public Utilities Code Section 275.6(b)(3) defines small independent telephone corporations' "rate design" to include a "mix of end user rates, high-cost support, and other revenue sources." The Independent Small LECs do not "know" what their revenues will

[50] ORA Testimony, p. 38.

be from year to year, and the amounts derived from federal high-cost support and CHCF-A fluctuate from year to year.[51]

Q30. If an Independent Small LEC does not achieve revenues sufficient to meet its revenue requirement in a given year, do the USF or CHCF-A programs provide a mechanism to make up for that shortfall?

A. The federal USF program provides no mechanism to correct for revenue shortfalls experienced by program participants. Similarly, subject to a narrow exception that addresses only a limited subset of revenue impacts, the CHCF-A program has no mechanism for supplementing funding to address revenue shortfalls. Each company's CHCF-A revenue is set in its most recent rate case, and that annual funding level remains effective until the company's next rate case, subject only to limited annual adjustments based on specific factors prescribed in the CHCF-A rules.

Q31. What are the limited annual adjustments?

A. There are four processes that can alter CHCF-A levels between rate cases. First, if a company is projected to earn more than its target rate of return based on seven months of annualized data, its CHCF-A funding level for the next year will be reduced by the amount by which the company exceeded the target. This "means test" serves to decrease prospective funding levels for "over-

[51] See D.91-09-042, Appendix.

earning," but it provides no supplemental funding for "under-earning." Second, because federal support for the intrastate revenue requirement fluctuates from year to year, and because that support may be higher or lower than forecasted in a rate case, CHCF-A is adjusted on a revenue-neutral basis to account for the differences. If federal funding is higher than projected, the CHCF-A will be prospectively reduced dollar for dollar by that additional amount. If federal funding is lower than anticipated, the CHCF-A will be prospectively increased by that amount. Third, if a company does not file a rate case within prescribed timeframes under the CHCF-A rules, CHCF-A funding is to be reduced to zero over a three-year period, starting with a 20% funding reduction in the first year of reduction, followed by a contraction to 50% funding in the second, and concluding with no funding in the third year. The mechanism is known as the CHCF-A "waterfall." Finally, CHCF-A funding can be adjusted annually for the revenue effects of "regulatory changes of industry-wide effect" that alter the assumptions upon which the CPUC set a company's rate structure in a rate case. This adjustment for "regulatory changes of industry-wide effect" is the one limited and narrow exception whereby CHCF-A funding can compensate for a limited subset of revenue shortfalls. As reflected in the Commission's most recent Resolution establishing funding amounts for the CHCF-A for

2016, the only "regulatory changes of industry-wide effect" that generated annual adjustments were changes to the California LifeLine program that shifted LifeLine-related administrative expenses to the CHCF-A program, and changes related to the FCC's intercarrier compensation reforms.[52]

Q32. Does this fourth mechanism, accounting for the revenue effects of regulatory changes, "shield" the companies from "fluctuations in revenue"?

A. No. In fact, the effects of regulatory changes are generally small relative to the universe of factors that could influence a company's cost structure and realized revenue. The limited annual adjustments for fundamental regulatory changes do not provide a sufficient mechanism for increased funding in response to changes in a company's income statement. If, for example, a company must spend significantly more than anticipated to provide its employees with health benefits, the CHCF-A provides no additional funding. If more customers than expected drop their landlines to rely on wireless services, the CHCF-A provides no additional funding. If a catastrophic event occurs, which requires significant additional costs to be incurred, the CHCF-A provides no additional funding. ORA is not correct that the CHCF-A "shields" from fluctuations in revenues and therefore eliminates

[52] *See* Res. T-17505.

company risk. Moreover, as I noted above, if a company earns more than its earnings target, the carrier will lose funding dollar-for-dollar in the next year.

Q33. Is it true that revenues are "updated annually," as ORA asserts?[53]

A. No. As I explained, revenues fluctuate based on many factors, and there is no mechanism to increase revenues on an annual basis to adjust for revenue shortfalls. Neither revenues nor revenue requirements are "updated annually."

Q34. Does federal high-cost support provide a mechanism for recouping lost revenues or neutralizing unanticipated costs or revenue losses?

A. No. USF support is calculated based on specific formulas designed to recover specific costs, but if those amounts prove to be insufficient to cover actual costs, no additional funding is provided.

Q35. Are there other risk factors associated with federal high-cost support and CHCF-A funding that ORA fails to explain?

A. Yes. ORA ignores the significant political and regulatory risks related to these programs. In fact, in my conversations, it is clear that investors and companies have become increasingly concerned about the uncertainties affecting small and vulnerable carriers that

[53] ORA Testimony, p. 40, lines 8-10.

are clearly dependent on support mechanisms. More specifically, the *USF/ICC Transformation Order* (FCC 11-161) and the various subsequent FCC orders have put in motion dramatically more unpredictable support mechanisms. Those federal reforms are ongoing, creating significant uncertainties and risks. Similarly, the CPUC has adopted changes to the CHCF-A program, and it is considering additional changes.[54] In D. 14-12-084, the CPUC adopted a rebuttable presumption that Independent Small LECs' revenue requirements could not include corporate expenses beyond the levels applicable to federal support mechanisms, thereby placing a significant limitation on the use of CHCF-A funding. Phase II of the CHCF-A rulemaking includes even more sweeping proposals for change, including the potential for imputation of unregulated broadband revenues into intrastate ratemaking and considerations of "alternative forms of regulation."[55] The breadth of Phase II of the rulemaking contradicts ORA's claim that the CHCF-A "shields" the companies from risk. This regulatory risk is further compounded by the political reality that the CHCF-A is subject to a "sunset" provision, such that the program will terminate at the end of 2018 if it is not legislatively renewed.[56]

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[54] See R.11-11-007 (CHCF-A rulemaking).

[55] D.14-12-084, at p. 12.

[56] See Pub. Util. Code § 275.6(g).

Even without changes to the CHCF-A program, the Independent Small LECs are dependent upon the CPUC's timely processing of rate cases to make adjustments to rate structures to account for increasing costs. Illustrating this, one of the Independent Small LECs, Kerman Telephone, has a current rate case that has been pending for more than four years.[57] It is my understanding that Kerman has been unable to address any of the cost increases that have occurred since 2008, which was the company's last rate case "test year." Significant delays in rate cases are major risk factors for the companies, and further rebut the claim that the CHCF-A eliminates risk for the carriers.

Q36. ORA rejects the portion of your testimony concerning merger and acquisition ("M&A") data.[58] How do you respond?

A. ORA summarily rejects the M&A data and analyses that I used to test the Ibbotson/Morningstar and Duff & Phelps calculations. ORA contends that the M&A data represents too small a sample because only 24 sales or about 20% of all the sales over the period were accompanied by public disclosure of data. I respond that it is typical that the vast majority of small transactions are announced with no significant disclosure of valuation information. At the same time, the number of transactions about which we do have

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[57] *See* A.11-12-011.

[58] ORA Testimony, p. 41, lines 8-14.

data is large and consistent, revealing the collapse in valuation over the period. Moreover, the transactions include sales and purchases of properties by sophisticated sellers and buyers, so those publicly-disclosed purchase prices provide compelling evidence about the sharply-lower valuations. If, for example, Verizon were to sell its California assets to Frontier at values meaningfully below market value, Verizon would be legally liable to its shareholders, some of whom would certainly file lawsuits.[59] If Qwest were to sell to CenturyLink at valuations below fair value, it too would be at risk for shareholder actions.[60] The data reveal a clear and convincing downward value trend that is in sharp contrast to valuations ten years ago. The factual trend cannot be dismissed, and it provides important corroborative evidence about the increasing cost of equity reflected in the CAPM valuation methodology.

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[59] Frontier reported on February 5, 2015, when the company announced the transaction to purchase Verizon's California, Texas and Florida wireline operations that it was paying 3.7x 2014 estimate pro forma EBITDA, a figure below the 4.5x to 5.5x EBITDA that I used as a typical value in my Opening Testimony. *See* Frontier Investor Presentation, *Frontier Communications to Acquire Verizon Wireline Operations in California, Florida and Texas* (Feb. 5, 2015), available at http://investor.frontier.com/common/download/download.cfm?companyid=AMDA-OJWDG&fileid=807528&filekey=D05E3F23-F896-4B56-AB6C-3D69DB74DBFB&filename=Frontier_Communications_to_Acquire_Verizon_Wireline_Operations_in_California_Florida_and_Texas.pdf, slide 6.

[60] See Balhoff Opening Testimony, p. 47, Figure 4; Qwest sold for 5.1x EBITDA, which is well below the prices that averaged 8.0x EBITDA from 2001 to 2007; see Balhoff Opening Testimony, p. 46.

Q37. What about ORA's argument that regulators rely on book value and not market value?[61]

A. I make the point clearly in the Opening Testimony:

> I emphasize that the following assessment is a corroboration of the analyses above, not the central presentation in this testimony. A critic might argue that there is a mixing together of book value and market value. Such an argument misses the larger point, which is that the size of the *relative contraction in value in the marketplace* is a clear indication of the startlingly increased risks in the industry, which is the basis for contending that a higher return on equity is appropriate.[62] (Emphasis in original.)

The M&A testimony was not proposed as the foundation for setting a rate of return, but as confirmation of the reasonableness of the increase in equity costs and the relative size of the change. ORA does not respond to these data from the real world which, in my view, provide convincing evidence that equity costs have risen steeply. These data offer the CPUC an ultimate test about whether the rising cost of equity and falling equity values are reasonable.

IV. RESPONSE TO ORA TESTIMONY ABOUT COST OF DEBT

Q38. Does ORA accurately state that "the applicants request the Commission to use a forward looking debt rate of 5.5%,"

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[61] ORA Testimony, p. 41, lines 14-19.

[62] Balhoff Opening Testimony, p. 64, lines 14-18.

including for the three Independent Small LECs which do not have any debt on their balance sheets?[63]

A. No. I was far more precise than ORA suggests, and it was not my testimony that a 5.5% cost of debt is more appropriate than actual debt costs for carriers that have debt. I stated from the outset that "it is more typical to use embedded [debt] costs which are the 'actual interest obligations, including amortization of discount premium, and expense of the utility's embedded debt outstanding.'"[64] Second, I recommended using 5.5% for the carriers that had no debt . . . *if the Commission wishes to use a hypothetical capital structure*.[65] I offered my professional opinion and recommendation that such a rate was reasonable because it was below the AAA rate and was slightly lower than the rate actually being paid by Sierra Telephone.[66] And my testimony was careful in stating that the rate might be reasonable if the CPUC were to determine that a hypothetical capital structure were appropriate.[67] Finally, I explained that the current Treasury rates

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[63] ORA Testimony, p. 10, lines 9-13; see also p. 10, line 14.

[64] Balhoff Opening Testimony, p. 15, lines 12-14.

[65] Balhoff Opening Testimony, p. 10, lines 13-16; p. 76, lines 1-17.

[66] Balhoff Opening Testimony, p. 10, lines 5-9; *see also,* Exhibit MJB-14.

[67] Balhoff Opening Testimony, p. 76, lines 11-17.

are at levels that are unsustainable, a proposition that ORA fails to address.[68]

Q39. Do you agree with ORA that actual debt costs should be used for the LECs with debt on their balance sheets?[69]

A. Yes, I agree that it is most appropriate to use embedded debt costs for the carriers that have actual debt.

Q40. ORA cites the current Treasury and Federal Financing Bank ("FFB") rates, which are 2.82% and 2.47%, respectively.[70] Are these legitimate rates to use in calculating the cost of debt?

A. No. As I explained above and in my Opening Testimony, the low Treasury-based rates noted by ORA are artificially depressed. ORA's use of those rates to demonstrate the conservatism of its proposal is not convincing, as those rates are historically low, due to the temporary intervention of the Federal Reserve, and will almost certainly increase and return to more normalized levels.

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[68] Balhoff Opening Testimony, p. 19, lines 2-10; Duff & Phelps 2015 Cost of Capital, p. 3-3 "The yields of U.S. government bonds in certain periods during and after the [financial crisis of 2008] may have been artificially repressed, and therefore [are] likely unsustainable. Many market participants will agree that nominal U.S. government bond yields in recent periods have been artificially low. Even members of the Federal Open Market Committee (FOMC) have recently discussed the need to 'normalize' interest rates." (Emphasis in original.)

[69] ORA Testimony, p. 21, lines 12-14.

[70] ORA Testimony, p. 23, lines 1-9.

Q41. How does ORA determine that an imputed cost for debt for the Independent Small LECs should be 4.53%?

A. ORA averages the debt costs for the seven Independent Small LECs that have debt on their balance sheet to arrive at 4.53%.[71] ORA attempts to support its proposal as purportedly conservative based on its belief that the carriers could access far less expensive FFB (2.47%-2.82%) or Rural Utilities Service ("RUS") funding. In fact, three of the seven Independent Small LECs have 2014 debt costs above 5.0% and two carriers have debt costs in the 4.5% to 4.8% range, and the remaining two have 2014 debt costs of 2.9% and 3.7%. However, all the California carriers have rates above those cited by ORA, including five of the seven with rates well higher than the government subsidized rates, so ORA's claims about the availability of lower debt are not reflected in carriers' actual experiences.[72] It is my understanding that carriers find certain conditions in the application process and in the covenants imposed by the government to be unfavorable, and the effect is that the government-subsidized loans are *not* as readily available as ORA implies.

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[71] ORA Testimony, p. 23, lines 1-2.

[72] *Id.;* Calaveras reports debt costs of 4.5%; Ducor reports 5.1%; Foresthill reports 4.77%; Sierra reports 5.53%; and Volcano reports 5.2%. Balhoff Opening Testimony, p. 72, Table 8.

Q42. Is ORA correct in stating that your testimony is incorrect or unsubstantiated about the current lending environment, including RUS loans?[73]

A. No. The RUS reports that FFB funding has contracted sharply, as I reported in my Opening Testimony. Less than one-third of the available funds have been placed each year since the federal telecommunications reforms at the end of 2011.[74] My conversations with the RUS have confirmed that the recent federal reforms have precipitated changes at the RUS. The federal regulatory reforms have prompted the RUS to be more conservative, requiring more detailed five-year forecasts and extending the approval process from a previous approval period of 6-12 months to today's 12-18 months. I am aware of the RUS concerns because I was requested to brief the entire senior leadership at the RUS on several occasions regarding the 2011 reforms. The senior RUS personnel were candid in reporting concerns about deteriorating operating and financial performance of the carriers to which they were lending. Because of the concerns, I was also requested to brief the Under Secretary of the Department of Agriculture. Subsequently I was invited to discuss the challenging environment in two briefings, one with the White

[73] ORA Testimony, p. 25, lines 14-17.

[74] Balhoff Opening Testimony, p. 49, Table 2.

House and the second with the Secretary of Agriculture, in part because of their concern that certain carriers might fail. Based on my professional experience and conversations, I am confident that the funding environment has become significantly more difficult for lenders and for smaller LECs, as evidenced by the sharp contraction in actual lending.

Q43. Did the FCC Staff Report, to which ORA cites, state that the small carriers have access to less expensive debt through subsidies, and, hence, lower-than-market cost, for loans provided by CoBank?[75]

A. Yes, but CoBank, which is part of the Farm Credit System and is the largest private lender to small LECs, corrected the FCC Staff Report within weeks of the release of the study, clarifying that:

> We ask that the Staff Report be corrected to reflect accurately CoBank's requirement to charge a market interest rate to all telecommunications company borrowers and to remove any comments that suggest in any way that CoBank provides subsidized interest rate loans to telecommunications companies. We further ask that the paragraph 49 of the Staff Report be removed in its entirety given it is misleading with respect to the availability of funding to RLECs [rural local exchange carriers].[76]

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[75] FCC Staff Report, para. 49.

[76] Comments of CoBank, ACB, *In the Matter of Rate Represcription Staff Report, Connect America Fund,* WC Docket No. 10-90, July 25, 2013 ("CoBank"), June 21, 2013, available at https://prodnet.www.neca.org/publicationsdocs/wwpdf/62113cobank.pdf, p. 5.

CoBank also addressed the state of the lending environment, contending that it was misleading for the FCC Staff Report to state . . .

> that all RLECs have access to "extensive funding" from CoBank under the existing rate-of-return (RoR) regulations. Regrettably, many RLECs do not meet CoBank's lending standards due to the various caps and limitations on universal service funding and inter-carrier compensation. It is unfortunate that the uncertainty of a stable, predictable cost recovery mechanism is making it increasingly difficult for CoBank to extend credit for the purpose of deploying ubiquitous rural broadband networks.[77]

CoBank went on to offer a pointed summary about its financial perspective on the rural marketplace:

> As CoBank has commented numerous times, for those communication companies serving high-cost areas, deploying affordable broadband is not economically possible without a sufficient, sustainable, and predictable level of support. CoBank views RoR regulation for RLEC customers as an important component to their ability to continue to service existing debt and obtain future access to debt capital. RoR regulation is an important component of CoBank's evaluation of potential loans. While incentive regulation can work for larger consolidators, the vast majority of RLECs are too small, and operate in areas where subscriber density is too low for price-cap or other incentive regulation to be viable. With the new caps and limitations on Universal Service Fund (USF) and the decrease of Interstate Common Line Support (ICLS) from the USF/ICC Transformation Order and Further Notice, *any reduction in the prescribed RoR will further decrease the ability of RLECs to obtain debt capital.* The authorized RoR is a factor in determining USF support and ICLS, therefore decreasing the RoR will further reduce the cost

[77] CoBank, pp. 4-5.

> recovery possible. If RLECs don't have a sufficient, sustainable and predictable level of support, deploying affordable broadband is not economically possible and; therefore, not bankable.[78] (Emphasis added.)

It is notable that CoBank is not simply indicating that risks have increased to the point where lending standards have become more restrictive, but CoBank warns against the precise recommendation being made by ORA. CoBank states that reduced allowed rates of return will create greater limitations on credit, and potentially make the industry "not bankable." The comments were provided by Robert F. West, who is Senior Vice President of CoBank and responsible for all of CoBank's professionals in its rural telecommunication division. Most financial experts in the industry know that CoBank is careful and professional. It is my expert opinion that Rob West's commentary is not overstated when he points to the increasing risk in the small-ILEC sector, the critical importance of appropriate rates of return, the greater vulnerability of the small carriers compared with larger carriers, and the growing problem with access to capital.

Q44. How do you respond to ORA's reliance on the assertion that "none of the Independent Small LECs has a pending loan

[78] CoBank, p. 6.

application with RUS" and none "has had a loan request denied from January 1, 2010 to the present"?[79]

A. The fact that none of the Independent Small ILECs has sought a new loan is indicative of the regulatory challenges about which Mr. West was writing and the growing concern in the industry about the risk of holding debt in a more uncertain regulatory and capital environment. The lack of pending applications is also another data point supporting the sharply-reduced loan totals and the increasingly careful review of pending loans at RUS. ORA posits that the Independent Small LECs were, at a time in the past, able to obtain loans from RUS and that no loans have recently been denied (a tautology because the Independent Small LECs did not apply for loans). The logic is difficult to follow when ORA concludes that RUS' current lower cost of debt provides an important marker for the carriers.[80] In response, I have cited the clear language of CoBank's senior officer, Rob West, who states unequivocally to the contrary in his communications with the FCC. Additionally, while the RUS is not making public pronouncements, this government agency is in fact reporting that loan totals have fallen by more than 70% annually, on average, from 2012 to the present. Something more ominous is occurring here and ORA

[79] ORA Testimony, p. 24, lines 19-22.

[80] ORA Testimony, p. 23, lines 5-9; p. 24, lines 1-22.

chooses to dismiss it with the claim that "no actual evidence" exists in support of my testimony that the debt markets are today not what they were previously. As I have summarized, my views are amply supported by the statements and actions of actual lenders, as well as the debt-related behavior of the carriers.

Q45. ORA states that your testimony includes an implied assumption that a "sudden and significant increase in Treasury rates is imminent."[81] Is that a correct representation of your testimony or your opinion?

A. Absolutely not. My testimony is that interest rates are artificially and historically low due to extraordinary monetary policies. I do not expect a sudden and significant increase, but I do expect the easing of monetary controls, which will allow rates to rise to more normalized levels. In fact, ORA's testimony points to the same insight, as ORA cites a statement from the Chairwoman of the Federal Reserve to the effect that rates will rise in a "prudent and gradual manner."[82] Naturally, this means that rates will rise, as the Federal Reserve eases the repressive controls that have reduced those rates. It is my professional view and it is the view of the experts to which I pointed in my Opening Testimony that Treasury

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[81] ORA Testimony, p. 27, lines 5-8.

[82] *Id.*

rates today reflect a biased view of lending costs to the extent that those rates are proffered by ORA to support debt estimates going forward. It is entirely reasonable to expect rising rates over the next several years. Whether those increases are gradual or dramatic, the likelihood of increases defeats ORA's reliance on the current rates.

Q46. Please comment on ORA's calculations about the incremental debt necessary to raise the weighted average cost of debt to 5.5%.[83]

A. My testimony recommends using the embedded cost of debt for each of the carriers at the time of the carriers' rate cases. ORA's testimony reflects a misplaced focus on how much incremental debt will be necessary to cause certain carriers, which have debt already, to arrive at a weighted average of 5.5%. I did not testify that such an approach would be appropriate. I testified as follows:

> If the Commission were to posit a cost of debt figure as part of a hypothetical capital structure calculation, I recommend that the Commission use a hypothetical debt rate of 5.5% for companies without any actual debt rates. This is above the current median of 5.2% of the Independent Small LECs. However, it is approximately the interest rate that Sierra Telephone currently pays (5.53%), and approximates a rate that might be expected in the future for any of these carriers, although it is very possible the rates will rise

[83] ORA Testimony, p. 30, lines 10 ff.

> higher. Again, this exercise is purely to arrive at a target WACC [weighted average cost of capital].[84]

It remains my testimony that 5.5% is a reasonable estimate if the CPUC chooses to use a hypothetical capital structure. And it is still my testimony that embedded costs of debt remain reasonable inputs in calculating a carrier's WACC. To get the most up-to-date data related to a carrier's debt costs, the Commission should use the debt that is in place at the time of the company's rate case.

V. RESPONSE TO ORA TESTIMONY ABOUT CAPITAL STRUCTURE

Q47. Did you recommend that the CPUC use a hypothetical or an actual capital structure in your Opening Testimony?

A. I am aware that the Independent Small LECs have expressed a preference for a hypothetical capital structure, but my testimony presents recommendations for both an actual and a hypothetical capital structure.[85] If properly framed, either a hypothetical or an actual structure could be financially and reasonably defensible. My Opening Testimony stated, however, that an actual capital structure should not be used if it "*is inconsistent with forward-looking*

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[84] Balhoff Opening Testimony, p. 76, lines 11-14; p. 10, lines 5-7.

[85] Balhoff Opening Testimony, p. 16, lines 3 ff.

expectations regarding the appropriate mix of capital sources."[86] (Emphasis added.) If equity should be built up, because it is judged to be too low, or if the actual capital structure includes excessive levels of equity, then a hypothetical structure might be used. I recommended that, if a hypothetical structure is used, it would be reasonable to use a hypothetical 70%/30% equity-to-debt capital structure.

Q48. Did you "request a single, uniform, hypothetical 70% equity and 30% debt capital structure" for ratemaking purposes?[87]

A. No. I *proposed* that 70% equity ratio and 30% debt ratio was a reasonable hypothetical capital structure.[88] In every instance, I made it clear that I relied upon the CPUC's judgment, but would propose such a capital structure if the CPUC were to choose to employ such an approach.

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[86] Balhoff Opening Testimony, p. 16, lines 20 ff.

[87] ORA Testimony, p. 7, lines 10-12.

[88] Balhoff Opening Testimony, p. 71, lines 4-7; "Thus, I suggest that the Commission consider whether the former zone of reasonableness (60%-80%) should be shifted higher above 70% and likely to 80% to preserve forward-looking access to capital and to manage operating risk." See also Balhoff Opening Testimony, p. 76, lines 1-14; in response to a question "What do you recommend if the Commission were choose to use a hypothetical capital structure and establish a target WACC", I stated that "I would propose that the Commission employ a hypothetical capital structure with approximately 70% to 80% equity."

Q49. Did you request that no specific capital structure should be mandated for anything more than ratemaking purposes, as ORA has claimed?[89]

A. Such a question was not posed to me in my Opening Testimony and I offered no such opinion. I believe, however, that, whether a hypothetical or actual structure is used, a reasonable function of that structure is to calculate a resulting cost of capital for application in the ongoing round of rate cases.

Q50. ORA recommends the use of a capital structure that reflects the five-year average of the Independent Small LECs' capital structure.[90] Is this reasonable?

A. The Commission's analysis of capital structure should employ an appropriate forward-looking view of capital structure.[91] The risk in relying primarily on the historic five-year average, which is ORA's recommendation, is that the historical data do not properly capture higher or lower risk in an industry that is undergoing rapid

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[89] ORA Testimony, p. 7, lines 12-13.

[90] ORA Testimony, p. 8, lines 11-13.

[91] Balhoff Opening Testimony, p. 16, lines 16 ff.; "It is my understanding that the Commission has attempted in the past to arrive at a more generic cost of capital that is forward-looking, and therefore the WACC may not be based strictly on any single company's actual capital structure. I support this goal of determining a cost of capital that is forward-looking, and I believe that it would be unreasonable to use a company's actual structure if such a structure is inconsistent with forward-looking expectations regarding the appropriate mix of capital sources."

technological, competitive and regulatory changes. Illustrating this, a clear movement is discernible toward a higher proportion of equity, as demonstrated by the companies' reduction of their debt load since 2010. There appears to be a deliberate commitment to managing perceived risks in response to new regulatory changes. This is the rationale for suggesting a 70/30 ratio of equity and debt.

Q51. ORA argues that the proxy group used to estimate the CAPM beta in your Opening Testimony has higher debt ratios than the proxy group used by the CPUC in 1997, and ORA then points to your more recent proxy group to question whether it is reasonable to maintain the 1997 zone of reasonableness (60% to 80%).[92] What is your response to these claims?

A. ORA's testimony is nonsensical as it juxtaposes two analyses that have nothing to do with each other, except that both employ proxy groups. The first proxy group was appropriately employed by the Commission in 1997 to determine capital structure and the second was used appropriately in my Opening Testimony to correct for a demonstrably incorrect CAPM beta. ORA illogically suggests using my beta-related proxy group to determine an appropriate capital structure.

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[92] ORA Testimony, p. 10, lines 10 ff.

Q52. Why was and is the 1997 proxy group helpful in setting the appropriate capital structure and not in adjusting the capital structure today?

A. For nearly 20 years, the Commission has relied on its 1997 capital structure analysis that has proven to be relatively reasonable, as the Independent Small ILECs, on average, have maintained an equity ratio near 60% to 80%, which was determined in 1997 to be a "zone of reasonableness." The CPUC stated in those decisions:

> The capital structures maintained by similar companies should reflect their collective efforts to finance themselves so as to minimize capital costs while preserving their financial integrity and ability to attract capital. Hence, applicant compiled a group of ten publicly traded small independent telephone companies to arrive at a reasonable capital structure for applicant. The average capital structure of the ten comparable small independent companies consisted of approximately 21% debt and 79% equity. . . . ORA calculated the 1994 and 1995 average common equity for California's eighteen small independent telephone companies. This secondary analysis showed an average common equity ratio of 70.3% for 1994 and 75.9% for 1995. . . . Upon our analyses of the 1994 and 1995 average common equity for California's eighteen small independent telephone companies and *evaluation of a higher equity ratio trend for smaller companies*, as demonstrated by comparing the results of ORA's large comparable companies to applicant's mid-size comparable companies analyses, we concur with applicant's assessment that a reasonable range of common equity for small telephone companies, such as applicant, should be between 60% and 80% equity.[93] (Emphasis added.)

[93] Decision No. 97-04-034, Application No. 95-12-075 (Filed December 26,

More recently, the Independent Small LECs are becoming even more conservatively capitalized, which was a similar observation in 1997, with equity ratios rising, in spite of the fact that the carriers derive no incremental benefit in terms of their rates. The equity ratio is rising because risk is increasing, which is precisely the reason that a forward-looking hypothetical equity ratio should not be reduced. ORA contends that it is not reasonable "to rely on the previously established zone of reasonableness . . ." because the beta-related proxy group in my Opening Testimony yields different results for a capital structure (reducing the equity ratio).[94] Again, I was simply using the group to estimate a more useful figure for the industry beta. However, when applied to the capital structure, ORA's argument results in a nonsensical outcome—that the carriers should be assumed to have greater debt and lesser equity. Moreover, the market-based evidence indicates precisely the opposite—that carriers are becoming more cautious and increasing their equity ratios, apparently because the carriers believe that such conservatism is prudent.

Q53. Is ORA stating that your proxy group is incorrect in generating an appropriate beta?

1995), No. I.96-04-016 (Filed April 10, 1996).

[94] ORA Testimony, p. 11, lines 1-4.

A, No. The use of the proxy group that I proposed to generate a beta is reasonable and unchallenged by ORA. ORA is apparently only arguing that the capital structure might be modified, and the equity ratio assumed for the Independent Small LECs might be reduced.

Q54. So, is it your opinion that the appropriate proportion of equity should be higher now for the Independent Small LECs compared with the ratio in 1997?

A. Yes. Risks have *increased* in the LEC sector since 1997, which suggests that companies will capitalize themselves more conservatively today than they did nearly twenty years ago. Rural carriers are attempting to reduce their fixed obligations—including interest costs—to manage the higher risks associated with growing competition, rapid technological change, and uncertain regulatory revenues. Again, it is not reasonable or prudent to reduce the previously-established range of 60%-80% equity today. If anything, it should be increased to assume relatively more equity which mitigates risks.

Q55. Is ORA correct in excluding the 100% equity-financed companies on the basis that they skew the average equity

structure higher and thus result in a higher WACC or rate of return?[95]

A. No. ORA presents a table that shows that the elimination of three companies with 100% equity ratios results in a lower equity ratio of 56.8%, using average statistics from the last five years. This is apparently an argument sponsored by ORA with a view to reduce the 20-year-old zone of reasonableness. Of course, it is a mathematical certainty that the equity ratio is reduced when one eliminates the three highest equity ratios among the ten ILECs, just as certainly as the equity ratio would be raised if one eliminated the three lowest ratios. It is unreasonable to perform either of these exclusions, which serve only to distort the data. More important, the companies with 100% equity are part of a clear trend toward greater equity, underscoring the increasing risks associated with maintaining significant debt burdens. Three of the ten companies currently have 100% equity ratios and five of the other seven companies have increased equity ratios in 2014 by an average 689 basis points compared with the ratios in 2010. This suggests a growing financial conservatism that cannot be ignored.[96] And, this increasing equity ratio undercuts ORA's

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[95] ORA Testimony, p. 14, lines 1-6.

[96] Balhoff Opening Testimony, p. 72, Table 8; Calaveras' equity ratio improved from 2010 to 2014 by 864 bps, Foresthill by 463 bps, Ponderosa by 397 bps,

argument that debt costs are actually low. If ORA were correct, the low government-subsidized debt rates assumed by ORA might motivate a company to incur increasing levels of debt to benefit from the spread between debt costs and equity costs. Contrary to what ORA expects, the companies are behaving in a manner that clearly communicates that it is appropriate to have higher proportions of equity in today's higher-risk LEC environment. Since the Commission has not mandated that any of the companies actually maintain any particular capital structure, the carriers' migration toward equity represents an undeniable trend reflecting on the Independent Small LECs' views of the capital markets and the judgment of the carriers regarding prudent risk-mitigation.

VI. PROBLEMS WITH THE FCC STAFF REPORT

Q56. Can you comment on ORA's reference to, and reliance on, the FCC Staff's Report entitled "Prescribing the Authorized Rate of Return"?

A. Yes. First, the ORA testimony makes reference in its "Return on Equity" section to "the FCC's Report," which appears in those words or similar words four times in its filing.[97] However, in the second paragraph of the FCC Staff document to which ORA refers,

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Sierra by 616 bps, and Volcano by 1,105 bps.

[97] ORA Testimony, pp. 39, 40, 42, and 43.

there is the clarification that "[t]he staff of the [FCC's] Wireline Competition Bureau has prepared this Staff Report to assist the Commission as it considers prescribing a new authorized rate of return."[98] The FCC Staff Report is a discussion document prepared by the FCC Staff, and has not been adopted or approved by the FCC commissioners. In fact, the FCC Staff Report states in its Introduction that the FCC rules require attention to certain costs and capital structure "*[i]f the [FCC] elects to represcribe the authorized rate of return.*"[99] (Emphasis added.) Thus, the FCC Staff Report reflects an inquiry in process, not a final determination that could permit a citation to the FCC's authority. The document is incorrectly cited by ORA as the "FCC's Report." The Staff Report has no more authoritative value than the Application that the Independent Small LECs submitted to initiate this proceeding, which reflects a specific proposal for how to calculate cost of equity. ORA's apparent attempt to dismiss a reasoned analysis of this issue by implying that the FCC has already reached a conclusion regarding adjustments to rate of return is misleading and should be rejected.

Q57. Has the FCC taken action to adopt the FCC Staff Report?

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[98] FCC Staff Report, para. 2.

[99] FCC Staff Report, para. 5.

A. No. As of today, about 34 months after the release of the FCC Staff discussion paper, the FCC has not yet represcribed the allowed rate of return, nor, to the best of my knowledge, has it opined publicly about the value of any of the content in the FCC Staff Report. A review of the comments in response to the FCC Staff Report, as compiled on the FCC's website indicates that the majority of the replies contest the reductions proposed in the Report.[100] It is my opinion that the commentaries arguing against lowering the rate of return provide more substantive analyses and are better reasoned.

Q58. In your opinion, are there material flaws in the analysis in the FCC Staff Report?

A. Yes. First, the FCC Staff Report relies on a proxy group of companies that appears to be fundamentally different from rural ILECs and certainly different from the Independent Small LECs before the Commission in this proceeding. Second, the calculation of equity costs does not include necessary adjustments to reflect risks arising from size or liquidity/marketability. Third, for the CAPM, the FCC Staff Report uses a very low risk-free rate, which is today artificially depressed by economic conditions and an

[100] While certain commenters noted that the criticisms came from rural trade associations, consultants and rural carriers, such input is logical—not simply because the carriers are self-interested, but also because they are more knowledgeable about the issues and risks.

aggressive fiscal policy.[101] Fourth, the Staff Report does not accurately reflect rural ILECs' reduced access to the debt markets. Finally, the Staff Report does not account in any way for the unique political, regulatory, and market risks that the Independent Small LECs face in California. I believe the flaws are so profound that they render the FCC Staff Report unreliable. Even if the FCC commissioners were to use the same approach, in whole or in part, the analysis remains seriously flawed. This Commission should examine the issue more closely and consider the full range of factors that I have outlined here and in my Opening Testimony.

Q59. What proxy group does the Staff use and why has the selection been criticized?

A. The Staff uses a proxy group of companies identified on the basis of certain criteria: companies that (i) report that 10% of their overall operations include price-regulated interstate telecommunications services, (ii) serve some rural regions, and (iii) were ILECs that were judged to publish reliable financial data.[102] The criteria, therefore, provided a very low 10% threshold for similarity of regulated operations, failed to account for the

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[101] FCC Staff Report, para. 65: "Because we believe the interest rate that is the best predictor of the future interest rate on government securities is the current interest rate (which is consistent with the hypothesis that interest rates follow a random walk), we use the current rate as the risk-free interest rate."

[102] FCC Staff Report, para. 12.

financial challenge when a relatively large proportion of the business is rural, and chose to emphasize an analysis of carriers that were required to publish significant financial information and attract financial analytical coverage. Thus, the financial profile of the universe of companies—the so-called "proxy group"—used in the FCC Staff Report is, by definition, markedly different from that of the Independent Small LECs', which are not remotely as diversified as the large carriers, have 100% of their intrastate telephone operations regulated, and 100% of their territories focused on rural regions. Based on criteria that support the inclusion of patently non-comparable companies, the FCC Staff proposed a "proxy group" that included the large regional holding companies—AT&T, Verizon and CenturyLink. Additionally, the FCC included mid-sized companies Alaska Communications Systems, Cincinnati Bell, FairPoint, Frontier, Hawaiian Telcom, and Windstream. Finally, the Staff rounded out the sixteen proxy companies with publicly-traded "rural" carriers, including HickoryTech (which was then Enventis and is now merged into Consolidated Communications), Shenandoah Telecommunications, TDS, Consolidated Communications, New Ulm, Lumos and Alteva (which at that time owned an ILEC, Warwick Valley). The Staff made a judgment that the smaller RLECs were less reliable proxies, which created an obvious definitional bias, because fewer

analyst estimates were available to use for the Discounted Cash Flow ("DCF") model and because the stocks for those companies are traded infrequently. In short, the FCC Staff presents a set of criteria that pre-determines reliance on large public and diversified companies with a risk profile—regulatory dependence, diversification of operations, concentrated service regions, and access to capital markets—that is entirely different from the Independent Small LECs.

Q60. Do you have further comments about the proxy group?

A. Yes. I recognize the FCC Staff's challenges in choosing a proxy group, particularly as so many smaller carriers with publicly-traded stocks have been merged into other entities or sold in the last decade. Despite these limitations, a rational and knowledgeable investor would see no meaningful similarities between the larger carriers and the Independent Small LECs. In some ways, the businesses of smaller ILECs and the larger carriers may have once been more similar, but those similarities have disappeared over the last twenty years. Today, the differences are increasingly consequential from an operational and financial perspective.

Q61. Please explain the consequential differences that you see between the proxy group and smaller ILECs.

I can summarize the differences.

- Verizon and AT&T have wireless operations that have generated more revenue than any other segment of their businesses, making their businesses very different from those of the Independent Small LECs. For 2015, AT&T reported that 50% of its revenues were generated by wireless, while Verizon reported 71% of its revenues were generated by wireless and the wireless proportion is growing. Thus, Verizon and AT&T have growth opportunities and meaningful diversification that do not exist for rural telephone companies, and those trends are moving in the opposite direction for the Independent Small LECs.
- Virtually every other carrier on the FCC Staff's proxy list has other significant differences from the majority of rural ILECs, including and perhaps especially from the Independent Small LECs.
    - Specifically, as of the time when the FCC Staff Report was released, CenturyLink was a large multi-state carrier with significant enterprise and data center operations (the legacy ILEC operations at the end of 2013 were 42% of total revenues) and growth was generated by those two sectors;

- Cincinnati Bell serves a dense cluster of customers in and around a major metropolitan city, supporting a very different regulatory and cost profile;
- Alteva was an integrated communications provider (the small ILEC operations contribute virtually no cash flow), making the core of that company vastly different from the rural carriers; and
- Windstream relied on multi-state operations with diversified data center services and competitive local exchange carrier ("CLEC") businesses (only 22% of total 2013 revenues were from consumer services).

The FCC Staff explained that the reason for including these carriers was the FCC's requirement for a large enough sample of analysts' estimates to ensure the value of the DCF constant growth model. Because the FCC purportedly sought reliable data, it included carriers that had risks and prospects vastly different from the smaller, private ILECs. From an investment point of view, which is what should inform the determination of the appropriate return on equity and allowed rate of return, there are some superficial similarities between the proxy group and the Independent Small LECs; however, the significant differences require adjustments to the cost-of-capital estimation models,

particularly because the size and diversified operations of the large carriers result in lower equity risk compared with the smaller carriers.

Q62. What about the other problems you note regarding the FCC Staff Report?

A. Two other fundamental problems with the Staff Report unavoidably lead to a flawed analysis. First, the Staff assumes it has correctly determined the risk-free rate, which the FCC Staff astonishingly sets at 1.92% based on the ten-year Treasury note at the time. As detailed in my Opening Testimony, the adoption of so low a "risk-free rate" in a forward-looking proceeding is not defensible because the current interest rates are at historic low levels, which are generally regarded as unsustainable.[103] I have already noted that the major valuation firms—Ibbotson/Morningstar and Duff & Phelps—set the risk-free rate well higher than the figure in the FCC Staff Report based on the fact that the current Treasury rates have been managed to extraordinarily depressed levels. The FCC does not attempt to match the risk-free rate's term with the equity premium which, is

[103] FCC Staff Report, para. 64: "In our detailed analysis below, we take the interest rate on the 10-year Treasury note as the risk free rate because the standard deviation of the mean historical equity premium measured relative to returns on 10-year Treasury securities is readily available. This rate was 1.92 percent as of March 26, 2013."

reported to be 5.88% by Professor Damodaran.[104] A second major problem is that the FCC uses a DCF valuation, which estimates value using dividend and growth expectations that should be applied to a stable industry, which the ILEC sector is not. The ILEC business model is undergoing a wrenching set of technological, competitive and regulatory changes, as I have described at length in my Opening Testimony. The assumption that dividends will be paid into perpetuity in such an environment is a highly questionable—and I believe, incorrect—proposition.

Q63. Are those issues the extent of the problems with the FCC Staff Report?

A. No. The problems with the FCC Report include other factors. If one studies the FCC Staff Report more carefully, it becomes clear that there are other anomalies. For example, the embedded cost of debt is higher than the computed cost of equity for six of the

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[104] FCC Staff Report, paras. 71-72. Aswath Damodaran, Professor of Finance at the Stern School of Business at New York University, available at http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histretSP.html. See also Professor Damodaran's spreadsheet available at http://www.stern.nyu.edu/~adamodar/pc/datasets/indname.xls. While Professor Damodaran provides the companies included in, for example, "Telecom. Services," and provides ticker symbols as well as the countries where services are provided, there are no data which would permit us to understand and analyze the summary results which he reports.

sixteen carriers.[105] The FCC Staff admits that this makes no sense, and I agree that it does not.[106] However, the FCC Staff Report dispenses with the anomalies, stating that when it finds that the debt costs are higher than the equity costs, it is making adjustments to the cost of equity to ensure that the cost of equity is no lower than the cost of calculated debt. It is my opinion that, when data do not make sense, a more careful examination of the assumptions, the inputs, and the model is needed. It is not sufficient to make arbitrary adjustments to offset irrational results, especially when the results are likely signaling that the model itself and the inputs are wrong. The FCC Staff Report, however, chooses to adjust certain of the unreasonable outputs, apparently without re-examination of the underlying premises. The FCC Staff Report—and its conclusions—do not provide a reasonable foundation for

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[105] FCC Staff Report, para. 84: "We note that the CAPM estimates of the cost of debt for six of the sixteen carriers - New Ulm, Alteva, Alaska, Hawaiian, and Frontier - are actually higher than the cost of equity. For New Ulm: the cost of debt is 5.41 percent (versus 4.83 percent cost of equity); for Alteva: 5.89 percent (versus 5.0 percent); for Alaska: 7.38 (versus 6.84 percent); for Hawaiian: 7.52 (versus 6.30 percent), and for Frontier, 8.27 (versus 7.56 percent)."

[106] FCC Staff Report, paras. 86-87: "[r]equiring a minimum return to equity necessary to ensure all carriers' cost of equity is not less than their cost of debt, we conclude that the CAPM analysis suggests the WACC most likely lies between 7.39 and 8.58 percent. Any equity premium less than 7.57 percent results in a cost of equity that is less than the cost of debt for some of our firms, which violates a fundamental precept of financial economics, strongly implying error in our estimates. As an approximation designed to remove this anomaly, we performed the cost of equity calculation using 7.57 percent as the lower bound of the market premium, obtaining cost of equity ranges of 8.69-11.35 percent."

decision-making by the FCC or by the CPUC. ORA's reliance upon the FCC Staff Report is misplaced.

Q64. Do you have estimates about the impact on rural carriers if the cost of equity were to be set at the reduced levels recommended in the FCC Staff Report?

A. I do not know the specific financial effect, but John Staurulakis, Inc. ("JSI") stated in an FCC filing, on the basis of its analysis of 151 cost-company clients, that the effect on rural carriers would be to reduce per-line per-month regulated revenues by approximately $4.99 or $3.99, depending on whether one assumes the low or high rate of return that the FCC Staff proposes.[107] While JSI did not comment further, no avoided costs are associated with such a revenue reduction, and therefore the operating cash flows should fall by the same amount. If one were to assume that the rates were $30 monthly and the EBITDA margins were 40%, rate reductions arising from the very low 8.06% and 8.72% allowed return on equity capital proposed by the FCC Staff would result in the carrier losing operating cash flow per customer that amounts to 41% or 33% of its regulated total operating cash flow, respectively. This is not an inconsequential reduction, if JSI is correct. I do not

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[107] Comments of John Staurulakis, Inc., On Rate of Return Represcription Staff Report, July 25, 2013, available at http://www.jsitel.com/files/JSI_Rate_of_Return_Represcription_Comments.pdf, pp. 5-6.

believe that reasonable investment in rural telephone company infrastructure could be sustained at these levels. This was the same point that CoBank made earlier when it suggested that the sector could become "not bankable."

Q65. Does the FCC Staff Report make adjustments to the cost of capital to reflect risk arising from size, liquidity, and marketability?

A. No. The FCC Staff Report does not provide any allowance for factors reflecting size or marketability/liquidity premia to adjust the CAPM. In fact, citing a single source that purports to summarize other studies, the FCC Staff suggests that any size premium disappears over time.[108] This is a startling conclusion based on one citation, particularly when that source states that there is a liquidity risk for smaller companies and concedes that there is demonstrably higher risk for the smallest-decile companies, as I explained earlier. Most valuation professionals rely on the data and resources provided by companies such as Morningstar, Inc. (Ibbotson Stocks, Bonds, Bills, and Inflation

[108] FCC Staff Report, para. 75: "NECA asserts that '[e]xtensive research documents that small capitalization firms such as the average RLEC also require an additional risk premium of about 1.53 percent.' However, recent research [the FCC Staff cites one 2011 report] indicates that the size effect 'seems to vary over time or even disappears,' with smaller firms in the United States not performing significantly better than large ones from 1980 onward. Therefore, we do not recommend adding a risk premium based on size to the cost of equity."

("SBBI")) and Duff & Phelps, LLC.[109] As I outline below, significant authorities have responded to those claims, providing specific explanations for the cyclical anomalies, and analyzing additional data that refute the 1980s-based data. Both Ibbotson/Morningstar and Duff & Phelps are clear that adjustments should be made for size effects and possibly other factors. For example, Duff & Phelps in its *2013 Valuation Handbook* writes:

> Research tells us that the CAPM often misprices risk for certain investments. Specifically, researchers have observed that commonly used methods of measuring risk used in the CAPM (specifically, beta) often understate the risk (and thus understate the required return) for small company stocks. Examination of market evidence shows that within the context of CAPM, beta does not fully explain the difference between small company returns and large company returns. In other words, the historical (observed) excess return of portfolios comprised of smaller companies is greater than the excess return predicted by the CAPM for these portfolios. This "premium over CAPM" is commonly known as a "beta-adjusted size premium" or simply "size premium."[110]

Duff & Phelps is clear that research verifies the necessity for application of a premium to reflect market-based risk beyond the overall equity return for smaller companies compared with larger companies. Ibbotson/Morningstar also provides statistics to

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[109] Ibbotson SBBI 2013 Valuation Yearbook, Market Results for Stocks, Bonds, Bills, and Inflation 1926-2012 (Chicago, IL: Morningstar, Inc., 2013) ("Ibbotson 2013 Yearbook"); Ibbotson SBBI 2014 Classic Yearbook, Market Results for Stocks, Bonds, Bills, and Inflation 1926-2013 (Chicago, IL: Morningstar, Inc., 2014) ("Ibbotson 2014 Classic Yearbook"); Duff & Phelps, 2014 Valuation Handbook, Guide to Cost of Capital (Chicago, IL: Duff & Phelps, LLC, 2014).

[110] Duff & Phelps, 2013 Valuation Handbook, Guide to Cost of Capital (Chicago, IL: Duff & Phelps, LLC, 2013), p. 60.

demonstrate the effect of size on returns, and explains that "[i]f small companies did not provide higher long-term returns, investors would be more inclined to invest in the less risky stocks of large companies.[111]

Q66. Are there critiques in the current financial literature addressing the issues raised by the FCC concerning the "disappearance" of the size premium in the early 1980s?

A. Yes. Pratt and Grabowski explain that the methodology of the new studies use average returns that obscure "performance."[112] They describe how, using a more appropriate methodology, small stocks actually "outperformed" large stocks even using early 1980s start dates (contrary to the argument that small-company stocks performed similarly to large-company stocks beginning in that period), which means that the cost of equity is higher for smaller companies. The exception to this "outperformance" occurred when the start date was 1983-1984, when there were, according to Hou and Van Dijk, specific cash flow shocks in the market that the

[111] Ibbotson 2014 Classic Yearbook, p. 109.

[112] Pratt and Grabowski Cost of Capital 2014, p. 352, Exhibit 15.13; Pratt and Grabowski posit a $1 investment in Fund A that rises each year by 10% over the ten year period except in year 5 when it falls by 70%, resulting in an annual average performance of 2%, and an ending principal of $0.71. Fund B rises by 3% in year one, 1% in year two, and then alternates 3% and 1% in subsequent years, to average 2% annual returns, but to end the decade with $1.22. The annual averages in the two funds were the same 2%, but the "performance" of Fund B was superior.

researchers believe explain the anomaly concerning relatively lower returns for small stocks and higher returns for larger stocks.[113] In their most recent edition of "Cost of Capital," Pratt and Grabowski explicitly respond to the data compiled in the Crain article, and they explain that the data today show small stocks are still providing superior returns, which means that the estimation for their cost of equity requires the addition of a size premium.[114] In its 2013 Risk Premium Report, Duff & Phelps responds to the critics who contend that the size effect has disappeared since 1980.

> In the most recent periods, say 2000–2012, small-cap stocks have outperformed large-cap stocks significantly. Referring to Graph 13, a $1 investment in December 1999 in CRSP decile 10 (small-cap stocks) would have increased to $3.79 by the end of December 2012, while a $1 investment in December 1999 in CRSP decile 1 (large-cap stocks) would have only increased to $1.06 by the end of December 2012. . . . The average annual arithmetic return of decile 1 (the largest-cap stocks) was 2.12 percent over the 2000–2012 period (and 0.42 percent measured on a geometric basis), while the average annual arithmetic return

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[113] Kewei Hou and Mathias A. Van Dijk, "Resurrecting the Size Effect: Firm Size, Profitability Shocks, and Expected Stock Returns," Charles A. Dice Center Working Paper no. 2010-1, July 13, 2012, available at http://ssrn.com/abstract=1368705. See, also, Duff & Phelps Risk Premium Report 2013, available at http://www.duffandphelps.com/assets/pdfs-us/publications/valuation/(excerpt)%202013%20duff%20phelps%20risk%20premium%20report.pdf, ("2013 Risk Premium Report"), p. 34. See Pratt and Grabowski Cost of Capital 2014, p. 355; "[Hou and Van Dijk' adjusted the realized returns [in the 1980s and 1990s] for the cash flow shocks, and the result was that the returns of small firms on a pro forma basis exceeded the returns of large firms by approximately 10% per annum, consistent with the size premium in prior periods."

[114] Pratt and Grabowski Cost of Capital 2014, pp. 350-358.

> of decile 10 (the smallest-cap stocks) was 16.62 percent (and 10.78 percent measured on a geometric basis).[115]

Still, the FCC Staff Report's approach excludes size-effect, citing the one article (and its sources) as justification, and summarily arguing that cost of capital is fundamentally a market return, modified by a telecommunications industry beta that slightly reduces the market return. This approach is contrary to that recommended by the major financial sources and it is inconsistent with the significant data compiled over multiple periods, including the most recent two decades.

Q67. What adjustments typically are made by regulatory commissions and financial analysts to account for specific risks?

A. Small companies are assumed to carry greater risk, as explained above, which supports an adjustment to the large-company proxy calculation by adding a size premium. This straightforward rationale is spelled out by the American Society of Appraisers, which explains:

> A discount or premium is warranted when characteristics affecting the value of the subject interest differ sufficiently from those inherent in the

[115] 2013 Risk Premium Report, p. 35.

base value to which the discount or premium is applied.[116]

In fact, there are material and obvious differences between the Independent Small LECs and the FCC Staff Report's proxy group. As explained above, the FCC proxy group includes large, diversified carriers with services in meaningful growth segments, such as wireless, fiber transport and data centers.[117] Further, the larger carriers in the proxy group are nearly all engaged in aggressive acquisition and diversification activities, which provide them with opportunities for cash flow growth and risk mitigation. These factors are size-related "characteristics affecting the value of the subject interest" such that adjustments to reflect the increased risk in the equity cost of the Independent Small LECs are required.[118]

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[116] Shannon Pratt, "Overview of Business Valuation Discounts and Premiums and the Bases to Which They are Applied", p. 2, available at http://www.shannonpratt.com/article/overview_business_valuation_discounts_premiums.pdf.

[117] The proxy group is presented in the FCC Staff's Appendix F: Enventis Corp., TDS, New Ulm, Shenandoah Telecom, Consolidated Communications, Lumos, Alteva, Windstream, Alaska Communications Systems, Hawaiian Telcom, Frontier Communications, FairPoint, Cincinnati Bell, CenturyLink, Verizon and AT&T.

[118] Also, see the American Institute of Public Accountants, *Statement on Standards for Valuation Services*, para 40, available at (http://www.aicpa.org/InterestAreas/ForensicAndValuation/DownloadableDocuments/SSVS_Full_Version.pdf): "During the course of a valuation engagement, the valuation analyst should consider whether valuation adjustments (discounts or premiums) should be made to a *pre-adjustment* value. Examples of valuation adjustments for valuation of a business, business ownership interest, or security

Q68. Are you saying that ORA's exclusion of the size effect is not justified?

A. Yes. *ORA points to literature that actually supports the opposite conclusion, which is that a size factor should be included.* ORA has provided no justification for excluding a size factor that the CPUC found to be appropriate in 1997, except to cite to the FCC Staff Report. The FCC Staff Report justifies its exclusion of the size factor only by citing to the Michael Crain literature survey. However, this study explains that other factors may better explain the size effect, and that the size effect is observable in the three smallest deciles. The Independent Small LECs fall in the *smallest of the four quartiles of the tenth or smallest decile.* Thus, ORA has not only failed to show that a size factor should be excluded, but has pointed to sources that *justify* the inclusion of a size factor.

VIII. CONCLUDING COMMENTS

Q69. Please summarize your testimony in response to ORA.

A. I have provided a disciplined and comprehensively sourced framework for the CPUC's consideration of capital structure, imputed debt costs and an estimation of equity costs. The CPUC and ORA can assess those sources, data, and the logic based on

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include a *discount for lack of marketability or liquidity* and a *discount for lack of control*." [Emphasis in the original]

rigorous and scholarly approaches that test and re-test the conclusions. In response, ORA has provided virtually no sources and does not directly challenge the specific findings in my Opening Testimony. Without valid citations, ORA simply proposes use of a CAPM that is driven by two inputs that ORA believes are appropriate—a very low three-year average Treasury rate of 2.91%—plus 5.88%, which ORA adopted from the FCC Staff Report. Contrary to the Supreme Court opinions and the opinions of reputable financial experts, ORA does not propose analysis of any industry-specific risks, and ORA rejects important sources that call for size and liquidity factors. ORA also proposes a capital structure that is below the 1997 CPUC-defined zone of reasonableness (equity ratio of 60%-80%) and ORA relies on an average capital structure calculated after arbitrarily excluding the three companies with the highest equity ratios. ORA also proposes 4.53% as the imputed debt costs for carriers that do currently have debt, by contrast with our recommendation of 5.5%. I believe that I have presented and supported a balanced and clearly defensible set of findings that ORA has not refuted. As surprising as the data may appear to be, the cost of equity has certainly risen since 1997. The data support a cost of equity that is above 20% based on M&A data. However, I have relied on the traditional CAPM formulae, and have found an equity cost of 18.5% and proposed a WACC of

14.6%. As I have explained and sourced, I was conservative by applying no liquidity or marketability premium. I used a size premium that is 641 basis points lower than the 11.98% recommended by Duff & Phelps for the smallest of companies (the 10z grouping into which the Independent Small ILECs clearly fall). I also used a beta that is relatively low at 1.06, in spite of the fact that it is drawn from proxies that are all substantially larger, more liquid, more capable of acquisitions, and more diversified. Finally, I used a risk-free rate that is the lower of the two options (a higher result is generated when using total return on the Treasury note). My testimony is well-founded in valuation and regulatory practice, and is not aggressive. It should guide the Commission's consideration of establishing a cost of capital in this proceeding.

Q70. Does this conclude your testimony?

A. Yes. Thank you.

The CHAIRMAN. Thank you very much.
The Subcommittee now recognizes Ms. Bloomfield.

STATEMENT OF SHIRLEY BLOOMFIELD, CHIEF EXECUTIVE OFFICER, NTCA-THE RURAL BROADBAND ASSOCIATION

Ms. BLOOMFIELD. Thank you very much, Chairman Wicker, Ranking Member Schatz, members of the Subcommittee. Good morning and thank you very much for the invitation to participate in today's hearing. I'm Shirley Bloomfield, CEO of NTCA-The Rural Broadband Association. We represent about 850 small businesses who are deploying rural broadband infrastructure in 46 states.

For decades, small rural broadband providers have led the charge in deploying state-of-the-art communications services to their consumers, who are their neighbors. However, the job is not done. As a country, we must both reach the unserved and ensure that rural America stays connected in the great challenges that face us with distance and density.

Last year, the Hudson Institute, in conjunction with the Foundation for Rural Service, released a report examining the economic impacts and benefits of broadband infrastructure. The report determined that the investments in ongoing operations of small rural broadband providers contributed $24.1 billion annually to the Nation's gross domestic product. The report also found that rural broadband investment is an important driver of job growth in both urban and rural America. And, finally, the study found that rural broadband supported over $100 billion in e-commerce in 2015.

None of this economic activity would be possible without the Universal Service Fund, or USF, which is essential to making the business case for investment in rural broadband. The High Cost USF program is the most successful example of a public-private partnership in the broadband space. Remade as the Connect America Fund in recent years, USF helps unleash billions of dollars in private investment in rural markets that are simply uneconomic to serve and would not and could not otherwise justify obtaining loans or using cash-flows to build broadband to.

The reforms in recent years also help to ensure that USF support is targeted toward areas of real need spent on network investments and operations and tied to the delivery of service at very specific locations. Unfortunately, despite these reforms, the viability and effectiveness of universal service is in peril. While regulatory uncertainty in the USF program has frankly been a fact of life for these small network operators for many years, the effects of a budget that has been flat for almost a decade are finally coming home to roost for rural consumers.

There isn't a day that goes by that I don't get a phone call from one of my community-based providers on how the budget mechanism is having them cancel broadband deployment plans, holding their standalone broadband rates simply too high, or they're laying off staff. In Mississippi, instead of upgrades in Fulton, the only investments will be to remain operational. And in the Upper Midwest, a co-op is canceling their 2018 projects, which means 500 people who have never had broadband will not get broadband next year.

There's concern in Washington and across the country about the USF budget shortfall. In May 2017, nearly 170 Members of Congress, including Chairman Wicker and many members of this subcommittee, wrote to the FCC expressing serious concern about how the USF budget shortfall will undermine private infrastructure investment and consumer rates. We're hopeful that such bipartisan congressional leadership, we will see these issues addressed so that the promise of last year's USF reforms can actually be realized by millions of rural consumers.

While there are several potential options to address this shortfall, doing nothing is no longer an option if rural broadband deployment truly is going to be a public policy priority. The time to act really is now. One option is for the FCC to leverage the existing USF mechanism to fill the shortfall. This would involve the use of existing USF program funds or reserves, funds that the FCC has collected but has not yet disbursed, for USF program purposes. Or the FCC could actually increase the USF contribution factor by a very small amount to help pay for the shortfall. While not ideal, this would result in American consumers paying perhaps the cost of one Starbucks coffee a year so that rural Americans aren't paying tens or even hundreds of dollars more per month for broadband.

Another longer term option could be for Congress to direct infrastructure funding toward supplementing of or at least for use in coordination with the USF program. As Congress starts to consider potential infrastructure initiatives, leveraging the USF program in some way would be an effective and immediate means of promoting rural broadband availability and adoption.

Finally, one key issue that requires further emphasis is what sorts of broadband networks our country should be aiming to promote. If one is paying for it and building an asset intended to be future-proofed, that asset should be built to last for a few decades. That means not spending valuable USF or other funds on a network that are cheaper on the front end that are going to be obsolete in a few years.

So in conclusion, small rural broadband providers are eager to continue deploying infrastructure and delivering services that rural America needs to participate in the digital economy, but a reasonable ability to justify investment, and then recover the cost of sustaining infrastructure in these high-cost rural areas is critical to this mission's success.

NTCA is honored to participate in this timely conversation regarding rural broadband. We look forward to working with all of you and other stakeholders on a comprehensive infrastructure strategy that includes the tools to actually achieve our Nation's shared broadband goals.

Thank you for the opportunity to testify and for the Subcommittee's commitment to creating an environment conducive to broadband infrastructure investment in rural America.

[The prepared statement of Ms. Bloomfield follows:]

PREPARED STATEMENT OF SHIRLEY BLOOMFIELD, CHIEF EXECUTIVE OFFICER, NTCA–THE RURAL BROADBAND ASSOCIATION

Introduction

Chairman Wicker, Ranking Member Schatz, members of the Subcommittee, good morning and thank you for the invitation to participate in today's hearing focused on broadband, economic development, and the Universal Service Fund (USF).

I am Shirley Bloomfield, Chief Executive Officer of NTCA–The Rural Broadband Association ("NTCA"). NTCA represents approximately 850 rural small businesses deploying broadband infrastructure in 46 states. All NTCA members are fixed voice and broadband providers, and many of our members also provide mobile, video, satellite and other communications-related services to their communities. The small telcos like those in NTCA's membership serve less than 5 percent of the population of the United States, but cover approximately 37 percent of its landmass. These companies operate in rural areas left behind by other service providers because the markets were too sparsely populated, too high cost, or just too difficult in terms of terrain.

Small, rural broadband providers have for decades been frontrunners in deploying state of the art communications services to their customers. Services that enable local businesses to serve globally and connect rural America to urban America and the world. These impacts are felt not only in agriculture, but in all sectors of the economy that depend on broadband connections, such as education, commerce, health care and government. However, the job is far from finished. Communications providers must not only deploy broadband; they must sustain and upgrade their networks to keep pace with their consumers' growing demands. We also still face the challenge, of course, of delivering services to parts of rural America without access.

Before turning to the USF High Cost Program—also referred to these days as the Connect America Fund—and the challenges of deploying and sustaining broadband infrastructure in rural America, it is important to understand the economic and other benefits that accrue to America as a whole when every American has reasonably comparable access to high-quality communications services at affordable rates.

Rural Broadband: Economic Development and Job Creation

Broadband networks facilitate greater interconnection of community resources and enable greater participation in the national and global economy. To not have access to high-speed Internet today should be unimaginable, yet millions of rural Americans have limited or even no access to robust broadband. And while it is critical to deliver broadband to the unserved, it is just as critical that those already receiving broadband remain served. There are many places in rural America where networks have been built by committed companies like those in NTCA's membership, but the sustainability of that infrastructure and the affordability of services remain in question—putting the sustainability of rural communities in question as well.

In many parts of rural America, the challenges of distance and density are so great that they cannot sustain even one broadband network. These are places where the market does not work. Section 254 of the Communications Act therefore rightly recognizes that our national policy is not merely about deploying infrastructure, but also ensuring that such infrastructure, once deployed, means something lasting and ongoing for the consumer—that is, "reasonably comparable" services at "reasonably comparable" rates for urban and rural consumers alike.[1] If a network is built but then becomes unsustainable, or if the services offered over it are unaffordable or unreliable or cannot keep pace with increasing consumer demand, then these outcomes deny rural Americans the benefits of broadband and represent a terrible waste of the resources that help to make broadband infrastructure available in the first instance. This is not about a "scoreboard" of locations served, although public policy these days unfortunately seems to take just such a short-term focus all too often. Rather, it's about whether we are building broadband that will make a lasting, long-term difference for rural areas looking to attract and retain residents and businesses, who are in turn betting on the viability of those communities.

In April 2016, the Hudson Institute, in conjunction with the Foundation for Rural Service (FRS), released a report examining the economic benefits of rural broadband infrastructure.[2] This report determined that the investments and ongoing operations of small rural broadband providers contribute $24.1 billion annually to the Nation's

[1] 47 U.S.C. § 254(b)(3) (2015).

[2] The Hudson Institute, "The Economic Impact of Rural Broadband," April 2016, ("Hudson Paper"). *https://s3.amazonaws.com/media.hudson.org/files/publications/20160419KuttnerTheEconomicImpactofRuralBroadband.pdf.*

gross domestic product, with 66 percent ($15.9 billion) of that amount accruing to the benefit of urban areas.[3] The report also found that rural broadband investment is an important driver of job growth, estimating that 69,595 jobs—54 percent of which are with vendors and suppliers in urban areas—can be attributed directly to economic activity of small rural broadband providers.[4] These findings confirm that investment in rural broadband infrastructure yields returns that reach far beyond the confines of rural America.

Finally, the study found that rural broadband supported over $100 billion in e-commerce in 2015. Nearly $10 billion of that total involved retail sales, and Hudson estimates that if the broadband deployment in rural areas was equivalent to that in urban areas, sales would have been at least $1 billion higher.[5] Such data underscore that not only is the widespread availability of robust affordable broadband important for our national economy, but the direct act of investing in and operating broadband infrastructure is itself a substantial economic driver.

But, there are also jobs beyond the telecom technicians, engineers, materials suppliers and manufacturers that are supported by rural broadband infrastructure. In Sioux Center, Iowa, a major window manufacturer built a 260,000 square-foot plant to employ 200 people. The company considered more than 50 locations throughout the Midwest, but selected Sioux Center in part because the rural broadband provider enabled this plant to connect with its other locations throughout the U.S. using a sophisticated "dual entrance" system that could route traffic to alternate paths, ensuring that the main headquarters 250 miles away and other facilities would remain connected. In Cloverdale, Ind., a rural broadband provider met with developers and helped bring an industrial park to its service area. Powered by this provider's broadband, the facility brought more than 800 jobs to the area. In Havre, Mont., a rural broadband provider is partnering with a tribally-owned economic development agency to create a Virtual Workplace Suite and Training Center that is expected to create about 50 jobs. These stories are repeated throughout NTCA member service areas.

The Universal Service Fund Successes and Challenges

Created decades ago and modernized over the past several years, the Federal USF High-Cost Program is essential to the business case for investment in rural broadband infrastructure—it is the best, most successful example of a public-private partnership in the broadband space. Recast as the Connect America Fund within the past decade, the USF initiative helps unleash billions of dollars in private investment in rural markets that are uneconomic to serve and would not and could not otherwise justify obtaining loans or using cash flows to build broadband. The USF does not fully fund (or "pay for") rural network investments; it helps to justify the business case for private network investments that totaled approximately $29 billion (in terms of gross plant in service) just for small rural carriers as of 2015.

The High-Cost USF programs have recently been reformed to improve their effectiveness and accountability. While they were already successful in promoting increased broadband in rural areas served especially by smaller rural providers, recent reforms help ensure that funds are targeted to areas of real need, that they are spent on network investments and operations, and that the locations served via USF can be identified. The High-Cost USF program is therefore already a success story in many respects, and it is positioned to achieve even greater things in a broadband era going forward. Unfortunately, despite all this progress, the viability and effectiveness of the USF is at the same time in serious peril. While regulatory uncertainty from USF reforms and budgets has seemed like a fact of life for small network operators for more than a decade, the effects of a budget that has been flat for almost a decade are finally coming home to roost.

While the Federal Communications Commission (FCC) thankfully took steps to provide some level of additional funding earlier this year within the fixed overall USF budget for a subset of carriers that elected model-based High-Cost USF support, the funding was insufficient to achieve the goals of the model the FCC designed. An additional $110 million per year is needed to fully fund an alternative model that the FCC created to promote broadband deployment. Because of this budget shortfall, 71,000 rural locations will receive lower-speed broadband, and nearly 50,000 may see no broadband investment at all.

And the problem is even more dire for those small carrier recipients of High-Cost USF that could or did *not* elect model support. The High-Cost USF has been locked at the same budget level overall since 2011, and a lower budget target first adopted

[3] *Id.,* pp. 13–14.
[4] *Id.,* p. 13.
[5] *Id.,* pp. 19–20.

in 2011 for smaller carriers within that overall budget total is now being enforced via a strict budget control mechanism that threatens to wreak havoc on consumer rates and network investment. Under this tightly constrained USF budget, over the next 12 months, small rural network operators will be denied recovery of $173 million in actual costs for private broadband network investments that these carriers have already made. In other words, small rural network operators and the customers they serve will need to come up somehow with $173 million to pay for broadband investments that the USF program would have supported just a year ago—and that the rules would still have permitted for recovery today via USF had it not been for "haircuts" made to enforce an artificial budget target adopted six years ago back when the program supported voice services only.

Because of these support cuts, rural network operators are already increasing rural broadband rates for consumers and cutting back on future infrastructure investments. We have had one member company in the Southeast indicate, for example, that it cannot justify seeking a $26 million loan to build high-speed broadband infrastructure due to the USF cuts; a project that would have delivered approximately 1,000 miles of fiber to over 7,000 rural customers is now on indefinite hold. Similarly, due to the USF budget cuts, a cooperative in the upper Midwest is on the cusp of cancelling 2018 construction projects worth several million dollars; these projects would have upgraded or delivered broadband for the first time to approximately 500 rural consumers and businesses, but the company now needs to scale back future investment because the USF cuts are taking away millions of dollars that were counted upon for investments already made in the past. In Mississippi, a small rural provider has been forced to hold off indefinitely on plans for future investments in communities like Fulton and surrounding rural areas due to the USF budget concerns, instead making minimal investments just to keep existing network plant operational rather than upgrading that network for higher-speed broadband that would help those areas thrive. In Nebraska, a small company with only 12 employees that just recently completed a significant fiber-to-the-home project has declined to fill four open positions—effectively cutting its workforce by 25 percent—because of concerns with declining USF support and its impact on the ability to pay for the network construction already completed. And in Iowa, a small carrier has not been able to lower its prices for standalone broadband because the USF budget cuts are effectively wiping out any support for such connections, despite the intention of the reforms and the repeated calls for such a fix from Congress.

And the most insidious aspect of this budget control is that it not only cuts support that the rules indicate should be available, but it does so in unpredictable ways. For the last four months of last year, the budget control was 4.5 percent on average; for the first six months of this year, it rose to 9.1 percent on average. Now, as of July 1 of this year and for the 12 months after that, the budget control will on average reduce USF support by 12.3 percent. As if the support losses for investments already made were not bad enough, this lack of predictability makes it even harder to justify building going forward—it hearkens back to a cap system the FCC adopted a few years ago called Quantile Regression Analysis or "QRA." Many members of Congress, including many on this Committee, wrote to the FCC several years ago expressing grave concern about the QRA caps because they could change in unpredictable ways and thus severely undermined investment incentives. We eventually got rid of those caps, thanks in no small part to the efforts of the members of this Committee in pressing the FCC to do the right thing.

But now with this budget control, we are venturing right back into the kind of unpredictability created by the QRA. If a company does not know whether the budget control will be 5 percent or 10 percent or 20 percent next year—and given the growth trends, all we can guess is that the budget control will grow—that company cannot make informed decisions to invest in capital-intensive broadband infrastructure. Put another way and without hyperbole, the budget control—the USF budget shortfall—is the worst thing for promoting rural broadband investment since the much-maligned QRA. If it does not get fixed soon, we will be looking at years of lost rural broadband investment to the detriment of millions of rural Americans. Rather than creating new programs from scratch or taking flyers on untested theories of broadband deployment, why not use a program that has a proven track record and has just been improved in recent years? Why starve that program's budget while throwing dollars at new initiatives that might not work or, worse still, might conflict with this proven program? If rural broadband is really a priority, good public policy would indicate we should be building upon what has worked to promote it, rather than neglecting it.

It's not just NTCA that is concerned about the USF budget shortfall. In May 2017, nearly 170 Members of Congress—including Chairman Wicker and other members of this Subcommittee—wrote to the FCC expressing serious concern about

how the USF budget shortfalls will undermine private infrastructure investment and consumer rates. This letter demonstrated the shared bipartisan interest in prompt action on this issue, and a window of opportunity exists. We are hopeful that with continued congressional interest and leadership we can see these issues addressed, and the promise of last year's USF reforms can be realized by the millions of rural consumers served by smaller rural network operators.

A Path Forward for the Universal Service Fund

Solving the USF budget shortfall requires a demonstrated commitment on the part of policymakers to rural broadband—but the shortfall is actually just a small fraction of the increases that other USF programs have received in recent years to further their mission. There are several potential options to address this shortfall, but what is clear is that doing nothing is no longer an option if rural broadband remains a public policy priority.

One option would be for the FCC to leverage the existing USF mechanism to fill the shortfall. This could involve the use of USF program funds or reserves—funds that the FCC has collected but has not yet disbursed for USF program purposes. Certain reserves were previously used to help fund the model election referenced earlier in this testimony. It is unclear the extent to which other reserves remain, but getting a public accounting regarding how much is left in the reserves, if anything, would seem an important first step.

Alternatively, the FCC could increase the contribution factor by a small amount to help pay for the shortfall. While not ideal, this would result in American consumers paying perhaps a few dollars more per year so that rural Americans are not paying *tens or hundreds of dollars more per month* for broadband, which is a clear violation of the universal service mandate in the Communications Act.

Another option could be for Congress to direct infrastructure funding toward supplementing of (or at least for use in coordination with) the USF program. As Congress starts to consider potential infrastructure initiatives, leveraging the USF program would seem the most effective and immediate means of achieving a real effect on rural broadband availability and adoption. The USF initiative is up and running, so there is no need to "reinvent a wheel" to see results. Sufficient USF funding targeted for broadband infrastructure deployment could help fill the specific shortfalls mentioned above and accelerate private network investments in the most rural 37 percent of the U.S. landmass—while leaving substantial funding also to promote fixed network investments in other rural areas, for rural mobility services, and for unique challenges on tribal lands. The FCC's various High-Cost USF programs—the Connect America Fund 2 initiative and the programs that enable service delivery in rural areas served by smaller businesses—therefore offer a ready-made platform that, with additional resources but with very little additional "heavy lifting" or process, could "hit the ground running" and yield immediate, measurable benefits for rural consumers.

If an infrastructure package including broadband moves forward through Congress and if it is not targeted toward somehow supplementing the USF programs, other options could include creation of new grant or capital infusion programs, comparable to what several states have used to address "market failure areas"—places where the business case for investment is difficult, if not impossible, to make without additional resources. At the same time, creating such programs would require more administrative effort than leveraging existing programs, and the rules for any such new program must still be informed by "lessons learned" from similar prior efforts at the Federal and state levels. For example, as a matter of program integrity and to ensure the most efficient possible use of resources, it would be necessary to ensure such a capital infusion program is accurately targeted to unserved areas rather than enabling installation of duplicative infrastructure; in effect, this means that any new program would still require substantial coordination with the existing USF programs, among other things. And although some have alternatively touted tax incentives as offering promise—and while there are certainly areas in which such incentives might help—such measures are unlikely to make a material impact in most rural areas where distance and density make it difficult, if not impossible, to justify a business case for infrastructure investment to start. Put another way, if there is insufficient USF to help enable the business case for ongoing operation of networks and providing affordable broadband in rural areas, a capital infusion program or tax incentives may do very little to promote meaningful broadband deployment in many rural areas.

Regardless of what path might be chosen in developing a broadband infrastructure package, one key factor that requires further consideration is what sorts of broadband networks we should be aiming as a country to promote. Presumably if one is paying for and building an asset intended to last for a few decades, that asset

should be built to last a few decades. Of course, in a world of finite resources, there is a difficult tension between, on the one hand, trying to reach as many unserved Americans as possible with networks that may cost less upfront and, on the other hand, deploying more sustainable "future-proof" networks to potentially fewer locations. This is not an easy choice. But NTCA submits that deploying a network that may be less expensive upfront—but which consumers will find substandard in just a few years' time, or will require much more to operate and upgrade over time—makes little sense for either the consumers who would use those networks or the American ratepayers or taxpayers who would ultimately help support them.

As a more traditional infrastructure analogy that may resonate: if one projects that car traffic is doubling every few years on a single-lane road, one likely does not rebuild the new highway with only two lanes and then go back to add two more lanes a few years later and yet two more lanes a few years after that. Instead, given the relatively high costs of infrastructure deployment and the disruption involved in repetitious construction, one builds the highway "the right way" the first time. The same should be true of our broadband networks. We should certainly look for a balanced approach to reach as many locations as possible, but not at the societal and economic cost of deploying networks that in only a few years' time will look obsolescent and inadequate for the users consigned to them. It is therefore important that any rules adopted by the FCC in connection with USF and any other new programs created as part of a broader rural broadband infrastructure initiative deliver the best, most balanced payback for both the American taxpayer and the users of the networks—*both* in the near-term *and* over the life of that infrastructure.

Finally, I should not close without noting that the long-term sustainability of the universal service program depends upon rationalizing a contributions framework that is not built for a 21st century marketplace. One can have differences in opinion on how this should be done, but it is hard to dispute the basic notion that has already driven contributions policy all along—that those who make use of communications networks should contribute to the well-being and universal availability of those networks. Today, however, a shrinking base of legacy services that do not represent the majority users of our communications networks are being asked and tasked with funding universal service goals that are centered on broadband. Assuming all agree that universal service is an important public policy—and the Communications Act indicates that Congress thinks it is—rationalizing and reforming contributions requirements is essential to firm up the foundation of universal service for the 21st century.

Conclusion

Small, rural broadband providers are eager to continue deploying infrastructure and delivering services that rural America needs to participate in the modern world. But the ability to justify and then recover the initial and ongoing costs of sustaining infrastructure investment in high-cost rural areas is critical to this mission's success.

NTCA is excited to participate in this conversation regarding rural broadband. We look forward to working with policymakers and other stakeholders on a comprehensive infrastructure strategy that provides the tools and capabilities needed to achieve our Nation's shared broadband goals.

Thank you for the opportunity to testify, and for the Subcommittee's commitment to creating an environment conducive to broadband infrastructure investment in rural America.

The CHAIRMAN. Thank you, Ms. Bloomfield.

Mr. Graham.

STATEMENT OF ERIC B. GRAHAM, SENIOR VICE PRESIDENT, STRATEGIC RELATIONS, C SPIRE

Mr. GRAHAM. Thank you, Chairman Wicker, and thank you, Ranking Member Schatz, for having this hearing today. Thank you, members, for attending to discuss this incredibly important topic of the Universal Service Fund and rural broadband expansion.

My fellow panelists so far have done a very good job of talking about expansion of wireline networks, so at least in my oral statement, I will turn most of my attention to wireless networks.

It would be almost impossible to overstate the importance of rural areas to a company like C Spire. We trace our roots to 1959, when our owners began the operation of a rural independent telephone company providing telephone service to areas of Mississippi that otherwise would not have had that service.

We entered the wireless market as Cellular South in 1988, and for 30 years now have been providing wireless services throughout Mississippi. We began receiving universal service support from the High Cost mechanism in 2003. And little by little, we acquired customers and were able to cobble together enough USF support to expand our networks beyond the more heavily populated areas of Mississippi into the more rural parts of Mississippi.

Today, we operate a wireless network that covers virtually the entire state. It covers over 98 percent of the population in Mississippi. What has been done in Mississippi is a USF success story, but proceeding on the path that the FCC has chosen to take so far, that story will not be repeated in other states. There are two primary reasons for this; the second is an outgrowth of the first.

The first reason is that the FCC is prepared to move ahead on declaring areas eligible or ineligible for future mobility fund support based on insufficient data. This is data that is submitted to the FCC based on Form 477, and it's submitted by wireless operators across the country. So far, so good, except the FCC has never established a consistent standard by which that information should be submitted. So the FCC doesn't have an apples-to-apples comparison of coverage in various areas of the country.

We, as operators, know that the information is bad. Senators know that the information is bad. Mr. Chairman, you wrote a letter along with Senator Manchin to the FCC addressing this very problem. The FCC knows the data is bad. And if anyone thinks that the data might still be good, if you just go to the FCC's website and pull up the map that shows covered areas according to this data, you find a disclaimer at the bottom that reads, "These coverage calculations, while useful for measuring developments in mobile coverage, have certain limitations that likely result in an overstatement of the extent of mobile coverage." By my count, that's four hedges in one sentence, which has to be some kind of record.

[Laughter.]

Mr. GRAHAM. Rather than pushing Pause and getting the information correct, the FCC's attitude seems to be it's close enough for government work, let's get the money out the door as quickly as we can.

With insufficient data, we have no idea of the size of the problem that we're trying to address, and that's problem number two, issue number two. Without knowing what areas truly are covered and which areas lack coverage, the FCC, nor anyone else, can put together a model that shows the cost of covering unserved areas. There is no place in the record where the FCC has done an independent economic analysis to see what the cost would be to cover areas that lack wireless service today.

CostQuest Associates made an attempt at this and determined that it would take approximately $25 billion to cover unserved areas in this country with an additional $1 billion per year going to operational support. That's the only number that's in the record

so far. The Mobility Fund today has the maximum amount that it could recapture of approximately $450 million.

Now, quick math will tell you that would take over 50 years if we use CostQuest projections. The amount of funding that's available today is simply not enough. Making matters worse, the FCC's plan at this point is to continue to sweep money from the legacy High Cost mechanism, which supports ongoing operational expenses of existing networks, into the new Mobility Fund 2 and use that money for new construction. Many networks that are supported today with USF funding for operational expenses are at risk of being shut down. This means that you could have scenarios by which towers constructed as recently as last year would be shut down over the next year due to a lack of support for ongoing expenses.

Remember, USF would not have supported these towers in the first place unless there was no economic case for a private company or a public company to do this on their own. This creates a rusty tower problem where the landscape of rural America could be dotted with rusty towers that are no longer in use.

Clearly, the FCC is on the wrong path with its current plan for USF, and it will take continued engagement from you, Mr. Chairman, from this committee, and from other Members of the Senate if the FCC is going to get this right.

Thank you again for inviting C Spire to be here today. I look forward to your questions and dialogue this morning.

[The prepared statement of Mr. Graham follows:]

PREPARED STATEMENT OF ERIC B. GRAHAM, SENIOR VICE PRESIDENT, STRATEGIC RELATIONS, C SPIRE

Good morning Chairman Wicker and Ranking Member Schatz. Thank you for holding this hearing, and thank you for the invitation to appear before you this morning to offer testimony on The Universal Service Fund and Rural Broadband. My name is Eric Graham, and I am the Senior Vice President for Strategic Relations for Cellular South, Inc., the provider of C Spire Wireless services ("C Spire"). We are the largest privately-held wireless provider in the United States with an operating area that primarily consists of Mississippi, but also includes portions of southwest Tennessee (including the Memphis area), as well as coastal Alabama (including the Mobile area). Our company also provides both fiber to the home and enterprise broadband at Gigabit speeds, but the primary focus of my comments today will be wireless broadband, both mobile and fixed.

The network that C Spire has constructed is an example of everything that can go right with a federally supported infrastructure program when a local company has the commitment to provide the latest technology to the people in its region. For over fifteen years, our company has participated in the Universal Service Fund's High Cost program and we have used that support to help in building a wireless network in Mississippi that covers virtually the entire geography of the state. We continue to upgrade the wireless network with the latest generation of technology so that Mississippians from Tunica in the northwest to Gautier in the southeast, have access to the same techno logy as people in Jackson and Tupelo. For that matter, we ensure that people in Jackson and Tupelo have access to the same technology as people in New York, San Francisco, and Washington, D.C.

A. Background on C Spire and Wireless Expansion

Why do we do it? Quite simply, it's in our DNA to provide telecommunications services to hard-to-reach areas of Mississippi. Our company traces its roots to a pair of rural independent telephone companies, the first of which our owners began operating in 1959. In that time, in rural Mississippi, telephone service wasn't available everywhere. The Bell incumbent served the easy-to-reach areas, and people living outside those areas had no access unless an independent telephone company stepped in to serve the area. In one of the areas served by our rural independent telephone

companies, two sisters lived within sight of each other's houses, but they were separated by a river. Although they could see each other from a distance, they had no real way to communicate until our company laid the telephone lines that allowed them to call each other. It was an expensive effort, and it would have been far more convenient not to provide telephone service to one or both of those ladies, but our belief then—and our belief today—is that people in rural and hard-to-serve areas need connectivity and access to modern technology just as much as those who live in densely-populated, easy-to-serve areas of our country.

Congress believed the same thing in 1996 when it passed the Telecommunications Act. Recognizing that competition results in better service, the Senate and the House constructed a new Universal Service support mechanism that promoted competition for the first time and moved rural consumers away from telecommunications monopolies. The FCC adopted rules to implement the 1996 Act, ensuring that wireless providers could qualify for Universal Service funding on a competitively neutral basis. The result was tremendous expansion of wireless networks across the country, including areas where independent providers such as C Spire now had the missing piece of the financial model that made it feasible to build wireless networks in rural areas.

B. Problems with the USF Structure

1. Distribution Problem

There were two important flaws in the USF structure. The first flaw was in the way that support was distributed to carriers. Under the distribution mechanism, the reimbursement amounts were based on the local landline carrier's average cost to serve a customer. This was a simple exercise of dividing allowable expenses by the number of a landline company's subscribers in its service area, and providing an equal "per customer" amount of monthly support to the competitive provider that won the customer.

As wireless networks expanded, cord-cutting became a practical option and there was a dramatic decline in the number of landline customers. However, the landline companies never lost USF support despite losing almost half of their lines over the past 10–15 years. The result was that the competitive carrier (almost always a wireless provider) received USF support to provide service to the customers it won, while at the same time the landline carrier continued to receive support for the customers it lost. This was a problem in 2009 when I testified before the House of Representatives on the topic of USF, and it remains a problem today.

2. Contribution Problem

The second flaw in the USF structure is that contributions are based on a percentage of interstate and international telecommunications (long distance) revenues. Today, a small percentage of basic telephone service is interstate or international and that revenue base is shrinking rapidly as consumers now use Internet-based services to communicate. As interstate/international telecommunications revenues continue to decline, the FCC must increase the percentage assessed on the remaining revenue base, because it has no authority to assess intrastate telecommunications service revenues, or on any other service that is not telecommunications (such as information services).

Accordingly, while the size of the Federal Universal Service Fund has not increased significantly over the past seventeen (17) years, the percentage of interstate/international revenues that consumers pay in (the "Contribution Factor") has risen from about four percent (4 percent) to nearly twenty percent (20 percent).[1] Over the years, some mischaracterized growth in the Contribution Factor as evidence of a USF crisis, when in fact it is not. Reforming the contribution mechanism has been on the FCC's radar for over fifteen (15) years, and the Federal-State Joint Board on Universal Service has recommended multiple solutions that have never been implemented.[2] In today's world, where many connected devices use alternative means of communicating that do not use the public switched telephone network, and incur little or no interstate/international telecommunications charges the contribution mechanism is hopelessly outdated.

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[1] *See, http://www.usac.org/cont/tools/contribution-factors.aspx*

[2] Over the years, the Joint Board has addressed contribution reforms on multiple occasions. Most recently, in August of 2014, the FCC requested the Joint Board to make recommendations, but they have yet to act. See, *https://apps.fcc.gov/edocs_public/attachmatch/FCC-14-116A1.pdf,* at n.5.

C. Compounding the USF Problems

As shown above, rather than fix the way that Universal Service funds are collected, the FCC has ignored the problem. Its actions to date on distribution reform have protected certain classes of providers and short-changed mobile wireless networks that rural citizens desperately want and need.[3] Today, wireless consumers contribute over half of the $8+ billion dollar annual USF budget, which covers schools and libraries, rural health care, Lifeline, and High Cost (Connect America Fund and Mobility Fund), yet annual High Cost support going to mobile broadband is approximately $600 million (only 7.5 percent of all USF support) and is scheduled to be cut back to only $453 million (less than 6 percent of all USF support) when Mobility Fund II is implemented.

Recently, CostQuest estimated the cost of building out a high-quality mobile broadband network throughout the unserved/underserved areas in rural America to be approximately $25 billion, with another $1 billion of support needed for annual operating costs.[4] And these figures don't even touch the coming 5G revolution. Does an annual budget of $453 million sound like the FCC has a sense of urgency to help build out modern 4G LTE networks in rural America? At that pace, it will take more than twenty years to get the job done, and even then, rural America will be further behind than it is today.

Providers like C Spire, and many other small independent carriers who participated in the Universal Service program in the early years, used that support to expand and maintain their networks and were able to compete aggressively for customers in areas where networks improved. But starting in 2008, the Federal USF mechanism was capped, artificially preventing prevented many carriers from constructing comprehensive networks. That lack of coverage continues today in many of your states, and the FCC is proceeding down a path that will make the problem worse. In fact, history is about to repeat itself, as the new Universal Service mechanisms for broadband have two structural flaws of their own.

D. Flaws in Current USF Reform Plans

1. Lack of Accurate Data to Direct New Network Construction

First, the Commission is preparing to distribute funding without an accurate view of where support is needed. This will be the second time in the past five (5) years that the FCC has done this. The Commission intends to base funding decisions for Mobility Fund Phase II on data submitted by wireless providers across the country purporting to show where broadband exists or is lacking. This sounds reasonable on its face, but if you scratch slightly below the surface, you find that the FCC never established a consistent standard for how wireless carriers provide coverage information. This is a serious problem. Some providers submitted data showing coverage that an engineer would guarantee at all times and under all conditions, while others submitted data that would make a marketing department blush. To be clear, these differences are not necessarily malicious. Theoretical coverage, outdoors, in a low-foliage, flat landscape will always appear greater than real-world, indoor coverage in rolling terrain. While both coverage simulations have legitimate purposes, the problem is the FCC permitted providers to submit data using factors the providers chose, and the resulting maps show either accurate, overstated, or understated coverage, depending upon how each carrier presented their respective mapping data.

Members of this Committee have taken note and have pushed the FCC to take corrective action. Mr. Chairman, you and Senator Manchin recognized this problem in a letter to FCC Chairman Ajit Pai in April of this year, where you wrote:

> *. . . the Commission's efforts [to promote broadband deployment in unserved and underserved areas] must accurately target every area that is in need of support so that no one is left behind. Residents, first responders, businesses, public institutions, and travelers in rural areas need reliable mobile broadband access. To that end, collecting and using reliable, standardized coverage data are critical steps toward ensuring consumers in the most rural and remote communities have access to the comparable services that Congress mandated for Universal Service.* [5]

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[3] *See, One Nation, Divisible/Rural America is Stranded in the Dial-Up Age,* J. Levitz & V. Bauerlein, WSJ (June 15, 2017: *https://www.wsj.com/articles/rural-america-is-stranded-in-the-dial-up-age-1497535841*

[4] *See, https://ecfsapi.fcc.gov/file/10217086509033/2017%200216%20CQ%20Cost%20Study%20for%20Unserved%20Areas%20FINAL.pdf.*

[5] *See,* April 12, 2017 Letter to FCC Chairman: *https://www.wicker.senate.gov/public/_cache/files/d2d30dd8-76f2-4c45-8d3a-b64c9018265c/041217-fcc-rural-broadband-auctions-task-force-letter.pdf*

It is also clear that this Committee understands what is needed to correct this problem because you, Mr. Chairman, Ranking Member Schatz and Senators Manchin, Fischer, and Moran introduced legislation in May of this year to help solve the data problem facing the FCC.[6] That bill, the *Rural Wireless Access Act of 2017,* directs the FCC to establish a methodology to (1) ensure that wireless coverage data is collected in a consistent and robust way; (2) improve the validity and reliability of wireless coverage data; and (3) increase the efficiency of wireless coverage data collection. In introducing the bill, Senator Schatz put the need for its passage succinctly: "We can't close the digital divide if we don't know where the problem is."[7]

Additionally, just last Thursday, Senators Heller and Machin introduced the *Rural Broadband Deployment Streamlining Act.*[8] This legislation, as Senator Manchin noted upon its introduction, "includes an assessment of whether the data in the National Broadband Map accurately reflects the broadband coverage currently available to rural consumers and . . . is a critical step towards ensuring that the infrastructure necessary for broadband coverage in unserved and underserved communities is more quickly deployed."[9]

We are grateful for these efforts to correct this known problem, and we are hopeful that the FCC will recognize your concerns and amend its plan accordingly, but we believe it will take your active participation in this issue and vigilant oversight in order for the FCC to get it right.

To the FCC's credit, the Commission opened a proceeding this spring seeking comments on how to get more accurate data before the upcoming Mobility Fund II auction. C Spire participated in stakeholders' workshops to develop a set of standards that work for the industry and that could be adopted by the FCC in their entirety, or with minimal changes. The working group submitted its suggestions to the Commission last month, but we have no indication those recommendations will be adopted. At this point, it is unclear whether the Commission is prepared to make the hard but necessary decision to require all carriers to submit improved coverage data based on a consistent standard.

As part of this Committee's oversight responsibility, we urge you to see that the FCC does not spend $4.6 billion dollars until it has a clear picture of which areas will deliver the biggest bang for the buck for all Americans.

2. The FCC's Current Reform Plan Will Reduce Existing Coverage

The Commission's current plan to proceed with its overhaul of the Universal Service Fund is fatally flawed because it eliminates operating support for the very networks that the Universal Service Fund helped to construct. This could have the perverse effect of forcing carriers to decommission cell sites over the next year that were constructed with Universal Service Support as recently as last year, thus reducing coverage and leaving towers to rust. This "rusty tower" scenario is very real because the whole purpose of the High Cost mechanism was to help wireless operators across the country construct and operate towers in areas that cannot justify the expense of continuing operations without support. Indeed, ensuring that networks in rural high-cost areas are maintained is one of the core purposes that Congress set forth in Section 254(e) of the Communications Act, 47 U.S.C. § 254(e). Consumers with dependable wireless broadband today could find themselves on the wrong side of the digital divide tomorrow, unable to access services they currently use for everything from social connectivity and directions to telehealth services and reaching first responders in times of emergency. Mr. Chairman, this result is exactly the opposite of the goals that you, Senator Manchin and twenty-eight (28) of your Senate colleagues set forth in a February letter to Chairman Pai.[10] In that February letter, nearly one-third of the Senate—both Republicans and Democrats—provided this guidance to the FCC:

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[6] See, S.1104, 115th Congress, introduced May 11, 2017: *https://www.congress.gov/115/bills/s1104/BILLS–115s1104is.pdf*

[7] May 11, 2017, Press Release, "Manchin Introduces Bipartisan Bill to Expand Broadband Deployment Using Accurate Coverage Maps": *https://www.manchin.senate.gov/public/index.cfm/2017/5/manchin-introduces-bipartisan-bill-to-expand-broadband-deployment-using-accurate-coverage-maps.* We note that Congressman Dave Loebsack of Iowa has introduced similar legislation (H.R. 1546) aimed at improving the quality of mobile broadband coverage data. *See,* H.B. 1546: *https://www.congress.gov/bill/115th-congress/house-bill/1546/text.*

[8] June 15, 2017, Press Release, "Heller, Manchin Introduce Bill to Expand Access to Rural Broadband": *https://www.manchin.senate.gov/public/index.cfm/press-releases?ContentRecord_id=A3E25E12-1A27-47B9-B1E5-BB9B93738916*

[9] Id.

[10] *See,* February 2, 2017, letter to FCC Chairman Pai: *https://www.manchin.senate.gov/public/index.cfm?a=files.serve&File_id=4B24485D-D61A-40D8-AE03-867D0139A37E*

As you move forward with MFII, we ask that your efforts help to incent wireless carriers to preserve, upgrade, and expand mobile broadband in rural America, rather than degrade and reduce competition in areas that need it most. Competing in a capital-intensive environment, wireless carriers need long-term certainty of ongoing support to invest, deploy maintain and update their networks that provide vital mobile broadband services in rural areas. [11]

The combination of these two flaws in the new Universal Service mechanism—the failure to gather accurate, standardized data and the failure to protect the Universal Services Fund's decades of existing investment in rural areas—is a recipe for tremendous waste as funding will be directed to areas that do not require it while portions of existing networks will be turned off and cell towers will be abandoned. At this point, it will take leadership from the Senate and the House to ensure that the Universal Service Fund promotes broadband deployment in a way that preserves and expands network availability in rural areas.

F. Effect if FCC Stays on Current Path

If network coverage and quality are reduced in rural areas, modern initiatives such as remote patient monitoring and precision agriculture are at risk along with many critical applications like distance learning and telecommuting that help people in rural areas participate in the todays digital and information economy. This is tremendously important because, according to the USDA's most recent figures, over 46 million Americans live in rural communities. That's fourteen percent (14 percent) of the total U.S. population living in seventy-two percent (72 percent) of the Nation's geography.[12]

During the Recession, almost 9 million jobs vanished from our U.S. economy, GDP shrank by more than five percent (5 percent),[13] and our rebound has been uneven. Many of America's urban and coastal populations have recovered, and today they are generally ahead of where they were ten years ago. But, that's not true for tens of millions living in rural Americans, which remains well behind where it was before the Recession, some ten years ago.

Just last week, Chairman Pai participated in the inaugural Rural Prosperity Task Force meeting,[14] where he outlined how important policies that support broadband availability in rural areas are for demonstrating that the Federal Government cares about rural America. As he articulated, providing connectivity nationwide is at the core of why the FCC was created in 1934.[15] Chairman Pai shared examples of economic growth powered by broadband with the task force, including remote monitoring in a meat processing plant in Nebraska, feed lot monitoring of cattle in Kansas, connected combines and field monitoring in Maryland, and healthcare, education, and job creation advances all made possible by broadband.

These examples are not purely anecdotal. The Hudson Institute recently found that the investments and ongoing operations of small rural broadband providers contribute $24.1 billion annually to the Nation's gross domestic product, with sixty-six percent (66 percent), or nearly $16 billion, of that amount benefiting urban areas. The same report also found that an estimated 70,000 jobs can be attributed directly to economic activity of small, rural broadband providers, underscoring how broadband is an important driver of job growth.[16] A separate report has found that when a county gains access to broadband, there is approximately a 1.8 percentage point increase in the employment rate, with larger effects in rural areas.[17]

In testimony before this subcommittee last year, Mr. Darrington Seward, a Mississippi farmer, estimated a minimum "10–15 percent loss of efficiency when connections are disrupted" for their farm machinery alone.[18] New remote patient monitoring services can save millions for rural hospitals and state Medicaid budgets. In fact, C Spire has partnered with the University of Mississippi Medical Center on a diabetes monitoring project that has the potential to save Mississippi Medicaid

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[11] Id.

[12] USDA, Economic Research Service, Population & Migration Overview: *https://www.ers.usda.gov/topics/rural-economy-population/population-migration/*

[13] CBPP, *Legacy of the Great Recession,* June 9, 2017: *http://www.cbpp.org/research/economy/chart-book-the-legacy-of-the-great-recession*

[14] *See, https://www.whitehouse.gov/blog/2017/06/16/secretary-perdue-hosts-inaugural-rural-prosperity-task-force-meeting*

[15] Id.

[16] *See, https://hudson.org/research/12429-hudson-institute-releases-report-on-economic-impact-of-broadband-in-rural-communities*

[17] *See, http://digitalcommons.ilr.cornell.edu/ilrreview/vol66/iss2/2/*

[18] *See, https://www.commerce.senate.gov/public/_cache/files/86a9b24c-e124-4b4b-a701-f0fe165be074/F3297DD6CC57D51B9EA2A54F209F07E3.darrington-seward-testimony.pdf*

over $189 million a year in hospitalization costs.[19] Secondary education, technical training, and even university degrees are available online, but only accessible for Americans with broadband services that support delivery of materials and facilitate interactive classes. The future of rural economic growth is directly tied to the availability of mobile broadband.

We see examples nearly every week that demonstrate how we are, in many ways, living in a time of two Americas. Our most recent national election showed that there are millions of Americans who feel like they have been detached from the process and are being left behind, and many of these live in rural areas. I certainly won't claim today that wireless broadband availability alone will solve that complex problem, but I truly believe that if we do not connect our fellow citizens in rural areas the way that we have in urban and coastal parts of our country, economic and social divides will get worse. The good news is that policymakers can choose to connect these Americans if USF is properly channeled to support broadband in rural areas.

G. Options to Promote Rural Broadband Deployment

The FCC's biggest USF shortcoming has been its unwillingness to aggressively pursue the core goal that Congress set before it: that rural citizens should have access to modern services that are reasonably comparable to those in urban areas in both quality and price.[20] The FCC's timidity in this area is a bipartisan problem, stretching back more than a decade. If the FCC cannot bring itself to do the job Congress gave it by increasing investment to close the urban/rural broadband access gap, then Congress must act.

Chairman Pai has suggested that, "any direct funding for broadband infrastructure appropriated by Congress as part of a larger infrastructure package should be administered through the FCC's Universal Service Fund (USF) and targeted to areas that lack high-speed Internet access."[21]

Given the big gap that exists and the efficiencies that can be gained from using an existing mechanism that would not require creating a new program or bureaucracy, one way to provide a big boost to rural broadband is to make a special USF appropriation in each of the next five years, targeted to rural infrastructure, and with accountability protections. Projects could be funded as soon as the FCC accurately determines the areas that are most in need.

Alternatively, Congress could implement a fix to the contribution mechanism to spread the cost of universal service more equitably. This would provide the FCC with more flexibility than it has now to meet the needs of rural America because the Universal Service Fund would have a contribution base that is reflective of today's broader network usage, and a greater amount of funding available to provide support for rural broadband networks that our country clearly needs.

What cannot happen is more of the same. Rural America has fallen behind and we need policymakers to demonstrate a sense of urgency to fix this problem now.

H. Conclusion

Let's return, for a moment, to where I began my testimony this morning. I shared with you how C Spire has spent its history providing connectivity and modern telecommunications services to people in rural and hard-to-reach areas. Today, we've built an advanced fiber optics network that provides ultra-fast broadband connectivity to some of the most rural communities in Mississippi. We have almost 5,000 miles of fiber throughout Mississippi that can be a foundation to extend connections to rural communities. We're engaged in field trials of 5G equipment that can deliver wireless speeds of multiple Gigabits per second without needing a physical connection to a household or business. In the millimeter wave spectrum bands, technology has caught up with spectrum availability, and equipment is now available to utilize spectrum that has been fallow for decades. The missing piece is the financial model that proves in the deployment of advanced wireless networks in rural America. That's where support from the Universal Service Fund can, as it has throughout its history, bridge the gap. In order to do that, policymakers must solve the problems that I highlighted earlier: accurately map broadband availability so that support can go where it is truly needed, and preserve the networks that the Universal Service Fund has helped to build.

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[19] *See, https://www.fcc.gov/faces-connected-care-mississippi-story*

[20] *See, 47 U.S.C. § 254 (b)(3).*

[21] *See, "Bringing the Benefits of the Digital Age to All Americans,"* Remarks of Chairman Ajit Pai at Carnegie Mellon's Software Engineering Institute, March 15, 2017: *https://apps.fcc.gov/edocs_public/attachmatch/DOC-343903A1.pdf*

Thank you again for inviting me to be here today. I welcome your questions and look forward to our dialogue this morning.

The CHAIRMAN. Thank you, Mr. Graham.
Dr. Rheuban.

STATEMENT OF KAREN S. RHEUBAN, MD, PROFESSOR OF PEDIATRICS, SENIOR ASSOCIATE DEAN, CONTINUING MEDICAL EDUCATION AND EXTERNAL AFFAIRS; AND DIRECTOR, UNIVERSITY OF VIRGINIA CENTER FOR TELEHEALTH

Dr. RHEUBAN. Chairman Wicker, Ranking Member Schatz, members of the Subcommittee, thank you for the opportunity to provide testimony regarding the FCC's Rural Health Care Program established by the Telecommunications Act of 1996.

I'm a pediatric cardiologist, Co-founder and Director of the Center for Telehealth at the University of Virginia, past President of the American Telemedicine Association, and Board Chair of Virginia Medicaid.

UVA is home to the HRSA-funded Mid-Atlantic Telehealth Resource Center, through which we provide technical assistance to providers and systems across eight states and the District of Columbia. From these perspectives, I offer testimony regarding the critically important role of the Universal Service Fund.

As committee members know, telehealth is the use of technology designed to enable the provision of health care services at a distance. Telemedicine effectively mitigates the significant challenges of workforce shortages and geographic disparities and access to care; supported by secure broadband communications services, a critical underpinning of any telehealth program.

The UVA telemedicine program was established more than 20 years ago to address the pervasive health disparities faced by rural Virginians. The same is true for Mississippi. We connect with 153 facilities across the Commonwealth of Virginia. Our program spans more than 60 different clinical subspecialties ranging from prenatal services to emergency and acute care consults, follow-up visits, and chronic disease management using remote patient monitoring tools. More than 200,000 different health care services have been provided, and we have reduced the burden of travel for Virginians by many millions of miles. Most importantly, we have improved patient outcomes. We rely on the FCC Rural Health Care Program for connectivity between facilities. Absent the program, our ability to provide these services would be severely constrained.

As an example, not long after we launched our telemedicine program in 1996, we received a grant from NTIA, which I understand falls under this committee's jurisdiction, to connect health care facilities in Appalachia to UVA. For that grant, the cost of a 1.54 megabit connection to one small rural hospital was unaffordable, at nearly $6,000 per month.

After passage of the Telecommunications Act, through the Rural Health Care Program, we have secured discounts that allow us to purchase greater bandwidth for a fraction of that cost. That hospital and others participate in our telestroke program, facilitated by the rapid transmission of CT scans and high-definition video conferencing that informs mutual clinical decisionmaking and

treatment when time is brain. Lives have been saved and disability avoided.

Affordable broadband connectivity is without question foundational to our telemedicine program. Between 1998 through 2016, the Commonwealth of Virginia has received support of more than $23 million in USAC funding for health care programs, and we have more to go.

USAC has accelerated its outreach efforts and streamlined the application process amongst other changes consistent with program modernization, but we have a way to go.

Utilization has greatly increased, and recently the $400 million funding cap established by the Commission in 1998 was exceeded. The Commission has recently reduced support by 7.5 percent, and this has created hardships for many states, and in particular for Alaska. There is much more to be done.

For this reason, we urge the FCC to expand the funding cap that it established nearly two decades ago. If this is not feasible, we urge Congress and the FCC to explore additional Federal options to support costly infrastructure buildouts for rural health care providers. The FCC should prioritize rural providers in the Rural Health Care Programs, and further simplify the administrative and application processes.

Additionally, we recommend expanding eligible health care providers under the program to include emergency medical services providers, consistent with the public health and public safety provisions of the Act.

We also recommend including wireless technologies as eligible under the Rural Health Care Program, especially as we strive to improve chronic disease management with remote monitoring tools.

But it is important to note that the success of any telehealth program relates to factors that include, but also extend beyond the cost of broadband connectivity. Elements that contribute to the success of any telehealth program includes payment by government and private payers. Unfortunately, for both our rural and non-rural seniors, access to quality telehealth services still remains stifled by Medicare payment barriers related to originating site restrictions. Improving that will increase demand for services.

We strongly support the CONNECT for Health Act, the Chronic Care Bill, and the FAST Act, along with other bills that include provisions to expand the use of telehealth and remote monitoring in Medicare.

In summary, telehealth affords patients enhanced access, lowers the overall cost of care, and improves efficiency, quality, and clinical outcomes. The Rural Health Care Program is foundational to a modernized health care delivery system and, as such, along with other efforts, must be continued, expanded, and further modernized to fulfill the promise of health care in the 21st century.

Thank you so much.

[The prepared statement of Dr. Rheuban follows:]

PREPARED STATEMENT OF KAREN S. RHEUBAN MD, PROFESSOR OF PEDIATRICS, SENIOR ASSOCIATE DEAN, CONTINUING MEDICAL EDUCATION AND EXTERNAL AFFAIRS; AND DIRECTOR, UNIVERSITY OF VIRGINIA CENTER FOR TELEHEALTH

Chairman Wicker, Ranking Member Schatz, members of the Subcommittee on Communications, Technology, Innovation and the Internet, thank you for the opportunity to provide testimony regarding the Federal Communications Commission's (FCC) Universal Service Fund and in particular, the Rural Healthcare Support Mechanism established by the Telecommunications Act of 1996 (the Act).

I am the co-founder and Director of the Center for Telehealth at the University of Virginia (UVA), past President of the American Telemedicine Association, and current Board Chair of the Virginia Telehealth Network. UVA is also the home of the Department of Health and Human Services' Health Resources and Services Administration (HRSA) funded Mid Atlantic Telehealth Resource Center, through which we provide technical assistance to providers and systems across 9 states including the District of Columbia. It is from these related perspectives that I offer testimony regarding the critically important role of the Universal Service Fund in advancing access to high quality care to rural Americans through telehealth related programs and services. Although the focus of this hearing relates to the Rural Healthcare Support Mechanism, I will also touch upon the multifactorial issues that continue to impact the adoption of telehealth nationwide.

As Committee members know well, telemedicine is not a new specialty, a new procedure or a new clinical service . . . simply defined, it is the use of technology designed to enable the provision of healthcare services at a distance. 21st century telemedicine services can be provided live, via high-definition interactive videoconferencing supported by high resolution peripheral devices; asynchronously, using store and forward technologies, or through the use of remote patient monitoring tools. Telemedicine has been demonstrated to effectively mitigate the significant challenges of workforce shortages, geographic disparities in access to care, while improving patient triage and timely access to care by the right provider at the right time. Telemedicine tools foster patient engagement and self-management where appropriate.

Rural healthcare

Where local specialty care services are not available, particularly in rural and underserved regions and health professional shortage areas, telemedicine offers timely access to care and spares patients the burden of long distance travel for access to that care. Telemedicine supports an integrated systems approach focused on disease prevention, enhanced wellness, chronic disease management, decision support, and improved efficiency, quality and patient safety.[1]

Although rural communities face the same basic challenges in access, quality and cost as their urban counterparts, they do so at far greater rates, attributable to a host of factors. "Core health care services" such as primary care, emergency medical services, long term care, mental health and substance abuse services, oral health and other services are considerably less accessible in rural communities.[2] Lack of access to specialty care services is an even greater challenge. Rural communities lack sufficient patient volumes to support specialty and subspecialty practices and primary care providers are often overwhelmed with complex patients with acute and chronic illness. Telehealth technologies offer ready access to such services when rural communities and providers partner with tertiary and quaternary care facilities and where appropriate, with one another.[3]

Attracting health professionals to rural communities remains a daunting task and retaining those health professionals to practice in rural communities is equally difficult. Strategies to recruit and retain clinicians to practice in rural and frontier communities must also include innovative applications that enhance the management of patients with acute and chronic illness, and reduce the chronic sense of isolation experienced by those practitioners by affording enhanced connectivity to colleagues and educational opportunities.

Telehealth technologies should be viewed as integral to rural development. In our program, more than 90 percent of patients seen via telehealth remain within their community healthcare environment, resulting in reduced burdens for patients and

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[1] Agency for Healthcare Research and Quality. Effective health care programs. *https://effectivehealthcare.ahrq.gov/ehc/products/624/2254/telehealth-report-160630.pdf.* Rockville, MD 2016

[2] Institute of Medicine, Committee on the Future of Rural Health Care. "Quality through collaboration: The future of rural health care." (2004).

[3] Lustig, Tracy A. Institute of Medicine, The role of telehealth in an evolving health care environment: workshop summary. National Academies Press, 2012.

their families. These benefits include a reduction in unnecessary transfers, and related transportation and housing expenses for patients and family members. In addition, a reduction in hospital lost revenue (as might occur with patient transfers) can lead to enhanced economic viability of the rural community hospital. A viable community healthcare environment supports jobs, provides incentives for the relocation of industry, and enhances community economic development.

The aging of our population has already created increased demand for specialty healthcare services to address both acute and chronic disease in the elderly. These challenges are exacerbated in rural communities. As an example, rural patients experience 25 percent higher death rates from ischemic heart disease than do their urban counterparts.[4]

The FCC's Connect2Health Taskforce has created a searchable database to overlay health status indicators with broadband availability. Not surprisingly, according to the Taskforce, close to half of U.S. counties are "double burden" counties—that is, areas with high levels of chronic disease and need for more broadband. More than 36 million Americans live in these double burden counties, according to the FCC report, where the fixed broadband access rate is 55 percent. The FCC also found that in these counties, as an example, the prevalence of obesity is 19 percent above the national average, while the prevalence of diabetes is 25 percent above the national average. A lack of Internet access is also connected with challenges in seeing health professional. "Most of the counties with the worst access to primary care physicians are also the least connected," according to the FCC report.[5] The 2010 National Broadband Plan sets achievable targets for healthcare connectivity.[6]

Although the challenges of unfavorable geography and distance tend to be uniquely rural, socioeconomic issues, health disparities, and other serious barriers to access to quality healthcare are also, of course, compelling in urban areas. Poverty, unhealthy behaviors and adverse health status indicators are also highly prevalent in our urban communities. Wait times for access to specialty care services adversely impact our urban insured beneficiaries as much as they impact our rural insured. Isolated vulnerable urban patients suffer from high rates of chronic illness. A bus ride across town with a long wait in an emergency room can be as challenging for an isolated, vulnerable uninsured urban patient as is a long ride for a rural patient. Telehealth tools can help to mitigate health disparities and improve outcomes in urban populations as well.

The University of Virginia Center for Telehealth

The University of Virginia Health System is a 610 bed state-supported academic medical center, and one of the two safety-net hospitals in the Commonwealth. The Health System is comprised of the UVA Medical Center, the UVA School of Medicine, the UVA School of Nursing, and University Physicians Group, our practice plan. Our UVA telemedicine program was formally established in 1996, as an effort to improve access to high quality care for all Virginians, regardless of geographic location. Recognizing the limited availability of broadband connectivity in rural regions of our state, we were early advocates for the Rural Healthcare Support Mechanism prior to the passage of the Telecommunications Act of 1996, and have since worked with the Federal Communications Commission by participating in Commission hearings, hosting members of the Commission at UVA and in the form of comments to multiple FCC proceedings. My UVA Center for Telehealth faculty colleague Colonel Eugene Sullivan served on the initial FCC Healthcare Advisory Board and Katharine Wibberly, PhD, Director of Research at our Center currently serves on the Universal Service Administrative Company (USAC) board representing rural healthcare.

Since the establishment of our telemedicine program, we have developed collaborations that connect the UVA Health System with 153 sites across the Commonwealth using high definition video-teleconferencing, store and forward technologies, remote patient monitoring and mobile health tools to improve access to healthcare services for the citizens of the Commonwealth. We connect with hospitals, clinics, federally qualified health centers, free clinics, community service boards, health departments, medical practices, dialysis facilities, correctional facilities, PACE programs, rural schools, and skilled nursing facilities. Our telemedicine program has reduced the burden of travel for Virginians by more than 17 million miles, saved

[4] Texas A&M University, Rural & Community Health Institute (2017) What's next? Practical suggestions for rural communities facing a hospital closure.

[5] *https://www.fcc.gov/health/maps*

[6] Thomes, Cynthia. "The National Broadband Plan: Connecting America. Administered by the Federal Communications Commission, 445 12th Street SW, Washington, DC 20554. Retrieved October 15, 2010, from http://www. broadband. gov." (2011): 435–436.

lives and fostered innovative models of care delivery and workforce development. We have launched a care coordination and remote patient monitoring program for patients at home that has significantly reduced hospital readmissions by more than 40 percent regardless of payer. UVA telemedicine spans more than 60 different clinical subspecialties, spanning the continuum from prenatal services, to emergency and acute care consultations and follow up visits, to chronic disease management and palliative care. We have facilitated more than 65,000 live interactive patient consultations and follow up visits using high definition video-teleconferencing, monitored more than 3,000 patients at home with remote monitoring tools, screened more than 2,500 patients with diabetes for retinopathy, the number one cause of blindness in working adults, used our connectivity to support more than 100,000 teleradiology services and through our electronic medical record, EPIC, facilitated more than 2,500 e-consults between providers. These programs and partnerships are dependent on reliable broadband communications services and in the majority of cases, we rely on the FCC Rural Healthcare Program for connectivity between facilities. *Absent the Rural Healthcare program, our ability to provide these services would be severely constrained.*

As an example, not long after we launched our telemedicine program in 1996, we received a grant from the U.S. Department of Commerce NTIA TIIAP program. Prior to the passage of the Telecommunications Act, the cost of a 1.54 megabit connection to a small rural community hospital in Appalachian Virginia was unaffordable, priced nearly $6000 per month. After passage of the Act, with enhanced competition and through the Telecommunications program of the Rural Healthcare Program, we secured discounts that allowed us to deploy telehealth services to that same hospital with greater bandwidth for a fraction of that original cost. Lives have been saved. That community hospital participates in our acute telestroke program, facilitated by the rapid transmission of radiographic images and CT scans and high definition videoconferencing that informs the mutual clinical decision making processes. By benchmarking against urban sites, we have secured subsidies as high as 89 percent for some eligible rural partners through the Telecommunications program. Since the inception of the Rural Healthcare Program in 1988 to 2016, the Commonwealth of Virginia has drawn down support of $23,588,000 in USAC funding for healthcare programs.[7]

Affordable broadband connectivity is without question, the requisite underpinning of our telemedicine program, and as such, these efforts have changed the standard of care in rural Virginia. However, in light of the complexity of the program applications, we established a process by which we applied on behalf of our telemedicine partners across the state. Few small hospitals or federally qualified health centers could easily navigate the complex process inherent in the Program.

In 2002, in response to a notice of proposed rulemaking, and in the face of low utilization of the Telecommunications Program nationwide, we proposed that the Commission consider inclusion of rural for-profit hospitals with an emergency room as eligible for subsidies. Our justification was that many of those rural hospitals were financially strapped not-for-profit hospitals later acquired by for-profit entities, the only healthcare facility in the rural community, were bound by EMTALA (Emergency Treatment and Labor Act) and as such, inclusion of those facilities in the Rural Healthcare program was consistent with the public health and public safety provisions of the Act, which identified the relationship between universal service and public safety was clearly addressed. "The Joint Board in recommending, and the Commission in establishing, the definition of the services that are supported by Federal universal service support mechanisms shall consider the extent to which such telecommunications services (A) are essential to education, public health, or public safety . . . [and] (D) are consistent with the public interest, convenience and necessity".[8]

The Commission agreed, and in its subsequent rulemaking, included as eligible entities for-profit rural hospitals with emergency departments. Using a similar argument, we also suggested the Commission consider funding emergency medical services providers (EMS) however, the Commission demurred.

In 2007, UVA was awarded a FCC Pilot Program to expand our telehealth and telestroke network across the Commonwealth. The pilot program provided broadband discounts of 85 percent, and for the first time, permitted inclusion of a limited number of urban entities. Our Pilot program ends with Funding Year 2016, on June 30, 2017 and we will apply as a consortium to continue through the Healthcare Connect Fund.

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[7] Universal Service Administrative Company 2016 Annual Report
[8] 47 U.S.C. Section 254 (C) 1 A,D

The Healthcare Connect Fund (HCF), a modernized Rural Healthcare Program was established in 2013 to allow for consortium applications, for funding up to three years which reduces the cumbersome annual reapplication process. The Commission recently added skilled nursing facilities as eligible entities both for both the Telecommunications and the HCF fund. The HCF provides 65 percent support and limited urban support within consortia.

USAC has accelerated its outreach efforts and by streamlining the application process (amongst other changes consistent with program modernization), utilization has greatly increased, such that in Funding Year 2016, remarkably, the $400 million funding cap was exceeded. Hence, to ensure equitable use of the program, the Commission has reduced support in Funding Year 16 by 7.5 percent. This has created hardships for states such as Alaska that currently draw down more than $100 million to support their extraordinary needs to expand telehealth programs within rural and frontier regions of the state. We fully support an expansion of the $400 million cap established by the Commission for the Rural Healthcare Program in 1998. If that is not feasible, we would suggest consideration of additional Federal options for infrastructure build out.

Sustainability of telehealth

It is important to note that the success of any telehealth program relates to factors that include but also extend beyond the cost of broadband connectivity. Elements that contribute to the success of program operations and sustainability include payment by private and government payers, tracking of clinical and process quality metrics, workforce capacity, and careful analysis of outcomes. All play a role in institutional commitments to sustaining a telehealth program. Return on investment must be considered in the context of organizational mission and programmatic alignment with that mission.

The UVA Center for Telehealth tracks a broad range of process and quality metrics to include such metrics as time from consult request to completion of encounter, data transport metrics (as they relate to the transfer of medical images and quality of service of the connection), *clinical outcomes measures,* miles of travel avoided, patient satisfaction, provider satisfaction and other organizational metrics.

Examples of clinical outcomes include the following:

a) Our stroke telemedicine program has supported the evaluation and treatment of more than 1,000 rural Virginians, resulting in TPA (Tissue Plasminogen Activator) administration rates now exceeding >20 percent in rural partner hospitals. These TPA administration rates align with the rates of TPA administration for stroke patients treated in our own emergency department. This compares favorably to statewide TPA administration rates of <1 percent prior to the initiation of our stroke telemedicine program and others within the Commonwealth. In addition, we have more recently accelerated time to treatment by connecting EMS providers to our stroke team further accelerating time to treatment when "time is brain". The human toll and cost to society (and the payers) of a lack of access to such therapies is enormous.

b) Our high-risk obstetrics telemedicine program serves rural high risk pregnant women. We, like others, have documented a reduction in NICU hospital days for the infants born to these patients by 39 percent compared to control patients, reduced patient no-shows by 62 percent and reduced patient travel by these pregnant women by 200,000 miles.

c) With our partner, UVA Remote Care Solutions,, using care coordination and remote patient monitoring tools, we launched a program to prevent hospital readmissions for patients with heart failure, acute myocardial infarction, chronic obstructive pulmonary disease, pneumonia, stroke and joint replacement, and have reduced all cause 30 day readmissions by > 40 percent.

d) Store and forward ophthalmologic screening for retinopathy, the number one cause of blindness in working adults has been provided to underserved adults with diabetes. Over the past two years, more than 2,500 ophthalmologic screens have been performed, with 46 percent of patients identified as having abnormal studies, requiring follow up or sight saving intervention.

e) Our telepsychiatry program represents the number one request for services. We offer child and adolescent, adult, emergency and substance use services. These programs have been shown to be effective, with high rates of patient satisfaction and rely upon high definition videoconferencing technologies supported by reliable bandwidth.

Issues for consideration

There remain significant barriers to the broader integration of telemedicine services into everyday healthcare that impact provider utilization. More than 16 different Federal agencies report engagement in telehealth, be it through research and other grant funded opportunities, through the establishment of broadband communications networks, clinical service delivery, and even device development and regulation. In the face of a multi-billion dollar Federal investment in telemedicine and broadband expansion in support of access to healthcare, those good faith efforts have also been stifled by 20th century Federal and state barriers to widespread adoption and a lack of alignment across the programs.

Reimbursement

Medicare: Payment coverage restrictions remain a major impediment to the broader adoption of telehealth by providers. Congress, in 1997, through the Balanced Budget Amendment, and later in 2000, though the Benefits Improvement and Protection Act, authorized the Center for Medicare and Medicaid Services (CMS) to reimburse for telemedicine services provided to rural Medicare beneficiaries across a broad range of CPT codes and services. However, those Medicare telehealth provisions, as established in the Section 1834 (m) of the Social Security Act limit eligible patient originating sites to rural, and have not evolved to take advantage of subsequent analyses of best practices, outcomes data, and new paradigms of healthcare delivery, even following enactment of the Affordable Care Act. The Medicare definition of rural for purposes of telehealth coverage remains as non-Metropolitan statistical areas and Health Professional Shortage Areas which are aligned with primary care shortages but not adequately for specialty workforce shortages.

Medicare reimbursement of telehealth services remains woefully limited. The Center for Telehealth and e-Health Law (CTeL) reported that in 2015, Medicare allowed $15,664,543 in distant site reimbursement and $1,937,453 in originating site charges NATIONWIDE. Medicare payment data in the fee for service program are shown below, courtesy of CTeL.

Medicare Telehealth Allowed Services and Allowed Charges				
	Distant Site		Originating Site	
Year	Allowed Service	Allowed Charges	Allowed Service	Allowed Charges
2001	1,494	$55,422	294	$5,880
2002	5,285	$185,086	1,596	$31,836
2003	6,776	$404,764	4,389	$90,186
2004	11,266	$765,179	7,841	$161,880
2005	15,970	$1,176,329	10,972	$227,349
2006	25,461	$2,124,881	15,908	$333,138
2007	25,395	$1,991,753	14,336	$310,296
2008	23,144	$1,613,408	9,247	$208,964
2009	37,503	$2,797,893	17,100	$393,291
2010	46,655	$3,397,285	23,660	$550,171
2011	82,701	$5,938,090	32,450	$761,230
2012	106,023	$7,467,157	38,540	$903,233
2013	136,429	$10,689,862	46,147	$1,112,446
2014	155,387	$12,482,270	58,959	$1,452,160
2015	192,692	$15,664,543	79,185	$1,937,453

The Center for Medicare and Medicaid Innovation has funded pilot programs that incorporate broader telehealth reimbursement; although some Accountable Care Organizations remain limited to the rural originating site restrictions.

The Connect for Health Act (S 1016/HR 2556), the Chronic Care Bill (S 870) and the FAST Act (S 431/HR 1148) along with other bills include provisions to expand the use of telehealth and remote patient monitoring in Medicare by reducing originating site restrictions.

The American Medical Association Digital Medicine Payment Advisory Group is currently working to align telehealth taxonomies with use cases, and make recommendations to the CPT Advisory Panel and the RVUs Update Committee (RUC).

Medicaid: Currently nearly every state Medicaid program provides some form of reimbursement for the delivery of telehealth facilitated care to Medicaid beneficiaries. Medicaid innovations adopted by many states in addition to video-based telemedicine consults and follow up visits include coverage for remote monitoring, home telehealth, store forward services.

Private pay: Thirty three states plus the District of Columbia require that private insurance cover telehealth services. Many of the ERISA plans have chosen to cover telehealth services.

Other Federal payers: The Office of Personnel Management offers some telemedicine benefits for individuals covered under the Federal Employee Health Benefit Plans. The Veterans Health Administration has long integrated telehealth solutions as has the Department of Defense.

Standards and practice guidelines

Telemedicine does not create a new field of healthcare, but rather allows duly credentialed clinicians to provide care at a distance using technology. That being said, the American Telemedicine Association and its >9,000 member supported Special Interest Groups, Committees and Discussion groups have developed standards and practice guidelines to address technical applications, and clinical practice guidelines, endorsed by specialty societies. Many of these standards and practice guidelines extend beyond the practice guidelines that currently exist for traditional healthcare.

Acceptance of advanced technologies

Patient acceptance of the use of telehealth technologies for consultation and ongoing acute and chronic care has been remarkably positive, attributable in part to the obvious benefit of timely access to locally unavailable specialty healthcare that spares patients the burden and expense of travel to remote tertiary and quaternary healthcare facilities. Indeed, we have collected data that demonstrates that for pediatric tele-psychiatry services, the telehealth "no-show" rate is considerably lower than the in person clinic "no show" rate. Provider acceptance of advanced technologies and telehealth tools has been equally gratifying for patient consultation, patient education, distance learning opportunities, for acquisition of timely information services and for clinical decision support. High bandwidth and high quality connections remain the underpinnings of successful telehealth encounters.

Recommendations

1. Continue the Rural Healthcare Programs and expand the $400 million funding cap established by the Commission in 1998. There is no statutory requirement that the fund be capped at that level.
2. If the $400 million funding cap cannot be increased, explore additional Federal options to support costly infrastructure build-outs for rural healthcare providers.
3. Additionally, if the funding cap cannot be raised, prioritize rural providers in the Rural Healthcare programs.
4. Further simplify the administrative and application processes for rural healthcare providers
5. Expand eligible providers for the Rural Healthcare program to include emergency medical service providers and community paramedics, consistent with the public health and public safety provisions of the Act.
6. Coordinate with the effort being undertaken by the NTIA Department of Commerce with FirstNet to create a nationwide public safety wireless broadband network for Emergency responders.
7. Include wireless technologies as eligible under the Rural Healthcare Programs.
8. Further eliminate barriers to telehealth payment in the Medicare program such as geographic and other originating site restrictions so as to allow the nearly 80 percent of Medicare beneficiaries currently not covered for telehealth services to avail themselves of the benefits of telehealth mediated care.
9. Allow for Medicare coverage of home telehealth and remote patient monitoring services, in particular, for patients with chronic illnesses. Allow as eligible providers for telehealth services otherwise eligible Medicare providers such as physical, occupational and speech and language therapists.
10. Improve coordination amongst the Federal agencies such that our national interests in population health, improved health outcomes, emergency preparedness, workforce, and health information exchange, enhanced by connected health tools and strategies.

In summary, telehealth affords patients enhanced access, lowers the overall cost of care, and improves efficiency, quality, clinical outcomes and population health. The Rural Healthcare Program is a critical underpinning of a modernized healthcare delivery system in the digital era and as such must be continued, expanded and further modernized to fulfill the promise of healthcare in the digital era.

The CHAIRMAN. Well, thank you all for your excellent testimony. You were very helpful to the Subcommittee in keeping to the time constraints, and we really appreciate that.

Mr. Graham, let me begin with you. You mentioned your support for the Rural Wireless Access Act and the problem with getting the right data collected. Let me drill down on that. How does the FCC currently collect mobile coverage data to determine areas eligible for USF support? Why is this data collection process inadequate? Finally, how would standardizing collection methods at the FCC help truly identify areas that are unserved or underserved?

Mr. GRAHAM. Thank you, Mr. Chairman. Currently, the FCC has wireless operators file a Form 477, which shows how the operator views its coverage in a given area. Now, operators will measure their coverage in different ways. They'll either measure indoor coverage or outdoor coverage or they can run simulations with leaves on trees, without leaves on trees. The terrain makes a difference. There are theoretical maximums that are real-world speeds that you see, real-world coverage that you see.

And each operator can have a different view of what their coverage looks like and what the same coverage looks like just based on their internal metrics. There are some operators that would submit data that only an engineer would stand behind anywhere and at all times. There are other operators who submit data that a marketing department would maybe look crossways at because it may overstate things slightly. And it's not necessarily malicious that the data is different, it's just different, there's not an apples-to-apples comparison.

The FCC needs to pause and tell operators how this information should be presented. Let's agree on what the signal strength should be. Let's agree on whether this is indoor coverage or whether it's outdoor only. Let's agree on the time of year. All of these factors make a difference in what wireless coverage looks like, and that needs to be standardized if the FCC wants to have an accurate view of what coverage looks like in a given area.

Another example quickly is that in the display, it gets down to the actual pixels that carriers use on their maps. Some carriers will use larger pixels which show coverage in an area—more pixels that shows coverage in an area where it doesn't actually exist because other carriers choose to reflect that in smaller units.

So right now we don't know where coverage truly exists, we don't know where coverage is lacking, and the FCC's answer is, "Unless you can come back and challenge the process and show us that we're somehow off with this measurement, we're going to assume that it's correct even though we acknowledge that it's not."

The CHAIRMAN. Who's doing the better job right now? Can you point to someone who's collecting data better than the FCC?

Mr. GRAHAM. I will tell you that our company obviously.

The CHAIRMAN. Oh, I am shocked.

[Laughter.]

Mr. GRAHAM. We stand behind our coverage maps. We don't have a marketing coverage map and an internal coverage map that shows where we really have coverage. We submit true data. We know that there are companies out there that compile other carriers' data, but the technology exists today for wireless devices to actually feed anonymous information back into a program to provide mapping of data, mapping of coverage areas, so you get a better sense of where coverage truly exists.

The CHAIRMAN. You mentioned that the Commission seems to want to get the money out there quickly even if it's not sent to the right places. Do you worry that what you're suggesting will delay the process in a way that disadvantages rural America?

Mr. GRAHAM. My fear is that moving forward without delay is going to disadvantage rural America, and here's why.

The CHAIRMAN. How quickly can they get it right?

Mr. GRAHAM. I don't know how quickly they can get it right, but when they make this decision, it will be locked in for a decade, meaning if they're wrong in any area that's lacking in coverage, that area is locked out, universal support, universal service support, for a decade.

The CHAIRMAN. Let me just ask you, what's the difference between mobile broadband and fixed wireless broadband? From a consumer perspective, does that difference matter particularly as it relates to a consumer's access and the use of telemedicine?

Mr. GRAHAM. So we have built our network to support mobile, but in doing so, technology has advanced to the point that our network can support fixed wireless at this point as well. Mobility obviously will take care of that customer anywhere they go that's in that coverage area. With fixed wireless, we can increase speeds point to point up to speeds that rival what's available over certainly coaxial cable and even fiber, and even our mobile network can deliver 100 megabits per second.

The CHAIRMAN. Senator Schatz.

Senator SCHATZ. Thank you, Mr. Chairman.

Ms. Bloomfield, thank you for your testimony. You know that Hawaii's unique geography makes it difficult and more expensive to deliver broadband services, and I know a lot of people are at this dais because they have their own unique geography. I worry that the way the FCC has implemented its USF mandate does not always account for that uniqueness. Can you comment on what you think the different USF programs should accommodate for the significant cost differences between various geographies and topographies?

Ms. BLOOMFIELD. Absolutely. And you do have your own unique challenges. That lava rock is pretty hard to bore some fiber into, much less an ocean that you have to carry your traffic out from.

So there are—you know, and I look around the dais, and absolutely, you've got different topography, you've got different build seasons. You know, what you can do in terms of construction in Montana is very different than what you can do in South Carolina. Those windows also change the cost of actually the infrastructure that you're building.

So one of the things that the FCC, you know, I think has been very interested in is trying to create a model that becomes kind of

a one-size-fits-all, and the problem is you can't have a one-size-fits-all, it simply doesn't work that way.

So they did recognize when they did the reforms that there's a model approach, which a number of carriers took, but an even larger number of carriers that said, "You know what, our variations are simply—our swings are too great, our construction costs are too varied, that we're actually going to stay on rate of return so that we can actually try to measure our actual costs." So that does continue to be a challenge, and certainly something that we appreciate your recognition of.

Senator SCHATZ. A quick change of topics, Ms. Bloomfield. You know, we're talking about the various uses of the USF fund, and I think we all advocate for all of the various uses, from E-rate to telehealth to broadband deployment in rural areas.

I think the elephant in the room is contribution reform. You know, we don't talk about it enough. And here we have all of these wonderful uses of deploying the dollars that come into the Fund, and a decreasing percentage of the American population that pays into the Fund. And so I would like you to comment on that, Ms. Bloomfield, and maybe we can start to have an adult conversation about how to spread out the revenue, spread out the contribution into USF? If we're talking about deploying rural broadband, we can't possibly have it paid for by people who pay for long line, long distance telephone service because at some point we're going to run out of money.

Ms. BLOOMFIELD. Senator Schatz, what a timely question. In my prepared remarks, I really do address a little bit more in terms of contribution reform. The FCC at the time had a decision to kind of go forward with contribution reform. Where do you get the appropriate funding from or distribution, how you're going to actually distribute the funding? So they went with distribution first, which didn't appropriately size the pot of the resources available.

And you're absolutely right, it's tacked on to a diminishing pool. And when you think about broadband and how when all of us are talking about broadband services here, the fact that broadband is not adequately captured.

However, I will share with you, this has been bantered around for about 10, 15 years, we've been talking about contribution reform, how incredibly important it is. It seems to be a little bit of a political hot potato. I would love to see Congress address it. The immediate needs now that you are hearing from folks at this table is that we simply cannot build the infrastructure without dealing with some immediate resolution.

So I would say that's critically important, but I would also say we've got to look at what is really right on the table at this point in time, and I don't think these carriers and I don't think rural Americans can wait 2 or 3 years for us to kind of go through the process that we'll need to go through on contribution reform, which I do hope we do, but I think that the immediate need is more urgent. But absolutely, we welcome that discussion.

Senator SCHATZ. And I agree with you. I think that we have to be able to do things in the distribution side of this, and contribution reform is a challenging topic, but it's not just a matter of the fact that we're going to not have enough revenue relatively soon,

it's also deeply, deeply unfair to the remaining people who are paying into this fund for services that they may or may not receive.

In the interest of time, I'm going to reduce a couple of questions for Dr. Rheuban to write in for the record. I appreciate the work that you've done on telehealth, and I want to recognize the Chairman, Senator Capito, and others who have gotten on the CONNECT for Health Act. We have a lot of bipartisan support. And there is a Commerce Committee nexus here. We look forward to working with you and getting your expertise.

Thank you.

The CHAIRMAN. Thank you. We are joined by our Ranking Member, Mr. Nelson. Sir, you are recognized.

STATEMENT OF HON. BILL NELSON,
U.S. SENATOR FROM FLORIDA

Senator NELSON. Thank you, Mr. Chairman, and I'll be quick because I want you all to have the opportunity to continue. I will insert opening comments into the record. Obviously, we're here dedicated and want very much to get broadband out into the rural areas.

Technology changes so fast. So Elon Musk has a business plan where he is going to put up a constellation of 400 satellites to distribute broadband all over the globe. Whenever that occurs down the road, is that going to solve the problem?

Ms. BLOOMFIELD. Well, I'll take a crack at that one. So satellite technology has its challenges, right? And I don't know if anybody sitting in this room actually has satellite broadband, but you're really subject to a lot of latency issues. You are subject to the whims of weather, lines of vision. There are a lot of things that make actually satellite a lot more complicated than it seems. So it seems easy out of the box.

I will tell you, you know, it would be fabulous in a number of years if that technology hits that point in time. It is not there yet. And when we think about broadband, whether it is fixed wireless, whether it's wireless, you know, right now the fiber connectivity really is the most important building block that we have.

Mr. BALHOFF. I would agree with that. I was a financial analyst following Motorola and Iridium, which was, of course, the original satellite deployment plan, and it was found that there were so many technical difficulties. Now, obviously technology continues to move forward, but I would even suggest that with the fixed wireless or mobile wireless solutions that people talk about, there's a reason why AT&T and Verizon have spent over $20 billion on fiber in their networks, and that is the future-proofing of their network and the kinds of demands, because fundamentally, if you build it, they will fill it.

And so with wireless, what you tend to find is that there are certain limitations eventually that people bump against in those cases, which is not to say that wireless is not extremely valuable in that plan. So C Spire and others have done a very, very good job in that regard, but fiber continues, as Shirley has mentioned, to be the building block going forward.

Mr. GRAHAM. I will also, if I might, say I think that satellite has the opportunity to be a very good tool in the toolbox of ways that

broadband is provided across America. We have in our hands right now fiber, as my other panelists have said, and wireless and technologies that work today, and if satellite can come in and can improve and supplement that, I think that would be a great use. We have a wireless network. We also deliver gigabit fiber to the home as well as fiber to businesses. We also continue to operate the rural independent telephone companies that I referenced earlier in my testimony, and we operate a cable company. So every terrain is different, every use case is different, and it's an issue of matching the right tool in the box to the job at hand.

[The prepared statement of Senator Nelson follows:]

PREPARED STATEMENT OF HON. BILL NELSON, U.S. SENATOR FROM FLORIDA

Broadband use is an essential part of our everyday lives—but according to the FCC, millions of Americans throughout the country still lack access to an adequate high-speed broadband connection. Even in Florida—where we are blessed to have some of the most advanced networks in the country—there are still areas where our residents do not have access to high-speed broadband or struggle to have access to even the most basic of broadband services. This is unacceptable—plain and simple.

Those who do not have access are being left behind. The plight they're facing to find good jobs, learn new skills and provide a foundation where their children will fare better in the future than themselves is being hampered by few broadband options and slow service in an Internet-driven economy and society. And it's only going to get worse unless we get serious about ensuring all Americans have access to fast and affordable broadband.

All of the FCC's universal service programs are vitally important to our longstanding efforts to close this lingering digital divide. The FCC has undertaken massive and thoughtful modernization and updating of the universal service program funds over the past few years. While many of these changes are beginning to deliver substantial benefits to companies, schools, libraries, health care facilities and consumers, I look forward to hearing from our witnesses today on how we can do better to deliver for Americans who aren't connected and have been left behind.

But, let me be clear, the FCC's universal service fund alone isn't the only answer to providing broadband access to every nook and cranny of this country. All of us on this committee should get behind the idea of including Federal funding to jumpstart deployment of broadband services and Next Generation 9–1–1 in any bipartisan infrastructure bill. Our rural communities and neighbors need and deserve our help. Mr. Chairman, I remain hopeful that we'll all come together and will indeed provide these Americans with the broadband access they and their families desperately need.

The CHAIRMAN. Thank you.

Senator Klobuchar.

STATEMENT OF HON. AMY KLOBUCHAR, U.S. SENATOR FROM MINNESOTA

Senator KLOBUCHAR. Thank you very much, Mr. Chairman and Senator Schatz, for holding this hearing. We have worked very hard to expand broadband. We have our Senate Broadband Caucus. I see Senator Capito, who is one of the co-chairs along with myself. And I want to thank you so much for being here.

I'm going to start with standalone. Ms. Bloomfield, you know that Senator Thune and I have worked to reform outdated Universal Service Fund rules. We got the FCC to make some changes after we got a number of people from this committee and other places to support that model. But shortfalls in USF funding have prevented the new model-based support from offering services to rural consumers at comparable rates. There are still problems. Do

you have a sense of how many locations did not get served because of the model budget shortfall?

Ms. BLOOMFIELD. So, first of all, thank you very much for your leadership. It was very timely, Senator Klobuchar.

Yes, there is definitely, as we talked before, and in my written testimony, there's a budget mechanism that is currently in place. And so because universal service is actually helping folks recover cost of investments they've already made, what we're seeing is that the standalone broadband piece, because of the gap in the programs, for example, on the ACAM, which is the model side, there's a shortfall of about $110 million for this year. On the rate-of-return side, it's about $173 million.

So the problem with that shortfall is there are a couple of things. We know on the model side, for example, that there are about 71,000 people who will not be getting the higher speeds that my carriers had intended to be able to provide this year. And in addition, there are about 50,000 consumers that will actually not be getting broadband at all.

On the non-model side of the house, you know, I am hearing from folks that on average—we just did a survey, and on average, the cost of standalone broadband right now still stands at about $160, $170 a month. That is simply not affordable. So we have not been able to get that differential. And I do attribute all of that to the budget mechanism just simply holding down those numbers.

Senator KLOBUCHAR. And how would you fix it?

Ms. BLOOMFIELD. So I would fix it. I think there are a couple of immediate things that we could do, but I think that, you know, the first thing I would say is looking to the FCC with hopes that there are reserves there in the universal service program and that those reserves be put forward to help support some of the gap. They were able to do a little bit of that on the model side early out of the box. They did not do that on the rate-of-return side.

The second thing would be to take a look at the contribution factor. I know they held it down for good reason, but I think again just a slight uptick in that will be enough to sufficiently fund this program. We're not talking about a lot of money.

Senator KLOBUCHAR. OK. Thank you. And I also appreciate NTCA's support for the bill that I've done with Senator Capito, Sullivan, and others on measuring the economic impact of broadband, and I think that's going to be helpful as we work to get more funding either in a major infrastructure package or in some of the ways that you just discussed.

Mr. Graham, in your testimony, you highlighted a letter that I signed along with several of my colleagues to Chairman Pai regarding Mobility Fund 2. We expressed concern that Mobility Fund 2 should encourage carriers to preserve upgrade and expand mobile broadband and not degrade it. How significant could the loss of service be in rural communities if sufficient operating support is not provided?

Mr. GRAHAM. Well, quite simply, support—excuse me—coverage will be turned down, carriers like us, like C Spire, who have been participants in the Universal Service Program for a long time, used the support that we receive to extend our wireless networks into

rural areas and introduce coverage, introduce networks that then form the foundation for advanced wireless services.

Today, our receipts from the Universal Service Fund has been cut to the point that expansion is no longer an option. What we're doing now is maintaining what has been built. The FCC plans to take the rest of that universal service support away from providers like C Spire, and when that support goes away, the operating expense dollars go away. It is literally that dire. Defunding existing networks in order to fund the expansion or construction of new networks will have that effect.

Senator KLOBUCHAR. OK. One last with a quick answer. I'm Co-Chair of the Next Generation 911 Caucus. The ability to reach help shouldn't depend on your ZIP Code, as you know. In your testimony, you mentioned that some coverage maps, that the FCC overstate coverage. Could this result in an inability to call 911 in areas that appear to be served?

Mr. GRAHAM. Yes, it absolutely could. My answer is as simple as that.

Senator KLOBUCHAR. OK. Very good. And I had a question regarding a letter Senator Fischer and I did on comparable rates in urban and rural communities, and I'll ask that in writing, Ms. Bloomfield.

So thank you very much for your work, all of you.

The CHAIRMAN. Thank you, Senator Klobuchar.

Senator Peters.

STATEMENT OF HON. GARY PETERS,
U.S. SENATOR FROM MICHIGAN

Senator PETERS. Thank you, Chairman Wicker and Ranking Member Schatz, for holding this hearing. And I would like to certainly thank all of our witnesses for your testimony here today.

I represent the state of Michigan, which has vast rural areas in Northern Michigan, and, of course, our beautiful Upper Peninsula, and this is an incredibly important issue for the folks up there. I actually like to think of universal broadband access as something very similar to access to electricity. If you live in a rural area, we made a major focus as a country to make sure that every inch of this country was electrified, believing if you lived in a rural area, you should have equal access to electricity as someone in an urban area, and I think that is every bit as true in terms of this technology in order to advance those communities to allow for economic development going forward.

But before we talk about some of the reforms, I also think that it's very important that we address the issue of incomplete and inaccurate coverage data, and there have been some real issues in Michigan in relation to that. So I was happy to join Mr. Wicker on your bill, the Rural Wireless Access Act of 2017. I appreciate your leadership. I'm very proud to be a cosponsor with you of that legislation. Hopefully we can get Chairman Thune and Ranking Member Nelson to take it up shortly in the broader committee because I think that's absolutely essential for us moving forward.

But my questions are for Ms. Rheuban, and I appreciate your testimony regarding expanding telehealth services into rural America. You have called for expanded Medicaid coverage in those serv-

ices, and, in fact, Senator Gardner and I introduced the Telehealth Innovation Improvement Act, which seeks to do just that, which would require the Department of Health and Human Services to allow eligible hospitals to test telehealth services through the Center for Medicare and Medicaid Innovation. It would also allow telehealth models to be covered by the greater Medicare program if they meet independent evaluation for cost effectiveness and improvement for quality of care, which I believe a lot of these programs will be able to do. Certainly the folks that I represent sometimes have to drive hours to get basic medical care. And now this promises to change that pretty dramatically, but, of course, you have to have access to broadband in order to do that.

My question, though, is, what type of criteria do you believe a telehealth program should meet in order to match a national standard of care?

Dr. RHEUBAN. I don't believe telehealth programs should be held to any higher standard of care than what we do with everyday health care. The National Quality Forum right now is doing actually an analysis of the quality metrics for telehealth programs. There are practice guidelines that have been developed both by the specialty societies in partnership with the American Medical Association and the American Telemedicine Association. And the Agency for Health Care Quality and Research are looking at the quality outcomes of telehealth services.

So I would push back a bit and just say we should not be held to a higher standard in the provision of telehealth services as we are for everyday health care services.

Senator PETERS. Well, as a follow-up, as we push to expand Medicare to cover these new innovative services, how can we collect better data and conduct enforcement to ensure that these programs are truly the best that we can offer?

Dr. RHEUBAN. Well, currently, when we bill Medicare, we bill with specific modifiers, so that data is available, but there are even flaws in the review by Medicare. We had a recent example at the University of Virginia with one of our really great telestroke initiatives and partners, and we had payment retracted by a Medicare intermediary because the originating site didn't bill Medicare for the service, where there is nowhere in statute or in regulation that requires the originating site to bill for the originating site fee.

So there's a lot of misinformation, quite frankly. And I think we can certainly, as telehealth providers, document the outcomes of the services we provide. We bill with the appropriate modifiers, and the Agency for Health Care Research and Quality is evaluating those outcomes.

Senator PETERS. Are you familiar with the legislation that I mentioned that I'm working on with——

Dr. RHEUBAN. No, I'm not.

Senator PETERS. Well, I would certainly look forward to having an opportunity to discuss that further with you, if you had an opportunity to review that bill and give us any input as to how we can make it better.

Dr. RHEUBAN. I would love to.

Senator PETERS. I appreciate your work on this and look forward to working with you. Thank you.

Dr. RHEUBAN. Thank you.
The CHAIRMAN. Thank you, Senator Peters.
Senator Hassan.

STATEMENT OF HON. MAGGIE HASSAN,
U.S. SENATOR FROM NEW HAMPSHIRE

Senator HASSAN. Thank you, Mr. Chair and Senator Schatz, and thank you to the witnesses for appearing today. It has been a very informative panel. I obviously come from a state, New Hampshire, where we have granite to go through. So he has lava, I have granite, and they both present their challenges.

And you've answered a couple of the questions I had, but perhaps starting with Dr. Rheuban and then if the other panelists want to chime in. Obviously, universal service support for rural health care programs is something that we all care a great deal about, and I think we're beginning to gain a growing appreciation of how important and useful it can be.

In states like New Hampshire, not only do we have rural health care programs that could really leverage this technology, but right now in the middle of the opioid epidemic, we're looking for every single tool we have, and certainly in rural areas, telehealth is incredibly important, and the Healthcare Connect Fund will provide Federal support for state and regional broadband health networks.

It's my understanding that the amount for the support last year exceeded the amount of support available for the program. So how should the FCC prioritize this program while balancing the needs of other USF programs that Granite Staters and people across the country also rely on?

Dr. RHEUBAN. Senator Hassan, that's a very appropriate comment. This is a public health emergency, the opioid epidemic. For our program at the University of Virginia, a full 50 percent of our encounters relate to behavioral health services needed by rural patients, and I think this is critical.

The Commonwealth of Virginia has just launched a project ECHO-like model that will connect providers to do case presentations with experts in substance abuse or substance use mitigation, and I think this is a critical element. And as we look to the public health safety component of the Telecommunications Act, we should also then include additional services for rural health providers who choose to participate in such programs.

Senator HASSAN. Thank you.

Ms. BLOOMFIELD. If I could also jump in. So one of the things, too, that's important in these rural areas is that you also have to have that underlying network that helps to connect the clinics to the teaching hospitals and the other infrastructure.

When we look at the rural areas, my folks are community-based companies, so they have every motivation to keep their communities alive and vibrant. And probably one of the biggest keys, with an elderly population, a lot of American vets, is access to health care. So we are—and we worked the good doctor a number of years on some of these initiatives because we see a lot of synergy between broadband providers and the ability for them to connect these community-based entities that really make a difference in the quality of life. So we look to be supportive as well.

Senator HASSAN. Thank you.

Mr. Graham?

Mr. GRAHAM. Yes, and I'll just add, this also gets back to the data coverage, the bad data issue, that we've talked about. In the Mississippi Delta, there as a diabetes monitoring trial that was run, it's referenced in my written testimony, and when the monitoring units were sent to the patients, they were sent to patients for a particular carrier based on coverage maps that showed coverage in that area. Coverage didn't exist in that area, which is how C Spire ended up in the pilot program, a pilot program that based on projections in my written testimony, could save the state of Mississippi $200 million a year in Medicaid.

Senator HASSAN. Sure. Thank you. Well, I appreciate it very much.

I guess the other couple of thoughts I have, and, Dr. Rheuban, maybe you can address this, is one of the other challenges with the opioid epidemic that we have is physician training because a lot of physicians haven't been trained in either pain management or the science of substance use disorders. So I'm wondering if you see, you know, if your rural hospitals have very strong coverage and access, whether this is a way we could also leverage broadband so we could do more physician training around this issue.

Dr. RHEUBAN. Actually my other hat is I am the Associate Dean for Continuing Medical Education.

Senator HASSAN. Yes.

Dr. RHEUBAN. And so we have used our networks in the Commonwealth of Virginia to do training. Now, we also have to do more training in Suboxone prescribing, and that's one of our goals actually in the Commonwealth of Virginia. And so I agree completely with you. The Commonwealth has also mandated, it's not much, but several hours of training for licensure renewal in pain management. And, again, telehealth technologies are a great tool to be able to provide distance learning and educational tools for providers who wish to learn more. So I agree completely.

Senator HASSAN. Well, I thank you all. I think what we're hearing this morning, and I thank the Chair and Ranking Member, is we can all agree on the incredible possibilities that making sure that our entire country sees broadband, has broadband coverage, and is treated as a true utility, there are great possibilities ahead, we just have to find a way to do it. Thank you.

The CHAIRMAN. Thank you, Senator Hassan.

Senator Fischer.

STATEMENT OF HON. DEB FISCHER,
U.S. SENATOR FROM NEBRASKA

Senator FISCHER. Thank you, Mr. Chairman.

Ms. Bloomfield, my colleagues and I have heard frustration about the prices for and also the availability of standalone broadband, and even after the reforms to the Universal Service Fund, many operators are unable or they're unwilling to offer such services because the prices are still very high. Recently, 57 of my colleagues and I sent a letter to the FCC Chairman expressing our concern about the lack of sufficient resources and the reformed High Cost

mechanism. So how has the FCC's treatment of standalone broadband impacted deployment in our rural communities?

Ms. BLOOMFIELD. So I think we're going to start to see that, Senator Fischer, and I think it's terrific you've been hearing from your carriers. The state of Nebraska is going to be impacted to the tune of about $3.6 million this year in terms of money that folks had actually invested that will not be coming back in on the non-model side of the house.

So what folks are doing, we actually, as I mentioned, just on the survey, we found that 65 percent of our companies are now pulling back on their investments. So things that they had planned to do, infrastructure they had planned on putting into the ground, they are no longer going to go forward with, or where there were areas they thought they were going to hit higher speeds, they are not going to be able to go forward.

And to your point on standalone broadband, the price point simply is not there because of these budget mechanisms. So we need to find a way. And, again, it's such a small amount, but it's so critical to these carriers that have already made these investments to get those fully funded.

Senator FISCHER. OK. Thank you.

For the entire panel, we had the Department of Transportation Secretary here before the Committee not too long ago, and Secretary Chao has said that broadband deployment could be included in the administration's infrastructure package. As Congress considers infrastructure priorities, what role do you believe that the states should play in order to support broadband buildout? And should the Federal and state funding have different roles?

Who would like to begin?

Ms. BLOOMFIELD. All right. I'll do the buzzer. So I will be honest with you, when we've been talking a lot to many folks across town about infrastructure, and I think it's a little bit of a longer term proposition, but the one thing I will say is to be looking at a mechanism that is in place already. So that's where I immediately go to universal service because you're not creating a new program. Now, granted, states may have a role, and we already see states having Universal Service Funds that help to supplement, which I believe you may have in Nebraska, that supplement the cost on the back end. I think there are ways to be looking at completely unserved areas; that's something that I know a lot of folks have looked at NTIA or RUS or some of these other entities for. But I will say I think we'd be really remiss to not look at the FCC and universal service with the mechanism that has now been reformed——

Senator FISCHER. Is that High Cost? High Cost?

Ms. BLOOMFIELD. High Cost, and I think, you know, potentially even wireless. I see the button getting ready to go. Because there are some needs, and we know where the needs are, and they're ready, it just needs the infusion into the system.

Senator FISCHER. OK. Mr. Graham.

Mr. GRAHAM. Yes, I would agree. There's a role for the states to play, and currently some of the states do play that role in certifying eligible telecommunications carriers who can receive universal service support. I know in Mississippi, we receive input from

the Public Service Commission routinely about areas that they have identified that lack coverage, and we work together on what our coverage plan will be for the coming year.

So there's a role for states to play, and I think states in particular can determine some of those areas where coverage is lacking and then find local providers then who are willing to make that initial investment to get broadband into these rural areas that are unserved or underserved either through fiber or through wireless or other technologies.

Mr. BALHOFF. On the basis of the financial issues that exist out there, most of the carriers will look at grant monies as a one-time type of thing, but ultimately their real concern is, what can they expect over the longer period of time? So the kind of support.

And it actually goes back to what Senator Schatz was talking about before, which is a contribution mechanism. We have to find a better solution so there is more predictability. So the carriers that we provide advice to—and there are a very, very large number of those across the country—they wrestle with the unpredictability of the monies that will be there for operating the networks.

So building the networks is one thing, which everybody pays attention to, and they don't really understand the nature of the problem. I will suggest the data collection problem is not simply the one that we are dealing with here where there is service or there is not service, it's to understand the evolving problems that are coming in rural America.

So, for example, a number of the carriers are terribly concerned about the amount, the volume, and the over-the-top video services that are there, and so they're finding themselves more and more pressed without the necessary revenues to be able—that is, universal service—to be able to support these problems.

The problems are different today than they were 10 years ago or 20 years ago. So when I first started providing financial analyses to these communities, it became obvious to me that things were relatively stable. Today things are changing so rapidly, and the pressures on the networks are very, very significant. So we need to understand the nature of the problems that are affecting broadband deployment and ongoing operating costs, and that's more than a single——

Senator FISCHER. Should the Federal Government be responsible for one of those roles and the state funding then be responsible for another; one for construction, one for operation?

Mr. BALHOFF. Well, I will tell you I have a bias toward the states because the states are very, very close to the problems that are there. So the Commissioners that I've worked with at the state level are usually very sophisticated. I will admit somewhat candidly, and it's impolite to say this, that the bench at the state level is much thinner than it used to be.

So it used to be that there were a lot of telecom commissioners who understood the nature of the problems. More and more of the commissioners are paying attention to the energy issues than the telecom issues, so we find not as good an understanding at the state level today as it was 5, 10 years ago. And this is my judgment.

Senator FISCHER. Thank you, sir.

Thank you, Mr. Chairman.
The CHAIRMAN. Thank you, Senator Fischer.
Senator Capito.

STATEMENT OF HON. SHELLEY MOORE CAPITO, U.S. SENATOR FROM WEST VIRGINIA

Senator CAPITO. Thank you, Chairman Wicker. Thank all of you for being here today. I think what you hear on both sides obviously is we're unified in our concerns. We have very similar concerns, which is interesting. You've heard a lot of different bills that have been introduced. I'm from West Virginia, and we don't go through lava, we go through mountains and coal, and we have some of the lowest deployment of high-speed Internet in the country, if not the lowest. Consequently, you're left behind. I used to say it's economic, it's medical, it's education, but I've now added tourism and agriculture, as I listen to my colleagues talk about the challenges in different areas.

I recently introduced the Gigabit Opportunity Act to get to the money issue, which would seek expedited deployment of broadband services in low-income, rural, and urban communities. It gives the states flexibility, streamlines existing regulations, and eliminates barriers to investment to try to bring more private investment to go with the Universal Service Fund investments that we see in the states. I'm encouraged that Representative Collins, over on the House side, has introduced a companion bill.

One of the questions that I have comes after hearing NTIA mention the FCC and rural development along with USDA rural development. We're dealing with three different Cabinets. I don't want to say maybe too far displaced from one another, but we have $38 million now coming to support 89,000 eligible locations across our state for the Universal Service Fund. I'm concerned when I hear the reporting and the 477 data issue because in a recent OIG report, it said that the BTOP funds now say we had showed $4.7 million in costs that were unallowable. So accountability is what I'm getting to here.

I guess, what would you say are the checks and balances that would make you feel like mistakes like that aren't going to happen again?

Mr. Graham, I'll start with you.

Mr. GRAHAM. Thank you for the question. I think, as Ms. Bloomfield said, using an existing program such as the Universal Service Fund prevents you from having to stand up a new program and create checks and balances. The Universal Service Fund includes audit provisions, USAC audit provisions. And we were audited, since 2008, we were audited, I believe it's seven times, including a couple of onsite visits in back-to-back years. These were random audits that happened to spring up at the time when USF reform was hot and heavy, and we were very involved in it. But the auditing provisions are already in place in this existing program.

Senator CAPITO. On the auditing side, are you talking auditing just on the financial side or are you talking auditing on the reporting side as to actual service deployment? How accurate are those numbers? Are you audited on that?

Mr. GRAHAM. On the onsite visits we were, so we had auditors who came, camped out in our office, went through the financials, and then verified that——

Senator CAPITO. Was that service delivered at the levels that it was promised?

Mr. GRAHAM. That's right, the locations. And also the Public Service Commission, who certifies us as an ETC designee each year, verifies that the equipment that we claim to have put in service is in service.

Senator CAPITO. Is there any clawback mechanism in that? If you're not delivering the service and if you're found to not be providing the service, are there clawback funds?

Mr. GRAHAM. I'm not aware. I'm not aware of a clawback provision other than just the practical penalty of having equipment deployed because the money is spent up front.

Senator CAPITO. Right.

Mr. GRAHAM. So there is no incentive to deploy the equipment and then not provide the level of service that the equipment is designed to provide.

Senator CAPITO. Did anybody else want to answer?

Ms. BLOOMFIELD. So I would also just jump in. I completely agree with Mr. Graham about that, and between the NECA pool oversight, the USAC audits.

The other thing that I think is going to be really helpful, and particularly in a case such as West Virginia, is that with the reforms that the FCC approved last year, you literally now have to geocode where your infrastructure is going. So it is literally—you know, when you're doing new locations or you're doing upgrades, that is all geocoded to exactly where you are committing to spending the money. So I think we're going to see even more accountability and transparency going forward.

Senator CAPITO. Thank you.

Dr. Rheuban, telehealth holds great promise for a state like mine, many of ours. We're an elderly state, too. I'm wondering if in your experience, if you find that a barrier for your older patients, as remote patients. How is the acceptance level with that? And what kind of ideas you might have there for the deployment of telehealth for more seniors?

Dr. RHEUBAN. Thank you, Senator. Actually, our seniors love telehealth. First of all, telehealth reduces the burden of travel. We've reduced the burden of travel in our UVA telemedicine program by more than 17 million miles for 60,000 clinical encounters. They love remote patient monitoring, so we've deployed a remote patient monitoring care coordination program to the home for our patients, many of whom are seniors and Medicare beneficiaries, and they love it. The adoption rate is great. The continuation is great. And so I find that our seniors are very much supportive of receiving high-quality care, whether it's in home settings or in their community setting. It's easy and it's well done.

Senator CAPITO. Well, you're making a better case then for better and broader broadband deployment to the rural areas especially where a lot of our seniors live.

Dr. RHEUBAN. Absolutely.

Senator CAPITO. Thank you so much.

The CHAIRMAN. She surely is. Thank you, Senator Capito.

Senator Baldwin.

And a vote is taking place, but I think we can squeeze this in, and they'll wait just fine.

STATEMENT OF HON. TAMMY BALDWIN,
U.S. SENATOR FROM WISCONSIN

Senator BALDWIN. Very, very good. Thank you, Mr. Chairman.

This sort of flows well from the questions that Senator Fischer was asking about appropriate role of the Federal level and appropriate role of the state level. But, in particular, I wanted to share a reflection of a roundtable with stakeholders that I had in northern Wisconsin.

Eagle River in Vilas County, it's about as far north as you can get without being in the Upper Peninsula of Michigan, and they have been doing some really interesting things there. First of all, surveying their summer residents, and asked, "If there were broadband access, would you stay longer?" and found on average that probably about 2 weeks a year would be the estimate of how much longer people would stay, with probably an enormous impact to the local economy.

But the other thing that they were motivated to do in that community is in addition to the regular planning that governments go through—budget planning, infrastructure planning, et cetera—they put together a technology plan for their county. And from what I got to hear in our short time together, it was pretty visionary. But their frustration I think is that the Federal programs that are set up don't necessarily give their plans and their vision a voice.

So, Ms. Bloomfield, I'm wondering if you agree that there should be more engagement with local and state planning processes especially where the local ones exist. And if so, what could or should that look like in USF programs or other ways in which we might invest in broadband in the future?

Ms. BLOOMFIELD. It's an excellent question, and I know there's a lot of frustration in areas that are currently unserved or underserved today. One of the things we've been trying to do, one of the things we find, is the first part is getting people to talk to each other and having these conversations, right? So you've got folks in Eagle River. There probably are—the state of Wisconsin has about 30 independent providers out in the state. You know, it's getting folks together who can actually have these conversations about, "What are your needs? And how can we help?"

One of the things that we actually just released about a week ago is a Web portal called Partnerships in Broadband, where we are literally opening it up to electric cooperative communities, to municipalities, to folks who are looking to have some of those critical conversations about, "We have a need, but we need somebody to potentially partner with because, frankly, broadband is really expensive and it's very tough to do. You've got to do a lot of assessments, you've got a lot of regulations you need to comply with."

So one of the things we're trying to do is take that middle piece out and say, "We've got a need. How do we connect people with needs to possibly entities that might be interested and able to come in and support some of those needs themselves and provide that

service?" My carriers could frankly use more customers, and I think that rural Americans living in those remote communities have needs.

So we're trying to think a little bit out of the box. But how do you actually connect these dots in a way that makes sense on a local or a state level? Where USF comes into play, you know, obviously I would see some of those areas increasing the needs even further, but we'd be happy to at least get enough momentum to start having some of those discussions as well.

Senator BALDWIN. Thank you. Pivoting now, Dr. Rheuban, in your testimony, you highlighted the progress that the University of Virginia has made in improving stroke evaluation and treatment through telemedicine. I've been particularly concerned about access to quality stroke care for our Nation's veterans, especially those veterans living in rural areas in Wisconsin. And unacceptably, there have been cases in which veterans have died or have suffered severe injury due to lack of timely stroke diagnosis and treatment.

How can we strengthen and improve USF programs to make this type of care available to more veterans in particular? And would greater support allow your center to partner and work with more institutions including the VA facilities in providing telestroke care to veterans in rural areas?

Dr. RHEUBAN. There is a tremendous opportunity with telemedicine in terms of reducing the burden of and complications of stroke. We would love to work with the Veterans Health Administration, and we have reached out, and we do have partnerships with the VHA hospitals in the Commonwealth of Virginia. We have a Virginia State Stroke Systems of Care Task Force. And, in fact, our FCC pilot program, funded a number of years ago, was built around our need to expand access to stroke services. It was the Virginia Acute Stroke Telemedicine Initiative.

We have done some phenomenal work, as have others. It is really now considered the standard of care for stroke patients. And I will tell you that in our telestroke network, patients at a rural community hospital can receive TPA, the clot-busting medication, at the same rate they might receive it because of telemedicine if they had been a Charlottesville-based patient who showed up in our emergency department.

The other element that we have also integrated into our telestroke program is access to stroke neurologists from the EMS vehicles, so that our stroke neurologists are actually evaluating patients the moment they set into the ambulance and traverse the distance to UVA, so that it can reduce the time for treatment, which is a 3-hour window for TPA administration. There are other services that can be informed by telemedicine, such as device retrievers and other things that can be done.

So absolutely we all need to be at the table together. This is the standard of care for stroke patients. And how we can incent hospitals and providers to collaborate is a really important opportunity.

Senator BALDWIN. Thank you.

The CHAIRMAN. Thank you, Senator Baldwin.

Senator Cortez Masto. You got me worried there.

STATEMENT OF HON. CATHERINE CORTEZ MASTO, U.S. SENATOR FROM NEVADA

Senator CORTEZ MASTO. Thank you. Thank you, Mr. Chair. And I'm so sorry I wasn't here for the initial start of the hearing. I have a competing hearing going on, and so I was trying to make sure I covered both. And thank you for your comments that I was able to take a look at prior to the hearing today.

Let me just say I'm from the state of Nevada. We have rural and urban communities. Rural broadband is key, and it is so important. I believe we need to invest in this infrastructure to open doors to services that we know are challenged in our rural communities, and one of those is this telemedicine that is so important.

And so let me follow up on the question that was asked by my colleague, Dr. Rheuban. And you may not know this, and let me open it up. But can you give me a sense of how advanced or fast the broadband infrastructure needs to be in these communities in order to utilize these types of services?

Dr. RHEUBAN. For our telestroke network, we have deployed 100 megabit connections, and they are affordable, quite frankly. Where hospitals might, you know, without the Universal Service Fund, spend $3,500 a month, we now, with the Universal Service Fund, have been able to reduce that cost to $350 a month for that hospital, the net cost, which is affordable for a community hospital. $3,600 a month is pretty pricey. So, you know—and we need to do a lot with that connection. So that hospital is sending CT scans, which are imperative for stroke services, as well as deploying high-quality video conferencing. Could we do it with less? Yes, I think we could do it with less, but the more we have, the better we are. The higher the quality, the higher quality video conferencing can be supported with a higher bandwidth.

Senator CORTEZ MASTO. Thank you. And let me just throw this out here as well because it's not just telemedicine, it's education——

Dr. RHEUBAN. Sure.

Senator CORTEZ MASTO.—that we could bring to communities, right? It is treatment services, it is social services. There are so many benefits that we know that particularly our rural communities are challenged to get professional services in those communities.

Let me jump onto another subject, which is siting issues. In Nevada, 85 percent of the land is public land, and we work very closely with our Federal partners, but there are challenges, as we all know, that, yes, we want to bring broadband, but there are siting issues. And so let me open this up again to a question on how we should be looking at better coordination to address this issue so that we can open the door for the infrastructure?

Mr. GRAHAM. That's an excellent question. I'll address it because our company is involved in permitting issues for both fiber construction, which we do, but also wireless construction. And anything that can be done to streamline that process, to let a report that's done for environmental impact, for instance, be shrunk to begin with, and then be enough to satisfy multiple agencies, would be a great start.

Streamlining the process would make a tremendous difference for us, and we're on the larger end of a lot of the wireless providers that are not the big four. Smaller wireless providers have it even worse. And we also are on the larger end of some of the fiber providers, and on the smaller end of that, they have it even worse because the reports cost the same whether you're large or small, it's based on the size of the project.

Senator CORTEZ MASTO. Right.

Ms. BLOOMFIELD. I completely concur, Senator. And what we're finding is as you have to go through multiple agencies, multiple hoops, it really delays the time of actually the expansions. So what we're seeing is it's actually holding down things that actually could be done immediately are taking that 12 to 18 months to get some of that permitting done. And what we find is everybody again has different processes, so if you've got to get something that's through RUS and through BLM and maybe you've got to go through some NEPA hoops, it's just very tough to get a project up and running. So streamlining that would be extraordinarily helpful.

Senator CORTEZ MASTO. Thank you. And thank you all for being here today. I appreciate the conversations and the comments. This is an important topic. Thank you.

The CHAIRMAN. Thank you, Senator Cortez-Masto.

The hearing record will remain open for 2 weeks. During this time, Senators are asked to submit any questions for the record. Upon receipt, the witnesses are requested to submit their written answers to the Committee as soon as possible. Give your own definition for that.

[Laughter.]

The CHAIRMAN. We would appreciate it within 2 hours, I think, or longer if you need be.

So thank you very much. This has been a very good hearing. And this hearing is now adjourned.

[Whereupon, at 11:19 a.m., the hearing was adjourned.]

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