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Sent: Friday, June 15, 2018 4:56 PM
To: Comments, Urc; Heline, Beth E.
Cc: Jeremy Fetty; ATerrell@ineca.org
Subject: IUSF-Broadband Study - Comments of INECA
Attachments: INECA - GAO 2018-3 - Comments of INECA with Attachments.PDF

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Good Afternoon:

Attached please find the comments of INECA responsive to the study topics set forth in the Commission's GAO 2018-3 (IUSF-Broadband Study).

Kind regards,

Liane K. Steffes

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**COMMENTS ON BEHALF OF
INDIANA EXCHANGE CARRIER ASSOCIATION, INC.
TO THE INDIANA UTILITY REGULATORY COMMISSION
REGARDING IUSF-BROADBAND STUDY**

**COMMENTS ON BEHALF OF
INDIANA EXCHANGE CARRIER ASSOCIATION, INC.
TO THE INDIANA UTILITY REGULATORY COMMISSION
REGARDING IUSF-BROADBAND STUDY**

The Indiana Exchange Carrier Association, Inc. (“INECA”) and its member companies are dedicated to the promotion of state-of-the-art telecommunications facilities and services throughout rural Indiana. The purpose of INECA is to advocate for its member companies on federal and state issues, to educate government leaders, as well as the public at large, on the importance of modern telecommunications to rural communities and to ensure that voice, broadband and video services comparable to those available in urban and suburban areas are available in the rural areas of Indiana at affordable prices.

INECA consists of 33 local exchange companies¹ that service thousands of telephone access lines throughout rural Indiana. In addition to providing quality telephone service, the companies and their affiliates also provide a broad array of telecommunications services. These include broadband Internet services, long-distance services, and in many cases, video, wireless, security, and information technology services. The INECA companies play a significant role in the economy and the well-being of the communities they serve. These companies make millions of dollars in infrastructure investments annually and employ hundreds of Hoosiers.

¹ INECA’s membership includes: Bloomingdale Home Telephone Company, Inc.; Citizens Telephone Corporation; Clay County Rural Telephone Cooperative, Inc. d/b/a/ Endeavor Communications; Craigville Telephone Company Inc.; Daviess-Martin Rural Telephone Corporation d/b/a RTC Communications; Geetingsville Telephone Company Inc.; Hancock Rural Telephone Corporation d/b/a NineStar Connect; Ligonier Telephone Co., Inc.; Monon Telephone Company Inc.; Miles Communications, Inc. d/b/a Enhanced Telecommunications Corp.; Mulberry Cooperative Telephone Company, Incorporated d/b/a Mulberry Telephone Company; New Lisbon Telephone Company Inc.; New Paris Telephone Inc.; Northwestern Indiana Telephone Company Inc. d/b/a Nitco; Perry-Spencer Rural Telephone Cooperative Inc. d/b/a PSC; Pulaski White Communications, Inc. d/b/a Lightstream; Rochester Telephone Company Inc.; Southeastern Indiana Rural Telephone Cooperative Inc. d/b/a SEI Communications; Smithville Telephone Company, Incorporated d/b/a Smithville Communications; Swayzee Telephone Company, Inc. d/b/a Swayzee Communications Corp.; Sweetser Rural Telephone Company Inc.; TDS Telecom Companies (Camden Telephone Company Inc., Communications Corporation of Indiana, Communications Corporation of Southern Indiana, Home Telephone Company Inc., Home Telephone Company of Pittsboro Inc., Merchants and Farmers Telephone Company d/b/a TDS Telecom-Hillsboro., S & W Telephone Company, Inc., Tipton Telephone Company Inc., Tri-County Telephone Company Inc., West Point Telephone Company, Incorporated); Washington County Rural Electric Telephone Cooperative Inc. d/b/a Tele-Media Solutions; and Yeoman Telephone Company Inc.

IUSF-Broadband Study

In GAO 2018-3, the Indiana Utility Regulatory Commission (the “Commission”) invited service providers, customers, and interested stakeholders to provide written comments on the study topics set forth below. INECA hereby provides its comments to those study topics.

Study Topic 1 -The types of service on which the Indiana Universal Service Funds (“IUSF”) surcharge is imposed.

Response - The IUSF surcharge is imposed on intrastate retail communications services, examples of which include, but are not limited to, the following:

- Local service
- Service establishment charges
- Custom calling services
- Intrastate subscriber line charges
- Intrastate long distance
- Directory assistance
- Non-published number fees
- Paging

The IUSF surcharge is not imposed on interstate or non-telecommunications services, such as:

- Interstate long distance
- Interstate subscriber line charges
- Wholesale services
- Voicemail
- Directory advertising
- Video services
- Internet access or broadband services

At this time, INECA supports maintaining the status quo regarding the types of service upon which the IUSF surcharge is imposed.

Study Topic 2 - The types of service for which disbursements from the IUSF may be used.

Response: Currently there is no limitation on what type of services for which IUSF disbursements can be used. INECA supports maintaining the status quo in this respect.

Study Topic 3 - The eligibility requirements for service providers to receive disbursements from the IUSF.

Response: The Commission's March 17, 2004 Order in Cause No. 42144 approved a settlement agreement that created the IUSF (the "Settlement Agreement"). The eligibility requirements for service providers to receive disbursements from the IUSF, as set forth in the Settlement Agreement, are as follows:

Disbursement Eligibility:

- a) Designation as an ETC (eligible telecommunications carrier);
- b) Offer the services and functionalities identified by the FCC's rules described in 47 C.F.R. g 54.10 1(a) adopted by the IURC in its order in Cause No. 40785 dated October 28, 1998, which are:
 - i. Voice grade access to the public switch network;
 - ii. Local usage;
 - iii. Dual multi-frequency signaling or its equivalent;
 - iv. Single party service or its functional equivalent;
 - v. Access to emergency services;
 - vi. Access to operator services;
 - vii. Access to interexchange service;
 - viii. Access to directory assistance; and
 - ix. Toll control services for qualifying low-income consumers.
- c) Benchmark Rates: RLECs (rural local exchange carriers) required to set rates at a minimum rate level for residential and single-line business basic local exchange service; and
- d) Qualification test: the passing of a "Qualification Test" required for disbursements from the IUSF absent special circumstances completed from

information provided within the RLECs' annual reports to the Commission or, with respect to those RLECs not within Commission jurisdiction, from their year-end "Part 32" financial statements prepared in compliance with FCC orders

INECA supports maintaining the status quo with respect to current eligibility requirements to receive disbursements from the IUSF.

Study Topic 4 - Broadband deployment (expansion and improvement of access to broadband services).

Response: INECA membership has been at the forefront of broadband deployment in rural areas of Indiana, experiencing success in deploying broadband in and outside of their ILEC territories.

However, the INECA members face significant challenges in broadband deployment, primarily from a financial perspective. See below for information from certain INECA members regarding broadband deployment projects and the costs thereof (please note, such projects are not necessarily inclusive of all of a member's broadband projects), and see also the Indiana Broadband and Technology Association's 2018 Indiana Report on Broadband Progress, attached hereto as Attachment C, and Vantage Point Solutions' report on Deploying a Broadband Network – From Start to Finish (and Beyond), outlining procedures associated with deployment and upkeep of broadband-capable networks, attached hereto as Attachment D.

NineStar Connect. NineStar Connect was born of a merger between Hancock Telecom Indiana Rural Telephone Company and Central Indiana Power, an Indiana rural electric membership corporation. NineStar Connect also provides sewer and water services. Currently, it has approximately 15,000 customers in its electric division, 12,000 customers in its communication division, and 600 customers in its water and sewer division. As of April 1, 2018, 5,500 of its electric members were also communications customers. By the end of 2018, 100% of NineStar's customers will have access to fiber to the home technology. To the far east of NineStar territory, there are no competitors, and the area is very rural. To the far west, there are several providers that NineStar competes with, and the area is very suburban.

NineStar believes that deploying fiber optics in the underserved areas of rural America helps communities thrive and, as a result, offers residents better quality of life. One example of this is in Blue River Township, where a recent college graduate was able to start a global business in the animal nutrition field and, thus, stay on the family farm. Had it not been for connectivity, he would have had to move away from the community for the same opportunity.

NineStar Connect began deploying residential Fiber-to-the-Home (FTTH) network to its regulated telecom territory in 2002. Beginning in 2011, NineStar Connect began phase deployment in its electric service territory, which will be completed by fall of 2018. NineStar Connect currently owns, leases, and manages 1,506 miles of backbone and distribution fiber and currently has 40 miles of work in progress. NineStar Connect offers gigabit Ethernet services, it can offer speeds of up to 1 gig for residential and its active fiber can provide businesses speeds of up to 10 gig.

The backbone of the NineStar Connect network was built using legacy Rural Utilities Service (RUS) funds under the telecom program and its participation in the FCC Universal Service Fund as a rural telecom provider. Additional extensions to expand the network have been financed by gross customer telecommunication revenues that have accompanied the growth of the network. In 2002, NineStar Connect reinvested millions of dollars into building its fiber network, partly financed through RUS low interest loans, in addition to capital expenditures.

NineStar Connect's partnerships have allowed it to expand its fiber footprint. Currently, partners of Johnson County REMC have deployed fiber in their territory for businesses and residential customers. In 2015, the corporate median expense for customers was \$158.68, but was only \$124.36 for Ninestar Connect because of saved deficiencies. NineStar connect finds the demand which is created for broadband in communities concerning because of the difficulties in managing expectations with how quickly and cost effectively it can be deployed to all.

Rochester Telephone, RTC Communications. As it already has fiber to the home to all customers in its exchange, Rochester Telephone Company has been investing in the expansion of its fiber to the home internet services to underserved areas outside of its exchange. Two years ago, it took fiber into Argos, Indiana and is currently providing high speed fiber internet service to over 100 customers in Argos. Most recently, RTC has partnered with Marshall County REMC creating Marshall County Fiber, LLC. The partnership has built out a neighborhood in Marshall

County in order to expand broadband into an area identified by Marshall County REMC as underserved. The first neighborhood was viewed as a pilot and totaled 60 homes. This took 3.5 miles of fiber and \$200,000 in costs, not including approximately \$1,000 per customer for electronics and drop costs to/for each home. 25% of the potential customers signed up for internet service within the first month with 40% of those taking a speed package above the base offering of 50Mb. The partnership is now in the process of building to three additional neighborhoods - passing 170 homes and businesses. In the initial stages of the partnership, RTC has seen strong interest from consumers in these rural areas. RTC hopes there can be financial justification to continue the expansion of this partnership and fiber build to Marshall County REMC's customers in rural Marshall County.

Perry-Spencer Rural Telephone Cooperative, Inc. d/b/a PSC. PSC has been constructing a cooperative-wide Fiber-to-the-Home (FTTH) network since late 2010. In order to finance this project, PSC relies on federal and state revenue and support mechanisms...federal USF, cost recovery, access, etc. But due to reductions to these revenue streams and support, PSC sought and received funding from the Rural Utility Service (RUS) in the form of a \$30M low interest rate loan to pay for the bulk of the project.

To date, PSC has completed approximately 72% of its fiber build at an approximate cost of \$32.5M. The average cost of connecting cooperative members to date is \$8,430 per drop. The remaining network build out will cost approximately \$17.5M at an average cost of \$10,294 per drop, due to remaining cooperative members residing in higher cost serving areas.

Current plans have 100% of the FTTH network to be completed by year 2022. This, however, is dependent on any change in the regulatory landscape and its effect on revenue streams and support mechanisms currently in place.

Citizens Telephone. Citizens has completed its fiber to the home project for the town of Warren, Indiana and about two miles into the surrounding rural. 100% of the fiber is buried, which took \$4.5 million to accomplish (total for labor/fiber/ back office/ modems, etc.), and passes about 700 homes. Citizens' take rate is 65%. Citizens had a lot of people concerned that it was going to raise its rates. As such, Citizens started with the same price and speed as it had before on DSL. As Citizens still had 400 people on DSL, it believed it the best way to launch.

Customers were immediately unhappy that they were not getting any more speed. Citizens had offered affordable packages for higher speeds, but had no takers. Eventually, Citizens doubled the speeds for the same price as before and are now seeing some customers to upgrade to higher speeds - 64 total so far.

Smithville Telephone. Smithville built 8,278 feet of buried 48 fiber through a residential subdivision, Windsor Private (North of Bloomington, Monroe County), located in a rural area that passes 41 residential customers. The project cost \$185,000 or \$4,512 per home passed. Of these 41 customers, Smithville signed 33 to internet services and 33 to voice services.

In Overlook/Windfree Estates (South of Bloomington toward Lake Monroe), Smithville built 16,592 feet of fiber, of which 12,078 was buried and 4,514 was aerial, and the fiber routes passed 102 residential customers. The project cost \$254,408 or \$2,651 per home passed. Of these 102 customers, Smithville signed up 46 to Internet services and 46 to voice services.

In Pointe MDU (Rural Monroe County, off Lake Monroe), Smithville built 76,550 feet of buried fiber in an area where the terrain is mostly bedrock, and the fiber routes passed 987 residential customers. The project cost \$6,626,800 or \$6,715 per home passed. Of these 987 customers, Smithville signed up 661 to internet services and 460 to voice services.

In Griffin (Posey County), Smithville built 315,674 feet of buried fiber in a very rural area and the fiber routes passed 345 customers. The project cost \$3,937,052 or \$11,412 per home passed. Of these 345 customers, Smithville signed up 168 to internet services and 166 to voice services.

Daviess-Martin Rural Telephone Corporation d/b/a RTC Communications. In 2017, RTC was approached by the Daviess County Economic Development Committee to discuss a partnership to deploy fiber to an area in Washington, Indiana located in Southwest Indiana. This partnership was a driving force in the city of Washington's efforts to convince M&C Tech, a new Japanese residual manufacturing facility, to locate its new American operation to Washington. This project was also designed to serve over a dozen commercial and enterprise customers located in an unserved area in Washington.

In late 2017, RTC embarked on additional self-funded edge-out projects located in Daviess County. These projects were designed to deploy FTTH to an area within Daviess County that was unserved by a traditional land-based provider. RTC also deployed fiber in an AT&T

area south of Plainville, again unserved by a traditional land-based provider. These projects brought fiber to the home to of an additional 54 rural Daviess County residents as well as to one sizable enterprise commercial customer and 5 small business. To date, RTC has connected fiber to nearly 43 residential customers in rural Indiana and to all 6 of the commercial customers, delivering industry leading fiber internet and access to Gig speed service.

All aforementioned projects were completely funded by RTC with zero outside grants or loans making the take-rate crucial in delivering a strong return on investment. Unlike most residential projects located in a competitive area, the take-rates are never at the levels needed to secure a solid return on investment. The projects had no competitive environment from a land-based provider, so the RTC project located 3 miles south of Washington was able to net 36 residential data customers out of 43 households, and the Plainville project netted 7 data customers out of the 12 households served. In a competitive area, the take-rates would have prevented these projects from meeting a reasonable return on investment as nearly \$80,000 dollars was spent to deliver said services.

As a side note; the projects, though unserved by a traditional land-based provider, were ineligible for any USDA funding, as cellular data was available in the relevant areas.

New Lisbon Telephone Company, Inc. One of New Lisbon's fiber projects is six miles in length, cost approximately \$266,000 (\$44,333 per mile) to construct, and has the potential of serving 34 customers. New Lisbon estimates cutover costs of \$1,000 per subscriber (fiber drop, ONT, and labor) and a total cost per customer of \$8,824.

TDS Telecom. See Attachment E.

Study Topic 5 - Any other matter concerning universal service reform that the Commission consider appropriate.

Response:

INECA members support finding ways to support and fund rural broadband and are committed to providing broadband services to their customers, as illustrated above. However, the IUSF, put in place to replace lost intrastate revenues as a result of mirroring, is not the appropriate funding mechanism for broadband. The IUSF was established in 2004 to promote universal telephone service by ensuring its availability at just, reasonable and affordable rates that are reasonably comparable between rural and urban areas of Indiana.

There is a strong continued need for support for providing telephone service to Indiana's rural residents and businesses. The importance of reliable landline phone service cannot be overstated, and landlines continue to play an important role in telecommunications for rural residents and businesses. People in rural areas use landline telephone to apply for jobs, call 911, run their businesses, and reach their doctor, loved ones, and elected officials. Currently, landline service is the most affordable, accessible and reliable communications tool in rural communities. There remain practical limitations of wireless, fiber, and other broadband mechanisms in rural areas. We must ensure that the current technology transition remains an opportunity to increase investment in rural communities and does not become a process that takes away communications tools from rural Americans.

The decline in the number of access lines and Federal Communications Commission (FCC) intercarrier compensation reforms have led to a substantial loss of intrastate revenues for the INECA members and have the potential to result in further reductions in revenue. As addressed in the direct testimonies of Chad Duval and Larry Landis, filed in the most recent IUSF Triennial Review in Cause No. 45064 and attached hereto as Attachments A and B, respectively, this situation is becoming increasingly dire, with most of INECA's members currently operating at significantly below their nominally authorized rate of return and some at negative rates of return.

As discussed by Mr. Duval in his testimony, based on an analysis of 25 INECA member companies that receive IUSF support who provided five years of historical IUSF Qualifications Test data for the years 2013 through 2017, a five-year average rate of return for each company

and all 25 companies in total was developed. Of the 25 companies, only one was found to be earning more than the rate of return cap of 11.50% based on a five-year average. The remaining 24 companies earned less than 11.50% on average, including 10 companies that had negative rates of return for the five-year period.

As discussed by Mr. Duval in his testimony, in its 2011 USF/ICC Transformation Order,² the FCC ordered the unification of interstate and intrastate terminating switched access rates over two years, which was completed in 2013, and a further seven year transition of interstate and intrastate terminating switched access rates to bill and keep (\$0.00 per minute of use). Effective July 1, 2018, intrastate terminating switched access revenues will be approximately 69.83% of what they were at the same point in 2011. The FCC has yet to address reform of intrastate originating switched access. However, in a Public Notice dated September 8, 2017, the FCC sought further comment to refresh the record on intercarrier compensation reform related to the network edge, tandem switching and transport, and transit.³ In doing so, the FCC made it clear that it continues to consider further reforms to terminating and originating intercarrier compensation rates, both of which could impact the intrastate revenues of the INECA member companies as the result of mirroring interstate rates. There is no way to know for sure what the FCC will do if and when it addresses further reform of intercarrier compensation. Depending on the FCC's treatment of intrastate originating switched access, it is possible that further reductions in intrastate switched access revenues will occur at some point in the future.

It is important to recognize that INECA members must satisfy the provider of last resort ("POLR") statutory requirements under Indiana Code § 8-1-32.4 *et seq.* and, as a result of such requirements, irrespective of number of access lines and declining revenues, must financially support the maintenance of the telephone network. Thus, even though the number of access lines, and, coincident thereto, revenues, have declined, INECA members are statutorily required to continue maintaining their systems regardless.

Given these revenue declines that INECA members are experiencing and are likely to continue experiencing due to loss of access lines and FCC ICC reforms, IUSF disbursements are critical, more so now than ever, to support INECA members in providing affordable, accessible

² *Connect America Fund et al.*, WC Docket No. 10-90 et al., Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663 (2011) (*2011 USF/ICC Transformation Order and/or FNPRM*), *aff'd sub nom*, *In re: FCC 11-161*, 753 F.3d 1015 (10th Cir. 2014).

³ See DA 17-863, released September 8, 2017.

and reliable landline service to the least served, Hoosiers living in low-income, rural, and high cost areas, and in meeting their POLR statutory obligations.

Please Address Questions to:

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May 24, 2018
INDIANA UTILITY
REGULATORY COMMISSION

STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

IN THE MATTER OF THE COMMISSION’S)
TRIENNIEL REVIEW OF THE INDIANA) CAUSE NO. 45064
UNIVERSAL SERVICE FUND)

SUBMISSION OF DIRECT TESTIMONY

The Indiana Exchange Carrier Association, Inc. (“INECA”), by counsel, hereby submits
in the above referenced Cause the Direct Testimony of Chad Duval.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Direct Testimony of Chad Duval was served upon the following via electronic mail this 24th day of May, 2018:

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STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

**IN THE MATTER OF THE COMMISSION'S)
TRIENNIAL REVIEW OF THE INDIANA) CAUSE NO. 45064
UNIVERSAL SERVICE FUND)**

PREFILED TESTIMONY OF CHAD A. DUVAL

ON BEHALF OF

INDIANA EXCHANGE CARRIER ASSOCIATION, INC.

IURC CAUSE NO. 45064
PREFILED TESTIMONY OF CHAD A. DUVAL

1
2
3
4
5 **Q. WHAT IS YOUR NAME, TITLE, AND BUSINESS ADDRESS?**

6
7 A. My name is Chad A. Duval. I am a Principal at Moss Adams LLP (Moss Adams), an
8 accounting and business consulting firm. My business address is 3121 W. March Lane,
9 Suite 200, Stockton CA, 95219.
10

11 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND**
12 **EXPERIENCE.**

13
14 A. My educational background includes a Bachelor of Science degree in Business
15 Administration, with an emphasis in Statistics, from the University of Denver, in Denver,
16 Colorado. In 1995, I was hired by GVNW Inc./Management to serve as a Consulting
17 Analyst in the Company's Colorado Springs office. In 1998, I was promoted to
18 Management Consultant. In 1999, I accepted the position of Manager of Strategic Pricing
19 with US WEST Communications in Denver, Colorado. In January of 2000, I was
20 promoted to Group Manager of Strategic Pricing. In October of 2000, I accepted the
21 position of Director of Product Management with Vanion, Inc., a competitive local
22 exchange carrier headquartered in Colorado Springs, Colorado. In September of 2001, I
23 accepted the position of Senior Consultant with GVNW in Colorado Springs, Colorado.
24 In October of 2004, I accepted the position of Senior Manager with Moss Adams in
25 Stockton, California. In October of 2007, I became a Principal at Moss Adams in that
26 office. In August of 2015, I was named the National Practice Leader of Moss Adams'
27 Communications and Media practice.
28

29 **Q. CAN YOU PLEASE DESCRIBE YOUR DUTIES AND RESPONSIBILITIES AS A**
30 **PRINCIPAL AT MOSS ADAMS?**
31

32 A. Moss Adams is a regional accounting and consulting firm with offices in major cities in
33 the states of Arizona, California, Kansas, New Mexico, Oregon, Texas and Washington.
34 Moss Adams' Communications and Media practice provides audit, tax, and financial and
35 regulatory consulting services to the telecommunications industry, particularly to rural
36 telecommunications carriers. I am the National Practice Leader of the Communications
37 and Media practice. In that role I provide technical and strategic guidance to a team of
38 approximately 80 professionals in our audit, tax and consulting groups. In addition, I
39 provide consulting services to companies in several states, including state and federal
40 universal service funding, cost separations studies, business plans, budgets, depreciation
41 studies, regulatory policy and compliance, and management analysis on various
42 regulatory and business issues.

43

44 **Q. FOR WHOM ARE YOU APPEARING IN THIS PROCEEDING?**

45

46 A. I am appearing on behalf of Indiana Exchange Carrier Association, Inc. ("INECA").
47 INECA, on behalf of its enumerated members,¹ is a party to the Settlement Agreement
48 ("Settlement Agreement") on the Indiana Universal Service Fund ("IUSF") filed on May
49 24, 2018m in this Cause.

50

51 **Q. HAVE YOU EVER TESTIFIED BEFORE THE INDIANA UTILITY**
52 **REGULATORY COMMISSION OR ANY OTHER REGULATORY AGENCY?**

¹ INECA's membership includes: Bloomingdale Home Telephone Company, Inc.; Citizens Telephone Corporation; Clay County Rural Telephone Cooperative, Inc. d/b/a/ Endeavor Communications; Craigville Telephone Company Inc.; Daviess-Martin Rural Telephone Corporation d/b/a RTC Communications; Geetingsville Telephone Company Inc.; Hancock Rural Telephone Corporation d/b/a NineStar Connect; Ligonier Telephone Co., Inc.; Monon Telephone Company Inc.; Miles Communications, Inc. d/b/a Enhanced Telecommunications Corp.; Mulberry Cooperative Telephone Company, Incorporated d/b/a Mulberry Telephone Company; New Lisbon Telephone Company Inc.; New Paris Telephone Inc.; Northwestern Indiana Telephone Company Inc. d/b/a Nitco; Perry-Spencer Rural Telephone Cooperative Inc. d/b/a PSC; Pulaski White Communications, Inc. d/b/a Lightstream; Rochester Telephone Company Inc.; Southeastern Indiana Rural Telephone Cooperative Inc. d/b/a SEI Communications; Smithville Telephone Company, Incorporated d/b/a Smithville Communications; Swayzee Telephone Company, Inc. d/b/a Swayzee Communications Corp.; Sweetser Rural Telephone Company Inc.; TDS Telecom Companies (Camden Telephone Company Inc., Communications Corporation of Indiana, Communications Corporation of Southern Indiana, Home Telephone Company Inc., Home Telephone Company of Pittsboro Inc., Merchants and Farmers Telephone Company d/b/a TDS Telecom-Hillsboro., S & W Telephone Company, Inc., Tipton Telephone Company Inc., Tri-County Telephone Company Inc., West Point Telephone Company, Incorporated); Washington County Rural Electric Telephone Cooperative Inc. d/b/a Tele-Media Solutions; and Yeoman Telephone Company Inc.

53 A. Yes, I previously testified before the Indiana Utility Regulatory Commission (the
54 “Commission”) during the 2015 Triennial Review of the IUSF in Cause No. 44681 on
55 behalf of INECA. In addition, I have testified before the California Public Utilities
56 Commission, the Colorado Public Utilities Commission, the Georgia Public Service
57 Commission, the Public Utilities Commission of Nevada, the North Dakota Public
58 Service Commission, the Oklahoma Corporation Commission, the Oregon Public
59 Utilities Commission, the Public Service Commission of Utah, and the Wyoming Public
60 Service Commission. Further, I regularly consult with carriers around the country on
61 issues related to universal service funding, both at the state and federal levels.

62

63 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

64

65 A. The purpose of my testimony is to support maintaining the status quo with the current
66 IUSF until at least the Commission’s next triennial review. In this testimony I will:
67 explain the original purpose of the IUSF and how that purpose is still being served today,
68 outline the ongoing reforms of federal universal service funding that continue to create
69 uncertainty for INECA’s member companies, discuss how the IUSF is an integral
70 component in keeping local rates just, reasonable and affordable for customers in rural
71 areas of Indiana, and address the purpose and scope of the triennial review and explain
72 why it is recommended that the Commission maintain the status quo.

73

74 **Q. PLEASE PROVIDE THE BACKGROUND PROMPTING INECA TO FILE**
75 **DIRECT TESTIMONY IN THIS CAUSE.**

76

77 A. The Commission’s March 17, 2004 Order in Cause No. 42144 approved a settlement
78 agreement that created the IUSF. The IUSF settlement agreement included a periodic
79 review of the IUSF on a triennial basis, stating:

80

81 The primary purpose and scope of the reviews shall be: (1) to ensure that the operations
82 of the IUSF are meeting the Commission’s objectives of preserving and advancing
83 universal service within the state of Indiana; (2) to ensure that universal service is
84 continuing to be made available at rates reasonably comparable to rates for basic
85 residential and single-line business local exchange service in urban areas, and that are
86 just, reasonable and affordable; (3) to ensure that the processes, funding levels, size, and

87 the operation and administration of the IUSF remain adequate and sufficient; and (4) to
88 review the operation of the IUSF relative to the federal universal service fund as may be
89 appropriate.²
90

91 On March 21, 2018, in furtherance of the aforementioned review process, the
92 Commission issued an Order in Cause No. 45064, scheduling a prehearing conference
93 and defining a preliminary, but non-exhaustive issues list to be addressed in the context
94 of the 2018 Triennial Review.
95

96 **Q. CAN YOU SUMMARIZE THE FCC'S ONGOING REVIEW AND REFORM OF**
97 **INTERCARRIER COMPENSATION FOR RATE-OF-RETURN CARRIERS?**

98 A. In its 2011 USF/ICC Transformation Order,³ the FCC ordered the unification of interstate
99 and intrastate terminating switched access rates over two years, which was completed in
100 2013, and a further seven year transition of interstate and intrastate terminating switched
101 access rates to bill and keep (\$0.00 per minute of use). Interstate originating switched
102 access rates were also frozen at the levels in effect at the time. At the same time, the
103 FCC instituted a new end user charge, the Access Recovery Charge (ARC), to help offset
104 the reduction in switched access revenues as a result of the rate phase down. In addition,
105 the FCC froze interstate switched access revenues and intrastate terminating switched
106 access revenues at their 2011 level⁴ and provided for a 5% annual phase down in these
107 revenues. The phased down annual revenues are referred to as the annual revenue
108 baseline.
109

² *In The Matter of the Investigation on the Commission's Own Motion Under Indiana Code § 8-1-2-72, Into Any and All Matters Related to the Commission's Mirroring Policy Articulated in Cause No. 40785 and the Effect of the FCC's Mag Order on Such Policy, Access Charge Reform, Universal Service Reform, and High Cost or Universal Service Funding Mechanisms Relative to Telephone and Telecommunications Services Within the State of Indiana*, Cause No. 42144, pp. 11-12 (Ind. Util. Reg. Comm'n March 17, 2004).

³ *Connect America Fund et al.*, WC Docket No. 10-90 et al., Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663 (2011) (*2011 USF/ICC Transformation Order and/or FNPRM*), *aff'd sub nom*, *In re: FCC 11-161*, 753 F.3d 1015 (10th Cir. 2014).

⁴ Interstate switched access revenue was frozen at the revenue requirement submitted to the FCC in the 2011 switched access tariff filing, which was effective on July 1, 2011. This revenue requirement is the average of the forecasted revenue requirement for each company for 2011 and 2012. Intrastate terminating switched access was frozen at the revenue billed from October 1, 2010 through September 30, 2011 and collected by March 31, 2012.

110 As a result of this freeze and phase down of interstate and intrastate terminating switched
111 access revenues, and the phase down of interstate and intrastate terminating switched
112 access rates, the FCC implemented the Connect America Fund Inter-carrier Compensation
113 (the “CAF ICC”) support to provide cost recovery for the difference between the annual
114 revenue baseline and the switched access revenues received from interexchange carriers
115 and ARC revenue received from end users. Any shortfall in cost recovery from the
116 annual revenue baseline is made up from CAF ICC support, less the 5% annual phase
117 down in the annual revenue baseline. CAF ICC support is a joint interstate and intrastate
118 cost recovery mechanism, so a portion of this support is assigned to offset reductions in
119 intrastate terminating switched access revenues.

120
121 In the *FNPRM*, the FCC indicated that it was further analyzing its authority to regulate
122 intrastate originating switched access and that it would address reform of originating
123 switched access in a future order. The FCC has yet to address reform of intrastate
124 originating switched access. However, in a Public Notice dated September 8, 2017, the
125 FCC sought further comment to refresh the record on inter-carrier compensation reform
126 related to the network edge, tandem switching and transport, and transit.⁵ In doing so, the
127 FCC made it clear that it continues to consider further reforms to terminating and
128 originating inter-carrier compensation rates, both of which could impact the intrastate
129 revenues of the INECA member companies as the result of mirroring interstate rates
130 discussed below. There is no way to know for sure what the FCC will do if and when it
131 addresses further reform of inter-carrier compensation.

132
133 **Q. HOW HAS THE FCC’S REFORM OF TERMINATING SWITCHED ACCESS**
134 **IMPACTED SWITCHED ACCESS REVENUES IN INDIANA?**

135 A. First and foremost, the 5% annual reduction in intrastate terminating switched access
136 revenues from 2011 levels ensures that intrastate terminating switched access revenues
137 decline by 5% every year. This 5% annual reduction takes effect each July 1, so effective
138 July 1, 2018, intrastate terminating switched access revenues will be approximately

⁵ See DA 17-863, released September 8, 2017.

139 69.83% of what they were at the same point in 2011. Any reduction beyond the 5%
140 annual phase down is recovered from CAF ICC support. This 5% annual reduction will
141 continue unless and until the FCC modifies the annual phase down, which the *FNPRM*
142 indicated could increase at some point in the future.

143
144 In addition to the annual phase down of intrastate terminating switched access revenues,
145 intrastate originating switched access revenues could be impacted as well. Commission
146 policy and the Indiana Code⁶ support the mirroring of intrastate rates and interstate rates,
147 which is consistent with the FCC's *2011 USF/ICC Transformation Order* for terminating
148 switched access. However, depending on the FCC's treatment of intrastate originating
149 switched access, it is possible that further reductions in intrastate switched access
150 revenues will occur at some point in the future. Of significant concern is the fact that the
151 FCC has maintained a \$2 billion budget for universal service funding for rate-of-return
152 carriers, including CAF ICC support. As a result of this cap on federal universal service
153 funding, rate-of-return carriers have seen significant reductions in high-cost support
154 disbursements relative to the amount of support that is determined based on individual
155 carrier costs. Unless the FCC considerably increases its budget for rate-of-return USF, it
156 is highly likely that there will not be sufficient funding for the reductions in originating
157 switched access if and when the FCC implements its reform.

158
159 **Q. CAN YOU SUMMARIZE THE FCC'S ONGOING REVIEW AND REFORM OF**
160 **UNIVERSAL SERVICE FUNDING?**

161 A. Yes. There has been a significant amount of USF reform over the last several years. This
162 started with the *2011 USF/ICC Transformation Order*, in which the FCC implemented a
163 variety of reforms to universal service funding for rate-of-return carriers. An overall
164 limitation on the amount of High Cost Support that a rate-of-return carrier can receive
165 was implemented at \$250 per line per month, beginning in 2012. The National Average
166 Cost Per Loop that determines how much High Cost Loop Support ("HCLS") a company

⁶ Indiana Code § 8-1-2.6-1.5(c)(2) provides, "the commission shall consider the provider's rates and charges for intrastate access service to be just and reasonable if the intrastate rates and charges mirror the provider's interstate rates and charges."

167 receives was frozen effective July 1, 2015, which results in a Pro-Rata Adjustment
168 (reduction) in support to maintain the FCC's HCLS-specific budget.

169
170 In March of 2016, the FCC issued the *Rate-of-Return Reform Order*, in which it adopted
171 a variety of reforms to universal service funding for rate-of-return carriers. It
172 implemented the Alternative Connect America Cost Model ("A-CAM") as an optional
173 replacement of legacy high-cost support mechanisms. The A-CAM provides a fixed
174 amount of support for a 10-year funding period, from 2017 through 2026, in exchange for
175 meeting specific broadband buildout obligations. In adopting the A-CAM, the FCC
176 increased funding for rate-of-return carriers by \$2 billion over the 10-year funding period
177 (approximately \$200 million per year), but this additional funding is only available to A-
178 CAM electing carriers and some carriers are actually receiving less support from the A-
179 CAM than they were under the legacy rate-of-return support mechanisms. Of the 33
180 study areas served by INECA member companies, 11 elected A-CAM support while the
181 remaining 22 chose to stay on legacy rate-of-return support.⁷

182
183 The *Rate-of-Return Reform Order* also established a new funding program for broadband
184 only service, called Connect America Fund Broadband Loop Support ("CAF-BLS").
185 CAF-BLS replaces Interstate Common Line Support ("ICLS"), by continuing to provide
186 support for the portion of the local loop that is assigned to interstate in the jurisdictional
187 separations process, while also providing support for broadband only local loops. Doing
188 so closes a loophole in federal funding for the cost of the local loop, in which rate-of-
189 return carriers were obligated to provide broadband in order to be eligible for federal
190 universal service funding, but did not previously receive support for broadband only
191 loops. CAF-BLS recipients must also meet specific broadband deployment obligations.
192 However, the FCC did not provide any additional funding for CAF-BLS, so the support
193 provided for broadband only loops is also subject to the \$2 billion annual budget for rate-

⁷ The 11 study areas that elected A-CAM support are: Bloomingdale Home Telephone Co., Camden Telephone Company, Inc., Communications Corporation of Indiana, Communications Corporation of Southern Indiana, Home Telephone Company of Pittsboro, Inc., Home Telephone Company of Waldron, Inc., The Merchants and Farmers Telephone Co., Inc., S & W Telephone Company, Inc., Tipton Telephone Company, Inc., Tri-County Telephone Company, Inc., West Point Telephone Company, Inc.

194 of-return high-cost support. As a result, the FCC implemented a Budget Control
195 Mechanism (“BCM”) to ensure that annual support does not exceed the budget, by
196 reducing or deferring HCLS and CAF-BLS to meet the annual budget. The result of the
197 BCM is that HCLS will be approximately 84.48% of the calculated amount⁸ in the 3rd
198 quarter of 2018, while CAF-BLS will be approximately 87.65%.⁹

199
200 In addition, the *Rate-of-Return Reform Order* implemented a variety of other reforms of
201 rate-of-reform high-cost support. The Operating Expense Limitation establishes an upper
202 limit of annual operating expenses that a rate-of-return carrier may include in its annual
203 high-cost support filings. The Capital Investment Allowance establishes an upper limit
204 of annual investment in loop plant, as well as a per-location cost limitation, that a carrier
205 may include in its annual high-cost support filings. The *Rate-of-Return Reform Order*
206 also established a process for the elimination of high-cost support in areas served by a
207 qualifying competitor, although this provision has yet to be implemented. Further, the
208 Rate-of-Return Reform Order re-prescribed the interstate authorized rate of return to
209 9.75% through a six-year transition from 11.25%, in equal annual increments of 0.25%.
210 As of the date of this testimony, the interstate authorized rate of return is 10.75%.
211 Finally, the *Rate-of-Return Reform Order* included a *Further Notice of Proposed*
212 *Rulemaking* (“FNPRM”), which outlined a series of further potential reforms to be
213 addressed by the FCC.

214
215 In its latest *USF Reform Modification Order*,¹⁰ dated March 23, 2018, the FCC addressed
216 a variety of outstanding matters and clarifications from prior orders. The most extensive
217 change in this order was the identification of costs that have been deemed ineligible for
218 recovery through federal high-cost support, including personal expenses, expenses
219 unrelated to operations and corporate luxury goods. While most of the items deemed

⁸ The BCM is applied to HCLS after the application of the HCLS-specific pro-rata adjustment, which is currently estimated at 79.61% for the 3rd quarter of 2018. The result of these two adjustments is that the support provided is 67% of the amount required based on an individual carrier’s reported costs.

⁹ The BCM for CAF-BLS does not result in an actual reduction in support. If a carrier provides broadband only service, the BCM for CAF-BLS is recovered through the rate for this service. If a carrier does not provide broadband only service, the BCM for CAF-BLS is deferred for two years and included in support for that year.

¹⁰ This order has not been named at this time, so I am referring to it as the *USF Reform Modification Order*.

220 ineligible for recovery have not been common practice for the INECA member
221 companies, there are certain items that have historically been deemed eligible for
222 recovery that will no longer be supported. Some of the items that are no longer eligible
223 for recovery include food and beverage for certain company events, charitable
224 contributions, memberships in professional organizations and associations, and public
225 relations related expenses.

226
227 In addition to these limitations, the *USF Reform Modification Order* provided additional
228 funding for both A-CAM and legacy rate-of-return carriers. The order increased funding
229 for A-CAM carriers by approximately \$365 million over the 10-year funding period in
230 return for additional broadband buildout obligations. It also provided relief of the BCM
231 for legacy rate-of-return carriers for the period from July 1, 2017 through June 30, 2018
232 (Tariff Year 2018/2019), but did not address periods before or after those dates. This will
233 provide an estimated \$180 million in one-time funding for these carriers, which is likely
234 to be paid in the 4th quarter of 2018 or the 1st quarter of 2019.¹¹ On May 1, 2018, the
235 Universal Service Administrative Company (“USAC”) announced that the Budget
236 Control Mechanism for Tariff Year 2018/2019 is estimated to be 15.52%, so the relief
237 will be short lived and the reduction in support continues to increase. In addition, the
238 *USF Reform Modification Order* implemented an inflationary factor into the calculation
239 of the Operating Expense Limitation implemented in the *Rate-of-Return Reform Order*
240 and also updated the calculation of the FCC’s Corporate Operations Expense Limitation
241 to include broadband only lines.

242
243 Finally, the *USF Reform Modification Order* included a Notice of Proposed Rulemaking
244 (“NPRM”) that identifies a variety of USF-related issues that the FCC still intends to
245 address. These items include: a review of the high-cost support budget for rate-of-return
246 carriers, a potential new offer of A-CAM support for carriers still receiving legacy rate-
247 of-return support, further funding for existing A-CAM recipients, establishing a threshold

¹¹ Based on publicly available information from the Universal Service Administrative Company, INECA member companies will receive approximately \$3.195 million in one-time relief from the BCM. I will later discuss the overall impact that the BCM has, and likely will continue to have, on INECA member companies.

248 of support that would not be subject to the BCM, additional broadband deployment
 249 obligations for legacy rate-of-return carriers, and other miscellaneous items that could
 250 impact the amount of federal high-cost support that rate-of-return carriers receive.
 251

252 **Q. HOW HAVE THESE FCC REFORMS OF UNIVERSAL SERVICE FUNDING**
 253 **IMPACTED COST RECOVERY FOR THE INECA MEMBER COMPANIES?**

254 A. I have performed an analysis of the impacts of both the HCLS-specific Pro-Rata
 255 Adjustment and the overall Budget Control Mechanism on the HCLS support received, or
 256 projected to be received, by the 33 INECA member companies from 2016 through 2018.
 257 This analysis is based on information produced by USAC and the National Exchange
 258 Carrier Association (“NECA”). The analysis begins with the amount of HCLS that each
 259 company is projected to receive after the impact of the HCLS-specific Pro-Rata
 260 Adjustment, as the pre-adjustment support is not as readily available. I calculated the
 261 pre-adjustment support by dividing the post-adjustment support by the Pro-Rata
 262 Adjustment factor for the year. I then included the estimated Budget Control Mechanism
 263 impact for the year based on quarterly, semi-annual, or annual estimates available on
 264 USAC’s public website. Finally, the HCLS-specific Pro-Rata Adjustment and the
 265 Budget Control Mechanism impacts on HCLS are added together to determine the
 266 estimated annual reduction in HCLS, which is intended to provide recovery for intrastate
 267 costs. For the period from July 1, 2017 through June 30, 2016, I removed the impacts of
 268 the Budget Control Mechanism, as the FCC has announced that it will make companies
 269 whole for this time period.
 270

271 The results of this analysis are summarized in the following table for all INECA member
 272 companies combined.
 273

Table 1

Adjustment	2016	2017	2018
Pro-Rata Adjustment	\$ (3,694,634)	\$ (5,427,619)	\$ (5,948,388)
Budget Control Mechanism	\$ (404,527) ¹²	\$ (1,095,448)	\$ (1,798,645)

¹² The Budget Control Mechanism was not instituted until September 1, 2016, so the impact is limited to 4 months.

Total	\$ (4,099,160)	\$ (6,523,066)	\$ (7,747,033)
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What this analysis shows is a significant and growing reduction in federal HCLS that is designed to help recover the intrastate portion of costs associated with the provision of local loops in the highest cost areas of Indiana. In 2016, INECA member companies faced a shortfall of \$4,099,160 between the amount of support calculated using the FCC's HCLS algorithm and the amount of support that they actually received. This shortfall increased to \$6,523,066 in 2017 and is projected to be \$7,747,033 in 2018. Both the HCLS-specific Pro-Rata Adjustment and the Budget Control Mechanism have increased at a rapid pace and will continue to do so unless the FCC significantly increases its budget for High-Cost support, something which it is considering but it is not certain if and when it will do so, and by how much it may increase the budget. At approximately \$12 million for 2018, an estimated 65% of the total IUSF is being used just to make up for reductions in federal HCLS. This is up from approximately 34% in 2016 and 54% in 2017. This paints a stark picture that shows just how important the IUSF is in maintaining rates that are just, reasonable and affordable for customers served by the INECA member companies.

Q. HOW WILL THESE FCC REFORMS OF UNIVERSAL SERVICE FUNDING CONTINUE TO IMPACT COST RECOVERY IN INDIANA?

A. Recovery of intrastate costs is a joint proposition between the FCC and the Commission. Intrastate costs are recovered through the combination of local rates, intrastate switched and special access rates, federal High Cost Loop Support or A-CAM support, federal Connect America Fund Intercarrier Compensation support, and the IUSF. To the extent that the FCC continues to make significant reforms to federal universal service support, reductions in federal support could shift more of the intrastate cost recovery burden to rate payers in Indiana, or other methods of ensuring universal service such as the IUSF. It is also true that increases in federal support could provide additional funding for intrastate costs, but there is no way of knowing for sure how the scales will eventually tilt until the FCC completes its ongoing reforms of federal high-cost support. Until that time,

303 the INECA member companies believe that it is prudent to maintain the IUSF in its
304 current form and only make changes to this vital program once there is greater certainty
305 of support available from the FCC.
306

307 **Q. WHAT IS CURRENTLY HAPPENING WITH INTRASTATE SWITCHED**
308 **ACCESS MINUTES OF USE FOR THE INECA MEMBER COMPANIES?**

309 I performed an analysis of 24 INECA member companies that are recipients of IUSF
310 support and who were able to provide five years of historical intrastate switched access
311 minutes of use for the years 2013 through 2017. What this analysis shows is that
312 intrastate originating switched access minutes of use are in significant decline. The total
313 intrastate originating minutes of use in 2013 was almost 42.9 million and by 2017 had
314 declined to just over 29 million. This is an average annual reduction of more than 8% per
315 year. Each lost minute of use means lost intrastate revenue for the INECA member
316 companies. This is concerning because the INECA member companies currently have no
317 way to recover this lost revenue, and, unless the FCC or the Commission comes up with a
318 significantly greater budget for CAF ICC or IUSF, there may be no means of recovering
319 this lost revenue in the future if and when intrastate originating switched access is
320 reformed.
321

322 **Q. ARE THE INECA MEMBER COMPANIES EXPERIENCING A SIMILAR**
323 **REDUCTION IN THEIR INTRASTATE SWITCHED ACCESS REVENUE**
324 **REQUIREMENTS?**

325 A. No. I performed a similar analysis, this time of 20 INECA member companies¹³ that
326 receive IUSF support and were able to provide five years of historical intrastate switched
327 access revenue requirement data for the years 2013 through 2017. What this analysis
328 shows is that intrastate switched access revenue requirements are in decline, but not at the
329 same pace as intrastate switched access minutes of use. The total intrastate switched
330 access revenue requirement for the INECA member companies has declined from

¹³ The number of INECA member companies included in each of the referenced analyses varies due to the ready availability of data from each company to perform that particular analysis.

331 approximately \$3.54 million in 2013 to \$2.86 million in 2017, an average annual
332 reduction of nearly 3.7%. This is concerning because intrastate switched access minutes
333 of use, and therefore the revenues derived from those minutes, are declining faster than
334 the associated revenue requirement, leaving a greater portion of the costs to be recovered
335 from sources other than per minute of use access charges.

336

337 **Q. ARE THE INECA MEMBER COMPANIES EARNING RATES OR RETURN**
338 **THAT ARE HIGHER OR LOWER THAN THE RATE OF RETURN CAP IN**
339 **INDIANA?**

340 A. No. I performed an analysis of 25¹⁴ INECA member companies that receive IUSF
341 support and were able to provide five years of historical IUSF Qualifications Test data for
342 the years 2013 through 2017. Rather than look at any individual year, which can be
343 skewed by anomalies (for example, 2017 may be skewed due to the financial statement
344 impacts of the *Tax Cuts and Jobs Act* on deferred income tax expense), I developed a
345 five-year average rate of return for each company and all 25 companies in total. Of the
346 25 companies, only one was found to be earning more than the rate of return cap of
347 11.50% based on a five-year average. The remaining 24 companies earned less than
348 11.50% on average, including 10 companies that had negative rates of return for the five-
349 year period.

350

351 **Q. IS THE IUSF CURRENTLY MEETING THE COMMISSION'S OBJECTIVES**
352 **OF PRESERVING AND ADVANCING UNIVERSAL SERVICE WITHIN**
353 **INDIANA?**

354 A. Yes. The IUSF serves an important role in providing intrastate cost recovery for the high
355 cost of providing service in rural and areas of the state. This funding assists the rate-of-
356 return carriers in these high cost areas to continue to build and maintain communication
357 networks that are consistent with those in more urban areas of Indiana. As a result,
358 customers throughout the State of Indiana have access to high quality local exchange and
359 switched access services at rates that are just, reasonable and affordable. While the

¹⁴ See Footnote 13.

360 INECA member companies would like to have even more IUSF support, to bridge some
361 or all of the shortfall identified above, they are also understanding of the burden that
362 doing so would place on rate payers in the State of Indiana.

363

364 **Q. IS UNIVERSAL SERVICE IN INDIANA CONTINUING TO BE MADE**
365 **AVAILABLE AT RATES REASONABLY COMPARABLE TO RATES FOR**
366 **BASIC RESIDENTIAL AND SINGLE-LINE BUSINESS LOCAL EXCHANGE**
367 **SERVICE IN URBAN AREAS AND AT RATES THAT ARE JUST,**
368 **REASONABLE AND AFFORDABLE?**

369 A. Yes. All of the recipients of IUSF have rates for basic residential and single-line business
370 local exchange service that are consistent with the IUSF benchmark local rates to be
371 eligible for IUSF support. This benchmark rate was established, and continues, to ensure
372 that universal service is provided in Indiana at rates that are consistent with rates in urban
373 areas and are just, reasonable and affordable. In addition, each of the INECA member
374 companies has maintained residential rates that are consistent with the FCC's benchmark
375 local rates to be eligible for the full amount of HCLS available (after the application of
376 the Pro-Rata Adjustment and Budget Control Mechanism).

377

378 **Q. DO THE PROCESSES, FUNDING LEVELS, SIZE, AND OPERATION AND**
379 **ADMINISTRATION OF THE IUSF REMAIN ADEQUATE AND SUFFICIENT?**

380 A. Yes, Solix, the IUSF administrator, the IUSF Oversight Committee, and the Commission
381 perform regular monitoring functions to ensure that the processes, funding levels, size
382 and operation of the IUSF remain adequate and sufficient. Solix, the IUSF administrator,
383 provides quarterly financial reports on the status of the fund and performs an Annual
384 Report of Activity in which it provides a management discussion and analysis and
385 unaudited financial statements. The last Annual Report of Activity for the IUSF for
386 calendar year 2017 was submitted to the Commission by Solix on February 15, 2018.¹⁵

¹⁵ See *In the Matter of Issues Relating to Universal Service and Lifeline Assistance Fund Administration Articulated in Cause Nos. 40785, 42144, and 43082, and the Provisions Set Forth in HEA 1279, Codified as I.C. § 8-1-36, Cause No. 42144-S3.*

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In addition to receiving reports from Solix and recommendations from the IUSF Oversight Committee, the Commission conducts a triennial Qualifications Test and Triennial Review of the IUSF, which is the subject of this Cause. The most recent Qualifications Test was performed in 2016 for calendar years 2013, 2014, and 2015 to determine the amount of IUSF support for which each of the recipients is eligible.

Finally, an independent audit of the IUSF is conducted periodically. The most recent independent audit was conducted by Hurlbert CPA LLC for the years ending December 31, 2015 and December 31, 2016, which was issued September 21, 2017. The Auditor's Report concluded that, "In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the IUSF administered by Solix as of December 31, 2016 and 2015"; that "Given these limitations, during our audit, we did not identify any deficiencies in internal control that we consider to be material weaknesses."; and that "The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under Government Auditing Standards." The Auditor's Report was reviewed by the members of the IUSF Oversight Committee and determined to be a comprehensive and completely satisfactory independent audit.

Q. PLEASE EXPLAIN THE PUBLIC INTEREST BENEFITS THAT WOULD ACCRUE IF THE COMMISSION WERE TO APPROVE THE SETTLEMENT AGREEMENT.

A. One primary public interest benefit that would accrue upon Commission approval of the Settlement Agreement is that the Commission and parties would not devote time and resources on an extended proceeding regarding issues that would likely need to be revisited when the FCC completes its reforms of originating switched access and federal universal service funding. In addition, the public interest is served when carriers that serve high cost areas have sufficient financial resources to ensure that rates are just, reasonable and affordable.

417 **Q. WOULD APPROVAL OF THE SETTLEMENT AGREEMENT PRECLUDE ANY**
418 **CHANGES TO THE IUSF PRIOR TO THE COMMISSION'S NEXT TRIENNIAL**
419 **REVIEW?**

420 A. No. As provided in Section 14.B of the Settlement Agreement, any interested party may
421 bring issues before the IUSF Oversight Committee or the Commission at any point prior
422 to the next triennial review if it believes that changes to the IUSF are necessary. The
423 IUSF Oversight Committee meets on a regular basis in order to take up any issues that
424 may arise. As a result, changes to the IUSF could occur at any time between the effective
425 date of the Settlement Agreement and the next Triennial Review.

426
427 **Q. WHAT DO THE SETTLING PARTIES RECOMMEND FOR THE IUSF?**

428 A. The Parties to the Settlement Agreement recommend that the IUSF be continued under
429 the status quo until the next triennial review, currently scheduled to commence in 2021.
430 By that time, it is currently anticipated that the FCC will have completed the
431 development and implementation of its reforms of intercarrier compensation and federal
432 universal service funding, or at least developed greater consistency in support, which will
433 allow the Commission the opportunity to ensure that the impacts on intrastate revenues
434 are fully understood and incorporated in the 2021 triennial review of the IUSF. While the
435 INECA member companies also believed this would be the case between 2015 and 2018,
436 the FCC has made significant strides on the reforms of high-cost support in the
437 intervening years and is currently working on further reforms. At the time of the 2015
438 IUSF Triennial Review, the first of two significant high-cost support reform orders had
439 not yet been released. These orders have now been released and the FCC has issued a
440 *Notice of Proposed Rulemaking* to address outstanding issues, so the likelihood of
441 resolution before the 2021 IUSF Triennial Review is now even greater.

442
443 **Q. PLEASE SUMMARIZE YOUR DIRECT TESTIMONY.**

444 A. The IUSF is currently meeting the Commission's objectives of preserving and enhancing
445 universal service in the State of Indiana, as evidenced by the availability of high quality
446 telecommunications services throughout the state. Universal service in Indiana continues

447 to be provided at just, reasonable and affordable rates, consistent with those provided in
448 urban areas as a result of the ongoing application of the IUSF benchmark rate. The
449 processes, funding levels, size and operation and administration of the IUSF remain
450 adequate and sufficient, as documented in the Annual Audit of the fund, the Solix Annual
451 Report, the 2018 IUSF surcharge increase, and the extension of the Solix contract to
452 continue to administer the fund. The Commission's identified goals of the triennial
453 review have been met, so it is in the public interest to close the current triennial review.

454
455 The amount of IUSF that the Parties require is highly dependent on sources of revenue
456 that are impacted by the actions of the FCC, including both intercarrier compensation and
457 federal universal service funding. The FCC continues to review potential reforms of
458 originating switched access services (including intrastate rates) and the associated CAF
459 ICC support, as well as HCLS and A-CAM, portions of which are treated as intrastate
460 revenue in the determination of IUSF. Of major consideration by the FCC at this time is
461 the overall budget for high-cost support for rate-of-return carriers, which has a direct and
462 meaningful impact on the IUSF. As a result of these ongoing reforms and their potential
463 impacts on the IUSF, the Parties recommend that the Commission approve the Settlement
464 Agreement to maintain the status quo until the next triennial review, scheduled for 2021.
465 Doing so will allow the FCC the time necessary to complete its ongoing reforms, and the
466 Commission the ability to fully weigh the impacts of such reforms on the IUSF.

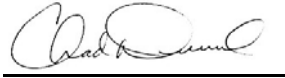
467

468 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

469 **A.** Yes.

VERIFICATION

The undersigned affirms under the penalties of perjury that the facts stated in the foregoing testimony are true to his best information and belief.

A handwritten signature in black ink, appearing to read "Chad A. Duval", written over a solid horizontal line.

Chad A. Duval

861631

FILED
May 24, 2018
**INDIANA UTILITY
REGULATORY COMMISSION**

STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

**IN THE MATTER OF THE COMMISSION’S)
TRIENNIEL REVIEW OF THE INDIANA) CAUSE NO. 45064
UNIVERSAL SERVICE FUND)**

SUBMISSION OF DIRECT TESTIMONY AND EXHIBITS

The Indiana Exchange Carrier Association, Inc. (“INECA”), by counsel, hereby submits
in the above referenced Cause the Direct Testimony and exhibits of Larry S. Landis.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Direct Testimony of Chad Duval was served upon the following via electronic mail this 24th day of May, 2018:

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STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

**IN THE MATTER OF THE COMMISSION'S)
TRIENNIAL REVIEW OF THE INDIANA) CAUSE NO. 45064
UNIVERSAL SERVICE FUND)**

PREFILED TESTIMONY OF LARRY S. LANDIS

ON BEHALF OF

INDIANA EXCHANGE CARRIER ASSOCIATION, INC.

IURC CAUSE NO. 45064
PREFILED TESTIMONY OF LARRY S. LANDIS

Q. WHAT IS YOUR NAME, TITLE, AND BUSINESS ADDRESS?

A. I am Larry S. Landis. I was appointed to the Indiana Utility Regulatory Commission (the “Commission”) in 2003 to fill an unexpired term, by the late Governor Frank O’Bannon. I was reappointed to a full term by former Governor Joe Kernan, and twice by former Governor Mitch Daniels. I also served during the administration of former Governor Mike Pence, before retiring in 2014. I was active with the National Association of Regulatory Utility Commissioners (NARUC), serving on the Board for six years and also serving as Co-Chair of the Washington Action Committee, NARUC’s liaison to the Federal legislative and executive branches of government. I served in numerous capacities while on NARUC’s Telecommunications Committee, including service on both of the FCC-State Joint Boards and the FCC-State Joint Conference (the 706 Joint Conference) on Advanced Telecommunications (“broadband”) of which I was State Chair. A complete background may be found as Attachment 1 to this testimony.

Q. FOR WHOM ARE YOU APPEARING IN THIS PROCEEDING?

A. I am appearing on behalf of Indiana Exchange Carrier Association, Inc. (“INECA”). INECA, on behalf of its enumerated members,¹ is a party to the Settlement Agreement

¹ INECA’s membership includes: Bloomingdale Home Telephone Company, Inc.; Citizens Telephone Corporation; Clay County Rural Telephone Cooperative, Inc. d/b/a/ Endeavor Communications; Craigville Telephone Company Inc.; Daviess-Martin Rural Telephone Corporation d/b/a RTC Communications; Geetingsville Telephone Company Inc.; Hancock Rural Telephone Corporation d/b/a NineStar Connect; Ligonier Telephone Co., Inc.; Monon Telephone Company Inc.; Miles Communications, Inc. d/b/a Enhanced Telecommunications Corp.; Mulberry Cooperative Telephone Company, Incorporated d/b/a Mulberry Telephone Company; New Lisbon Telephone Company Inc.; New Paris Telephone Inc.; Northwestern Indiana Telephone Company Inc. d/b/a Nitco; Perry-Spencer Rural Telephone Cooperative Inc. d/b/a PSC; Pulaski White Communications, Inc. d/b/a Lightstream; Rochester Telephone Company Inc.; Southeastern Indiana Rural Telephone Cooperative Inc. d/b/a SEI Communications; Smithville Telephone Company, Incorporated d/b/a Smithville Communications; Swayzee Telephone Company, Inc. d/b/a Swayzee Communications Corp.; Sweetser Rural Telephone Company Inc.; TDS Telecom Companies (Camden Telephone Company Inc., Communications Corporation of Indiana, Communications Corporation of Southern Indiana, Home Telephone Company Inc., Home Telephone Company of Pittsboro Inc.,

(“Settlement Agreement”) on the Indiana Universal Service Fund (“IUSF”) filed on May 24, 2018, in this Cause.

Q. PLEASE PROVIDE THE BACKGROUND PROMPTING INECA TO FILE DIRECT TESTIMONY IN THIS CAUSE.

A. The Commission’s March 17, 2004 Order in Cause No. 42144 approved a settlement agreement that created the IUSF. The IUSF settlement agreement included a periodic review of the IUSF on a triennial basis.

On March 21, 2018, in furtherance of the aforementioned review process, the Commission issued an Order in Cause No. 45064, scheduling a prehearing conference and defining a preliminary, but non-exhaustive issues list to be addressed in the context of the 2018 Triennial Review.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to respond to the questions posed in the Commission’s order dated March 21, 2018.

Q. COULD YOU PLEASE PROVIDE A BRIEF OVERVIEW OF DEVELOPMENTS IN THE TELECOMMUNICATIONS SECTOR OVER THE PAST QUARTER CENTURY SINCE DIVESTITURE OF AT&T IN 1984?

A. In order to address the questions posed from the Commission in this proceeding, it is useful to briefly review the recent history of state and federal regulation regarding the obligation to achieve universal telecommunications service and to understand the

obligations that remain despite dramatic (and some would suggest radical) changes at the Federal level.

The Telecommunications Act of 1996 (TA96)² laid the framework for support necessary to assure that all consumers, including “*low-income consumers and those in rural, insular and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services (i.e., broadband), that are reasonably comparable to those services that are provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas.*”³

In today’s contentious political environment, it is important to note that there was not only strong bipartisan support for the legislation, but there was near-unanimous support among all segments of the telecommunications industry and allied sectors, with initiation at the state level being primarily responsible for opening the door to support other communication providers such as cable(notably here in Indiana). An important part of that consensus was a recognition that true universal service required what might almost be dubbed a covenant with the small rural companies and (to a lesser but significant extent) with the larger (price cap) companies which likewise served rural areas.

For rural customers served by small, independent co-ops and investor-owned companies, a construct was devised for the singular purpose of serving customers and prospects, and for the networks that serve those customers, not for the benefit of the companies.

“Industry experts point to a distinction related to the *concept of support rather than subsidies*. ‘Subsidies’ are, in the strictest sense, assistance to a troubled business or to an economic sector to help the producer. [Universal Service Fund (IUSF)] is not fundamentally an ‘assistance’ to help a struggling carrier or sector. In fact, wireline carriers can often have successful businesses if they are able to concentrate their

² Pub. LA. No. 104-104, 110 Stat. 56 (1996).

³ 47 U.S.C. § 254(b)(3) (emphasis added).

operations on profitable services and customer clusters. However, state and federal governments have chosen to ‘purchase’ another ‘product set’ in high cost regions, which is customer service that otherwise would not be provided in those regions.”⁴

In order to meet the need for support to maintain and sustain service to the high cost, truly rural, and uneconomic areas served by the rural local exchange carriers (RLECs), policy makers devised a revenue system with three components, much like a three-legged stool. The first source was earned revenue from customers for services provided. The second source was USF funding, generated from a levy on long distance revenues. And the third source was intercarrier compensation (ICC), payments made by the originating carriers for long distance calls placed to customers of the rural local exchange carriers (RLECs) and others, for delivering those calls to their customers.

While this construct was not perfect (for example, competition and other factors led to long distance, originally viewed as a cash cow, increasingly becoming a commodity characterized by decreasing margins), and while it became increasingly urgent to address its problems, the challenge to reformers was to find a solution which generated relatively stable funding to cover the total operation of those who served customers that were uneconomic to serve, and to do so year in and year out.

The order of magnitude related to customers that are uneconomic to serve, which can be seen clearly by the fact that while “...*small rural carriers account for about 5% of the U.S. telephone access lines but serve more than 40% of the land mass.*”⁵ Even at the most intuitive level, there is a glaring need to cover costs of service, given the decades-long commitment to universal service.

⁴ Balhoff & Williams, LLC, *White Paper: State USF New Rural Investment Challenges*, 7 (June 2013), <https://c.yimcdn.com/sites/www.wyotelassn.org/resource/resmgr/imported/State%20USF%20White%20Paper%20June%202013.pdf> (emphasis added).

⁵ *Id.*

The same economic considerations which have discouraged Indiana's RLECs from building out broadband to the "truly rural" areas have provided a hefty disincentive to competitive local exchange carriers (CLECs) from overbuilding in those areas, also dissuading cable and wireless providers from building out on their own. Dispersion of population (i.e., low population density), frequently combined with challenging terrain, are equal opportunity disincentives to buildout and to competitive entry. It is not the responsibility of any carrier or provider to deliberately undertake buildout for the sake of universal service when there is a high likelihood of incurring serial losses, starting with the cost of buildout and continuing with the annual cost of operation.

TA96 provided the first explicit legislation of a national universal service policy, with significant reforms of universal service and intercarrier compensation following in 2000 and 2001.⁶

Recalling the significance of the three legs of the stool to the business model of the RLECs, the "reforms" initiated by the FCC in October, 2011, as established in its *Connect America Fund, A National Broadband Plan for Our Future*,⁷ dramatically changed and some would argue, eviscerated the existing model.⁸

Buried in the *2011 USF/ICC Transformation Order* establishing the Connect America Fund (CAF) in the short term is a retreat from a core principle that all consumers, including low-income consumers and those in rural, insular and high cost areas, should have access to telecommunications and information services, including advanced telecommunications and information services (i.e., broadband), that are reasonably comparable to those services that are provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas. The FCC's restatement of this basic principle without referencing a commitment to

⁶ See *id.* at 10-16.

⁷ *Connect America Fund et al.*, WC Docket No. 10-90 et al., Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663 (2011) (*2011 USF/ICC Transformation Order and/or FNPRM*), *aff'd sub nom*, *In re: FCC 11-161*, 753 F.3d 1015 (10th Cir. 2014).

⁸ See *id.* at 12-16.

reasonably comparable rates indicates a repudiation of one of the two basic principles underlying universal service.

Still less obvious but no less serious is the dramatic step back from “reasonably comparable services.” In the *2011 USF/ICC Transformation Order*, the FCC defines broadband as 4/1 (that is 4 megabits “down,” or to the user, and 1 megabits “up”),⁹ only to subsequently redefine broadband as 25 megabits down and 3 megabits up at the national level, an action which resulted in much of the early broadband buildout being defined out of existence.¹⁰ Moreover, what constituted “broadband” was sector-dependent; given relative capabilities at the time, differing speeds were required of differing technologies.

Q. SHOULD THE COMMISSION CONFORM TO THE FCC’S CURRENT DEFINITION OF SUPPORTED SERVICES, AS THE COMMISSION’S MARCH 21, 2018 ORDER SUGGESTS?

A. To do so would be premature, and quite possibly mean the abandonment of universal service, and ultimately to cutoff of service to the truly rural. It is worth stating:

“State legislators and commissioners should assess the costs, benefits, risks and alternative mechanisms of providing universal telecommunications service in their states. Notably, *where broadband does not exist at present and will not be supported sufficiently, all terrestrial universal service funding – for voice and broadband – will cease.*”¹¹

Moreover, because the ultimate goal of the *2011 USF/ICC Transformation Order* is to move to a single, seamless IP network, any customers who cannot be migrated to an IP

⁹ *2011 USF/ICC Transformation Order* at 94.

¹⁰ Federal Communications Commission, Archive of Released Broadband Progress Notices of Inquiry, available at <https://www.fcc.gov/general/archive-released-broadband-progress-notices-inquiry>.

¹¹ *Id.*

platform may well be denied all services, including voice, services to the disabled, 911 service, other numbering services...even basic dial tone.

“USF/ICC support benefitting rural customers served by larger price-cap carriers under the Transformation Order could be reduced by an estimated 85-90% during the period 2012-2020, and by approximately 35% on average for those served by the RLECs.”¹²

In effect, the FCC has taken a Federal-state partnership in support of the urban-rural covenant and converted it into yet another unfunded liability thrust upon the states, leaving the states with a Hobson’s Choice of increasing support (and therefore appropriations) for rural customers, or forcing the companies which have served them for decades to cut off the truly rural among us.

Moreover, the FCC’s “solution” to broadband buildout has proven to be ill-conceived and ill-informed. Scale and scope contribute to efficiency in major markets, which is why the light regulatory touch worked well in urban areas. Such is not the case in “truly rural” Indiana or America. This, coupled with a deeply flawed pricing strategy, is why nearly two-thirds of the CAF one-time broadband buildout funding (with accompanying further requirements) released by the FCC in 2012 was rejected by the carriers,¹³

Q. YOU MAINTAIN THAT THE FCC HAS ADOPTED POLICIES WHICH HAVE CRIPPLED RURAL BUILDOUT OF BROADBAND THROUGH UNIVERSAL SERVICE. ARE THERE OTHER EXAMPLES WHICH WOULD SUGGEST THE FCC HAS CRIPPLED BROADBAND PROPAGATION SINCE ADOPTION OF THE 2011 USF/ICC TRANSFORMATION ORDER?

A. Fundamentally, given alternative investment options, a rational investor will choose to invest first in those options which best meet the investment objectives of the investor and

¹² *Id.* at 1.

¹³ *Id.* at 3.

conventionally, in those options which produce the highest return consistent with the risk of the investment.

Translated into network investments, the RLECs (and for that matter, all broadband providers) will build out first in those areas which are easiest to serve and which will produce the highest return. They will reserve for later those areas which are more costly to build out.

In the wake of the issuance of the Transformation Order, AT&T Chairman Randall Stephenson announced that going forward, his company – the largest wireline carrier in the US – can no longer justify investing in 25% of its landline network because of high costs, presumably without USF support.

Mr. Stephenson's announcement is a mixed bag. It suggests a retreat from the goal of universal service, with the 25% of AT&T's customers' needs being met with lesser service, a step back from delivering comparable services at comparable prices, but note that it does indicate that in an IP world at least some form of service will be continued. Apart from corporate assurances such as those of AT&T, the Transformation Order provides no such assurance. The reality is that Mr. Stephenson's action is a rational response to the deeply flawed Transformation Order.

Verizon, on the other hand, has dramatically stepped back from service to rural, insular and high cost areas, through several sales of its land lines, each involving one or more states, for the most part outside Verizon's RBOC territory. With the sole exception of the package sale of several states to Frontier, primarily consisting of former GTE territory, every other acquiring company either wound up in bankruptcy reorganization or being acquired, at least in part due to issues of deferred maintenance and investment. While one can take umbrage at this behavior and whether the necessary investment needs were fully disclosed, Verizon's action can be defended as an earlier recognition of the burden of

maintaining and enhancing service to the “truly rural,” and to the diminished likelihood of continued funding under the legacy USF and intercarrier compensation structure.

Q. FROM 1996 THROUGH 2010, WE SAW EXTENSIVE INVESTMENTS IN THE BUILDOUT OF BROADBAND UNDER THE “LIGHT REGULATORY TOUCH” THEN IN PLACE, WHICH RECEIVED STRONG BIPARTISAN SUPPORT. THIS OCCURRED THROUGHOUT THE STATE IN ALL BUT THE MOST RURAL, MOST DIFFICULT TO REACH AREAS. WHAT IS THE OUTLOOK FOR COMPLETING THE PROCESS?

A. Candidly, the outlook is not good. The recent policies of the FCC have hurt rather than facilitated broadband buildout. In 2010, then-FCC Chair Julius Genachowski proposed a dramatic reformulation of “net neutrality,” including a retrograde reclassification of broadband under Title II (of TA96) common carrier telecommunications service. That policy was ultimately implemented as the FCC’s 2015 Open Internet Order¹⁴ under subsequent FCC Chair Tom Wheeler, thereby abrogating a 20-year bipartisan regulatory framework known as “light touch.” This action set off a firestorm of debate over, among other things, whether the result would be to stifle capital expenditures on broadband. Several studies purported to examine whether such expenditures had risen or fallen. Only two studies, both by the same author,¹⁵ address the “...*relevant question...not* [emphasis in original] *whether capital expenditures rise or fall, but rather whether such expenditures are below the level [where] they would have been “but for”* [emphasis in original] *the regulatory intervention.*”

“...[R]esults indicate that *investment in total fixed assets would have been about \$30 billion more annually “but for” reclassification. Investment in equipment and property*

¹⁴ Federal Communications Commission, FCC-15-24, In re Protecting And Promoting the Open Internet (Mar. 12, 2015) (*2015 Open Internet Order*).

¹⁵ George S Ford Ph.D., Chief Economist of the Phoenix Center for Advanced Legal and Economic Public Policy Studies, *Net Neutrality, Reclassification and Investment: A Counterfactual Analysis*, Phoenix Center Policy Perspective No. 17-02 (April 2017) and *A Further Analysis*, Phoenix Center Policy Perspective No.17-03 (May 2017) available at <http://phoenix-center.org/perspectives>.

would have been \$20 billion more “but for” reclassification. Over the five-years since 2010 [for which data is available] total investment is down \$150 billion and investment in equipment and property, which excludes intellectual property, is down \$100 million.”¹⁶

Q. SHOULD WE USE IUSF FUNDING TO UNDERWRITE BROADBAND BUILDOUT?

- A. As has already been indicated, the cost of operation in the service areas of the RLECs is a multiple of the cost of delivering service in urban, suburban and even exurban areas. Within the total service area, in the cities and towns served by the RLECs costs are significantly less than in the truly rural areas. But offsetting that advantage of lower costs in the cities and towns is the fact that the RLECs generally have at least one competitor (cable) in those “less rural” areas. As has been the case in larger markets, margins have been competed away, to the benefit of ratepayers. But for the rurals, that means that earned income is declining as customers are lost to competition in their core markets and revenues per customer decline due to competitively-driven lower prices.

The revenue provided by USF, IUSF and intercarrier compensation is necessary if the rural providers are to remain solvent, let alone profitable. Funding to build out in those truly rural areas is meaningless if it is essentially a matter of taking money out of one pocket and putting it into the other...it does no good to build out those last miles if the company is slipping into bankruptcy because the FCC is starving it of the funds established to sustain the network that is the backbone of the urban/rural covenant. And in some of the very rural areas, there are no other viable options for broadband.

Most of INECA’s members are currently operating at significantly below their nominally authorized rate of return; some are currently losing money, as demonstrated in Attachment 4.

¹⁶ *Id.* at 4.

Because of this (1) it cannot be expected that the FCC re-evaluate its broadband policies, and (2) the State of Indiana needs to find an alternate mechanism other than IUSF to fund the capital expenditures to complete broadband buildout.

Q. SHOULD THE METHOD OF DIRECTING SUPPORT BE MODIFIED, SO THAT “HIGH COST AREAS” ARE DEFINED AT THE CENSUS BLOCK LEVEL RATHER THAN ON THE BASIS OF THE INCUMBENT LOCAL EXCHANGE CARRIER’S (ILEC’S) SERVICE TERRITORY?

- A. It is possible that IUSF could be distributed on a more granular basis than the total service territory, but that should be done based on network logic rather than arbitrary political designations (census tracts). Keep in mind that high-cost support was specifically designed to support a universally-available network. Any unserved areas are going to be built out, regardless of the technology employed, with the existing network in mind, so that connections are as efficient as possible.

Since the FCC has abandoned its commitment to support of efficient networks in favor of piecemeal support, and it falls to the State of Indiana to take up the unfunded liability pushed on the states by the FCC, it makes sense to allocate our resources based on the architecture of efficient networks built over several decades.

Q. SHOULD THE IUSF EMULATE THE FCC IN DISBURSEMENT OF FUNDS TO SUPPORT BUILDOUT BY WILLING PROVIDERS – I.E., RURAL ELECTRIC COOPERATIVES, CABLE COMPANIES, CLECS?

- A. In a word, no. Over the last several years, the FCC has repeatedly demonstrated its ineptitude at estimating the cost of buildout to unserved areas. The census tract is not a particularly useful geographic variable.

Given the collective expertise of the parties to this Cause, the Commission could create a subdocket or a separate docket to design a simpler and less costly approach for selecting participants, in the event the Commission chooses to emulate the FCC’s practice. Given

the FCC's challenges in the CAF-1 proceeding, the track record is not encouraging. IUSF should focus on assuring a reasonable return to RLECs that meet qualifying test requirements.

Q. SHOULD THE IURC ADOPT THE RATEMAKING PROCESS OUTLINED IN THE FCC'S RATE OF RETURN ORDER (FCC 16-37 RELEASED MARCH 30, 2016) TRANSITIONING THE RATE OF RETURN TO 9.75%?

- A. No. The action of the FCC, measured against virtually universal procedures for establishing a rate of return, is suspect. The roots of the Rate-of-Return Reform Order are to be found in the FCC's action capping funds available for the high cost fund shortly prior to the issuance of the Transformation Order. This action was taken without effort to determine whether the capped amount was "...sufficient to support networks and services in rural regions."¹⁷

The Rate of Return Reform Order was actually driven by the cap on funding. Since there were not sufficient funds available to meet the demonstrable needs, the FCC acted to cut the rate of return.

The FCC's contention that the cost of capital has fallen is not even remotely defensible. Assuming, arguendo, that 11.25% (the prevailing Federal rate) was correct when the ILECs' costs were spread over the entirety of communications users (as with water, natural gas and electric utilities), enjoyed monopoly status with no competitive risk or exposure to revenue being competed away, when volatility was markedly lower, the regulatory environment was stable-to-evolutionary and predictable... to suggest that today's environment warrants a lower rate of return is quite simply disingenuous.

Should the IURC adopt the FCC's approach and rate of return? At a minimum, the current 11.5% rate should stand.

¹⁷ Michael J Balhoff, CFA, *Testimony Before the Senate Committee on Commerce, Science and Transportation, Subcommittee on Communications, Technology, Innovation and the Internet*, 2 (June 20, 2017).

It would be difficult to overstate the importance of this issue. For this reason, with his permission, I have appended Attachment 2, inclusive of the Balhoff's education and business background, prefiled opening testimony, and rebuttal testimony, representing testimony before the Senate and in a similar California proceeding, prepared by Michael Balhoff, CFA. Mr. Balhoff is perhaps the pre-eminent analyst and student of rural finance. Mr. Balhoff is associated with two entities, Balhoff & Williams, a consultancy; and Charlesmead Advisors, LLC, an investment banking firm.

In addition to examining the rate of return issue through rate-setting models, Mr. Balhoff brings a confirming perspective as an investment banker intimately involved with M&A in the communications sector. In his Senate testimony, he notes that "...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 [EBITDA]. Since then, the valuations have settled generally between 4.5 and 5.5 times operating cash flow....investors perceive new risks that have caused a startling contraction of 30%-40% in value."¹⁸ As Mr. Balhoff persuasively argues, the best indicator of value is the price agreed to by a willing buyer and willing seller.

But it gets worse. Many, probably most, RLECs are earning significantly below the authorized rate of return...not, as is often the case with other utility sectors, by 50 to 150 basis points, but by half or more of their FCC-set rate of return.

At a time when the remaining unserved areas will be the most difficult and costly to build out, and when actions of the FCC in the last 5 years have created a climate of greater instability and uncertainty than at any time in a generation, it makes little sense to reduce the proposed rate of return solely based on the FCC's actions. Reducing the rate-of-return would compound the damage done by the FCC. The rate-of-return should not be adjusted below the authorized rate of return set in simpler, more stable and more predictable times.

¹⁸ *Id.* at 5.

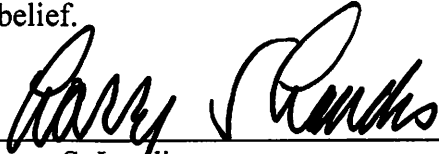
In conclusion, in addition to his Senate testimony (Attachment 2), I would direct your attention to Mr. Balhoff's prefiled testimony dated September 1, 2015, at pages 49-71, for those interested in a detailed dissection of the FCC order, attached hereto as Attachment 3.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes

VERIFICATION

The undersigned affirms under the penalties of perjury that the facts stated in the foregoing testimony are true to his best information and belief.



Larry S. Landis

**Larry S. Landis, Commissioner Emeritus
Indiana Utility Regulatory Commission**

Narrative Biography

Larry S. Landis was founder and President of Marketrends, Inc., a marketing/communications company in Indianapolis; and co-founder of American Grassroots, LLC, prior to being appointed to the Indiana Utility Regulatory Commission in January 2003 by Indiana's late Governor Frank O'Bannon (D-IN), and reappointed to a full term by former Governor Joe Kernan (D-IN) in July of 2004. In December of 2007 and 2011, he was appointed to consecutive full terms by former Governor Mitch Daniels (R-IN). He retired from the Commission in 2014.

In August, 2003, he was named to the National Association of Regulatory Utility Commissioners' (NARUC) Telecommunications Committee, and was active in a number of roles on that Committee. Landis served on NARUC's Legislative Task Force, charged with developing recommendations for a rewrite of the nation's telecommunications laws; he was Vice Chair of NARUC's Intercarrier Compensation Task Force.

In January of 2005, Landis was named to the Federal-State Joint Conference on Advanced Telecommunications Services. In November of 2005 he was also appointed to the Federal-State Joint Board on Universal Service, serving two terms (2005-2011). In 2012, he was appointed to the Federal-State Joint Board on Jurisdictional Separations. In May of 2008, Commissioner Landis was appointed to the NARUC Board of Directors, and to a second term in 2010. In 2013, he was appointed Co-Chair of NARUC's Washington Action Committee (WAC).

Landis was also a member of the Advisory Board of the Financial Research Institute at the Trulaske College of Business, University of Missouri/Columbia of which he was Vice Chair in 2009-2010 and Chair in 2010-11; and is a member of the Society of Utility and Regulatory Financial Analysts (SURFA).

He worked on the campaigns of former Indianapolis Mayor and Indiana's longest serving Senator, Richard G. Lugar (1967); former Senate candidate from Indiana and first Administrator of the U.S. Environmental Protection Agency William D. Ruckelshaus (1968); the late former Indiana Governor and former U.S. Health and Human Services Department Secretary Dr. Otis R. Bowen; and former Indiana Secretary of State and Congressional candidate William N. Salin (both in 1972). He also served as Assistant to the Mayor in the Lugar administration from 1969-71.

Other career highlights include 15 years of service with three separate Indianapolis advertising agencies. Landis also served four years as Vice President of Corporate Advertising for American Fletcher National Bank, now part of JP Morgan Chase. In 1999 he co-founded American Grassroots LLC, established to introduce new "grassroots" communications technologies to member organizations (such as trade associations), public policy organizations, political campaigns and utilities. These solutions empowered users to engage, notify, mobilize, and activate members and/or customers through more cost-effective, more efficient grassroots telecommunications tools. In all, he spent 30 years in the private sector prior to being named to the IURC.

A *cum laude* graduate of Wabash College (1967) with a double major in political science and economics, Landis also pursued graduate work in organizational theory and political behavior at the University of North Carolina/Chapel Hill and at Indiana University. Born in Princeton, NJ, Landis grew up in Goshen, Indiana. He and his wife Carol L. (Butz) Landis are the parents of an adult son, Christopher, who resides with his wife Heather and their daughters Lauren, Anna and Emily in nearby Carmel.



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

BEFORE THE
SENATE COMMITTEE ON COMMERCE, SCIENCE AND
TRANSPORTATION
SUBCOMMITTEE ON COMMUNICATIONS, TECHNOLOGY,
INNOVATION, AND THE INTERNET

JUNE 20, 2017

HEARING

UNIVERSAL SERVICE FUND AND RURAL BROADBAND INVESTMENT

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 USE/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 original 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% 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%, 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

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.

2016, the FCC chose to address the oversubscription by reducing the per-line offer of support by 27%, 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.

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 Inter-carrier 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 (including 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% in a transition that is

gradually implemented annually through a 25-basis point reduction until the rate settles at 9.75% 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%-40% 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.

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.

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.

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% in 1990 (the last time the rate was adjusted before 2011) or in 2001 when the 11.25% 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%, 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%—and again I believe it has gone higher still—the shortfall for the RoR carriers in the upcoming year would be approximately 16.2%, by my calculation. If the rate should be 12.00%, then this coming year's shortfall is 21.5%.

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

II. MIGHT THERE BE IMPROVED TARGETING OF THE USE/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.”

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.

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% 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 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 be 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.

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.

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

State	Rural locations		Number of carriers		State	Rural locations		Number of carriers	
	Large carrier HC locations	RoR total lines	Large carrier	RLEC		Large carrier HC locations	RoR total lines	Large carrier	RLEC
AK	35,364	116,991	1	15	MT	46,355	121,730	2	12
AL	135,139	147,915	5	14	NC	71,764	377,598	5	12
AR	144,651	106,737	3	16	ND	12,108	186,937	1	17
AZ	65,065	58,026	2	11	NE	56,238	122,870	3	25
CA	290,948	76,447	5	10	NH	14,305	54,273	1	5
CO	77,102	43,306	2	19	NJ	6,865	9,467	2	1
CT	2,076	-	2	-	NM	54,229	59,925	3	12
DE	3,422	-	1	-	NV	20,648	35,925	3	8
FL	91,785	36,525	6	4	NY	145,205	136,642	4	21
GA	144,455	273,892	4	22	OH	174,840	103,924	6	26
HI	13,202	8,090	1	1	OK	92,737	237,036	4	31
IA	111,196	244,661	4	125	OR	69,371	86,322	2	20
ID	34,842	54,714	2	14	PA	152,808	71,898	6	14
IL	135,664	104,601	5	36	RI	864	-	1	-
IN	144,015	170,449	3	24	SC	52,429	555,934	4	12
KS	89,000	140,894	3	32	SD	19,688	164,706	1	20
KY	159,635	200,816	3	12	TN	97,809	404,275	3	13
LA	107,832	101,302	2	8	TX	266,640	289,094	5	41
MA	15,329	4,019	2	2	UT	14,622	98,270	2	9
MD	21,946	7,373	1	1	VA	145,156	114,368	3	11
ME	40,884	96,793	1	6	VT	29,345	60,776	1	6
MI	191,203	126,139	3	22	WA	103,541	53,712	3	13
MN	198,065	341,056	4	41	WI	243,729	353,709	3	36
MO	305,093	130,394	4	27	WV	101,518	19,411	1	5
MS	149,603	67,203	4	9	WY	23,884	48,348	1	6

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.

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 underinvesting 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 Institutional 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.

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Appendix 2—California Prefiled Testimony
of
Michael J. Balhoff, CFA

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Application of)	
Calaveras Telephone Company (U 1004 C))	Application _____
Cal-Ore Telephone Co. (U 1006 C))	
Ducor Telephone Company (U 1007 C))	(Filed September 1, 2015)
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)	
_____)	

PREFILED OPENING TESTIMONY

OF MICHAEL J. BALHOFF

ON BEHALF OF THE APPLICANTS

1 **I. Introduction and Purpose**

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

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

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

8 A. B&W provides advisory services, including financial and regulatory consulting. Our
9 clients are various telecommunications, cable television, and energy companies.
10 B&W previously was known as Balhoff & Rowe, LLC, and then Balhoff, Rowe &
11 Williams, LLC. The firm changed its name to reflect the active partners, but the
12 services of the firm have remained consistent since the company was established in
13 2004. With two other partners, I also co-founded Charlesmead in June 2010 to
14 provide investment banking services to telecommunications companies. My services
15 in this proceeding are provided through B&W.

16 **Q. Please describe your relevant educational and professional background.**

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

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

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

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

20 **Q. What is your relationship with the companies?**

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

1 **Q. Have you appeared before the California Public Utilities Commission**
2 **(“Commission”) in any other proceedings?**

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

8 **II. PURPOSE AND SUMMARY OF TESTIMONY**

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

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

¹ See Decision 15-06-048 June 25, 2015 at 20.
Page 4 of 79

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

3 A. As I explained above, at Legg Mason, I developed a financial specialization in the
4 equities of rural telephone companies in addition to my broader telecommunications
5 coverage. I have given numerous presentations to the National Association of
6 Regulatory Utility Commissioners (“NARUC”) and appeared before Congressional
7 and federal agency groups. Most recently, after the Federal Communications
8 Commission’s (“FCC”) sweeping 2011 reforms of universal service and intercarrier
9 compensation, I was invited to brief the Department of Agriculture’s Rural Utilities
10 Service (“RUS”), the White House, the Secretary of Agriculture, and the FCC
11 concerning the financial effects of those policy changes. On the basis of coverage of
12 rural companies, my Legg Mason practice was named by Institutional Investor
13 magazine as the top telecommunications financial analysis boutique in the country in
14 2003. I was also honored to be named as a Wall Street Journal All-Star Analyst in six
15 annual awards for the performance of my equity recommendations.

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

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

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

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

6 A. I evaluated, among other sources, the procedural record in Commission Rulemaking
7 11-11-007, prior cases involving cost of capital brought before the Commission,
8 United States Supreme Court decisions related to cost of capital, orders of the FCC
9 concerning rate-of-return matters, cost-of-capital resources related to telephone
10 companies as compiled by Ibbotson/Morningstar² and Duff & Phelps,³ as well as
11 transactional data that we maintain at our firm, Charlesmead Advisors. I have also
12 studied the financial reports of each of the Independent Small LECs, reviewing their
13 capital structure and debt costs, with a focus on the last six years from 2009 through
14 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.

1 **Q. Please summarize your testimony.**

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

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

- 22 • **Industry changes that affect the corporate cost of capital for small ILECs.**
23 The second section emphasizes that the Commission should assess industry

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

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

1 traditional valuation approaches. Using those methods, and by making
2 appropriate adjustments for equity risk, industry-specific risk, and size risk, I
3 identify an appropriate range for the Independent Small LECs' equity costs.
4 On the basis of the historical data, I estimate that a realistic range for the
5 Independent Small LECs' cost of equity is 17% to 22%, and I recommend
6 18.5%, which I will show to be a conservative calculation. I also testify that an
7 assessment of industry risks provides the Commission with a high degree of
8 confidence that the cost of equity for the Independent Small LECs is
9 substantially higher than it was eighteen years ago when the Commission set
10 the 10% target WACC. Given the relatively low costs of equity that are often
11 applied in public utility sectors, I recognize that some may initially be skeptical
12 about a 18.5% equity cost estimate, but I am confident that it is reasonable for
13 these companies and appropriate for adoption in this proceeding. If anything,
14 the cost of equity I recommend may be lower than will be required to attract
15 capital for investments in rural telecommunications infrastructure. As I explain
16 above, I rely on multiple methodologies to test and re-test my findings, and
17 then I check the results against M&A data in an approach that is rigorous,
18 intellectually honest, and convincing. In this section, I also provide a summary
19 of other premia that I have chosen not to add to my estimate, including premia
20 for liquidity and marketability risks, in spite of the fact that there is significant
21 authority for including those incremental adjustments. The data and the
22 methodologies demonstrate that my proposed cost of equity in this proceeding
23 is both responsible and conservative.

- 1 • **Debt costs.** There is evidence that the Independent Small LECs will have
2 lesser access to debt capital in the future and that debt costs are likely to rise in
3 the future. The average and median costs of debt in 2014 for the seven
4 Independent Small LECs with debt on their balance sheets were 4.5% and
5 4.8%, respectively. If the Commission wishes to use a target cost of debt to
6 calculate a target WACC, I recommend the use of 5.5% as the cost for
7 forward-looking debt. The interest rate is in line with Sierra Telephone's
8 current cost of debt and less than the 5.6% average for the AAA corporate
9 monthly rate from January 1997 to June 2015. I will provide a full explanation
10 for this recommendation below.
- 11 • **Capital structure.** I present the actual capital structures for each of the
12 Independent Small LECs, and report that the 2014 equity ratios averaged
13 70.1%. The capital structure ratios have remained relatively stable over recent
14 years (*e.g.*, there was a 68% average equity ratio five years ago in 2010). I also
15 offer my opinion about how a hypothetical capital structure might be
16 formulated, if the Commission were to use such an approach. I testify that it is
17 my judgment that the appropriate capital structure is toward the high end of the
18 Commission's 1997 equity ratio "zone of reasonableness," which was
19 previously defined as 60% to 80%. It is my opinion that an imputed capital
20 structure might reasonably incorporate equity percentages between 70% and
21 80%, particularly as lenders and other investors have become more cautious
22 about the industry. If the Commission chooses to use a target for the
23 companies' cost of capital, I recommend that the Commission use the equity

1 and debt costs that are presented in this testimony as reasonable. In the event
2 that the Commission seeks to set an overall rate of return for all companies, I
3 have calculated a standardized WACC that assumes a 70% equity ratio (at the
4 low end of the range I believe is reasonable for such a hypothetical figure), a
5 cost of equity of 18.5% and a cost of debt of 5.5%, resulting in a WACC of
6 14.6%. I test that WACC, using the underlying data and actual transactional
7 prices over the last several years, to provide convincing support for the costs of
8 equity and the proposed WACC that I present in this testimony. I demonstrate
9 that M&A data are the most reliable test of “reasonableness” for valuations and
10 hence for costs of equity, and those data confirm the conservative nature of the
11 estimates that I calculate using the CAPM-related methodologies. The data
12 from these various analyses are compelling and support my conclusions.

13 **III. LEGAL BACKGROUND.**

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

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

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

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

14 From the investor or company point of view it is important that there
15 be enough revenue not only for operating expenses but also for the
16 capital costs of the business. These include service on the debt and
17 dividends on the stock. . . . By that standard *the return to the equity*
18 *owner should be commensurate with returns on investments in other*
19 *enterprises having corresponding risks*. That return, moreover,
20 should be sufficient to assure confidence in the financial integrity of
21 the enterprise, so as to maintain its credit and attract capital.
22 (Emphasis added.)

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

27 Admittedly, the impact of certain rates can only be evaluated in the
28 context of the system under which they are imposed. One of the
29 elements always relevant to setting the rate under *Hope* is the return
30 investors expect given the risk of the enterprise. *Id.*, at 603, 64 S.Ct.,
31 at 288 (“[R]eturn to the equity owner should be commensurate with
32 returns on investments in other enterprises having corresponding
33 risks”); *Bluefield Water Works & Improvement Co. v. Public Service*
34 *Comm'n of West Virginia*, 262 U.S. 679, 692-693, 43 S.Ct. 675, 679,
35 67 L.Ed. 1176 (1923) (“A public utility is entitled to such rates as
36 will permit it to earn a return . . . equal to that generally being made
37 at the same time and in the same general part of the country on
38 investments in other business undertakings which are attended by

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

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

11 In short, an equity owner in a rate-regulated utility should be allowed the opportunity
12 to earn returns that are comparable with those derived from investments in other
13 businesses that have equivalent risks, with appropriate adjustments for other risks such
14 as regulatory risk. The issue to be determined by the Commission, therefore, is what
15 rate of return is necessary to allow the Independent Small LECs to earn on their
16 investments a return that is commensurate with the risk-adjusted, market-based rate
17 available for other similar investments. My professional opinion is that the current
18 10% overall rate of return applied in ratemaking for Independent Small LECs should
19 be significantly *raised* to reflect the increased risks since 1997. The remainder of this
20 testimony will develop and support that opinion, relying on relevant data and
21 authoritative sources.

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

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).

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

16 Federal and California regulators have identified a wide range of broadband
17 deployment goals and continued network investment is needed to meet those goals.⁵
18 However, an improperly low cost of capital could thwart achievement of these
19 objectives. Moreover, an insufficient rate of return could disincent investments
20 necessary to ensure service quality and network reliability in rural areas. In short, if
21 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.

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

3

4 **A. DETERMINING THE CAPITAL STRUCTURE.**

5 **Q. What is involved in calculating an appropriate WACC?**

6 A. Valuation (including estimation of cost of capital) is both an art and a science. Most
7 fundamentally, the process requires judgment, and it must employ data that create a
8 discipline to the process. Estimation of an appropriate rate of return begins with the
9 computation of a WACC that sums the costs of debt and equity, each weighted by its
10 proportion in the real or the hypothetical capital structure of the subject companies.
11 There can be disputes regarding whether to use the market value of debt and make
12 adjustments for the tax effects, but it is more typical to use embedded costs which are
13 the “actual interest obligations, including amortization of discount premium, and
14 expense of the utility’s embedded debt outstanding”⁶ Using this latter approach,
15 for example, if the cost of debt is 6.0%, the dividend on outstanding preferred equity is
16 7.0%, and the cost of common equity is estimated to be 12.0%, while the capital
17 structure includes 5% preferred equity and 70% common equity, the calculated
18 WACC would be as illustrated in Table 1 below.

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.**

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

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

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

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

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.

1 **B. ESTIMATING THE COST OF DEBT.**

2 **Q. Is the cost of debt difficult to determine?**

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

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

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

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).

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

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

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

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

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

23 ***C. ESTIMATING THE COST OF EQUITY.***

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

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.*

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

9 **Q. How are the costs of preferred equity estimated?**

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

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

20 A. Most financial experts with whom I have been associated seek to estimate common
21 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.

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

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

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

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

1 Companies, also known as Regional Holding Companies (“RHCs”).¹⁵ In the 1990
2 rescription order, the FCC clarified at paragraph 35 that the formula for that DCF
3 is:

$$4 \quad K_e = D/P + G$$

5
6 Where:

7 K_e = Cost of equity

8 D = Annual dividend on a share of common stock

9 P = Price of a share of common stock

10 D/P = Dividend yield on a share of common stock

11 G = Annual dividend growth rate
12

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

¹⁵ FCC, *In the Matter of Rescribing 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.

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

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

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

13 **Q. What is the CAPM?**

14 A. The CAPM is a computation of the expected return on a security, based on concepts
15 derived from the work of Harry Markowitz and the subsequent study of William
16 Sharpe in 1960. The premise underlying this method is that the expected return of a
17 security, or of a portfolio, equals the rate on a risk-free security (generally assumed to
18 be the long-term U.S. Treasury Bond for which the risk of principal loss or failure-to-
19 pay is very low) plus certain other risk-premia to adjust for systematic (market) risk.
20 This approach reflects the overall market risk (the broad market rising or falling), plus
21 adjustments for individual-company risk captured by a “beta,” plus adjustments for
22 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.

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

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

7
8
9 Where:

10 K_e = Expected return (cost) on equity

11 R_f = Risk-free rate

12 β = Beta of the security (statistical volatility v. the market)

13 RP_m = Equity Risk Premium

14 RP_s = Size premium

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

19 **Q. What is the Buildup Method?**

20 A. The Buildup Method is an additive Risk Premium approach that relies on CAPM
21 concepts in computing the cost of equity. In reality, it is the CAPM, with the beta
22 calculation divided into two parts: one for the overall market risk (the equity risk
23 premium) and the second for a proxy premium related to the industry (an industry-risk
24 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.

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

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

16 Where:

17 K_e = Expected return (cost) on equity

18 R_f = Risk-free rate

19 RP_m = Equity risk premium

20 RP_i = Industry risk premium

21 RP_s = Size premium

22
23 Duff & Phelps also provides a formula that is an alternative to the Buildup Model
24 presented above. In that alternative, a size adjustment that includes the market
25 premium can be added to the risk-free rate. That is, only two variables are added, and
26 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.

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

3 ***E. USE OF TRANSACTIONAL DATA TO CONFIRM CAPM ESTIMATES.***

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

6 A. In my experience, the CAPM, Buildup and DCF models are the most commonly-used
7 cost-of-capital estimation tools in regulatory proceedings.²¹ Before the mid-1960s, the
8 Comparable Earnings approach was used almost exclusively in regulatory valuation
9 exercises, but it was replaced by the DCF after that time.²² In the investment banking
10 industry, including at our firm, Charlesmead, value (with calculations that rely on cost
11 of equity estimates) is assessed using the CAPM, with adjustments for size or
12 company-specific differences from the industry, and detailed (not the constant growth)
13 DCFs. As I explained earlier, we also rely on two other methodologies that are not
14 typically used in regulatory proceedings, but which help to confirm the validity of our
15 conclusions. Specifically, we assess multiples (ratios) of enterprise value (“EV”),
16 which is defined as equity value plus net debt (total debt less cash and equivalents),
17 divided by cash flows, most often using operating cash flow (earnings before interest,
18 taxes, depreciation and amortization or “EBITDA”). We compile those EV/EBITDA
19 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.

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

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

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

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

22 It is clear to me that we are in such a period for telecommunications carriers, both
23 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.

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

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

16 A. Some, but not all, transactional data are available. Exhibit MJB - 5 provides the
17 publicly-available data related to small ILEC transactions from 2001 to the present.
18 Some of the transactions listed in the Exhibit appear to have higher valuations in
19 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.

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

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

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

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

15 First, and probably most significantly, the regulatory factors affecting small rural
16 carriers are fundamental to the business of those companies, which have a high
17 proportion of their operations in regions that are uneconomic or less economic than
18 those served by large carriers. Large carriers rely on relatively little or no regulatory
19 support revenues because their businesses are concentrated in denser areas and those
20 carriers provide lesser-regulated or non-regulated products such as wireless, enterprise,
21 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.

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

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.

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

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

7 Research tells us that the CAPM often misprices risk for certain
8 investments. Specifically, researchers have observed that commonly
9 used methods of measuring risk used in the CAPM (specifically,
10 beta) often understate the risk (and thus understate the required
11 return) for small company stocks. Examination of market evidence
12 shows that within the context of CAPM, beta does not fully explain
13 the difference between small company returns and large company
14 returns. In other words, the historical (observed) excess return of
15 portfolios comprised of smaller companies is greater than the excess
16 return predicted by the CAPM for these portfolios. This ‘premium
17 over CAPM’ is commonly known as a “beta-adjusted size premium”
18 or simply “size premium”.³⁰

19 To be clear, investors *require* a return for smaller companies that exceeds that
20 predicted in the CAPM for larger companies, as proven in the historical studies. This
21 investor behavior cannot be ignored in valuation. Moreover, Duff & Phelps is clear in
22 its *Valuation Handbook*, cited above, that research verifies the existence of a size
23 premium. This premium is appropriately added to the equity return to reflect market-
24 based risk that is greater for smaller companies compared with larger companies.
25 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](http://www.duffandphelps.com/SiteCollectionDocuments/Reports/(EXCERPT)%202013%20Duff%20Phelps%20Risk%20Premium%20Report.pdf).

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

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

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

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

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

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.

1 informed judgment and reasonableness must enter into the process of
2 weighing those facts and determining their aggregate significance.³³
3 IRS Revenue Ruling 77-287 recognizes that there are important valuation differences
4 and considerations for small and closely-held companies.³⁴ Further, various United
5 States Tax Court and Court of Federal Claims cases support the application of
6 discounts or premia arising from illiquidity, lack of marketability, lack of control, and
7 industry risk.³⁵ In particular, there is substantive support that the cost of equity should
8 include additional premia for illiquid and less-marketable securities.

9

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.)

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

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

³⁶ IRS Engineering/Valuation Program DL0M 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 DL0M”], p. 1.

³⁷ IRS DL0M, 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
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1 that an adjustment should be made related to both size *and* lack of marketability. It
2 has been my experience that marketability is reduced further in environments where
3 investors find that regulatory obligations are greater than in other jurisdictions and
4 where sales are perceived to be accompanied by more challenging regulatory
5 conditions. While I am convinced that such a discount for lack of marketability likely
6 should be included, *the omission of such a discount makes the inclusion of a size*
7 *premium even more critical in the calculation of the cost of equity to assure an*
8 *appropriate return on equity.*

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

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

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

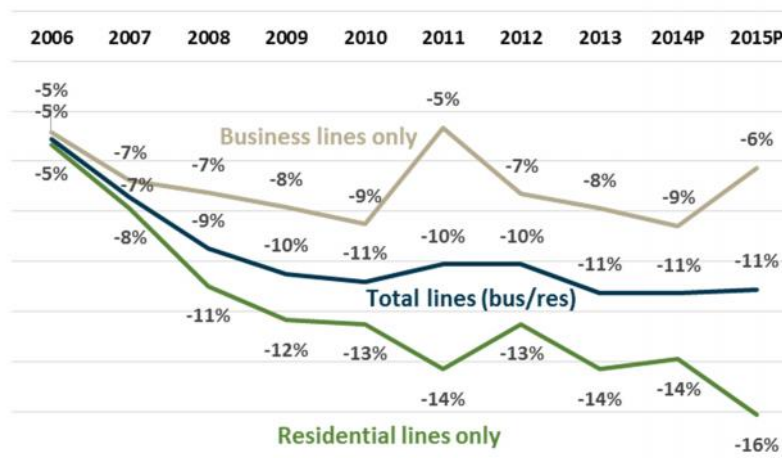
cases. For example, the range of court discounts might have been from 20% to 25% so the valuator chooses 22.5% with the rationale that his valuation subject is similar to the subjects under consideration in the cases cited. Judges are sometimes found to adopt this approach as well. The judge will look 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%, Hertzell & 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%.”

Q. How have technology changes affected the telecommunications marketplace?

A.2 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>.

1

Source: US Telecom, April 2014.

2

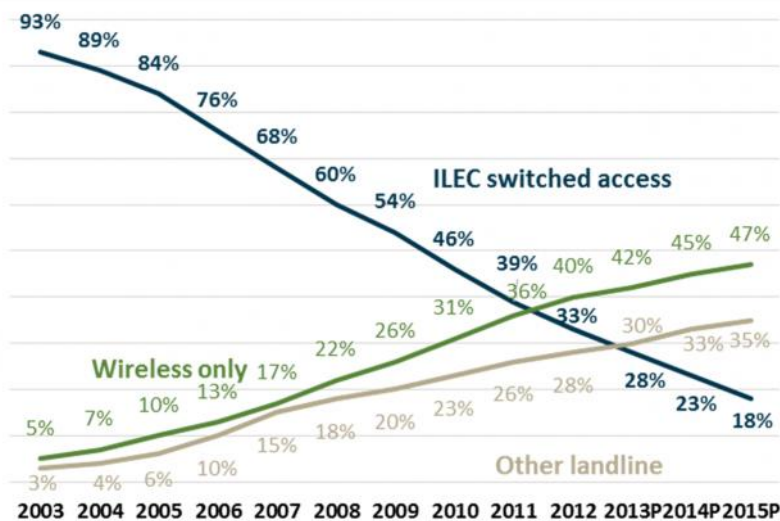
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Figure 2: Share of Nationwide U.S. Households



7

8

Source: US Telecom, April 2014.

9

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

10

11

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

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

9 I generated a study related to this problem, relying on extensive data in Texas.⁴¹ The
10 Texas study evaluated 350,000 access lines, using confidential financial data. Among
11 other conclusions, the study highlighted that without universal service funding, 77% of
12 the rural wire centers generated on average a negative 9.7% return on investment. And
13 13% of the wire centers generated an average positive return of 2.9% , which was
14 insufficient to justify investment. Finally, 10% of the wire centers generated a 10%
15 return or higher. The conclusion was that, without universal service support funding
16 (“USF”), 90% of the wire centers are candidates to lose service entirely. From a
17 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>.

1 and would not be served – absent high-cost support. The data in that 2007 report
2 assumed that the ILEC would continue to have intercarrier compensation revenues and
3 margins. This study also relied on the assumption that the universal service system
4 would continue in substantially the same form as it had for the decade preceding 2007.
5 However, the most recent FCC reform in November 2011 has mandated the
6 elimination of terminating access charges by 2020 and implemented a sweeping and
7 evolving set of reforms of the federal universal service system.⁴² The import of the
8 2011 reforms is that the financial outlook for small carriers is today more dire than the
9 cases I studied in 2007, where the situation was already challenging.

10 **Q. Does the rate-of-return regulatory platform or the Independent Small LECs’**
11 **access to California High Cost Fund A (“CHCF-A”) shield the Independent Small**
12 **LECs from the effects which you describe?**

13 A. The Independent Small LECs are not shielded if there is a failure to determine and set
14 appropriate rates of return. While the rate-of-return regulatory structure should result
15 in a fair opportunity for companies to earn a reasonable rate of return, that opportunity
16 only exists to the extent that the rate structure is set, based on reasonable assumptions.
17 Rate-of-return regulation provides no guarantee that a company will achieve any
18 particular revenue level, and I believe that CHCF-A support is not retroactively
19 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*”).

1 believe that the Commission has introduced certain high-cost fund reductions from the
2 federal system and applied them to CHCF-A calculations, including the imposition of
3 a “corporate cap” that is designed to disallow companies’ corporate expenses. *See*
4 D.14-12-084, at p. 101 (O.P. 3). Further, the CHCF-A program remains under review
5 in R.11-11-007, and the scope of that proceeding could further threaten Independent
6 Small LEC revenue streams. *See* D.14-12-084, at p. 12.⁴³ Regulatory changes and
7 risks must be taken as a whole in assessing the financial stability of carriers whose
8 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.

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

2 A. No, it would not be correct to say that wireless is the future of all telecommunications.

3 I make this point because the Commission might ask whether it is appropriate to
4 maintain a utility, and hence its cost of capital, if the industry is dying. I do not
5 believe the wireline industry is dying, but rather I believe that it is evolving toward a
6 new core service. I note that customers are today increasingly reliant on broadband,
7 which is now an important service. The FCC’s 2011 reforms of USF and intercarrier
8 compensation (“ICC”) outlined this migration in its *USF/ICC Transformation Order*
9 cited above. At paragraph 10 of the *USF/ICC Transformation Order*, the FCC stated
10 that it was “modernizing USF and ICC from supporting just voice service to
11 supporting voice and broadband, both fixed and mobile, through IP networks is
12 required by statute.”

13 Broadband is likely to remain primarily a wired service. The FCC reported in 2009
14 that the average monthly consumption of wired data services was 9 gigabytes (“GB”)
15 and the agency expected the average to rise to 15 GB by the end of 2010.⁴⁴ The FCC
16 now reports that the average fiber user and average DSL user consumes each month 32
17 GB and 22 GB of data, respectively.⁴⁵ The growth in volume is up over a year ago by
18 42% and 79%, respectively. Further “proving” the value of the wired broadband
19 network, the two dominant U.S. *wireless* carriers—Verizon and AT&T, Inc.
20 (“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>.

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

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

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

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.)

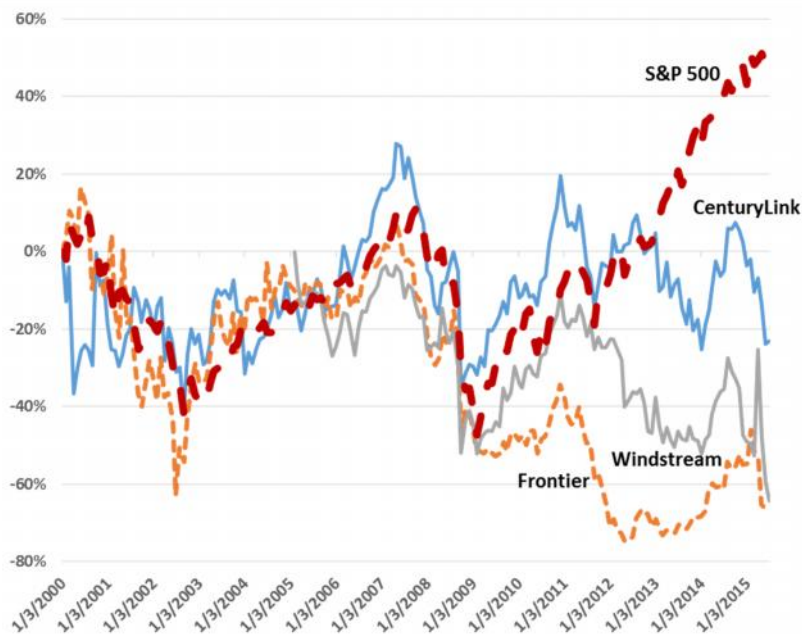
⁴⁷ See *USF/ICC Transformation Order*, para. 10: "Under these circumstances, modernizing USF and ICC from supporting just voice service to supporting voice and broadband, both fixed and mobile, through IP networks is required by statute. The Communications Act directs the Commission to preserve and advance 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."

1 A. Investors are now assigning lower valuations (higher required return on equity) to
2 ILECs and becoming even more cautious in light of the regulatory uncertainty and the
3 changing competitive marketplace. The equity prices of the ILEC-centric carriers, that
4 is, those without major wireless operations, have lagged, as is illustrated in Figure 3.
5 The graphic provides an indexed view beginning in 2000 for the stock prices of
6 CenturyLink (ticker symbol CTL), Frontier (FTR) and Windstream (WIN), and
7 tracking their performance relative to the S&P 500, which is widely used as an index
8 for the overall market.⁴⁸ The three carriers are the largest of the publicly-traded ILECs
9 with no wholly-owned wireless business and with extensive service in rural areas.
10 Figure 3 illustrates that, from the low point in the market collapse in 2008, the S&P
11 500 has sharply outperformed the three ILEC companies, which I believe are
12 approximately representative of investor sentiment about ILECs prior to considering
13 any “size effects” or rural carrier regulatory risks. The stocks of CenturyLink and
14 Windstream have outperformed Frontier’s stock, in part because those two carriers
15 have diversified within the last five years into business and data services where
16 investors may be expecting higher growth. Windstream’s stock weakened at the end
17 of April 2015, as the company spun-off its operating assets to a real estate investment
18 trust (“REIT”) in a sales-leaseback, and investors appear to be uncertain about
19 valuations for the surviving operating company and the REIT. Frontier has the largest
20 percentage of ILEC-only operations and has at least recently slipped below the
21 performance of the other two carriers and that of the S&P 500. It is my conviction that
22 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.

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

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



4
 5 Source: Yahoo Finance.

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

7 A. Yes. The prices paid—expressed as multiples on cash flow (*e.g.*, EV/EBITDA)—to
 8 acquire or bid on pure-play⁴⁹ ILECs have fallen since 2001 and most notably since
 9 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.

1 transaction or one valuation with another.⁵¹ In 2001, as detailed in Exhibit MJB - 5,
2 there were three rural ILEC transactions at an average price that was 10.2 times last-
3 twelve-month trailing EBITDA.⁵² Figure 4 illustrates more recent, large and medium-
4 sized ILEC transactions since the beginning of 2006, depicting how the pricing trend,
5 based on multiples of EV to EBITDA, has weakened.⁵³ In the period since the end of
6 2008, the average purchase price of the seven announced transactions was 5.4 times
7 EBITDA.⁵⁴ Because small ILECs do not typically announce sale prices, most of the
8 data remain confidential and we are not able to discuss specific pricing for certain
9 transactions on which we have worked. However, my partners and I have been
10 reporting in our presentations at conferences that the “going rate” for a pure-play ILEC
11 appears to have collapsed to approximately 4.5 to 5.5 times trailing (last full year)
12 EBITDA, which means that the value today is about half the value reflected in the
13 EBITDA multiples realized in 2001 and about 56% to 69% (based on 4.5x and 5.5x

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).

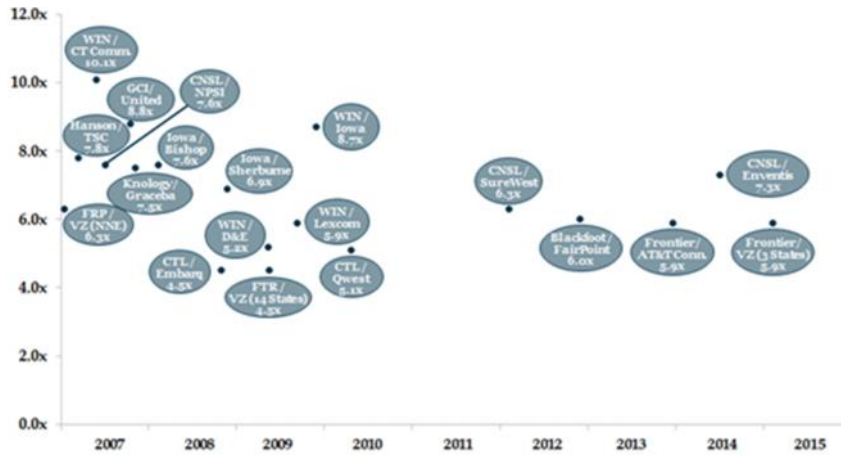
⁵³ Again, the data are included in Exhibit MJB - 5. The abbreviations include CNSL (Consolidated Communications), CTCO (Commonwealth Telephone), CTL (CenturyTel which became CenturyLink), CZN/FTR (Citizens Communications which became Frontier), D&E (D&E Communications), SNET (Southern New England Telephone 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.

1 EBITDA) of the 8.0 times EBITDA value realized on average between 2001 and the
2 end of 2007.⁵⁵ To be clear, investors appear to be signaling that there is significantly
3 greater risk today compared with ten years ago or even five years ago, as will be
4 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
 (1) Windstream / Iowa transaction value includes the value of Iowa's net operating loss carry-forwards.

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

1 decades-long mission of bringing modern telecommunications
2 services to their subscribers.⁵⁶

3
4 Similarly, the RUS, which is part of the Department of Agriculture, has \$4.7 billion in
5 principal outstanding for telecom infrastructure loans and the Farm Bill Broadband
6 Loan Program. The RUS has been able to place its full loan portfolio every year that I
7 have been able to track—*until* 2012 (immediately after the FCC’s November 2011
8 Transformation Order) when borrowers were lent only 11.6% of the \$690 million that
9 was available. This means that the RUS and/or the borrowers have become more
10 cautious in light of regulatory instability in the industry. Further, of another \$736
11 million available for RUS broadband loans, only 9.4% (\$68.9 million) was placed with
12 carriers in 2012.⁵⁷ As presented in Table 2, the percentage of available funding placed
13 in 2013 and 2014 improved to 28% and 31%, respectively, but it is still profoundly
14 troublesome that total dollars loaned declined by more than two-thirds from the pre-
15 2012 levels even in the most recent period. Our conversations with companies and
16 with the RUS indicate that the low investment is a combination of caution at the RUS
17 and uncertainty among the companies. In either case, the financial import is similar.

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;

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

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

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

20 A. The inputs most commonly used for the CAPM or Buildup Models are drawn from
21 data compiled in annual publications from Ibbotson/Morningstar and from Duff &
22 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.
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1 annual returns on equity for the market as a whole, and returns for specific industries
2 relative to the overall market. Ibbotson/Morningstar has continued to publish its
3 *Classic Yearbook*, but it ceased publishing its *Valuation Handbook* after 2013. The
4 Ibbotson valuation data and analyses are now consolidated into the publications
5 provided by Duff & Phelps, as of 2015. I make reference in this testimony to both
6 sources, which are the principal authoritative resources.

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

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

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

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

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

10 A. I begin with the longest period available, which is the Ibbotson data from 1926 to
11 2014. I also use readily available information in the most recent Duff & Phelps 2015
12 *Valuation Handbook*, which details inputs for the period from 1963 to 2014, Finally, I
13 use the Ibbotson years 1995 to 2014, which are absorbed into and reported in the Duff
14 & Phelps 2015 *Valuation Handbook*. I provide specific citations to each of these
15 sources in my subsequent testimony. The CAPM/Buildup data are included in Table 3
16 below. I also present the Duff & Phelps Risk Premium data in the final column for
17 1963 to 2014. As I will explain below, the Duff & Phelps’ Risk Premium approach
18 uses a different size premium, which is more general because it does not include an
19 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

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

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

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

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

13 A. Yes. It might be argued—with strong authority—that the appropriate rate is higher
14 than the yield alone. According to this school of thought, the risk-free rate is not
15 simply the yield for the 20-year treasury bond, but also includes inflation as well as
16 maturity risk.⁶¹ In certain years, the underlying bond value is up or down, depending
17 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.

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

7 ***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%

8
 9 *I have not used this alternative in my calculations, but point out that this approach is*
 10 *supported by significant authorities. A comparison of this table with the previous*
 11 *table reveals that this alternative computation, which is included immediately above in*
 12 *Table 4, generates higher estimated costs of equity for the first three columns and the*
 13 *same cost of equity for the last column. My choice to avoid using this formulation*
 14 *again highlights the conservative nature of the approach in this testimony.*

15 **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.

1 A. Duff & Phelps provides industry-specific adjustments that can be used in the
2 calculation of the Buildup analysis, which is a useful approach when no company-
3 specific beta is available, and such is the case with the Independent Small LECs. The
4 industry-specific adjustment relies on data compiled for SIC codes, which, in this case,
5 is SIC code 4813 (Telephone Communications, except Radiotelephone).⁶³ The 2015
6 adjustment for SIC 4813 is recommended to be -1.44%, which would offset the long-
7 term historical equity premium (dropping it lower by 1.44%) because the industry
8 companies in 4813 are perceived, according to the data in Duff & Phelps, as having
9 less risk compared with the overall market. However, Duff & Phelps explains that an
10 analyst can review the companies included in the industry-specific group to determine
11 whether they are truly comparable, and then Duff & Phelps provides a formula for
12 adjusting the industry-specific risk if a “custom” beta is used.⁶⁴ The companies
13 included in SIC code 4813, upon review, are very different from the Independent
14 Small LECs, as revealed in a quick glance at the entire list in the footnote below.⁶⁵
15 The companies include CenturyLink, multi-national Cogent which is an Internet
16 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., Otelco Inc., Sprint Corp., Verizon Communications Inc., Windstream Holdings Inc.

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

18
19 **Q. What is the equity risk premium and how do you estimate that premium?**

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

⁶⁶ See Exhibit MJB - 13.
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1 risk premium is a simple exercise in subtraction, taking the total market return or
2 expectation, based on historical data, for equities and subtracting the risk-free rate.
3 The appropriate market premium data are tabulated in studies such as Duff & Phelps
4 2015 *Valuation Handbook* which builds on the data previously published by
5 Ibbotson/Morningstar. In Exhibit 3.10 of the Duff & Phelps *Valuation Handbook*
6 *Guide to Cost of Capital*, the Handbook reports that the long-horizon equity risk
7 premium is 7.0%, which is the observed premium from 1926 to the present. For the
8 period from 1963-2014, the equity risk premium is 5.05% as reported by Duff &
9 Phelps. For the period from 1995 to 2014, the premium is 6.84% as also reported by
10 Duff & Phelps.⁶⁷

11 **Q. What size premium should be applied?**

12 A. As Ibbotson/Morningstar did in the past, Duff & Phelps provides two approaches to
13 size premia based on its longer-term observations of data. The size effects can be
14 captured by adding them to CAPM results or to the risk-free rate, using one of two
15 different size premia, each appropriate to the different respective starting points for the
16 analysis. I used the former because the latter approach is less precise, but I also report
17 the latter result below. The data, based on statistics from 1963 to the present, are
18 compiled in the Duff & Phelps 2015 *Valuation Handbook Guide to Cost of Capital* in
19 the Appendices, with Exhibit B-2 providing size premia above the CAPM and with
20 Exhibit A-2 providing size premia over the risk-free rate. I provide the pages from the
21 relevant Appendices in Exhibit MJB - 2. The pages in question divide companies into
22 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.
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1 Portfolio 25 in Appendix Exhibit B-2 and in Exhibit A-2 includes companies with an
2 average book value of \$65 million, which is larger than any of the Independent Small
3 LECs. I have used the smoothed premium of 5.78% over the CAPM for Portfolio 25
4 drawn from Duff & Phelps Exhibit 7.3 rather than 10z premium of 11.98% (smallest
5 group in the tenth decile) or the 8.94% (average of the two smallest groups in the tenth
6 decile), further underscoring that my estimate is conservative.⁶⁸

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

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

14 **Q. What is the Duff & Phelps Risk Premium?**

15 A. Duff & Phelps provides an analysis of Portfolio 25 stocks, indicating that, since 1995,
16 this group of stocks has generated a total return of 21.43%. This percentage is
17 comprised of the 6.61% risk-free rate and the 6.67% excess return predicted by the
18 CAPM in addition to the size difference, which was 8.15%.⁷⁰ As I explained above,
19 this formulation does not make any adjustments for industry-specific risks or
20 company-specific risks, so the inputs and results are more general. The results reflect
21 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.

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

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

5 A. No. Size premia are standard modifications in CAPM calculations, and they are
6 clearly appropriate for application here.⁷² Ibbotson/Morningstar and Duff & Phelps
7 have compiled extensive data to show that very small companies, such as the
8 Independent Small LECs, should have a size premium that is substantially higher than
9 the 5.78% premium that I use above. The tenth decile (grouping of the smallest
10 companies) is subdivided in Duff & Phelps Exhibit 7.3 into four categories, 10w, 10x,
11 10y, and 10z, with respective size premia of 3.18%, 5.54%, 7.51%, and 11.98%. The
12 Ibbotson/Morningstar 2015 Yearbook provides data in Table C-1.⁷³ Ibbotson/
13 Morningstar explains that the smallest sub-category of “10z” includes companies with
14 a market capitalization of up to \$96.16 million.⁷⁴ At the same time, I have chosen to
15 be conservative and use a premium of 5.78% rather than 11.98%, and have applied this
16 figure to each of the periods being analyzed.

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

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.

Attachment B

1 A. Yes. Table 5 summarizes the debt and equity for each of the Independent Small LECs
2 from 2010 to 2014 based on information that I received from the companies. The
3 book value of all the ten California ILECs is very small, and the largest book value is
4 reported by Siskiyou Telephone, which has \$60 million in 2014 book equity, while the
5 average and median values for all the Independent Small LECs are \$20.2 million and
6 \$14.3 million, respectively; thus, it is apparent that the ten California ILECs fall in the
7 lower half of the “10z” group, for which the indicated size premium is 11.98%.

1

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

2

3

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

4

A. As I explained in a previous section of this testimony, I believe that a good case can be

5

made for assigning a cost to illiquidity to capture the lack of marketability in the

6

equity of the Independent Small LECs. I have little question that this factor is

7

appropriate because small companies generally trade at discounts that reflect a higher

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

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

13 A. Yes. I have provided multiple periods and methodologies to assess the reasonableness
14 of my findings, as is the practice when I work on M&A transactions. Additionally, to
15 test my findings, I turned to the M&A data, which provide compelling confirmation of
16 reasonableness. In fact, the transactional marketplace reports sharply reduced
17 valuations for small ILECs, which have slipped from approximately 10 times EBITDA
18 in 2001 (based on three transactions with publicly-available data) to 4.5 to 5.5 times
19 EBITDA over the last several years. Taking a longer view, from the beginning of
20 2001 through the end of 2007, at least 98 transactions involving small ILECs were
21 announced, 20 of which included announcements of public valuation data, as included
22 in Exhibit MJB - 5. The transactional multiple based on EV to EBITDA averaged
23 8.0x in that period. Assuming no change in the small ILEC industry's absolute level

1 of debt and the cost of debt (which I believe is a realistic assumption) for industry-
2 wide carriers as of the period when small ILECs were valued at 8.0x (*i.e.*, 2000-2007),
3 this collapse in enterprise value implies that the equity value has fallen very sharply,
4 and the near-total loss of value is absorbed in the market value of equity.⁷⁵ The
5 concept is relatively simple. If a house is valued at \$1 million and \$200,000 is owed
6 to the bank, and then subsequently the house value slips to \$500,000 and the same
7 \$200,000 is owed to the bank, the residual equity value has fallen from \$800,000 to
8 \$300,000. Because the debt must be repaid at face value, the equity account bears the
9 entire loss of value in this scenario. This is what I believe is occurring for the
10 Independent Small LECs.

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

13 A. Before responding, I emphasize that the following assessment is a corroboration of the
14 analyses above, not the central presentation in this testimony. A critic might argue
15 that there is a mixing together of book value and market value. Such an argument
16 misses the larger point, which is that the size of the *relative contraction in value in the*
17 *marketplace* is a clear indication of the startlingly increased risks in the industry,
18 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.

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

8 **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			
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%

9
10 **Q. Please explain the table.**

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

1 times EBITDA with no change in the amount of the debt, then the loss of value (\$25 in
2 this illustration) is entirely subtracted from the market value of the equity. If the
3 equity ratio was 80%, then one has to subtract \$25 from \$80, or if the equity ratio was
4 70%, then the loss of value is \$25 from \$70, and if the equity ratio was 60%, the loss
5 is \$25 from \$60. The table demonstrates that if the current multiple is actually 5.5
6 times EBITDA, then the losses to equity value are greater, and if the current multiple
7 is 5.0 times EBITDA, the losses are greater still.

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

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

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

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

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

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

	CPUC Decision / Resolution	Debt			Equity			Wtd avg (WACC)
		Ratio	Cost	Wtd cost	Ratio	Cost	Wtd cost	
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%

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

3 A. The demonstration is straightforward. Today’s capital structure of the Independent
4 Small LECs, on average, is approximately the same as in 1997, as the equity ratio falls
5 within the Commission’s previously-defined zone of reasonableness which, in 1997,
6 was described as 60% to 80%, and when the cost of equity was, on average, near 12%,
7 as presented in Table 7.⁷⁶ In Table 6, above, I then tested my finding of 18.5% using
8 the following base formula: [old cost of equity x old market equity] = [new cost of
9 equity x new market equity]. The calculation attempts to generate an equity return
10 today that is the same as that generated in 1997, again assuming that returns are
11 relatively matched with capital invested. If I assume that the old return on equity
12 should approximately equal the new return, the new cost of equity is derived by an
13 algebraic adjustment to divide the [old cost of equity x old market equity] by the [new
14 market equity] to get the [new cost of equity], as indicated in Table 6. Again, I used
15 12% as the old cost of equity and the other calculations are spelled out in that table.⁷⁷
16 Taking the top (5.5 times) of today’s EV valuation range (assuming 4.5 to 5.5 times
17 EBITDA), the result is that today’s cost of equity should rise to 19.7% to offset the
18 loss in equity value if the equity ratio is 80% or to 21.7% if the equity ratio is 70%.
19 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.

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

10 **Q. Please summarize your analysis of the transactional data.**

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

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

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

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

9 **Q. What are the fundamental points of this analysis?**

10 A. The recent transactional data tell us that the cost of equity capital is sharply higher
11 than it was previously. This is not speculative or theoretical, but demonstrable in the
12 transactional markets. I also believe that there is no sign that valuations will rise, as
13 risks remain significant and competition is growing. This assessment leads me to
14 several important conclusions. First, the figures in the shaded section of Table 6
15 confirm the direction and demonstrate the reasonableness of the estimates calculated
16 using the Ibbotson/Morningstar and Duff & Phelps statistical information in the earlier
17 CAPM/Buildup analyses. Second, the M&A-based costs of equity are higher because
18 they likely reflect the fact that the Duff & Phelps and Ibbotson/Morningstar analyses
19 relied on historical valuation data that were too conservative or did not include other
20 risk factors, such as the changing ILEC marketplace as well as liquidity and
21 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.

1 equity capital-structure ratios, as low equity ratios result in increased risk when market
2 equity values are falling. That is, when market values are falling, the proportion of
3 market equity is also falling relative to debt, which means that the company's debt
4 costs are likely to rise in the future and its operating risk is likely to increase. Thus, I
5 suggest that the Commission consider whether the former zone of reasonableness
6 (60%-80%) should be shifted higher above 70% and likely to 80% to preserve
7 forward-looking access to capital and to manage operating risk.

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

9 A. I provide the data in the following table about the companies' debt and equity capital
10 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.

Attachment B

1

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%

2

3

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

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

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

⁸¹ See, e.g., D.97-04-032, p. 5.
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1 diversified. The risk-free rate employed is the lower of the two options (a higher
2 result is generated when using total return on the Treasury). And, the strongest
3 evidence of reasonableness, in my judgment, is the M&A data where I have again
4 been conservative, as my experience leads me to the judgment that the multiple on
5 EBITDA for these companies is likely closer to 5.0 times, which suggests a higher
6 cost of equity than the one I have used. The transactional data indicate that the actual
7 cost of equity is between 19.7% and 25.9%, which is well above 18.5% that I
8 recommend to the Commission here. I assume that the Commission recognizes that
9 risks in this industry are well higher than they were in 1997.

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

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

1

Table 9: WACC for each of the Independent Small LECs

	Average 2013/2014						WACC
	Debt ratio	Preferred equity ratio	Common equity ratio	Cost of debt	Cost of preferred equity	Cost of common equity	
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%

2

3

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

4

5

A. My observation in reviewing Table 9 is that there are widely divergent WACCs in

6

California, the result depending on whether the ILEC has 100% equity, or, for

7

example in the case of Foresthill, where there is an equity ratio of 43.8%. I believe

8

that providing Foresthill with return on capital set at 10.8% could make it difficult to

9

build equity during a challenging time for ILECs, and it is possible that customers may

10

be negatively impacted. The evaluation of the public policy import belongs to the

11

Commission, which I believe could make the determination that a WACC other than

12

the actual WACC, for example for Foresthill, does not harm customers as they are

13

paying the same capital costs as those incurred by customers of other ILECs and such

14

a WACC may help the customer because the carrier will be able to build a stronger

15

financial foundation to serve customers in the future. For companies that fall

16

significantly outside the Commission's previously defined "zone of reasonableness," a

17

hypothetical structure would be appropriate.

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

3 A. I would propose that the Commission employ a hypothetical capital structure with
 4 approximately 70% to 80% equity. I use 70% in my calculations below. This opinion
 5 relies on the Commission’s previous adoption of a zone of reasonableness of 60%-
 6 80%. It also reflects my conclusion that the market value of equity has fallen and that
 7 the companies will increasingly have to rely on book equity ratios that are relatively
 8 higher in the future than in the past. In calculating a target WACC, I also assume that
 9 the cost of debt will rise, both because we are going to emerge from the artificially-
 10 low interest rates in today’s markets and because I believe the risk for telephone
 11 companies will grow greater in the future. If the Commission were to posit a cost of
 12 debt figure as part of a hypothetical capital structure calculation, I recommend that the
 13 Commission use a hypothetical debt rate of 5.5% for companies without any actual
 14 debt rates. This is above the current median of 5.2% of the Independent Small LECs.
 15 However, it is approximately the interest rate that Sierra Telephone currently pays
 16 (5.53%), and approximates a rate that might be expected in the future for any of these
 17 carriers, although it is very possible the rates will rise higher. Again, this exercise is
 18 purely to arrive at a target WACC. Using the figures above and the recommended
 19 18.5% cost of equity, a realistic target WACC is 14.6%.

20 ***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%

1 While the target WACC is higher than the current 10.0%, it is consistent with my
2 transactional analysis. That is, the market collapse in ILEC enterprise value from 8.0
3 times trailing EBITDA to 5.5 times trailing EBITDA converts the former 10% target
4 WACC to 14.5% and if the change is assumed to be from 8.0 to 5.0 times trailing
5 EBITDA, the result is a target WACC of 16.0%. The calculation is $10\% * (1 / (5.5 / 8.0))$
6 $= 14.5\%$. or $10\% * (1 / (5.0 / 8.0)) = 16.0\%$.

7
8 **VII. CONCLUDING COMMENTS.**

9 **Q. Do you have any concluding comments?**

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

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

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

4 A. Yes.

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Appendix 3—California Rebuttal Testimony
of
Michael J. Balhoff, 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

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

1

REBUTTAL TESTIMONY OF MICHAEL J. BALHOFF

2

I. INTRODUCTION AND PURPOSE

3

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

4

A. My name is Michael J. Balhoff.

5

Q2. Are you the same Michael J. Balhoff who provided prefiled

6

opening testimony on September 1, 2015 in this proceeding?

7

A. Yes, I provided prefiled testimony (“Opening Testimony”) on

8

behalf of the Applicants (the “Independent Small LECs”).¹

9

II. SUMMARY OF REBUTTAL TESTIMONY

10

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

11

proceeding?

12

A. This rebuttal testimony addresses misconceptions, errors, and

13

policy concerns raised by the testimony of the Office of Ratepayer

14

Advocates (“ORA”) of the California Public Utilities Commission

15

(“Commission” or “CPUC”) submitted in this proceeding on

16

February 12, 2016.²

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

1 **Q4. Please summarize your rebuttal testimony.**

2 A. I organize my response into four sections.

3 • **Response to ORA Testimony about cost of equity.** My
4 testimony explains that ORA did not provide any
5 meaningful substantive response to my testimony. Rather,
6 ORA provided its opinions about inputs for estimating
7 equity costs and offered no authority or source information
8 for those estimates except for a 2013 report prepared by the
9 FCC Wireline Competition Bureau Staff (the "FCC Staff
10 Report³") that has never been adopted or endorsed by the
11 FCC, and which is now nearly three years old. I will show
12 that ORA's reliance on the FCC Staff Report to reject the
13 use of a premium for small companies and the FCC Staff
14 Report's reliance on one citation to a survey article (and no
15 other citation) to justify eliminating such a premium results
16 in an exclusion that is demonstrably wrong for multiple
17 reasons. In particular, the survey article itself reports the
18 finding that there is a size effect among the smallest

"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").

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

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

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

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

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

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

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

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

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

13
14 **III. RESPONSE TO ORA TESTIMONY ABOUT RETURN ON**
15 **EQUITY**

16 **Q5. ORA expresses concern that your calculation of the cost of**
17 **equity is higher by 50% over the implied cost of equity in the**
18 **1997 rate case decisions for the Independent Small LECs. How**
19 **do you respond?**

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

1 equity range referenced in the 1997 decisions.⁵ However, capital
2 markets and ILEC industry dynamics have evolved significantly
3 since the late 1990s, as regulatory, political, and competitive
4 developments have sharply increased the risk profiles of these
5 companies. I urge the Commission to look past ORA's superficial
6 skepticism regarding my proposal, as the proof of its
7 reasonableness lies in its details. I was careful in my testimony to
8 provide the highest-quality sources for data and applications of
9 premia, relying on the most respected resources provided by
10 Ibbotson/Morningstar and Duff & Phelps. I used not one or two,
11 but multiple analytical estimation tools to test and re-test the data,
12 including assessments of data across various historical periods to
13 appropriately smooth any anomalous results.⁶ I rejected any
14 estimations that might have been interpreted as aggressive.
15 Specifically, I was conservative by: (i) applying no incremental
16 liquidity or marketability premium; (ii) using a size premium that
17 is 641 basis points lower than the 11.98% recommended by Duff &
18 Phelps for the smallest of companies (appropriate for a 10z
19 grouping into which the Independent Small ILECs clearly fall);
20 (iii) relying on an industry beta that is relatively low at 1.06, as it is
21 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.

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

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

13 A. ORA provides virtually no sourcing for the estimates or the
14 opinions it offers in its testimony. ORA’s single source for its
15 Capital Asset Pricing Model (“CAPM”) equity risk premium is the
16 FCC Staff Report. I will address in detail the deficiencies in the
17 FCC Staff Report in a later section of this testimony. ORA also
18 reported that it “looked at data collected by Professor Aswath
19 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.”

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

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

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

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

15 A. No. ORA relies on a CAPM, which is fundamentally the same as
16 the Build-up Method used in my testimony, but ORA suggests its
17 own inputs that are different from those drawn from the various
18 Ibbotson and Duff & Phelps data.¹¹ Most surprising, ORA reduces
19 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.

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

9 **Q9. What risk-free rate does ORA utilize?**

10 A. ORA notes that the ten-year Treasury rate has fallen from 6.68% in
11 1997 to 3.07% in 2014. Then, ORA proposes to use the most
12 recent reported three-year average rate of 2.91%. ORA provides no
13 citation or authority for its recommended approach, nor does it
14 comment on today's extraordinarily anomalous rate-environment.

15 **Q10. Is the use of 2.91% appropriate?**

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

¹² ORA Testimony, p. 36, lines 15-18.

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

1 premium is apparently based on data from 1928 to 2012, a 76-year
2 period,¹⁴ yet its Treasury rate is drawn from a three-year average.
3 The result is a mismatch that is problematic. Even more
4 troublesome, however, is the fact that ORA's proposed Treasury
5 rate is not a sound data point, as it is drawn from a period in which
6 the rate is at historically low levels and, according to most or all
7 financial experts, is artificially depressed.¹⁵ Using a rate that is at
8 extremely low levels, and demonstrably constrained by the Federal
9 Reserve's interventions, does not provide a good indication of rates
10 that might be projected over extended future periods. It would be
11 just as wrong as if one were to use the 1981 Treasury Bond rate of
12 13.72% or the five-year Treasury Bond average of 12.09% for
13 1980 to 1984. Using a short period with extreme data is not
14 appropriate as such an approach leads to intellectually dishonest
15 and unreliable results. ORA's use of these artificially low starting
16 "risk free" rates appears to be opportunistic and is, in my strong
17 opinion, not based on reasoned judgment and informative data.

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

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").

Attachment B

1 A. I matched the term of the risk-free rate from several periods with
2 the equity market premium drawn from those same periods. I used
3 extended periods to estimate an appropriate risk-free rate, thereby
4 smoothing data that would otherwise be too high or too low in
5 various periods. This is the standard practice in valuations. I also
6 used multiple periods to test the findings. The extended time
7 periods used in my testimony were 1926-2014, 1963-2014 and
8 1995-2014, and I provided the source data from
9 Ibbotson/Morningstar and from Duff & Phelps, so the Commission
10 can assess so-called “risk-free” rates in different, protracted
11 periods.¹⁶ As I have explained, the valuation-discipline requires
12 evaluating data that eliminate the distortive effects of extreme data
13 points, such as the depressed interest rates reported at the present
14 time. I have sourced the commentary about the Federal Open
15 Market Committee’s comments on the artificiality of today’s
16 Treasury rates.¹⁷ It is my professional opinion that ORA’s
17 approach cannot be viewed as reasonable, which may explain why
18 ORA provides no authorities to affirm its recommendation. My
19 testimony provides the Commission with data, sources, and
20 alternative time periods to justify, test, and confirm the results.

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.

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

7 **Q12. What equity risk premium does ORA propose?**

8 A. ORA cites to the FCC Staff Report and suggests using the Staff's
9 figure of 5.88%, which it states is a figure comparable to the one
10 the CPUC used in 1997; the 5.88% rate is based on the period 1928
11 to 2012.¹⁸ ORA reports that recent estimates range from 4.51% to
12 6.21%, but ORA defaults to the FCC Staff Report proposal of
13 5.88%.¹⁹ My Opening Testimony provides equity premia that
14 were 5.1%, 6.6% and 4.9%, for the periods 1926-2014, 1963-2014
15 and 1995-2014, respectively, and alternative data using total
16 Treasury returns (yield plus capital appreciation) of 5.7%, 7.4%
17 and 8.6%, respectively, which, to be conservative, were not the
18 basis of my recommendations.²⁰ Again, ORA does not consider

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

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

9 **Q13. Have you reviewed ORA's Attachment 9, which presents a**
10 **6.43% averaged return on equity?**

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

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

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

Testimony.

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

17 **Q15. Have you reviewed the data that ORA reported that it had**
18 **“looked at” regarding Professor Damodaran’s calculation of**
19 **ROE?**

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

²¹ ORA Testimony, p. 42, lines 10-12.

1 and I understand that this data was not produced by ORA in
2 response to the Independent Small LECs' request for the
3 underlying data collected by Professor Damodaran that ORA
4 reviewed in connection with its Opening Testimony. I note that
5 ORA reported that Professor Aswath Damodaran calculated that
6 Telecommunications Services companies generated an ROE of
7 8.31% in 2014.²² A review of the Professor's spreadsheet reveals
8 that he lists global securities, which, when sorted, yields 65 stocks
9 in the U.S. telecommunications services sector, only 16 of which
10 have ILEC businesses. The stocks that are included are so
11 disparate—including equipment, long-haul fiber, cable operators,
12 standalone Voice over Internet Protocol (“VoIP”) companies and
13 large conglomerates—that the calculated ROE proves meaningless
14 in the ORA testimony.²³ Without conceding that ORA's citation
15 to Damodaran is instructive or proper, I note that the spread
16 between the Treasury rate proposed by ORA (2.9%) and the
17 generalized reported Damodaran Telecom Services ROE is about
18 540 basis points (“bps”). Even this crude metric shows the
19 reasonableness of my testimony, which reports equity market
20 premia of 700 bps, 505 bps, and 684 bps, for the three periods

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>.

1 1926-2014, 1963-2014 and 1995-2014, respectively, and an ILEC
2 beta of 1.06, which is only slightly riskier than the overall market.
3 Another salient problem with the ORA analysis—again noting that
4 it is not possible to review the underlying Damodaran company-
5 specific performance data to assess potential outliers—is that ORA
6 is relying on one single year to “sample” telecommunications
7 services companies’ equity returns. As such, the approach
8 employed by ORA is so imprecise that it offers no meaningful
9 insight in this proceeding. Again, to reach accurate results, it is
10 necessary to use a longer period of years in assessing a comparable
11 industry group, consistent with the approach employed in my
12 testimony.

13 **Q16. What is your view regarding ORA’s proposal not to use an**
14 **industry-specific adjustment?**

15 A. ORA is fundamentally arguing that the CAPM should be reduced
16 to a “proposed” risk-free rate and a generic market equity return.
17 ORA proposes to use a very depressed Treasury rate and simply
18 add a low equity risk premium of 5.88%, again employing only
19 two inputs to estimate its so-called “reasonable cost of equity.”²⁴
20 ORA reveals its fundamentally flawed “logic” when it explains
21 that “[h]olding all other variables fixed, one would expect the cost
22 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;

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

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

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

²⁵ ORA Testimony, p. 39, lines 15-17.

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

²⁶ ORA Testimony, pp. 34-35.

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

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

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

19 **Q19. Is it appropriate to dismiss the size premium?**

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.

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

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

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

4 Researchers find the size effect, when observed, is
5 concentrated in smaller firms. It seems the size
6 effect is not linear across listed firms. Horowitz et
7 al. (2000a) observe the size effect seems to occur
8 only in smaller listed firms. . . . Since Horowitz et
9 al. replicate the methodology of Fama & French
10 (1992), they argue that the findings of Fama &
11 French are concentrated in very small firms and not
12 across all small firms as Fama & French claim. In
13 another study, Fama & French (2008) observe that
14 the size effect exists in U.S. listed firms but it is
15 strongest among microcap firms using data from
16 1963 to 2005.³²
17

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.

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

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

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

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.

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

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

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

1 NYSE breakpoints for size and only marginal across
2 the remaining larger firms.³⁵
3
4 In addition to the sources cited in Crain’s article, including those
5 referenced in footnote 31, above, the highly-respected valuation
6 experts. Shannon Pratt and Roger Grabowski, dedicate two entire
7 chapters and an appendix to size effect— “Chapter 14: Size
8 Effect,” “Chapter 15: Criticism of the Size Effect,” and “Appendix
9 15A: Other Data Issues Regarding the Size Effect”—in their *Cost*
10 *of Capital* text.³⁶ Pratt and Grabowski report that:

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

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*

1
2 In this discussion, “beta” is the company or industry adjustment (a
3 single number) multiplied times the CAPM equity premium and
4 the result is added to the “risk-free rate.” As I explained in my
5 Opening Testimony, “beta” is a number used in the CAPM to
6 adjust the overall market return to account for the greater or lesser
7 risk associated with a stock or with an industry relative to the
8 overall market risk.³⁸ Notably, in the quotation above, Pratt and
9 Grabowski state that the use of an industry beta in the CAPM is
10 not sufficient, in the absence of a size premium, which is a view
11 consistent with my experience and my testimony about the
12 necessity for a size-related adjustment. Pratt and Grabowski are
13 criticizing the proposal that the FCC Staff has made—that a risk-
14 free rate plus an industry beta (applied to the equity market return)
15 with no size premium is sufficient. ORA’s proposal is even more
16 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.

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

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

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

9 Investment risk increases as company size diminishes,
10 all else remaining constant. Small companies have
11 very different returns than large ones, and on average
12 they have been higher. The greater risk of small
13 stocks does not fully account for their higher returns
14 over many historical periods. The size phenomenon
15 is well-documented in the finance literature.
16 Empirical studies by Banz (1981) and Reinganum
17 (1981A) have found that investors in small
18 capitalization stocks require higher returns than
19 predicted by the standard CAPM. . . . The relationship
20 between firm size and return cuts across the entire
21 size spectrum but is most evident among companies
22 that have higher returns than larger ones on average.
23 Ibbotson Associates’ well-known historical return
24 series publication covering the period 1926 to the
25 present reinforces this evidence (Ibbotson Associates’
26 *2005 Yearbook, Valuation Edition*). To illustrate, the
27 Ibbotson data suggests that under SIC Code 49,
28 *Electric, Gas & Sanitary Services*, the average return
29 for that group over almost an 80-year period was
30 14.03% for the small-cap company group and 10.86%
31 for the large-cap group, more than a 300-basis point
32 difference. This is true for all industry groups.⁴⁰

³⁹ Roger A. Morin, *New Regulatory Finance* (Vienna, VA: Public Utilities Reports, Inc., 2006) (“Morin”).

⁴⁰ Morin, pp. 181-182.

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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.

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

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

20
21 ORA's statement is not only speculative—and offered without any
22 citation or justification—but it is also contrary to prevailing
23 authority and common sense.

⁴² Morin, p. 187.

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

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

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

16 A. Yes. While not quantified in ORA’s testimony, the 2009 report
17 from Regulatory Research Associates (cited in the ORA testimony
18 at footnote 51), reveals that the average equity returns for electric
19 and gas utilities have declined from 11.34% in 1997 to 10.42% in
20 2008, that is, by approximately 92 bps over that 12-year period.⁴⁴
21 In that same footnote, ORA also cites an April 2009 slide

⁴³ ORA Testimony, p. 44, lines 13-15.

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

1 presentation from Moody’s Investors Service (“Moody’s”), which
2 tracks what appear to be authorized and realized utility ROEs for
3 the electric industry. At the time of the presentation, the
4 authorized returns were slightly above 10%, while the realized
5 ROEs were graphed at levels approximately 50 bps lower.⁴⁵ The
6 February 2013 *Industry Outlook* report from Moody’s, also cited in
7 ORA’s footnote 51, explains that the stable outlook for the electric
8 and gas sector is the result of a “sustained period of low natural gas
9 prices,” a “flight to quality” in the capital markets (when investors
10 are fearful they usually trade out of riskier securities and flee to
11 quality securities that are large, dividend paying and predictable
12 equities or higher-grade debt instruments), and anticipated large
13 capital expenditures that “will contribute to rate base growth.”⁴⁶
14 In the 2015 “Capital Market Conditions” article cited by ORA in
15 footnote 51, Dr. Randall Woolridge reports that gas and electric
16 companies have authorized ROEs that have fallen to approximately
17 9.7% by 2015.⁴⁷

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).

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

4 A. No. The ORA sources listed in footnote 51 all refer to gas and
5 electric companies that have little or no competition, and which are
6 readily distinguishable from ILECs. Moody's *Industry Outlook*
7 focuses primarily on the costs for natural gas, resulting in reduced
8 expenditures that should enable higher generation profitability. In
9 contrast, today's ILEC profitability and cash flows are shrinking as
10 the carriers work to respond to competitive pressures and
11 regulatory mandates for modern, broadband-capable infrastructure.
12 As an illustration of a telling difference between the utilities cited
13 by ORA and telecommunications carriers, Duff & Phelps in its
14 most recent *Industry Cost of Capital Handbook* indicates that, in
15 2015, the median cost of equity for the gas and electric industry
16 (SIC code 493) is approximately 240 bps *lower* than the cost of
17 equity for the telecommunications industry (SIC Code 4813),
18 which is a clear sign of the greater risk in the telecommunications
19 industry.⁴⁸ So, if Dr. Woolridge is correct that gas and electric
20 utilities should have authorized ROEs of approximately 9.7%, the
21 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.

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

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

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

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

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

⁴⁹ D.97-04-033 (Foresthill), at 20.

1 “shielded” from risks by virtue of their access to certain federal
2 and state high-cost support.

3 **Q28. Does ORA explain how it believes that universal service**
4 **programs “shield” the companies from risk?**

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

9 **Q29. Do the USF and CHCF-A provide “known levels of revenue”**
10 **for the Independent Small LECs?**

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

⁵⁰ ORA Testimony, p. 38.

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

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

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

16 **Q31. What are the limited annual adjustments?**

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

⁵¹ See D.91-09-042, Appendix.

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

1 2016, the only “regulatory changes of industry-wide effect” that
2 generated annual adjustments were changes to the California
3 LifeLine program that shifted LifeLine-related administrative
4 expenses to the CHCF-A program, and changes related to the
5 FCC’s intercarrier compensation reforms.⁵²

6 **Q32. Does this fourth mechanism, accounting for the revenue effects**
7 **of regulatory changes, “shield” the companies from**
8 **“fluctuations in revenue”?**

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

⁵² See Res. T-17505.

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

4 **Q33. Is it true that revenues are “updated annually,” as ORA**
5 **asserts?⁵³**

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

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

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

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

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

⁵³ ORA Testimony, p. 40, lines 8-10.

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

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).

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

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

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

⁵⁷ See A.11-12-011.

⁵⁸ ORA Testimony, p. 41, lines 8-14.

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

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=AMD-A-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.

1 **Q37. What about ORA’s argument that regulators rely on book**
2 **value and not market value?**⁶¹

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

4 I emphasize that the following assessment is a
5 corroboration of the analyses above, not the central
6 presentation in this testimony. A critic might argue that
7 there is a mixing together of book value and market value.
8 Such an argument misses the larger point, which is that the
9 size of the *relative contraction in value in the marketplace*
10 is a clear indication of the startlingly increased risks in the
11 industry, which is the basis for contending that a higher
12 return on equity is appropriate.⁶² (Emphasis in original.)
13

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

21 **IV. RESPONSE TO ORA TESTIMONY ABOUT COST OF DEBT**

22 **Q38. Does ORA accurately state that “the applicants request the**
23 **Commission to use a forward looking debt rate of 5.5%,”**

⁶¹ ORA Testimony, p. 41, lines 14-19.

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

1 **including for the three Independent Small LECs which do not**
2 **have any debt on their balance sheets?**⁶³

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

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.

1 are at levels that are unsustainable, a proposition that ORA fails to
2 address.⁶⁸

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

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

7 **Q40. ORA cites the current Treasury and Federal Financing Bank**
8 **(“FFB”) rates, which are 2.82% and 2.47%, respectively.⁷⁰**
9 **Are these legitimate rates to use in calculating the cost of debt?**

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

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.

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

3 A. ORA averages the debt costs for the seven Independent Small
4 LECs that have debt on their balance sheet to arrive at 4.53%.⁷¹
5 ORA attempts to support its proposal as purportedly conservative
6 based on its belief that the carriers could access far less expensive
7 FFB (2.47%-2.82%) or Rural Utilities Service (“RUS”) funding.
8 In fact, three of the seven Independent Small LECs have 2014 debt
9 costs above 5.0% and two carriers have debt costs in the 4.5% to
10 4.8% range, and the remaining two have 2014 debt costs of 2.9%
11 and 3.7%. However, all the California carriers have rates above
12 those cited by ORA, including five of the seven with rates well
13 higher than the government subsidized rates, so ORA's claims
14 about the availability of lower debt are not reflected in carriers'
15 actual experiences.⁷² It is my understanding that carriers find
16 certain conditions in the application process and in the covenants
17 imposed by the government to be unfavorable, and the effect is that
18 the government-subsidized loans are *not* as readily available as
19 ORA implies.

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.

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

4 A. No. The RUS reports that FFB funding has contracted sharply, as I
5 reported in my Opening Testimony. Less than one-third of the
6 available funds have been placed each year since the federal
7 telecommunications reforms at the end of 2011.⁷⁴ My
8 conversations with the RUS have confirmed that the recent federal
9 reforms have precipitated changes at the RUS. The federal
10 regulatory reforms have prompted the RUS to be more
11 conservative, requiring more detailed five-year forecasts and
12 extending the approval process from a previous approval period of
13 6-12 months to today's 12-18 months. I am aware of the RUS
14 concerns because I was requested to brief the entire senior
15 leadership at the RUS on several occasions regarding the 2011
16 reforms. The senior RUS personnel were candid in reporting
17 concerns about deteriorating operating and financial performance
18 of the carriers to which they were lending. Because of the
19 concerns, I was also requested to brief the Under Secretary of the
20 Department of Agriculture. Subsequently I was invited to discuss
21 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.

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

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

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

14 We ask that the Staff Report be corrected to reflect
15 accurately CoBank's requirement to charge a market
16 interest rate to all telecommunications company
17 borrowers and to remove any comments that suggest in
18 any way that CoBank provides subsidized interest rate
19 loans to telecommunications companies. We further
20 ask that the paragraph 49 of the Staff Report be
21 removed in its entirety given it is misleading with
22 respect to the availability of funding to RLECs [rural
23 local exchange carriers].⁷⁶
24

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.

1 CoBank also addressed the state of the lending environment,
2 contending that it was misleading for the FCC Staff Report to state
3 . . .

4 that all RLECs have access to “extensive funding”
5 from CoBank under the existing rate-of-return (RoR)
6 regulations. Regrettably, many RLECs do not meet
7 CoBank’s lending standards due to the various caps
8 and limitations on universal service funding and inter-
9 carrier compensation. It is unfortunate that the
10 uncertainty of a stable, predictable cost recovery
11 mechanism is making it increasingly difficult for
12 CoBank to extend credit for the purpose of deploying
13 ubiquitous rural broadband networks.⁷⁷

14
15 CoBank went on to offer a pointed summary about its financial
16 perspective on the rural marketplace:

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

⁷⁷ CoBank, pp. 4-5.

1 recovery possible. If RLECs don't have a sufficient,
2 sustainable and predictable level of support, deploying
3 affordable broadband is not economically possible and;
4 therefore, not bankable.⁷⁸ (Emphasis added.)
5

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

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

⁷⁸ CoBank, p. 6.

1 **application with RUS” and none “has had a loan request**
2 **denied from January 1, 2010 to the present”?**⁷⁹

3 A. The fact that none of the Independent Small ILECs has sought a
4 new loan is indicative of the regulatory challenges about which
5 Mr. West was writing and the growing concern in the industry
6 about the risk of holding debt in a more uncertain regulatory and
7 capital environment. The lack of pending applications is also
8 another data point supporting the sharply-reduced loan totals and
9 the increasingly careful review of pending loans at RUS. ORA
10 posits that the Independent Small LECs were, at a time in the past,
11 able to obtain loans from RUS and that no loans have recently been
12 denied (a tautology because the Independent Small LECs did not
13 apply for loans). The logic is difficult to follow when ORA
14 concludes that RUS’ current lower cost of debt provides an
15 important marker for the carriers.⁸⁰ In response, I have cited the
16 clear language of CoBank’s senior officer, Rob West, who states
17 unequivocally to the contrary in his communications with the FCC.
18 Additionally, while the RUS is not making public pronouncements,
19 this government agency is in fact reporting that loan totals have
20 fallen by more than 70% annually, on average, from 2012 to the
21 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.

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

6 **Q45. ORA states that your testimony includes an implied**
7 **assumption that a “sudden and significant increase in**
8 **Treasury rates is imminent.”⁸¹ Is that a correct representation**
9 **of your testimony or your opinion?**

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

⁸¹ ORA Testimony, p. 27, lines 5-8.

⁸² *Id.*

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

7 **Q46. Please comment on ORA's calculations about the incremental**
8 **debt necessary to raise the weighted average cost of debt to**
9 **5.5%.⁸³**

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

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

⁸³ ORA Testimony, p. 30, lines 10 ff.

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

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

9

10 **V. RESPONSE TO ORA TESTIMONY ABOUT CAPITAL**

11 **STRUCTURE**

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

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

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

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

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

8 **Q48. Did you “request a single, uniform, hypothetical 70% equity**
9 **and 30% debt capital structure” for ratemaking purposes?**⁸⁷

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

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.”

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

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

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

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

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."

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

7 **Q51. ORA argues that the proxy group used to estimate the CAPM**
8 **beta in your Opening Testimony has higher debt ratios than**
9 **the proxy group used by the CPUC in 1997, and ORA then**
10 **points to your more recent proxy group to question whether it**
11 **is reasonable to maintain the 1997 zone of reasonableness**
12 **(60% to 80%).⁹² What is your response to these claims?**

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

⁹² ORA Testimony, p. 10, lines 10 ff.

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

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

9 The capital structures maintained by similar
10 companies should reflect their collective efforts to
11 finance themselves so as to minimize capital costs
12 while preserving their financial integrity and ability to
13 attract capital. Hence, applicant compiled a group of
14 ten publicly traded small independent telephone
15 companies to arrive at a reasonable capital structure
16 for applicant. The average capital structure of the ten
17 comparable small independent companies consisted
18 of approximately 21% debt and 79% equity. . . . ORA
19 calculated the 1994 and 1995 average common equity
20 for California’s eighteen small independent telephone
21 companies. This secondary analysis showed an
22 average common equity ratio of 70.3% for 1994 and
23 75.9% for 1995. . . . Upon our analyses of the 1994
24 and 1995 average common equity for California’s
25 eighteen small independent telephone companies and
26 *evaluation of a higher equity ratio trend for smaller*
27 *companies*, as demonstrated by comparing the results
28 of ORA’s large comparable companies to applicant’s
29 mid-size comparable companies analyses, we concur
30 with applicant’s assessment that a reasonable range of
31 common equity for small telephone companies, such
32 as applicant, should be between 60% and 80%
33 equity.⁹³ (Emphasis added.)

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

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

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

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

⁹⁴ ORA Testimony, p. 11, lines 1-4.

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

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

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

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

1 **structure higher and thus result in a higher WACC or rate of**
2 **return?**⁹⁵

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

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,

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

13 **VI. PROBLEMS WITH THE FCC STAFF REPORT**

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

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

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

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

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

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

⁹⁸ FCC Staff Report, para. 2.

⁹⁹ FCC Staff Report, para. 5.

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

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

13 A. Yes. First, the FCC Staff Report relies on a proxy group of
14 companies that appears to be fundamentally different from rural
15 ILECs and certainly different from the Independent Small LECs
16 before the Commission in this proceeding. Second, the calculation
17 of equity costs does not include necessary adjustments to reflect
18 risks arising from size or liquidity/marketability. Third, for the
19 CAPM, the FCC Staff Report uses a very low risk-free rate, which
20 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.

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

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

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

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.

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

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

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

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

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

22 I can summarize the differences.

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

- 1 o Cincinnati Bell serves a dense cluster of customers
- 2 in and around a major metropolitan city, supporting
- 3 a very different regulatory and cost profile;
- 4 o Alteva was an integrated communications provider
- 5 (the small ILEC operations contribute virtually no
- 6 cash flow), making the core of that company vastly
- 7 different from the rural carriers; and
- 8 o Windstream relied on multi-state operations with
- 9 diversified data center services and competitive
- 10 local exchange carrier (“CLEC”) businesses (only
- 11 22% of total 2013 revenues were from consumer
- 12 services).

13 The FCC Staff explained that the reason for including these

14 carriers was the FCC’s requirement for a large enough sample of

15 analysts’ estimates to ensure the value of the DCF constant growth

16 model. Because the FCC purportedly sought reliable data, it

17 included carriers that had risks and prospects vastly different from

18 the smaller, private ILECs. From an investment point of view,

19 which is what should inform the determination of the appropriate

20 return on equity and allowed rate of return, there are some

21 superficial similarities between the proxy group and the

22 Independent Small LECs; however, the significant differences

23 require adjustments to the cost-of-capital estimation models,

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

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

6 A. Two other fundamental problems with the Staff Report
7 unavoidably lead to a flawed analysis. First, the Staff assumes it
8 has correctly determined the risk-free rate, which the FCC Staff
9 astonishingly sets at 1.92% based on the ten-year Treasury note at
10 the time. As detailed in my Opening Testimony, the adoption of so
11 low a “risk-free rate” in a forward-looking proceeding is not
12 defensible because the current interest rates are at historic low
13 levels, which are generally regarded as unsustainable.¹⁰³ I have
14 already noted that the major valuation firms—
15 Ibbotson/Morningstar and Duff & Phelps—set the risk-free rate
16 well higher than the figure in the FCC Staff Report based on the
17 fact that the current Treasury rates have been managed to
18 extraordinarily depressed levels. The FCC does not attempt to
19 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.”

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

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

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

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.

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

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.”

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

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

6 A. I do not know the specific financial effect, but John Staurulakis,
7 Inc. ("JSI") stated in an FCC filing, on the basis of its analysis of
8 151 cost-company clients, that the effect on rural carriers would be
9 to reduce per-line per-month regulated revenues by approximately
10 \$4.99 or \$3.99, depending on whether one assumes the low or high
11 rate of return that the FCC Staff proposes.¹⁰⁷ While JSI did not
12 comment further, no avoided costs are associated with such a
13 revenue reduction, and therefore the operating cash flows should
14 fall by the same amount. If one were to assume that the rates were
15 \$30 monthly and the EBITDA margins were 40%, rate reductions
16 arising from the very low 8.06% and 8.72% allowed return on
17 equity capital proposed by the FCC Staff would result in the carrier
18 losing operating cash flow per customer that amounts to 41% or
19 33% of its regulated total operating cash flow, respectively. This
20 is not an inconsequential reduction, if JSI is correct. I do not

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.

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

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

8 A. No. The FCC Staff Report does not provide any allowance for
9 factors reflecting size or marketability/liquidity premia to adjust
10 the CAPM. In fact, citing a single source that purports to
11 summarize other studies, the FCC Staff suggests that any size
12 premium disappears over time.¹⁰⁸ This is a startling conclusion
13 based on one citation, particularly when that source states that
14 there is a liquidity risk for smaller companies and concedes that
15 there is demonstrably higher risk for the smallest-decile
16 companies, as I explained earlier. Most valuation professionals
17 rely on the data and resources provided by companies such as
18 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.”

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

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

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

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.

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

5 **Q66. Are there critiques in the current financial literature**
6 **addressing the issues raised by the FCC concerning the**
7 **“disappearance” of the size premium in the early 1980s?**

8 A. Yes. Pratt and Grabowski explain that the methodology of the new
9 studies use average returns that obscure “performance.”¹¹² They
10 describe how, using a more appropriate methodology, small stocks
11 actually “outperformed” large stocks even using early 1980s start
12 dates (contrary to the argument that small-company stocks
13 performed similarly to large-company stocks beginning in that
14 period), which means that the cost of equity is higher for smaller
15 companies. The exception to this “outperformance” occurred
16 when the start date was 1983-1984, when there were, according to
17 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.

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

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

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](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.

1 of decile 10 (the smallest-cap stocks) was 16.62 percent
2 (and 10.78 percent measured on a geometric basis).¹¹⁵
3 Still, the FCC Staff Report’s approach excludes size-effect, citing
4 the one article (and its sources) as justification, and summarily
5 arguing that cost of capital is fundamentally a market return,
6 modified by a telecommunications industry beta that slightly
7 reduces the market return. This approach is contrary to that
8 recommended by the major financial sources and it is inconsistent
9 with the significant data compiled over multiple periods, including
10 the most recent two decades.

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

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

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

¹¹⁵ 2013 Risk Premium Report, p. 35.

1 base value to which the discount or premium is
2 applied.¹¹⁶

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

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

1 **Q68. Are you saying that ORA’s exclusion of the size effect is not**
2 **justified?**

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

15 **VIII. CONCLUDING COMMENTS**

16 **Q69. Please summarize your testimony in response to ORA.**

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

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

1 rigorous and scholarly approaches that test and re-test the
2 conclusions. In response, ORA has provided virtually no sources
3 and does not directly challenge the specific findings in my
4 Opening Testimony. Without valid citations, ORA simply
5 proposes use of a CAPM that is driven by two inputs that ORA
6 believes are appropriate—a very low three-year average Treasury
7 rate of 2.91%—plus 5.88%, which ORA adopted from the FCC
8 Staff Report. Contrary to the Supreme Court opinions and the
9 opinions of reputable financial experts, ORA does not propose
10 analysis of any industry-specific risks, and ORA rejects important
11 sources that call for size and liquidity factors. ORA also proposes
12 a capital structure that is below the 1997 CPUC-defined zone of
13 reasonableness (equity ratio of 60%-80%) and ORA relies on an
14 average capital structure calculated after arbitrarily excluding the
15 three companies with the highest equity ratios. ORA also proposes
16 4.53% as the imputed debt costs for carriers that do currently have
17 debt, by contrast with our recommendation of 5.5%. I believe that
18 I have presented and supported a balanced and clearly defensible
19 set of findings that ORA has not refuted. As surprising as the data
20 may appear to be, the cost of equity has certainly risen since 1997.
21 The data support a cost of equity that is above 20% based on M&A
22 data. However, I have relied on the traditional CAPM formulae,
23 and have found an equity cost of 18.5% and proposed a WACC of

1 14.6%. As I have explained and sourced, I was conservative by
2 applying no liquidity or marketability premium. I used a size
3 premium that is 641 basis points lower than the 11.98%
4 recommended by Duff & Phelps for the smallest of companies (the
5 10z grouping into which the Independent Small ILECs clearly
6 fall). I also used a beta that is relatively low at 1.06, in spite of the
7 fact that it is drawn from proxies that are all substantially larger,
8 more liquid, more capable of acquisitions, and more diversified.
9 Finally, I used a risk-free rate that is the lower of the two options
10 (a higher result is generated when using total return on the
11 Treasury note). My testimony is well-founded in valuation and
12 regulatory practice, and is not aggressive. It should guide the
13 Commission's consideration of establishing a cost of capital in this
14 proceeding.

15 **Q70. Does this conclude your testimony?**

16 A. Yes. Thank you.

17

FINANCIAL MARKET PERSPECTIVES

NETWORK NEUTRALITY PRINCIPLE 5

BALHOFF & WILLIAMS, LLC

DECEMBER 15, 2009

The following brief paper provides initial perspectives on how the financial markets might view the adoption of Network Neutrality Principle 5 (“Principle 5”) that requires nondiscriminatory handling of Internet content, applications and services. Because the policy proposals from the Federal Communications Commission (“FCC”) are still in the developmental stage, it is difficult to provide specific analyses regarding the impact of such proposals, but it is possible to offer substantive insights.

Balhoff & Williams (“B&W”) explains below that investors in both debt and equities are likely to view new regulation as negative for capital formation if those rules *unnecessarily* limit the return potential of network infrastructure investment, restrict the competitive options available to network providers, and inject government “regulation” into an industry segment that was largely unregulated. The logic of this paper is summarized in the following bullets:

INVESTORS IN BOTH DEBT AND EQUITIES ARE LIKELY TO VIEW NEW REGULATION AS NEGATIVE FOR CAPITAL FORMATION IF THOSE RULES UNNECESSARILY LIMIT THE RETURN POTENTIAL OF NETWORK INFRASTRUCTURE INVESTMENT, RESTRICT THE COMPETITIVE OPTIONS AVAILABLE TO NETWORK PROVIDERS, AND INJECT GOVERNMENT “REGULATION” INTO AN INDUSTRY SEGMENT THAT WAS LARGELY UNREGULATED.

- The Internet is based on various “layers” that work in concert to provide to end-users high-speed access to applications, content and services; those layers include data, software, and infrastructure. The most costly, highest-risk “layers” of the Internet are those that include network infrastructure, where the greatest risk is concentrated in the end-user access plant, often referred to as the “physical layer.”
- Because the risks associated with the physical infrastructure “layers” are the greatest (due to high investment costs, long cost-recovery cycles, and the potential for technological / competitive stranding of investment), investors who contribute capital to fund broadband network providers that supply the infrastructure “layers” will require a relatively higher return on very substantial capital commitments. As such, predictability, or the lack thereof, will be critical in determining the cost and availability of capital to support broadband networks.
- From a policy perspective, the physical “layer” is the most challenging to manage, as investment must occur to ensure that there is a network over which the Internet can operate. Therefore, policymakers should ensure appropriate incentives for network investment, including special mechanisms for high-cost regions, while avoiding unnecessary disincentives. Without a robust broadband infrastructure there is no Internet—open or closed.
- In this context, policymakers should be cautious about creating prophylactic regulations or policies that respond to problems that may not be real, particularly in an apparently competitive marketplace, as the result might be the creation of new and unanticipated problems that artificially chill critical new investment.

THE RATIONALE FOR PRINCIPLE 5

Policymakers are seeking input regarding a proposal that the FCC should adopt network neutrality Principle 5. The proposed rule is that . . .

5. Subject to reasonable network management, a provider of broadband Internet access service must treat lawful content, applications, and services in a nondiscriminatory manner.

At first glance, the principle appears reasonable, especially when viewed from the perspective of policymakers who have overseen a highly-regulated telecommunications monopoly for more than a century. The proposed rule focuses on the infrastructure “layers” of the Internet where it is assumed that a network owner (“a provider of broadband Internet access service”) may engage in discriminatory behavior that is viewed as anti-competitive.¹

A closer look, however, leads to a more informed view. The more detailed view reveals that today (1) there is no meaningful evidence of significant anti-competitive behavior on the part of network operators; (2) there are alternative competitive platforms for Internet service delivery; and (3) there is a growing national concern about network investment to enable rapid and ubiquitous deployment of broadband, including services to uneconomic areas that are often rural. Thus, the fundamental question for policymakers is whether there is a valid rationale for requiring Principle 5—a rationale based on truly well-defined risks or harms, and based on the sufficient probability that the principle itself will not have a detrimental effect on a growing national imperative that the U.S. should keep pace in the Internet economy.

INVESTMENT RISK IS CONCENTRATED IN PHYSICAL LAYER

The Internet is not a single service, nor is it provided by a single industry. It is a complex set of services that include data sources, applications, management services, peering and transport facilities, switching and routing, as well as access plant, among others. Policymakers understand this complexity that is, in some ways, extraordinarily difficult to manage.

The U.S. has grown increasingly concerned about its national communications infrastructure policy, as other nations appear to be leading in terms of broadband network deployment, at least based on certain studies. While vast network infrastructure remains fundamental to the Internet, the U.S. has relied almost exclusively on private investment to enable the Internet business opportunity, even in the face of major capital risks. The most basic capital risk is that networks are very

¹ The concept of layers is often traced to MCI which worked to define different layers, from highest to lowest, as application, presentation, session, transport, network, data link, and physical. The logic was that certain layers might be “chokepoints” and should be regulated differently, with the lower levels, such as the transport, data or physical treated as more highly regulated commodity services. Principle 5 appears to reflect the same viewpoint and concerns.

TODAY (1) THERE IS NO MEANINGFUL EVIDENCE OF SIGNIFICANT ANTI-COMPETITIVE BEHAVIOR ON THE PART OF NETWORK OPERATORS; (2) THERE ARE ALTERNATIVE COMPETITIVE PLATFORMS FOR INTERNET SERVICE DELIVERY; AND (3) THERE IS A GROWING NATIONAL CONCERN ABOUT NETWORK INVESTMENT TO ENABLE RAPID AND UBIQUITOUS DEPLOYMENT OF BROADBAND.

costly, as new and rapidly changing technologies must be deployed in ever shorter investment cycles to allow networks to cope with escalating demand for greater bandwidth and speed. Second, the majority of the network investment is concentrated in the end-user access plant, particularly for wireline operations where the labor component is high, and where stranded investment can be costly if the customer does not subscribe or cuts off service for any reason. Third, the competitive value proposition is based on a complicated combination of consumer judgments that can change quickly, including reliability of the network, throughput speeds, pricing, content (e.g., NFL network or local sports or other video programming), end-user devices (modems, iPhones, etc.), and convenience (e.g., wireless mobility). Finally, there is meaningful risk in terms of the technology cycle. The competitive performance of the technologies grows shorter and shorter by contrast with traditional telephony, for example, and alternative platforms continue to leap-frog the performance of today's networks, with faster cable technologies, the promise of mobile LTE and WiMAX, and growing fiber capacity. The risks are already high, and performance is evaluated carefully and actively by the consumer and by the investor. These capital risks apply in all geographic areas, but policymakers should be aware that the risks are exacerbated in lower-density rural markets that are particularly costly to serve.

WHILE THERE ARE RISKS TO ALL COMPANIES IN THE INTERNET VALUE CHAIN, IT IS CLEAR THAT THE MOST SIGNIFICANT CAPITAL COMMITMENTS ARE BEING MADE BY NETWORK PROVIDERS. AND, THIS PHYSICAL "LAYER" IS MOST CRITICAL TO THE DEVELOPMENT OF A STRONG INTERNET ECONOMY.

While there are risks to all companies in the Internet value chain, it is clear that there are extraordinarily high financial risks arising from the significant capital commitments being made by network providers. And, this physical "layer"² is most critical to the development of a strong Internet economy. Other elements remain important, but companies such as Google or eBay or Yahoo or peering companies provide services over an Internet which makes their products available to all who are connected. However, the capital investments of the application and service providers are not remotely as large or as risky as those of the network providers. While companies supplying other Internet "layers" face different and unique challenges, none of those companies must manage investment requirements and financial uncertainties that are as significant as those of the network providers.

The risk related to the physical "layer" network investment is substantial and is likely to continue to grow as technologies and competitive pressures evolve. Verizon is dedicating \$20+ billion to deploy what it hopes is a "future-proof" fiber-based wireline network in a high-risk initiative, while AT&T is upgrading its U-verse investment (pegged at \$7 billion to \$10 billion) to provide broadband services with current speeds of up to 24 Mbps downstream (in addition to video). Rural-focused ILECs, such as CenturyLink, Frontier Communications, Windstream, Consolidated Communications and Iowa Telecom, are achieving very high broadband availability using combinations of fiber and newer copper technologies even in very low-density markets. In addition, the largest wireless carriers will soon upgrade to Long-Term Evolution ("LTE") network technology with 5-12 Mbps download speeds, while Clearwire (in partnership with Sprint and several cable operators) continues to invest heavily to expand a WiMax 4G wireless

² For purposes of this paper, the "physical" layer is the access plant, involving end-user connectivity and devices, as well as the electronics that support those connections.

network. Meanwhile, cable companies report that they have committed more than \$146 billion to their U.S. plant since 1996, and that they invested nearly \$15 billion in 2008 alone.³ The cable operators are enhancing their broadband network capabilities through Data over Cable Service Interface Specification (“DOCSIS”) 3.0 modems that can deliver speeds that they represent as approaching 200 Mbps.

INVESTORS FOCUS ON HIGH RISKS FOR THE PHYSICAL LAYER

As described above, the U.S. broadband “policy” to-date has relied heavily on Internet capabilities developed through private investment. The reality is that the system has “worked” because investors believed that they had the potential for sound and appropriate returns on their investment in network operators. However, policymakers generally realize that the providers of capital to competitive enterprises have always and will always require a risk-adjusted return-on-investment that is almost certainly higher than the rate in the traditional monopoly utility model.⁴

Investors continue to assess carefully recent network investments that are high-risk. For example, Verizon’s major commitment to FiOS was (and is still) viewed somewhat skeptically in terms of the company’s ability to generate appropriate returns on a huge investment.⁵ As a result, most telecommunications financial analysts have understood that the markets valued Verizon’s stock at a discount to its peers, premised on the uncertain FiOS returns. Verizon pushed ahead with its investment plans in spite of that skepticism, but was able to do so only after regulators clarified that fiber-to-the-premise investments would be exempt from traditional telephony regulation.

THE FINANCIAL MARKETS ARE NOT FACTORING ANY POLICY-RELATED RISK INTO BROADBAND NETWORK COMMITMENTS TODAY. THE REASON IS THAT THE FCC AND CONGRESS HAVE MAINTAINED POLICIES THAT, IN TERMS OF ADVANCED NETWORKS AND BROADBAND, ENSURED THAT THE COMPETITIVE MARKETS WOULD BE DETERMINATIVE OF THE OUTCOMES.

³ See data from the National Cable and Telecommunications Association, available at <http://www.ncta.com/StatsGroup/Investments.aspx>.

⁴ The FCC is today attempting to determine how to assure appropriate investment, based on appropriate returns and supplementary universal service funding through the National Broadband Plan, including assuring service in uneconomic regions. See Public Notice # 19, Comment Sought on the Role of the Universal Service Fund and Intercarrier Compensation in the National Broadband Plan, GN Docket Nos. 09-47, 09-51, and 09-137, DA 09-2419 (rel. Nov. 13, 2009). See, also, A National Broadband Plan for Our Future, *Notice of Inquiry*, 24 FCC Rcd 4342, ¶ 5 (2009).

⁵ See Om Malik, *Who Wins: Verizon FiOS vs AT&T U-Verse*, August 19, 2008, available at <http://gigaom.com/2008/08/19/who-wins-verizon-fios-vs-att-u-verse/>; “Verizon recently launched its FiOS TV and fiber-based broadband service in New York City, The New York Times is taking stock of the service, which seems to be doing well. Verizon’s \$23 billion investment into FiOS wasn’t viewed kindly, and Wall Street viewed AT&T’s cheaper U-Verse plan as more practical and affordable. Despite such early shellacking on Wall Street, the company’s decision to go with the more expensive fiber is proving to be smarter, even though it is still not clear if (and when) Verizon is going to start making big money on its bet . . .” See also, Saul Hansell, A bear Speaks: Why Verizon’s Pricey FiOS Bet Won’t Pay Off, August 19, 2008, available at <http://bits.blogs.nytimes.com/2008/08/19/a-bear-speaks-why-verizons-pricey-fios-bet-wont-pay-off/?pagemode=print>; citing Sanford C. Bernstein analyst Craig Moffett, “Mr. Moffett has tried to figure out all the money Verizon will spend building and selling FiOS, the interest it pays on the money it borrowed to pay for it, the savings because the new system is cheaper to maintain and all the fees its customers will pay. He compares this to what he figures Verizon would have earned had it not built FiOS. Add up all the figures and discount it to present value and Mr. Moffett figures that FiOS puts Verizon some \$6 billion behind.”

B&W believes that the financial markets are not factoring any policy-related risk into broadband network commitments today. The reason is that the FCC and Congress have maintained policies that, in terms of advanced networks and broadband, ensured that the competitive markets would be determinative of the outcomes. Further, investors have seen that there are no meaningful signs that anti-competitive or discriminatory behavior is a real threat to consumers. From a financial point of view, then, investors view network-based companies as relatively free to compete effectively while attempting to generate appropriate returns on very high levels of capital investment.

What will investors think about Principle 5, which adds some undefined limitations to a network provider's potential return on investment? B&W suggests that investors, at least initially, will focus on three simple conclusions. First, government is adding regulatory constraints on an industry (Internet and broadband) where there was light regulation previously. Adopting regulatory principles that potentially reduce returns on previously invested capital will be viewed by the financial markets as the government changing the rules in the course of the game. As such, investors' will estimate that regulatory risk and uncertainty in the industry are greater. Second, once government begins to regulate more actively, Wall Street will assume the probabilities are higher still that more regulation will be forthcoming. Third, because there is elevated regulatory risk and uncertainty regarding operations, investors will require more certitude to commit capital for investment (slowing incremental investment) and/or higher returns to reflect the perceived risks. For carriers serving rural areas where capital costs and operating costs are particularly high, access to external capital at reasonable terms is particularly important in order to continue advancing the policy goal of universal broadband availability for the benefit of customers.

As such, there is real risk that *unnecessary* controls on network investment could commoditize network services, reduce expected returns on investment, and choke the critical capital formation process.

POLICY CHALLENGE IS TO CREATE INVESTMENT INCENTIVES AND AVOID UNNECESSARY DISINCENTIVES

Most recent national conversations regarding broadband networks concern the creation of incentives for more infrastructure upgrades. If the broadband network is in fact a critical component in assuring that America remains competitive in the Internet economy, the challenge for policymakers is to assure that a robust network infrastructure exists as widely as possible.

There are other concerns in terms of changing telecommunications regulations, intercarrier compensation regimes, and universal service funding. However, the migration toward robust and constantly evolving communications networks available in all markets—urban, suburban, and rural—appears to be the overriding policy imperative. And, to some extent, the challenge is even greater in more tenuously economic regions where policymakers are seeking more rapid and greater investment in the next years.

IF THE BROADBAND NETWORK IS IN FACT A CRITICAL COMPONENT IN ASSURING THAT AMERICA REMAINS COMPETITIVE IN THE INTERNET ECONOMY, THE CHALLENGE FOR POLICYMAKERS IS TO ASSURE THAT A ROBUST NETWORK INFRASTRUCTURE EXISTS AS WIDELY AS POSSIBLE.

B&W believes that regulators and legislators have important roles in advancing policy outcomes, or in protecting against abuses, but the current challenge remains that investment capital should be properly channeled to expand and enhance broadband networks, and this will require a rigorous focus. Without a robust broadband infrastructure there is no Internet—open or closed.

B&W believes that the competitive markets are working effectively today in terms of capital commitments. As noted above, policy is not working everywhere and government likely will have to intervene in support of rural geographic areas where the economic case for investing in high-cost broadband network deployment and operations is tenuous or non-existent. Additionally, it is possible that policymakers should provide other incentives even in economically viable areas to speed the deployment and upgrade of services. However, there do not appear to be substantive examples of policy failure in the majority of the markets regarding discriminatory handling of traffic.

It might also be pointed out that it is an *affirmative policy initiative* to continue applying a “light hand” to regulation of the Internet as there remain important uncertainties about the kind of network that will be required for the future, about the consumer demand for various kinds of products, about the technology platform that will provide the best foundation for evolution, and so on. It might also be argued that it is a *bad policy* to create uncertainties where no problems actually exist. B&W believes that the appropriate policy approach today should be to provide incentives and avoid disincentives that might raise meaningful concerns among investors about *unnecessarily* constrained returns.

SOLUTIONS FOR PROBLEMS THAT MAY NOT BE REAL

An important related debate surrounds the relative merit of *post facto* versus *ex ante* definitions of policy; that is, whether regulatory rules should anticipate potential problems before they develop or whether policy should wait and address specific abuses that consumers or firms are actually encountering in the market. The question is particularly apropos when there appear to be already-powerful market forces that provide protections for consumers in an environment that is changing rapidly.

In response, some policymakers might ask whether failing to adopt Principle 5 means that network companies will be permitted to engage in anti-competitive or discriminatory behavior. The answer is that anti-competitive behavior generally occurs when a carrier or company has dominant market power. In this case, it appears that no such power is possible in today’s communications markets, and it seems that there are sufficient substitute technologies and competitors to discipline any such behavior on the part of network operators. Investors appear to believe that this is the case, as they are requiring relatively higher returns on their investment due to higher capital risk and growing levels of competition. In fact, B&W knows of no stock price or debt security that reflects the potential that a single carrier or industry will be able to control or dominate the broadband access services market.

NO STOCK PRICE OR
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BROADBAND ACCESS
SERVICES MARKET.

In the case of prophylactic regulation, then, adopting a fifth “network neutrality principle” in the absence of specific harmful behavior on the part of network owners will require policymakers to decide various issues based largely on speculations about the future, including the extent to which regulators should possibly intervene and impose traditional telephony-like regulatory controls on broadband networks. In a dynamic industry that is characterized by relentless improvements in technology and ever-increasing levels of competition, B&W believes that it is dangerous to speculate on how the industry will or should develop or how financial performance might evolve. A more appropriate approach is to allow competitive behaviors to unfold in response to market forces. If harmful discriminatory or anti-competitive actions by network owners should develop in the future, targeted solutions can be crafted to address those specific problematic behaviors. However, until those problems become real, it is unnecessary and risky to attempt to develop speculative solutions such as Principle 5 that ultimately may cause more harm than they deter.

PUBLIC POLICY IS A CONSTRUCT THAT SUPPORTS AND PROVIDES INCENTIVES IN ACCOMPLISHING SOCIALLY BENEFICIAL GOALS — AND THAT CONSTRUCT MUST ABIDE BY THE FINANCIAL REALITIES THAT ULTIMATELY DETERMINE WHETHER OR NOT COMPANIES SUCCESSFULLY CAN ACHIEVE DESIRED POLICY GOALS.

SUMMARY

The core insight of this paper is based on the financial “reality” that appropriate incentives and return opportunities are necessary for every “layer” of the Internet, if such segregation into layers is sensible at all. Most notably, because the risk is so great at the “physical layer” — huge capital commitments (particularly in lower density, higher cost rural areas), potential for stranded investment, rapid technological changes, competitive last-mile networks (wireless, cable, etc.) — the business case for ongoing broadband investment likely will require rigorous protection of the opportunity for meaningful and sustainable returns.

B&W believes that the financial realities of the business and capital formation process remain critical in framing policy outcomes. Public policy is a construct that supports and provides incentives in accomplishing socially beneficial goals — and that construct must abide by the financial realities that ultimately determine whether or not companies successfully can achieve desired policy goals.

INECA Member Rate-of-Return Analysis


Company	5-Yr Avg Revenue	5-Yr Avg Net Income	5-Yr Avg RoR
Company 1	\$ 375,727	\$ 40,203	18.73%
Company 2	\$ 3,037,247	\$ 396,924	8.54%
Company 3	\$ 6,686,778	\$ 862,901	8.42%
Company 4	\$ 14,450,920	\$ 2,623,143	7.92%
Company 5	\$ 859,901	\$ 55,491	7.11%
Company 6	\$ 9,794,501	\$ 1,613,850	5.98%
Company 7	\$ 2,222,437	\$ 397,940	5.84%
Company 8	\$ 1,043,795	\$ 111,526	5.40%
Company 9	\$ 1,352,602	\$ 112,125	5.35%
Company 10	\$ 5,254,756	\$ 890,009	5.13%
Company 11	\$ 1,293,078	\$ 122,547	5.01%
Company 12	\$ 792,866	\$ 81,556	4.91%
Company 13	\$ 8,269,096	\$ 916,064	3.58%
Company 14	\$ 16,344,271	\$ 1,848,821	3.29%
Company 15	\$ 2,787,057	\$ 90,327	1.82%
Company 16	\$ 935,504	\$ (7,841)	-0.28%
Company 17	\$ 1,917,740	\$ (93,729)	-1.13%
Company 18	\$ 9,097,100	\$ (123,021)	-1.82%
Company 19	\$ 1,240,457	\$ (41,511)	-1.84%
Company 20	\$ 2,848,503	\$ (175,155)	-2.17%
Company 21	\$ 7,216,801	\$ (375,443)	-2.73%
Company 22	\$ 3,582,278	\$ (507,636)	-5.60%
Company 23	\$ 2,252,522	\$ (434,877)	-5.60%
Company 24	\$ 1,723,306	\$ (436,692)	-6.29%
Company 25	\$ 835,783	\$ (208,435)	-16.33%
TOTAL	\$ 106,215,026	\$ 7,759,087	2.96%

Attachment C
2018

INDIANA REPORT ON BROADBAND PROGRESS



Indiana Broadband and
Technology Association



“Today, high-speed Internet access (or broadband) is critical to economic opportunity, job creation, and civic engagement.”

FCC CHAIRMAN Ajit Pai

A Note About This Data

Since 2014 the FCC has collected Form 477 data from every broadband provider in the country. Providers are required to report broadband speeds and technology for each census block in which they offer service. This “IBTA Report on Broadband Progress” utilizes that data, as well as information from FCC annual broadband reports. Information from more than one hundred Indiana telecommunications providers are included in these maps and charts.

Form 477 data is filed twice a year. Data accurate as of June 30 is filed in September. Data accurate as of December 31 is filed in March. The FCC usually releases the data six to ten months after it is filed. For example, this “IBTA Report on Broadband Progress” was completed in December 2017, using data that was filed in March 2017, but not made available until November 2017. Accordingly, this report utilizes the most up-to-date Form 477 information available.



Bill Soards

IBTA CHAIRMAN

There's no doubt that broadband access is critical to our modern world. And IBTA member companies are proud to be in the business of bringing that access to the families and businesses of Indiana.

For more than a hundred years, telecommunications firms have been investing in the Hoosier state. These investments have transitioned our technologies from hand-cranked magneto phones, operator-assisted calling, and party lines, to world-class fiber and wireless services. Long distance calls and internet searches can zip across the globe with a speed and quality that were impossible to fathom not all that long ago. The history of the telecom industry in our state is one of investment and improvement.

We know the job isn't done, of course. Consumers have increasing demands for faster and faster broadband speeds. New and evolving applications in telemedicine, advanced manufacturing, agriculture and the Internet of Things (IoT) will require incredible speed and quality. It will take significant investment and continued leadership from our elected officials to meet the needs of Indiana. IBTA members are up to the challenge, just as they have been for more than a century.



John Koppin

IBTA PRESIDENT

Indiana has long been a leader in telecommunications, and one reason for that has been the common-sense regulatory approach established by the General Assembly and the Utility Regulatory Commission. Policy-makers and regulators, especially in recent years, have understood how a light-touch regulatory environment can foster innovation and investment.

IBTA members are seizing that opportunity by investing in networks that serve this state. Today, more than 90% of Hoosiers have access to 10 Mbps speeds or better. When the FCC released their sixth Broadband Deployment Report in 2010, it noted that only 14% of Indiana connections were capable of those speeds.

The Indiana approach is working, and the maps and charts in this report are evidence of that. The Indiana Broadband and Technology Association looks forward to continuing to work with our state leaders to ensure that Indiana continues to be served with the best in modern broadband services.

INDIANA TELEPHONE EXCHANGE AREAS

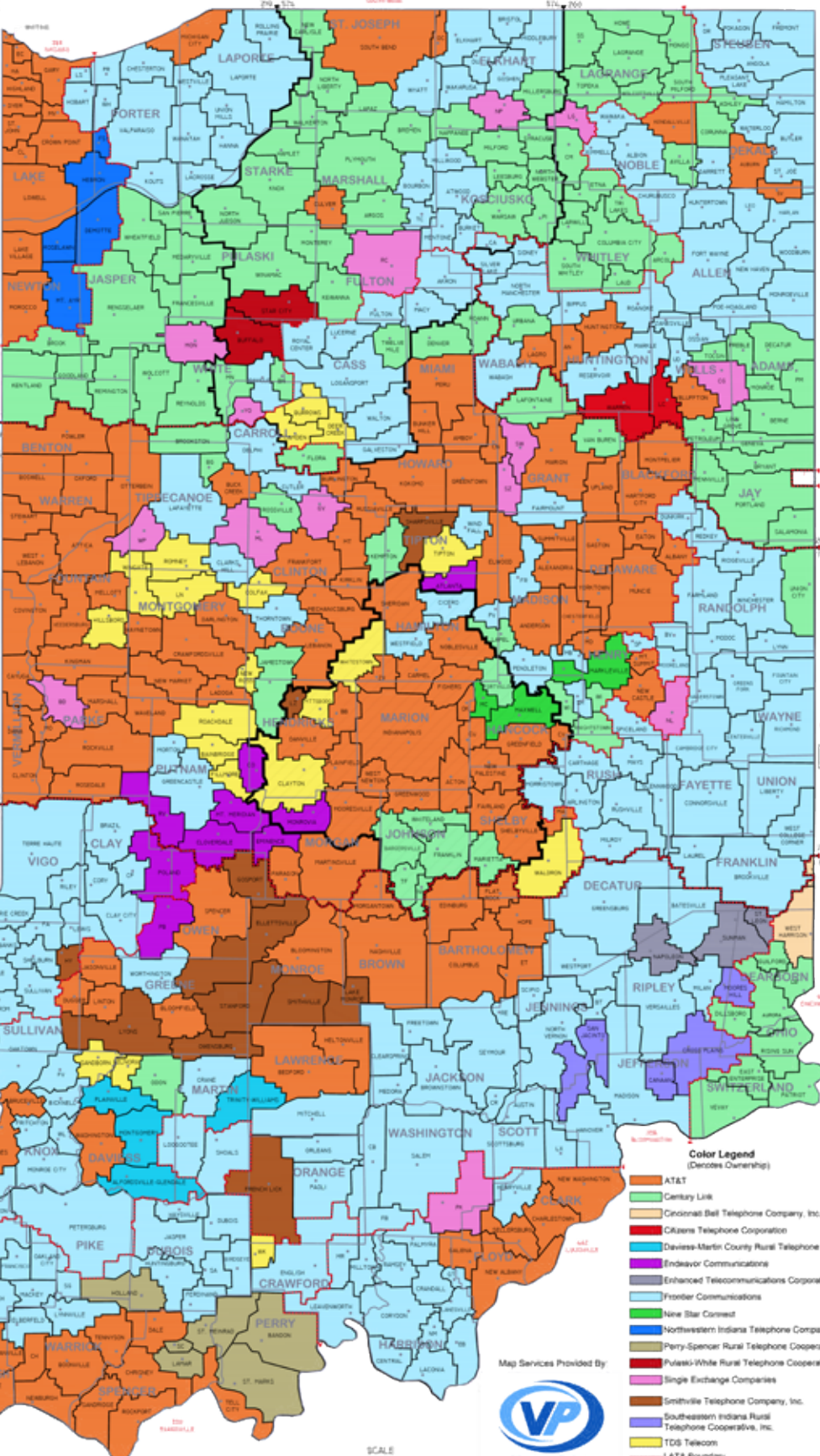
2018

LOCAL EXCHANGE CARRIER CORPORATIONS

AT&T	W-8
Bloomington Home Telephone, Inc.	W-8
CenturyLink	L-4
Chico Peak Bell	L-11
Citizens Telephone Corporation	E-8
Craigville Telephone Company, Inc.	E-10
Davess-Martin County Rural Telephone Corporation	M-4
Endeavor Communications Corporation	J-4
Enhanced Telecommunications Corporation	K-10
Frontier Communications Corporation	O-10
Georgetown Telephone Company, Inc.	E-5
Ministar Connect	W-8
Ligonier Telephone Company, Inc.	W-8
Monon Telephone Company, Inc.	O-4
Mulberry Cooperative Telephone Company, Inc.	E-5
New Lisbon Telephone Company, Inc.	W-8
New York Telephone, Inc.	E-7
Northwestern Indiana Telephone Company, Inc.	C-3
Perry Spencer Rural Telephone Cooperative, Inc.	O-5
Pulaski White Rural Telephone Cooperative, Inc.	O-5
Rochester Telephone Company, Inc.	O-4
Smithville Telephone Company, Inc.	E-5
Southeastern Indiana Rural Telephone Cooperative, Inc.	L-23
Swayzee Telephone Company, Inc.	E-7
Sweetser Telephone Company, Inc.	E-7
TES Telecom	W-5
Washington County Rural Telephone Cooperative, Inc.	M-7
Yonatan Telephone Company, Inc.	E-5

Exchange Abbreviations

AN - ANDREWS	PV - PERRINSVILLE
BB - BRONKHORST	RC - ROCHESTER
BE - BLOOMINGDALE	RE - REEDINGTON
BG - BATTLE GROUND	RV - REELSVILLE
BN - BURNETTSTOWN	SA - ST. ANTHONY
BT - BUTLERVILLE	SC - SAKATA CLAUDIS
BV - BOUNTYVILLE	SG - SPURGEON
CA - CLAYPOOL	SH - SHIPLEY
CB - CARROLLSBURG	SP - SPRINGDALE
CG - CRAIGVILLE	SS - SHIPSHEWANA
CH - CHANDLER	SV - SPENCERVILLE
CI - CANNON LAKE	SW - SWEETSER
CM - CROMWELL	SZ - SIBAZEE
CO - CONVERSE	
CD - COATESVILLE	
CP - CENTER POINT	
CR - CROTHERSVILLE	
CL - CUMBERLAND	
CV - CHARLOTTEVILLE	
CY - CYNTHIANA	
DU - DUNLAP	
EB - ELIZABETH	
EC - EAST CHICAGO	
EL - ELIZABETHTOWN	
FA - FARMERSBURG	
FB - FREDERICKSBURG	
FE - FEITCHTON	
FT - FRANKTON	
FO - FOUNTAIN GROVE	
FV - FRENCHLANDVILLE	
GT - GEORGETOWN	
LD - LIBERTY CENTER	
LI - LINCOLN NEW RICHMOND	
LS - LAKE STATION	
LX - LEXINGTON	
LZ - LUTON	
MA - MARILLA	
MB - MICHANICSBURG	
MC - MCCORDSVILLE	
MD - MIDDLETOWN	
ME - MULBERRY	
MR - MONTICELLO	
MO - MONTICUMA	
MO - MONTICUMA	
MR - MARENGO	
MT - MICHIGANTOWN	
NU - NEW UNIONVILLE	
NH - NEW HARMONY	
NY - NEW YORK	
NL - NEW LISBON	
NR - NEW RICHMOND	
NO - NEW PARIS	
OC - OSCEOLA	
OK - OKLAHOMA CITY	
OR - ORLAND	
PA - PATRICKSBURG	
PI - PINECASTLE	
PK - PLEASANT MILLS	
PL - PLEASANT MILLS	
PO - PORTAGE	



This map shows the traditional incumbent service area of Indiana providers. Although incumbent territories are less meaningful in today's competitive and deregulated environment, they still provide information on where providers have voice networks, traditionally had carrier of last resort obligations, and may be well-positioned to provide broadband.

The chart below lists the more than one hundred telecommunication providers who have broadband facilities within Indiana. Several dozen provide residential service at 10 Mbps or better, with others serving business customers or other telecommunications providers.

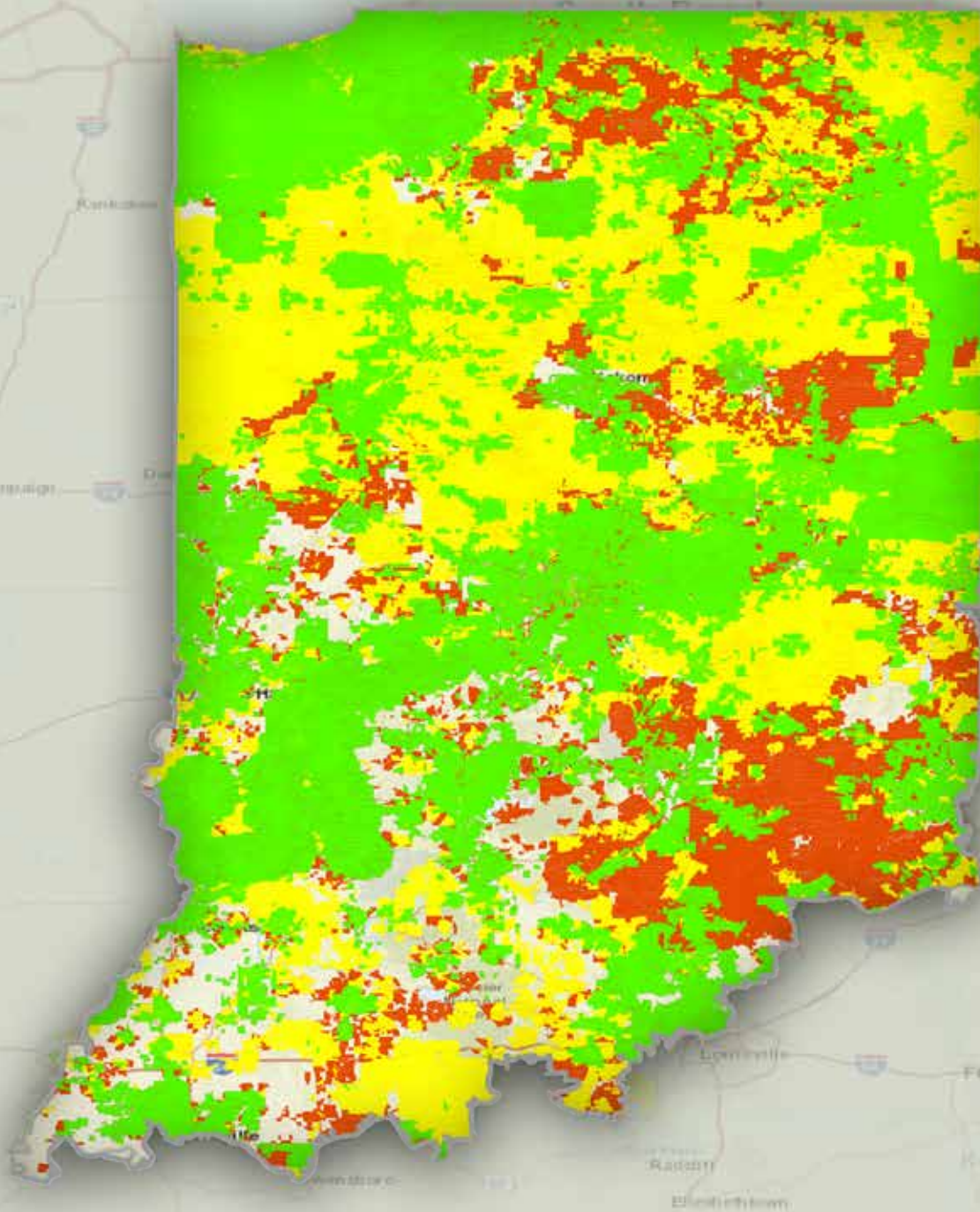
Provider	Max Reported Residential Speed (Mbps)	Max Reported Business Speed (Mbps)	Indiana Census Blocks Served (#)	Indiana Census Blocks Served (%)
Access One	0	3	6	0%
Acme Communications	120	120	28,559	11%
Advanced Integrated Technologies	0	3	1	0%
Agile Network Builders	0	100	320	0%
AgPro Wireless	30	0	1,614	1%
Alliance Internet Communications	20	0	9	0%
Alpheus Data Services	0	50	1	0%
ALTIUS Communications	10	0	2,276	1%
APX Net	0	100	11	0%
Asset Black	0	100	1	0%
AT&T Services	1000	0	151,207	57%
Auburn Essential Services	100	1000	706	0%
Avenue Broadband, NewWave	100	0	7,815	3%
Big Sandy Telecom	50	50	3	0%
Birch Communications	6	300	105	0%
Bloomington Home Telephone Company	100	100	184	0%
Blu Sky Wireless	25	25	108	0%
Blueriver Networking Services	10	0	697	0%
BroadRiver Communication Corporation	0	100	1	0%
Broadview Networks Holdings	0	1.5	1	0%
BullsEye Telecom	0	1.5	4	0%
Call One	0	1.5	1	0%
Central Indiana Communications	1000	1000	1,941	1%
CenturyLink	100	0	22,620	8%
Charter Communications	300	1000	32,362	12%
Cincinnati Bell Any Distance	0	0	2	0%
Cincinnati Bell Telephone Company	1000	0	267	0%
Citizens Communications	100	0	6,592	2%
Citizens Telephone	100	100	584	0%
Clay County Rural Telephone Cooperative	1000	1000	2,089	1%
CMN-RUS	1000	1000	9,840	4%
Cogent Communications Group	0	1000	15	0%
Colo Telephone Company	25	25	1	0%
Comcast Cable	987	0	88,981	33%
Community Fiber Solutions	50	50	3,775	1%
Compudyne	0	30	1	0%
Comteck of Indiana	50	50	223	0%
Convergence Technologies	0	20	31	0%
Craigville Telephone Company	1000	0	511	0%
Crossroads Broadband	3	0	12	0%
Cyber Broadcasting	30	0	45	0%
Daviess-Martin County Rural Telephone	13	13	1,442	1%
DMCI Broadband	15	20	558	0%
DoveTel Communications	0	20	1	0%

Provider	Max Reported Residential Speed (Mbps)	Max Reported Business Speed (Mbps)	Indiana Census Blocks Served (#)	Indiana Census Blocks Served (%)
EarthLink Business	0	100	1,025	0%
Eastern Indiana WIFI	300	102	281	0%
Essex Telcom	75	1000	7,577	3%
Everstream GLC Holding Company	0	1000	3	0%
eVolve Business Solutions	0	0	269	0%
FBN Indiana	100	1000	7,449	3%
First Communications	0	150	19	0%
Fourway Computer Products	25	100	85	0%
Frontier Communications Corporation	30	0	130,558	49%
Gallatin County Fiscal Court	8	5	7	0%
Global Capacity	6	45	425	0%
Geetingsville Telephone Co.	100	100	409	0%
Gtek Computers & Wireless	4	0	2	0%
Lightbound	0	1000	117	0%
iLOKA, NewCloud Networks	10	10	2	0%
Independents Fiber Network	0	1000	736	0%
Indiana Fiber Network	0	1000	73	0%
IP Global	0	20	1	0%
Joink	35	0	546	0%
KC Online	40	0	19	0%
King Street Wireless L.P.	1	0	61,384	23%
Lebanon Utilities	10	100	3,781	1%
Level 3 Communications	0	1000	1,424	1%
Lighttower Fiber Networks I	0	1000	3,227	1%
Ligonier Telephone Co.	30	0	563	0%
LigTel	15	0	6,413	2%
LocalLoop	20	0	16	0%
McClure Services	0	0	7	0%
MCI Communications Corporation	0	750	715	0%
McLeodUSA Telecommunications	0	1000	1,784	1%
Mediacom Indiana	1000	0	8,489	3%
Mercury Wireless Indiana	7	7	36,205	14%
MetaLINK Technologies	25	25	6,853	3%
Metro Fibernet	1000	1000	9,840	4%
Midwest Connections	1000	1000	1,016	0%
Midwest Telecom of America	20	20	12,741	5%
Miles Communications	1000	1000	9,571	4%
Mobilcomm	5	0	778	0%
Monon Telephone Company	50	50	1,637	1%
Mulberry Cooperative Telephone Co.	10	10	396	0%
National Mobile Communications	0	0	1	0%
NetCarrier Telecom	0	1000	1	0%
NetFortris Acquisition Co.	0	1.5	8	0%
Network Services Solutions	0	45	5	0%
New LisbonTelephone	1000	0	2,622	1%
New Paris Telephone	8	1000	1,953	1%
New Paris Telephones Quality Cablevision	14	14	542	0%
NineStar Connect	1000	1000	867	0%
NLBC	100	100	4,039	2%
Northern Indiana Technologies	3	0	693	0%

Attachment C

Provider	Max Reported Residential Speed (Mbps)	Max Reported Business Speed (Mbps)	Indiana Census Blocks Served (#)	Indiana Census Blocks Served (%)
Northwestern Indiana Telephone Company	100	1000	1,039	0%
NuWave Technology	10	10	288	0%
Perry-Spencer Communications	20	50	1,745	1%
Perry-Spencer Rural Telephone Cooperative	50	50	1,682	1%
Portative Technologies	20	50	624	0%
Precision Data Solutions	1000	0	180	0%
Pritell	5	0	8	0%
Pulaski White Rural Telephone Cooperative	150	150	799	0%
Q Wireless	10	0	1,867	1%
Richmond Power and Light	1	200	1,553	1%
Rochester Telephone Co.	50	1000	829	0%
RTC Communications Corp.	50	1000	2,776	1%
SAA bright.net	10	10	428	0%
SEI Data	3	0	280	0%
Smithville Communications	1000	1000	1,790	1%
Smithville Telecom	1000	1000	254	0%
S-Net Communications	0	1.5	1	0%
Southeastern Indiana Rural Telephone Coop	100	0	644	0%
Spectrotel	0	150	80	0%
Speedwavz	15	10	1	0%
Sunman Telecommunications Corporation	1000	1000	1,050	0%
Surf Air Wireless	25	25	12,949	5%
Swayzee Telephone Co	20	20	572	0%
Sweetser Telephone Company	50	50	184	0%
Talk America, Cavalier Telephone	0	6	1	0%
TDS MetroCom	0	100	1	0%
TDS Telecommunications Corporation	1000	1000	5,424	2%
Telecommunications Management, NewWave	100	0	2,945	1%
TelNet Worldwide	0	1.5	1	0%
The Laffoon Corporation	15	1000	701	0%
Transworld Network	10	1000	37,238	14%
TV Cable of Rensselaer	100	100	364	0%
Unite Private Networks	0	1000	188	0%
United States Cellular Corporation	1	0	9,992	4%
Urban Communications	10	0	1	0%
US LEC	0	100	28	0%
US Signal Company L.L.C.	0	1000	18,381	7%
Voyant Communications	0	100	26	0%
W A T C H TV	15	0	71,707	27%
Wabash Communications	5	20	463	0%
Wabash Mutual Telephone Company	80	1000	21	0%
Washington County Rural Telephone	50	0	549	0%
WideOpenWest Cleveland	1000	0	5,808	2%
Windstream Norlight	0	500	456	0%
Wintek Corporation	1000	1000	223	0%
XL Broadband	100	1000	16	0%
XSTREAM Wireless	20	50	105	0%
Yeoman Telephone Company	20	0	110	0%
Zayo Group	0	1000	23	0%

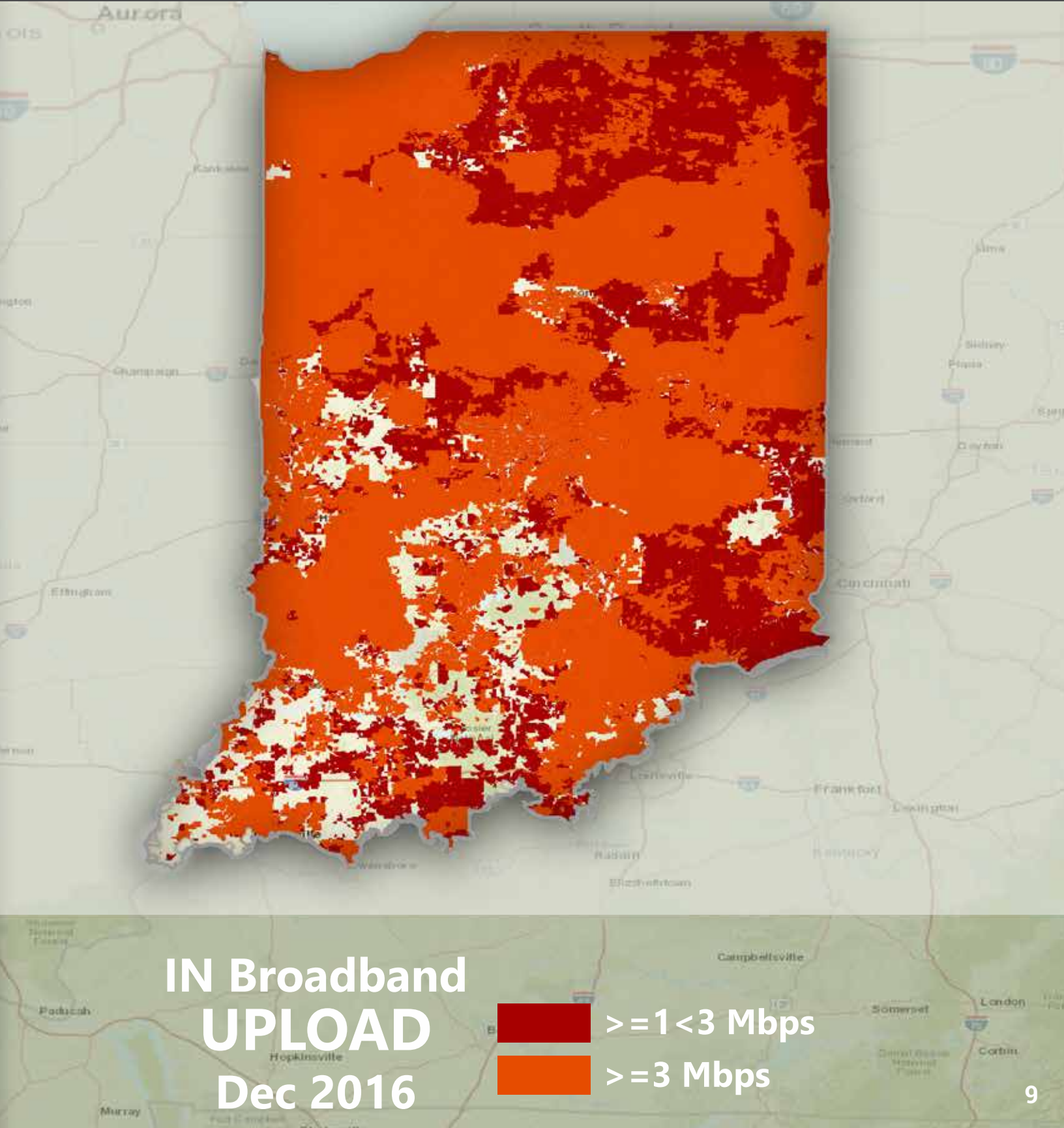
Three-quarters of Indiana geographically is covered with download speeds of 10 Mbps or better (shown in green and yellow). The populated areas of the state are generally well-served, and more than 86% of Indiana residents have access to broadband speeds of 25 Mbps or better, according to www.broadbandnow.com.



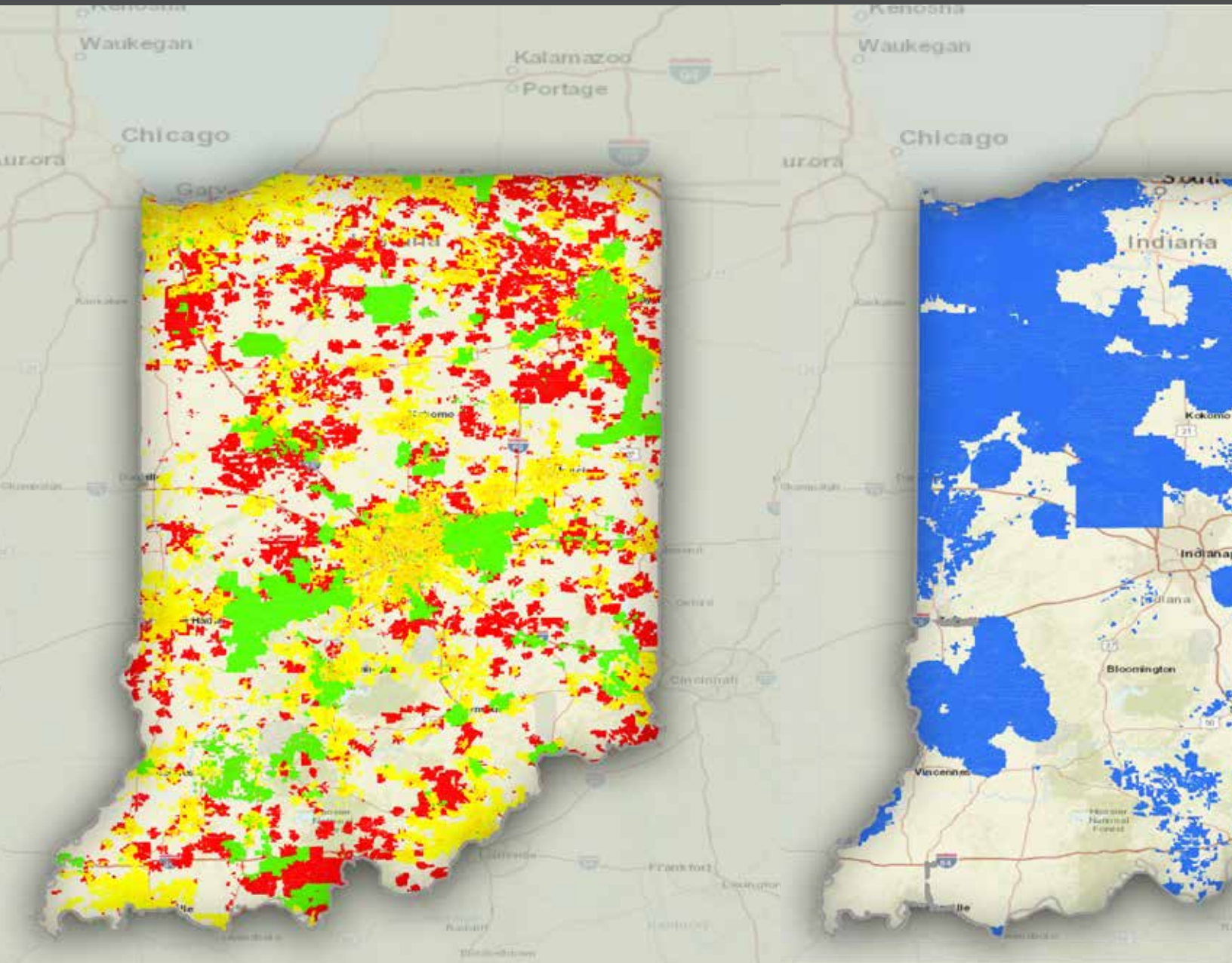
IN Broadband DOWNLOAD Dec 2016



Most of Indiana has upload speeds of 3 Mbps or better (shown in orange). Almost the entire state features upload speeds of at least 1 Mbps (shown in orange or red).



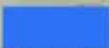
Indiana features widespread deployment of 10 Mbps using four different kinds of fixed broadband technology. The maps on this page shows where wired service is being delivered by DSL (red), cable modem (yellow), and fiber-to-the-premises (green). The second map shows fixed wireless service at 10 Mbps or better download (blue).



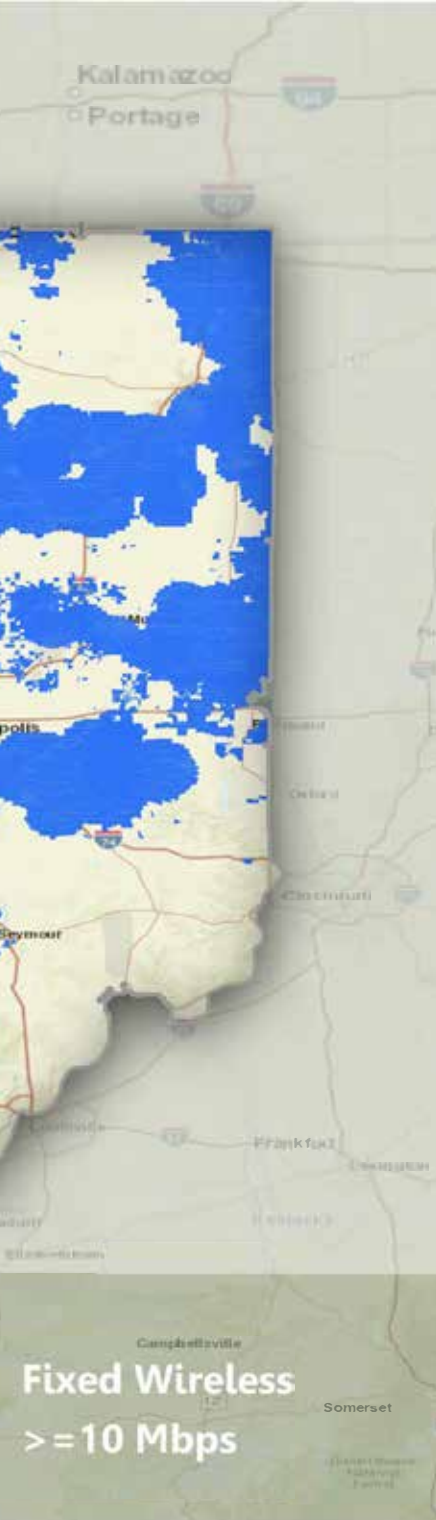
**IN Broadband
Dec 2016**

- DSL \geq 10 Mbps
- Cable \geq 10 Mbps
- Fiber \geq 10 Mbps

**IN Broadband
Dec 2016**

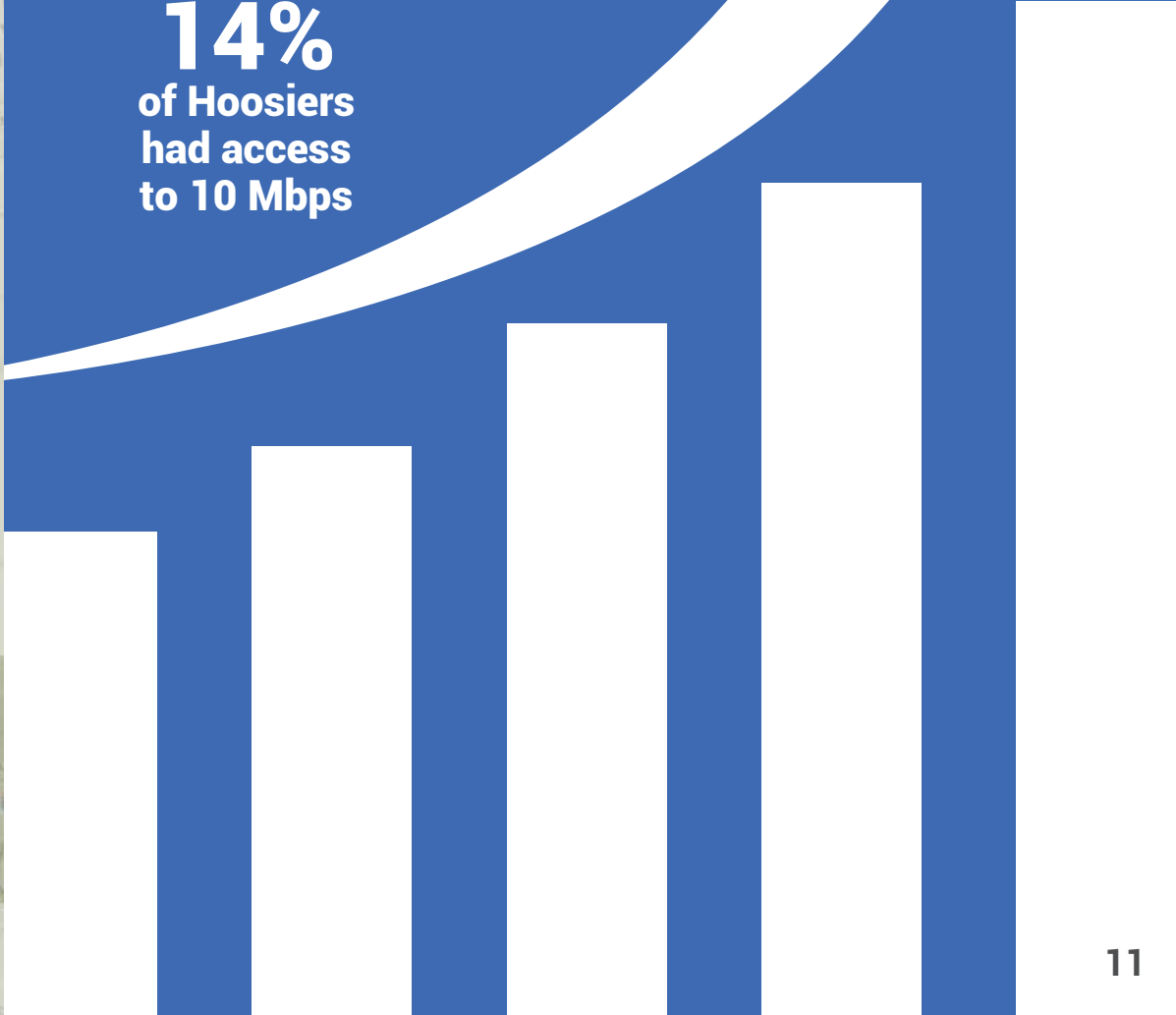


Access to 10 Mbps in Indiana has increased dramatically in recent years. As noted earlier, today, more than 90% of Hoosiers have access to 10 Mbps speeds or better. When the FCC released their sixth Broadband Deployment Report in 2010, it noted that only 14% of Indiana connections were capable of those speeds.

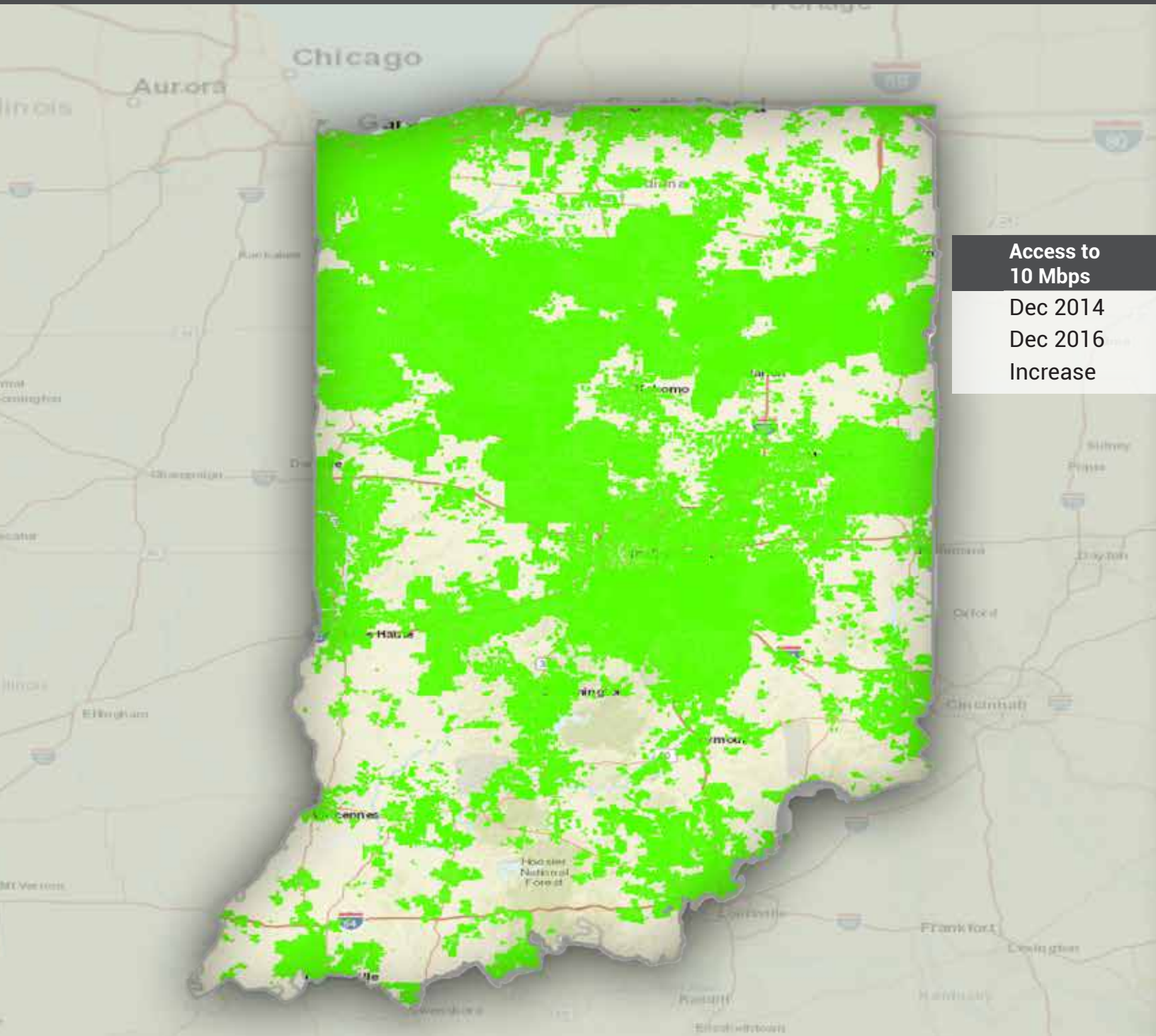


In 2008
14%
of Hoosiers
had access
to 10 Mbps

In 2016
91%
of Hoosiers
had access
to 10 Mbps




Substantial network investment has helped improve Indiana broadband access over the last two years, especially in northern and southwestern Indiana. The FCC didn't require filing of Form 477 data of broadband speeds at the census block level until December 2014, and that data is mapped on this page to show baseline access to 10/1 Mbps.

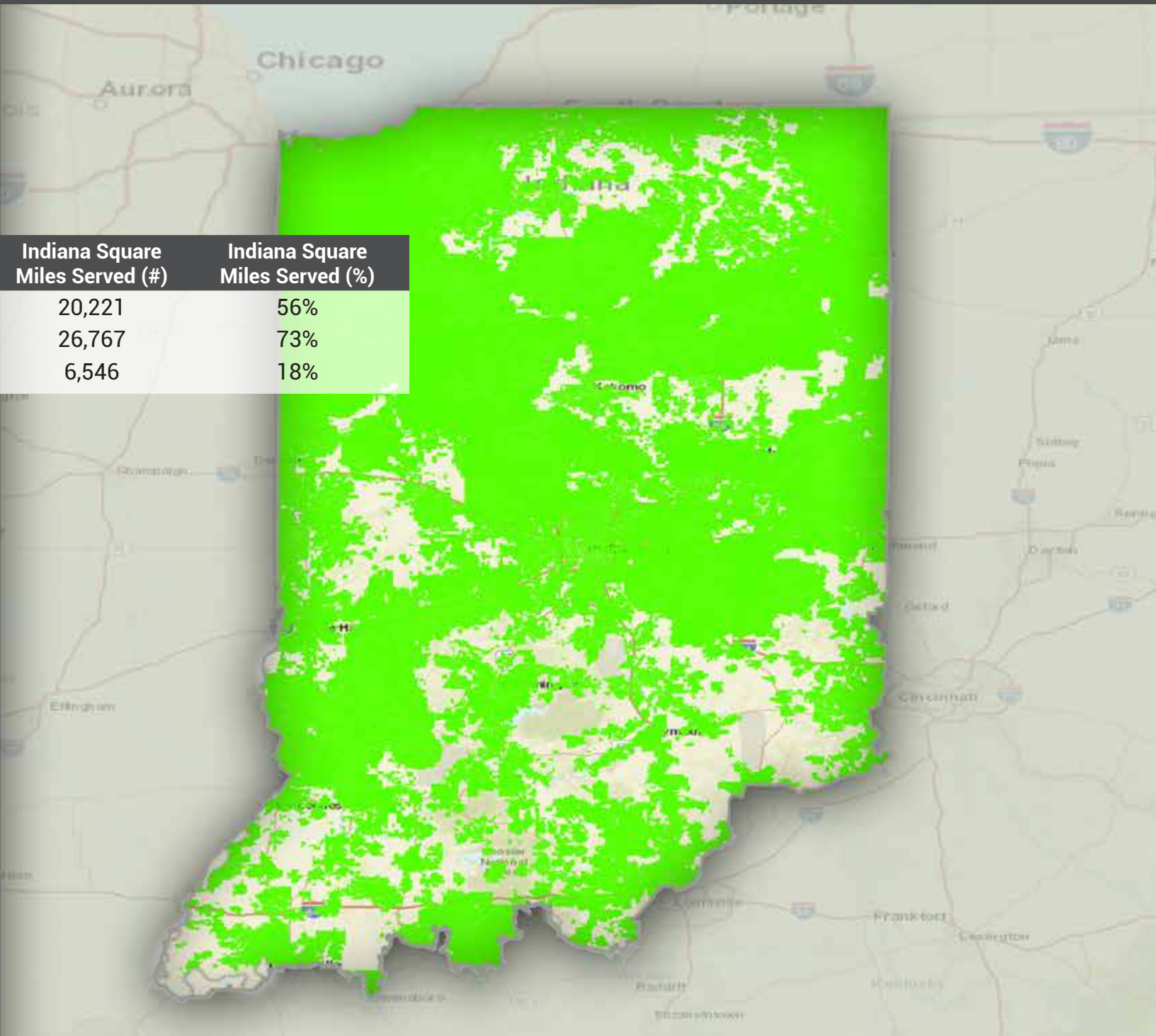


Access to
10 Mbps
Dec 2014
Dec 2016
Increase

IN Broadband
Dec 2014

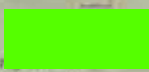
 ≥ 10 Mbps

This map shows the most recent publicly-available 10 Mbps data.

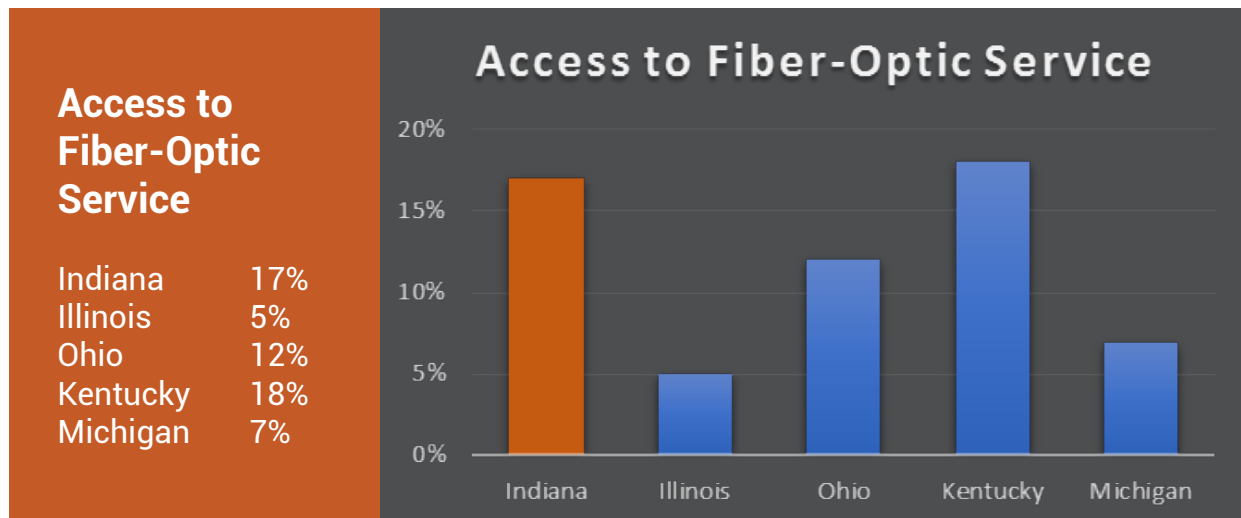
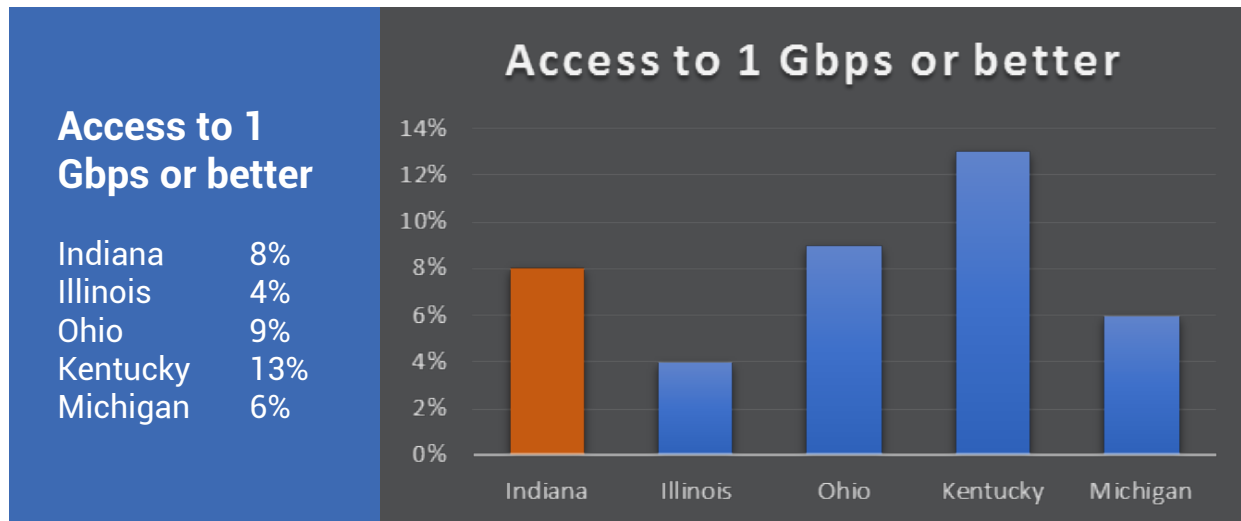
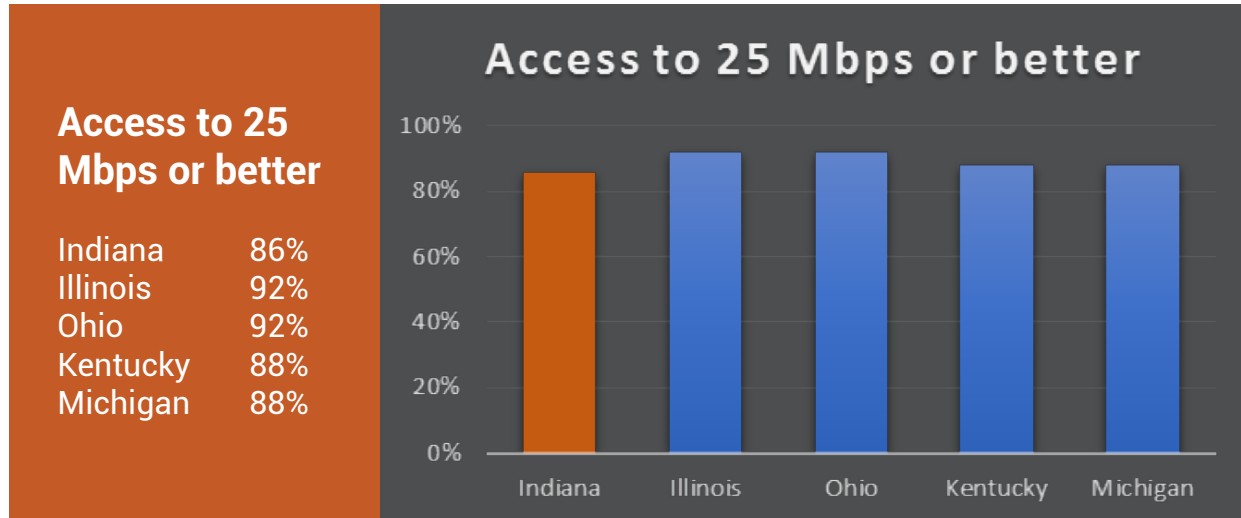


Indiana Square Miles Served (#)	Indiana Square Miles Served (%)
20,221	56%
26,767	73%
6,546	18%

**IN Broadband
Dec 2016**


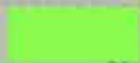
 **>= 10 Mbps**

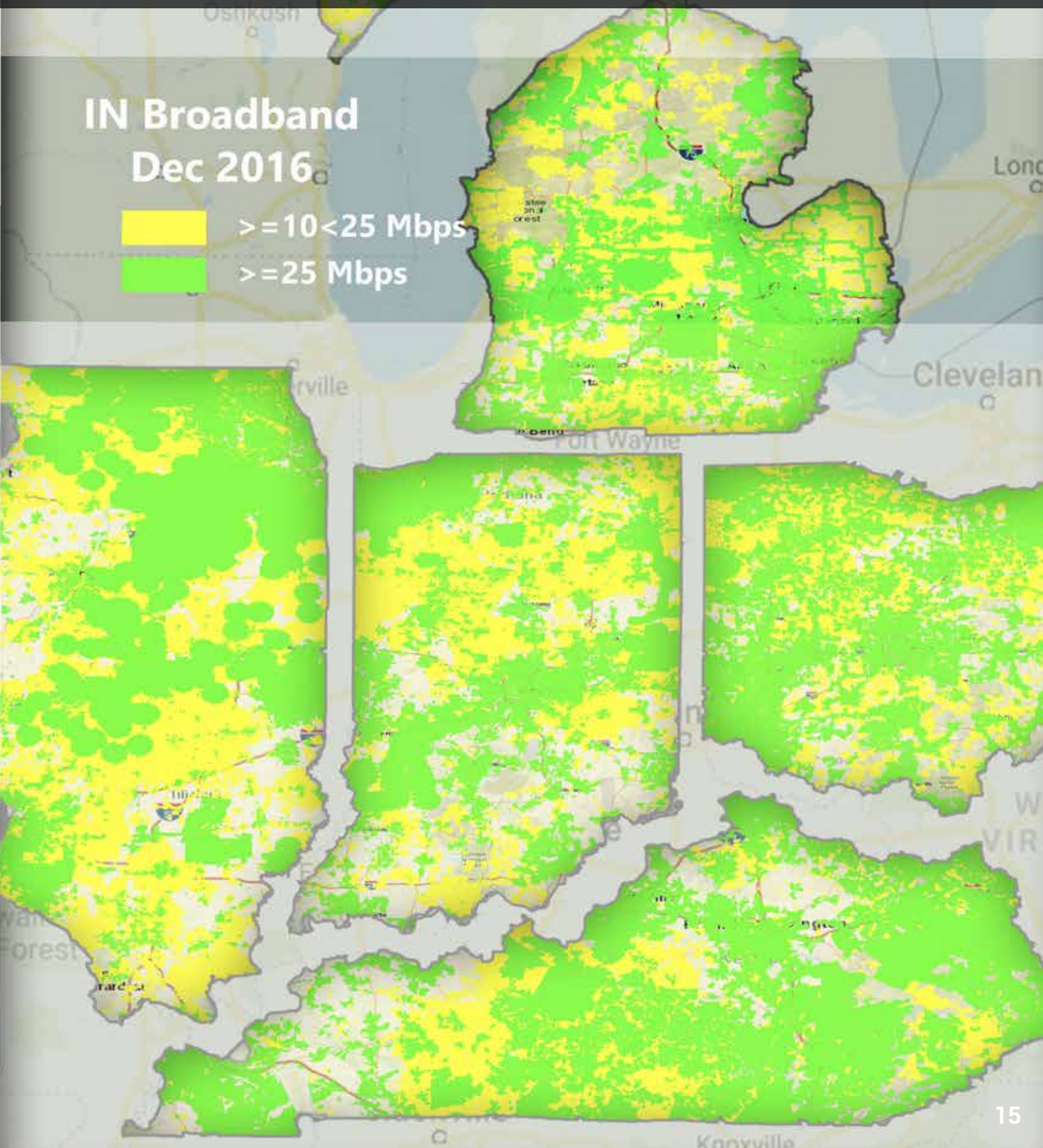
Indiana's high-speed connectivity stacks up well to other states in the region, with access to 1 Gbps service and access to fiber-optic service that is better than what is found in a number of neighboring states.



These maps display access to 10 Mbps (yellow) and 25 Mbps broadband (green) for each state in the region. In general, Indiana displays geographic coverage similar to or better than its neighboring states.

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-  $\geq 10 < 25$ Mbps
-  ≥ 25 Mbps



Key Findings

1. Dramatic Improvement

Indiana has seen dramatic improvement of 10 Mbps access in recent years. Today, more than 90% of Hoosiers have access to 10 Mbps speeds or better. In 2008, only 14% did.

2. Varied Technologies

A variety of technologies are being utilized to deploy broadband access in Indiana. There is widespread use of DSL, cable modem, fiber-to-the-premises, and fixed wireless to deliver service.

3. Continuing Buildout

More than 6,546 square miles (almost a fifth of Indiana) have received access to 10 Mbps in the last two years.

4. Regional Comparability

Indiana's high-speed connectivity stacks up well to neighboring states, with access to 1 Gbps service and access to fiber-optic service exceeding regional averages.

This report was sponsored by the Indiana Broadband and Technology Association and engineering and consulting firm Vantage Point Solutions. For more information on this report, contact:

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Deploying a Broadband Network – From Start to Finish (and Beyond)





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1 Executive Overview

Building a broadband network is a time-consuming, capital-intensive endeavor, which requires a considerable amount of planning and analysis to be successful. To be successful, a broadband network must be able to meet the customer's demands both today and into the future. Much of the investment in a broadband network is used to install elements that have economic lives of 30 years or longer, a term for which it can be difficult – if not impossible – to accurately predict customer demands over the life of the network. Long-term capital investments such as this can therefore be very risky ventures for the broadband provider and their investors.

The risk is significantly greater still in rural areas where the cost to construct to any given customer is much higher than urban areas. The lower population densities in the rural areas require the provider to make much larger investments in infrastructure and incur more expense associated with environmental permitting processes. The low customer density and large geographies of rural areas also result in higher operational costs as well.

There are a variety of network architectures being used today to deliver broadband, but nearly all providers understand that fiber provides the best broadband capabilities both immediately and over the longer term. Wireline networks are most commonly based on copper cables, such as coaxial or twisted pair, which struggle to keep up with the rapidly increasing broadband demands. As these copper networks reach the end of their useful lives, it is common for the copper cables to be replaced with fiber.

Like wireline copper networks, many wireless networks also struggle to deliver adequate broadband speeds because of limited spectrum availability, environmental effects, or overloading. To minimize these broadband bottlenecks, wireless and wireline providers alike are replacing large portions of their networks with fiber.

It is costly to deploy a broadband network even in ideal conditions. However, there are many local factors and customer demographics that can dramatically increase the costs. Customer density is one of the largest contributors to network costs. There is often no business case to serve customers who live outside areas with customer densities less than what is typical for a town customer. In rural areas that surround larger metropolitan areas, the broadband provider may be able to justify serving the rural customers by cost averaging the lower cost town customers with the higher cost rural customers. However, in some rural areas, the towns themselves are too small to have enough lower cost customers to make the rural areas economical to serve. In these instances, even where capital to build is on hand or otherwise in theory available, the provider must rely on mechanisms such as Universal Service Funding to make a business case to serve the rural customers.

Deploying a broadband network is a very capital-intensive undertaking, regardless if it is in a greenfield environment or when replacing an existing network. The extensive planning, long construction timeframes, and the coordination of approvals and permits from various regulatory, government and private entities add to the complexity and cost. The intent of this document is to give a brief overview of the process often needed to deploy a broadband network. This document is not intended to be exhaustive, since there are often local or regional rules and regulations that impact deployment costs and increase timeframes. This document will overview the processes common to nearly all deployments, focusing on the initial deployment but also covering some aspects of the operational expense and complexity introduced once the network is built.



2 Network Deployment Steps

For this document, the network deployment discussion has been divided into five primary phases. These are, 1) Business Planning, 2) Financing, 3) Design and Engineering, 4) Construction, and 5) Operations. As shown in Figure 2-1, each of these stages require complex, time-consuming, and costly efforts to be performed before the deployment can proceed to the subsequent phase or services ultimately delivered. Many of these tasks require a provider to obtain outside resources to properly and fully complete the requirements. Each of these phases are described in the following sections.

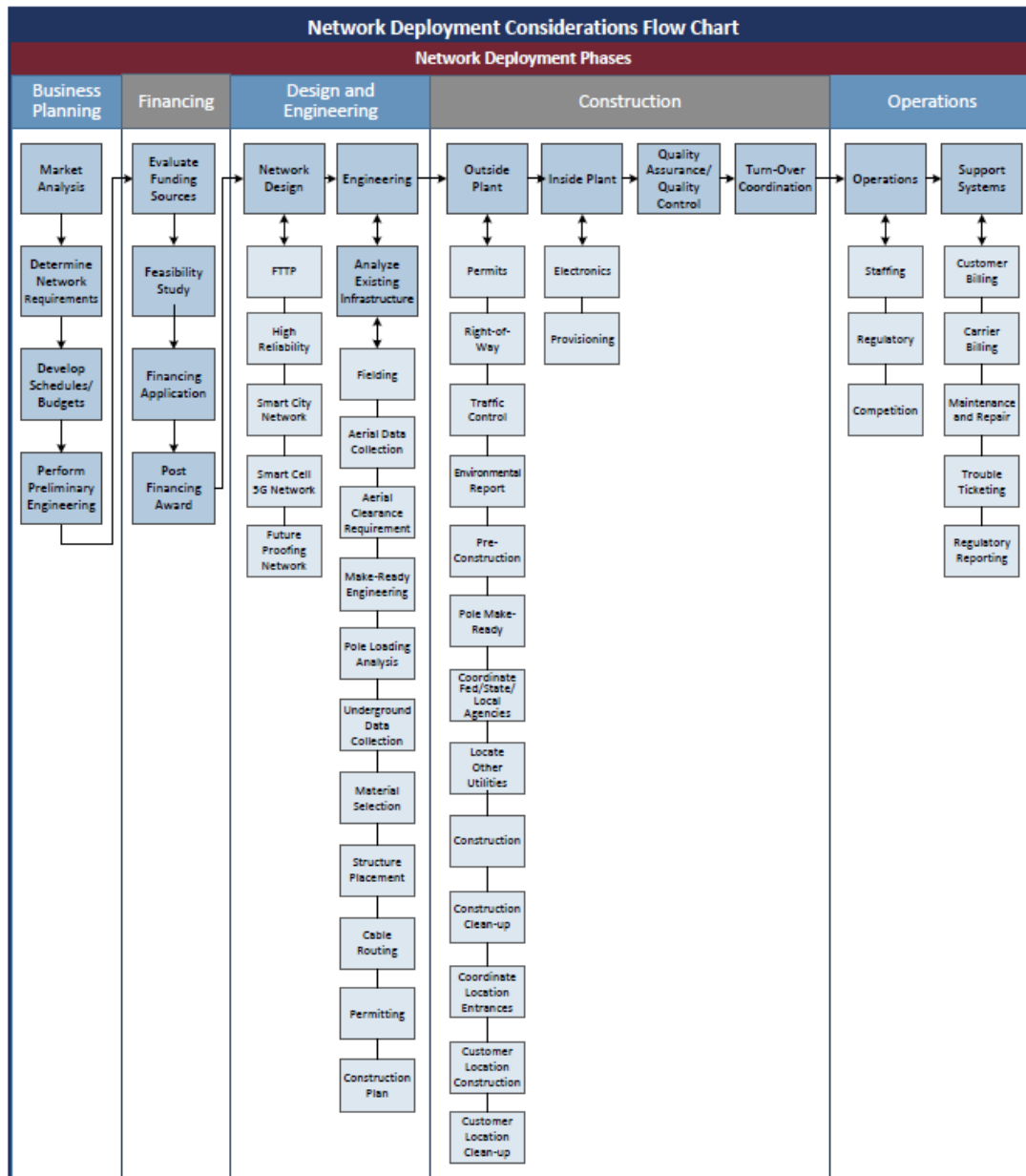


Figure 2-1: Network Deployment Phases



3 Business Planning

The initial step of a network deployment is the business planning phase. The business planning determines the area to be built, the services to be offered, the deployment schedule, and the overall project budget. The business planning requires a significant amount of effort and research and often requires outside resources to perform surveys, market studies, and high-level technical studies for compiling estimated budgets and schedules.

Once a business plan has been developed, it is typically reviewed by the provider's senior management, board of directors, business partners, and/or investors to decide whether to proceed with the project or not. A viable business plan is often a balance between the cost to deploy the broadband network along with anticipated upgrade costs and the expected revenues from customers and other sources that will provide at least some reasonable return and/or the ability to repay any debt.

3.1 Market Analysis

When offering new services to existing customers or building a network outside of a service provider's existing footprint, it is important to study the demographics and needs of the potential customers. To determine market demand and penetration rates, the provider must analyze the current wireline and wireless competition in the market. A detailed market analysis often includes a survey process to gather information from the potential customers to determine many key factors, such as:

- Capabilities and product pricing of current service providers
- Customer satisfaction with current service providers
- Customer demand
- Estimates of take rates
- Pricing sensitivity

This process is time consuming and typically utilizes outside sources to make phone calls and conduct focus groups.

The market analysis may also include coordinating with the local governments to determine interest in Smart City-type applications and identify potential anchor institutions. This could include service to local institutions (schools, libraries, public safety and other government buildings), as well as sensors (street lights and traffic signals).

3.2 Competition Analysis

Another item to consider when deploying a broadband network is determining the competitive environment in the areas being overbuilt. This step is often missed or only partially completed. In reviewing the market, a competitive analysis should be completed to determine how the service take rates may be impacted. In completing a competitive analysis, the main items to be considered consist of the following:



- Identify the Incumbent Service Provider(s) – The incumbent could be a price cap carrier, a wireless carrier, and/or a cable provider. Research of the market should be completed to determine which carriers are currently providing service today.
- Determine Presence of Competitive Providers – In addition to incumbent providers, determine if there are any competitive providers which may include both wireline/cable providers as well as wireless carriers.
- Strength of Name Recognition – Having a strong name and/or brand recognition and being known for high quality service would carry over in to a new market. Customers' perception of the services provided will have a significant impact on whether a new broadband provider will have a solid take rate and customer following.
- Current Services and Rates – A review of what services are currently being offered to the market as well as the current rates being charged will be the precursor of the services and rates to be offered when deploying a new broadband network.

In addition, an assessment must be made regarding the incumbent's ability and willingness to react to an additional competitor. Since building a competing network takes months or years of effort, the incumbent has the opportunity to upgrade its network if able and willing to do so, which could have impacts on the business plan.

3.3 Determine Network Required to Deliver Services

Following the market analysis, the second element of business planning is to determine the network topologies that would support the services the customers desire. This is necessary for compiling high-level project cost estimates and schedules. The correct network may be a combination of more than one network technology to meet the needs of all types of users including residential, business, and anchor institutions.

Much planning goes into the network topology planning and requires engineering resources to perform preliminary designs and options, cost estimates and technical reports regarding the pros and cons of various options. The following are types of modern wireline networks that are often considered, although the processes and procedures outlined in this paper are not limited to such networks; most are equally applicable to other terrestrial networks, particularly when one considers again that even "wireless" networks are in most cases dependent upon increasing densification of cells and wired backhaul to handle current and future data needs. To use a colloquial phrase: Wireless needs wires.

Fiber to the Premises (FTTP) Network

Most broadband networks today, regardless if they are wireless or wireline, rely heavily on fiber optic cable. Most modern wireline networks are constructed entirely of fiber because it is the least expensive medium to deploy and operate measured over the life of the network assets and has the largest bandwidth capabilities as an initial matter and as a matter of scalability in the future. These wireline networks are generically referred to as Fiber-to-the-Premises (FTTP) networks. FTTP networks can be architected as either a shared or dedicated design depending on the service needs of subscribers.

The shared network architecture utilizes passive optical network (PON) topology. Optical splitters are utilized in the network to share the broadband capacity between groups of subscribers



(typically up to 32 subscribers). It is generally targeted to residential subscribers and small businesses that require up to 1 Gbps services, and has a cost advantage over a dedicated system because not every fiber has to “home run” back to an active equipment location, which results in fewer fibers and fewer fiber splices.

Some FTTP architectures rely on a dedicated fiber to each customer and often utilize Active Ethernet (AE) technology. This design implements a point-to-point architecture with dedicated fiber to serve residential and business customers. This means that each subscriber is served by a fiber strand that is dedicated from their premises back to the site where the distribution electronics are located. AE technology provides for speeds of 1 Gbps or more both upstream and downstream for each user. It is generally targeted to businesses and “power user” residential subscribers that require 1 Gbps or higher services, with 10 Gbps services planned for some areas.

Dedicated Circuit Services

While FTTP services are typically utilized for providing Internet service, some end users may request services to enable private transport connections between the sites. For example, this could be a large business with multiple sites. Carrier Ethernet technologies such as Ethernet Private Line (EPL) can be utilized to enable these private circuits between customer locations.

Custom Services

The network can also be designed to support a variety of Smart City services depending on the needs of the city. This could include supporting Smart City applications such as street light sensors, traffic sensors, cameras and connecting various city institutions. Depending on specific needs of the applications, the network could support dedicated dark fiber, private dedicated circuits, or broadband connections such as 1 Gbps or 10 Gbps, and be ready for 100 Gbps when demand requires.

Likewise, the network can also be designed to support Small Cell services depending on the needs of service providers. This could include dark fiber or broadband connections (such as 1 Gbps or 10 Gbps) to the Small Cell locations.

3.4 Develop Preliminary Schedules and Budgets

A final step of the business planning phase is to determine preliminary project schedules and budgets. The project schedules may include a phased plan for how the network will be constructed over several years. The project phases could be determined by specific geographic areas based on ease of construction, customer density, or political or government factors, or based on expected penetration rates. Alternatively, the project phases could be determined by the prioritization of services that are being provided, such as residential and business.

Once the project phases are determined, budgetary estimates can be compiled for each of the phases of the projects. This would include outside plant, electronics, operations and maintenance budgets. Additionally, operations and maintenance budgets are compiled. This includes staff salary and benefits requirements for the provider’s various departments. It also includes areas such as vehicles, test equipment, billing systems, trouble ticket systems, and mapping systems.



4 Financing

4.1 Evaluation of Funding Sources

Depending on the geographic location, the status of competition, and the types of services to be offered, there are several state and federal financing options in addition to private lending institutions that are typically evaluated as potential funding sources.

Several states have developed broadband grant programs to provide funds for broadband deployments in areas that are currently unserved or underserved. Minnesota and New York are a couple of examples of states that have recently offered broadband grant awards.

Additionally, federal grant and low interest loan programs are available through the USDA's Rural Utilities Service (RUS). These include the Telecommunications Infrastructure, Farm Bill Broadband, and Community Connect programs.

These programs are often targeted to providing broadband to customers that meet specific criteria such as rurality of the serving area, currently available broadband speeds, number of competitors, and proposed service offerings that affect the eligibility of the specific proposed project. Therefore, considerable effort is required to understand the requirements of each program and to identify potential projects that satisfy the requirements.

In some areas, the cost to serve the customer is simply too great. The end user revenues needed to deploy and then support the network over time are beyond what the end user is willing or able to pay. In these instances, a business case cannot be made with a low interest loan (or even a federal, state, or local grant or the provider's own cash on hand), and the provider must therefore rely upon outside sources of funding such as what is available through the Universal Service Funds (USF) to make the business case.

4.2 Feasibility Study and Financing Application

Any external funding source will require some form of feasibility study to be provided. Depending on the program, it is likely that portions of the application may need to be developed and certified by a provider's professional engineering firm and financial consultant.

These studies incorporate the budgets, market penetration, rates and service offering information from the business planning phase to develop a multi-year financial forecast. A financial forecast includes the capital costs and depreciation, balance sheet, operating revenues and expenses and cash flows for each future year. Sample feasibility study information is included in Appendix A. Some key financial statements in the feasibility study include:

- Projected balance sheet
- Projected income statement
- Projected cash flow
- Projected ROR on investment
- Projected breakeven
- Projected financing ratios (DSCR, Debt-to-Equity, TIER)



In addition to the feasibility study, there is a large amount of additional information that most financing applications require. This may include:

- Company history
- Management experience
- Service plans and pricing
- Marketing plan
- Competition analysis
- Network maps
- Existing and proposed network descriptions
- Demonstration of community support
- Financial references

4.3 Post Financing Award

Once a provider has been awarded financing, there is typically a large amount of reporting requirements and procedures that must be followed, including:

- Construction progress reports
- Periodic financial reports
- Requests for reimbursement
- Audit support

The financing entity may also have specific procedures that the provider must adhere to regarding how construction contracts are awarded. This may include utilizing the entity's contract forms and obtaining approvals prior to the award of contracts.



5 Design and Engineering

Assuming the business plan and financial studies look positive, the design and engineering of the network commences. This is a time- and labor-intensive phase in which detailed designs and engineering plans are developed. A detailed engineering plan requires extensive on-site surveys and research to develop construction maps. Licensed professional engineers are often engaged to ensure that the plans meet local, state, and national codes in addition to industry standards, as well as protect the public safety.

5.1 Design

The overall design is based on delivering the services that were determined to be required in the business plan in the most cost-effective manner. Each of the service offerings require that specific network design needs be met.

Rural network designs are almost always more expensive on a per-subscriber basis than urban designs. It is not uncommon for the cost to serve a rural customer to be 4 or more times the cost to serve a town customer. The lower subscriber density of rural networks results in fewer subscribers over which to spread the network costs across. Additionally, rural network designs are unable to obtain the efficiencies of scale that can be achieved with urban networks. For example, a centralized electronics building in an urban network typically serves thousands of subscribers. This allows an urban provider to spread the building, back-up power, and other infrastructure elements across many subscribers. Rural networks typically must distribute their electronics across remote cabinets or huts that serve small numbers of subscribers. This is unavoidable and results in less efficiency in a rural network design.

Early in the design phase, aggregation sites must be identified. These are the primary locations of the electronics which directly serve the locations within the serving area, and all the local connections within the serving area must have a connection path back to an aggregation site. The aggregation site may serve as a co-location site for multiple entities that are utilizing the network to place their service electronics. The aggregation site may be a cabinet or a small building, or it may be located inside an existing building somewhere within the network footprint. Aggregation sites are typically placed in secure locations with 24/7 access and backup power capabilities. Some local codes may require that the aggregation sites be entirely underground or disguised as another type of building such as a house.

Next, the backbone fiber network that connects the various aggregation sites is designed. The backbone fiber network is typically deployed in ring architectures to provide network redundancy. To provide additional resiliency, backbone fiber typically enters the aggregation locations in two separate entrances and separation of the ring segments is maintained throughout the network. This allows for aggregation sites to remain connected in the event of a fiber cut, and for customers paying for ring protected services to maintain service during most network outage events.

Once the aggregation site and backbone fiber designs have been completed, the distribution networks, as described in the following sections, can be designed. The selection of the distribution architecture or combination of architectures affects the size of fiber cables and the amount and type of electronics that are required. Figure 5-1 depicts the various distribution network elements that are addressed in the design phase.

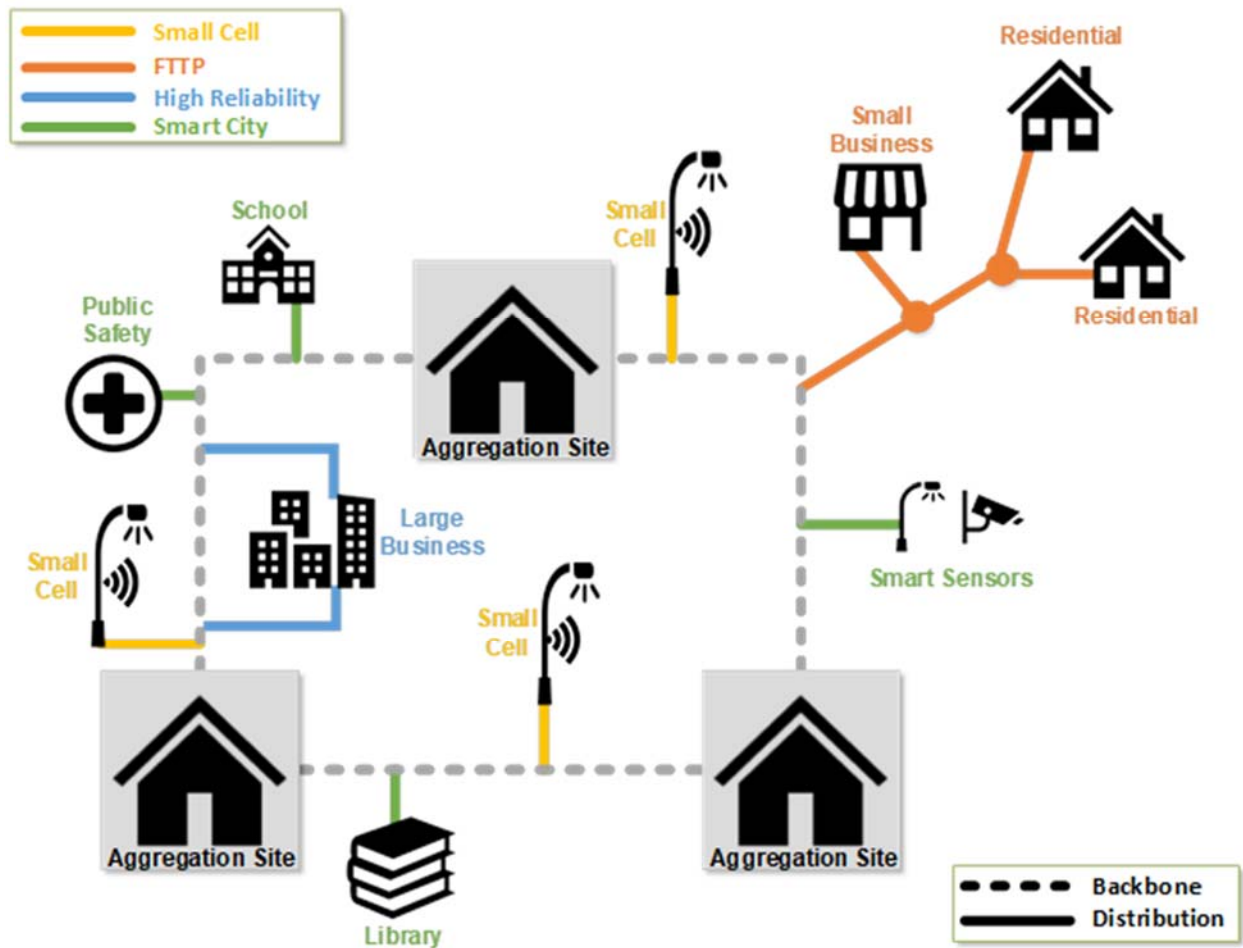


Figure 5-1: Distribution Network Design Elements

5.1.1 FTTP

As described in Section 2.2, an FTTP network can deliver services over a shared PON architecture or a dedicated AE architecture. In a PON architecture, optical splitters may be centrally located at the aggregation site or they may be distributed in the field. If they are distributed in the field, less fiber is required all the way back to the aggregation site. However, centrally locating the splitters allows for more efficient use of the splitters and the associated electronics ports. It also provides for an easier transition to an AE architecture in the future.

In an AE architecture, dedicated fiber connects from the subscriber back to the aggregation site. This requires more fiber in the distribution network than a distributed PON architecture and more electronics are required since each customer has a dedicated electronics port. However, it provides the most broadband capability to the subscriber.

5.1.2 High Reliability

Some medium and large businesses (or other entities that provide critical services) require higher service reliability than may be required for residential and smaller business applications. In these



cases, a fiber ring topology can be utilized to connect the businesses and provide redundancy that can survive a fiber cut or network outage on a portion of the ring.

5.1.3 Smart City Network

Smart City architectures could include items such as cameras at intersections, connections to traffic signal boxes, light sensors, and SCADA systems. It may also include fiber to city institutions such as schools, municipal buildings and libraries. The fiber design develops terminal locations for sensor connections and may include ring architectures for applications that require high levels of redundancy.

5.1.4 Small Cell 5G Network

A fiber deployment design may include working with carriers to design appropriate endpoints, route diversity and redundancy for Small Cell 5G deployments. This is typically designed based on coordination with the wireless carrier's backhaul and fronthaul requirements.

5.1.5 Future Proofing the Network

It is also important to build capacity and flexibility into the network design to accommodate future growth and technologies. The growth capacity can be built into the fiber network by increasing spare fiber availability at various network locations. Growth capacity can also be included in the aggregation sites to allow for more equipment racks. In addition to spare fiber and space availability, future growth and technology support can sometimes be accommodated by replacing the electronics that are attached to the fiber network. This capacity planning helps minimize future capital expenditures in the event of customer growth.

5.2 Engineering

Once the network design has been completed, detailed engineering is performed. This engineering results in construction plans that dictate construction materials, facility placement and network routing. Additionally, permit packages are completed and submitted during the engineering phase.

In preparation of the field engineering and permitting, the first step is to determine all agency jurisdictions that are impacted by the project. This includes municipal, state, federal, railroad, water, and environmental agencies that have jurisdiction in the project area. Once this list has been established, the next step is to meet with each agency to obtain their specific requirements.

5.2.1 Fielding

Fielding involves detailed onsite data collection, material selection, structure placement, and cable routing. The fielding staff develop construction plans that ensure the network design parameters, pole owner, and jurisdictional agency requirements are being met. The following describe the primary fielding tasks in more detail. Many providers utilize outside engineering firm resources to perform the fielding. Examples of fielding design maps are included in Appendix B.

Aerial Fielding

Data collection of existing and proposed aerial facilities is required on all poles that the new infrastructure will be framed on. This includes mainline, drop, and guy poles. The fielding staff gather both telecommunications and power infrastructure information.



Regional, state, and national regulating bodies have established minimum clearance requirements that all aerial installations must uphold. These entities include the National Electric Safety Code (NESC) and the National Electric Code (NEC). The fielding staff review the existing aerial infrastructure to determine if new cables can be added to the poles while meeting clearance and loading requirements.

In many instances additional communications plant cannot be added to a pole without creating a clearance violation. This violation may be a ground clearance issue or an overcrowding of different attachments. To resolve these violations, engineers perform make-ready engineering. This involves determining the work that needs to be performed on the pole to allow for the new attachment while not creating any violations. This commonly involves relocating existing attachments to a different height to create additional room on the pole. If no existing cables can be moved to create room on a pole, while maintaining all code requirements, the engineer often proposes a pole changeout to a taller pole or proposes an alternate construction method, such as underground construction.

Using the data collected in the field for each pole, an engineer also performs pole loading analysis (PLA) to ensure that the pole will not be overloaded. PLA is performed to meet federal, state, local, and pole owner requirements. In some instances, pole owners have higher standards than national, state, or local codes. If a pole does not meet the loading requirements, the engineer develops alternative solutions. This may be in the form of a pole change out or an alternate construction method. A sample PLA report for a single pole is included in Appendix B.

Underground Fielding

For underground data collection, the fielding staff determine the optimal running line of the underground fiber cable. To do this, the fielding staff must first research the existing utilities and right-of-way information in the project area. This research process includes meeting with local officials and residents to obtain maps and preliminary information and can take weeks or months depending upon the size of the area being constructed.

In determining existing utilities locations, cable and utility locates are also conducted. Any entity who has infrastructure near the proposed facilities will mark the exact location of their utility. The fielding staff will note the existing utilities from a reference point, such as the centerline of the road, along with the proposed fiber. Additionally, the fielding staff meets with local officials and residents to discuss items such as storm sewer information, soil conditions, and areas that may contain high amount of rock in the soil.

Material Selection

As part of the engineering process, an approved material list is created. During the fielding, this material list is utilized to select the actual products to be utilized for each facility placement. In the selection of materials, the engineer must review local codes, environmental requirements, manufacturer requirements and unique requirements of each placement location. For example, a structure that is being placed in a high-traffic area will have different requirements than a structure placed in a low traffic area. The engineer must also evaluate the upfront costs and long-term maintenance expenses associated with various materials choices.

There are numerous choices within each of the material types that must be decided upon. Each of these choices have cost and maintenance trade-offs and sometimes reliability or regulatory tradeoffs. This includes materials such as:



- Field cabinets
- Optical splitters
- Aerial cable
- Underground cable
- Conduit
- Aerial strand and materials
- Splice closures
- Manholes, handholes and vaults
- Grounding

Structure Placement

Structure placement is determined to minimize construction and operations/maintenance costs while meeting the design, engineering and agency jurisdiction requirements. This includes structures such as cabinet, handholes, vaults, and manholes. Some areas considered in the structure placement include:

- Permitting requirements – The permitting agency may have specific requirements that detail the acceptable placement of the structures.
- Location access – The placement must be evaluated to ensure that it can be easily accessed in the future for maintenance. For example, typically areas that require significant traffic control to access the structure are avoided.
- Interference with sidewalks or driveways
- Americans with Disabilities Act (ADA) compliance work – Placing a structure within an ADA area may result in significant cost to restore the area to ADA compliance.
- Grade of the terrain – Areas of steep grade of terrain are typically avoided as significant effort may be required in order to meeting permit and manufacturer requirements for the installation of the structure.

Cable Routing

The fielding staff plan the cable routing for the network. The fielding staff design the most efficient routes while adhering to the design and engineering specifications. Some considerations during the routing include:

- Minimum separations with other utilities, as specified in NESC and local codes, must be maintained along the route
- Locating splices where they can be easily accessed
- Avoiding easements that may be time consuming or expensive to obtain
- Avoiding locations that may have extensive permit requirements



The cable routing selection is critical, since a significant amount of the network investment is the labor associated with the placement of this cable. If this cable must be relocated for some reason before the end of the cable's economic life, the feasibility of the business plan can change dramatically.

5.2.2 Permitting

The permitting process is usually conducted in parallel to the fielding process. For a typical rural project there are usually many more agencies that require permits than an urban deployment. An urban deployment may only require coordination with a single municipality, while a rural deployment may require coordination with federal, state, county, and tribal agencies. Rural deployments may also require substantial amounts of private right-of-way coordination in some states depending on the rural roadway right-of-way laws. The permitting process often takes at least 30-60 days and involves the following entities:

- **Department of Transportation (DOT)** - DOT agencies often have specific permit drawing requirements. These include showing existing utilities, detailing the placement of cable relative to center line or right-of-way line, and inclusion of stationing and mile post information for all equipment placed in the right-of-way. The agencies may also require traffic control plans and storm water prevention plans. Often, they also request drive throughs with the field personnel to review proposed cable placement.
- **State/School** - Some states own land for purposes of recreation or wildlife conservation. To cross state-owned lands, a survey completed by a licensed surveyor may be required. In environmental sensitive areas, additional surveys may be required to ensure endangered species will not be affected. Completing these types of surveys requires significant time of three to six months to complete the necessary paperwork.
- **County Roads** - Counties may have specific construction requirements that need to be determined in the permitting process. This may include items such as: all roads and approaches must be bored, boring extra depth under culverts, cables may need to be placed on the edge of the road or in the actual road bed.
- **Municipal Permits** – Municipal entities may require such items as showing existing utilities, meetings with the city council to review the project, traffic control plans, and storm water prevention plans. These all require significant time and resources to engineer, compile drawings, and meet with the local officials.
- **Railroad** - Railroads often require engineered drawings to be submitted with the permits. The fees for crossing railroads can often be high cost and may take as long as 6 months for permits to be approved by the railroad.

Relevant particularly to rural construction and operations, the Federal government owns 28% of the land in the United States. When constructing in rural areas, it is therefore not uncommon to have to cross Federal land. When constructing on Federal lands, there are a variety of agencies that also require permits, which can be a time-consuming and costly process. These agencies could include one or more of the following:

- Bureau of Reclamation
- Bureau of Land Management



- US Forest Service/Grasslands
- US Park Service
- US Fish & Wildlife Waterfowl Areas
- Army Corp of Engineers
- Department of Natural Resources

These Federal entities often require additional information before permits will be granted. They may require cultural resource surveys and/or biological surveys (botany, mammalian, reptilian, insect). They may also require that construction only occur during specific times of the year to reduce impact to specific plant or wildlife species. They may require cable placement at deeper than normal depths, especially crossing larger water bodies. These items add significant time to reach an approved permit. Most Federal lands require a minimum of 6 months and often longer to receive an approved permit.

In many areas of the country, the provider may be constructing on tribal areas which may include the following coordination:

- Obtaining a tribal business license
- Complying with a Tribal Employment Rights Ordinance (TERO)
- Performing cultural surveys (could be in addition to other environmental surveys)
- Bureau of Indian Affairs (BIA) road and land permit approvals
- Tribal council permit/easement approvals for construction on tribal-owned tracts
- Allotted land easements (may require surveys, payment and signatures of 50% of interest holders)

To complete all the necessary paperwork and signatures for easements may require 6 months. Completion of the permit packages is often prioritized based on the processing lead-times indicated by the permitting agencies. Each required permit package is assembled according to the specific permitting agency standards.

Once submitted, there is ongoing coordination that occurs with the permitting agency. This includes obtaining periodic updates from the permitting agency to verify that the permit is being processed and to answer questions.

5.2.3 Construction Plans

Once the design and engineering has been completed, the construction plans are developed. The construction plans include the proposed construction maps, guide drawings, and construction standards. The construction plans are typically combined with contract requirement documents and then utilized in a competitive bid process to select a construction contractor for the project.

The competitive bid process typically requires pre-bid meetings with the potential contractors to answer questions and ensure that the bidders have full understanding of the project. Once the bids are received, they are tabulated and reviewed to ensure the accuracy of the bids and to select the successful contractor.



6 Construction

6.1 Outside Plant

The construction of the outside plant network is very time-intensive and requires many resources. Again, rural networks are more expensive to construct on a per-subscriber basis than urban networks. Factors that make the costs more expensive include higher contractor deployment costs to these remote areas, long subscriber drops, and low density of subscribers in the service area. There is also typically a shorter construction season for rural networks since the buried construction techniques utilized in rural areas are impacted more by the freezing of the soil. Urban construction typically utilizes existing conduit and boring techniques that are not as impacted by freezing soil.

Outside plant construction requires large amounts of construction equipment, construction materials, contractor staff, and service provider representatives. Much effort is taken to ensure that the network is properly constructed. Improper construction can result in safety issues, expensive rework costs, and long-term maintenance issues.

6.1.1 Pre-Construction

Prior to actual construction, there are many logistical and communication items that need to be coordinated between the provider, the engineer, and the outside plant contractor.

Once awarded the contract, an initial step of the contractor is to place the order for the materials required by the construction plans. To receive, store, and distribute these materials, the contractor will need to procure a warehouse. Additionally, the contractor will need to obtain an equipment staging area for storing equipment when not in use and for performing equipment maintenance.

The contractor may also be required to conduct crew training prior to construction. This could include training certification by local government agencies for street cuts and restoration as well as safety training. It may also include training by specific material manufacturers regarding acceptable construction techniques.

The contractor and the provider also finalize the sequencing of the construction areas to be built. This may be prioritized by customer demand, status of construction permits, type of construction, or other factors. Based on the agreed upon sequencing, the contractor provides the provider a projection of the number of crews and construction schedule for each of the build areas.

Finally, prior to construction, the provider and contractor establish communication and escalation protocols. This typically includes contact lists and discussion regarding the types of issues that various staff should be notified of when they occur. These communication protocols may also include third-party provider representatives that will assist the provider through the construction process, such as quality control.

6.1.2 Construction

The contractor's construction is dictated by the construction and permit packages for the work. This includes ensuring that all material is installed per the provider's requirements, material manufacturer instructions, and local, state and national codes. The construction also includes performing more than just the placement of the fiber cable and materials, encompassing tasks such as tree trimming, aerial pole make-ready, locating of utilities, and restoration of the impacted



area after construction. Each of these items requires teams of workers to perform the necessary work.

Once construction has commenced, there is much ongoing coordination between the contractor and the provider's representatives. It is important for the provider to be aware of daily contractor crew locations and activities. This is necessary for notifying residents and business of upcoming construction in the area, performing quality control inspections and providing updates to local government officials. For aerial construction, is also necessary for keeping poles owners aware of make-ready and cable placement schedule and construction status.

During the construction, there are many safety processes that are implemented. Traffic control plans are implemented to provide for safe construction along roadways. Additionally, protocols are implemented that dictate zones around the construction where only specific personnel with the appropriate safety equipment can be located. Other safety procedures include digging holes to visually observe utilities that are being crossed by the new constructions.

Inspection of the contractor's work is performed by the provider's representatives throughout the construction process. This process is described in more detail in section 6.3. Additionally, the provider's representatives answer questions regarding construction plans, make decisions regarding field changes, and ensure that construction is being performed according to the plans and specifications.

Daily production is typically reported by the contractor and verified by the provider's representatives. The production information is utilized to assess construction status, such as whether construction timeline goals are being met and the accuracy of contractor payment requests. When goals are not being met, the production reports are useful in determining potential resolutions, such as additional crew personnel, additional crew training, or more efficient construction techniques.

The provider also keeps the permit agencies and pole owners informed of construction status to ensure timely inspection of the construction and to close-out permits and applications as soon as possible.

Once the construction in an area has been completed, the construction corridor must be restored to its previous condition. This includes removing any waste materials and filling and repairing holes in roads, sidewalks and driveways. It may also include restoring residents' lawns and seeding areas with grass.

After the fiber has been constructed, the fiber cables are spliced together to provide connectivity throughout the network. This requires careful planning to ensure that the fibers are spliced efficiently throughout the network and to maximize the use of the fiber. It also requires documentation and labeling to allow for future maintenance and troubleshooting of the network. After the fibers are spliced, they are tested to ensure that the fiber splices meet minimum requirements and to verify that the correct fibers have been spliced together. Example splice diagrams and test results are included in Appendix C.



6.2 Inside Plant

6.2.1 Electronics

Once the fiber network has been constructed, the operations and management of the system begins. At the aggregation sites, several electronics systems must be installed and provisioned. This includes the core data network, transport electronics, distribution electronics, voice service electronics, and potentially video electronics. The service provider typically conducts a competitive bid process for these systems and evaluates the proposals to determine which solutions best fit their network.

6.2.2 Provisioning

Once the electronics systems have been installed and tested, they must be configured to interoperate, and the appropriate circuits and services must be provisioned. As part of this installation process, the management systems for each of the electronics systems is installed. The service provider's technicians also undergo training in the operations and troubleshooting of each of the systems.

6.3 Quality Assurance / Quality Control

To speed time to market, save costs, and maximize construction quality many providers develop Quality Assurance (QA) and Quality Control (QC) procedures for the outside and inside plant construction. QA is the act of observing and providing feedback to correct potential issues during construction but prior to project final acceptance. The purpose of QA is to identify potential problems and allow them to be corrected early in the construction process. This may include issues such as:

- Training deficiencies
- Poor crew performance
- Incorrect understanding of requirements
- Inconsistency between subcontractors
- Use of outdated specifications
- Installation of incorrect material

QC is the final inspection of the construction product. An effective QA process should result in very few issues being identified during the QC inspections.

Both QA/QC are most often performed by strategically sampling the construction. Critical construction elements and items that are very difficult to correct are sampled at higher rates than less critical items. Additionally, the sampling is typically adjusted depending on the contractor crew performance.

Third-party firms are typically utilized by the provider to perform the QA/QC. The third-party firm tasks may include inspection of work to confirm conformance with the specifications, development of deficiency punch lists, analyzing trends, performing contractor training, and verifying correction of issues.



6.4 Turn-over Coordination

Once the construction has been completed, the contractor provides a turn-over package to the provider. This package typically includes fiber test results, tabulation of all constructed units, and contract close-out paperwork.

It is common for the provider to utilize the third-party QA/QC firm to review this information and to also perform the as-built redlines of the construction maps. This includes compiling a geo accurate inventory of the constructed system and building databases and maps of the information required to maintain and locate the facilities. This results in every fiber strand being accounted for and traceable in the network.

6.5 Customer Location Construction

Once the fiber routes have been constructed and the electronics systems have been installed and provisioned, the customer turn-up can begin. This involves constructing a drop to the customer, installing customer premises equipment, provisioning the customer's service, testing the service, and educating the customer.

The installation requires coordination and scheduling with the customers. Providers may have several staff that are dedicated to maintaining installation schedules and coordinating the installation crews.

During the installation, installation crews perform grounding/bonding work and must adhere to NEC and local safety standards and codes. The installation crew must also interface or perform rework of the customer's inside wiring.



7 Operations and Management

7.1 Operations

Once the network has been constructed, the job is hardly done; from one perspective, the job of delivering broadband is just starting as of that point. There are several items that need to be considered and completed to ensure a successful operation of the network. The operations and maintenance of a rural network is more expensive on a per-subscriber basis than an urban network. Low subscriber density results in maintenance staff having to cover large service territories. Additionally, rural networks are more susceptible to environmental factors such as floods, grass fires, and ice storms that may take down miles of pole lines.

7.1.1 Staffing

A significant part of the operations and management planning is ensuring adequate staffing is allocated. Staffing levels need to be established based on the size of the service market and services offered. Positions include technicians experienced in maintaining the outside plant facilities, the central office, distribution electronics, and data network elements.

Staff should be qualified with the experience in operating and maintaining the network. In addition to subscriber turn-ups, the service provider must troubleshoot network issues and perform network maintenance and repair.

In addition to operating the network, positions will be required in customer service as well as marketing and sales to sell the services and in accounting for billing and financial accountability.

7.1.2 Regulatory Considerations

State and federal regulatory requirements are another area that is often overlooked during the planning stages of building a broadband network. Deploying a network capable of delivering voice, broadband and even video services comes with a long list of regulatory considerations that could have a strain on the operations from labor demand to the financials. The level of complexity in regulatory components varies depending on the services that are offered.

A few of the regulatory considerations to be addressed may consist of the following:

- Obtaining Regulatory Authority and/or Eligible Telecommunications Carrier (ETC) status
- Interconnection Agreements
- Obtaining Numbering Resources and Local Number Portability
- E911 Plans
- Tariff Development and Filings – Both State and Interstate Tariffs
- Obtaining FCC Registration Number and Completing FCC Regulatory Filings (e.g., Forms 477, 499, and 502; any ETC reporting duties)
- CPNI Compliance
- Red Flag Compliance
- CALEA Compliance



- Video – Programming and Retransmission Negotiations

In addition to the upfront startup regulatory considerations, there are regular regulatory filings that are required. These filings vary in recurrence with some being quarterly, semi-annually and annually.

7.2 Support Systems

There are several support systems that a typical service provider deploys to aid in the operations and management of the network. Each of these systems adds costs and requires staff and training to utilize.

A mapping system is needed to maintain the maps of the placed facilities. These systems contain information such as cable route, cable size, fiber splicing information and structure placement types and locations. These mapping systems typically also incorporate GPS location information regarding the facilities.

System providers also deploy trouble ticket systems. These systems are utilized to log subscriber troubles, assign them to staff for troubleshooting, and for escalating the issues. Trouble ticket systems can also be utilized to categorize the types of issues that are occurring and aid in identifying issue trends.

Providers also utilize complex billing and provisioning systems. These systems track customer information, financial information, service information, and various report functions. These systems may also be tied to flow through provisioning capabilities that allow a provider's customer representative to enable subscriber services through the network.



Appendices



Appendix A – Business Plan Examples

ABC COMPANY - FTTP FEASIBILITY STUDY PROJECTED BALANCE SHEETS FOR YEARS 1 - 5

	Year 1	Year 2	Year 3	Year 4	Year 5
ASSETS					
CURRENT ASSETS					
CASH	\$ 23,233	\$ 69,016	\$ 218,670	\$ 398,844	\$ 765,244
DEFERRED TAX ASSET	50,655	121,572	152,147	134,662	61,511
TOTAL CURRENT ASSETS	\$ 73,888	\$ 190,588	\$ 370,817	\$ 533,506	\$ 826,755
PROPERTY, PLANT & EQUIPMENT					
PROPERTY, PLANT & EQUIPMENT	3,946,128	4,505,338	4,785,031	5,064,549	5,341,627
LESS: ACCUMULATED DEPRECIATION	47,218	251,580	491,161	754,218	1,040,565
NET PROPERTY, PLANT & EQUIP.	\$ 3,898,910	\$ 4,253,758	\$ 4,293,870	\$ 4,310,331	\$ 4,301,062
TOTAL ASSETS	\$ 3,972,798	\$ 4,444,346	\$ 4,664,687	\$ 4,843,837	\$ 5,127,817
LIABILITIES & EQUITY					
CURRENT LIABILITIES					
TOTAL CURRENT LIABILITIES	\$ -	\$ -	\$ -	\$ -	\$ -
EQUITY					
PAID IN CAPITAL	\$ 4,071,128	\$ 4,680,338	\$ 4,960,031	\$ 5,105,240	\$ 5,247,221
RETAINED EARNINGS	(98,330)	(235,992)	(295,344)	(261,403)	(119,404)
TOTAL EQUITY	\$ 3,972,798	\$ 4,444,346	\$ 4,664,687	\$ 4,843,837	\$ 5,127,817
TOTAL LIABILITIES AND EQUITY	\$ 3,972,798	\$ 4,444,346	\$ 4,664,687	\$ 4,843,837	\$ 5,127,817

ABC COMPANY - FTTP FEASIBILITY STUDY PROJECTED INCOME STATEMENT FOR YEARS 1 - 5

	Year 1	Year 2	Year 3	Year 4	Year 5
OPERATING REVENUE					
VoIP SERVICES REVENUE	\$ 45,000	\$ 135,000	\$ 202,500	\$ 247,500	\$ 292,500
VIDEO SERVICES REVENUE	90,804	354,889	419,297	512,511	621,995
BROADBAND DATA REVENUE	79,425	238,275	357,413	436,838	516,263
LESS: UNCOLLECTIBLE REVENUE (1%)	(2,152)	(7,282)	(9,792)	(11,968)	(14,308)
TOTAL OPERATING REVENUE	\$ 213,077	\$ 720,882	\$ 969,418	\$ 1,184,881	\$ 1,416,450
OPERATING EXPENSE					
PLANT SPECIFIC OPERATIONS EXPENSE	\$ 68,609	\$ 120,524	\$ 123,712	\$ 129,955	\$ 136,282
PLANT NON-SPECIFIC OPERATIONS EXPENSE	20,100	55,236	82,273	100,311	118,350
DEPRECIATION & AMORTIZATION EXPENSE	47,218	204,362	239,581	263,057	286,347
CUSTOMER OPERATIONS EXPENSE	107,044	215,673	217,708	165,844	96,003
CORPORATE OPERATIONS EXPENSE	50,950	50,074	52,455	54,278	56,135
VIDEO PROGRAMMING AND BROADBAND EXPENSE	65,478	274,581	331,498	405,199	490,477
GENERAL TAX ¹	2,663	9,011	12,118	14,811	17,706
TOTAL OPERATING EXPENSES	\$ 362,062	\$ 929,461	\$ 1,059,344	\$ 1,133,454	\$ 1,201,300
NET OPERATING INCOME (LOSS)	\$ (148,985)	\$ (208,579)	\$ (89,927)	\$ 51,426	\$ 215,150
PROVISION FOR INCOME TAXES ²	\$ (50,655)	\$ (70,917)	\$ (30,575)	\$ 17,485	\$ 73,151
NET INCOME (LOSS)	\$ (98,330)	\$ (137,662)	\$ (59,352)	\$ 33,941	\$ 141,999
EBIDTA	\$ (101,767)	\$ (4,217)	\$ 149,654	\$ 314,483	\$ 501,497

¹ The General Tax Expense has been calculated at 2.5% on half of the annual gross revenues.

² The Federal Income Tax Expense has been calculated at a rate of 34%. The tax benefit of tax losses in the initial years has been taken into consideration in subsequent years.



**ABC COMPANY - FTTIP FEASIBILITY STUDY
PROJECTED CASH FLOW STATEMENT FOR YEARS 1 - 5**

	Year 1	Year 2	Year 3	Year 4	Year 5
CASH FLOW FROM OPERATING ACTIVITIES:					
NET INCOME (LOSS)	(98,330)	(137,662)	(59,352)	33,941	141,999
DEPRECIATION & AMORTIZATION EXPENSE	47,218	204,362	239,581	263,057	286,347
(INCREASE) DECREASE IN DEFERRED TAX ASSET	(50,655)	(70,917)	(30,575)	17,485	73,151
NET CASH PROVIDED (USED) BY OPER. ACT.	(101,767)	(4,217)	149,654	314,483	501,497
CASH FLOW FROM INVESTMENT ACTIVITIES:					
PROPERTY, PLANT AND EQUIPMENT ADDITIONS	(3,946,128)	(559,210)	(279,693)	(279,518)	(277,078)
NET CASH USED BY INVESTING ACTIVITIES	(3,946,128)	(559,210)	(279,693)	(279,518)	(277,078)
CASH FLOW FROM FINANCING ACTIVITIES:					
EQUITY INVESTMENT	4,071,128	609,210	279,693	145,209	141,981
NET CASH PROVIDED (USED) BY FIN. ACT.	4,071,128	609,210	279,693	145,209	141,981
NET INCREASE (DECREASE) IN CASH	\$ 23,233	\$ 45,783	\$ 149,654	\$ 180,174	\$ 366,400
CASH, BEGINNING OF PERIOD	\$ 0	\$ 23,233	\$ 69,016	\$ 218,670	\$ 398,844
CASH, END OF PERIOD	\$ 23,233	\$ 69,016	\$ 218,670	\$ 398,844	\$ 765,244

**ABC COMPANY - FTTIP FEASIBILITY STUDY
PROJECTED PROPERTY, PLANT AND EQUIPMENT INVESTMENT**

	Year 1	Year 2	Year 3	Year 4	Year 5
Projected Subscribers					
VoIP	188	375	400	563	656
Broadband Data	250	500	625	750	875
Video	200	400	500	600	700
Projected Electronics & Switching Equipment Investment					
Standard STB Count	229	229	115	114	115
DVR STB Count	98	98	49	49	49
Fiber-to-the-Premises (FTTP)					
Electronics	287,515	287,515	143,758	143,758	143,758
VIDEO					
Customer Premise Equipment - STB Standard	37,785	37,785	18,975	18,810	18,500
Customer Premise Equipment - STB DVR	24,500	24,500	12,250	12,250	12,250
Middleware - Incremental Cost (Licenses)	12,000	12,000	6,000	6,000	6,000
Encryption - Incremental Cost	3,270	3,270	1,640	1,630	1,500
Total Projected Electronics and Video¹	\$ 365,070	\$ 365,070	\$ 182,623	\$ 182,448	\$ 180,008
Projected Outside Plant Investment					
Mainline					
Town Fiber	3,156,907				
Fiber Drop to Premise	\$194,140	\$194,140	\$97,070	\$97,070	\$97,070
Total Projected Outside Plant¹	\$ 3,351,047	\$ 194,140	\$ 97,070	\$ 97,070	\$ 97,070
Central Office Investment					
Hut	\$ 230,011	\$ -	\$ -	\$ -	\$ -
Total Central Office and Hut Investment¹	\$ 230,011	\$ -	\$ -	\$ -	\$ -
Total Projected Property, Plant & Equipment Investment	\$ 3,946,128	\$ 559,210	\$ 279,683	\$ 279,518	\$ 277,078
Cumulative Investment Totals	\$ 3,946,128	\$ 4,505,338	\$ 4,785,031	\$ 5,064,549	\$ 5,341,627
Total Projected Subscribers	250	500	625	750	875
Investment per Subscriber	\$ 15,785	\$ 9,011	\$ 7,656	\$ 6,763	\$ 6,106

¹ Overheads to cover engineering, taxes and delivery have been included. - Year 1 is the construction year for the outside plant fiber and electronics.



**ABC COMPANY - FTTP FEASIBILITY STUDY
PROJECTED PENETRATION RATES & REVENUES**

Exchange	Total		Line Growth %	Year 1	Year 2	Year 3	Year 4	Year 5
	Locations ¹							
Unserved USA	2,500		0.0%	2,500	2,500	2,500	2,500	2,500
Totals	2,500		0	2,500	2,500	2,500	2,500	2,500
Penetration Rate								
VoIP Access Lines				7.5%	15.0%	18.8%	22.5%	26.3%
Projected Subscribers								
VoIP Access Lines				188	375	469	563	656
Total VoIP Lines				188	375	469	563	656
VoIP Revenues								
				Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Local Rate - Includes LD				\$ 40.00	\$ 40.00	\$ 40.00	\$ 40.00	\$ 40.00
Local Service Revenue				45,000	135,000	202,500	247,500	292,500
Total VoIP Revenue²				\$ 45,000	\$ 135,000	\$ 202,500	\$ 247,500	\$ 292,500
Video Subscribers at Year End								
		Subscriber Growth %		Year 1	Year 2	Year 3	Year 4	Year 5
Total Potential Video Subscribers ^{1*}		0.0%		2,500	2,500	2,500	2,500	2,500
Penetration Rate				8.0%	16.0%	20.0%	24.0%	28.0%
Video Subscribers				200	400	500	600	700
Basic Package Percentage				18%	18%	18%	18%	18%
Basic Package Subscribers				36	73	91	109	127
Expanded Package Percentage				50%	50%	50%	50%	50%
Expanded Package Subscribers				100	199	249	299	348
Digital Package Percentage				32%	32%	32%	32%	32%
Digital Package Subscribers				64	128	160	192	224
Premium Channels Package Percentage				18%	18%	18%	18%	18%
Premium Channels Package Subscribers				36	72	90	107	125
Additional Set Top Box Percentage				64%	64%	64%	64%	64%
Additional Set Top Box Subscribers				127	254	318	381	445
DVR Percentage				49%	49%	49%	49%	49%
DVR Subscribers				98	196	245	294	343
Whole Home DVR Percentage				17%	17%	17%	17%	17%
Whole Home DVR Subscribers				34	68	85	102	119
Video Rates								
Growth in Rates					0%	3%	0%	3%
Basic Package				\$ 31.95	\$ 31.95	\$ 32.91	\$ 32.91	\$ 33.90
Expanded Package				\$ 68.95	\$ 68.95	\$ 71.02	\$ 71.02	\$ 73.15
Digital Package				\$ 82.95	\$ 82.95	\$ 85.44	\$ 85.44	\$ 88.00
Premium Channels				\$ 12.95	\$ 12.95	\$ 13.34	\$ 13.34	\$ 13.74
Projected Video Revenues								
Basic Package				6,901	27,988	32,383	39,492	48,002
Expanded Package				41,370	164,653	190,902	233,514	283,968
Digital Package				31,853	127,411	147,640	180,449	219,648
Premium Channels				2,797	11,189	12,886	15,688	19,126
Total Video Revenues²				\$ 82,921	\$ 331,241	\$ 383,811	\$ 469,143	\$ 570,744
CPE Lease Rates								
Additional Set Top Box				\$ 4.95	\$ 4.95	\$ 4.95	\$ 4.95	\$ 4.95
DVR				\$ 5.95	\$ 5.95	\$ 5.95	\$ 5.95	\$ 5.95
Whole Home DVR				\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00
Projected CPE Revenues								
Additional Set Top Box				3,772	11,316	16,968	20,760	24,532
DVR				3,499	10,496	15,744	19,242	22,741
Whole Home DVR				612	1,836	2,754	3,366	3,978
Total CPE Lease Revenues⁴				\$ 7,883	\$ 23,648	\$ 35,466	\$ 43,368	\$ 51,251

¹ Per information provided by VPS engineering Cap Ex estimates

^{1*} No marketing survey completed. Penetration estimate based on previous feasibilities in the area by VPS

² Annual Revenues are based on avg Projected Subscribers at the beginning and end of the year multiplied by Projected Rates



**ABC COMPANY - FTTP FEASIBILITY STUDY
PROJECTED PENETRATION RATES & REVENUES**

<u>Broadband Data Subscribers at Year End</u>	Year 1	Year 2	Year 3	Year 4	Year 5
Broadband penetration rate ¹	10.0%	20.0%	25.0%	30.0%	35.0%
Broadband Data Subscribers Total	250	500	625	750	875
Broadband Data Subscribers-4M / 1M - Penetration	45%	45%	45%	45%	45%
Broadband Data Subscribers-4M / 1M - Subscribers	113	225	281	338	394
Broadband Data Subscribers-10M / 2.5M - Penetration	23%	23%	23%	23%	23%
Broadband Data Subscribers-10M / 2.5M - Subscribers	56	113	141	169	197
Broadband Data Subscribers-25M / 6.25M - Penetration	23%	23%	23%	23%	23%
Broadband Data Subscribers-25M / 6.25M - Subscribers	56	113	141	169	197
Broadband Data Subscribers-50M / 12.5M - Penetration	5%	5%	5%	5%	5%
Broadband Data Subscribers-50M / 12.5M - Subscribers	13	25	31	38	44
Broadband Data Subscribers-100M / 25M - Penetration	5%	5%	5%	5%	5%
Broadband Data Subscribers-100M / 25M - Subscribers	13	25	31	38	44
<u>Broadband Data Rates</u>					
Broadband Data Subscribers-4M / 1M	\$ 39.95	\$ 39.95	\$ 39.95	\$ 39.95	\$ 39.95
Broadband Data Subscribers-10M / 2.5M	\$ 49.95	\$ 49.95	\$ 49.95	\$ 49.95	\$ 49.95
Broadband Data Subscribers-25M / 6.25M	\$ 59.95	\$ 59.95	\$ 59.95	\$ 59.95	\$ 59.95
Broadband Data Subscribers-50M / 12.5M	\$ 79.95	\$ 79.95	\$ 79.95	\$ 79.95	\$ 79.95
Broadband Data Subscribers-100M / 25M	\$ 124.95	\$ 124.95	\$ 124.95	\$ 124.95	\$ 124.95
<u>Projected Broadband Data Revenues</u>					
Broadband Data Subscribers-4M / 1M	26,966	80,899	121,348	148,314	175,281
Broadband Data Subscribers-10M / 2.5M	16,858	50,574	75,862	92,720	109,578
Broadband Data Subscribers-25M / 6.25M	20,233	60,699	91,049	111,282	131,515
Broadband Data Subscribers-50M / 12.5M	5,996	17,989	26,983	32,979	38,976
Broadband Data Subscribers-100M / 25M	9,371	28,114	42,171	51,542	60,913
Total Broadband Data Revenues²	\$ 79,425	\$ 238,275	\$ 357,413	\$ 436,838	\$ 516,263

¹ No marketing survey completed. Penetration estimate based on previous feasibilities in the area by VPS

² Annual Revenues are based on an average of Projected Subscribers at the beginning and end of the year multiplied by Projected Rates



**ABC COMPANY - FTTP FEASIBILITY STUDY
TOTAL PROJECTED OPERATING EXPENSES**

	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Expense Growth Factor	3%	3%	3%	3%	3%
Projected VoIP subscribers	188	375	469	563	656
Projected video subscribers	200	400	500	600	700
Projected data subscribers	250	500	625	750	875
Network Expenses					
Vehicle					
Number of Vehicles-Maintenance	1	1	1	1	1
Monthly Operating Cost (Service Vehicle)	\$ 600	\$ 618	\$ 637	\$ 656	\$ 676
Total Vehicle Expense	\$ 7,200	\$ 7,416	\$ 7,644	\$ 7,872	\$ 8,112
Contracted Services					
Contracted Inside Wiring (\$150 per installation) ¹	-	-	-	-	-
Digital Headend Encoding Cost (\$2.50 /Sub/Mo)	3,000	9,000	13,500	16,500	19,500
EPG Annual Fee (\$500 min plus \$0.50/sub)	550	650	725	775	825
Annual Support Fee - License (\$3.50/sub)	350	1,050	1,575	1,925	2,275
Annual Encryption Fee (\$1.50/STB)	285	1,140	1,425	1,710	1,995
Personnel Related Network Expenses	33,614	99,243	71,320	73,459	75,664
Electronics & Equip. Investment warranty & support	6,000	6,180	6,365	6,556	6,753
Miscellaneous Plant Materials & Supplies (\$50 per sub)	9,375	9,375	4,688	4,688	4,687
Total Contracted Services	\$ 53,174	\$ 98,638	\$ 99,598	\$ 105,613	\$ 111,700
VoIP Services					
VoIP Costs (\$16.00/Sub - includes LD costs)	19,500	54,000	81,000	99,000	117,000
Total VoIP Services	\$ 19,500	\$ 54,000	\$ 81,000	\$ 99,000	\$ 117,000
Facility Leases					
Pole Lease Rate-In town(per attachments per yr)	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
In town Attachments ²	1,647	1,647	1,647	1,647	1,647
Lease - Pole Attachment(In town) Expense	8,235	16,470	16,470	16,470	16,470
Total Facility Leases	\$ 8,235	\$ 16,470	\$ 16,470	\$ 16,470	\$ 16,470
Miscellaneous					
Electricity / Utilities	600	1,236	1,273	1,311	1,350
Total Network Expenses	\$ 88,709	\$ 175,760	\$ 205,985	\$ 230,266	\$ 254,632
Video Programming and Internet Expense					
Basic Expense %	57%	57%	57%	57%	57%
Expanded Package Expense %	70%	70%	70%	70%	70%
Digital Package Expense %	75%	75%	75%	75%	75%
Premium Expense %	78%	78%	78%	78%	78%
HD Expense %	78%	78%	78%	78%	78%
Incremental cost per Data Sub per Month - 4/1	\$ 4.53	\$ 4.53	\$ 4.53	\$ 4.53	\$ 4.53
Incremental cost per Data Sub per Month - 10/2.5	\$ 7.59	\$ 7.59	\$ 7.59	\$ 7.59	\$ 7.59
Incremental cost per Data Sub per Month - 25/8.25	\$ 10.65	\$ 10.65	\$ 10.65	\$ 10.65	\$ 10.65
Incremental cost per Data Sub per Month - 50/12.5	\$ 18.30	\$ 18.30	\$ 18.30	\$ 18.30	\$ 18.30
Incremental cost per Data Sub per Month - 100/25	\$ 32.56	\$ 32.56	\$ 32.56	\$ 32.56	\$ 32.56
Basic Package Programming Cost ³	3,934	15,953	18,458	22,510	27,361
Expanded Package Programming Cost ³	28,959	115,257	133,631	163,400	198,778
Digital Package Programming Cost ³	23,890	95,558	110,730	135,337	164,736
Premium Programming Cost ³	2,182	8,727	10,051	12,237	14,918
HD Programming Cost ³	-	-	-	-	-
Total Video Programming Expense	\$ 58,964	\$ 235,496	\$ 272,871	\$ 333,544	\$ 405,793
Projected Incremental High Speed Internet Expenses ⁴	6,514	39,085	58,627	71,655	84,684
Total Video Programming and Internet Expense	\$ 65,478	\$ 274,581	\$ 331,498	\$ 405,199	\$ 490,477
Customer Operations Expense					
Personnel Related Customer Operations Expenses	12,448	25,642	26,411	27,203	28,019
Marketing ⁵	93,750	187,500	187,500	125,000	62,500
Billing & Collection Costs ⁶	846	2,531	3,797	4,641	5,484
Total Customer Operations Expenses	\$ 107,044	\$ 215,673	\$ 217,708	\$ 165,844	\$ 96,003

¹ Inside Wiring installations assumes existing employees will complete and the labor costs are assumed to cover the cost.

² Assumes 30 attachments per fiber mile.

³ Assumes basic channel line ups and applied average programming costs for the packages based on a % of revenue for the expenses

⁴ Estimated cost per subscriber is based on the following costs: \$4.53 for the 5/1.5; \$10.65 for the 25/5; and \$18.30 for the 50/5 offering - includes costs for bandwidth, call center tech support and additional maintenance. Subscribers added during year are assumed added in middle of year.

⁵ Marketing costs are calculated at an annual rate of \$10 per year per potential location in Year 1. In the remaining years, marketing costs are calculated at an annual rate of \$5 per year per potential location.

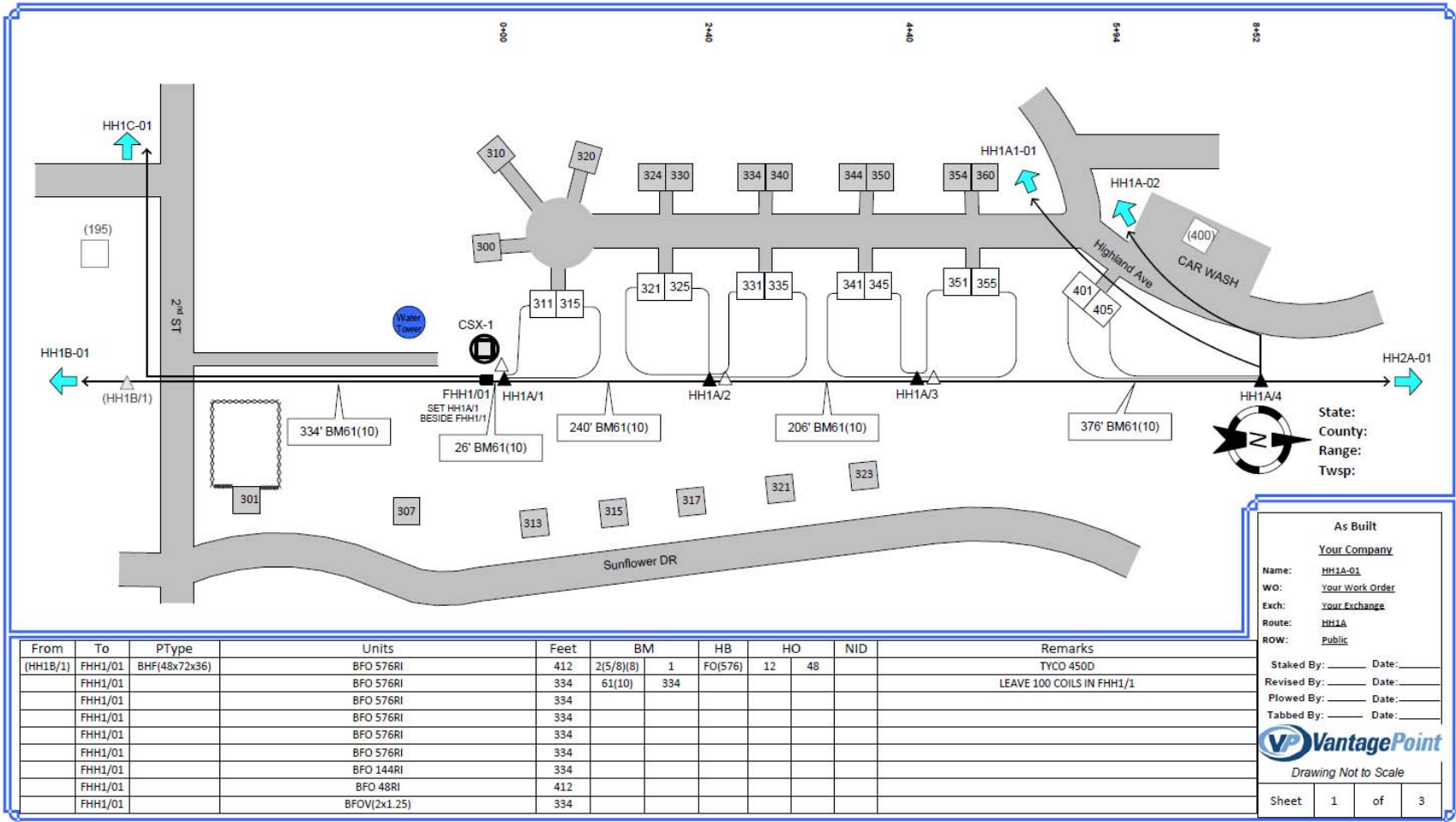
⁶ Billing & Collection costs are assumed to be \$0.75 per subscriber.



Appendix B – Design and Engineering Examples



Field Design Maps Examples



From	To	PType	Units	Feet	BM	HB	HO	NID	Remarks	
(HH1B/1)	FHH1/01	BHF(48x72x36)	BFO 576RI	412	2(5/8)(8)	1	FO(576)	12	48	TYCO 450D
	FHH1/01		BFO 576RI	334	61(10)	334				LEAVE 100 COILS IN FHH1/1
	FHH1/01		BFO 576RI	334						
	FHH1/01		BFO 576RI	334						
	FHH1/01		BFO 576RI	334						
	FHH1/01		BFO 576RI	334						
	FHH1/01		BFO 144RI	334						
	FHH1/01		BFO 48RI	412						
	FHH1/01		BFOV(2x1.25)	334						

As Built
Your Company

Name: HH1A-01
 WO: Your Work Order
 Exch: Your Exchange
 Route: HH1A
 ROW: Public

Staked By: _____ Date: _____
 Revised By: _____ Date: _____
 Plowed By: _____ Date: _____
 Tapped By: _____ Date: _____

VantagePoint
 Drawing Not to Scale

Sheet 1 of 3



Field Design Maps Examples - Continued

From	To	PType	Units	Feet	BM	HB	HO	NID	Remarks
FHH1/01			BFOV(9x2)	334					
	CSX-1	F(CSX-216)							
FHH1/01	HH1A/1	TV-106	BFO 576R	26	2(5/8)Ø	1	FO(48)	1 2	TYCD 450B
	HH1A/1		BFO 576R	26	61(10)	26			
	HH1A/1		BFO 576R	26					
	HH1A/1		BFO 576R	26					
	HH1A/1		BFO 576R	26					
	HH1A/1		BFO 144R	44					
	HH1A/1		BFO 96R	44					
	HH1A/1		BFO 48R	104					
	HH1A/1		BFO 48R	44					
	HH1A/1		BFOV(4x1.25)	26					
	HH1A/1		BFOV(8x2)	26					
HH1A/1	HH1A/1		BFOV(2x1.25)	8					
HH1A/1	311		SEBF 4	124	83	1	1 1 3		
HH1A/1	315		SEBF 4	236	83	1	1 1 3E		
HH1A/1	HH1A/2	TV-106	BFO 576R	240	2(5/8)Ø	1	FO(48)	1 4	TYCD 450B
	HH1A/2		BFO 576R	240	61(10)	240			LEAVE 36' CDL IN HH1B/2
	HH1A/2		BFO 576R	240					
	HH1A/2		BFO 576R	240					
	HH1A/2		BFO 576R	240					
	HH1A/2		BFO 144R	240					
	HH1A/2		BFO 96R	240					
	HH1A/2		BFO 48R	276					
	HH1A/2		BFO 48R	240					
	HH1A/2		BFOV(4x1.25)	240					
	HH1A/2		BFOV(8x2)	240					
HH1A/2	HH1A/2		BFOV(2x1.25)	8					
HH1A/2	321		SEBF 4	212	83	1	1 1 3		
HH1A/2	325		SEBF 4	108	83	1	1 1 3		
HH1A/2	331		SEBF 4	88	83	1	1 1 3		
HH1A/2	335		SEBF 4	168	83	1	1 1 3		
HH1A/2	HH1A/3	TV-106	BFO 576R	206	2(5/8)Ø	1	FO(48)	1 4	TYCD 450B
	HH1A/3		BFO 576R	206	61(10)	206			LEAVE 36' CDL IN HH1B/3
	HH1A/3		BFO 576R	206					
	HH1A/3		BFO 576R	206					
	HH1A/3		BFO 576R	206					
	HH1A/3		BFO 144R	206					
	HH1A/3		BFO 96R	206					
	HH1A/3		BFO 48R	242					
	HH1A/3		BFO 48R	206					
	HH1A/3		BFOV(4x1.25)	206					
	HH1A/3		BFOV(8x2)	206					
HH1A/3	HH1A/3		BFOV(2x1.25)	8					
HH1A/3	341		SEBF 4	180	83	1	1 1 3		

As Built

Your Company

Name: HH1A-01

WO: Your Work Order

Est: Your Exchange

Route: HH1A

ROW: Public

Staked By: _____ Date: _____

Revised By: _____ Date: _____

Plowed By: _____ Date: _____

Tabbed By: _____ Date: _____

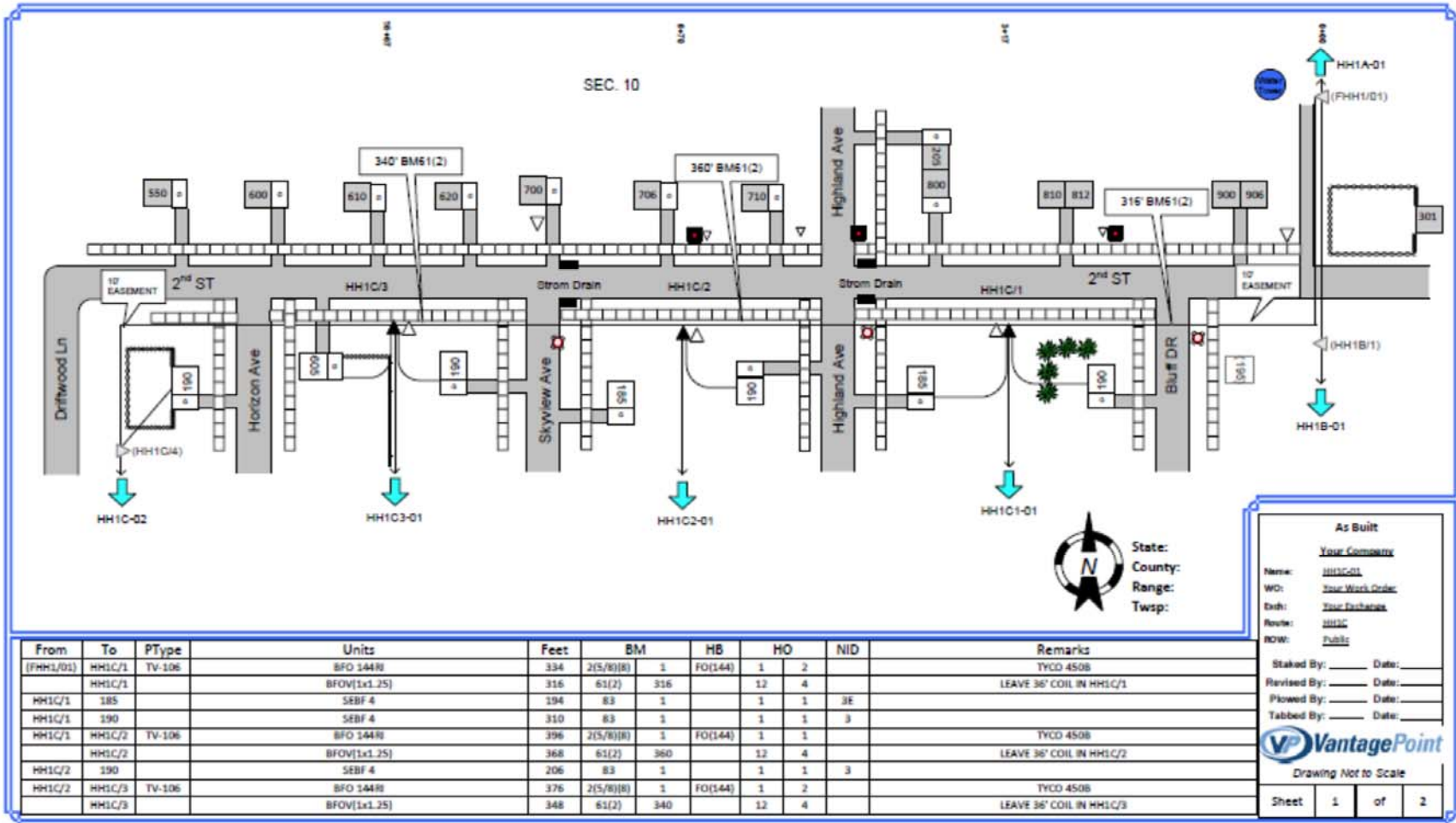
VantagePoint

Drawing Not to Scale

Sheet **1A** of **3**

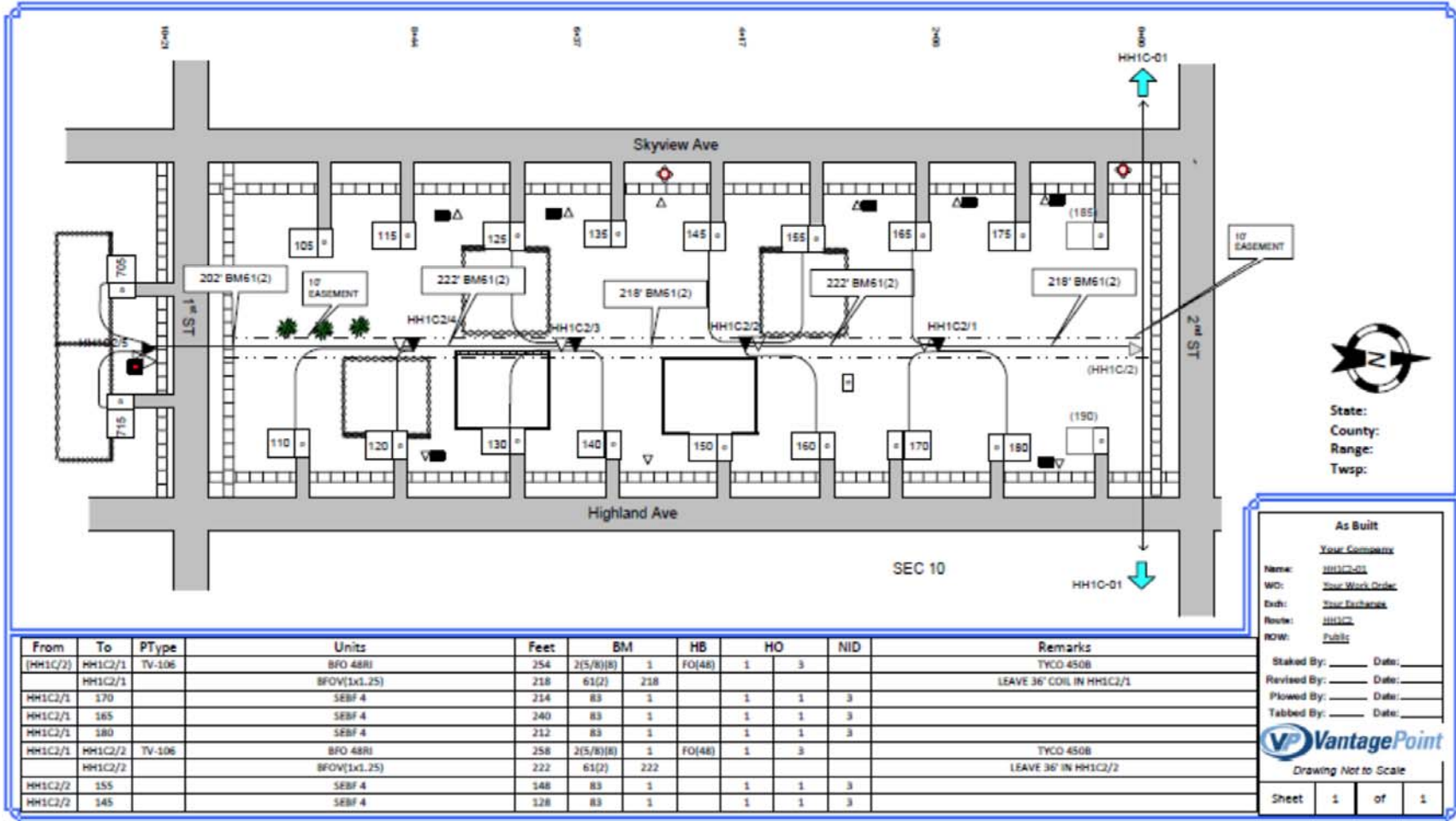


Field Design Maps Examples - Continued





Field Design Maps Examples - Continued





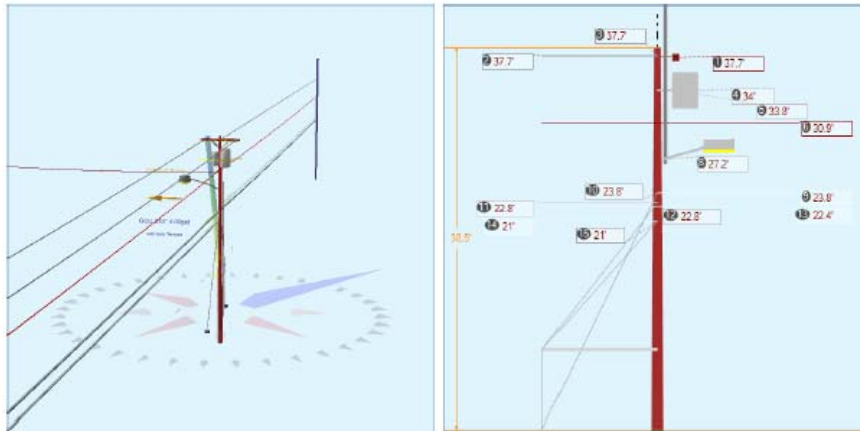
Pole Loading Analysis Example (for a single pole)

Pole ID:Pole_99_pplx.pplx

O-Calc® Pro Standard Report

Thursday, December 28, 2017 5:11 PM

Pole Num:	99	Pole Length / Class:	45 / 3	Code:	NESC	Structure Type:	Guyed Tangent
Map Number	B1101C	Species:	DOUGLAS FIR	NESC Rule:	Rule 250B	Status	Guy Wires Adequate
Aux Data 2	Unset	Setting Depth (ft):	6.50	Construction Grade:	B	Pole Strength Factor:	0.65
Aux Data 3	Unset	G/L Circumference (in):	37.31	Loading District:	Medium	Transverse Wind LF:	2.50
Aux Data 4	Unset	G/L Fiber Stress (psi):	8,000	Ice Thickness (in):	0.25	Wire Tension LF:	1.65
Aux Data 5	Unset	Allowable Stress (psi):	5,200	Wind Speed (mph):	39.53	Vertical LF:	1.50
Aux Data 6	Unset	Fiber Stress Ht. Reduc:	No	Wind Pressure (psf):	4.00		
Latitude:	0.000000 Deg	Longitude:	0.000000 Deg	Elevation:	0 Feet		



Pole Capacity Utilization (%)	Height (ft)	Wind Angle (deg)
Maximum	86.6	0.0
Groundline	86.6	0.0
Vertical	7.0	24.1

Pole Moments (ft-lb)	Load Angle (deg)	Wind Angle (deg)
Max Cap Util	60,228	211.9
Groundline	60,228	211.9
GL Allowable	71,284	



Pole Loading Analysis Example (for a single pole) - Continued

Pole ID:Pole_99_pplx.pplx

O-Calc® Pro Standard Report

Thursday, December 28, 2017 5:11 PM

Guy System Component Summary				Load From Worst Wind Angle on Pole	
Description	Lead Length (ft)	Lead Angle (deg)	Height (ft)	Nominal Capacity (%)	Wind Angle (deg)
Single - 10" - Soil Class 4 10M (Sidewalk)	6.0	326.0	21.0	24.2	233.4
Sidewalk Strut	6.0	326.0	8.0	34.0	233.4
EHS 1/4 (Sidewalk)			22.8	77.9	233.4
Single - 10" - Soil Class 4 10M (Down)	14.0	146.0	23.8	29.6	233.4
Single - 10" - Soil Class 4 HS 7/16 (Span/Head)	188.0	326.0	37.7	0.0	233.4
System Capacity Summary:				Adequate	

Groundline Load Summary - Reporting Angle Mode: Load - Reporting Angle: 211.9°										
	Shear Load* (lbs)	Applied Load (%)	Bending Moment (ft-lb)	Applied Moment (%)	Pole Capacity (%)	Bending Stress (+/- psi)	Vertical Load (lbs)	Vertical Stress (psi)	Total Stress (psi)	Pole Capacity (%)
Powers	1,816	48.5	59,794	99.3	83.9	4,808	230	2	4,810	92.5
Comms	2,227	59.5	41,494	68.9	58.2	3,337	897	8	3,345	64.3
GuyBraces	-804	-21.5	-51,859	-86.1	-72.8	-4,170	6,734	61	-4,109	-79.0
PowerEquipments	114	3.0	2,978	4.9	4.2	239	1,928	17	257	4.9
Pole	287	7.7	5,028	8.4	7.1	404	1,774	16	420	8.1
Crossarms	5	0.1	171	0.3	0.2	14	159	1	15	0.3
Streetlights	44	1.2	1,561	2.6	2.2	126	114	1	127	2.4
Risers	47	1.3	805	1.3	1.1	65	43	0	65	1.3
Insulators	7	0.2	256	0.4	0.4	21	44	0	21	0.4
Pole Load	3,742	100.0	60,228	100.0	84.5	4,843	11,923	108	4,950	95.2
Pole Reserve Capacity			11,056		15.5	357			250	4.8

Detailed Load Components:

Power	Height (ft)	Horiz. Offset (in)	Cable Diameter (in)	Sag at Max Temp (ft)	Cable Weight (lbs/ft)	Lead/Span Length (ft)	Span Angle (deg)	Wire Length (ft)	Tension (lbs)	Tension Moment* (ft-lb)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)	
Secondary	TRIPLEX 2 AWG	30.92	7.11	0.8060	2.04	0.248	188.0	326.0	188.0	1,710	-35,686	44	2,883	-32,760
Secondary	TRIPLEX 2 AWG	30.92	7.11	0.8060	0.45	0.248	50.0	236.0	50.0	143	6,656	12	16	6,684



Pole Loading Analysis Example (for a single pole) - Continued

Pole ID:Pole_99_pplx.pplx

O-Calc® Pro Standard Report

Thursday, December 28, 2017 5:11 PM

Secondary	TRIPLEX 2 AWG	30.92	7.11	0.8060	1.54	0.248	149.0	146.0	149.0	1,710	35,686	35	2,285	38,006
Neutral	#4 COPPER 7 STRAND	37.67	43.95	0.2316	0.54	0.129	149.0	146.0	149.0	1,000	25,428	-6	1,560	26,981
Neutral	#4 COPPER 7 STRAND	37.67	43.95	0.2316	0.54	0.129	149.0	146.0	149.0	1,000	25,428	10	1,560	26,997
Totals:											57,512	94	8,303	65,909

Comm		Height (ft)	Horiz. Offset (in)	Cable Diameter (in)	Sag at Max Temp (ft)	Cable Weight (lbs/ft)	Lead/Span Length (ft)	Span Angle (deg)	Wire Length (ft)	Tension (lbs)	Tension Moment* (ft-lb)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)
Overlashed Bundle	1/4" EHS	22.42	7.11	0.2500	1.24	0.121	149.0	146.0	149.0	1,142	17,282	48	3,244	20,574
CATV	CATV .75	22.13	7.11	1.0700	1.66		149.0	146.0	149.0			95	2,576	2,671
Overlashed Bundle	1/4" EHS	22.42	7.11	0.2500	1.95	0.121	188.0	326.0	188.0	1,351	-20,442	61	4,093	-16,288
CATV	CATV .75	22.13	7.11	1.0700	2.27		188.0	326.0	188.0			120	3,250	3,371
Overlashed Bundle	10M	21.00	4.70	0.3060	0.72	0.165	149.0	146.0	149.0	3,030	42,946	15	3,035	45,996
Telco	TELE 1.0	20.71	4.70	1.0000	0.52		149.0	146.0	149.0			19	2,407	2,426
Fiber	ADSS Fiber	22.83	4.59	0.4640	0.93	0.071	149.0	146.0	149.0	544	8,385	5	1,246	9,635
Overlashed Bundle	10M	23.83	4.53	0.3060	0.16	0.165	188.0	326.0	188.0	1,496	-24,075	-8	1,435	-22,648
Totals:											24,096	357	21,284	45,738

PowerEquipment		Height (ft)	Horiz. Offset (in)	Offset Angle (deg)	Rotate Angle (deg)	Unit Weight (lbs)	Unit Height (in)	Unit Depth (in)	Unit Diameter (in)	Unit Length (in)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)
Transformer	75KVA	34.03	22.93	100.0	100.0	1015.00	44.00	52.00	--	26.00	--	2,515	1,433
Transformer	15KVA	33.85	18.94	175.0	175.0	270.00	34.00	52.00	--	18.00	--	1,338	1,850
Totals:											-571	3,854	3,282

Crossarm		Height (ft)	Horiz. Offset (in)	Offset Angle (deg)	Rotate Angle (deg)	Unit Weight (lbs)	Unit Height (in)	Unit Depth (in)	Unit Diameter (in)	Unit Length (in)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)
Normal	CROSSARM 3-1/2 X 4-1/2 X 8	37.67	5.46	146.0	146.0	53.00	4.50	3.50		96.00	0	188	188
Totals:											0	188	188

Streetlight		Height (ft)	Horiz. Offset (in)	Offset Angle (deg)	Rotate Angle (deg)	Unit Weight (lbs)	Unit Height (in)	Unit Depth (in)	Unit Diameter (in)	Unit Length (in)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)
General	Street Light	27.25	4.33	236.0	236.0	76.00	24.00	31.81	3.00	72.00	533	1,187	1,720
Totals:											533	1,187	1,720

Riser		Height (ft)	Horiz. Offset (in)	Offset Angle (deg)	Rotate Angle (deg)	Unit Weight (lbs)	Unit Height (in)	Unit Depth (in)	Unit Diameter (in)	Unit Length (in)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)
Riser 90.0°	Riser	28.92	6.09	90.0	90.0	28.92	347.00	3.50	3.50	347.00	-15	903	888
Totals:											-15	903	888



Pole Loading Analysis Example (for a single pole) - Continued

Pole ID:Pole_99_pplx.pplx

O-Calc® Pro Standard Report

Thursday, December 28, 2017 5:11 PM

Insulator		Height (ft)	Horiz. Offset (in)	Offset Angle (deg)	Rotate Angle (deg)	Unit Weight (lbs)	Unit Diameter (in)	Unit Length (in)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)
Bolt	Three Bolt CATV	22.42	0.00	236.0	146.0	5.00	3.00	0.00	4	0	4
Deadend	Three Bolt Telco	21.00	0.00	146.0	146.0	5.00	3.00	0.00	1	0	1
Deadend	F/O	22.83	0.00	146.0	146.0	5.00	3.00	0.00	1	0	1
Deadend	Three Bolt MCI	23.83	0.00	326.0	326.0	5.00	3.00	0.00	-1	0	-1
Spool	Spool 4"	30.92	0.00	236.0	146.0	3.00	4.00	4.12	2	33	35
Deadend	Deadend 12.75"	37.67	-40.00	63.8	0.0	3.00	3.80	12.75	-11	118	107
Deadend	Deadend 12.75"	37.67	40.00	228.2	0.0	3.00	3.80	12.75	16	118	134
Totals:									13	269	282

Guy Wire and Brace		Attach Height (ft)	End Height (ft)	Lead/Span Length (ft)	Wire Diameter (in)	Percent Solid (%)	Lead Angle (deg)	Incline Angle (deg)	Wire Weight (lbs/ft)	Rest Length (ft)	Stretch Length (in)
10M	Sidewalk	21.00	0.00	6.00	0.306	75.00	326.0	64.9	0.165	22.16	0.62
EHS 1/4	Sidewalk	22.83	0.00	6.00	0.25	75.00	326.0	67.6	0.121	23.86	0.58
10M	Down	23.83	0.00	14.00	0.306	75.00	146.0	59.4	0.165	27.45	0.00
HS 7/16	Span/Head	37.67	37.67	188.00	0.438	75.00	326.0	0.0	0.399	187.69	3.02

Guy Wire and Brace (Loads and Reactions)		Elastic Modulus (psi)	Rated Tensile Strength (lbs)	Guy Strength Factor	Allowable Tension (lbs)	Initial Tension (lbs)	Loaded Tension ^{1,2} (lbs)	Maximum Tension ² (lbs)	Applied Tension ³ (lbs)	Vertical Load (lbs)	Shear Load In Guy Dir (lbs)	Shear Load At Report Angle (lbs)	Moment at GL* (ft-lb)
10M	Sidewalk	2.30e+7	10,000	0.90	9,000	700	5,600	3,394	3,062	2,772	1,302	-532	-3,924
EHS 1/4	Sidewalk	2.30e+7	6,650	0.90	5,985	700	3,263	1,978	1,771	1,638	675	-276	-2,435
10M	Down	2.30e+7	10,000	0.90	9,000	700	0	0	0	0	0	0	216
HS 7/16	Span/Head	2.30e+7	14,500	0.90	13,050	700	6,178	3,745	3,472	0	3,472	-1,421	-51,020
Totals:									4,410	5,449	-2,229	-57,162	

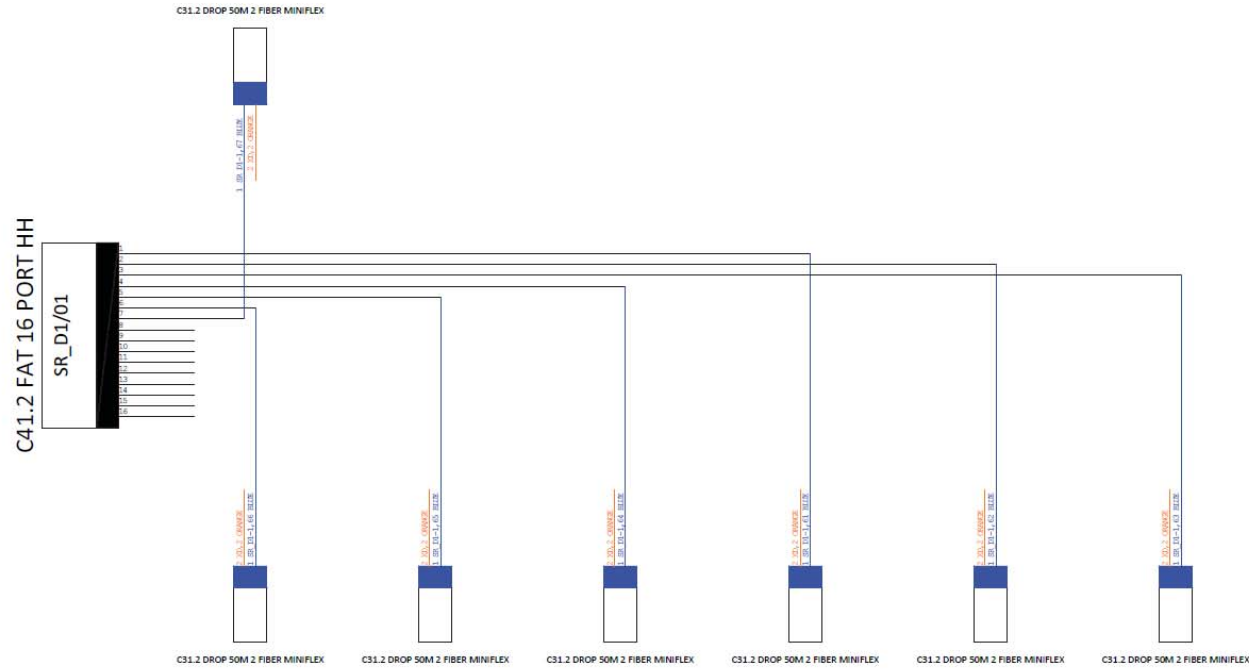
Anchor/Rod Load Summary		Rod Length AGL (in)	Lead Length (ft)	Lead Angle (deg)	Strength of Assembly (lbs)	Anchor/Rod Strength Factor	Allowable Load (lbs)	Max Load ² (lbs)	Load at Pole MCU ³ (lbs)	Max Required Capacity ² (%)
Single - 10" - Soil Class 4		0.00	6.00	326.0	20,000	1.00	20,000	5,370	4,832	26.8
Single - 10" - Soil Class 4		0.00	14.00	146.0	20,000	1.00	20,000	0	0	0.0
Single - 10" - Soil Class 4		0.00	188.00	326.0	20,000	1.00	20,000	3,745	3,472	18.7

Pole Buckling													
Buckling Constant	Buckling Column Height* (ft)	Buckling Section Height (% Buckling Col. Hgt.)	Buckling Section Diameter (in)	Minimum Buckling Diameter at GL (in)	Diameter at Tip (in)	Diameter at GL (in)	Modulus of Elasticity (psi)	Pole Density (pcf)	Ice Density (pcf)	Pole Tip Height (ft)	Buckling Load Capacity at Height (lbs)	Buckling Load Applied at Height (lbs)	Buckling Load Factor of Safety
0.71	24.15	33.61	10.92	17.12	7.32	11.88	1.60e+6	60.00	57.00	38.50	170,437	1703.22	14.29

Appendix C - Construction Examples



Fiber Splicing Plans



C41.2 FAT 16 PORT HH - SR_D1/01										
FROM	CONNECTS TO	PART	COUNT	LEAD/POLE	CUSTOMER	NAME	OWNER	SERVICE CATEGORY	USE	WEIGHT
1	Fiber 1	C31.2 DROP 50M 2 FIBER MINIFLEX	SR_D1-1.01						SR_D1/01 Part: C41.2 FAT 16 PORT HH	
2	Fiber 1	C31.2 DROP 50M 2 FIBER MINIFLEX	SR_D1-1.02						SR_D1/01 Part: C41.2 FAT 16 PORT HH	
3	Fiber 1	C31.2 DROP 50M 2 FIBER MINIFLEX	SR_D1-1.03						SR_D1/01 Part: C41.2 FAT 16 PORT HH	
4	Fiber 1	C31.2 DROP 50M 2 FIBER MINIFLEX	SR_D1-1.04						SR_D1/01 Part: C41.2 FAT 16 PORT HH	
5	Fiber 1	C31.2 DROP 50M 2 FIBER MINIFLEX	SR_D1-1.05						SR_D1/01 Part: C41.2 FAT 16 PORT HH	
6	Fiber 1	C31.2 DROP 50M 2 FIBER MINIFLEX	SR_D1-1.06						SR_D1/01 Part: C41.2 FAT 16 PORT HH	
7	Fiber 1	C31.2 DROP 50M 2 FIBER MINIFLEX	SR_D1-1.07						SR_D1/01 Part: C41.2 FAT 16 PORT HH	
8			XD.8							
9			XD.9							
10			XD.10							
11			XD.11							
12			XD.12							
13			XD.13							
14			XD.14							
15			XD.15							
16			XD.16							



Fiber Testing Results Example

FTTP Acceptance Test Results Form (To Be Completed By OSP Contractor)												
Serving Area _____		Client _____		Date _____								
Fiber #	OTDR Distance in feet	Number of splices	Number of connectors	1310 nm			1550 nm			End Point	Subscriber Address	Notes
				Maximum Allowable loss	Power Meter Actual Loss	DR Estima Span Loss	Maximum Allowable loss	Power Meter Actual Loss	OTDR Estimated Span Loss			
1	11601	4	1	2.71		1.123	2.36		0.649			
2	11601	4	1	2.71		1.123	2.36		0.649			
3	11601	4	1	2.71		1.123	2.36		0.649			
4	11601	4	1	2.71		1.123	2.36		0.649			
5	11878	6	2	3.65	2.84	1.218	3.29	1.93	0.802	A3/8	12987 CEDAR HILLS DR	
6	11325	6	2	3.58		1.486	3.24		0.963			
7	11601	4	1	2.71		1.315	2.36		0.793			
8	11604	4	1	2.71		1.488	2.36		1.06			
9	11601	4	1	2.71		1.356	2.36		0.834			
10	11438	6	2	3.59	2.77	1.286	3.25	2.1	0.758	A3/7	13063 CEDAR HILLS DR	
11	11530	6	2	3.61	2.01	1.038	3.25	1.47	0.577	A3/7	13032 CEDAR HILLS DR	
12	11624	6	2	3.62	1.86	1.198	3.26	1.46	0.752	A3/7	13064 CEDAR HILLS DR	
13	11329	4	1	2.68		1.292	2.34		0.914			
14	11609	4	1	2.72		1.299	2.36		0.841			
15	11606	4	1	2.71		1.304	2.36		0.875			
16	11367	6	2	3.59	2.11	1.037	3.24	1.71	0.767	A3/6	13136 CEDAR HILLS DR	
17	11482	6	2	3.60	2.46	1.154	3.25	2	0.792	A3/6	13121 CEDAR HILLS DR	
18	11172	6	2	3.56	1.79	1.506	3.22	1.39	0.973	A3/6	13128 CEDAR HILLS DR	
19	11193	4	1	2.66		1.352	2.32		0.977			
20	11420	6	2	3.59	2.97	2.312	3.24	2.45	2.061	A3B/2	13087 CEDAR HILLS DR	
21	11193	4	1	2.66		1.287	2.32		0.98			
22	11193	4	1	2.66		1.245	2.32		0.924			
23	11155	6	2	3.56	2.45	1.033	3.22	1.98	0.751	A3B/1	1311 CEDAR HILLS DR	
24	11132	6	2	3.56	3.32	1.645	3.22	2.94	1.437	A3B/1	13159 CEDAR HILLS DR	
25	11082	4	1	2.65		1.261	2.31		0.827			
26	11082	4	1	2.65		1.261	2.31		0.827			
27	11082	4	1	2.65		1.261	2.31		0.827			
28	11082	4	1	2.65		1.261	2.31		0.827			
29	11082	4	1	2.65		1.261	2.31		0.827			
30	11082	4	1	2.65		1.261	2.31		0.827			
31	11082	4	1	2.65		1.261	2.31		0.827			
32	11082	4	1	2.65		1.261	2.31		0.827			
33	11082	4	1	2.65		1.261	2.31		0.827			
34	11082	4	1	2.65		1.261	2.31		0.827			
35	11082	4	1	2.65		1.261	2.31		0.827			
36	11082	4	1	2.65		1.261	2.31		0.827			
37	11082	4	1	2.65		1.261	2.31		0.827			
38	11082	4	1	2.65		1.261	2.31		0.827			
39	11082	4	1	2.65		1.261	2.31		0.827			
40	11082	4	1	2.65		1.261	2.31		0.827			
41	11377	6	2	3.59	1.8	1.265	3.24	1.74	1.027	A3/5-1	11707 CEDAR HILLS DR	
42	11082	4	1	2.65		1.346	2.31		0.869			
43	11082	4	1	2.65		1.338	2.31		0.865			



Fiber Testing Results Example - Continued

FTTP Acceptance Test Results Form (To Be Completed By OSP Contractor)												
Serving Area		Client		Date			1310 nm			1550 nm		
Fiber #	OTDR Distance in feet	Number of splices	Number of connectors	Maximum Allowable Loss	Power Meter Actual Loss	DR Estimated Span Loss	Maximum Allowable loss	Power Meter Actual Loss	OTDR Estimated Span Loss	End Point	Subscriber Address	Notes
44	11084	4	1	2.65		1.316	2.31		0.867			
45	11082	4	1	2.65		1.296	2.31		0.834			
46	11109	6	2	3.55	2.23	1.446	3.22	1.84	0.979	A3/5-2	11762 32ND RD	
47	10982	6	2	3.54	2.36	1.087	3.20	1.9	0.729	A3/5-2	13142 CEDAR HILLS DR	
48	11023	6	2	3.54	2.58	1.066	3.21	2.17	0.882	A3/5-2	13186 CEDAR HILLS DR	
49	11606	4	1	2.71		1.329	2.36		0.83			
50	11606	4	1	2.71		1.315	2.36		0.914			
51	11606	4	1	2.71		1.329	2.36		0.918			
52	10521	6	2	3.48	2	0.948	3.16	1.63	0.461	A3/5	11768 32ND RD	
53	9591	4	1	2.47		1.276	2.18		0.69			
54	9593	4	1	2.47		1.127	2.18		0.624			
55	9807	6	2	3.40	2.12	1.04	3.10	1.63	0.531	A3/4-1	11961 32ND RD	
56	9761	6	2	3.39	2.82	0.928	3.09	2.28	0.473	A3/4-1	11963 32ND RD	
57	11606	4	1	2.71		1.308	2.36		0.662			
58	11606	4	1	2.71		1.283	2.36		0.758			
59	9964	6	2	3.41	2.71	1.141	3.11	2.24	0.615	A3/4	11794 32ND RD	
60	9668	6	2	3.38	2.27	0.97	3.08	1.85	0.635	A3/4	11952 32ND RD	
61	11604	4	1	2.71		1.215	2.36		0.827			
62	9051	6	2	3.30	2.02	1.17	3.03	1.65	0.745	A3/3	12042 32ND RD	
63	11604	4	1	2.71		1.426	2.36		1.162			
64	9042	6	2	3.30	2.06	0.789	3.03	1.66	0.495	A3/2	13140 IRISH RIDGE RD	
65	8538	6	2	3.24		0.954	2.98		0.621			
66	8540	5	1	2.54		0.899	2.28		0.52			
67	8540	7	2	3.44	2.16	0.833	3.18	1.69	0.41	A3A/1	12043 32ND RD	
68	8538	7	2	3.44	2.72	0.819	3.18	2.35	0.449	A3A/1	12039 32ND RD	
69	11604	4	1	2.71		1.367	2.36		1.102			
70	11601	4	1	2.71		1.377	2.36		1.233			
71	11604	4	1	2.71		1.381	2.36		1.177			
72	8532	5	2	3.04	2.38	0.895	2.78	1.85	0.511	A3/1	12123 32ND RD	
73	8684	5	1	2.56		1.038	2.29		0.626			
74	8684	5	1	2.56		0.937	2.29		0.595			
75	8684	5	1	2.56		1.091	2.29		0.594			
76	8684	5	1	2.56		0.807	2.29		0.399			
77	8684	5	1	2.56		0.99	2.29		0.65			
78	8684	5	1	2.56		0.961	2.29		0.474			
79	9130	7	2	3.51	2.25	0.896	3.23	1.78	0.44	A/12	13151 IRISH RIDGE RD	
80	8831	7	2	3.48	2.26	0.751	3.21	1.83	0.373	A/12	13179 IRISH RIDGE RD	
81	8684	4	1	2.36		1.09	2.09		0.654			
82	8682	4	1	2.36		0.947	2.09		0.598			
83	8682	4	1	2.36		0.982	2.09		0.651			
84	8912	6	2	3.29	1.71	0.801	3.01	1.36	0.392	A/11	13158 IRISH RIDGE RD	
85	8381	4	1	2.32		1.031	2.07		0.601			
86	8381	4	1	2.32		0.994	2.07		0.619			

About the Authors



Larry Thompson is a licensed Professional Engineer and CEO of Vantage Point Solutions. Larry has a Physics degree from William Jewell College and Bachelor and Master degrees in Electrical Engineering from the University of Kansas. Larry has helped hundreds of telecommunication companies be successful in this rapidly changing technical and regulatory environment. He has designed many wireless and wireline networks as he has assisted his clients in their transition from legacy TDM networks to broadband IP networks.

Brian Enga is a licensed Professional Engineer and part of the Senior Engineering team at Vantage Point Solutions. Brian has Bachelor of Science degrees in Electrical Engineering and Engineering Physics from South Dakota State University. He has been working in the telecommunications industry for nearly 20 years. Brian has engineered a variety of broadband networks and has been a pioneer in deploying IP video networks.



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