**Exhibit No. \_\_\_ HCT (JL-1HCT)**

**Docket UT-090842**

**Witness: Jing Liu**

**REDACTED VERSION**

**BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

|  |  |
| --- | --- |
| **In the Matter of the Joint Application of****FRONTIER COMMUNICATION CORPORATION AND VERIZON COMMUNICATIONS, INC.****for Approval of Indirect Transfer of Control of Verizon Northwest, Inc.** | **DOCKET UT-090842** |

**TESTIMONY**

**OF**

**JING LIU**

**STAFF OF**

**WASHINGTON UTILITIES AND**

**TRANSPORTATION COMMISSION**

**November 3, 2009**

**REDACTED VERSION**

**TABLE OF CONTENTS**

1. INTRODUCTION 1
2. state-wide BROADBAND DEPLOYMENT COMMITMENT 4
3. Broadband deployment in high-cost areas 13
4. Reporting requirements 17
5. Stand alone dsl offering and prices 18

**EXHIBIT LIST**

Exhibit No. \_\_\_ HC (JL-2HC)

1. **INTRODUCTION**

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

A. My name is Jing Liu. My business address is 1300 South Evergreen Park Drive Southwest, P. O. Box 47250, Olympia, Washington, 98504. My business email address is jliu@utc.wa.gov.

**Q. By whom are you employed and in what capacity?**

A. I am employed by the Washington Utilities and Transportation Commission (Commission) as a regulatory analyst in the telecommunications section.

**Q. What are your education and experience qualifications?**

A. I hold a Master of Arts degree in organizational communication and a Master of Science degree in communication technology and policy from Ohio University. I also completed four years of doctoral study in public policy from Ohio State University. I worked as a graduate research associate at the National Regulatory Research Institute (NRRI) from 2005 to 2007. During that period, I authored and coauthored five papers published by the NRRI, primarily on universal service and inter-carrier compensation issues. In 2009, I provided testimony in the proceeding on United Telephone Company of the Northwest Inc.’s intrastate access charges (UT-081393).

**Q. What is the scope of your testimony at this time?**

A. My testimony addresses Frontier Communications Corporation’s (Frontier) future broadband investment in Washington. It supplements Mr. William Weinman’s overall recommendation on the proposed transaction. If the Commission approves the transaction between Frontier and Verizon Northwest, Inc (Verizon), the approval should be conditioned on the specific broadband deployment targets I recommend below, along with conditions proposed by other Staff witnesses, to ensure the public interest.

**Q. On what basis do you propose the conditions on the company’s future broadband deployment?**

A. One of the “no harm” standards in evaluating the public interest merits of a proposed transaction is whether customers will be able to share benefits resulting from the transaction. Expansion of broadband services is the one of the major benefits that has been repeatedly emphasized by the Joint Applicants. My proposed conditions on the company’s future broadband deployment are intended to substantiate the company’s promise. The proposed conditions are explicit and enforceable targets to ensure that Washington consumers will benefit from the proposed merger transaction.

**Q. Are your proposed conditions on broadband deployment consistent with Washington State’s policy objectives on telecommunications?**

A. Broadband deployment has consistently been a policy of interest for the State of Washington. The Washington legislature explicitly expresses several state telecommunications policy objectives, which include maintaining and advancing the efficiency and availability of telecommunications services; and promoting diversity in the supply of telecommunications services and products in telecommunications markets throughout the state. *RCW 80.36.300*. No doubt, broadband availability and supply diversity are relevant concerns of this Commission in decision making. The Joint Applicants recognize that the Commission has significant interest in Frontier’s future deployment of broadband in Washington.[[1]](#footnote-1)

**Q. Are there any precedents for the Commission requiring broadband deployment in regulatory proceedings?**

A. Yes. The Commission previously conditioned its approval of Qwest Corporation’s Alternative Form of Regulation (AFOR) and the merger between Embarq Corporation and CenturyTel, Inc. on the companies’ specific broadband deployment commitments in the state. Those conditions reflect the reality of technological advancement, the change in consumer demand, and the shift from “plain old telephone service” to broadband data service in the use of the modern communications network. They are consistent with the general public interest as well as the companies' traditional role as a common carrier.

In the Qwest AFOR proceeding, Qwest committed to spend at least $4 million to increase the availability of advanced telecommunications services in underserved areas and among underserved customer classes in Washington.[[2]](#footnote-2) Similarly, in the Embarq and CenturyTel merger proceeding, the merged company agreed to provision broadband to 2,200 residential lines which were previously not broadband capable within three years after the close of the merger.[[3]](#footnote-3)

1. **state-wide BROADBAND DEPLOYMENT COMMITMENT**

**Q. Why is accelerating broadband deployment important to the merged entity?**

A. Broadband expansion is the key selling point of the proposed transaction. Broadband Internet access can be provided over a number of technological platforms, including digital subscriber lines (DSL) over the traditional telephone network, coaxial cable, fiber optic cable and various wireless access technologies. In this proceeding, Frontier’s future focus in Washington is mainly on expanding DSL capability over the existing network.[[4]](#footnote-4) Increasing DSL availability and subscribership is vital to the growth of Frontier’s business after the merger. It also has serious ramifications for consumers. I will illustrate the importance of broadband deployment in four aspects: (1) improving subscriber retention; (2) ensuring the company’s financial health; (3) maintaining a modern network; and (4) increasing availability and competitive offerings in rural markets.

 **Q. Why is broadband deployment important to subscriber retention?**

A. As recognized by the Joint Applicants, the wireline telecommunications industry nowadays faces increasing competitive pressure from the wireless service providers and from alternative service providers such as cable companies. Verizon’s traditional voice service subscriber lines and the associated intrastate revenue has experienced steady decline in the past few years. I agree with Frontier that broadband capacity is important to retain customers on the company’s network. Mr. McCarthy discusses in his direct testimony that the combination of various strategies, including aggressive marketing of DSL services, innovative promotion with a free personal computer for the “Free Ride” bundle, localized management, dedicated customer support, and computer backup and restoration services, have worked well in customer retention in Frontier’s current service territories. As a result, Frontier appears to have a slower annual loss of its access lines – 7 percent for its national operation, as compared to 10 percent for Verizon in the service areas Frontier is proposing to acquire.[[5]](#footnote-5) Such line retention objectives will not be achieved after the merger without more expansive broadband infrastructure.

**Q. Why is broadband deployment important to the company’s financial health?**

A. Broadband will be the cornerstone of the company’s future business model in Washington. DSL service used to be considered an auxiliary service over the telephone network. However, the data and voice services have switched roles in recent years as broadband Internet access became more widely adopted. With burgeoning Internet content and Internet protocol-based applications, broadband has changed from a luxury to a necessity. Broadband revenue has consisted of an increasingly large portion of telephone companies’ overall and the trend will continue. In the future, Frontier will rely more and more on its revenue from broadband access services than its traditional voice telephone services. As such, DSL deployment is a key factor that determines the company’s financial health. As Mr. McCarthy stated in his direct testimony, the key growth market for a provider like Frontier is to reach relatively higher penetration of broadband in less-dense regions.[[6]](#footnote-6) The low broadband availability and subscriber rate in Verizon’ service territory in Washington presents opportunities for future growth that Verizon has not yet tapped into.

**Q. Why does broadband deployment play an important role in maintaining a modern network?**

A. Making subscriber line DSL-capable can involve a number of network improvements, including investment in DSL Access Modules (DSLAMs), fiber optic cable in the loop, digital loop carrier remote terminals, power plant and advanced digital data transmission technologies. These upgrades are critical for a carrier to provide voice, data and video services over the same network. In particular, the increased deployment of fiber optic cable as well as increased switching capacity will make the overall network more efficient. More managerial attention and technical support will also be given to common facilities that support both voice and data services. Without investment in broadband technologies, the network will soon become antiquated.

**Q. Why is broadband deployment important to rural markets and consumers?**

A. The broadband market is far from competitive in rural and high-cost areas. Even if alternative broadband access technologies such as cable modem or satellite exist in some areas, their prices can be relatively high. Extending DSL services to unserved and underserved areas will especially benefit that portion of rural consumers who still rely on dial-up Internet connection either because no broadband service is available in the area or the price of alternative broadband technologies is too high. Competitive DSL offerings in those areas can enhance consumer choices and more importantly, assert pressure for providers to reduce price, increase service quality and compete with innovative product differentiation.

**Q. What is the current status of Verizon’s broadband availability?**

A. As illustrated in the following table, the status quo of Verizon’s DSL availability is poor as compared to other medium or large incumbent local exchange carriers in the state. It is also below the Washington state average.

| **Table 1. Comparison of DSL Availability** |
| --- |
| **Company** | **DSL Availability** |
| Washington average - residential[[7]](#footnote-7) | 83% | (June 30, 2008) |
| Qwest Corporation (WA)[[8]](#footnote-8) | 87% | (August 31, 2009) |
| CenturyTel (WA)[[9]](#footnote-9) | 89% | (2008) |
| Embarq (WA)[[10]](#footnote-10) | 78% | (2008) |
| Verizon Washington operation which Frontier will acquire in the proposed transaction[[11]](#footnote-11) | **XXX** | (February 2009) |

**Q. Did the Joint Applicants make tangible commitments for future broadband deployment?**

A. No. Even though the Joint Applicants claim that future broadband deployment will be a great consumer benefit after the transaction is completed, Frontier has not provided any enforceable commitments. So far, Frontier has not provided any cost estimate or project studies with regard to broadband deployment in the state. Frontier indicated that it has not prepared any business case analyses or capital plans;

it has not developed a timeline for increasing broadband availability in the acquired properties; it has not reviewed Verizon’s Washington broadband plans nor has it inspected Verizon’s infrastructure for broadband capabilities.[[12]](#footnote-12) Neither company applied for the federal broadband stimulus fund, nor have they determined whether they would apply in the future.

**Q. What is your recommended condition for Frontier’s overall broadband deployment in Washington?**

A. If the Commission approves the transaction, it should require the company to provide broadband to 95 percent of its customers, using DSL, FTTP or functionally equivalent technologies, by the end of 2013. The company should be required to meet the milestone of 75 percent broadband availability by December 31, 2010, 85 percent milestone by December 31, 2011, 90 percent milestone by December 31, 2012, and finally 95 percent milestone by December 31, 2013. This condition will ensure the consumer benefits that Frontier promises with respect to broadband expansion will actually come to fruition.

The speed capability of the broadband Frontier provides should not be lower than the lowest DSL speed that Verizon currently offers, which is 1 megabits per second (Mbps) for downloading and 384 kilobits per second (kbps) for uploading.[[13]](#footnote-13) While Frontier may offer a lower-end product to attract more customers, it must

modify all subscriber lines to meet the 1Mbps /384 kbps minimum capacity so that such capacity will be available to any customers who request it.

**Q. What is the basis of your recommended DSL availability ratio?**

A. The 95 percent broadband availability rate is a reasonable goal. Frontier has experience in deploying broadband to over 90 percent of the households in its existing service territory. Frontier has deployed DSL service in 99.3 percent of the company’s host and remote switches; it is able to serve over 90 percent of the local exchange customers with broadband capacity on the national basis.[[14]](#footnote-14) For the proposed merger, it is Frontier’s goal “to approach the levels of broadband availability and subscribership in these areas that more nearly approximate those achieved in Frontier’s service territories today.”[[15]](#footnote-15) XXXXX out of **XX** GTE operations Frontier acquired over years have reached at least 90 percent state-wide broadband availability as of March 2009.[[16]](#footnote-16) In 24 states where Frontier currently operates, the average percent of DSL availability is **XXX** percent as of March 31, 2009.[[17]](#footnote-17) The 95 percent target will also put Frontier on par with Qwest, Embarq and CenturyTel’s DSL deployment level in Washington in the next four years.

**Q. What is the basis of your recommended DSL availability timeframe?**

A. The four year time frame is reasonable based on several considerations. One, Frontier has made broadband available to over 90 percent of its customers that it serves nation-wide over the last eight years.[[18]](#footnote-18) However, technologies have advanced in recent years that can reduce the broadband deployment costs. Frontier also has been using some cost-effective solutions for extending DSL to customers such as pole mounted DSLAM or pad mounted cabinets.[[19]](#footnote-19) Besides, the average line density in the current Verizon territories (35 access lines per square miles) is much higher than Frontier’s current territories (17 access lines per square miles).[[20]](#footnote-20) Frontier will have a higher DSL availability rate to begin with in Washington (**XX** percent[[21]](#footnote-21)) than other states where Frontier is acquiring (60 percent average[[22]](#footnote-22)).

**Q. Why do you advocate a percent target for broadband availability rather than a capital expenditure target?**

A. As reflected in the Qwest AFOR proceeding and the Embarq-CenturyTel merger proceeding, determining the appropriate target for spending on broadband deployment is a difficult task. In the Qwest AFOR proceeding, the Commission stated that neither Qwest nor Public Counsel provided studies on the costs of additional DSL deployment or on future customer subscribership rate and that $4

million was a reasonably necessary commitment but not a calculation of precision.[[23]](#footnote-23) In the Embarq-CenturyTel merger proceeding, the Commission acknowledged that the expansion of DSL availability to 2200 customers seems a very modest benefit in expectation of $400 million company-wide annual merger synergy savings; and that the public interest demands more flow through of the merger benefits.[[24]](#footnote-24)

 Likewise, in this case, it is hard to decide what percent of the merger synergy gains, if any, should be allocated to broadband deployment in Washington. It is also difficult to estimate the costs of broadband deployment. Frontier provided an estimate of deploying broadband to approximately 85 percent of the households in the Verizon’s Washington exchanges, but this was a rough estimate based on very broad assumptions and did not involve even a preliminary field survey. In addition, the company will receive increased end-user revenue from broadband services. Future broadband revenue will likely offset much, if not all, of the costs of network upgrade conditioned in this merger proceeding.

Furthermore, broadband availability rate is a more direct measurement of how the policy goal has been achieved than capital expenditure. It avoids the uncertainty of cost estimates and revenue allocation, which are not an issue to be decided in this proceeding. Instead, a company-specific broadband availability target is outcome-oriented, directly measurable and transparent.

1. **Broadband deployment in high-cost areas**

**Q. Other than a state-wide target for broadband deployment, what else do you recommend in terms of the company’s future broadband investment in Washington?**

A. I also believe that from the distributional equity standpoint, Frontier should expand broadband internet access to 90 percent of its customers in each identified high-cost wire center by the end of 2013.

**Q. Why is distributional equity a concern in broadband deployment?**

A. Promoting broadband availability and adoption is crucial in rural communities for economic development and societal benefits. Without regulatory intervention, it is only natural for companies to invest in areas where they can reap the most profits. Lack of broadband infrastructure in rural and high-cost areas will deepen the existing digital divide between people who have advanced technologies to access information and those who do not. Without directed investment, there is no guarantee that rural customers will benefit from the proposed merger to the same extent as urban customers.

**Q. Is there any precedent for the Commission requiring broadband deployment in high-cost areas in Washington?**

A. Yes. The Commission has given more weight to broadband deployment in the rural areas. In the Qwest AFOR proceeding, committed investments were directed first to wire centers with no DSL capability and wire centers with less than 75 percent DSL availability. Initially, Qwest proposed to set the goal of DSL deployment as making DSL available to 83 percent of consumers in Washington. The Commission found the proposal to be in the right direction, but not sufficient to facilitate the broadband deployment, promote diversity in advanced services, or meaningfully address the issue of underserved communities.[[25]](#footnote-25)

**Q. What is Verizon’s current broadband deployment level in low-cost areas as compared to high-cost areas in Washington?**

A. Verizon’s current DSL availability status by wire center demonstrates serious distributional concerns. To illustrate the point, I will demonstrate the DSL availability across Verizon’s unbundled network elements zones (UNE zones) because UNE zone classification is based on network costs. Please see Exhibit No. \_\_\_ HC (JL-2HC), *Verizon DSL Availability, Take Rate and FiOS Availability by Wire Center*. Verizon classifies their wire centers into five zones for the purpose of determining the costs for UNEs, Zone 1 being the least costly area and Zone 5 being the most costly area. The Exhibit and the following summary table show that wire centers in Zone 3-5 have much lower broadband availability than wire centers in Zone 1-2. For example, broadband availability in all Zone 3-5 wire centers is below

Verizon’s Washington state average of **XX** percent. A total of 38 wire centers do not have DSL availability, 30 of which are located in Zone 3-5. The average DSL availability decreases steadily from Zone 1 through Zone 5. Different views of the DSL availability data across UNE zones all lead to one finding, that is, Verizon has neglected DSL deployment in high-cost areas. On the other hand, the customers’ take rate of DSL services[[26]](#footnote-26) does not decrease from low-cost zone to high-cost zone, indicating that rural customers have a similar, if not higher, level of demand for DSL services.

| **Table 2. Number of Wire Centers with DSL Capability and Take Rate****Highly Confidential – Redacted Version** |
| --- |
| **UNE Zone** | **Number of Wire Centers and Percent of Zone Total** | **Average DSL Availability** | **Average DSL****Take Rate** |
| **Total** | **0%****availability** | **0-50% availability** | **51-90% availability** | **91-100%****availability** |
| **Zone 1** | 29 | X | X | X | X | X | X | X | X | XXX | XX |
| **Zone 2** | 29 | X | X | X | X | X | X | X | X | XXX | XX |
| **Zone 3** | 25 | X | X | X | X | X | X | X | X | XXX | XX |
| **Zone 4** | 18 | X | X | X | X | X | X | X | X | XXX | XX |
| **Zone 5** | 1 | X | X | X | X | X | X | X | X | XXX | XX |
| **Total** | **102** | **XX** | **XX** | **XX** | **XX** | **XX** | **XX** | **XX** | **XX** | **XXX** | **XXX** |

Similarly, as also shown in Exhibit No. \_\_\_ (JL-2HC), Verizon’s current fiber-to-the-premises (FTTP) service, Fiber Optic Service (FiOS) is heavily

concentrated in urban areas. It is available mainly in 14 wire centers, 12 of which belong to UNE Zone 1; 2 to UNE Zone 2; and none to UNE Zones 3-5.

We have no reason to believe that Frontier will ever give priority to the high-cost wire centers in the future. As Mr. McCarthy stated in his direct testimony, the company’s investment will first go to areas where they can reach the highest number of customers most quickly. [[27]](#footnote-27) The investment decision will be driven by corporate profit motivation. It is therefore opposite to the State’s objective of making advanced services more available to rural customers.

**Q. What is your recommended condition for Frontier’s broadband deployment in high-cost areas of Washington?**

A. In addition to the requirement of 95 percent state-wide broadband availability, the company should be required to provide broadband to at least 90 percent of its customers in each of the 44 wire centers classified in UNE Zones 3-5, using DSL, FTTP or functionally equivalent technologies by December 31, 2013. Frontier asserted that it is strategically focused on targeting *smaller* markets and *less-dense* regions for growth, including for increased broadband penetration.[[28]](#footnote-28) Therefore, this condition is consistent with the company’s stated goal of retaining subscriber lines in rural areas. More importantly, it addresses the equity aspect of the company’s future network investment. The same broadband speed requirement discussed in the previous section should apply to high-cost wire centers.

1. **Reporting requirements**

**Q. What do you recommend in terms of reporting requirements for Frontier’s broadband deployment?**

A. To enforce the conditions on the company’s broadband deployment discussed in this testimony, I also recommend progress reporting requirements. The company should file an initial plan on broadband deployment and subsequently a status report with the Commission annually. It should submit the initial plan for broadband deployment within 90 days of the final approval of the merger. It should file the annual progress report on broadband deployment with UTC no later than May 1 of each succeeding year following the merger approval until all goals specified in the approval order are achieved. The annual report should contain information on a wire center basis as of December 31 of the previous year including:

* the total number of retail residential and business subscriber lines served by the company
* the number of broadband-capable subscriber lines by technology (DSL, FTTP and others)
* the number of broadband subscribers by technology, including both subscribers of stand-alone broadband services and subscribers of bundles that contain broadband services, and
* total expenditures associated with new broadband deployment in the previous calendar year by technology.
1. **Stand alone dsl offering and prices**

**Q. Do you have any other recommendation regarding the company’s future DSL offerings in Washington?**

A. Yes. I recommend that the Company be required to make DSL available to customers on a stand-alone, or “ala carte” basis. A stand-alone broadband offering is important for consumers to have diverse choices as well as for competing VoIP providers to access customers. Frontier currently provides stand-alone DSL services. The Commission should require Frontier to continue to offer stand-alone DSL service to ensure that Washington consumers get the maximum benefit from the expanded availability of DSL.

**Q. What do you think of Frontier’s price for stand-alone DSL services?**

A. I have serious concerns about the price increase of stand-alone DSL services after the transaction. As shown in the following table, Frontier’s prices for stand-alone DSL are significantly higher than Verizon’s for similar levels of service. Frontier’s low-end plan is priced at least 50 percent higher than Verizon’s most basic plan, and Frontier’s plan has lower downloading and uploading speed. Frontier’s high end plan is priced at least 67 percent higher than Verizon’s medium level plan, with Frontier’s plan having lower uploading access speed. Drastic price increase will make customers switch to alternative providers, which will not be desirable for Frontier. Although the Commission does not regulate the rates for DSL services, it should require Frontier to continue with Verizon’s price schedule for a period of time so that Verizon’s existing customers do not suffer a rate shock.

| **Table 3. Comparison of Frontier and Verizon Services** |
| --- |
| **Standalone DSL** | **Frontier[[29]](#footnote-29) (month-to-month)** | **Frontier[[30]](#footnote-30)****(1-3 year commitment)** | **Verizon [[31]](#footnote-31)****(1-year commitment)** |
| 768k/128k (High-Speed Internet Lite) | $34.99 | $29.99 |  |
| 768k/128k with security calling | $37.98 |  |  |
| 1 M/384k (Starter Plan) |  |  | $19.99 |
| up to 3M/384k (High-Speed Internet Max) | $54.99 | $49.99 |  |
| up to 3M/384k with security calling | $57.98 |  |  |
| up to 3M/768k (Power Plan)with free Wi-Fi access |  |  | $29.99 |
| up to 7.1M/768k (Turbo Plan)with free Wi-Fi access |  |  | $42.99 |

**Q. What do you recommend in terms of Frontier’s stand-alone DSL prices?**

A. Therefore, I recommend that Frontier be required to continue to offer stand-alone DSL services at Verizon’s current rates, terms and conditions for 12 months after the merger closing. If Verizon’s existing customers choose to terminate the service contact within the 12-month period, no early termination fees should be charged. Frontier should also be required to provide bundled services currently offered by Verizon for 12 months after the merger closing, as recommended by Staff witness, Ms. Jing Roth.

**Q. Please summarize your testimony.**

A. I recommend, as conditions of approval of the proposed transfer, that Frontier be required to: (1) provide broadband to 95 percent of its customers state-wide by the end of 2013 with annual milestones and with minimum speed capacity requirements; (2) provide broadband to 90 percent of its customers in each wire center classified in UNE Zones 3-5 by the end of 2013; (3) submit an initial broadband deployment plan within 90 days of merger approval and thereafter a progress report to the Commission annually; and (4) make a stand-alone DSL offering available to consumers and continue to offer stand-alone DSL services at the current Verizon rates, terms and conditions for 12 months after the merger closing.

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

A. Yes, it does.

1. Direct Testimony of Timothy McCallion, p.4, lines 19-21. [↑](#footnote-ref-1)
2. UT-061625, Order 06, ¶¶29-42. [↑](#footnote-ref-2)
3. UT-082119, Order 05, Appendix 1 Settlement Agreement, Condition 8. [↑](#footnote-ref-3)
4. Frontier Response to Public Counsel Data Request No.197 indicates that fiber to the premise technology is only used for green field projects. [↑](#footnote-ref-4)
5. Direct Testimony of Daniel McCarthy, p.11, lines 5-8. [↑](#footnote-ref-5)
6. Direct Testimony of Daniel McCarthy, p.13, lines 9-16. [↑](#footnote-ref-6)
7. Federal Communications Commission. *High-Speed Services for Internet Access: Status as of June 30, 2008*. Released July 2009. Table 14. [↑](#footnote-ref-7)
8. UT-061625, Qwest Broadband Availability Report filed on August 31, 2009. [↑](#footnote-ref-8)
9. UT-082119, Order 05, ¶19 footnote. [↑](#footnote-ref-9)
10. *Id*. [↑](#footnote-ref-10)
11. Verizon Response to Staff Data Request Nos. 18-19. [↑](#footnote-ref-11)
12. Frontier Response to Staff Data Request Nos.25 and 30. [↑](#footnote-ref-12)
13. <http://www22.verizon.com/Residential/HighSpeedInternet/Plans/Plans.htm>. [↑](#footnote-ref-13)
14. Direct Testimony of Daniel McCarthy, p.6, lines 5-11. [↑](#footnote-ref-14)
15. Direct Testimony of Daniel McCarthy, p.18, lines 1-5. [↑](#footnote-ref-15)
16. Frontier Response to Staff Data Request No.15. [↑](#footnote-ref-16)
17. Frontier Response to Staff Data Request No.75a. [↑](#footnote-ref-17)
18. McCarthy Direct Testimony, p.17. [↑](#footnote-ref-18)
19. Frontier Response to Public Council Data Request No.320. [↑](#footnote-ref-19)
20. Direct Testimony of Daniel McCarthy, p.20, lines 4-6. [↑](#footnote-ref-20)
21. Verizon Response to Staff Data Request Nos. 18-19. [↑](#footnote-ref-21)
22. Joint Application, ¶40. [↑](#footnote-ref-22)
23. UT-061625, Order 06, ¶¶38-39. [↑](#footnote-ref-23)
24. UT-082119, Order 05, ¶52. [↑](#footnote-ref-24)
25. UT-061625, Order 06, ¶¶29-42. [↑](#footnote-ref-25)
26. Calculated as the number of provisioned DSL lines divided by the number of DSL qualified lines. [↑](#footnote-ref-26)
27. Direct Testimony of Daniel McCarthy, p.19, lines 16-20. [↑](#footnote-ref-27)
28. Direct Testimony of Daniel McCarthy, p.13, lines 9-16; Frontier/Verizon to Staff DR No. 17, emphasis added. [↑](#footnote-ref-28)
29. <http://www.frontier.com/products/ProductOverview.aspx?type=1&p=511>. [↑](#footnote-ref-29)
30. Frontier Response to Public Counsel Data Request No. 346. [↑](#footnote-ref-30)
31. <http://www22.verizon.com/Residential/HighSpeedInternet/Plans/Plans.htm>. [↑](#footnote-ref-31)