REDACTED - FOR PUBLIC INSPECTION

HWG | HARRIS, WILTSHIRE & GRANNIS LLP

April 21, 2016

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Special Access Rates for Price Cap Local Exchange Carriers*, WC Docket No. 05-25; *AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, RM-10593

Dear Ms. Dortch:

In accordance with the Second Protective Order for the above-referenced proceedings, Windstream Services, LLC ("Windstream") herein submits a redacted version of the attached ex parte filing in the above-referenced proceedings.

Windstream has designated for highly confidential treatment the marked portions of the attached documents pursuant to the Second Protective Order[1] in WC Docket No. 05-25 and RM-10593. Highly confidential treatment is required to protect information about the extent to which Windstream relies on last-mile facilities and local transport facilities to provide special access-like services.

Pursuant to the protective order, Windstream is filing a redacted version of the document electronically via ECFS, one copy of the highly confidential version with the Secretary, and sending two copies of the highly confidential versions to Marvin Sacks.

Please contact me if you have any questions or require any additional information.

Sincerely,

John T. Nakahata
Counsel to Windstream Services, LLC

Attachment

[1] *Special Access for Price Cap Local Exchange Carriers; AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, Second Protective Order, DA 10-2419, 25 FCC Rcd. 17,725 (Wireline Comp. Bur. 2010).

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Dear Ms. Dortch:

On behalf of Windstream Services, LLC ("Windstream"), I write in response to a letter filed by CenturyLink on April 7, 2016, in the above-referenced proceedings,[1] a study of the economics of last-mile fiber deployment prepared by CostQuest Associates, which Windstream filed on June 8, 2015 ("CostQuest Study").[2]

While purporting to offer "detailed evidence" of "flaws,"[3] it is, in fact, CenturyLink's analysis that is riddled with unfounded assumptions and miscalculations. Deficiencies of the filing include sample bias (use only of areas in which a CLEC has overbuilt the ILEC), implausible and contradictory assumptions (such as including apparent best efforts-level locations in an evaluation of dedicated business data services markets and assuming a uniform distribution of high spend customers across the country when analyzing specific geographic areas), and even mathematical errors. The result is that CenturyLink vastly overstates the ability

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1 *See* Letter from Craig J. Brown, CenturyLink, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25, RM-10593 (filed Apr. 7, 2016) ("CenturyLink Letter"); Declaration of Daniel Gordon, attached to CenturyLink Letter ("Gordon Declaration").

2 *See* Letter from Jennie B. Chandra, Windstream, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 13-5 and 12-253, WC Docket No. 05-25, RM-10593, WC Docket No. 15-1 (filed June 8, 2015) ("Windstream Cover Letter"); *id.* Attach. A ("CostQuest Study"); Letter from John T. Nakahata, Counsel to Windstream, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 13-5 and 12-253, WC Docket No. 05-25, RM-10593, WC Docket No. 15-1 (filed June 8, 2015) ("CostQuest Presentation Letter").

3 *See* CenturyLink Letter at 2.

of a CLEC viably to enter a market using its own last-mile connections at any given level of dedicated business data service customer density.

In addition, CenturyLink's analysis does not challenge a key insight of CostQuest's model: that because of their much larger market shares and existing customer base that are a legacy of the monopoly era (among other factors), the Bells enjoy a dramatic cost advantage relative to competitive providers in the average cost-per-building fiber deployment. As CostQuest's study confirmed, substantial barriers to entry remain as a legacy of historical monopoly. Those barriers allow ILECs to continue to exercise market power, as has been long apparent to competitors and customers alike. The CostQuest Study, accordingly, remains a useful and robust tool for the Commission's analysis of the cost and viability of CLEC fiber deployment as compared with ILEC fiber deployment

I. CenturyLink's Analysis Exaggerates the Density of Dedicated Services Customers and Thus Understates the Per-Location Construction Costs.

CenturyLink's letter principally criticizes CostQuest's use of the AT&T building-density baseline,[4] which assumes a hypothetical 30-mile fiber ring that passes 200 buildings with potential dedicated services (Ethernet) customers, for a per-mile density of 6.67 buildings.[5] However, CenturyLink's own analysis uses a hand-picked data set that already is biased toward higher-density areas. Moreover, CenturyLink compounds that problem by making implausible assumptions about the assumed density of buildings *with dedicated services customers*, and the dedicated services revenue per building; and by calculating construction costs as if the building specific costs such as building access decreased with scale, which they do not.

First, CenturyLink's use of the Zayo metro fiber networks data—which are, of course, limited to areas in which there was an economic case for network construction—builds a powerful bias into its analysis.[6] If one assumes that Zayo acted rationally, one would expect to find that the building densities in these cities overbuilt by Zayo are higher than the threshold that the CostQuest model predicts is necessary to support competitive fiber deployment. In other words, CenturyLink found higher building density areas because it went looking for samples that included only higher building density cities. It does *not* show that the baseline density assumption in the CostQuest Study is unreasonable or unrepresentative of all the areas in which customers of business data services are located.

CostQuest has recently studied the density of buildings likely to need fiber connections in the 235 largest census designated places ("CDP") across the country to determine the

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4 *See* CenturyLink Letter at 3; Gordon Declaration ¶ 22.

5 CostQuest Study at 13.

6 *See* Gordon Declaration ¶¶ 10-14 (describing data set composed of areas in which Zayo has deployed metro fiber); *id.* ¶¶ 16-19 (describing existing Zayo fiber rings in three metro areas selected by CenturyLink for its analysis).

representativeness of the baseline density assumption.[7] The results show that the average building-density is very close—at 6 buildings per mile—to the baseline assumption used in the CostQuest Study. [8] To produce an average estimate of building densities using unbiased data, CostQuest first developed the total number of buildings in each of the largest 235 CDPs that are likely to contain businesses that require dedicated services provided over fiber connections, i.e., potential customers.[9] Consistent with the methodology used for the Connect America Cost Model,[10] CostQuest approximated demand for dedicated services by including businesses that (1) are classified as technology-oriented businesses under the Census Bureau's North American Industry Classification System ("NAICS") and have at least 10 employees, and (2) all other businesses that have at least 50 employees.[11] Any building that has at least one business meeting this standard and is located within the largest 235 CDPs is counted as a fiber served building. CostQuest then mapped efficient fiber routes along roads that would be required to connect these fiber served buildings to the central office in their respective service areas,[12] and calculated the resulting building-per-route-mile density. CostQuest found that the weighted average building density in any given service area across the top 235 CDPs is 6 buildings with potential dedicated services customers per mile.[13] While densities in individual CDPs vary, none is even close to 22 buildings per mile – the level asserted by CenturyLink.

Second, even if the Zayo data set were a valid starting point (which it is not), CenturyLink does not justify its assumption about the number of buildings passed by the fiber rings that have customers of dedicated services. The limited information provided by CenturyLink suggests that the assumption significantly overstates the actual number of buildings with dedicated services customers. CenturyLink states that its assumption for the number of buildings is based on "information from Equifax and GeoResults on customer locations and estimated monthly *wireline telecom spend*."[14] CenturyLink does not differentiate between

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7 *See* Attach. A, *Analysis of Fiber Lit Building Density*.

8 *See id*. at 1.

9 *See id*.

10 *See* Wireline Competition Bureau Announces Availability of Version 4.1 of the Connect America Fund Phase II Cost Model, Public Notice, DA 14-394, 29 FCC Rcd. 3088, 3090 (Wireline Comp. Bur. rel. Mar. 21, 2014). The methodology document is available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-326423A1.pdf ("CACM Methodology").

11 *See* Attach. A, *Analysis of Fiber Lit Building Density*, at 1; CACM Methodology at 21.

12 There were a total of 1,370 service areas included in the analysis, covering 645,137 buildings that have at least one business that is likely to require dedicated services. The total non-duplicate fiber route is 107,451 miles. *See* Attach. A, *Analysis of Fiber Lit Building Density*, at 1.

13 *See id.*

14 Gordon Declaration ¶ 10 (emphasis added).

dedicated services (Ethernet or TDM) and all other "wireline telecom spend," which presumably could include best efforts broadband, among other services.

In the first instance, it is unclear whether CenturyLink is actually counting buildings (i.e., unique addresses) or customers (unique business records). Counting customers rather than buildings would dramatically inflate density estimates, and would not be comparable to CostQuest's study, which examined buildings. Even if CenturyLink was counting buildings, it is unreasonable to assume that every single building that has a business with any telecom spend is also a building that has a dedicated services customer. Relying on this assumption, CenturyLink concludes that there are on average 22 buildings per mile with dedicated services customers within 1/10th of a mile of the Zayo metro fiber rings.[15] To reach its building density, CenturyLink assumes that every building in its data set—a total of 750,676 building across 33,689 fiber miles—has a customer of dedicated services.

Out of the total number of buildings in CenturyLink's data set, more than two-thirds, or 513,748, represent locations with "estimated monthly wireline telecom spend per location" of only $199.[16] Translated to a per-mile basis, of the 22 buildings used in CenturyLink's analysis, approximately 15 buildings have estimated total telecom spends of $199. Buildings with that monthly spend are highly unlikely to consist entirely, or even predominately, of dedicated services customers. A monthly spend of $199 is below the retail price for a single DS1/T1 connection offered by some ILECs and CLECs.[17] By comparison, in Windstream's experience, dedicated services customers in the lower-middle tier of monthly spend have monthly communications spends of between $1000 and $5000.[18] A monthly spend of $199 is much closer to the prices for best efforts broadband.[19]

Looking at just the buildings that have monthly wireline telecom spends of above $500, which is the next tier presented in CenturyLink's data (but still well below the middle lower tier of dedicated services customers in Windstream's experience), the building density drops to 6.9 buildings per mile,[20] very close to the 6.67 buildings per mile used as the baseline in CostQuest's

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15 *Id.* ¶¶ 13, 25.

16 *Id.* ¶ 24 Table 1.

17 *See* Comments of Windstream Services, LLC, at 24, WC Docket No. 05-25, RM-10593 (filed Jan. 27, 2016) ("Windstream Comments") (citing published retail prices for a Verizon DS1 service of between $170 and $264 per month, and for an Earthlink T1 line of $229 per month).

18 Declaration of Dan Deem, Douglas Derstine, Mike Kozlowski, Arthur Nichols, Joe Scattareggia, and Drew Smith ¶ 14, attached as Attachment A to Windstream Comments ("Windstream Declaration").

19 Windstream's Small/Medium Business broadband Internet access service ranges from $110 to $160 per month, not including additional services that customers likely would also purchase, such as voice service.

20 Gordon Declaration ¶ 24 Table 1.

model, as well as the 6 buildings per mile density calculated by CostQuest for the top 235 CDPs. Using a building density of 6.9 buildings per mile, and holding other factors in CenturyLink's analysis constant, the per-building construction cost equals $2,633.63, compared to the $2,712 used as CostQuest's baseline. Facing that cost, a hypothetical competitive provider, as indicated by the CostQuest Study, would still need to secure revenue representing more than 1 Gbps per location in order to pass the revenue hurdle.[21]

Third, CenturyLink applies the average per-building spend of $1,730 to all 750,676 buildings and to all of the buildings in the three specific markets (Tacoma, WA; Salem, OR; The Dalles, OR), despite relying on data that clearly shows a large variation in what businesses actually spend. Applying a single average assumes either that the distribution of higher-spend customers around the country is uniform, or that the hypothetical CLEC makes build decisions based on the average spend characteristics of the entire country rather than of any specific location. The first assumption is implausible: CenturyLink uses the same $1,730 per month revenue assumption for Tacoma, Washington, and for The Dalles, Oregon, even though Tacoma has nearly fifteen times the population of The Dalles.[22] By presuming the same average spend across markets with very different profiles, CenturyLink artificially increases the number of places in which a CLEC could meet the revenue hurdle for fiber deployment. The second assumption is directly contradicted by CLEC declarations submitted in this proceeding describing the factors that go into build decisions.[23] Either way, the average inflates the per-building monthly revenue in markets that are less likely to have customers that spend enough on dedicated services to cover the cost of construction.

Fourth, CenturyLink, through what presumably was an arithmetic error, also understates the per-building cost in its analysis, which lowers the revenue hurdle. CenturyLink scales the construction costs when it calculates the per-building costs by assuming a larger number of buildings over the same ring distance—i.e., it computes costs per building as if these costs at each location decline with the number of buildings served. But, of course, that is not the case for all costs. While the cost of the ring would decreases on a per-building basis as the number of buildings increases, the per-building cost also includes building rental, which does not fall as the number of buildings increases[24] Correcting for this mistake alone, even accepting all of

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21 CostQuest Study at 8.

22 Gordon Declaration ¶¶ 16, 18, 27 Table 4.

23 *See* Windstream Declaration ¶ 51; Comments of XO Communications, LLC on the Further Notice of Proposed Rulemaking at 5, WC Docket No. 05-25, RM-10593 (filed Jan. 27, 2016) ("XO Comments"); Draft Declaration of George Kuzmanovski ¶¶ 10-11, attached to XO Comments ("Kuzmanovski Declaration").

24 CenturyLink states that it used CostQuest's cost assumptions for its analysis, including the building rent assumption. *See* Gordon Declaration ¶ 10 n.18. CostQuest used an assumed rent of $678 per building, which was used in the AT&T study. Recent Windstream data yield a similar, if not slightly higher, value. *See* CostQuest Study at 5 & n.11.

CenturyLink's assumptions about revenue and building density, increases the per-building cost from $1,021 to $1,443.

In addition, CenturyLink's per-building costs do not include the cost of providing other wireline communication services, even though, as noted above, the retail pricing data that CenturyLink uses to calculate revenue are for "monthly wireline telecom spend" as opposed to Ethernet connectivity spend, as was used in CostQuest's model. Because CenturyLink does not provide the revenue and associated costs from these other services, we cannot quantify the impact that this error has on the revenue hurdle analysis.

CenturyLink also reiterates an unpersuasive argument previously raised by USTelecom that the revenue assumption should include "'margin contributions of additional components of bundled service packages customers typically purchase[]' today."[25] As Windstream highlighted in its response to USTelecom, this critique does not explain how such "margins" could be calculated in a way that accounts for the costs of providing the additional service components.[26] To avoid a bias one way or another, the CostQuest Study excluded the non-last-mile costs (e.g., cost of providing additional services, long-haul transport), and also excluded, where possible, the charges for additional services from the surveyed retail prices.[27] In addition, the sheer size of last-mile access and other costs of providing connectivity leaves very little margin even after accounting for additional revenue for such services, net of costs to providing them. *****BEGIN HIGHLY CONFIDENTIAL*****[redacted]*****END HIGHLY CONFIDENTIAL*****

CenturyLink's analysis fares no better when considering lease arrangements. CostQuest observed, based on publicly available data, "that retail Ethernet rates may be lower than wholesale rates for some service speeds," which led to its conclusion that "in such cases, leasing will not be a viable alternative to deploying facilities because the CLEC could not expect to recover its lease expense."[28] CenturyLink states that the average wholesale pricing data used by CostQuest, which was taken from ILECs' own publications, are not representative of the

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[25] CenturyLink Letter at 2 (quoting Letter from Patrick S. Brogan, United States Telecom Association, to Marlene H. Dortch, Secretary, FCC, at 1, GN Docket No. 13-5, WC Docket No. 05-25 (filed July 30, 2015)).

[26] *See* Letter from Malena F. Barzilai, Windstream, to Marlene H. Dortch, Secretary, FCC, at 2-3, GN Docket Nos. 13-5 and 12-353, WC Docket No. 05-25, RM-10593 (filed August 3, 2015).

[27] *See* CostQuest Study at 5-8. CostQuest noted that "granular retail rate element details were not available in all instances," which indicates that, if anything, the model overstates the revenue that a CLEC would be able to generate for a given bandwidth and thus produces a conservative revenue-hurdle threshold. *See id.* at 8 n.19.

[28] CostQuest Study at 2.

wholesale prices that CenturyLink currently charges Windstream.[29] The CostQuest Study explicitly used a 50 percent reduction as a proxy for wholesale discounts. In any event, the price squeeze problem that Windstream and others have identified goes well beyond any one particular contractual arrangement.[30] Moreover, the assertion that surveys overstate wholesale prices by failing to include negotiated discounts implies that surveys of *retail* prices (i.e., revenue) may also fail to capture negotiated discounts, which means that the number of sales that would have to be made at each bandwidth level would necessarily be higher, to meet the revenue threshold.[31]

II. CenturyLink's Additional Claims About the State of the Marketplace More Generally Do Not Undermine the Need for Commission Action.

CenturyLink's letter raises several additional points, which have already been refuted elsewhere in the record and do not counter the evidence of market power or countenance any delay in Commission action to remedy the harmful effects of such market power.

First, CenturyLink repeats the claim that the Bells have made throughout this proceeding about the availability of alternative last-mile inputs for competitive providers of dedicated services.[32] Cable companies themselves have stated that cable hybrid-fiber-coaxial ("HFC") connections do not exceed 10 Mbps x10 Mbps symmetrical service.[33] Windstream and others have explained at length why HFC connections are inadequate inputs for dedicated services.[34] For example, Sprint cited geographic limitation of cable HFC networks, bandwidth limitations of

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29 *See* Gordon Declaration ¶¶ 5, 29.

30 *See* Comments of TDS Metrocom, LLC at 28, WC Docket No. 05-25, RM-10593 (filed Jan. 27, 2016) ("TDS Comments"); Second Declaration of Matthew J. Loch ¶ 19, attached to TDS Comments (stating that based on a comparison of the "RBOC wholesale rates currently offered to TDS CLEC and the RBOC retail rates" quoted to TDS's existing and prospective customers and reviewed by the declarant, "the wholesale rates available to TDS CLEC are typically higher"); Windstream Declaration ¶ 95 (noting that observed retail prices in the market are lower than wholesale prices charged to Windstream for the same service by the same ILEC).

31 *See* CostQuest Study at 8 (using Ethernet retail pricing data from Telogical).

32 *See* CenturyLink Letter at 4-5.

33 *See* Letter from Matthew A. Brill, Counsel for Comcast Corporation, to Marlene H. Dortch, Secretary, FCC, at 3, WC Docket No. 05-25 (filed Mar. 25, 2016)

34 *See* Windstream Declaration ¶¶ 28-33 (describing limitations of cable connections); *id.* ¶¶ 34-36 (discussing constraints on widespread use of fixed wireless for last-mile connectivity). *See also* Letter from Jennifer Bagg et al., Counsel to Sprint, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 05-25 and 15-247 (filed Mar. 24, 2016) ("Sprint March 24, 2016 Letter"); Reply Comments of Windstream Services, LLC, at 6-9 & nn. 15-19 WC Docket No. 05-25, RM-10593 (filed Feb. 19, 2016) ("Windstream Reply Comments") (citing limitations of cable connections as set forth in sworn declarations filed by other providers and purchasers of dedicated services).

Ethernet over HFC, and performance limitations relating to factors such as latency and jitter, all as reasons why cable HFC connections are not substitutes for dedicated services that meet Sprint's requirements.[35] Likewise, Level 3 noted that not only is "Ethernet-over-HFC . . . not typically offered subject to SLAs with performance commitments for jitter," but "the actual jitter levels observed for Ethernet-over-HFC are significantly above the levels needed to reliably support real-time applications."[36]

In addition, non-ILEC last-mile facilities capable of supporting dedicated services are far less ubiquitous than represented by CenturyLink. Windstream and others have detailed the flaws in the Bells' assumption that the presence of any non-ILEC fiber in a given census block is capable of supporting a competitive provider of dedicated services to a nearby building.[37] After a decade of ILEC assurances of imminent facilities-based competition, non-ILEC fiber-to-the-building networks remain highly limited in reach.[38] Indeed, the data collection shows that 77.3% of buildings have only one facilities-based in-building provider,[39] which is considerably higher than the 58% ILEC market share assumed in the CostQuest Study's comparison of CLEC and

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35 *See* Sprint March 24, 2016 Letter at 6-8.

36 Letter from Thomas Jones, Counsel for Level 3 and Earthlink, to Marlene H. Dortch, Secretary, FCC, at 2, WC Docket No. 05-25, RM-10593 (filed Apr. 14, 2016). *See also id.* at 2-3 ("[T]he actual jitter levels observed for Ethernet-over-fiber and Ethernet-over-legacy loops *do* reliably support real-time applications.").

37 *See* Windstream Reply Comments at 12-21; Windstream Declaration ¶¶ 50-52; Windstream Comments at 35-42. *See also* Comments of Birch, BT Americas, EarthLink, and Level 3 at 31-40, WC Docket No. 05-25, RM-10593 (filed Jan. 27, 2016); Comments of Sprint Corporation at 35-38, WC Docket No. 05-25, RM-10593 (filed Jan. 27, 2016); TDS Comments at 18-21; XO Comment at 36-38 ("XO Comments"); Kuzmanovski Declaration ¶¶ 29-32; Declaration of Dr. Jonathan B. Baker on Market Power in the Provision of Dedicated (Special Access) Services ¶ 36, WC Docket No. 05-25, RM-10593 (filed Apr. 14, 2016) ("Baker Declaration"); Declaration of James Butman on Behalf of TDS Telecommunications Corporation ¶¶ 10-16, attached to Letter from Thomas Jones, Counsel for TDS Telecommunications Corporation, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25, GN Docket No. 13-5, 12-353 (filed Mar. 26, 2015).

38 Sprint March 24, 2016 Letter at 2-5. *See also* Sean Buckley, *AT&T, CenturyLink fiber builds help drive up U.S. business fiber penetration to 46.2%*, FIERCETELECOM (Apr. 14, 2016), http://www.fiercetelecom.com/story/att-centurylink-fiber-builds-help-drive-us-business-fiber-penetration-462/2016-04-14 (reporting that "AT&T announced that it reached its milestone of equipping *1 million business locations* with fiber," and that "XO Communications, . . . [which] has also been aggressive in bringing fiber to more buildings . . . had *4,000* on-net buildings" (emphases added)); Letter from Tamar E. Finn, Counsel for TDS Metrocom, to Marlene H. Dortch, Secretary, FCC at 3, WC Docket No. 05-25, RM-10593 (filed Apr. 4, 2016) (describing results TDS's "survey of HFC availability" in selected markets as showing very limited reach to current and potential TDS customers).

39 *See* Baker Declaration ¶ 44.

ILEC construction costs.[40] Even "aggressive" competitors continue to work at a pace of expansion that is far too slow to bring competition to most locations with demand for dedicated services.[41]

Second, CenturyLink asserts that it, along with other ILECs, also often has to construct last-mile connections in order to supply Ethernet circuits, and thereby concludes that it is incorrect to consider ILECs the first entrants into buildings in their territories.[42] CenturyLink does not, however, specify whether this construction is of a lateral or of the fiber ring itself. The fiber ring is the largest single cost component for competitive deployment, and part of the ILECs' cost advantage comes from an incumbent's ability to leverage existing infrastructure like conduits that are unavailable to CLECs.[43] These advantages exist even in cases when the incumbent incurs some costs to construct a lateral fiber connection.

CostQuest's analysis describes and quantifies how market share and incumbency lower the cost of fiber build-out, showing that the cost of laying a fiber ring is the largest component of deployment costs.[44] As Windstream explained, ILECs benefit from this fact because access to this fiber ring is often a "sunk cost" for them (either entirely or in large part due to existing network delivery facilities that can be used for new fiber), but most buildings that could potentially be served by a CLEC will not be near one of the CLEC's fiber rings.[45] The sensitivity analysis conducted by CostQuest also shows the importance of market share—as well as building density—in calculating the costs of deployment per building.[46] As Windstream previously noted, the CostQuest model does *not* capture all of the first-entrant advantages that

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40 *See* CostQuest Study at 13.

41 *See* Sprint March 24, 2016 Letter at 4-5 (citing reports of the cost and pace of XO's construction of fiber to 550 additional buildings, and observing that "[a]t that pace, it would take generations to expand XO's fiber network from its existing reach . . . to a number that even remotely approximates a meaningful share of" ILEC locations).

42 *See* CenturyLink Letter at 5.

43 *See* Windstream Cover Letter at 6 ("Based on Windstream's experience operating as both an ILEC and CLEC, access to this fiber ring is often a 'sunk cost' for the ILEC (either entirely or in large part due to existing network delivery facilities that can be used for new fiber), but most buildings that could potentially be served by a CLEC will not be near one of the CLEC's fiber rings.").

44 *See* CostQuest Study at 6.

45 *See* Windstream Cover Letter at 6.

46 *See* CostQuest Study at 13-17; Windstream Cover Letter at 6. In addition, because the CostQuest model is a "greenfield" analysis, it does not recognize that an ILEC may already have critical inputs available that it can leverage for fiber deployments at less or no cost, such as existing conduit or building entrances. *See* CostQuest Presentation Letter at 4.

ILECs often enjoy relative to CLECs, such as building entry charges,[47] and thus likely understates the ILECs' relative cost advantage.

Finally, CenturyLink falls back on the familiar canard that any action by the Commission to unlock competition would "dampen incentives to invest."[48] This refrain ignores the differences between the investment incentive scenarios facing incumbent and competitive providers as well as other ways that ILECs benefit from fiber deployment. A key insight of the CostQuest Study is that the costs of last-mile construction are *not* the same for an incumbent and for a competitive entrant, contrary to CenturyLink's attempt to group different providers together.[49] The advantages of ILECs derived from their legacy incumbent status include proximity to existing infrastructure, preexisting access to buildings, and far larger market shares of customers under contract, all of which reduce the per-customer cost of construction. The resulting lower cost gives ILECs higher margins relative to competitive providers irrespective of price regulation. Accordingly, the fact that, under CostQuest's model, a new entrant cannot clear the revenue hurdles in many areas does not mean that the revenues, i.e., prices, *of ILECs* are too low—or would become too low with price regulation—to support continued network investment.

ILECs have the incentive to invest in fiber networks because those networks—and the high speed Ethernet services they enable—are more cost-efficient than providing TDM services.[50] These savings improve the margins on existing revenues. ILECs also have incentives to invest in fiber networks apart from potential business data services revenues; fiber networks can be used to provide services to an entirely separate base of residential customers.[51] Cable operators likewise have independent incentives to upgrade their networks to fiber because the facilities can be built upon and used to provide additional or upgraded services to their existing residential customers. Finally, as the CostQuest Study shows, "available wholesale Ethernet rates, even if at levels below retail rates, may not have a meaningful impact on a CLEC's decision to deploy its own-last mile facilities" because the CLEC would still not be able to clear the revenue hurdle in lower density areas.[52]

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47 *See* CostQuest Presentation Letter at 4 ("[T]he CostQuest model is a 'greenfield' analysis. The analysis, therefore, does not recognize that an ILEC may already have critical inputs available that it can leverage for fiber deployments at less or no cost, such as existing conduit or building entrances.").

48 CenturyLink Letter at 6.

49 *See id.*

50 *See* Windstream Declaration ¶ 104.

51 *See* Sean Buckley, *CenturyLink, AT&T take Ethernet, fiber-based service aim at smaller businesses*, FIERCETELECOM (Mar. 11, 2016), http://www.fiercetelecom.com/story/centurylink-att-take-ethernet-fiber-based-service-aim-smaller-businesses/2016-03-11 (quoting CenturyLink CFO as stating "[w]e pass about 500,000 businesses today and a lot of that is associated with the residential builds and getting fiber out to neighborhoods").

52 CostQuest Study at 12.

Please contact me if you have any questions or require any additional information.

Sincerely yours,

John T. Nakahata
Counsel to Windstream Services, LLC

Attach.

ATTACHMENT A

Analysis of Fiber Lit Building Density

Overview

An analysis of buildings likely to be candidates for services requiring fiber optic (fiber) cable was performed.

The geographic footprint of the analysis included the Top 235 Census Designated Places (CDP). CDPs were ranked based upon 2010 population.

Methods

As a list of buildings that are currently fiber served is unavailable, buildings were selected consistent with the FCC CACM and A-CAM identification of buildings that may receive fiber service.[1] This identification process relies upon the North American Industry Classification System (NAICS) code and number of employees in a business.[2] If a business is identified as being fiber served, the building in which that business operates will be identified as fiber served.

Fiber optic routes were determined to serve these buildings, based upon the following methods

1. Each GeoResult wirecenter[3] boundary (service area polygon) was 'mapped' to the boundaries of 235 Census Designated Places. A Service Area was mapped to a CDP only if it had the majority of its area in that CDP. If a Service Area intersected multiple CDPs, it was assigned to the CDP that contained the majority of the Service Area.
2. Fiber served buildings were assigned to a serving Central Office based upon the GeoResults wirecenter boundary in which they were contained.
3. For each Service Area a road based route[4] was calculated from the Central Office of that Service Area to each of the fiber served building. Only roads within Census blocks containing fiber served buildings were used. To minimize total route length, in the circumstance where a route requires an overlap of an existing route, the distance is only considered once.

Results

The analysis covered 1,370 Service Areas. There were 645,137 buildings in the study covering 937,081 businesses. The total non-duplicated fiber route represented 107,451 miles.

On average, there were 6 fiber served buildings per road mile. When aggregated to the CDP level, the maximum was 15.95 fiber served buildings and the minimum was 2.31.

Figures 1 to 4 show the routing and location of modeled fiber served buildings for a sample of service areas.

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[1] *See* Connect America Cost Model Methodology, CQLL Service Assignment, at 20. https://transition.fcc.gov/wcb/CAM%20v.4.2%20Methodology.pdf.

[2] Business NAICS codes and employee counts were obtained from GeoResults (Q3 2015). GeoResults also provides a BuildingID, which is used to group businesses into the same structure.

[3] GeoResults Q4, 2015.

[4] Routing was performed using ESRI Network Analyst, version 10.3.

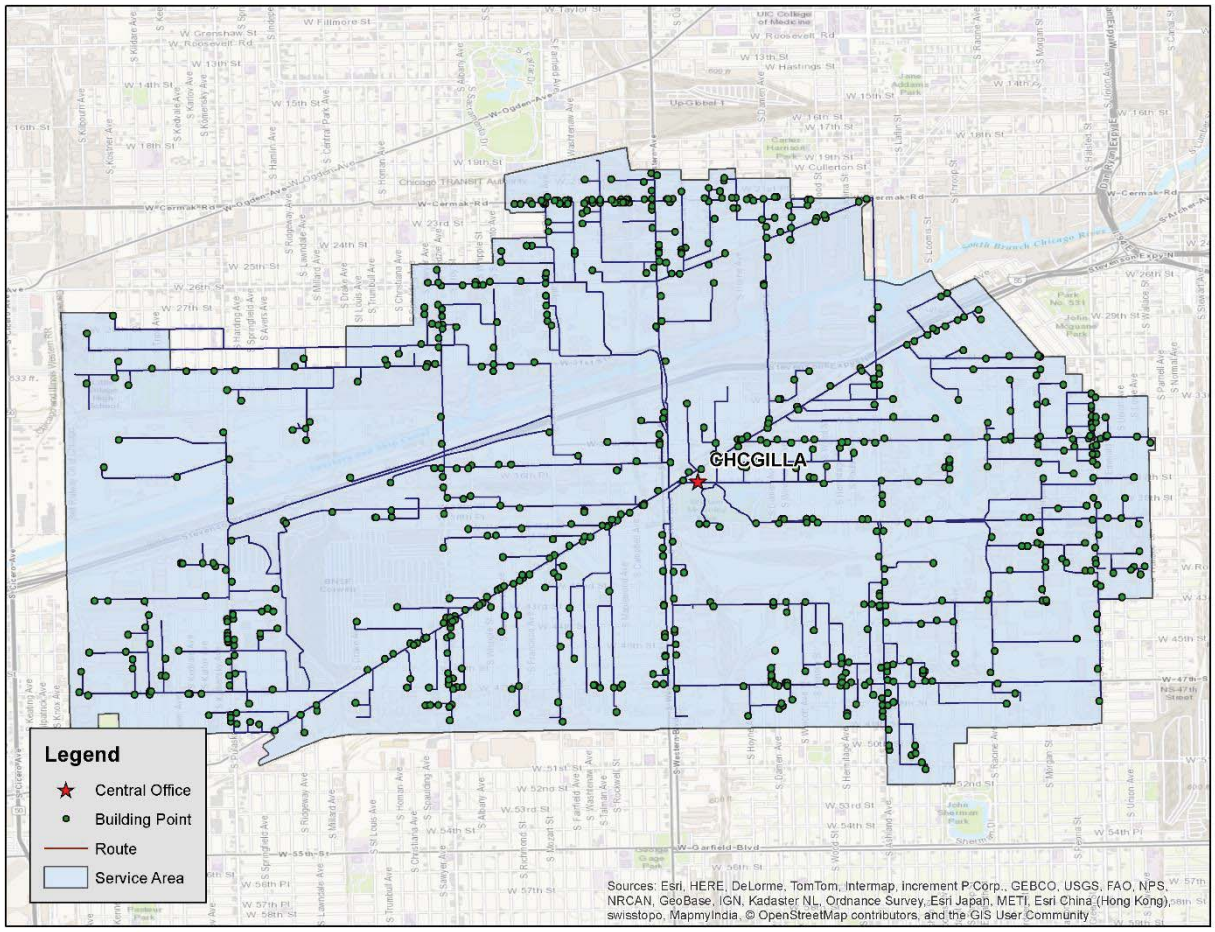

Figure 1-CHCGILLA

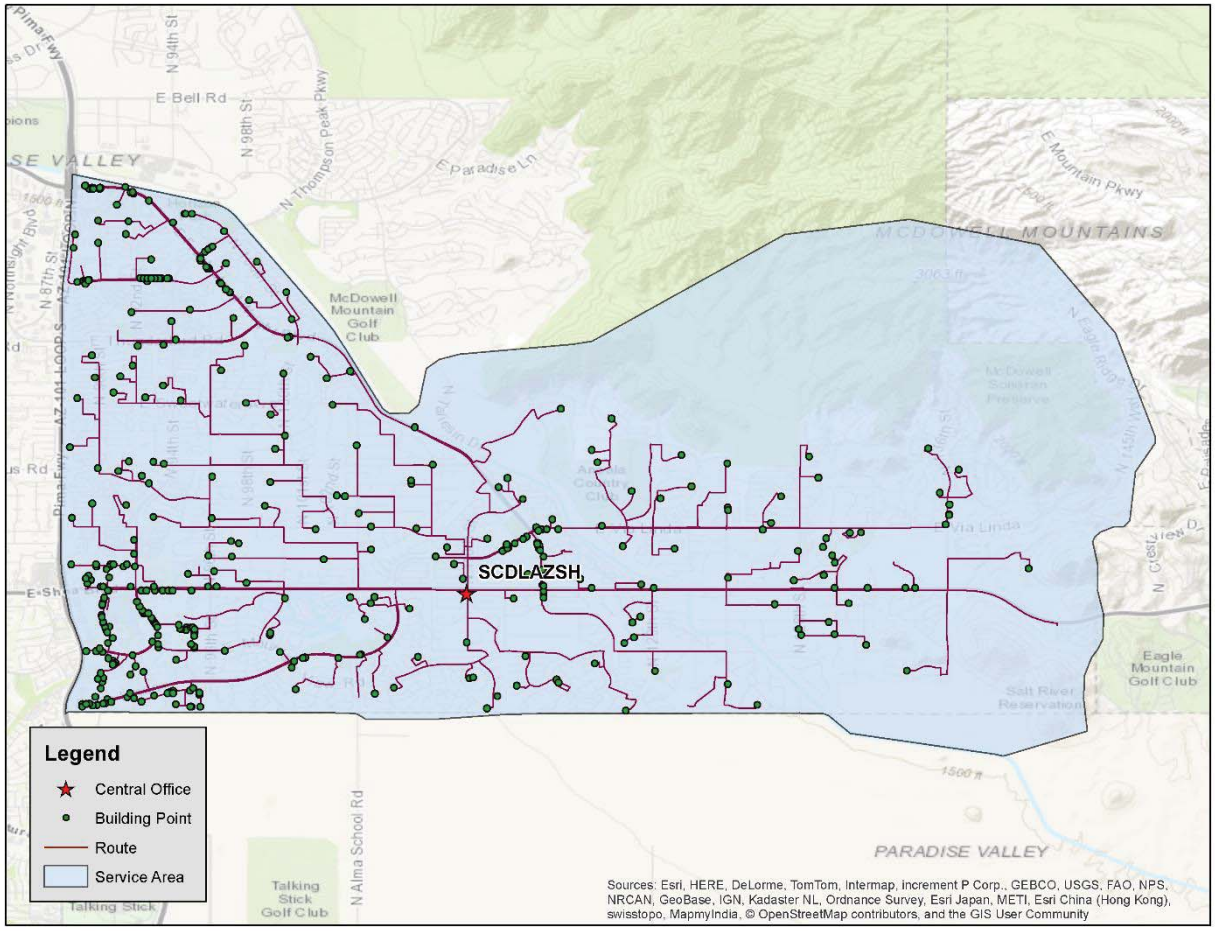

Figure 2-SCDLAZSH

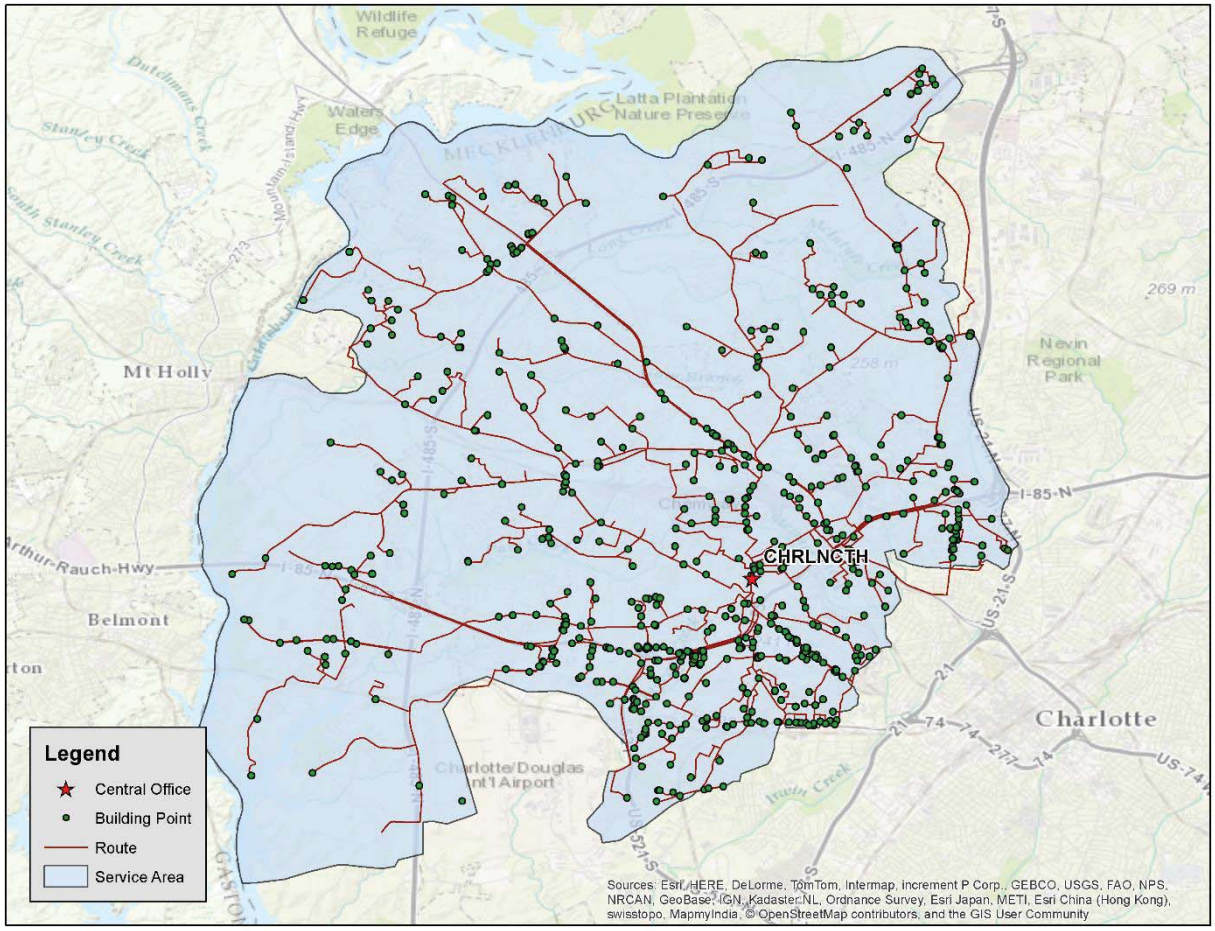

Figure 3-CHRLNCTH

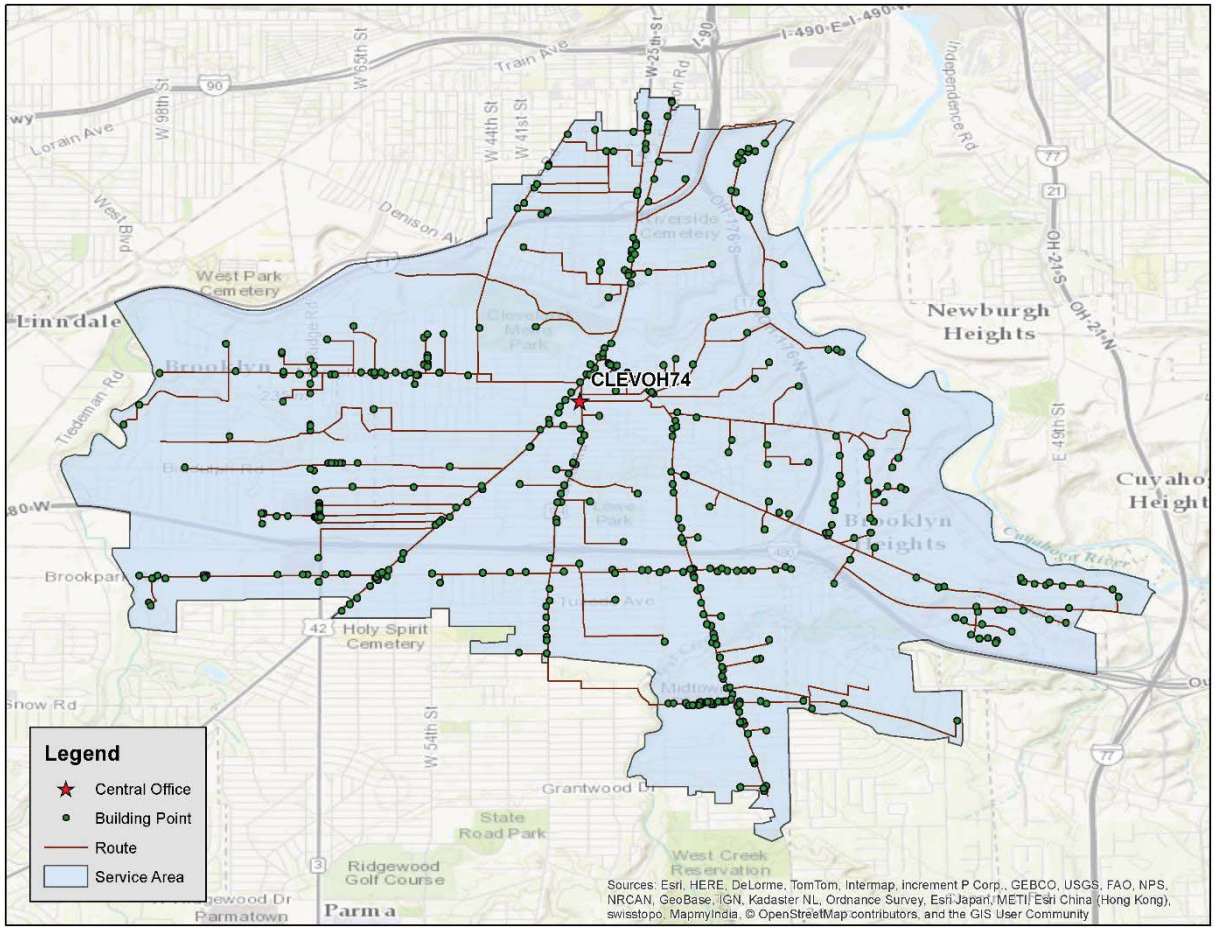

Figure 4-CLEVOH74

Table One provides a listing of the results by CDP. The averages are determined from the sum of buildings and sum of miles for all Service Areas assigned into the CDP. The overall average is determined from the sum of buildings and sum of miles for all studied Service Areas.

Table 1-Fiber served building density

Census Designated Place	Average of Fiber Served Buildings Per Non-Duplicated Road Mile
Abilene	3.58
Akron	6.02
Albuquerque	5.38
Alexandria	11.60
Allentown	6.78
Amarillo	3.59
Anaheim	8.14
Anchorage	4.60
Arlington	6.61
Athens-Clarke County unified government (balance)	3.73
Atlanta	6.80
Augusta-Richmond County consolidated government (balance)	3.94
Aurora	4.45
Austin	5.19
Bakersfield	4.14
Baltimore	7.89
Baton Rouge	6.31
Beaumont	4.58
Bellevue	8.37
Birmingham	4.61
Boise City	5.89
Boston	13.23
Bridgeport	7.36
Brownsville	4.50
Buffalo	7.52
Cape Coral	2.69
Carrollton	4.79
Cary	5.99
Cedar Rapids	3.52
Chandler	4.00
Charleston	5.45
Charlotte	5.24
Chattanooga	5.05
Chesapeake	3.83
Chicago	9.46
Chula Vista	5.08
Cincinnati	7.67

Census Designated Place	Average of Fiber Served Buildings Per Non-Duplicated Road Mile
Clarksville	3.75
Cleveland	7.80
Colorado Springs	5.34
Columbia	7.71
Columbus	5.84
Concord	7.14
Coral Springs	5.34
Corona	4.82
Corpus Christi	4.53
Dallas	5.70
Dayton	5.77
Denver	6.90
Des Moines	5.10
Detroit	4.75
Durham	4.22
East Los Angeles	6.94
El Paso	4.53
Elizabeth	8.39
Elk Grove	3.84
Escondido	5.65
Eugene	6.08
Evansville	5.80
Fayetteville	3.72
Fontana	4.03
Fort Collins	3.81
Fort Lauderdale	9.22
Fort Wayne	5.08
Fort Worth	4.30
Fremont	6.78
Fresno	4.82
Frisco	3.82
Fullerton	8.21
Gainesville	5.36
Garden Grove	7.32
Garland	4.75
Gilbert	4.38
Glendale	6.87
Grand Prairie	4.51
Grand Rapids	7.44
Greensboro	4.96
Hampton	5.73

Census Designated Place	Average of Fiber Served Buildings Per Non-Duplicated Road Mile
Hartford	7.92
Hayward	6.18
Henderson	3.65
Hialeah	7.04
Hollywood	6.26
Houston	5.21
Huntington Beach	6.84
Huntsville	3.91
Independence	3.72
Indianapolis city (balance)	5.13
Irvine	9.14
Irving	5.98
Jackson	4.84
Jacksonville	4.44
Jersey City	13.04
Joliet	4.97
Kansas City	4.86
Killeen	3.61
Knoxville	4.45
Lafayette	6.32
Lakewood	4.43
Lancaster	3.38
Laredo	3.98
Las Vegas	5.11
Lexington-Fayette	5.07
Lincoln	4.96
Little Rock	5.54
Long Beach	7.48
Los Angeles	8.11
Louisville/Jefferson County metro government (balance)	5.41
Lubbock	3.89
Madison	7.12
McAllen	7.29
McKinney	2.99
Memphis	5.16
Mesa	4.35
Mesquite	4.21
Metairie	7.32
Miami	8.55
Milwaukee	6.75

Census Designated Place	Average of Fiber Served Buildings Per Non-Duplicated Road Mile
Minneapolis	7.67
Mobile	4.62
Modesto	4.91
Montgomery	4.05
Moreno Valley	3.36
Naperville	4.98
Nashville-Davidson metropolitan government (balance)	4.55
New Haven	8.83
New Orleans	6.59
New York	15.41
Newark	9.03
Newport News	5.27
Norfolk	6.99
North Las Vegas	4.52
Oakland	7.95
Oceanside	4.68
Oklahoma City	4.69
Olathe	4.48
Omaha	5.15
Ontario	5.12
Orange	7.97
Orlando	6.05
Overland Park	5.77
Oxnard	4.74
Palmdale	3.43
Paradise	6.83
Pasadena	8.01
Paterson	9.50
Pembroke Pines	4.63
Peoria	3.82
Philadelphia	9.73
Phoenix	5.54
Pittsburgh	8.29
Plano	4.97
Pomona	5.49
Port St. Lucie	3.01
Portland	7.35
Providence	11.27
Raleigh	6.14
Rancho Cucamonga	6.03

Census Designated Place	Average of Fiber Served Buildings Per Non-Duplicated Road Mile
Reno	5.64
Richmond	7.68
Riverside	6.07
Rochester	6.98
Rockford	4.47
Roseville	5.15
Sacramento	6.54
Salem	5.09
Salinas	6.06
Salt Lake City	7.91
San Antonio	4.52
San Bernardino	4.63
San Diego	7.23
San Francisco	15.95
San Jose	6.54
Santa Ana	9.81
Santa Clara	8.99
Santa Clarita	5.03
Santa Rosa	5.02
Savannah	5.38
Scottsdale	4.58
Seattle	9.11
Shreveport	3.76
Simi Valley	5.13
Sioux Falls	5.28
Spokane	4.73
Spring Valley	8.27
Springfield	5.26
St. Louis	7.29
St. Paul	6.38
St. Petersburg	5.44
Stamford	6.72
Sterling Heights	6.09
Stockton	4.74
Sunnyvale	8.82
Sunrise Manor	3.84
Surprise	2.31
Syracuse	7.21
Tacoma	6.00
Tallahassee	4.36
Tampa	6.58

Census Designated Place	Average of Fiber Served Buildings Per Non-Duplicated Road Mile
Tempe	8.46
Thornton	4.37
Thousand Oaks	5.26
Toledo	5.70
Topeka	3.62
Torrance	8.68
Tucson	5.02
Tulsa	5.10
Urban Honolulu	10.61
Vallejo	4.64
Vancouver	4.73
Victorville	3.46
Virginia Beach	5.36
Visalia	4.98
Waco	3.40
Warren	6.06
Washington	13.16
West Valley City	4.00
Wichita	5.01
Winston-Salem	4.37
Worcester	5.67
Yonkers	8.65
Average of 235 CDPs	6.00