VIA ECFS

June 8, 2015

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

Re: GN Docket No. 13-5, Technology Transitions; GN Docket No. 12-353, AT&T Petition to Launch a Proceeding Concerning the TDM-to-IP Transition; WC Docket No. 05-25, Special Access Rates for Price Cap Local Exchange Carriers; RM-10593, AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services; WC Docket No. 15-1, Windstream’s Petition for Declaratory Ruling Seeking to Confirm ILEC’s Continued Obligation to Provide DS1s and DS3s on Unbundled Basis After Technology Transitions

Dear Ms. Dortch:

Windstream Services, LLC, on behalf of its affiliates and subsidiaries (“Windstream”), is filing two white papers prepared by CostQuest Associates analyzing the economics of last-mile fiber deployment to non-residential customers. CLECs are investing billions in network deployments in fiber backbone facilities and, where possible, in the last mile. However, there still are many places where competitive overbuilding of last-mile facilities alongside the incumbents’ existing infrastructure is not economically feasible. The CostQuest white papers focus on the cost conditions underlying competitive fiber network investments in the last mile, and on the cost trends over time for fiber deployments.
The first paper models the monthly cost for a hypothetical efficient competitive local exchange carrier (“CLEC”) to build last-mile fiber facilities and associated IP electronics, and compares that cost against the revenue required to support a build-out decision and against the cost of leasing equivalent facilities from incumbent LECs (“ILECs”). In particular, the first paper provides a framework for the Commission to analyze the following critical questions underlying all of the above-captioned dockets:

- Under what circumstances is it economically feasible for a CLEC to be able to build its own last-mile fiber loops to a location?
- To what extent do lower wholesale rates disincentivize a CLEC from constructing its own fiber loops?
- Given that the ILEC, as the historical monopolist, likely has a first-mover advantage and thus a larger market share than the CLEC, how does that larger market share affect comparative costs between the ILEC and the later entrant?

The findings of this paper underscore the importance of Commission action to ensure a viable wholesale market. First, this paper demonstrates that the revenue required to support CLEC overbuilding of a last-mile fiber facilities—in the face of the lower market share that CLECs can expect—remains prohibitively high for most business locations. Second, surveyed pricing data suggest that current wholesale Ethernet prices may exceed retail Ethernet prices in some locations. Such conditions make it difficult, if not impossible, for a CLEC relying on ILEC last-mile connectivity to compete for business service customers at many of those locations. Third, at pricing levels based on available data, the paper shows that wholesale price reductions are not likely to have a meaningful impact on CLEC’s decision to build its own facilities because no matter what the wholesale price, in most instances there is no economically feasible case for a customer to deploy its own last-mile facilities. Finally, the paper demonstrates that ILECs continue to enjoy a dramatic advantage over CLECs in the average cost per building of new last-mile fiber deployment—an advantage that is largely attributable to the incumbents’ much larger market shares, which is a direct result of the ILEC first mover advantage rooted in the monopoly era. In other words, CLECs face a much higher threshold than ILECs for fiber loop construction to be economically feasible. Thus, competition for most business service customer locations likely will continue to depend on CLECs’ being able to lease ILEC last-mile inputs so that they can connect their CLEC fiber backbone facilities to individual customer locations.

The second paper analyzes the changes in cost of network deployment over time as the technology is transitioning from TDM to IP. This analysis shows that the overall costs for building, operating, and maintaining IP services generally are less than those TDM services. This suggests that all carriers, including ILECs, will continue to have their own significant business reasons for migrating from TDM- to IP-based networks. Requirements to provide equivalent wholesale special access before and after such transitions and to continue to unbundle DS1 and DS3 capacity UNE loops merely maintain the existing regulatory status quo and do not
negate these important business incentives for transitioning to fiber/IP services. Indeed, under a regime merely requiring equivalent wholesale pricing, ILECs attain a windfall as they transition to lower cost networks but still charge wholesale rates based on more expensive legacy cost conditions.

As Windstream has advocated and as the Commission has consistently recognized, just and reasonable wholesale rates, terms, and conditions for last-mile access continue to be vital for business services competition. Such competition is critical to ensure business, nonprofit, and government customers enjoy lower prices and greater innovation in the IP Era. Thus, the Commission should act to ensure that wholesale special access services on at least equivalent terms and access to unbundled DS1 and DS3 capacity loops remain available during and following the IP transition.

Cost Model Methodology

The first CostQuest white paper compares the “greenfield” fiber overbuild costs for a hypothetical efficient CLEC against (i) the monthly Ethernet service revenues to be obtained, and (ii) the leasing costs of equivalent ILEC Ethernet connectivity. The cost model builds on the design and assumptions of a study submitted by AT&T in 2002 to estimate the break-even points for a CLEC to build its own fiber facilities to provide DS1 and DS3 service to business customers. As detailed in Attachment A, the cost model uses the parameters from that AT&T study relating to the size of the fiber ring and the number of buildings—a 30-mile fiber ring that extends to 20 revenue-producing buildings with business customers. It also updates cost and pricing factors using, where possible, publicly available data, including the inputs for labor, material, and structure values from the model employed for the Connect America Fund. In this regard, the model uses CAM annual charge factors that imply longer useful lives than the contract renewal cycle of a CLEC, and thus is conservative. The model is highly configurable

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1 See Attachment B to Letter from Joan Marsh, Director, Federal Government Affairs, AT&T, to Marlene Dortch, Secretary, FCC, CC Docket Nos. 01-338, 96-98, 98-147 (filed Nov. 25, 2002) (“AT&T Study Letter”). That study was cited by the Commission in its Triennial Review Order. See, e.g., Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, FCC 03-36, 18 FCC Rcd. 16,978, 17,156 ¶ 298, n.859 (2003) (“Triennial Review Order”) (citing the AT&T study when finding “for DS1 loops and some DS3 loops, overbuilding to enterprise customers that require services over these facilities generally does not present sufficient opportunity for competitors to recover their costs and, therefore, may not be economically feasible”).

and provides a framework for analyzing the effect of changing assumptions about any number of the factors. In particular, the paper contains a sensitivity analysis based on variations in market share and building density, two factors that greatly affect the per-customer cost of last-mile deployment.

The second white paper analyzes the changes to fiber deployment costs from the early-2000s to the present. As further described in Attachment B, the paper takes into account changes in the prices of labor, facilities placement, electronics and other equipment, and operations and maintenance. It also considers increases in labor productivity that compensate for the increase in hourly wage costs.

**The Model’s Estimation of Costs Supports the Continued Need for Wholesale Access**

CLEC last-mile deployment costs remain prohibitively high in many realistic market scenarios.

The white papers demonstrate that widespread CLEC last-mile build-outs to business customers remain economically infeasible today, just as the Commission has previously found. Using the same parameters for size of the fiber ring and potential market as used in the AT&T study, and updated data on services, retail rates, and costs, the CostQuest model shows that CLEC self-deployment of last-mile facilities to serve a single customer in each building would not be economically viable unless the customer at each building purchases more than 1 Gbps of capacity.

Specifically, the model calculates the monthly per-building cost of overbuilding fiber last-mile facilities to provision 1 Gbps service to a customer in each building to be $2,712, which is greater than the average monthly retail price for 1 Gbps Ethernet service of $2,157, as
estimated by Telogical.\textsuperscript{5} To merely break even on the cost of the build-out, a CLEC, therefore, would have to sign up one customer in every one of the 20 buildings reached from the fiber loop at revenue levels equivalent to more than 1 Gbps service. If the location only had customers with lower bandwidth needs, the number of customers required at each location grows: Where each customer would purchase only 10 Mbps, which is not uncommon among Windstream’s customers, a CLEC would need more than six customers in each of the 20 buildings. This revenue hurdle for carriers like Windstream that serve many business, government, and nonprofit customers with modest bandwidth needs is extremely significant.\textsuperscript{6} Thus, CLECs still cannot feasibly build to the vast majority of business locations—and conversions from TDM to IP or copper to fiber do not and will not change that.

Given these network economics, it is not surprising that ILECs continue to dominate last-mile connectivity,\textsuperscript{7} even while competitive providers have invested and continue to invest billions in their own networks, including in the last mile when economically feasible. For example, Windstream operates a fiber network encompassing 118,000 fiber route miles over 48 states.\textsuperscript{8} However, the investment required for this network has occurred largely in the network backbone rather than in last-mile connections to the customer, because competitors cannot make an economic case for overbuilding ILEC facilities in most instances.\textsuperscript{9} Likewise, notwithstanding

\textsuperscript{5} See id. at 9.

\textsuperscript{6} See Comments of Windstream Corporation, GN Docket No. 13-5, WC Docket Nos. 05-25, 15-1, RM-11358, RM-10593, at 15-20 (filed Feb. 5, 2015) (“Windstream Tech Transitions Comments”). See also Letter from Malena F. Barzilai, Windstream, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 13-5, WC Docket Nos. 12-353 & 05-25, and RM-10593, at 9 (filed Apr. 28, 2014) (“As the Commission noted in the TRO, deployment of last-mile facilities to customers that do not require high bandwidth presents ‘extremely high economic and operational barriers,’ and ‘overbuilding to enterprise customers that require services over [DS1 and DS3] facilities generally does not present sufficient opportunity for competitors to recover their costs . . . .’” (quoting Triennial Review Order, 18 FCC Rcd. at 17,173 ¶ 325 and 17,156 ¶ 218, n.859 ).


\textsuperscript{8} See Windstream Tech Transitions Comments at 15.

cable’s comparative ubiquity in residential markets, major cable companies have not incurred the expense to build last-mile networks outside of their incumbent service areas.10

Incumbent LECs hold a significant cost advantage even for “new” fiber builds.

CostQuest’s analysis describes and quantifies how market share and incumbency lower the cost of fiber build-out, and further expose the flaw in the ILECs’ argument that CLECs are on equal competitive footing when it comes to Ethernet, where they assert “there are no ‘incumbents.’”11 To support a build-out, CLECs must recover the costs for new infrastructure, including buried conduit, rights of way and pole access, and building entry portals and equipment rooms.12 The analysis shows that the cost of laying the fiber ring is the largest component of the deployment cost. This result holds notwithstanding several updates in the white paper to the AT&T study assumptions that tend to reduce the cost of build-out, such as using lower pricing for fiber cost elements and replacing the AT&T assumption of all buried conduit with a mix of underground and overhead cables.13 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. CLECs also may be charged for building entries in instances where the ILEC is not (a difference not captured by this “greenfield” analysis). A CLEC’s fiber build project costs, therefore, often are greater than if the ILEC deployed fiber in the same area.

Moreover, CLECs do not possess a massive customer base like ILECs, whose first-to-market historical advantage as the designated monopolist allows the ILEC to spread network costs over a larger number of locations within the same ring distance.14 The cost model’s sensitivity analysis shows the outsized effect that market share has, particularly in a lower-density area as used in the AT&T study, in reducing the per-building location cost of deployment: For the same building density, a decrease from the national aggregate ILEC market share of 58 percent to the national aggregate CLEC market share of 26 percent results in a

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10 See Windstream Tech Transitions Comments at 12-13.
12 See Triennial Review Order, 18 FCC Rcd. at 17,039-40 ¶ 89 (identifying first-mover advantages of incumbents that lower deployment costs).
13 See Attachment A at 5. The 100 percent underground construction assumption in the AT&T study was replaced with a mix of aerial, buried, and underground plant, which was derived from the national average CACM Plant Mix table. The Plant Mix used in the analysis was PlantMix V1. Using PlantMixV8 increases the building cost approximately $112 per month.
14 See Windstream Tech Transitions Reply Comments at 34.
32 percent increase in the per-building cost. To cement their advantage, ILECs may use lock-up agreements to leverage locational monopolies across entire markets. The Commission has recognized these ILEC advantages and concluded that competitors need access to bottleneck facilities since the introduction of local competition with the Telecommunications Act of 1996, and the ILEC advantages have been consistently reaffirmed in the intervening years.

Current Ethernet wholesale prices may preclude CLECs from continuing to serve end users.

The Telogical data cited in the paper also show that current published ILEC wholesale Ethernet prices may be significantly higher than retail Ethernet prices charged for equivalent capacities in the business marketplace. The Commission has previously recognized that wholesale last-mile access is a “critical input” for CLECs’ own retail services. However, at least two large ILECs’ average wholesale prices may exceed retail market pricing for comparable bandwidth. Wholesale prices that significantly exceed the retail prices for equivalent capacities can preclude CLECs from competing in the retail market, which would leave the incumbent with little or no retail competition for high capacity business services.

This straightforward cause-and-effect underlies prior Commission decisions and proposals currently awaiting Commission action. The Commission conditioned packet forbearance on the availability of other ex ante price-regulated wholesale inputs, and the importance of ensuring availability of viable wholesale inputs was expressly recognized in the

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15 See Attachment A at 13-15.
17 See Attachment A at 12.
19 See id. at 21 (citing Petition of the Frontier and Citizens ILECs for Forbearance Under Section 47 U.S.C. § 160(c) from Title II and Computer Inquiry Rules with Respect to Their Broadband Services, Memorandum Opinion and Order, 22 FCC Rcd. 19,478, ¶ 19 n.78 (2007) (“[W]e observe that the relief we grant excludes TDM-based, DS-1 and DS-3 special access services. Thus, those services, in addition to section 251 UNEs, remain available for use as wholesale inputs for these enterprise broadband services.”)).
Triennial Review Remand Order. This cause-and-effect also supports the Commission’s tentative conclusion in the Technology Transitions NPRM that it “should require incumbent LECs that seek Section 214 authority to discontinue, reduce, or impair a legacy service used as a wholesale input by competitive providers to commit to providing equivalent wholesale access on equivalent rates, terms, and conditions.” Windstream’s proposed principles directly address this issue by requiring ILECs to offer wholesale Ethernet at rates that are no higher than the rates for retail Ethernet providing comparable capacity.

Moreover, the higher wholesale prices for Ethernet compared to retail prices is further evidence of lack of effective competition in the market absent price-regulated wholesale inputs. The AT&T and CenturyLink wholesale prices are consistent with information previously presented by Windstream, such as the TeleGeography data showing that the United States and Canada have some of the highest prices worldwide for 10 Mbps Ethernet, with a median city price of $1,247, which led TeleGeography to conclude that the market data show “less competitive countries are both lower in capacity and higher in price.” This anticompetitive disparity between wholesale and retail is consistent with, and likely a preview of, the substantial per-Mbps price increases that will follow the transition from regulated TDM services to IP, unless the Commission adopts rules preserving the competitive status quo.

Given high build-out costs, competitive wholesale access does not disincentivize CLEC investment.

The high revenue hurdle created by the cost of deploying fiber networks also means that the continued availability of current wholesale access post-IP transition will not have any meaningful impact on CLECs’ incentive to invest in their own networks. As noted previously, the estimated monthly per-customer location cost of self-deploying 1 Gbps Ethernet is $2,712, which is higher than the average retail price of $2,157. Thus, the analysis indicates that in many market scenarios likely to be encountered by CLECs, self-deployment would not be economically viable, whether or not wholesale access is available at lower-than-retail rates.

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21 See TRRO, 20 FCC Rcd. at 2570 ¶ 63 (“[I]ncumbent carriers could strategically manipulate the price of their direct competitors’ wholesale inputs to prevent competition in the downstream retail market.”).


23 See Windstream Tech Transitions Comments at 27.

24 See Windstream Tech Transitions Reply Comments at 17.

25 See Windstream Tech Transitions Comments at 20.
Communications providers, including ILECs, continue to have strong incentives of their own to transition to IP and fiber in order to reduce operating and maintenance costs.

The analysis in the second white paper shows that although new deployment costs present a high revenue hurdle for CLECs, the costs of building, operating, and maintaining IP-based services over fiber are generally less than doing so for legacy technologies. The decline in cost over time is attributable to both changes in physical network technology, and in the software protocols used to transmit information. The large ILECs, likewise, recognized such benefits in recent filings in the Commission’s technology transitions proceeding.

The CostQuest white papers provide valuable updated analyses of the costs of CLEC fiber network deployment by building upon a study that the Commission has previously analyzed. They also offer a robust framework for further calculations using different assumptions about market share and customer density.

The white papers have important implications for several competition policy issues that warrant the Commission’s near-term attention in light of the ongoing TDM-to-IP transition within the industry. The finding that CLEC network self-deployment continues to be cost-prohibitive in familiar market scenarios supports the Commission’s tentative conclusion to require ILECs to provide at least “equivalent wholesale access” post-IP transition. In particular, the finding that network construction costs continue to pose a high hurdle to competitive market entry confirms that Windstream’s six proposed principles are necessary to protect the competitive status quo. Findings in the white papers also underscore the importance of comprehensive reform of special access. Finally, the findings indicate that the Commission should be wary of suggestions that competitors will be magically “unimpaired” in deploying last-mile facilities in the IP era. While UNE pricing may need to be revisited in light of ILEC efficiencies now possible with IP-based fiber networks, the last mile remains an enduring competitive bottleneck for CLECs to offer service to many multilocation and smaller enterprises.

26 See Attachment B at 1.

27 See id. at 1-3.

Please contact me if you have any questions.

Sincerely,

/s/

Jennie B. Chandra