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January 27, 2016

Via ECFS

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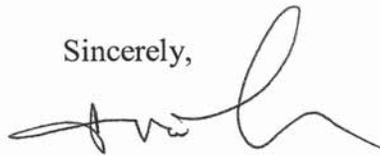
*Re: Special Access for Price Cap Local Exchange Carriers, WC Docket No. 05-25;
AT&T Corporation Petition for Rulemaking To Reform Regulation of Incumbent
Local Exchange Carrier Rates for Interstate Special Access Services, RM-10593*

Dear Ms. Dortch:

Attached is the Redacted version of Verizon's Comments in the above-captioned matters. Verizon is filing the Highly Confidential version of these Comments under separate cover.

Thank you for your assistance in this matter. Please contact me at (202) 326-7930 if you have any questions regarding this filing.

Sincerely,



Evan T. Leo

Attachment

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of

Special Access for Price Cap Local Exchange Carriers;

WC Docket No. 05-25

AT&T Corporation Petition for Rulemaking To Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services

RM-10593

COMMENTS OF VERIZON

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**Before the
FEDERAL COMMUNICATIONS COMMISSION
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In the Matter of

Special Access for Price Cap Local Exchange Carriers;

WC Docket No. 05-25

AT&T Corporation Petition for Rulemaking To Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services

RM-10593

COMMENTS OF VERIZON¹

Customer demands for high-capacity services are rapidly rising and shifting to IP-based services like Ethernet. Competitors of all stripes — including not only incumbent and competitive telephone companies but also cable companies — are investing in fiber and other networks to meet those demands. The data in this proceeding confirm that where there is concentrated demand for high-capacity services, there is competition. In this marketplace, the Commission should not single out one set of competitors — the companies it still regulates as incumbent LECs — for special regulation, and instead any regulation should apply even-handedly and be targeted at circumstances of market failure where competition cannot adequately protect consumers.

The data the Commission has collected paint an incomplete picture of this dynamic marketplace. Instead of collecting two years' worth of data — which the Commission said it needed for a comprehensive, forward-looking analysis — the Commission collected only one

¹ The Verizon companies participating in this filing are the regulated, wholly owned subsidiaries of Verizon Communications Inc. (collectively, “Verizon”).

year's worth. The data now are more than two years old, and they do not capture recent developments like Comcast's aggressive play to win enterprise broadband customers. Because they are from 2013, the data do not permit the Commission to analyze the "state of competition today," which was the goal of the original December 2012 *Notice*.² These and other issues cast doubt on the data's reliability and — especially when combined with problems with the process of obtaining access to and analyzing the data — have deprived the parties of a sufficient opportunity to review and analyze the data in sufficient detail in time for these comments.

Still, the record shows competition for high-capacity services is thriving in areas where there is concentrated high-capacity demand. For example, competitive providers have deployed facilities in more than << >> of the census blocks with any demand for high-capacity services. Competitive facilities are even more widespread in the relatively small subset of census blocks in which high-capacity demand is most heavily concentrated. Competitive facilities are deployed in virtually all — << >> — of the census blocks that account for 80% of U.S. business establishments, a reasonable proxy for special access demand. Excluding data from the National Broadband Map, competitive facilities have been deployed to more than << >> of the census blocks with any high-capacity demand, and to more than << >> of the census blocks that account for 80% of business establishments. The record also shows significant market entry by a wide range of providers, and that different types of competitors are succeeding in this marketplace using a wide array of high-capacity services.

By contrast, there is no evidence supporting a finding that ILEC rates for traditional TDM-based special access services (*e.g.*, DS1 and DS3) are unjust and unreasonable. The

² *Special Access for Price Cap Local Exchange Carriers*, Report and Order and Further Notice of Proposed Rulemaking, 27 FCC Rcd 16318, ¶ 1 (2012) ("*Notice*") (emphasis added).

revenue data do not permit even rudimentary comparisons of prices in different areas, or comparisons of ILEC and competitor prices. And with respect to terms and conditions, the record shows competitors have implemented discount plans similar to Verizon's pricing plans, using similar business justifications.

There is no market failure in the high-capacity marketplace that would justify increasing the regulatory burden on Verizon and other price-cap carriers. And heavier regulations on ILEC high-capacity services would not promote broadband competition. To the contrary, backwards-looking regulations on one group of competitors would undermine competition by giving another group of competitors — the cable companies, who are large, well-funded, and increasingly dominant in providing higher speed broadband services — an unjustified advantage.

As the Commission analyzes the data and comments in this proceeding, it should adhere to the forward-looking approach it committed to follow. The Commission should rely on competition to protect customers wherever possible, and it should apply even-handed regulation only in areas of market failure. As we discuss in Section One of these comments, the Commission's forward-looking approach must capture all forms of actual and potential competition for high-capacity services, from all providers. The marketplace is rapidly evolving as demand for broadband — particularly mobile broadband — is dramatically increasing. And while the data's flaws diminish their value, as we discuss in Section Two the record still demonstrates competition for high-capacity services from cable companies and other providers who have deployed facilities where there is concentrated demand. In Section Three we explain that competition constrains ILEC pricing, terms, and conditions, and that there is no basis to find those terms unjust or unreasonable. And as we explain in Section Four, the Commission should reduce its regulation of ILEC special access services. Increasing regulation of those services

would handicap one set of competitors, the ILECs, while unfairly advantaging cable companies and other providers.

I. The Commission Should Conduct a Forward-Looking Analysis of the Marketplace

Exploding use of mobile wireless broadband and high-speed data is creating enormous new demand for high-capacity connections, and a wide range of providers is investing to meet this growing demand in many parts of the country. Cable companies are aggressively expanding their increasingly dominant residential broadband networks. Other providers are deploying new high-capacity wireline and wireless facilities and technologies to compete more aggressively than ever before. Given these trends, the Commission cannot reliably measure competition for high-capacity services through a snapshot of the marketplace taken more than two years ago. Nor can it do so by focusing just on actual competition at the time of that snapshot.

To accurately assess competition in this dynamic marketplace, the Commission must instead determine how burgeoning demand and new technologies expand the potential for competition for high-capacity services going forward. The data the Commission collected in this proceeding, however, are insufficient to support that comprehensive analysis.

A. The Commission’s Forward-Looking Analysis Must Capture All Forms of Actual and Potential Competition for Special Access

The Commission has held that in a dynamic marketplace, competition “is more appropriately analyzed in view of larger trends in the marketplace, rather than exclusively through the snapshot data that may quickly and predictably be rendered obsolete as th[e] market continues to evolve.”³ In these circumstances, the Commission will “consider technological and

³ *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14853, ¶ 50 (2005) (“*Wireline Broadband Order*”).

market changes, and the nature, complexity, and speed of change of, as well as trends within, the communications industry.”⁴ The Commission has followed this approach — which focuses not on static market share but on trends showing the potential for competition — in a variety of contexts, including with respect to high-capacity services.⁵ The Commission has also acknowledged this approach is consistent with how the DOJ/FTC *Horizontal Merger Guidelines* treat dynamic marketplaces.⁶

The Commission also must consider all potential sources of actual and potential competition, both intramodal and intermodal, including the facilities that competitors (or even customers) self-supply.⁷ As the Commission performs this analysis, it must consider the

⁴ *Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation for Consent To Transfer Control of Licenses and Authorizations*, Memorandum Opinion and Order, 19 FCC Rcd 21522, ¶ 41 (2004).

⁵ *See Petition of AT&T Inc. for Forbearance Under 47 U.S.C. § 160(c) from Title II and Computer Inquiry Rules with Respect to Its Broadband Services*, Memorandum Opinion and Order, 22 FCC Rcd 18705, ¶ 23 (2007) (“*AT&T Broadband Forbearance Order*”) (finding that it was not “essential” to have “detailed market share information for particular enterprise broadband services” and that it “would not give significant weight to static market share information” in this “emerging and evolving” marketplace “in any event”); *Access Charge Reform, et al.*, Fifth Report and Order and Further Notice of Proposed Rulemaking, 14 FCC Rcd 14221, ¶ 90 (1999) (granting price cap LECs special access pricing flexibility based on a standard that looked at where the marketplace was “contestable,” and rejecting a test that would have required the ILECs to demonstrate that they did not have market power); Comments of Verizon and Verizon Wireless in WC Docket No. 05-25, at 4-7 (FCC filed Feb. 11, 2013) (“2013 Verizon Comments”).

⁶ *See AT&T Broadband Forbearance Order* ¶ 23 & n.96; U.S. Dep’t of Justice & Federal Trade Comm’n, *Horizontal Merger Guidelines* § 5.2 (2010) (“*2010 DOJ/FTC Horizontal Merger Guidelines*”) (“[R]ecent or ongoing changes in market conditions may indicate that the current market share of a particular firm either understates or overstates the firm’s future competitive significance.”).

⁷ *See Notice* ¶ 69 n.152 (recognizing that analysis “must take account of both actual and potential competition, as well as sources of intramodal and intermodal competition”); *AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366, 389 (1999) (faulting the Commission for failing to consider carriers that self-provide facilities in evaluating competitive alternatives); U.S. Dep’t of Justice & Federal Trade Comm’n, *Horizontal Merger Guidelines* § 1.31 (1992) (the relevant market begins with all

significant and growing role of cable operators in this marketplace. The Commission must determine where there is actual and potential competition from cable, taking into account cable's advantages resulting from its broadband networks, the enterprise facilities it has deployed to date, and rising demand that increase the available revenue opportunities. Likewise, the Commission must consider technologies such as fixed wireless and microwave. Wireless carriers have long used microwave facilities for the backhaul in their networks,⁸ and many competitors use fixed wireless as an economical alternative to fiber to serve enterprise customers of all sizes. The Commission must consider the potential for competitors to use these various technologies to provide high-capacity services, at different types of locations, for various types of customers, before it can draw reliable conclusions about competition in the marketplace.

B. The High-Capacity Marketplace Is Rapidly Evolving

The dramatic changes taking place in the marketplace necessitate in this proceeding a forward-looking analysis that focuses on the potential for competition to develop.⁹

firms that currently produce or sell in the relevant market, including “vertically integrated firms to the extent that such inclusion accurately reflects their competitive significance in the relevant market”); 2B Phillip E. Areeda *et al.*, *Antitrust Law* ¶ 423, at 101-03 (4th ed. 2014) (self-suppliers that can easily switch production to serve other customers must be considered part of the relevant market).

⁸ *See, e.g.*, Comments of Clearwire Corporation to Second Further Notice of Proposed Rulemaking and Second Notice of Inquiry at 3, WT Docket No. 10-153 *et al.* (FCC filed Oct. 5, 2012) (Clearwire “uses microwave backhaul for more than 90 percent of its cell sites.”); Reply Comments of the United States Cellular Corporation at 1, WT Docket No. 10-153 *et al.* (FCC filed Oct. 25, 2011) (U.S. Cellular “makes extensive use of fixed microwave facilities to provide ‘backhaul’ between its base stations and switches, holding approximately 2,600 microwave licenses.”); Ericsson Press Release, *MetroPCS Selects Ericsson as Primary Microwave Backhaul Equipment Provider* (Jan. 30, 2012), <http://www.ericsson.com/news/1580968> (MetroPCS entered into a four-year agreement to use Ericsson’s microwave backhaul equipment to serve MetroPCS’s wireless broadband network).

⁹ *See Notice* ¶ 69 n.152 (Commission’s analysis “must take account of both actual and potential competition”); *Wireline Broadband Order* ¶ 50; *Petition on Behalf of the State of Hawaii, Public Utility Commission, for Authority To Extend Its Rate Regulation of Commercial Mobile Radio*

1. *Demand for Mobile Broadband Is Exploding*

Mobile wireless broadband is transforming communications and society.¹⁰ In just the past five years, providers have deployed 4G LTE networks to more than 98% of the U.S. population, propelling enormous growth in the adoption and use of smartphones, tablets, and other connected devices.¹¹ Between 2009 and 2014, the number of active smartphones in the U.S. increased more than 400% (from 50 million to over 200 million), the average monthly traffic per smartphone increased by more than 2,200% (from 76 MB to 1.8 GB), and total wireless network traffic grew more than 20-fold (from 191 billion MB to more than 4 trillion

Services in the State of Hawaii, Report and Order, 10 FCC Rcd 7872, ¶ 26 (1995) (“evidence concerning dynamic factors” such as “[g]rowth and investment” is a “more persuasive market indicator than evidence concerning static factors” such as “prices or rates of return”); *MTS-WATS Market Structure Inquiry*, Second Report and Order, 92 FCC 2d 787, ¶ 133 (1982) (“Regulatory policy must take cognizance of the dynamic factors existing in the marketplace. It should not be based solely on static conditions existing today.”).

¹⁰ See, e.g., Cisco, *Cisco Virtual Networking Index: Global Mobile Data Traffic Forecast Update, 2014-2019*, at 35 (2015) (“Mobile data services are well on their way to becoming necessities for many network users. Mobile voice service is already considered a necessity by most, and mobile voice, data, and video services are fast becoming an essential part of consumers’ lives.”); *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, 30 FCC Rcd 1375, ¶ 114 (2015) (“Coincident with this extensive investment in these networks, mobile wireless services have gone from a luxury to a convenience to an absolutely central part of Americans’ daily lives.”).

¹¹ See, e.g., T. Sawanobori & Dr. R. Roche, CTIA, *Mobile Data Demand: Growth Forecasts Met* at 4 (June 22, 2015) (“Sawanobori & Roche, *Mobile Data Demand: Growth Forecasts Met*”) (4G LTE networks cover 98% of the population, had a penetration rate of nearly 50% as of year-end 2014, and the average LTE user consumes nearly twice as much cellular data compared to a 3G user.); *Policies Regarding Mobile Spectrum Holdings*, Report and Order, 29 FCC Rcd 6133, ¶ 23 (2014); Gian Fulgoni, comScore, *The State of Mobile* at 6 (Sept. 17, 2014) (“most of the growth in digital media consumption over the past four years has occurred on smart phones”).

MB).¹² And this is just the beginning. Wireless demand is expected to keep growing rapidly for the foreseeable future, including by up to six-fold or more by 2019.¹³

As these trends indicate, customers use wireless broadband for a broad range of data-consuming activities. Consumers, for example, use their wireless devices to listen to music, watch video, and access news and information, among other things.¹⁴ Small and mid-sized businesses are replacing credit card terminals and other specialized devices that typically require their own dedicated connection with smart wireless devices that can perform the same functions using WiFi hotspots.¹⁵ Larger businesses are providing wireless broadband to employees to

¹² See CTIA, Annual Wireless Survey (June 2015); Sawanobori & Roche, *Mobile Data Demand: Growth Forecasts Met* at 1, 5.

¹³ See, e.g., Sawanobori & Roche, *Mobile Data Demand: Growth Forecasts Met* at 7 (“Ericsson projects traffic in 2019 will be five times the traffic in 2014, while Cisco projects traffic in 2019 will be seven times the traffic in 2014. Averaging the two indicates that traffic in 2019 will be about six times higher than the traffic in 2014.”); CTIA, Annual Wireless Survey (June 2015).

¹⁴ See, e.g., Sawanobori & Roche, *Mobile Data Demand: Growth Forecasts Met* at 5 (between 2008 and 2015, the proportion of wireless subscribers using their devices to access news or information increased from 13.1% to 99.5%, while the number using their devices to listen to music increased from 6.7% to nearly 50%); *id.* (mobile video traffic grew more than 3,700% from 2009 to 2014, now accounts for 60% of all mobile data traffic, and is expected to grow nearly nine times by 2019).

¹⁵ See, e.g., Sarah Thomas, *AT&T Woos SMBs with Small-Scale WiFi*, Light Reading (Mar. 26, 2015), <http://www.lightreading.com/mobile/carrier-wifi/atandt-woos-smbs-with-small-scale-wifi/d/d-id/714696> (“Virtualization and the cloud are helping to reduce the need for human capital by automating processes and moving support online. Small cells and WiFi are also making it easier on the connectivity front, giving SMBs options that are easy to install and don’t break the bank.”).

facilitate working outside the office.¹⁶ And the emerging “Internet of Things” is adding wireless Internet connectivity to billions of new devices from watches, to thermostats, to cars.¹⁷

To meet this exploding demand, wireless providers are deploying more and smaller cells and using technologies such as femtocells and distributed antenna systems to make even more efficient use of their limited spectrum.¹⁸ This rapidly growing base of macro cells, small cells,

¹⁶ See, e.g., Nicole Fallon, *No Face Time? No Problem: How To Keep Virtual Workers Engaged*, Business News Daily (Oct. 2, 2014), <http://www.businessnewsdaily.com/7228-engaging-remote-employees.html> (“Thanks to smart devices, cloud computing and constant Wi-Fi access, most desk jobs can be done outside the office. Many companies now allow employees to work remotely in some capacity, and may even have several virtual full-time staff members.”); FierceCable News Release, *Time Warner Cable Business Class Launches Teleworker Solutions Providing for Increased Productivity, Convenience, Flexibility, and Security* (Feb. 25, 2013), <http://www.fiercecable.com/press-releases/time-warner-cable-business-class-launches-teleworker-solutions-providing-in> (“Time Warner Cable Business Class offers remote access services and security applications designed specifically for teleworkers that leverage our advanced technologies and robust network.”).

¹⁷ See, e.g., Sawanobori & Roche, *Mobile Data Demand: Growth Forecasts Met at 5* (“[T]here will be twice as many M2M devices in the U.S. market than smartphones by 2019. By the end of 2020, M2M connections are projected to represent 27 percent of total mobile connections in North America, up from 10.5 percent in mid-2014.”); Sue Rudd, Strategy Analytics, *Small Cells Taking Off, Need Fiber Backhaul Soon at 2* (June 27, 2014) (“Rudd, *Small Cells Taking Off, Need Fiber Backhaul Soon*”) (“Mobile network bandwidth and signaling demands are projected to continue to increase rapidly. Smartphones and tablets spearheaded dramatic applications growth and they will be followed by a flood of new connected mobile sources — from connected car systems, wearables and sensor networks to high bandwidth M2M real time control systems.”).

¹⁸ See, e.g., Rudd, *Small Cells Taking Off, Need Fiber Backhaul Soon at 1-2* (“Mobile Broadband traffic growth accelerated by video demand is now driving the deployment of LTE small cells in urban hot zones and indoor venues. . . . Small cells or ‘spatial reuse’ will play a major role alongside LTE’s ‘new spectrum’ and LTE-A ‘spectral efficiency’ to meet this dramatic growth in capacity demand.”); Small Cell Forum, *Crossing the Chasm: Small Cells Industry at 2* (Nov. 2015), http://www.scf.io/en/white_papers/Crossing_the_Chasm_Small_Cells_Industry_2015.php (“Enterprise small cell shipments are on track for 110% growth in 2015”); FierceWirelessTech, *AT&T, Verizon and Others Ride the DAS Wave* (Aug. 26, 2013), <http://www.fiercewireless.com/tech/special-reports/att-verizon-and-others-ride-das-wave> (“According to a recent forecast from SNS Research, the market for DAS infrastructure gear will grow at a compound annual growth rate (CAGR) of nearly 11 percent over the next five years and account for nearly \$4 billion in revenue.”).

and hotspots have become new points of traffic concentration, each of which requires its own high-speed data connection.¹⁹ Likewise at existing cell sites, wireless providers are increasing backhaul capacity to handle the transition from 3G to 4G LTE and increasing volume of data traffic traversing their network.²⁰

2. *Demand for Wireline Broadband Also Is Rapidly Increasing*

Business customers' increasing needs for data are also driving increasing demand for wireline broadband connections. Businesses today require high-bandwidth applications like datacenter interconnection, disaster recovery, video services, and access to cloud services.²¹ And

¹⁹ See, e.g., Rudd, *Small Cells Taking Off, Need Fiber Backhaul Soon* at 1 (“Mobile Broadband traffic growth accelerated by video demand is now driving the deployment of LTE small cells in urban hot zones and indoor venues.”); Infonetics Research, *Macrocell Mobile Backhaul Equipment and Services: Biannual Worldwide and Regional Market Share, Size, and Forecasts* at 4 (2d ed. Oct. 14, 2014) (“Infonetics Research, *Macrocell Mobile Backhaul Equipment and Services*”) (“The main drivers of the mobile backhaul market are: More phone and mobile broadband subscribers . . . Increased user bandwidth for mobile broadband . . . More new cell sites added for coverage . . .”); Ron Kline, Ovum, *Mobile Backhaul Forecast Report: 2014-19*, at 1 (July 17, 2014) (“Kline, *Mobile Backhaul Forecast Report: 2014-19*”) (“The ongoing mobile network transition to LTE is the key driver for augmenting the backhaul capacity of mobile networks. Ovum is projecting that the mobile backhaul market will grow at a 7% CAGR during the 2013-19 period, exceeding \$12bn by 2019.”).

²⁰ See, e.g., Kline, *Mobile Backhaul Forecast Report: 2014-19*, at 3 (“Mobile operators around the world are upgrading their mobile radio access networks (‘RANs’) with either 3G or 4G LTE technologies. At the same time they must upgrade their mobile backhaul networks to provide more bandwidth.”).

²¹ See, e.g., Nav Chander, IDC, *Market Analysis: U.S. Carrier Ethernet Services 2015-2019 Forecast* (Mar. 2015) (“Chander, *Market Analysis: U.S. Carrier Ethernet Services 2015-2019 Forecast*”) (“Enterprises continue to migrate from packet services and private line services to Ethernet to support high-bandwidth applications like datacenter interconnection, disaster recovery, video services, and direct connections to public cloud services including metro area connectivity.”); Matt Davis, IDC, *Market Analysis: U.S. SMB Telecom Voice and Data Services 2014-2018 Forecast*, at 4 (May 2014) (“Davis, *Market Analysis: U.S. SMB Telecom Voice and Data Services 2014-2018 Forecast*”) (“Broadband serves as the foundation for services ranging from simple email to advanced forms of communication like videoconferencing and increasingly to access cloud-based services that are essential for the efficient running of small businesses in a fast-moving and competitive marketplace.”).

they are replacing traditional TDM-based special access services with Ethernet services that offer greater flexibility, ease of implementation, ability to transport multiple types of traffic, higher bandwidth, and cost effectiveness.²² As a result, analysts project the demand for Ethernet and other enterprise broadband services will continue to rise rapidly.²³ As one competitor describes it, “10 Mbps Ethernet is the new T-1.”²⁴

²² See, e.g., Frost & Sullivan, *Business Carrier Ethernet Services Market Update, 2014*, at 7 (Mar. 2014) (“Carrier Ethernet continues to gain acceptance among enterprises, due to the benefits it offers: scalability, reliability, and cost efficient bandwidth.”); Chander, *Market Analysis: U.S. Carrier Ethernet Services 2015-2019 Forecast*, at 2-3 (“Ethernet service can be purchased in granular bandwidth increments as small as 1Mb and scale to 10Gbps, allowing customers flexible bandwidth choices compared with static overprovisioning, as may be the case with private line connectivity.”); Nav Chander, IDC, *Industry Developments and Models: Carrier Ethernet and Network Virtualization Market Trends* (Sept. 2014) (“Since 2013, there has been a significant global shift from private line TDM services for enterprise WAN communications to a Carrier Ethernet environment.”); Davis, *Market Analysis: U.S. SMB Telecom Voice and Data Services 2014-2018 Forecast*, at 5 (Ethernet services “have traditionally been targeted at the larger enterprise market, but IDC has seen service providers showing a greater focus on the SMB market by enhancing their reach with additional fiber builds — particularly into commercial buildings”).

²³ See, e.g., Chander, *Market Analysis: U.S. Carrier Ethernet Services 2015-2019 Forecast* (“Total Ethernet revenue is expected to grow from \$7.0 billion in 2014 to \$12.1 billion in 2019, a compound annual growth rate (CAGR) of 11.4%.”); Frost & Sullivan, *Business Carrier Ethernet Services Market Update, 2015*, at 37 (Sept. 2015) (forecasting growth in the metro segment revenue for business carrier Ethernet, from \$2.6 billion in 2013 to \$7.4 billion in 2020, at a CAGR of 16.4%); Frost & Sullivan, *Wholesale Carrier Ethernet Services Market Update, 2015*, at 30 (Aug. 2015) (forecasting growth in the metro segment revenue for wholesale carrier Ethernet, from \$2.1 billion in 2013 to \$13.1 billion in 2020, at a CAGR of 27.8%).

²⁴ Presentation of Stephen Webster, VP, Carrier Sales, Charter Business, Comptel Plus Business Expo 2014 Spring, *What’s New and What’s Next in Cable Wholesale?*, at 30 (Mar. 17, 2014), <http://files.comptelplus.org/2014Spring/Slides/Cable%20Slides%20Final%203-15-14.pdf>; see also Cox Business, *The Ethernet Advantage* at 2 (2011), http://xact.spiceworks.com/client_interactive/vendor_pages/cox/imgs/CS-EAAAL_Ethernet%20Advantage%20Advertorial%20-%20Alcatel%20Lucent.pdf (“Ten years ago, 1.5 megabits per second of capacity was fast, and even five years ago it was still pretty good But today 1.5 mbps is nothing. One video conference can use up a megabit per second or more just by itself.”) (quoting Leigh King, Vice President, Cox Business Louisiana).

C. The Commission’s Data Do Not Account for the Dynamic Nature of the High-Capacity Marketplace and Suffer from Other Flaws

The Commission faces a high burden before it may subject a service to regulation. The Commission must find “there is evidence of a market failure and a regulatory solution is available that is likely to improve the net welfare of the consuming public.”²⁵ “At bottom, market failure occurs when there is no incentive for private businesses to provide a service.”²⁶ Market failure is rare: “in most instances market forces will yield economically efficient results.”²⁷

Because the data collection as implemented is far from the comprehensive record the Commission originally envisaged,²⁸ it cannot support the analysis the Commission promised to undertake to evaluate market forces. The data suffer from many shortcomings and fail to capture the growth and change in the dynamic high-capacity marketplace, understating the true extent of actual and potential competition.

First, the Commission collected data for only a single year, even though it originally found at least two years of data were necessary for key parts of the analysis. The Commission recognized “[m]ost importantly, collecting a time series of data will help us assess potential

²⁵ *Amendment of 47 CFR § 73.658(j)(1)(i) and (ii), the Syndication and Financial Interest Rules*, Tentative Decision and Request for Further Comments, 94 FCC2d 1019, ¶ 107 (1983). *See Farmers Union Cent. Exch., Inc. v. FERC*, 734 F.2d 1486, 1508 (D.C. Cir. 1984) (“It is of course elementary that market failure and the control of monopoly power are central rationales for the imposition of rate regulation.”) (citing S. Breyer, *Regulation and Its Reform* 15-16 (1982)).

²⁶ *MB Fin. Group, Inc. v. United States Postal Serv.*, 545 F.3d 814, 819-20 (9th Cir. 2008).

²⁷ FCC, *Biennial Regulatory Review 2000*, 2001 FCC Lexis 378, ¶ 19 (2001); *see also Implementation of Sections 3(n) and 332 of the Communications Act; Regulatory Treatment of Mobile Services*, Second Report and Order, 9 FCC Rcd 1411, ¶ 173 (1994) (“[I]n a competitive market, market forces are generally sufficient to ensure the lawfulness of . . . terms and conditions of service by carriers who lack market power.”).

²⁸ *Notice* ¶ 13.

competition,” by enabling it to “better understand how and why competition has evolved over time and, therefore where potential competition exists.”²⁹ In addition, the Commission acknowledged collecting two years of data was critical to conduct “an analysis that controls for factors that may vary widely across geographic areas, but not within a given geographic area,” whereas with “only one year’s worth of data, we will be less able to associate particular factors with levels of deployment.”³⁰

Second, even with respect to the single year of data the Commission collected, the Commission did not achieve its objective of having “the most-up-to-date data available.”³¹ The Commission requested data for only 2013. It did not collect those data until early 2015. And not until late last year did it make those data available for analysis. As a result, the data do not permit reliable conclusions about the state of competition in the dynamic high-capacity marketplace. As shown in Table 1 below, publicly available data demonstrate that competition has grown significantly since the data were collected.³²

²⁹ *Id.* ¶ 29.

³⁰ *Id.* ¶ 28.

³¹ *Id.* ¶ 27; *Special Access for Price Cap Local Exchange Carriers*, Order on Reconsideration, 29 FCC Rcd 10899, ¶ 10 (2014) (“*Order on Reconsideration*”) (finding that change from collecting two years of data to one, and changing that single year to more recent (2013) data, “allows the Commission to obtain data from the most recent calendar year as originally intended in the *Data Collection Order*.”).

³² According to Vertical Systems Group, the percentage of buildings with more than 20 employees with fiber increased from 10.9% in 2004 to 42.5% in 2014, and by 7% from 2013 to 2014 alone. Vertical Systems Group Press Release, *Business Fiber Penetration hits 42.5% in U.S.* (Mar. 31, 2015), <http://www.verticalsystems.com/vsgpr/business-fiber-penetration-hits-42-5-in-u-s/>; Vertical Systems Group Press Release, *U.S. Business Fiber Gap Narrows in 2013* (Apr. 3, 2014), <http://www.verticalsystems.com/vsgpr/u-s-business-fiber-gap-narrows-in-2013/>.

Table 1. Select Examples of Increased Competition 2013 to 2015 (3Q)
(based on publicly reported data)

	<i>Fiber Route Miles</i>	<i>On-Net Buildings</i>	<i>Bus. Customers</i>	<i>Bus. Revenue</i>
Time Warner Cable	+200,000 (150,000 to 350,000)	+120,000 (860,000 to 980,000)	+110,000 (624,000 to 734,000)	+\$108m (\$2.31b to \$2.42b)
Cox Communications	+12,000 (13,000 to 25,000)	Not available	+30,000~ (300,000+ to 330,000)	+\$400m (\$1.4b to \$1.8b)
Spectrum (Charter)	+0 (65,000 to 65,000)	+2,000~ (10,000+ to 12,000)	+58,000 (375,000 to 433,000)	+\$21m (\$812m to \$833m)
Cablevision Lightpath	+200 (5,600 to 5,800)	+300 (6,700+ to 7,000+)	Not available	-\$59m (\$333m to \$273m)
Comcast	+4,000 (141,000 to 145,000)	Not available	Not available	+\$242m (\$3.24b to \$3.48b)
Level 3	+28,000 (27,000 to 55,000)	Not available	Not available	+\$690m (\$3.95b to \$4.64b)
Windstream	+3,000 (118,000 to 121,000)	Not available	Not available	Not available
Zayo Group	+9,550 (75,950 to 85,500)	+2,846 (7,854 to 10,700)	Not available	+\$88m (\$573m to \$662m)
Lumos Networks	+1,000 (7,400 to 8,400)	+298 (1,344 to 1,642)	Not available	-\$19.6m (\$104.1m to \$84.5m)
Edison Carrier Solutions	+1,000 (4,000 to 5,000)	+0 (140+ to 140+)	Not available	Not available
FiberLight	+300,000 (1.3m to 1.6m)	+1,000 (500 to 1,500)	Not available	Not available
Integra Telecom	+1,000 (3,000 to 4,000)	+1,000 (2,200 to 3,200+)	+0 (85,000 to 85,000)	Not available
Lightower Fiber Networks	+10,000 (20,000+ to 30,000+)	+7,500 (7,500+ to 15,000+)	+0 (2,000+ to 2,000+)	Not available
Unite Private Networks	+1,500 (4,000 to 5,500)	+500 (2,000 to 2,500)	Not available	Not available

Comcast’s recent announcements regarding its business services are one example of the significant growth of competition that has occurred in the past year alone. In September 2015, Comcast announced it had formed a new business unit to provide enterprise broadband services to Fortune 1000 enterprise customers.³³ Comcast made this decision after reporting “continued

³³ Comcast Business Press Release, *Comcast Business Announces New Unit Targeting Fortune 1000 Enterprises* (Sept. 16, 2015) (“Sept. 16, 2015 Comcast Press Release”) <http://corporate.comcast.com/news-information/news-feed/comcast-business-announces-new-unit-targeting-fortune-1000-enterprises>.

growth in the number of customers receiving [its] Ethernet network and cellular backhaul services”³⁴ and growth in revenues at the highest levels “in the business’ history.”³⁵ Comcast stated that it will continue to expand its network and Business Services offerings,³⁶ and in 2015 Comcast added new fiber in ten markets (Vermont; eastern Connecticut; Portland, OR; Denver; Cobb County, GA; northern California; Salt Lake City; Minneapolis-St. Paul; the Scranton/Wilkes-Barre metro area in Pennsylvania; and in Washington state).³⁷ These developments are absent from the Commission’s data even though they are highly relevant — particularly given Comcast’s unique competitive position as the nation’s largest broadband provider — to an evaluation of actual and potential competition in the high-capacity marketplace.

Third, even with respect to the single outdated year of data the Commission collected, much of the data is flawed and incomplete in several respects.³⁸

1) The data regarding high-capacity revenues are unreliable. The revenue totals that competitors report on an annual basis (for CBDS per II.A.15 and for PBDS per II.A.16) do not

³⁴ Comcast Corp., Form 10-K, at 59 (SEC filed Feb. 27, 2015), <http://www.sec.gov/Archives/edgar/data/902739/000119312515068526/d817352d10k.htm>.

³⁵ Thomson Reuters StreetEvents, *Edited Transcript: CMCSA — Q1 2015 Comcast Corp Earnings Call*, at 6 (May 4, 2015) (statement by Comcast Corporation Vice Chairman and CFO Michael Angelakis); Comcast, *1st Quarter 2015 Results*, at 5 (May 4, 2015).

³⁶ Thomson Reuters StreetEvents, *CMCSA — Q4 2014 Comcast Corp Earnings Call*, at 16 (Feb. 24, 2015) (statement by Comcast Corp. EVP and Comcast Cable President & CEO Neil Smit).

³⁷ *See* n.83, *infra*.

³⁸ The list of issues with the data is not comprehensive. Given the short time that Verizon has had to review what the Commission has represented as the complete data set, Verizon’s analysis is still ongoing.

match the sum of the monthly billed revenues that competitors report by circuit and location for these services (II.A.12).³⁹

In addition, despite the best efforts of some parties to report available data, approximately << >> of high-capacity revenues (competitor and ILEC combined) are not associated with an individual address,⁴⁰ and another approximately << >> of high-capacity revenues (competitor and ILEC combined) contain invalid or incomplete addresses. This prevents assigning these to a particular geographic area (*e.g.*, census block or zip code), which precludes a reliable analysis of geographic demand concentration. These same omissions affect the quantities of circuits that providers report by location. And these circuit quantities are also flawed because where providers could not determine the quantity they provided at a given location, they listed the quantity as “.01.”⁴¹ Further, where providers reported circuits with bandwidth above 1 Gigabyte (II.A.4, II.A.12, II.B.3, II.B.4), the Commission did not provide actual bandwidth, but instead masked these data using “-99999.”⁴² These issues impede a reliable analysis of the average billed revenues per circuit for providers individually and collectively.

³⁹ Given the limited time available to review the data, we were unable to do a thorough reconciliation of the revenues to determine the cause of discrepancies.

⁴⁰ Approximately << >> of the revenues that CLECs report pursuant to II.A.12 are not associated with a location, while approximately << >> of the revenues that ILECs report pursuant to II.B.4 are not associated with a location.

⁴¹ *See, e.g.*, <<

>>

⁴² *See Special Access for Price Cap Local Exchange Carriers*, Order and Modified Data Collection Protective Order, 29 FCC Rcd 10899, ¶ 27 (rel. Sept. 18, 2015).

2) The data on competitive facilities are materially incomplete.⁴³ Some providers, despite their best efforts, simply were unable to identify all of the location information that the Commission requested. For example, for at least << >> of the locations at which competitors reported deployed fiber (II.A.4), the Commission's data do not include a standardized address, latitude and longitude information, census block, or a zip code.⁴⁴ As a result, these locations with fiber cannot be correlated with census blocks or zip codes for the purposes of analyzing the extent of competitive facilities. In addition, the data on census blocks with competitive fiber exclude the last-mile of cable networks.⁴⁵ As shown below, however, other Commission and public data indicate that cable operators supply a significant share of all last-mile connections to high-capacity customers, and they have been expanding those connections faster than other competitive providers. Further, many of the locations for which providers report data do not contain a location type, such as whether it constitutes a building, cell-site, or other type of man-made structure. For example, the location type cannot be

⁴³ The Commission also never provided data regarding the date that competitors provided fiber. As a fallback when the data request was cut from two years to one, the Commission indicated it would give providers a sample list of locations at which they reported competitive facilities to indicate the year in which those facilities were deployed. *Order on Reconsideration*, Data Collection at 6 (II.A.6). Those data (assuming a meaningful sample) would have helped gauge the trend of special access competition, which is relevant for, among other things, evaluating potential competition. But the Commission never provided this list nor provided any reason for its failure to do so.

⁴⁴ CLEC and ILEC locations for which the Commission provided standardized information were reported in the CLECLocations_Geocoded, ILECLocations_Geocoded, IIA04_Building_xWalk, and IIB03_Building_xWalk crosswalk files. The total here represents the unique Location_IDs (II.A.4) at which competitors have deployed fiber (including IRUs), for which standardized address/city/state, zip code, census block, or latitude/longitude information were not available (in CLECLocations_Geocoded and IIA04_Building_xWalk crosswalk files), divided by the unique combination of non-blank Filer_FRNs and Location_IDs reported in II.A.4.

⁴⁵ See *Order on Reconsideration*, Instructions at 13 (II.A.5).

determined for approximately << >> of the total locations at which competitive fiber is reported; the location type is marked as “unknown.” Each of these flaws has the effect of understating the extent of competitive facilities deployment.

3) The Commission’s data do not provide the locations where competitors are providing service using ILEC special access. Although the focus here is determining the extent of competitive facilities, data on locations competitors serve using special access is relevant to the scope of potential facilities-based competition. For example, where competitors serve a large number of customers at the same or adjacent locations using special access, it may indicate that it is viable for them to deploy facilities at those locations. In addition, comparing the revenue opportunities at locations that competitors serve using special access with the revenues at locations competitors serve using their own facilities is relevant to assessing the economic opportunities that justify such deployment.

4) Despite the Commission’s and NORC’s efforts, the process of obtaining access to the data has impeded efforts to perform a comprehensive analysis. The data made available to the public through NORC were incomplete when first made available, and they contained known omissions until the week before this filing was originally due.⁴⁶ The data were subject to frequent updates, each of which typically required a recalculation of prior formulas and analyses or brand-new calculations.⁴⁷ In many cases, Verizon’s and other parties’ outside counsel and

⁴⁶ See, e.g., ReadMe (011316).docx, *attached to* E-mail from Daniel Lee, NORC, to Data Enclave Managers, re: xWalk Table Update (Jan. 13, 2016) (describing changes to be posted to the enclave on January 13, 2016).

⁴⁷ See Declaration of Glenn Woroch in Support of Request for Extension of Time to File Comments, *attached to* Joint Request for Further Extension of Time of the United States Telecom Association and ITTA – The Voice of Mid-Size Communications Companies, WC Docket No. 05-25 & RM-10593 (FCC filed Nov. 10, 2015).

consultants found omissions, raising the specter that other unknown omissions or problems remain. For example, data on locations where Comcast has deployed fiber were not available in the enclave until December 31, 2015, 24 days after Verizon notified NORC of its omission. In other cases, NORC did not make system-wide announcements of changes NORC made to the data, making it impossible for Verizon to determine whether it has made all the necessary adjustments to its analyses. As a result of these and other difficulties in accessing and using the data, the parties have had just a few weeks to analyze what has been represented as a complete data set.

II. Despite Flaws with the Data, the Record Demonstrates Extensive Competition for High-Capacity Services in Areas with Concentrated Demand

Despite these problems, the record confirms competitors have deployed facilities in large and small areas throughout the country — not only in downtown areas, but in all types of locations where there is concentrated demand for high-capacity services. The record also shows a wide range of providers and significant new entry, including from cable operators, and that different types of competitors are succeeding in this marketplace, using a wide array of high-capacity services.

A. The Commission Should Not Adopt Arbitrary or Narrow Market Definitions

The Commission’s data do not permit an evaluation of competition using product and geographic markets defined using a formal antitrust approach.⁴⁸ The record nonetheless contains

⁴⁸ Under the DOJ and FTC Merger Guidelines, product and geographic markets are generally determined according to three factors: demand-side substitution, supply-side substitution, and potential competition. *2010 DOJ/FTC Horizontal Merger Guidelines* § 4. Demand-side substitution looks at consumers’ reaction to a small but significant non-transitory increase in price, while supply-side substitution looks at the response of suppliers to such price increases. *See id.* These types of analyses require historical data, which is precisely why the *Notice* indicated that the Commission’s proposal to conduct panel regressions using historical data “will assist us in delineating both relevant product and geographic markets.” *Notice* ¶ 68. Because the

considerable information about how competition in the high-capacity marketplace actually works, which is relevant both to the types of services that are being sold and purchased interchangeably in the marketplace and to the geographic areas that reflect the scope of competitive entry for these services.

First, the record demonstrates the Commission's analysis should include all forms of high-capacity services that customers are using to meet their needs, which includes not just legacy TDM-based special access services but also Ethernet services and best-efforts broadband services offered by cable. Many customers prefer Ethernet services and cable modem services over traditional special access because of the superior technology and value proposition they offer. And just as cars may substitute for horses and buggies, but not vice versa, Ethernet services are a competitive alternative for legacy special access services even where legacy special access services may not meet the needs of a customer seeking the benefits that Ethernet offers. In these cases where competition from a new technology substitutes primarily in one direction, it is proper to analyze the new technology, in this case Ethernet, as a competitive alternative to the legacy services it replaces.⁴⁹

Second, the record demonstrates that facilities-based competitors typically enter markets at the level of a metropolitan area and not in small geographic areas like an individual office building or city block. Although the Commission has observed that demand varies significantly

Commission did not collect any historical data, however, it is unable to do these panel regressions or to perform a formal product market definition.

⁴⁹ See, e.g., *United States v. Microsoft Corp.*, 253 F.3d 34, 49 (D.C. Cir. 2001) (“Rapid technological change leads to markets in which firms compete through innovation for temporary market dominance from which they may be displaced by the next wave of product advancements.”).

within an MSA and that areas with higher demand tend to attract greater competition,⁵⁰ it does not necessarily follow that an MSA or metropolitan area is an improper unit of geographic analysis. Rather, it is precisely because most demand within an MSA or metropolitan area may be heavily concentrated within a subset of the geographic area, that it makes sense — for economic and administrative reasons — to use this as the starting unit of geographic analysis. As economists Mark Israel, Dan Rubinfeld, and Glenn Woroch explain in their white paper, *Competitive Analysis of the FCC’s Special Access Data Collection*, the data show that competitive facilities have typically been deployed in the census blocks that cover more than 80% of special access demand in << >> where Phase II pricing flexibility has been granted.⁵¹

Using metropolitan areas or some other broad geographic area to evaluate demand and competition is consistent with how the marketplace actually works. As discussed further below, when competitors announce the availability of their services, they do so in terms of broad geographic areas, such as entire metropolitan areas. Competitors deploy networks that are within reach of all or most of the concentrated demand within a given metropolitan area. The competitor will then market its service broadly throughout the geographic area, and it will serve customers on demand, where it believes it is likely to earn a profit from doing so. The economic consideration is not limited solely to the revenues from the customer at hand, at a given building or location, but may also consider the economic opportunities from adjacent locations within that

⁵⁰ *Special Access for Price Cap Local Exchange Carriers*, Report and Order, 27 FCC Rcd 10557 ¶¶ 35-37 (2012).

⁵¹ M. Israel, D. Rubinfeld & G. Woroch, *Competitive Analysis of the FCC’s Special Access Data Collection*, WC Docket No. 05-25 & RM-10593, at Table All-MSA-PEN-C (FCC filed Jan. 27, 2016) (“Israel *et al.*, *Competitive Analysis of the FCC’s Special Access Data Collection*”).

same vicinity. Thus, once the Commission identifies areas of concentrated demand within each metropolitan area, it should determine whether there are competitors serving that area of concentrated demand and, if so, conclude that competition is possible throughout that concentrated area.

The Commission also should take into account administrative practicality when delineating the areas where demand is concentrated. The Commission has provided data that would permit the concentration of demand to be measured according to either census blocks or zip codes. For example, the Commission could use the data to determine, for each metropolitan area, the subset of census blocks or zip codes in that area that account for the majority of high-capacity demand, using data on high-capacity revenues in those areas, business establishments, or both. In virtually every metropolitan area, the Commission is likely to find that the vast majority of high-capacity demand in that area is concentrated in a small number of census blocks or zip codes, and that actual or potential competition exists in those concentrated areas.

This approach is further warranted because the dynamics of the competitive marketplace ensure that the benefits of competition redound to all customers in an area where competitive facilities have been deployed, not just those who are located within a certain distance of a network, or that offer a certain level of revenues. When a potential customer for high-capacity services solicits bids or otherwise requests service, providers have no way of knowing with any reasonable degree of certainty which other providers are capable of serving that customer over their own facilities, particularly if the customer is seeking service at more than one location. Competing providers don't have precise details of each other's networks or know each other's business rules for extending those networks — which is precisely why the Commission has gone to great lengths to protect the highly confidential nature of this type of competitive data. They

must instead make much rougher assessments of the possibility of facing competitive bids, based, for example, on the presence of competitive facilities within the general vicinity of the customer. The Commission's approach to analyzing competition for high-capacity services should follow this same marketplace dynamic.

Finally, when the Commission analyzes the competitive alternatives at a granular geographic level, whether a census block or zip code, it must consider whether those areas are capable of supporting competitive facilities, not on whether they have already been deployed there. That inquiry must look not only where competition has emerged and is likely to emerge based on current economics, but also where competition is likely to be possible in the future based on the dynamic shifts that are occurring in the marketplace. For example, the Commission must determine the locations where competitors are likely to extend high-capacity facilities in the near term, given rising demand, as well as the locations where demand is sufficiently concentrated in 2013 or even today. It must also determine how this future deployment will beget still further competition, recognizing that once facilities have been deployed to a location, they can typically be used to serve many adjacent locations at much lower marginal cost.⁵² For example, after Zayo signed a deal in December 2015 to provide fiber-to-the-tower backhaul services to “over 500 towers” in Atlanta, it announced it would “leverage its expanded Atlanta network to provide lit and dark fiber services to other enterprises and carrier customers.”⁵³ The

⁵² See, e.g., Simon Flannery & Lisa Lam, Morgan Stanley, *Level 3 Communications, Inc. 3Q13 Preview: Enterprise Growth and Ongoing Cost Initiatives Are Key Focuses* at 3 (Oct. 28, 2013) (Observing that, because Level 3 already has extensive fiber networks in place, “the cost [for Level 3] to add fiber to a new building is fairly low relative to [its] peers.”).

⁵³ Zayo Press Release, *Zayo To Significantly Expand Fiber-to-the-Tower Footprint in Atlanta* (Dec. 2, 2015), <http://www.zayo.com/news/zayo-to-significantly-expand-fiber-to-the-tower-footprint-in-atlanta/>.

Commission must therefore analyze how the rapidly rising demand for fiber-based wireless backhaul creates opportunities for competitors that they can in turn “leverage” to serve other locations and customers.

B. Competitive Facilities Are Widespread and Capable of Serving All Locations in Areas with Concentrated Demand for High-Capacity Services

1. Competitors Have Deployed Facilities in All Metropolitan Areas with Concentrated Demand for High-Capacity Services

Competitors typically deploy a core network in a geographic area where the highest concentration of potential customers reside, such as a downtown metropolitan area or office park, and then attach individual locations to that core as they win customers.⁵⁴ According to the Commission’s data, competitors have deployed networks capable of providing high-capacity services in all metropolitan areas throughout the country that contain concentrated demand for these services.

The *Competitive Analysis of the FCC’s Special Access Data Collection* finds competitors have deployed facilities in << >>.⁵⁵ This analysis further shows that competitive providers have deployed facilities in more than << >> of the census blocks with any demand for high-capacity services.⁵⁶ Competitive facilities are even more widespread in the

⁵⁴ See, e.g., *Unbundled Access to Network Elements*, Order on Remand, 20 FCC Rcd 2533, ¶ 154 (2005) (stating that when competitive LECs are deciding whether and where to build their own facilities, they “target areas that offer the greatest demand for high-capacity offerings (i.e., that maximize potential revenues) and that are close to their current fiber rings (i.e., that minimize the costs of deployment). The evidence in the record shows that the highest concentration of competitive LEC deployment of loops in the central business districts of large metropolitan areas are near where competitors have already deployed fiber rings.”).

⁵⁵ See Israel *et al.*, *Competitive Analysis of the FCC’s Special Access Data Collection* at Table All-MSA-PEN-C.

⁵⁶ See *id.* at Table C.

relatively small subset of census blocks in which high-capacity demand is most heavily concentrated. For example, competitive facilities are deployed in virtually all — << >> — of the census blocks that account for 80% of U.S. business establishments, a reasonable proxy for special access demand.⁵⁷ Excluding data from the National Broadband Map, the *Competitive Analysis of the FCC’s Special Access Data Collection* finds that competitive facilities have been deployed to more than << >> of the census blocks with any high-capacity demand, and to more than << >> of the census blocks that account for 80% of business establishments.⁵⁸

Verizon’s own analysis of the data at the zip code level confirms these findings.⁵⁹ According to the data, competitive providers report deployed fiber (including IRUs) to approximately << >> locations, including at least << >> locations competitors self-identify as “buildings.”⁶⁰ Within Verizon’s ILEC footprint, competitors report fiber at

⁵⁷ See *id.* at Table C-PF2.

⁵⁸ See *id.* at Tables F-CP & F80.

⁵⁹ Verizon was not able to do the same level of analysis for census blocks as for zip codes. The Commission did not provide location data by census block until the update posted by NORC on January 13, 2016 that was available for review on January 14, 2016 and corrected on January 15, 2016. See *ReadMe (011316).docx*, attached to E-mail from Daniel Lee, NORC, to Data Enclave Managers, re: xWalk Table Update (Jan. 13, 2016); E-mail from Daniel Lee, NORC, to Data Enclave Managers, re: Updated Tables (Jan. 19, 2016). In addition, Verizon did not have access to business establishment data by census block.

⁶⁰ See II.A.4 data (limiting results to locations where “MEDIUM” = Y; excluding locations served using only UNEs or unbundled copper loops according to supplier data, or outside of the 50 states and the District of Columbia); CLECLocations_Geocoded crosswalk file (standardized zip codes for locations reported in response to Question II.A.4); IIA04_Building_xWalk crosswalk file (standardized census block and “geo_bldg” codes based on building latitude/longitude analysis by the FCC); SPADC Filers (122915).xlsx (company names by FRN) (collectively, “*Locations Served by Competitive Fiber Sources*”). Verizon’s calculations here are conservative because they exclude approximately << >> reported locations without “geo_bldg” codes, preventing unique locations from being determined. It also excludes locations marked with an “unknown” location type (*i.e.*, “LOC_TYPE” = 6), even though many may be buildings.

approximately << >> locations, including at least << >> buildings.⁶¹ Competitors have deployed fiber to locations in at least << >> zip codes that contain approximately << >> of the U.S. population,⁶² and at least << >> census blocks that contain approximately << >> of the U.S. population.⁶³ In Verizon's ILEC footprint, competitors have deployed fiber to locations in at least << >> zip codes that contain approximately << >> of the population in that footprint,⁶⁴ and at least << >> census blocks that contain approximately << >> of the population in that footprint.⁶⁵ Zip codes with

⁶¹ See *Locations Served by Competitive Fiber Sources* described in n.60. Verizon's ILEC footprint is based on census blocks for Verizon locations that appear in the IIB03_Building_xWalk crosswalk file, based on Verizon's response to Question II.B.3, as well as census blocks reported by Verizon in Attachment II.C.1-1 in response to Question II.C.1.

⁶² See *Locations Served by Competitive Fiber Sources* described in n.60, adding the missing leading zeros where zip codes appeared with only three or four digits; U.S. Census Bureau, 2010 Decennial Census Data for Total Population by 5-Digit ZIP Code Tabulation Areas within United States and Puerto Rico, http://factfinder.census.gov/faces/nav/jsf/pages/download_center.xhtml. The U.S. Census Bureau publishes population estimates for "ZIP Code tabulation areas" (ZCTAs), which are geographic representations of ZIP Codes made up of groupings of census blocks." U.S. Census Bureau, *Frequently Asked Questions: Why Does the Census Bureau Only Have Data for ZIP Code Tabulation Areas (ZCTAs) and Not for ZIP CodesTM?*, <https://ask.census.gov/faq.php?id=5000&faqId=10488>.

⁶³ See *Locations Served by Competitive Fiber Sources* described in n.60; CensusBlocksWithFiber crosswalk file based on mapping data filed in response to Question II.A.5, excluding census blocks outside of the 50 states and District of Columbia; IIA04_Building_xWalk crosswalk file identifying census blocks for competitors' locations reported in response to Question II.A.4; U.S. Census Bureau, 2010 Census population and topological data by census block, <http://www2.census.gov/geo/tiger/TIGER2010BLKPOPHU/> and <ftp://ftp2.census.gov/geo/tiger/TIGER2010/TABBLOCK/2010> (collectively, "*Census Block Sources*").

⁶⁴ See *Locations Served by Competitive Fiber Sources* described in n.60. Verizon's ILEC footprint is based on standardized zip codes for Verizon locations that appear in the ILECLocations_Geocoded crosswalk file, based on Verizon's response to Question II.B.3.

⁶⁵ See *Locations Served by Competitive Fiber Sources* described in n.60; *Census Block Sources* described in n.63; Verizon's ILEC footprint based on census blocks described in n.61.

competitive fiber contain approximately << >> of all business establishments nationwide, and approximately << >> of all business establishments within Verizon’s ILEC footprint.⁶⁶ And as shown in Table 2, competitive fiber has been deployed in zip codes containing even higher percentages of the larger business establishments that typically purchase high-capacity services.⁶⁷ Although the Commission’s data suffer from flaws that prevent a significant percentage of high-capacity revenues to be assigned to a zip code (or census block), based on those data, approximately << >> of zip codes nationwide with high-capacity revenues account for approximately 80% of high-capacity revenues that can be assigned to zip codes, and approximately << >> of census blocks nationwide with high-capacity revenues account for approximately 80% of high-capacity revenues that can be assigned to census blocks.⁶⁸

⁶⁶ See *Locations Served by Competitive Fiber Sources* described in n.60, adding the missing leading zeros where zip codes appeared with only three or four digits; Verizon’s ILEC footprint described in n.64; and U.S. Census Bureau, *County Business Patterns: 2013: Complete ZIP Code Industry Detail File*, ftp://ftp.census.gov/econ2013/CBP_CSV/zbp13detail.zip (total number of establishments by zip code) and *ZIP Code Industry Detail Record Layout*, http://www.census.gov/econ/cbp/download/noise_layout/ZIP_Detail_Layout.txt (together, “U.S. Census Bureau Establishments by Zip Code Data”). Census Bureau data are not available by zip code for 0.2% of all business establishments, including 0.3% with 5 or more employees, 0.4% with 20 or more employees, 1% with 100 or more employees, and 9% with 1,000 or more employees. See U.S. Census Bureau, *County Business Patterns: 2013: Complete ZIP Code Industry Detail File*, ftp://ftp.census.gov/econ2013/CBP_CSV/zbp13detail.zip (data for the invalid 99999 zip code). The number of competitors in Table 2 consolidates affiliated entities that separately reported data, where affiliations were disclosed in response to Question II.A.1.

⁶⁷ Many competitors state they principally target businesses with 20 or more employees. See §§ II.C & II.D. According to U.S. census data, there are 7,488,353 business establishments nationwide, 4,088,288 of which (55%) have 1-4 employees. See U.S. Census Bureau, *2013 County Business Patterns (NAICS)*, <http://censtats.census.gov/cgi-bin/cbpnaic/cbpsect.pl>.

⁶⁸ Total special access revenues were calculated using the sum of “Total_Billed” in response to Questions II.A.12 and II.B.4, assigned to locations for which the Commission provided standardized zip codes in the CLECLocations_Geocoded and ILECLocations_Geocoded crosswalk files, or standardized census blocks in the IIA04_Building_xWalk and IIB03_Building_xWalk crosswalk files. Locations outside of the 50 states and the District of Columbia were excluded from these analyses.

Competitors have deployed fiber to approximately << >> of the zip codes representing 80% of high-capacity revenues that can be assigned to zip codes, and << >> of the subset of top zip codes that comprise 80% of total high-capacity revenues in Verizon’s ILEC footprint that can be assigned to zip codes.⁶⁹ Competitors have deployed fiber to approximately << >> of the census blocks representing 80% of high-capacity revenues that can be assigned to census blocks, and << >> of the subset of top census blocks that comprise 80% of total high-capacity revenues in Verizon’s ILEC footprint that can be assigned to census blocks.⁷⁰

Competitors:	Nationwide			Verizon’s ILEC Footprint		
	1 or More	2 or More	3 or More	1 or More	2 or More	3 or More
All Establishments	<< >>	<< >>	<< >>	<< >>	<< >>	<< >>
5+ Employees	<< >>	<< >>	<< >>	<< >>	<< >>	<< >>
20+ Employees	<< >>	<< >>	<< >>	<< >>	<< >>	<< >>
100+ Employees	<< >>	<< >>	<< >>	<< >>	<< >>	<< >>
1000+ Employees	<< >>	<< >>	<< >>	<< >>	<< >>	<< >>

These totals understate the true extent of competitive deployment, however. First, they exclude many locations with competitive facilities for which the address information was incomplete. *See* § I.C, *supra*. Second, they look only at competitive fiber, even though competitors are capable of and are providing high-capacity services using other technologies such as fixed wireless.

C. Cable Companies Are Significant and Rapidly Growing Competitors for High-Capacity Services

A key reason the availability and use of competitive high-capacity facilities has grown so rapidly and significantly in recent years is the entry of cable operators in this marketplace. In

⁶⁹ *See id.*; Verizon’s ILEC footprint described in n.64.

⁷⁰ *See* revenue calculation described in n.68; Verizon’s ILEC footprint based on census blocks described in n.61.

1999, when the Commission instituted pricing flexibility for special access services, cable companies had only just begun to upgrade their networks to provide broadband services.⁷¹ Fifteen years later, cable companies are not only increasingly dominant providers of wireline residential broadband nationwide, but they also have expanded their networks and services to provide dedicated high-capacity services to businesses of all sizes as well as to other providers. As analyst IDC observes, cable companies are now “a disruptive wild card that may choose to bring enormous pressure on pricing in order to realize quick market share gains.”⁷² Indeed, the enterprise-focused units of the largest cable operators — Time Warner Cable, Comcast, and Cox — have in just a few years become the fifth, sixth, and eighth largest providers of Ethernet services in the United States, respectively.⁷³ And as one cable industry executive recently acknowledged at a major industry conference, “there is no reason cable can’t serve this [enterprise] market and dominate it.”⁷⁴

⁷¹ California Cable & Telecommunications Association, *History of Cable*, <http://www.calcable.org/learn/history-of-cable/> (“Also during the latter half of the decade, cable operating companies commenced a major upgrade of their distribution networks, investing \$65 billion between 1996 and 2002 to build higher capacity hybrid networks of fiber optic and coaxial cable.”); NCTA, *Cable’s Story*, <https://www.ncta.com/who-we-are/our-story> (“The early 2000’s saw the benefits of cable’s massive investment to build high-capacity hybrid fiber-coax networks. Soon after, operators began delivering digital and HD video, high-speed Internet access, and two-way voice services to the home.”).

⁷² Davis, *Market Analysis: U.S. SMB Telecom Voice and Data Services 2014-2018 Forecast*, at 6.

⁷³ See, e.g., Vertical Systems Group, *Mid-Year 2015 U.S. Carrier Ethernet LEADERBOARD* (Aug. 24, 2015), <http://www.verticalsystems.com/vsglb/mid-year-2015-u-s-carrier-ethernet-leaderboard/> (Time Warner Cable, Comcast, and Cox are the fifth, sixth, and eighth largest providers of Ethernet services in the United States, respectively).

⁷⁴ Carol Wilson, *Cable Looking Past AT&T, Verizon*, Light Reading (Dec. 4, 2015), <http://www.lightreading.com/cable/cable-business-services/cable-looking-past-atandt-verizon/d/d-id/719679> (statement by Bright House Networks chief network officer and VP-enterprise solutions Craig Cowden: “AT&T and Verizon aren’t as focused on this space as they

Cable companies have expanded quickly and aggressively into the high-capacity marketplace. Since 2013, each of the major cable operators has expanded its networks and operations.⁷⁵

Comcast's experience vividly illustrates this rapid and aggressive evolutionary path. Comcast started its Business Service unit in 2006 when it "made the decision to package our Internet and voice services for a new market — the small business."⁷⁶ It started "targeting companies with less than 20 employees" and later "expanded [its] product portfolio to introduce better solutions aimed at larger, mid-market businesses with up to 500 employees."⁷⁷ By the end of 2012, Comcast reported "Business Services has become a \$2.4 billion unit" and "is the second-largest contributor to Cable revenue growth at Comcast behind high-speed Internet."⁷⁸ And more recently, Comcast expanded from serving small-to-medium sized business to serving large ones. In September 2015, Comcast established a new "Enterprise Services" division to sell broadband, WiFi, Ethernet and other services to Fortune 1000 companies.⁷⁹ In just the first nine months of 2015, Comcast signed up 25 to 30 enterprise customers with \$45 million in

used to be. . . . Other competitive operators are, but there is no reason cable can't serve this enterprise market and dominate it.").

⁷⁵ See Table 1, *supra*; Ex Parte Letter from Curtis L. Groves, Verizon, to Marlene H. Dortch, FCC, WC Docket No. 05-25 & RM-10593, at 2-4 & Appendix (Sept. 24, 2015).

⁷⁶ Comcast, *Business Services Tops \$2.4 Billion in Revenue at Comcast Cable*, <http://corporate.comcast.com/news-information/news-feed/business-services-tops-1-8-billion-at-comcast-cable>.

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ Sept. 16, 2015 Comcast Press Release, <http://corporate.comcast.com/news-information/news-feed/comcast-business-announces-new-unit-targeting-fortune-1000-enterprises>.

contracts.⁸⁰ In 2014, Comcast Business reported revenue of \$4 billion, up 22% from 2013, and stated that it expects to earn \$1 billion from large enterprise customers alone within the next few years.⁸¹ Comcast plans to serve enterprise customers not only within its cable territory, but in major markets nationwide, such as Los Angeles and New York City, through partnerships with other competitors such as Time Warner Cable and Cox Communications.⁸² And since the beginning of 2015, Comcast announced new fiber in at least ten markets (Vermont; eastern Connecticut; Portland, OR; Denver; Cobb County, GA; northern California; Salt Lake City; Minneapolis-St. Paul; the Scranton/Wilkes-Barre metro area in Pennsylvania; and in Washington state).⁸³

⁸⁰ CNBC, *Comcast Creates Enterprise Services Unit to Target Big Businesses* (Sept. 16, 2015), <http://www.cnbc.com/2015/09/16/comcast-creates-enterprise-services-unit-to-target-big-businesses.html>.

⁸¹ *Id.*

⁸² *Id.*

⁸³ Comcast Business Press Release, *Comcast Business Extends Fiber Network To Bring Multi-Gigabit Ethernet Services to Three Communities in Sullivan County, New Hampshire, and Windsor County, Vermont* (Mar. 2, 2015); Comcast Business Press Release, *Comcast Business Launches 10 Gigabit-per-Second Ethernet Services Across Six Towns and Cities in New London County, Connecticut* (Mar. 30, 2015); Comcast Business Press Release, *Comcast Business Expands Fiber Network to Businesses Moving into Portland's Central Eastside* (May 12, 2015); Comcast Business Press Release, *Comcast Expands Fiber Network Throughout the Denver Metro Area* (Apr. 7, 2015); Comcast Business Press Release, *Cobb County Selects Comcast Business Ethernet to Connect 34 Sites for Improved Access to Information and Services for Residents* (June 3, 2015); Comcast Business Press Release, *Comcast Business To Expand Multi-Gigabit Ethernet in East Bay with \$2 Million Fiber Extension* (Apr. 6, 2015); Comcast Business Press Release, *Comcast Business Extends Fiber-Based Network to San Ramon Business Park* (Oct. 28, 2015); Comcast Business Press Release, *Comcast Business Extends Fiber-Based Network to Modesto Business Park* (Nov. 10, 2015); Comcast Business Press Release, *Comcast Launches New Fiber-Based Network and Internet and Phone Services at Two Napa Business Parks to Support Local Business Innovation and Productivity* (Dec. 9, 2015); Comcast Business Press Release, *New DataVaulting Service Based Inside Granite Mountain Combines Virtual with Physical Security* (July 22, 2015); Comcast Business Press Release, *Comcast Supports Local Business Innovation and Productivity with New High Speed Connections for Salinas Municipal Airport Business District* (July 28, 2015); Comcast Business Press Release, *Comcast Business*

Other major cable companies report a similar focus and success in providing high-capacity services to business customers.⁸⁴

- **Time Warner Cable** just reported its “17th consecutive quarter of year-over-year growth above \$100 million.”⁸⁵ The company states that “Business Services is performing very well and we’re still targeting at least \$5 billion in annual revenue in the Business Services area by 2018.”⁸⁶ Through the first nine months of 2015 alone, Time Warner “added 50,000 commercial buildings to our network, representing almost \$750 million in serviceable annual opportunity,” including “18,000 commercial buildings” added in the third quarter alone.⁸⁷ To put this in perspective, Time Warner Cable reported to the Commission that, as of 2013, it had deployed fiber at approximately << >> locations, including at least << >> buildings.⁸⁸

Expands Network in Twin Cities (Oct. 8, 2015); Comcast Business Press Release, *Comcast Business Investment Expands Fiber Network Throughout CenterPoint Commerce & Trade Park* (Oct. 29, 2015); Comcast Business Press Release, *Comcast Business Extends Ethernet Network to Redmond-Woodinville Business District* (Nov. 4, 2015); Comcast Business Press Release, *Comcast Business Helps Local Businesses Embrace Technology with High-Performance Communications Network in Fife, Washington* (Dec. 9, 2015).

⁸⁴ Davis, *Market Analysis: U.S. SMB Telecom Voice and Data Services 2014-2018 Forecast*, at 12-13 (“Cable operators have moved from broadband to single line VoIP offerings, but now they are making the move into SIP trunking, unified communications, and additional services like storage and security. . . . Cable operators are seeking new areas for growth and a way to leverage their increasing voice capabilities. The entry of this group will disrupt pricing and create a new focus on the SMB telecom voice and data services marketplace.”).

⁸⁵ Time Warner Cable Earnings Call Transcript, Q3 2015 Earnings Call (Oct. 29, 2015) (statement of William F. Osbourn, Jr., Senior Vice President, Controller, Chief Accounting Officer & Acting Co-Chief Financial Officer, Time Warner Cable).

⁸⁶ *Id.*

⁸⁷ Time Warner Cable Earnings Call Transcript, Q3 2015 Earnings Call (Oct. 29, 2015) (statement of Matthew Siegel, Senior Vice President, Treasurer, and Acting Co-Chief Financial Officer, Time Warner Cable).

⁸⁸ See Time Warner Cable II.A.4 Response and *Locations Served by Competitive Fiber Sources* described in n.60. This includes locations with unique “geo_bldg” codes, as well as locations for which the FCC did not provide “geo_bldg” codes.

- **Cox** states that “[c]arrier services is a big push for [Cox Business],” and that it has experienced “double-digit growth again in the wireline last mile.”⁸⁹
- **Cablevision** says its Lightpath unit “continues to be a nice growth area for [Cablevision],” with its “Ethernet business . . . growing much more rapidly than [Lightpath’s 6% revenue growth] number would indicate.”⁹⁰
- **Charter** reports that “[c]ommercial revenue grew by approximately 13%” in the most recent quarter and its “repositioned the business to grow faster just like we did the residential business four years ago.”⁹¹ Charter sees “tremendous upside” for future growth and is “very bullish on the future of enterprise.”⁹² Charter claims that it is expanding “to nearly 300 new companies/buildings in Charter markets every month,”⁹³ which is an average of 3,600 buildings per year. By comparison, Charter reported to the Commission that, as of 2013, it had deployed fiber at << >> locations, including << >> buildings.⁹⁴

Cable also has vast potential to provide high-capacity services to a far greater number of locations than they currently serve today. Cable companies do not define the scope of their competitive presence in narrow geographic terms such as route miles of fiber or on-net buildings.

⁸⁹ Carol Wilson, *Cox Biz Looks Beyond SMBs*, LightReading (Dec. 4, 2014) (“Wilson, *Cox Biz Looks Beyond SMBs*”), <http://www.lightreading.com/cable-video/cable-business-services/cox-biz-looks-beyond-smbs/d/d-id/712419> (quoting Cox Business SVP Steve Rowley).

⁹⁰ *Cablevision Systems Corp. at Bank of America Merrill Lynch Media, Communications and Entertainment Conference – Final*, FD (Fair Disclosure) Wire, Transcript 091614a5486218.718 (Sept. 16, 2014) (statement by Cablevision Systems Corp. Vice Chairman and CFO Gregg Seibert); *CVC – Cablevision Systems Corp at Deutsche Bank Media, Internet and Telecom Conference*, FD (Fair Disclosure) Wire, Transcript 030915a5637615.715 (Mar. 9, 2015) (statement by Cablevision Systems Corporation Vice Chairman Gregg Seibert).

⁹¹ Charter Communications Earnings Call Transcript, Q3 2015 Earnings Call (Oct. 29, 2015) (statement of Thomas M. Rutledge, President, CEO & Director, Charter).

⁹² *Id.*

⁹³ See Charter Business Presentation, Comptel Plus Business Expo 2014 Spring, *What’s New and What’s Next in Cable Wholesale?*, at 28 (Mar. 17, 2014), <http://files.comptelplus.org/2014Spring/Slides/Cable%20Slides%20Final%203-15-14.pdf>.

⁹⁴ See Charter II.A.4 Response and *Locations Served by Competitive Fiber Sources* described in n.60. This includes locations with unique “geo_bldg” codes, as well as locations for which the FCC did not provide “geo_bldg” codes.

Instead, they market their enterprise services as widely available throughout their incumbent cable territories, and they target wide swaths of customers within these broad footprints. For example:

- **Comcast** markets the availability of its Metro Ethernet service <<

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>> but instead “targets its Dedicated Services to <<

>>

Comcast “primarily targets customers <<

>> which reflects the advantages Comcast enjoys from its widespread broadband network.”⁹⁶

- **Cox’s** reported data indicate that it has facilities at approximately << >> locations in Louisiana,⁹⁷ but its marketing material states that “[w]ith our network, we have the capability to serve 90% of all existing businesses in greater New Orleans, greater Baton Rouge and Acadiana.”⁹⁸
- **Time Warner Cable** states that it << >>⁹⁹ The company boasts “58,000 unique fiber lit buildings and 100,000 near net.”¹⁰⁰

⁹⁵ Comcast II.A.10 Response. In describing its expansion plans, Comcast likewise uses <<

>> *See id.*

⁹⁶ Comcast II.D.1 Response.

⁹⁷ *See* Cox II.A.4 Response and *Locations Served by Competitive Fiber Sources* described in n.60. This includes locations in Louisiana with unique “geo_bldg” codes, as well as locations for which the FCC did not provide “geo_bldg” codes.

⁹⁸ Cox Business, *The Ethernet Advantage*, at 2 (2011), http://xact.spiceworks.com/client_interactive/vendor_pages/cox/imgs/CS-EAAAL_Ethernet%20Advantage%20Advertorial%20-%20Alcatel%20Lucent.pdf (quoting Leigh King, Vice President, Cox Business Louisiana).

⁹⁹ Time Warner Cable II.D.1 Response.

¹⁰⁰ *See, e.g.*, Time Warner Cable Business Class Presentation, Comptel Plus Business Expo 2014 Spring, *What’s New and What’s Next in Cable Wholesale* at 22 (Mar. 17, 2014), <http://files.comptelplus.org/2014Spring/Slides/Cable%20Slides%20Final%203-15-14.pdf>.

- **Cablevision** describes its <<

company targets the <<

>>¹⁰¹ The

>>¹⁰²

In addition, cable companies generally do not apply rigid rules or formulas for extending their network to serve a customer, but instead evaluate these opportunities case-by-case, to determine whether potential revenue opportunities are likely to exceed costs.¹⁰³ In doing so, cable operators need not limit their consideration to the revenues available solely from a single customer at a single location, but may consider other potential opportunities from other customers at the same or nearby locations.¹⁰⁴ Cable operators' expansive cable networks provide

¹⁰¹ Cablevision Lightpath II.D.1 Response.

¹⁰² *Id.*

¹⁰³ In the Commission's recent order regarding USTelecom's forbearance petition, the Commission claimed Verizon "believes cable company competition is not ubiquitous even within such companies' own territory," citing a Verizon ex parte stating that cable companies are often willing to construct facilities to locations where they don't have existing facilities. *Petition of USTelecom for Forbearance Pursuant to 47 U.S.C. §160 (c) from Enforcement of Obsolete ILEC Legacy Regulations that Inhibit Deployment of Next-Generation Networks*, Memorandum Opinion and Order, WC Docket No. 14-192 *et al.*, FCC 15-166, ¶ 93 & n.308 (rel. Dec. 28, 2015). The fact that cable companies do not have laterals to every building today is irrelevant to whether cable networks are extensive enough to reach all (or virtually all) locations with demand for high-capacity services, and the facts here overwhelmingly demonstrate that cable companies are capable of doing so.

¹⁰⁴ *See, e.g.,* <<

significant cost advantages,¹⁰⁵ enabling them to extend facilities economically. Even where these factors still may not be enough, cable operators may give customers the option to pay up-front charges to cover the costs of deployment, or to commit to longer terms of service.¹⁰⁶ Applying these rules, cable operators acknowledge they have built out their networks not only to districts with high business density, but also to <<

>>¹⁰⁷

The Commission's data confirm cable competition is expansive and that cable operators are capable of serving all areas where high-capacity demand is concentrated.¹⁰⁸ Cable operators have deployed fiber in approximately << >> zip codes nationwide that contain approximately << >> of the U.S. population, including approximately << >> zip codes

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¹⁰⁶ <<

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¹⁰⁸ As noted above, the Commission's data do not permit a valid analysis of cable fiber at the more granular census block level, because cable operators reported only their middle-mile fiber, not their fiber to end-user locations.

within Verizon’s ILEC footprint that contain approximately << >> of the population in that footprint.¹⁰⁹ Cable operators have deployed fiber in at least << >> census blocks that contain approximately << >> of the U.S. population, including at least << >> census blocks within Verizon’s ILEC footprint that contain approximately << >> of the population in that footprint.¹¹⁰ These zip codes with cable company fiber contain approximately << >> of all business establishments nationwide, and approximately << >> of all business establishments within Verizon’s ILEC footprint.¹¹¹ At least one cable company has deployed fiber in << >> of the subset of top zip codes that comprise 80% of total high-capacity revenues nationwide that can be assigned to zip codes, and << >> of the subset of top zip codes that comprise 80% of total high-capacity revenues in Verizon’s ILEC footprint that can be assigned to zip codes.¹¹² At least one cable company has deployed fiber in << >> of the

¹⁰⁹ See *Locations Served by Competitive Fiber Sources* described in n.60, population data and limitations described in n.62, and Verizon’s ILEC footprint described in n.64. *Locations Served by Competitive Fiber Sources* were limited to respondents that were classified by the Commission as “CP – Cable Operator” = Y in SPADC Filers (122915).xlsx, as well as Bright House Networks, Cablevision Lightpath, CSC Holdings, and WideOpenWest Cleveland.

¹¹⁰ See *Locations Served by Competitive Fiber Sources* described in n.60 and limitation for cable respondents described in n.109; *Census Block Sources* described in n.63; Verizon’s ILEC footprint based on census blocks described in n.61.

¹¹¹ See *Locations Served by Competitive Fiber Sources* described in n.60; *U.S. Census Bureau Establishments by Zip Code Data* described in n.66; Verizon’s ILEC footprint described in n.64. Cable companies have deployed fiber to zip codes containing approximately << >> of business establishments nationwide with 5 or more employees, << >> with 20 or more employees, << >> with 100 or more employees, and << >> with 1,000 or more employees. Within Verizon’s ILEC footprint, cable companies have deployed fiber to zip codes containing approximately << >> of all business establishments with 5 or more employees, << >> with 20 or more employees, << >> with 100 or more employees, and << >> with 1,000 or more employees.

¹¹² See *Locations Served by Competitive Fiber Sources* described in n.60, limited to cable respondents described in n.109; revenue calculations described in n.68; Verizon’s ILEC footprint described in n.64.

subset of top census blocks that comprise 80% of total high-capacity revenues nationwide that can be assigned to census blocks, and << >> of the subset of top census blocks that comprise 80% of total high-capacity revenues in Verizon’s ILEC footprint that can be assigned to census blocks.¹¹³

Finally, the Commission must also take into account “best efforts” business class broadband services that cable operators provide, which for many customers offer a viable substitute to traditional special access and other high-capacity services.¹¹⁴ Cable broadband services are the most widely available and used form of broadband in the United States.¹¹⁵ These services are available to approximately 89% of the population according to the National Broadband Map — and to 93% of U.S. households according to NCTA.¹¹⁶ In addition, analysts estimate that cable broadband networks pass more than three quarters of small and medium business customers in the U.S.¹¹⁷ And a recent, third-party study of the Atlanta metro area found that cable broadband services were available to four-fifths of businesses in that area based on

¹¹³ See *Locations Served by Competitive Fiber Sources* described in n.60, limited to cable respondents described in n.109; revenue calculations described in n.68; revenue calculation described in n.68; Verizon’s ILEC footprint based on census blocks described in n.61.

¹¹⁴ Notice ¶ 76.

¹¹⁵ NCTA, *Broadband by the Numbers*, <https://www.ncta.com/broadband-by-the-numbers> (“As the nation’s largest broadband provider, cable’s fiber-rich networks are available to 93 percent of U.S. homes.”).

¹¹⁶ NTIA, *Broadband Statistics Report* at 3 (Mar. 2015), [http://www.broadbandmap.gov/download/Technology by Speed.pdf](http://www.broadbandmap.gov/download/Technology%20by%20Speed.pdf) (national availability of cable broadband download speeds > 1.5 Mbps, as of June 2014); NCTA, *Industry Data*, <https://www.ncta.com/industry-data> (citing “NCTA analysis of SNL Kagan and Census Bureau estimates”).

¹¹⁷ Alan Breznick, Heavy Reading, Presentation to The Future of Cable Business Services 2014 (Dec. 2, 2014) (“Cable industry’s HFC lines already passed more than three quarters of SMBs in U.S.”).

where cable companies have already signed up customers.¹¹⁸ A similar study of the Albany, Boston, Philadelphia, Virginia Beach and Washington, DC metropolitan areas found that cable could provide broadband to more than three-quarters of the businesses in those areas.¹¹⁹

Cable providers themselves view broadband services as competitive alternatives to special access — particularly the lower-end services like DS1 — and routinely market them that way. Comcast, for example, states that “[w]ith speeds 64x faster than T1, advanced security, and dedicated national support, Business Internet provides the bandwidth, reliability and scalability your organization needs to help you be more competitive and successful.”¹²⁰ Charter states that “[c]oax solutions are the best value for companies that do not regularly transfer large files or data. Coax provides significantly greater throughput than DSL, and is more affordable than a T1.”¹²¹

Although best-efforts broadband differs in some respects from traditional special access, these differences are not critical for many customers, and also are diminishing. For example, Comcast recently launched Ethernet @Home, delivered over its hybrid fiber-coax network, which provides home-based workers with a secure private link to their corporate network. Like traditional dedicated services, Ethernet @Home is backed by SLAs and is available for a variety

¹¹⁸ See Ex Parte Letter from Patrick S. Brogan, USTelecom, to Marlene H. Dortch, FCC, WC Docket No. 05-25 & RM-10593, Attach., Arthur Menko, *Methodology for Identifying Local Competitive Commercial Infrastructure: Cable Modem High Capacity Services* at 1 (Oct. 16, 2015).

¹¹⁹ Letter from Maggie McCready, Verizon, to Marlene Dortch, FCC, WC Docket No. 05-25 & RM-10593, Attach. A, December 18, 2015 Declaration of Arthur Menko (Jan. 14, 2016).

¹²⁰ Comcast Corporation, *Business Internet for Branch Offices*, <http://business.comcast.com/ethernet/products/internet-for-branch-offices>.

¹²¹ Charter Business, *Fiber or Coaxial: Which One Is Best for Your Business* at 3 (2013) <https://business.spectrum.com/mediacontent/pdfs/wp-fiber-or-coax.pdf>.

of Ethernet services at symmetric bandwidth speeds up to 10 Mbps.¹²² Analysts call this service “a business-class, high-capacity symmetric network access service for teleworkers that is more secure than broadband Internet access paired with Layer 3 IP VPNs that remote workers often use.”¹²³ The service requires the cable operator to upgrade the cable headend with Ethernet equipment to support the service, “but overall the operator should have little trouble delivering the service.”¹²⁴

D. Fiber-Based CLECs Are Succeeding in the Marketplace

In addition to cable, CLECs have deployed fiber networks for more than three decades and are a significant source of competition for high-capacity services throughout the country. More than << >> CLECs filed data with the Commission indicating they provide competitive high-capacity services using their own facilities.¹²⁵ CLEC business models vary widely, with some competing nationally or in as many as 300 metropolitan areas, with others focusing on a handful of markets or even just one.¹²⁶ Many CLECs rely primarily on their own fiber, while others lease fiber from other competitors, use fixed wireless technologies, or use some combination of these alternatives.

¹²² Cindy Whelan, Current Analysis, *Comcast Takes Telework to the Next Level with Ethernet @Home* at 2 (Dec. 16, 2014).

¹²³ *Id.*

¹²⁴ *Id.* at 3.

¹²⁵ See *Locations Served by Competitive Fiber Sources* described in n.60, excluding data filed by cable companies described in n.109. The number of CLECs consolidates affiliated entities that separately reported data, where affiliations were disclosed in response to Question II.A.1.

¹²⁶ See, e.g., DQE Communications, *Network Map*, http://www.dqecom.com/network_map.php (Pittsburgh, PA and surrounding counties); ZenFi Networks, Inc., *About*, <http://zenfi.com/about/> (New York City); Zayo Group Holdings, Inc., Form 424(B)(4) Prospectus, at 2 (SEC filed Mar. 13, 2015) (“*Zayo Group Prospectus*”), <http://www.sec.gov/Archives/edgar/data/1608249/000119312515090531/d877708d424b4.htm> (“300 metro markets”).

According to their own public statements, CLECs are succeeding. Over just the past several years, several “Mega CLECs” have formed through a combination of acquisitions and other expansion. These very large CLECs boast nationwide or near-nationwide scale and significant success in the marketplace. For example:

- **Windstream** states that it has “a presence in virtually every city”¹²⁷ and is “the provider of choice for four out of five Fortune 500 companies for data, voice, network and cloud solutions.”¹²⁸ Windstream reports steadily increasing enterprise service revenues and “[g]rowing market share.”¹²⁹
- **Level 3** — which now ranks as the second largest U.S. provider of Ethernet services ahead of Verizon¹³⁰ — reported it experienced 10 percent growth in 2014 for its Core Network Services to enterprises.¹³¹
- **The Zayo Group**, which was formed from acquisitions of more than 34 companies worth about \$4.9 billion, now operates fiber networks covering “over 300 metro markets” in “46 states, plus Washington D.C.”¹³² As of September 30, 2015, the company reported “\$6.2 billion in revenue under contract with a weighted average remaining contract term of approximately 46 months.”¹³³

¹²⁷ *Windstream Communications at Citi Internet Media & Telecommunications Conference – Final*, FD (Fair Disclosure) Wire, Transcript 010714a5261028.728 (Jan. 7, 2014) (statement by Windstream CEO Jeff Gardner).

¹²⁸ Windstream Communications, *Why Windstream?*, <http://www.windstreambusiness.com/why-windstream>.

¹²⁹ Windstream 3Q15 Earnings Presentation, at 15 (Nov. 5, 2015) (enterprise service revenues grew from \$477M in 3Q14 to \$501M in 3Q15).

¹³⁰ Vertical Systems Group, *Mid-Year 2015 U.S. Carrier Ethernet LEADERBOARD* (Aug. 24, 2015), <http://www.verticalsystems.com/vsglb/mid-year-2015-u-s-carrier-ethernet-leaderboard/>.

¹³¹ Level 3 Communications, Inc., Form 10-K, at 72 (SEC filed Feb. 27, 2015), http://www.sec.gov/Archives/edgar/data/794323/000079432315000003/lvlt-123114_10k.htm.

¹³² *Zayo Group Prospectus* at 2; About Zayo, <http://abovecast.com/about/>.

¹³³ Zayo Group Holdings, Inc., Form 10-Q, at 24 (SEC filed Nov. 10, 2015), http://www.sec.gov/Archives/edgar/data/1608249/000156459015010369/zayo-10q_20150930.htm.

Just as with respect to cable companies, the Commission’s data do not account for the full extent of either actual or potential competition that fiber-based CLECs provide. CLECs large and small have expanded their networks considerably since the 2013 data collection, and they indicate they will continue to do so. Windstream, for example, recently announced “12 new 100G markets including: Buffalo, Denver, Houston, San Antonio, Oklahoma City, and Tulsa” and “plans to expand 100G service to seven additional markets, including Minneapolis and Louisville in September” 2015.¹³⁴ Alpheus announced in August 2015 “its fourth major fiber network expansion in the past 12 months,” adding “over 1,000 new near-net buildings for a total of approximately 7,000 near-net buildings in Texas.”¹³⁵ In February and April 2015, Birch announced “large network expansion[s] of Fiber services” in its Dallas, Houston, Denver, Los Angeles, and Washington, D.C. markets, as well as a “2015 roadmap” that “includes ongoing expansion of its Fiber services to several other markets in the coming months.”¹³⁶

As these recent developments show, CLECs stand willing and able to extend their networks to acquire new customers where demand warrants it. CLECs market their high-capacity services as being widely available throughout large geographic areas. They emphasize

¹³⁴ Windstream News Release, *Windstream and Infinera Partnership Drives Windstream Carrier Solutions’ Leadership in the Wave Transport Market* (Aug. 12, 2015), http://news.windstream.com/article_display.cfm?article_id=1659.

¹³⁵ Alpheus Communications News Release, *Alpheus Communications’ Latest Network Expansion Gives New Fiber Last-Mile Option to Thousands of Buildings and Businesses in Texas* (Aug. 13, 2015), <http://www.alpheus.net/press-releases/alpheus-communications-latest-network-expansion-gives-new-fiber-last-mile-option-to-thousands-of-buildings-and-businesses-in-texas/>.

¹³⁶ Birch Communications, Inc. Press Release, *Birch Expands Metro Fiber Services in Key Markets* (Feb. 2, 2015), <http://www.birch.com/press-releases/birch-expands-metro-fiber-in-key-markets>; Birch Communications, Inc. Press Release, *Birch Continues To Boost Metro-Fiber Services in Key Markets* (Apr. 20, 2015), <http://www.birch.com/press-releases/birch-continues-to-boost-metro-fiber-services-in-key-markets>.

not merely the buildings they have “on net,” but also the buildings that are “near net,” which signals to potential customers the CLECs’ ability to extend their facilities. For example:

- **Level 3 Communications** “markets *Dedicated Services* nationwide” to “the enterprise market, which includes entities that have significant demand at a single location and enterprises that have varying levels of demand at multiple locations.”¹³⁷ Before several major acquisitions, including tw telecom, Level 3 reported “[o]ver 100,000 enterprise buildings” “within 500 ft.” of its U.S. network.¹³⁸

- **Windstream** states that its <<

>>¹³⁹

- **FPL FiberNet** <<

>>¹⁴⁰ It claims “over 1,700 on-net buildings, approximately 700 free-standing towers, and tens of thousands [of] near net locations.”¹⁴¹

- **Zayo** states that it <<

>>¹⁴²

- **Lightower** describes its “network footprint” as “essentially from Maine to Virginia and also Chicago.”¹⁴³

CLECs market and describe their services as providing availability and coverage throughout the markets they serve, and they indicate a willingness to serve customers on demand. The Commission therefore should not create rigid rules or formulas for determining

¹³⁷ Level 3 II.D.1 Response.

¹³⁸ Level 3 Communications, *2011 Annual Meeting of Stockholders*, Presentation at 3 (May 19, 2011), http://files.shareholder.com/downloads/LVLT/2168870475x0x469486/f0c304e5-b9ea-4c17-a9b6-bd3a8088c521/Level%203%20Communications%20Annual%20Meeting_May%202011_FINAL.pdf.

¹³⁹ Windstream II.D.1 Response.

¹⁴⁰ FPL FiberNet II.D.1 Response.

¹⁴¹ FPL FiberNet, *Capacity*, <http://www.fplfibernet.com/capacity.shtml>.

¹⁴² Zayo Group II.D.1 Response.

¹⁴³ LTS Buyer (Lightower) II.D.1 Response.

what locations or buildings may be economic to serve. CLECs make every effort to serve requesting customers over as much of their networks as possible and, as the CLECs' own business rules confirm, to make the economics of doing so work. CLECs generally evaluate each opportunity to extend facilities on a case-by-case basis, and they may look at all possible revenue opportunities in an effort to try to add new customers to their networks.¹⁴⁴ Where CLECs have extensive fiber already in place, it reduces the costs of further extensions.¹⁴⁵ CLECs may consider not only the revenues from the requesting customer at a single location, but also the potential to serve future demand at the same or nearby locations.¹⁴⁶ And even where

¹⁴⁴ *See, e.g.,* <<

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¹⁴⁵ *See, e.g.,* <<

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¹⁴⁶ *See, e.g.,* <<

costs to serve an individual location may exceed ordinary revenue projections, potential customers may still be able to obtain service if they are willing to make a larger term commitment or to pay upfront costs.¹⁴⁷

The Commission's data show that CLEC facilities are widely deployed and capable of serving customers where there is concentrated demand for high-capacity services. CLECs have deployed fiber in approximately << >> zip codes nationwide, including approximately << >> zip codes within Verizon's ILEC footprint.¹⁴⁸ These zip codes with CLEC fiber cover approximately << >> of the U.S. population and approximately << >> of the population in Verizon's ILEC footprint.¹⁴⁹ CLECs have deployed fiber in at least << >> census blocks nationwide, including approximately << >> census blocks within Verizon's ILEC footprint. These census blocks with CLEC fiber cover approximately << >> of the U.S. population and approximately << >> of the population in Verizon's ILEC footprint.¹⁵⁰

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¹⁴⁷ See, e.g., <<

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¹⁴⁸ See *Locations Served by Competitive Fiber Sources* described in n.60, excluding data for cable companies described in n.109.

¹⁴⁹ See *Locations Served by Competitive Fiber Sources* described in n.60, population data and limitations described in n.62, and Verizon's ILEC footprint described in n.64.

¹⁵⁰ See *Locations Served by Competitive Fiber Sources* described in n.60, excluding data for cable companies described in n.109; *Census Block Sources* described in n.63; Verizon's ILEC footprint based on census blocks described in n.61.

Zip codes with CLEC fiber contain approximately << >> of all business establishments nationwide, and approximately << >> of all business establishments within Verizon's ILEC footprint.¹⁵¹ At least one CLEC has deployed fiber in << >> of the subset of top zip codes that comprise 80% of total high-capacity revenues that can be assigned to zip codes, and << >> of the subset of top zip codes that comprise 80% of total high-capacity revenues in Verizon's ILEC footprint that can be assigned to zip codes.¹⁵² At least one CLEC has deployed fiber in << >> of the subset of top census blocks that comprise 80% of total high-capacity revenues that can be assigned to census blocks, and << >> of the subset of top census blocks that comprise 80% of total high-capacity revenues in Verizon's ILEC footprint that can be assigned to census blocks.¹⁵³

E. Fixed Wireless Provides Additional Competition and Is Particularly Economic in Underserved Areas

The Commission's analysis of competition must also include fixed wireless, use of which is surging. Fixed wireless technology enables carriers to extend their existing networks quickly

¹⁵¹ See *Locations Served by Competitive Fiber Sources* described in n.60, excluding data for cable companies described in n.109; *U.S. Census Bureau Establishments by Zip Code Data* described in n.66; Verizon's ILEC footprint described in n.64. CLECs have deployed fiber in zip codes containing approximately << >> of business establishments nationwide with 5 or more employees, << >> with 20 or more employees, << >> with 100 or more employees, and << >> with 1,000 or more employees. Within Verizon's ILEC footprint, CLECs have deployed fiber to zip codes containing approximately << >> of all business establishments with 5 or more employees, << >> with 20 or more employees, << >> with 100 or more employees, and << >> with 1,000 or more employees.

¹⁵² See *Locations Served by Competitive Fiber Sources* described in n.60, excluding data for cable companies described in n.109; revenue calculations described in n.68; Verizon's ILEC footprint described in n.64.

¹⁵³ See *Locations Served by Competitive Fiber Sources* described in n.60, excluding data for cable companies described in n.109; revenue calculation described in n.68; Verizon's ILEC footprint based on census blocks described in n.61.

and at relatively low cost compared to wireline technologies, and therefore provides enterprise customers as well as other providers with an alternative source of dedicated high-speed connections.¹⁵⁴ Providers today use fixed wireless extensively, so the Commission should have no doubt about its potential to be used even more broadly, both to fill in any coverage gaps left by wireline high-capacity facilities, and to provide a lower-cost alternative to customers for whom that is a priority.

Competitors themselves characterize fixed wireless as an economic and technological alternative to traditional special access and other wireline high-capacity services in instances where extending those wireline networks may not be viable. Windstream is so bullish on this technology that, in October 2014, it acquired a major fixed wireless provider, Business Only Broadband.¹⁵⁵ Windstream states that “the advantages of the service, particularly in areas where Windstream has not built out its own facilities, is that it is a cost-effective alternative to wireline fiber or copper/coax that can be quickly installed yet offers higher speeds and security.”¹⁵⁶

¹⁵⁴ See Michelle Pampin, *Reality Check: Fixed Wireless Myth Busting*, RCR Wireless News (Jan. 20, 2015) (“Pampin, *Reality Check: Fixed Wireless Myth Busting*”), <http://www.rcrwireless.com/20150120/opinion/reality-check/reality-check-fixed-wireless-myth-busting> (“Fixed wireless can be rapidly installed to extend the reach of a fiber network core. This means that customers served by fixed wireless can enjoy the same bandwidth-intensive services as their wireline counterparts — and in a fraction of the time and at a much lower cost.”); *Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, Declaratory Ruling, 22 FCC Rcd 5901, ¶ 14 (2007) (fixed wireless networks “typically have a reach of one to five miles” and merely require that customers “have a rooftop antenna that can establish a line-of-sight connection with the network transmitter”); *AT&T Inc. and BellSouth Corporation Application for Transfer of Control*, Memorandum Opinion and Order, 22 FCC Rcd 5662, ¶ 48 (2007) (“fixed wireless offers the potential of being a cost-effective substitute for fiber as a last-mile connection to commercial buildings”).

¹⁵⁵ Windstream News Release, *Windstream Acquires Chicago-Based Fixed Wireless Provider* (Oct. 1, 2014), http://news.windstream.com/article_display.cfm?article_id=1575.

¹⁵⁶ Sean Buckley, *Windstream Brings Fixed Wireless Service to Boston, Deepens Alternative Ethernet Access Reach*, Fierce Telecom (July 16, 2015), <http://www.fiercetelecom.com/story/windstream-brings-fixed-wireless-service-boston-deepens->

Windstream further claims that “fixed wireless is as reliable as any comparable technology, which enables Windstream to deliver 99.99% uptime.”¹⁵⁷ Since acquiring Business Only Broadband, Windstream has continued to invest in expanding its fixed wireless operations’ footprint, and it now offers “carrier-grade Ethernet and Internet-over-Ethernet connectivity delivered by digital microwave technology” in Chicago, New York, Northern New Jersey, Milwaukee, Boston, Philadelphia, and Cleveland.¹⁵⁸

Other competitors have likewise embraced fixed wireless technology and tout its virtues as a cost-effective and reliable alternative to last-mile fiber. For example:

- **FiberTower** states that “24GHz fully licensed fixed wireless connections can function as ‘wireless fiber extension cords’, extending the reach of existing fiber optic infrastructure and connecting additional customers, under-served office buildings and community anchor institutions.”¹⁵⁹
- **Cambium Networks** states that its “Fixed wireless is a proven technology used to extend fiber networks inexpensively to areas outside embedded plant reach for what

alternative-etherne/2015-07-16; *see also Windstream Announces Fixed Wireless Availability in Cleveland*, Market Watch (Sept. 16, 2015), <http://www.marketwatch.com/story/windstream-announces-fixed-wireless-availability-in-cleveland-2015-09-16> (Joseph Harding, Windstream’s enterprise executive vice president and chief marketing officer: “This solution is an affordable alternative to fiber optic or traditional copper/coax networks and is an ideal fit for businesses in need of high-bandwidth, enterprise-class Ethernet connectivity, supported by our industry-certified dedicated account teams and engineers and backed by our ‘smart solutions, personalized service’ brand promise.”).

¹⁵⁷ Windstream Communications, *Fixed Wireless Frequently Asked Questions* (Aug. 2015), <http://www.windstreambusiness.com/resources/faqs/fixed-wireless>.

¹⁵⁸ Windstream News Release, *Windstream Announces Fixed Wireless Availability in Cleveland* (Sept. 16, 2015), http://news.windstream.com/article_display.cfm?article_id=1666.

¹⁵⁹ FiberTower News Release, *FiberTower Releases “Wireless Fiber” Fact Sheet for Montgomery County ultraGig Partnership* (Aug. 5, 2015), <http://www.fibertower.com/news-1/2015/8/4/fibertower-releases-wireless-fiber-fact-sheet-for-montgomery-county-ultragig-partnership>.

is known as last-mile connectivity. It offers bandwidth comparable or greater than most physical media at a significantly lower cost.”¹⁶⁰

- **Pulstream** states that “Fixed wireless contrary to the belief of yesteryear, is a very viable and cost effective way of delivering high bandwidth low latency networks over the last mile.”¹⁶¹

Competitors market fixed wireless services as being available widely across metropolitan areas. For example, after Windstream extended its fixed wireless service to Boston, Philadelphia, and Cleveland in 2015, it published coverage maps marketing the service as available throughout these cities, including many outer suburbs.¹⁶² The coverage maps of Towerstream and One Ring Networks show similarly broad geographic coverage in the markets they have entered.¹⁶³

Historical problems related to clear lines of sight for fixed wireless services have been overcome, making the inability to receive service a rare exception, particularly in urban settings.¹⁶⁴ As TelePacific, another CLEC that uses fixed wireless, explains: “[g]enerally, this is

¹⁶⁰ Troy Conley, *Connecting Small and Mid-size Enterprise with Fixed Wireless*, Cambium Networks, <http://www.cambiumnetworks.com/blog/connecting-small-and-mid-size-enterprise-with-fixed-wireless/>.

¹⁶¹ Pulstream Internet Services, *Fixed Wireless*, http://www.pulstream.net/documents/fixed_wireless.pdf.

¹⁶² Windstream Communications, *Fixed Wireless Boston Coverage Map* (June 2015), <http://www.windstreambusiness.com/resources/coverage-maps/fixed-wireless-boston>.

¹⁶³ See Towerstream coverage maps, available at: Towerstream, *Coverage Areas*, <http://www.towerstream.com/coverage-areas>; One Ring Networks, *About: Network Coverage*, <http://oneringnetworks.com/about/>.

¹⁶⁴ Pampin, *Reality Check: Fixed Wireless Myth Busting*, <http://www.rcrwireless.com/20150120/opinion/reality-check/reality-check-fixed-wireless-myth-busting> (“Long gone are the days when line-of-sight was an imperative for fixed wireless installations. Buildings, trees, mountains and water are no match for the technological strides made in ensuring that communities can count on the connectivity fixed wireless broadband equipment provides. This capability ensures additional cost savings for fixed wireless network

not a problem as the base stations are deployed on the roofs of high-rise buildings, which have a commanding view over adjacent terrain. In some cases, trees and other buildings may cause obstructions, which should be overcome using a mast extension at the user's location or with a repeater."¹⁶⁵ Similarly, competitors do not view either roof access or interference as practical concerns with providing the service, and inform their customers as much.¹⁶⁶ Nor are their reliability concerns valid: "Naval officers and high-frequency traders alike rely on fixed wireless for their mission-critical data transactions and transmissions, so clearly it is no runner-up to wireline in terms of reliability."¹⁶⁷

According to the Commission's data, approximately << >> competitors have indicated that they are using fixed wireless to provide special access services at more than << >> locations nationwide.¹⁶⁸ This includes cable companies such as <<

operators, who don't need to cut down trees or otherwise remove obstructions to set up a high-quality network.").

¹⁶⁵ TelePacific Communications, *Wireless Business Internet FAQ*, <http://www.telepacific.com/offer/data-network/internet-faq.asp>; see also Central Valley Broadband, *Installation Services and other Questions concerning the service*, http://www.calwisp.com/html/installation_services.html ("If you do not have a direct line-of-sight to a transmitter or relay tower, one option is to use point-to-point (PTP) networking. PTP networking is where the signal from the Internet antenna is bounced to a second set of antennas.").

¹⁶⁶ TelePacific Communications, *Wireless Business Internet FAQ*, <http://www.telepacific.com/offer/data-network/internet-faq.asp>.

¹⁶⁷ Pampin, *Reality Check: Fixed Wireless Myth Busting*, <http://www.rcrwireless.com/20150120/opinion/reality-check/reality-check-fixed-wireless-myth-busting>.

¹⁶⁸ This is conservative because it only includes locations for which latitude and longitude coordinates were provided, either by the FCC or by the respondent; approximately << >> additional locations without "geo_bldg" codes, preventing unique locations from being determined. See *Locations Served by Competitive Fiber Sources* described in n.60, where "SOLD_BANDWIDTH_TFW" in II.A.4 data does not equal 0 and is not null. The number of

>> and CLECs such as

<<

>> Based on these data, competitors are using fixed wireless to provide high-capacity services in approximately << >> zip codes that contain approximately << >> of all business establishments.¹⁶⁹ As discussed further below, fixed wireless also is being used extensively for mobile wireless backhaul.

F. Competition for Wireless Backhaul Is Thriving

Wireless backhaul represents a significant and rapidly growing segment of the marketplace. The dramatic growth in wireless broadband usage has fueled increases in demand for backhaul bandwidth at existing cell sites, and it also has caused providers to deploy new cell sites and hotspots that require their own new backhaul connections. As Verizon's own experience as a wireless carrier confirms, this massive and ongoing surge in backhaul demand has enabled many new alternative providers and technologies to emerge to compete aggressively for this business, including cable operators, fiber-based CLECs, and fixed wireless providers.¹⁷⁰ T-Mobile has stated that, as a result of working with dozens of competitive backhaul

competitors consolidates affiliated entities that separately reported data, where affiliations were disclosed in response to Question II.A.1.

¹⁶⁹ See *Locations Served by Competitive Fiber Sources* described in n.60, where "SOLD_BANDWIDTH_TFW" in II.A.4 data does not equal 0 and is not null; *U.S. Census Bureau Establishments by Zip Code Data* described in n.66. This includes approximately << >> of all business establishments with 5 or more employees, approximately << >> with 20 or more employees, approximately << >> with 100 or more employees, and approximately << >> with 1,000 or more employees.

¹⁷⁰ See Comments of Verizon at 27, WC Docket No. 05-25 & RM-10593 (FCC filed Aug. 8, 2007) ("Verizon Aug. 8, 2007 Comments") & Attach. D, Declaration of Cynthia Wells (June 20, 2007) ("Wells Decl.").

providers,¹⁷¹ including cable operators (Bright House Networks) as well as numerous fiber-based CLECs (including FPL FiberNet, IP Networks, and Zayo Bandwidth),¹⁷² the company “resolved our backhaul problem for our [cell sites] several years ago.”¹⁷³ In addition, wireless carriers have long self-supplied backhaul facilities using microwave or other alternative technologies, which also must be factored into the competitive analysis.

Massive upgrades to the backhaul network are required to support the inexorable growth of wireless broadband. LTE technology requires ten times the bandwidth of 3G, and next-generation standards like LTE-A require many times the bandwidth of LTE.¹⁷⁴ This has required

¹⁷¹ Phil Goldstein, *T-Mobile To Focus on 1900 MHz LTE Deployment To Expand Network Footprint*, FierceWireless (Sept. 24, 2014), <http://www.fiercewireless.com/story/t-mobile-focus-1900-mhz-lte-deployment-expand-network-footprint/2014-09-24> (“[Dave] Mayo [T-Mobile’s Senior Vice President of Technology] said T-Mobile is working with dozens of backhaul partners to ensure it has adequate backhaul to support 1900 MHz LTE service; most of the backhaul will be fiber, he said but in some cases in rural parts of the country it will be microwave.”).

¹⁷² T-Mobile News Release, *T-Mobile Signs New Backhaul Agreements for Six Major U.S. Markets* (Sept. 18, 2008), <https://newsroom.t-mobile.com/news/t-mobile-signs-new-backhaul-agreements-for-six-major-us-markets.htm>.

¹⁷³ T-Mobile Earnings Report: Q3 2015 Conference Call Transcript (Oct. 28, 2015), <http://www.thestreet.com/story/13341417/14/t-mobile-us-inc-tmus-earnings-report-q3-2015-conference-call-transcript.html> (Neville Ray, EVP & CTO, T-Mobile: “For us, I mean to be quite frank, we resolved our backhaul problem for our [cell] sites several years ago. We embarked on a fiber to the [cell] strategy. It’s five years ago, and that’s been a huge help for us with our LTE rollout. . . . Much of what we’ve been doing on expanding the footprint has driven us into obviously more rural parts of America and backhaul is tougher to find, but that’s less of a special access issue I think.”).

¹⁷⁴ Kline, *Mobile Backhaul Forecast Report: 2014-19*, at 10 (“As mobile operators transition their networks to 3G and 4G/LTE, they must also evolve their backhaul infrastructure to support higher bandwidth requirements. LTE requires 10x the bandwidth of 3G, and LTE-A bandwidth requirements are 6x that of LTE (66x higher than 3G).”); Roopashree Honnachari *et al.*, Frost & Sullivan, *Wholesale Carrier Ethernet Services Market Update, 2014*, at 16 (Apr. 2014) (“Mobile backhaul application continues to drive demand for Ethernet circuit speeds varying from 20 Mbps to 100 Mbps at the cell sites. With the proliferation of bandwidth-hogging 3G/4G wireless devices, there is an exponential growth in mobile backhaul traffic on service providers’

wireless carriers to upgrade their backhaul facilities from traditional TDM-based circuits, such as copper T-1s, to fiber-based Ethernet services.¹⁷⁵ For example, T-Mobile announced in August 2012 that it had “enhanced backhaul covering 100 [percent] of our 4G network, 95 [percent] of which is fiber backhaul,” and that it had “upgraded to fiber backhaul on over 32,000 cell sites.”¹⁷⁶ In addition to enhancing capacity at existing cell sites, wireless providers are deploying new macro cells as well as smaller cells and hotspots to enhance their networks and relieve congestion, which further accelerates the need for high-capacity backhaul.¹⁷⁷ A July 2015 study

networks, thus pressuring mobile operators to evaluate cost-effective backhaul and aggregation networks.”).

¹⁷⁵ Kline, *Mobile Backhaul Forecast Report: 2014-19*, at 10 (“HSPA (3G) and LTE (4G) data-plane traffic is IP-based, and carrier Ethernet has emerged as the preferred technology to support this growth because it is a standardized approach and can economically scale to meet demand.”); Infonetics Research, *Macrocell Mobile Backhaul Equipment and Services* at 19, 21 (“[T]he increased need for higher capacity backhaul has forced North American operators to deploy more fiber and limited microwave to overcome copper limitations — cell site fiberization is nearing the end of a 4-5 year process. . . . AT&T and Verizon have major initiatives underway to fiberize 90% their owned cell sites over the next few years, yet they are using microwave in places.”).

¹⁷⁶ David Beren, *T-Mobile Says “Backhaul Strategy Key to a Competitive 4G Experience,”* TmoNews: The Unofficial T-Mobile Blog (Aug. 1, 2012), <http://www.tmonews.com/2012/08/t-mobile-says-backhaul-strategy-key-to-a-competitive-4g-experience/>; Wayne Rash, *T-Mobile LTE Backhaul Nearly Complete*, FierceMobileIT (Aug. 7, 2012), <http://www.fiercemobileit.com/story/t-mobile-lte-backhaul-nearly-complete/2012-08-07> (“Mayo [T-Mobile’s Senior Vice President of Technology] noted that T-Mobile is eliminating the old T1 lines from its system, and that all but a handful have already been replaced with fast network connections. He did say that many of T-Mobile’s competitors still use those slow T1s. He also said that the company has nearly reached its goal of building out all of the sites it needs for LTE deployment. ‘Our aspiration is to have 37,000 modernized sites,’ Mayo said.”); Carol Wilson, *Level 3: Mobile Backhaul Brutally Competitive*, LightReading (Oct. 7, 2011), <http://www.lightreading.com/mobile/backhaul/level-3-mobile-backhaul-brutally-competitive/v/d-id/705103> (video interview of Amanda Tierney of Level 3, noting that “4G is really the catalyst for the ubiquity of Ethernet and the ubiquity of fiber to the tower.”).

¹⁷⁷ Rudd, *Small Cells Taking Off, Need Fiber Backhaul Soon* at 1 (“Mobile Broadband traffic growth accelerated by video demand is now driving the deployment of LTE small cells in urban hot zones and indoor venues. Carrier Aggregation with LTE-Advanced (LTE-A), WiFi roaming and Local Breakout will all accelerate the need for smart high bandwidth broadband backhaul

by SNL Kagan projected that cell sites would grow from approximately 298,000 in 2014 to approximately 353,000 in 2019 and approximately 452,000 in 2025.¹⁷⁸ Analysts expect that the growth in broadband traffic will be so enormous that even small cells will “cross the Fiber Threshold,” making it economic to deploy fiber at these locations.¹⁷⁹

This enormous increase in demand for high-capacity backhaul has created further opportunities for suppliers. For example, all of the major cable companies use their networks to provide wireless backhaul services.¹⁸⁰

- **Comcast** states that “[a]s the demand for smart phones, wireless air cards, and 3G and 4G networks increases, more and more carriers depend on Comcast to help handle their growing demands for network bandwidth while reducing the costs

capacity. Within two years this will dramatically increase the use of fiber backhaul for multiple high capacity clusters of small cells.”); *id.* at 2 (“Small cells or ‘spatial reuse’ will play a major role alongside LTE’s ‘new spectrum’ and LTE-A ‘spectral efficiency’ to meet this dramatic growth in capacity demand.”); Sean Buckley, *Zayo Carves Niche in Fiber-Based Small Cell Backhaul, Turnkey Installation Services*, FierceInstaller (Sept. 1, 2015), <http://www.fierceinstaller.com/story/zayo-carves-niche-fiber-based-small-cell-backhaul-turnkey-installation-serv/2015-09-01> (Sprint deploying 70,000 small cells according to report by RBC Capital Markets).

¹⁷⁸ John Fletcher, *Tower Projections Through 2025*, SNL Kagan (July 13, 2015), <https://www.snl.com/InteractiveX/Article.aspx?cdid=A-33164108-14126>.

¹⁷⁹ Rudd, *Small Cells Taking Off, Need Fiber Backhaul Soon* at 1 (“So we expect small cell backhaul to cross the ‘Fiber Threshold’ due to: Aggregated Traffic from clusters of small cells; LTE Carrier Aggregation; Shared backhaul transport capacity for WiFi Roaming and Local Breakout.”); *id.* at 8 (“The ‘Fiber Threshold’ for backhaul therefore will vary with each deployment. But bandwidth per cell ‘cluster’ is expected to escalate rapidly and many small cell clusters are expected to cross the critical 200 Mbps breakeven ‘Fiber Threshold’ during 2015 and 2016, especially as: (i) LTE-Advanced (LTE-A) with 3GPP Release 10 – for Carrier Aggregation will be deployed rapidly in the near future (ii) Many small cells will be deployed with integrated 802.11 ac WiFi Access points for video and other traffic Offload”).

¹⁸⁰ Infonetics Research, *Macrocell Mobile Backhaul Equipment and Services* at 19 (“Several US MSOs are leveraging their metro fiber (HFC) plants by deploying fiber to nearby cell sites where the business case makes sense.”).

associated with it.” Comcast offers cellular backhaul services using both microwave and fiber-based backhaul technologies.¹⁸¹

- **Time Warner Cable** “[I]everag[es] [its] robust core metro meshed network” to “provide[] high-capacity Cell Tower Backhaul solutions that serve as a solid foundation to satisfy the exponential traffic growth of next-generation mobile devices.”¹⁸² The company reports that “[c]ell tower backhaul [] continues to be an area of strong growth,” with more than “14,000 towers generating revenue and a healthy backlog.”¹⁸³ In the first six months of 2015, Time Warner Cable reported a \$25 million increase in cell tower backhaul revenue.¹⁸⁴
- **Cox Business** “serves 100 different carriers including the major U.S. wireless service providers.”¹⁸⁵ According to the company’s chief strategist, Cox Business has “‘had great success in macrocell backhaul services, with double-digit growth again in the wireline last mile.’”¹⁸⁶
- **Spectrum Business**, the recently renamed division of Charter, reports “a successful run with” “the cell tower business,”¹⁸⁷ which represents approximately 10 percent of

¹⁸¹ Comcast, *Comcast Business — Cell Backhaul*, <http://business.comcast.com/ethernet/products/cell-backhaul>.

¹⁸² Time Warner Cable Business Class, *Cell Tower Backhaul*, <http://business.timewarnercable.com/solutions/carrier-services/cell-tower-backhaul.html#>.

¹⁸³ Q1 2014 Time Warner Cable Inc. Earnings Conference Call – Final, FD (Fair Disclosure) Wire, Transcript 042414a5338998.798 (Apr. 24, 2014) (statement by Time Warner Cable Inc. CFO Artie Minson).

¹⁸⁴ Time Warner Cable Inc., Form 10-Q, at 15 (SEC filed July 30, 2015), <https://www.sec.gov/Archives/edgar/data/1377013/000119312515269291/d146752d10q.htm>.

¹⁸⁵ Sean Buckley, *Cable Hones Its Wholesale Skills in Special Access, Wireless Backhaul*, FierceTelecom (Apr. 7, 2015), <http://www.fiercetelecom.com/special-reports/cable-hones-its-wholesale-skills-special-access-wireless-backhaul>.

¹⁸⁶ Carol Wilson, *Cox Biz Looks Beyond SMBs*, LightReading (Dec. 4, 2014), <http://www.lightreading.com/cable-video/cable-business-services/cox-biz-looks-beyond-smb/d/d-id/712419> (quoting Cox Business SVP Steve Rowley).

¹⁸⁷ Q4 2014 Charter Communications Inc Earnings Call – Final, FD (Fair Disclosure) Wire, Transcript 020515a5610607.707 (Feb. 5, 2015) (statement by Charter Communications Inc. CFO Chris Winfrey).

total commercial revenues and drives about 20 percent of the company's growth.¹⁸⁸ Cablevision Lightpath also "ha[s] been doing some backhaul business."¹⁸⁹

Cable operators also are particularly well suited to capture new demand at small cells and hotspots. Cable companies are in fact deploying their own private and public WiFi hotspots throughout the U.S., and providing the backhaul for these sites using their own networks.¹⁹⁰ Comcast launched a new hotspot business WiFi service in April 2014, which is now available across Comcast's facilities-based cable modem footprint as of August 2014. Although Comcast does not break out business locations versus combined residential and business hotspot-capable locations, the company has indicated that its hotspot-enabled business customer counts have almost tripled since the start of the program.¹⁹¹ Hossam Salib, the VP of Edge Technology for Comcast, has stated that the ability to provide "fronthaul" connections between provider

¹⁸⁸ *Charter at Deutsche Bank Leveraged Finance Conference – Final*, FD (Fair Disclosure) Wire, Transcript 100113a5186233.733 (Oct. 1, 2013) (statement by Charter Communications Inc. President & CEO Tom Rutledge).

¹⁸⁹ *Cablevision Systems Corp. at Bank of America Merrill Lynch Media, Communications and Entertainment Conference – Final*, FD (Fair Disclosure) Wire, Transcript 091614a5486218.718 (Sept. 16, 2014) (statement by Cablevision Systems Corporation Vice Chairman and CFO Gregg Seibert).

¹⁹⁰ Richard Webb, Infonetics Research, *Small Cells Americas: Wireline Providers Position for Small Cell Backhaul* at 1-2 (Dec. 22, 2014) ("Webb, *Small Cells Americas: Wireline Providers Position for Small Cell Backhaul*") ("It is no secret that cable operators in the US and elsewhere are rapidly deploying hundreds of thousands of private and public WiFi hotspots. . . . Yet for all the competitive positioning around WiFi by cable MSOs, it also plays into a strategy that is much more cooperative with mobile operators, said Salib of Comcast: that of a small cell backhaul provider. . . . Not necessarily just fiber, according to Salib, who believes the coax deployed in many parts of the MSO network will be more than adequate in supporting the backhaul needs of small cells.").

¹⁹¹ Matt Davis and Sathya Atreyam, IDC, *IDC's SMB Telecom Innovation Series: Comcast Business WiFi* at 5 (Sept. 2014).

networks and wireless small cells and hotspots “could be the biggest opportunity for us out of all the evolving mobile architectures.”¹⁹²

Traditional CLECs are likewise thriving in providing backhaul services. Zayo states that it “provide[s] fiber based cell tower backhaul services to all major mobile service operators.”¹⁹³ The company reported having 4,500 cellular towers on-net at the end of 2014, and that it is “actively constructing fiber to an additional 1,200.”¹⁹⁴ The company further states that “the services will yield a more than 20% return on a \$23 million incremental investment” and that “macro and small cells sales have increased by more than 50% compared to the same period in 2014.”¹⁹⁵ Most recently, Zayo announced that its small cell service has grown 260% over the past year and that it is seeing an average cash flow yield of 15% across all small cell sales.¹⁹⁶ Windstream has “invested \$600 million in our fiber to the tower projects,” which has entailed fiber deployment to 4,700 of 5,200 in its region to date, with hundreds more under construction.¹⁹⁷ Level 3 states that it is “in a unique position to be what we call a wireless

¹⁹² Webb, *Small Cells Americas: Wireline Providers Position for Small Cell Backhaul* at 2.

¹⁹³ Zayo Group, *Tower Backhaul*, <http://www.zayo.com/services/mobile-infrastructure/tower-backhaul-msc-connectivity>.

¹⁹⁴ *Zayo Group Prospectus* at 95.

¹⁹⁵ Zayo Group, *Mobile Infrastructure*, <http://www.zayo.com/services/mobile-infrastructure/>.

¹⁹⁶ Sean Buckley, *Zayo Extends Fiber, Turnkey Services to 1,200 Wireless Small Cell Sites*, FierceTelecom (Nov. 9, 2015), <http://www.fiercetelecom.com/story/zayo-extends-fiber-turnkey-services-1200-wireless-small-cell-sites/2015-11-09>.

¹⁹⁷ Sean Buckley, *Windstream’s Gardner: TDM-based Wireless Backhaul Revenue Headwinds To Continue Throughout 2014*, FierceTelecom (May 21, 2014), <http://www.fiercetelecom.com/story/windstreams-gardner-tdm-based-wireless-backhaul-revenue-headwinds-continue/2014-05-21> (“‘Wireless data is growing incredibly fast across the country so that’s the good news about the fiber to the tower story,’ Gardner said. ‘We are now substantially complete; we have invested \$600 million in our fiber to the tower projects.’ The

integrator, which means we not only leverage our on-net presence that includes about 8,000 traffic aggregation points, but we also (use) a number of off-net solutions so we can provide that holistic solution across both the core and the edge as our customers need to reach those towers.”¹⁹⁸

Fixed wireless is also a major source of backhaul. Microwave radio provides high-bandwidth transmission over long distances — and was in fact the foundation of nationwide long-distance networks until the emergence of fiber. Indeed, in most of the world outside of the U.S., microwave is the predominant backhaul technology.¹⁹⁹ According to analysts, the main reason microwave did not become more prevalent in the U.S. is because of how much cheaper T-1 lines have been in the U.S. compared to the rest of the world.²⁰⁰

Fixed wireless backhaul is supplied both by carriers who focus on this technology, wireline CLECs who use it to expand their fiber network, and wireless carriers themselves. FiberTower states that its wireless technology provides “an ideal solution” for small cells that are

telco is nearing the end of its wireless backhaul deployment initiative, having completed 4,700 of 5,200 towers in its region. It has another 300 under construction.”).

¹⁹⁸ Sean Buckley, *Verizon Wireless’ Ongoing LTE Drive Creates a Lush Wireline-Based Backhaul Opportunity*, FierceTelecom (Mar. 28, 2011) <http://www.fiercetelecom.com/story/verizon-wireless-ongoing-lte-drive-creates-lush-wireline-based-backhaul-opp/2011-03-28> (Amanda Tierney, VP, Wholesale Market Management, Level 3 Communications in an interview with FierceTelecom at CTIA).

¹⁹⁹ Infonetics Research, *Macrocell Mobile Backhaul Equipment and Services* at 5 (“Microwave dominates the mobile backhaul market with 55% of installed backhaul connections worldwide in 2013. Microwave products are improving each year and are scalable from hybrid TDM/Ethernet to all-Ethernet microwave, enabling phased upgrades in line with capacity upgrades to the access network.”).

²⁰⁰ Infonetics Research, *Macrocell Mobile Backhaul Equipment and Services* at 19 (“North America has the lowest adoption of microwave, having historical partiality to PDH, since T1s were much cheaper than E1s in the rest of the world, where the buy/lease business case favored investment in microwave to save the monthly recurring charges of E1s.”).

“often technically or economically difficult” to supply with fiber backhaul.²⁰¹ Towerstream signed an agreement in September 2015 with international carrier Syscom Telecom “to co-market backhaul, small cell and Wi-Fi services to billboard owners and wireless carriers operating throughout Towerstream’s network.”²⁰² Verizon uses microwave within its wireless network.²⁰³ And according to the Commission’s Universal Licensing System database, Sprint and T-Mobile have extensive active two-way microwave licenses throughout the country.²⁰⁴

The Commission’s data on wireless carriers’ expenditures on backhaul further demonstrate that competition is extensive.²⁰⁵ Wireless carriers reported the amount of their

²⁰¹ Fiber Tower Corp., *Small Cell and Macro Cell Backhaul*, <http://www.fibertower.com/carrierservices/> (“Fourth generation (or 4G) networks now require anywhere from five (5) to twenty (20) small cells for every macro cell built in their network. These small cells can be located on towers, rooftops, street poles, light poles, smaller structures, inside parks, stadiums, offices and many other locations. It is often technically or economically difficult to provide fiber backhaul to these locations. FiberTower’s 24GHz and 39GHz spectrum and technology, which can offer over 200 high capacity links per square kilometer, provides an ideal solution.”).

²⁰² Telecompaper, *Towerstream, Syscom To Sell Backhaul, Small Cells, Wi-Fi* (Sept. 10, 2015), <http://www.telecompaper.com/news/towerstream-syscom-to-sell-backhaul-small-cells-wi-fi--1101699>.

²⁰³ See Verizon Aug. 8, 2007 Comments, Attach. D, Wells Decl. ¶ 6; Infonetics Research, *Macrocell Mobile Backhaul Equipment and Services* at 19 (“AT&T and Verizon have major initiatives underway to fiberize 90% their owned cell sites over the next few years, yet they are using microwave in places.”).

²⁰⁴ See Comments of Verizon at 28-29, WC Docket No. 05-25 & RM-10593 (FCC filed Aug. 8, 2007) (citing Sprint with more than 600 licenses and T-Mobile with more than 400 licenses, according to the ULS database).

²⁰⁵ The data that wireless carriers reported regarding their backhaul providers at individual cell sites (II.E.2) are unfortunately of limited use in measuring the extensive competition to provide dedicated services at cell sites. First, these data are particularly out of date with respect to this segment of the marketplace given the incredible growth that has occurred. Second, although wireless carriers reported the backhaul providers they use at each cell site they report, there is no consistency in how these names are supplied, including no indication regarding the type of provider (e.g., ILEC or CLEC), which is particularly vexing given that some suppliers (e.g., AT&T, Verizon, CenturyLink) may operate as both. Determining the competitive backhaul

backhaul expenditures attributable to ILECs and CLECs, separately for packet-switched and circuit-switched connections. Based on these data, which do not count the extensive self-supply that wireless carriers are using, competitors to ILECs comprised << >> of total backhaul expenditures nationwide in 2013, including << >> of packet-switched expenditures and << >> of circuit-switched expenditures.²⁰⁶ In the case of Verizon Wireless, competitors comprised << >> of total backhaul expenditures nationwide in 2013, including << >> of packet-switched expenditures and << >> of circuit-switched expenditures.

These data also show that some wireless carriers rely much more heavily on non-ILEC providers than others, demonstrating that the potential for competitive supply is far greater than what static averages suggest.²⁰⁷ For example, << >> reported that competitors account for << >> of its total backhaul expenditures nationwide, including << >> of its packet-switched expenditures.²⁰⁸ << >> reported that competitors account for << >> of its total backhaul expenditures nationwide. <<

>> reported that competitors account for << >> of its total backhaul expenditures nationwide, including << >> of its packet-switched expenditures. <<

>> reported that competitors account for << >> of its total backhaul expenditures nationwide, including << >> of its packet-switched expenditures, and

suppliers at cell sites would therefore require manually coding thousands of rows of data based on necessarily arbitrary and subjective determinations.

²⁰⁶ II.E.3 data, where Provider_Type = 1 for *Competitive Providers*.

²⁰⁷ See II.E.3 data.

²⁰⁸ Although << >> expenditures on backhaul rely on competitors to a much lesser degree, it also uses much less PBDS service than other wireless carriers. Only << >> backhaul expenditures are for PBDS service, compared to <<

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<< >> of its circuit-switched expenditures. << >> reported that competitors account for << >> of its total backhaul expenditures nationwide, including << >> of its packet-switched expenditures. << >> reported that competitors account for << >> of its total backhaul expenditures nationwide, including << >> of its packet-switched expenditures.

III. The Commission’s Data Confirm that Competition Constrains ILEC Special Access Prices, Terms, and Conditions

A. There Is No Record Evidence Supporting a Finding That ILEC Rates Are Unjust and Unreasonable

The *Notice* indicates the Commission will determine “where and when special access prices are just and reasonable.”²⁰⁹ The data do not permit this to be done reliably.

The Commission originally proposed to evaluate pricing through a “panel analysis,” a methodology used to analyze changes over time by comparing data collected at different points of time.²¹⁰ The Commission proposed to analyze changes in prices over time, controlling for different variables.²¹¹ The Commission can no longer conduct such an analysis, however, because it collected pricing data for only one year.

Moreover, even a panel regression would have had limited utility in determining whether prices were just and reasonable. Any analysis of pricing over time must account for the fact that when the Commission introduced limited pricing flexibility for special access services in 2001, those services had been subject to artificial regulatory price constraints for long periods, including at least ten years in which special access rates were capped and subject to annual

²⁰⁹ *Notice* ¶ 67.

²¹⁰ *See id.* ¶ 68 (“As part of our one-time, multi-faceted analysis, we propose to conduct panel regressions designed to determine how the intensity of market competition (or lack thereof), whether actual or potential, affects prices, controlling for all other factors that affect prices.”).

²¹¹ *See id.*

decreases, without regard to what competitive market prices might be. Then, the Commission expressly acknowledged that once the ILECs implemented pricing flexibility, special access prices might move either up or down, ultimately reaching equilibrium in a competitive market.²¹² The Commission noted that in some cases special access prices might rise “because our rules may have required incumbent LECs to price access services below cost.”²¹³ Thus, it is difficult to draw any reliable conclusions about price “increases” over time, given that baseline special access prices were artificially low for many years.

The data also do not permit a reliable comparison of the prices that competitive and incumbent providers charge for different kinds of services and bandwidths, in different geographic areas. As explained above, the revenue totals that CLECs report are unreliable. Among other things, over << >> of the high-capacity revenues and associated bandwidths cannot be associated with an individual address, which render these data unreliable.

In any event, even if the Commission were to somehow find instances where ILEC prices are higher than competitor prices, it would not support a finding that such prices are unjust or unreasonable. That ILEC prices exceed CLEC price is relevant only if this difference lacks a legitimate business justification, such as differences in cost, service quality, or other factors. But the Commission has not collected any data regarding cost that permit such analysis.

Finally, the way that special access services are typically bought and sold further complicates the analysis. Verizon’s tariffs offer special access discounts that are at a minimum region-wide, and in some cases company-wide (*i.e.*, available throughout Verizon’s entire ILEC footprint). This decision to maintain geographically uniform pricing is driven by the economics

²¹² See *Pricing Flexibility Order* ¶¶ 11-13, 155.

²¹³ *Id.* ¶ 155.

and logistics of competing in the special access market. The major purchasers of special access — not only other carriers, but non-carrier customers as well — typically require service at multiple locations across Verizon’s region and across the country. Verizon’s carrier and large enterprise customers invariably purchase special access in multiple MSAs and for multiple locations within those MSAs, with each customer having its own mix of locations. And once Verizon offers special access discounts to meet the needs of these customers, those discounts redound to the benefits of the entire marketplace.

B. Competition Constrains ILEC Terms and Conditions

The Commission sought data on ILEC terms and conditions “[t]o more fully understand competition in the special access market.”²¹⁴ The Commission more recently opened a separate proceeding focused exclusively on the very terms and conditions that led the Commission to collect those data here.²¹⁵ The data the Commission collected on *competitor* terms and conditions, however, provides additional relevant evidence of competition in the high-capacity marketplace.

The Commission required non-ILEC providers to describe “how [their] terms and conditions compare with ILEC offerings,” together with the “business justification for Term and Volume Commitments.”²¹⁶ Competitors also were asked whether their contracts or tariffs contain “either a Prior Purchase-Based Commitment or a Non-Rate Benefit” and to “explain

²¹⁴ *Notice* ¶ 91.

²¹⁵ *See Investigation of Certain Price Cap Local Exchange Carrier Business Data Services Tariff Pricing Plans*, Order Initiating Investigation and Designating Issues for Investigation, WC Docket No. 15-247, DA 15-1194 (rel. Oct. 16, 2015).

²¹⁶ *Order on Reconsideration*, Instructions at 32.

how, if at all” those offerings differ from ILEC offerings.²¹⁷ Data from the competitors who responded to these questions show that it is commonplace in the high-capacity marketplace to offer discount plans that are similar in structure to those of the ILECs, including not only term and volume discounts, but also volume commitment levels that are based on historical purchase levels. The responses also make clear that the rationales underlying these plans for competitors are the same as they are for the ILECs, including competitive pressure, satisfying the demands of customers, ensuring predictable revenue streams, and reducing administrative overhead.

First, the responses show that term and volume discounts are commonplace throughout the high-capacity marketplace. For example, cable operators and CLECs acknowledging they offer discounts for customers who commit to a specified term, generally with larger discounts for longer terms, include: <<

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Competitors acknowledging they offer greater discounts to customers who commit to greater volumes include: <<

>>²¹⁹

Second, the responses show that some competitors enter into agreements that contain what the Commission has labeled a “Prior Purchase-Based Commitment,” where the volume specified in the agreement is agreed upon based on historical purchasing levels. For example, <<

²¹⁷ *Order on Reconsideration*, Data Collection at 9 (II.A.18).

²¹⁸ See these providers’ responses to II.A.19.

²¹⁹ *Id.*

²²¹>> These competitors further acknowledge that they face competition
 << ²²²>> which demonstrates that these provisions are not
 anticompetitive restraints imposed by carriers with market power, but instead reflect a bargain
 between the supplier and purchaser with benefits for both parties. As << >> notes,
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>>²²³

Third, the business justifications that competitors give for offering term and volume
 discounts are the same justifications underlying Verizon’s own discount plans, which further

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demonstrates that marketplace terms and conditions for all providers are driven by the same competitive forces. Competitors may offer these discount plans for a variety of reasons, including to ensure they can recover the fixed up-front costs of providing service;²²⁴ to increase traffic on their networks and get more of a customer's spend;²²⁵ to improve their planning of network capacity to meet future needs;²²⁶ to ensure reliable revenue streams;²²⁷ to reduce their

²²⁴ See, e.g., <<

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²²⁵ See, e.g., <<

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²²⁶ See, e.g., <<

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²²⁷ See, e.g., <<

administrative costs for billing, sales, and other functions;²²⁸ and because customers have come to expect these discounts.²²⁹ These arrangements permit providers <<

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²²⁸ *See, e.g.,* <<

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²²⁹ *See, e.g.,* <<

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²³⁰ <<

>> *See also, e.g.,* <<

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IV. The Commission Should Further Reduce Regulation of ILEC Special Access Services

The evidence demonstrates there is no factual basis to support a finding of market power or market failure in the high-capacity marketplace, and the Commission should not increase the regulation of ILEC special access services.

The Commission should identify for each metropolitan area the areas where demand is concentrated, and grant relief throughout those areas. The record demonstrates that in each metropolitan area competitors are capable of and are serving the areas where demand is concentrated. For those areas where demand is not concentrated and where competition — both actual and potential — cannot adequately protect consumers, the Commission should consider the appropriate level of even-handed regulation in those circumstances.

But a regulatory approach that penalizes arbitrarily one set of competitors — the ILECs — after years of pricing flexibility and forbearance is not only unjustified but also would be counterproductive. This backward approach would give cable companies and other competitors an unfair advantage, to the detriment of customers who benefit from the many high-capacity broadband services that have thrived free from unnecessary rate regulation.

Like the cable companies, CLECs, and others, Verizon and other ILECs aggressively invested in advanced networks. Customers won. And there is no basis to reverse course and confer a benefit on cable and other competitors in this marketplace while disadvantaging ILECs through new rate and other regulations on their enterprise broadband services. Unnecessary and uneven regulation not targeted at true market failure deters competition and constrains incentives to invest in facilities. It is long been a goal of the Commission to “ensure regulatory parity

among providers of similar services,” in order to “minimize marketplace distortions arising from regulatory advantage.”²³¹

Further regulation of ILEC special access services would also impede another one of the Commission’s chief goals: “to help guide and accelerate the technological revolutions that are underway involving the transitions from networks based on TDM circuit-switched voice services running on copper loops to all-IP multi-media networks using copper, co-axial cable, wireless, and fiber as physical infrastructure.”²³²

Imposing price controls or other onerous restrictions on ILEC’s legacy TDM services would impede the transition to IP and deter competition and investment in at least two important respects. First, suppressing rates for legacy TDM services would increase competitors’ incentives to rely on the ILECs’ network at the expense of deploying their own competitive facilities. Even where competitors may find it profitable to deploy facilities of their own, further regulation of ILEC special access prices could create a scenario where the competitor could earn even greater profits using an ILEC’s legacy facilities. This would impede investment and competition. Second, imposing new price controls on ILEC special access services would also curb ILECs’ own incentives to invest.

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²³¹ *Telephone Number Requirements for IP-Enabled Service Providers*, Report and Order, Declaratory Ruling, Order on Remand, and Notice of Proposed Rulemaking, 22 FCC Rcd 19531, ¶ 1 (2007).

²³² *Technology Transitions*, Report and Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking, 30 FCC Rcd 9372, ¶ 8 (2015).

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Respectfully Submitted,

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