Kathleen Grillo
Senior Vice President
Federal Regulatory and Legal Affairs

1300 I Street, NW, Suite 400 West
Washington, DC 20005

Phone 202 515-2533
Fax 202 336-7858
kathleen.m.grillo@verizon.com

January 15, 2015

Ex Parte

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

RE: Protecting and Promoting the Open Internet, GN Docket No. 14-28

Dear Ms. Dortch:

Verizon and many others – including broadband providers, manufacturers, distinguished academics, trade groups, labor unions, and entrepreneurs – have made the case for why Title II regulation of broadband services is unnecessary, illegal, and bad public policy. The case is even stronger when it comes to mobile broadband services given that the U.S. mobile marketplace is the envy of the world, leading the globe in capital investment, 4G LTE deployment, and virtually every other measure.

If the Commission pursues this path, it will inject massive uncertainty into the dynamic and competitive mobile broadband space. First, the radical course of "reclassification" will lead to endless rounds of litigation and will likely be reversed on appeal. Congress shielded mobile broadband from common carriage regulation twice over: by exempting information services from common carrier regulation and again in Section 332 of the Act, which expressly prohibits the FCC from regulating "private mobile services" under Title II. Second, it will jeopardize the U.S. leadership position in the mobile space. The mobile broadband marketplace is intensely competitive, with head-to-head competition for world-class 4G LTE services exploding, investment soaring, broadband speeds and capabilities steadily improving, and effective prices dropping. Applying regulation meant for the rotary era telephone system to this dynamic industry will risk reversing this successful trajectory and could prevent mobile broadband from developing into a true competitive alternative to advanced wireline broadband services, such as cable.

Despite these risks, regulatory advocates and competitors continue to press the FCC to adopt Title II regulation for broadband, including mobile broadband. The fundamental economic premise for their arguments has always been that broadband providers enjoy a "terminating access monopoly" that allow them to restrict consumer choice and disadvantage competitors.

The attached declaration deals a fatal blow to the case for Title II regulation of mobile broadband.[1] In their declaration, Professor Janusz Ordover, former Deputy Assistant Attorney General

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[1] Andres V. Lerner and Janusz A. Ordover, *The "Terminating Access Monopoly" Theory and the Provision of Broadband Internet Access* (Jan. 15, 2015) (attached).

for Economics in the Antitrust Division of the U.S. Department of Justice, and Dr. Andres Lerner confirm that there is no "terminating access monopoly" for wireless broadband. As Drs. Ordover and Lerner explain, the basic premise for that case is both flatly inconsistent with the competitive reality of the mobile broadband marketplace and deeply flawed as a matter of economic theory.

First, the intense competition in today's mobile broadband marketplace promotes and protects consumer interests and denies providers any ability to profit by restricting their customers' access to the open Internet. Mobile broadband providers compete vigorously to attract and retain customers by offering services that enable consumers to go where they want and do what they want online. As Ordover and Lerner show, consumers are well-informed, switching costs are low (as evidenced by churn numbers within the wireless market), and providers aggressively pursue others' customers. Under these circumstances, a mobile broadband provider would quickly lose customers, not grow profits, if it sought to restrict access to the open Internet.

Second, they explain why the economic theory of a terminating monopoly does not apply to mobile broadband. Terminating monopolies exist when the sender of traffic has no relationship with the ultimate recipient and the market cannot discipline the access provider's behavior. Mobile broadband services do not fit that model. If a mobile broadband provider does anything that prevents a customer from accessing online content or an online service, the content provider (e.g., Netflix, Google, Facebook) has a direct relationship with that same customer. The content provider can and will use various weapons – including rallying the customer base – to raise the alarm and fend off the bad behavior. This market feedback loop does not exist in a true terminating monopoly.

Professor Ordover and Dr. Lerner also address why there is no terminating monopoly in the case of Verizon's wireline broadband services, including Verizon's FiOS broadband service. Verizon's wireline broadband services face a near-ubiquitous "intense competitive rivalry" with cable broadband companies. Verizon must compete aggressively to attract and retain customers: there is little stopping customers from switching to the higher speed DOCSIS 3.0 services almost always available from cable competitors. In this competitive environment, any effort to restrict consumers' access to content would trigger a mass defection of customers.

The lack of a "terminating monopoly" eviscerates the case for Title II reclassification. When these economic considerations are added to the many other legal, factual and public policy arguments against Title II regulation, the risk of pursuing the radical Title II path becomes all the more clear.

Sincerely,

Kathleen Grillo

Attachment

The "Terminating Access Monopoly" Theory and the Provision of Broadband Internet Access

Andres V. Lerner and Janusz A. Ordover*

January 15, 2015

* Lerner: Executive Vice President, Compass Lexecon; Ordover: Professor of Economics, New York University, and Senior Consultant, Compass Lexecon.

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About the Authors

Andres V. Lerner is an Executive Vice President at Compass Lexecon. He has extensive experience applying economic and econometric analysis to antitrust matters, including mergers, regulatory proceedings, and litigation. Dr. Lerner has been named one of the foremost competition economists in *The International Who's Who of Competition Economists* for 2014. He has published scholarly articles in leading economic and legal journals, including the *American Economic Review*, the *Antitrust Law Journal*, and the *Antitrust Bulletin*, and has co-edited a collection of seminal articles in antitrust economics. Dr. Lerner has taught Economics as a Visiting Professor at the University of Southern California Marshall School of Business. He has presented economic testimony and submitted declarations in various regulatory proceedings, including to the U.S. Federal Trade Commission, the Antitrust Division of the U.S. Department of Justice, and the U.S. Federal Communications Commission. Dr. Lerner holds a Ph.D. in Economics from the University of California at Los Angeles (UCLA).

Janusz A. Ordover is a Professor of Economics and a former Director of the Masters in Economics Program at New York University. He served as the Deputy Assistant Attorney General for Economics in the Antitrust Division of the U.S. Department of Justice under President George H. W. Bush. While at the Antitrust Division, Professor Ordover served on the White House de-regulation task force, guided economic analyses of antitrust enforcement and acted as a liaison between the Justice Department and various regulatory agencies. At the Division, he was one of the main drafters of the 1992 Horizontal Merger Guidelines. Professor Ordover served as an advisor to the Organization for Economic Cooperation and Development (OECD) in Paris, the World Bank, and the Inter-American Bank for Development on matters of privatization, regulation, international trade policy, and competition policy. He has advised the governments of Poland, Czech Republic, Russia, Hungary, Argentina, and others on regulation and competition matters, as well as on privatization strategies. He has published many articles in economics and law journals on various antitrust issues, including predation, access to bottleneck facilities, vertical integration, as well as overlap between intellectual property rights and competition policy. He is a frequent lecturer on antitrust policy in the U.S. and abroad. Professor Ordover was voted "The Economist of the Year" in 2010 in a poll organized by the *Global Competition Review.*

I. Introduction and Executive Summary

1. Despite the significant competition that exists in the wireless broadband Internet access industry, some parties have claimed that broadband Internet access providers, including wireless providers, are "terminating access monopolies" with regard to providers of online content and services. We have been asked by counsel for Verizon to assess these claims. We conclude that claims that wireless providers are "terminating access monopolies" are both flawed as a matter of economic logic and inconsistent with the empirical evidence.

2. In the highly competitive wireless marketplace, the vast majority of consumers have the ability to choose among different providers offering competing wireless broadband Internet access services. Spurred by fierce competitive rivalry, wireless providers have made massive capital investments to deploy high-speed broadband services, including "fourth-generation" ("4G") LTE technology, and to improve network coverage and capacity. Verizon was the first and leading wireless provider to roll out 4G LTE in the U.S., and is considered "the pioneer in LTE deployment." Today, 93 percent of U.S. consumers have access to at least two 4G LTE services (Verizon and AT&T), and most have access to two more providers (T-Mobile and Sprint).

3. Wireless providers compete intensely for customers on the basis of price, network coverage and reliability, plan characteristics, and with respect to other important aspects of the wireless ecosystem, including the provision of handset devices, operating systems, applications, and content. This competition has led to important consumer benefits—mobile wireless speeds have increased, prices per megabyte of data continue to fall, and consumers have access to a wide and increasing variety of devices and plans.

4. In the competitive environment for wireless broadband, consumers evaluate competing wireless offers, and choose the best provider, plan, and mobile device based on their data needs, price range, and various other factors. The competitive rivalry among providers, and the presence of competitive choices, is evidenced by the significant rate of subscriber switching among wireless providers, with the percent of customers switching providers (or "churning") in a given year ranging from 12 to 26 percent for individual providers. Wireless consumers switch not only because of price differences, but also due to data download speeds, data coverage, reliability, and other quality attributes. Subscriber switching is enhanced by the fact that wireless

broadband consumers have access to information on competitive offers from various sources, including extensive comparative advertising by wireless providers themselves, from industry groups and publications, and consumer groups. The high rate of switching by subscribers shows that subscribers are not "locked-in" to specific broadband networks, and indicates that subscriber switching costs are low.

5. Some industry observers claim that, notwithstanding the significant competition between wireless providers, once a subscriber chooses a broadband provider, that provider is a "terminating monopoly" over access to that subscriber by online content and service providers.[1] However, the nature of wireless broadband Internet access means that the fundamental assumptions of the "terminating access monopoly" theory are not present, and distinguishes wireless broadband Internet access from other services where the Commission has invoked that theory. In the context of long-distance voice services, the area to which the "terminating access monopoly" theory traditionally has been applied, local exchange carriers ("LEC") were claimed to be "terminating access monopolies" because long-distance carriers (known as "inter-exchange carriers" or "IXCs") required access to the LEC's network to reach the LEC's customers. In this context, there were no effective market constraints on the ability of LECs to impose high termination fees on IXCs for termination of long-distance calls. A LEC could charge the IXC a high price to reach its customer, and, because the IXC provided no service to and had no relationship with the end user on the terminating end, there was no mechanism for the IXC to pass those costs back to the terminating LEC's customer. And because IXCs were barred by regulations from refusing to terminate traffic to LECs with inflated rates, the IXCs had no way to discipline LECs with inflated terminating rates. At most, the IXC could spread the higher costs across the customers of all LECs nationwide. Thus, individual LECs could impose high termination fees, and marketplace constraints would not prevent them from doing so.

[1] Comments of the Ad Hoc Telecommunications User Committee, In the Matter of Protecting the Open Internet, Before the Federal Communications Commission, GN Docket No. 14-28, July 18, 2014 (hereinafter, *Ad Hoc Comments*) at i-ii; Comments of Free Press, In the Matter of Protecting the Open Internet, Before the Federal Communications Commission, GN Docket No. 14-28, July 17, 2014 (hereinafter, *Free Press Comments*) at 44; Comments of Netflix, Inc., In the Matter of Protecting the Open Internet, Before the Federal Communications Commission, GN Docket No. 14-28, July 15, 2014 (hereinafter, *Netflix Comments*) at 12; Nicholas Economides (2011), "Broadband Openness Rules Are Fully Justified by Economic Research," *Communications & Strategies*, 84(4): 1-25.

6. These market characteristics are fundamentally different from the provision of wireless broadband Internet access. Unlike the long-distance situation, any action that a wireless broadband provider takes with regard to an online content or service provider resonates back to the wireless broadband provider's own customers. That is, there is a direct "feedback loop" whereby imposing artificially-high fees on online providers, or restricting access to their content or services, would impact the wireless broadband provider's own customers.

7. Any restrictions on access to the content or services of online providers would lower demand for the network itself, which would lead current subscribers to switch to other providers and inhibit the ability of the wireless broadband provider to attract new customers. Because online content and service providers have a direct relationship with subscribers, they are well positioned to inform the wireless provider's subscribers of any practice that degrades access to their content, thus bringing substantial customer and public pressure on any wireless provider that engaged in anticompetitive practices. Rival wireless providers also would have incentives to inform consumers of any such practices through advertising and other means in order to attract customers that value unrestricted access to particular content.

8. Moreover, because online content and service providers have a direct relationship with subscribers, some online providers would pass on to subscribers any fees imposed by a wireless broadband provider in higher prices for the content itself—*e.g.,* the online providers could single out the wireless provider by imposing an additional fee on that wireless broadband provider's customers—which also could reduce demand by subscribers for that provider's services. These competitive reactions were not available to IXCs because IXCs did not have a relationship with, and could not impose fees on, the terminating LEC's customers (*i.e.*, the called party), and even if they could levy a surcharge on the originating LEC's customers (*i.e.,* the calling party), such a surcharge would not have had an effect on the terminating LEC or its customers.

9. While these market mechanisms exist even in the case of a monopoly Internet access provider, the risk of losing wireless subscribers imposes a powerful competitive constraint on wireless broadband providers. There is significant competition for subscribers, and subscribers have the ability and incentive to switch providers in response to any limitation in access to high-quality content. Surveys indicate that between 71 and 91 percent of subscribers would switch broadband providers if their provider started to block, slow down, or impose other restrictions on

access to content they demand. Because content is highly differentiated and subscribers highly value particular content—to the point that they are willing to switch wireless broadband providers to be able access the content— online content and service providers have considerable bargaining power in negotiating with wireless providers.

10. For these reasons, the lack of market constraints that is the basis for "terminating access monopoly" concerns in other contexts simply does not apply to the provision of wireless broadband Internet access. Moreover, claims that once a subscriber chooses a wireless broadband Internet access provider, that provider is a "terminating access monopoly" over access to that subscriber also are false for the additional reason that consumers generally "multi-home" by accessing online content and services on multiple platforms, such as one or more wireless broadband services, a wireline broadband service at home, a wireline broadband service at work, and Wi-Fi networks at numerous locations (*e.g.*, Starbucks, libraries, airports).

11. We also have been asked by counsel for Verizon to assess claims that Verizon's *wireline* broadband Internet access services qualify as terminating monopolies. While an analysis of wireline broadband services nationwide is beyond the scope of this paper, our analysis has determined that the "terminating access monopoly" framework also does not apply to the *wireline* broadband Internet access services that are offered by Verizon based on the nature of those services and the competitive conditions in the markets where they are offered. While industry observers and commenters typically frame their arguments to focus on areas in which a cable operator competes against a DSL network that offers much lower speeds, or is the only option, Verizon faces significant competition from next-generation, high-speed cable services in almost all areas in which it offers wireline broadband services, including virtually all areas in which it offers its FiOS services. In addition, customers can and do regularly switch broadband providers in these markets, and content providers have the same ability as in the wireless context to pass costs back to end user customers and to encourage customers to switch providers if Verizon were to increase the cost or degrade the quality of their content services.

12. This paper is organized as follows. Section II discusses the significant competitive rivalry between wireless broadband providers, and the evidence of switching by wireless subscribers that is the result of this competitive rivalry. Section III explains that the fundamental assumptions of the "terminating access monopoly" theory are inconsistent with the provision of

wireless broadband Internet access services because there are significant market constraints that limit the ability and incentive of wireless providers to set supra-competitive fees to online providers or to anticompetitively degrade access to their content or services. Section IV explains that Verizon also faces significant competitive constraints in the provision of *wireline* broadband services, and that the terminating access monopoly theory also does not apply to Verizon's wireline Internet access services. Section V offers concluding remarks.

II. There Is Significant Competition in the Provision of Wireless Broadband Internet Access

A. There is significant competitive rivalry between providers of wireless broadband Internet access

13. There is little dispute that there is vigorous competitive rivalry among providers of wireless broadband Internet access. Consumers today can obtain wireless broadband from various providers, with over 91 percent of the U.S. population having access to four or more wireless broadband providers.[2] The majority of U.S. consumers also have access to high-speed 4G LTE services from multiple providers: Verizon currently offers 4G LTE coverage to over 97 percent of the U.S. population, AT&T to 96 percent, Sprint to 83 percent, and T-Mobile to 85 percent.[3] These estimates imply that at least 93 percent of U.S. consumers have access to two LTE services (from Verizon and AT&T), and between 61 and 71 percent also have access to LTE services from T-Mobile and Sprint. The upper end of this range is consistent with projections of industry observers.[4, 5] And, an even greater share of consumers have access to

[2] Federal Communications Commission National Broadband Map, *available at* http://www.broadbandmap.gov/summarize/nationwide. Data as of December 31, 2013.

[3] Martin Blanc, "T-Mobile Plans To Overtake Verizon Communications Next Year," bidnessetc, December 31, 2014, *available at* http://www.bidnessetc.com/31786-tmobile-plans-to-overtake-verizon-communications-next-year. See also John Legere, "What's Next in Wireless: My 2015 Predictions," T-Mobile, December 30, 2014, *available at* http://newsroom.t-mobile.com/issues-insights-blog/2015-predictions.htm; "Sprint Network Information Center," Sprint, December 29, 2014, *available at* http://newsroom.sprint.com/presskits/sprint-network-vision-information-center.htm.

[4] For instance, one industry analyst noted that in the near future "about 60 percent-70 percent of Americans will have access to between three and four LTE networks." (Anna-Maria Kovacs, "Telecommunications competition: the infrastructure-investment race," Internet Innovation Alliance, October 8, 2013 at 19.)

[5] Despite the fact that most U.S. consumers have, or will soon have, access to four 4G LTE networks, some industry observers claim that "[w]ireless broadband is not robustly competitive" because it "is a very concentrated industry." (Nicholas Economides (2011), "Broadband Openness Rules Are Fully Justified by Economic Research," *Communications and Strategies*, 84(4): 1-25 at 9.) However, as we discuss in Section IV, there is no economic or

high-speed services from T-Mobile and Sprint in addition to 4G LTE services from Verizon and AT&T.[6]

14. Wireless providers compete intensely for customers on the basis of price, network coverage and reliability, plan characteristics, and with respect to important aspects of the wireless ecosystem, including the provision of valuable services, handset devices, operating systems, applications, and content.[7] Analysts report that the competitive rivalry among wireless broadband providers has been intensifying, with all major providers reducing prices and moving away from long-term service contracts.[8] One recent analyst report noted "sizeable cuts in service prices for 10GB+ data" plans by Verizon and AT&T.[9] The Commission's current Wireless Competition Report noted that recently "both AT&T and Verizon cut the monthly service fees on selected data tiers outright."[10] A recent article noted that T-Mobile has been "eliminating contracts, dropping international roaming charges and offering to pay competitors' customers $650 to switch over. … Sprint, AT&T and Verizon have all cut prices in response to T-Mobile's campaign, and they have begun moving away from two-year contracts as well."[11] Sprint began

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empirical basis for the proposition that a market with four rivals is not sufficiently competitive. And, the actual empirical evidence of significant competitive rivalry clearly disputes this proposition.

[6] Sprint's 3G network covers 90 percent of the U.S. population (281 million consumers) and T-Mobile's network covers 77 percent (240 million consumers). This implies that at least 83 percent of U.S. consumers have both 4G LTE access from Verizon and AT&T, and 3G access from Sprint (and likely HSPA+ services from T-Mobile as well). ("The Sprint Family Share Pack," 2014, *available at* http://www.sprint.com/landings/indirect/sprintplans.pdf; Sascha Seagan, "T-Mobile Details 'Data Strong' Plans," PC Magazine, June 18, 2014.)

[7] See Declaration of Andres V. Lerner, Competition in Broadband and "Internet Openness," July 15, 2014 (hereinafter, *Lerner Declaration*) at 31-33, 36-39.

[8] See, *e.g.*, Bank of America Merrill Lynch, "A Frantic Start to 2014 in Wireless Pricing," April 4, 2014 at 2: "we see rising risk of accelerating competitive action and reaction. 1Q14 was the most active quarter in recent memory from a pricing perspective."; Bank of America Merrill Lynch, "3Q preview & model book – Wireless pricing is top of mind," October 17, 2014 at 3: "U.S. wireless carriers have implemented more than 20 pricing and promotional changes since June, 2014. The moves reflect the intersection of T-Mobile and Sprint's initiatives to gain or sustain subscriber momentum after years of losses, and AT&T and Verizon's efforts to hold share and keep churn low."

[9] Bank of America Merrill Lynch, "A Frantic Start to 2014 in Wireless Pricing," April 4, 2014 at 1.

[10] Federal Communications Commission, 17th Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, December 18, 2014 (hereinafter, "Federal Communications Commission, 17th Annual Mobile Wireless Competition Report") at 68.

[11] James O'Toole, "T-Mobile is at a crossroads, so is the U.S. wireless industry," CNN Money, June 8, 2014, *available at* http://money.cnn.com/2014/06/08/technology/mobile/tmobile-sprint/.

providing compatible devices for free to customers switching from other wireless providers, thus further reducing switching costs to customers.[12]

15. This competition among wireless providers has led to important consumer benefits. Mobile wireless speeds continue to rise and prices per megabyte of data continue to fall.[13] Wireless competition also has facilitated the availability of a wide variety of devices (and associated operating systems), applications, and services that are complements to a robust wireless broadband ecosystem.

16. The Commission has recognized the competitive nature of the wireless marketplace, and the consumer benefits that have resulted from such competition. The Commission's most recent Wireless Competition reports provide "an analysis and description of the CMRS industry's competitive metrics and trends,"[14] and noted that "market performance metrics provide more direct evidence of competitive outcomes and the strength of competitive rivalry than intermediate factors, such as concentration measures."[15] In reviewing these performance metrics, the Commission noted a "significant increase" in the number of wireless Internet connections and the dramatic growth in smartphone adoption in recent years.[16] The Commission also noted that wireless broadband prices (per megabyte of data) have declined.[17] The

[12] For instance, Sprint effectively offered free iPhones to consumers who switched to Sprint from another wireless provider in late 2013. (Joan Solsman, "Free iPhone 5C? Sprint offers $100 discount to rivals' users," CNET, September 16, 2013, *available at* http://www.cnet.com/news/free-iphone-5c-sprint-offers-100-discount-to-rivals-users/: "Sprint is offering $100 off any phone to people switching their number over from a rival carrier, just in time for the $99 iPhone 5C's arrival.") See also, "For a Limited Time, Customers Who Switch a Number to Sprint on a Framily Plan Can Save up to $650." Sprint Newsroom, April 4, 2014, *available at* http://newsroom.sprint.com/news-releases/for-a-limited-time-customers-who-switch-a-number-to-sprint-on-a-framilysm-plan-can-save-up-to-650.htm.

The Commission's current Wireless Competition Report also noted that "[e]ffective 12/05/2014, available for limited time only, Sprint is introducing the Cut Your Bill in Half Event for Verizon and AT&T customers who are interested in switching to Sprint to cut their rate plan in half." (Federal Communications Commission, 17th Annual Mobile Wireless Competition Report at 137.)

[13] See *Lerner Declaration* at 37-40.

[14] Federal Communications Commission, 16th Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, March 21, 2013 (hereinafter, "Federal Communications Commission, 16th Annual Mobile Wireless Competition Report") at 5; Federal Communications Commission, 17th Annual Mobile Wireless Competition Report at 5.

[15] Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 33.

[16] Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 157-159; Federal Communications Commission, 17th Annual Mobile Wireless Competition Report at 9, 39-40.

[17] Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 181.

Commission also has recognized the "rapidly evolving" nature of wireless broadband services in recent years, and the increasing array of choices available to consumers.[18] The Commission's most current Wireless Competition Report noted that "the ongoing deployment and adoption of LTE networks and the technologies they have enabled, has had a particularly profound effect throughout the mobile wireless marketplace."[19]

17. The broad availability of high-speed wireless Internet access and resulting consumer benefits have been enabled by massive investments by wireless broadband providers in deploying high-speed broadband services. Major wireless providers have rolled out 4G LTE technology, which allows the provision of much higher data speeds over wireless broadband, and improved network coverage and capacity.[20] In the past five years, U.S. wireless providers have made more than $134 billion in capital investments, averaging $26.8 billion a year.[21] In each of the past three years (2011 to 2013), Verizon and AT&T were the top two American firms in terms of capital expenditures.[22]

18. Verizon was the first and leading wireless provider to roll out 4G LTE in the U.S., and is considered "the pioneer in LTE deployment."[23] Verizon began deploying its 4G LTE network in late 2010 and aggressively expanded its 4G LTE network coverage. By 2012, the majority of

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[18] Federal Communications Commission, Report and Order, Preserving the Open Internet Broadband Industry Practices, GN Docket No. 09-191, December 23, 2010, ¶ 94: "The mobile ecosystem is experiencing very rapid innovation and change, including an expanding array of smartphones, aircard modems, and other devices that enable Internet access; the emergence and rapid growth of dedicated-purpose mobile devices like e-readers; the development of mobile application ('app') stores and hundreds of thousands of mobile apps; and the evolution of new business models for mobile broadband providers, including usage-based pricing."

[19] Federal Communications Commission, 17th Annual Mobile Wireless Competition Report at 6.

[20] These investments include both cell sites and the backhaul connections between sites, which facilitate increased speed and capacity. (Federal Communications Commission, 17th Annual Mobile Wireless Competition Report at 61.) "4G" includes a variety of technological specifications. The terms "3G" and "4G" are used by industry for marketing purposes, as well as by the International Telecommunications Union (ITU) for technical specifications. (Federal Communications Commission, 17th Annual Mobile Wireless Competition Report at 91.) For example, T-Mobile, AT&T, and Verizon Wireless refer to their WiMAX, HSPA+, and LTE networks as "4G." (Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 123.)

[21] Federal Communications Commission, 17th Annual Mobile Wireless Competition Report at 85.

[22] Excludes R&D. Diana Carew and Michael Mandel, "Investment Heroes: Who's Betting on America's Future?" Progressive Policy Institute, July 2012 at 3; Diana Carew and Michael Mandel, "U.S. Investment Heroes of 2013: The Companies Betting on America's Future," Progressive Policy Institute, September 2013 at 5; Diana Carew and Michael Mandel, "U.S. Investment Heroes of 2014: Investing at Home in a Connected World," Progressive Policy Institute, September 2014 at 3.

[23] Marguerite Reardon, "T-Mobile launches 4G LTE network," CNET, March 26, 2013, *available at* http://www.cnet.com/news/t-mobile-launches-4g-lte-network/.

Verizon's data traffic was transmitted on 4G.[24] AT&T, Sprint, and T-Mobile subsequently launched their 4G LTE networks (in 2011, 2012, and 2013, respectively).[25]

19. Even as the rollout of 4G LTE continues, wireless providers continue to invest in expanding the capabilities of their wireless broadband networks. Verizon recently began further upgrades of its 4G network by rolling out "XLTE," which delivers faster peak data speeds, and double the bandwidth compared to "regular" 4G.[26] Verizon's roll-out of XLTE in many of its 4G LTE markets is expected to improve performance on Verizon's wireless broadband network, especially in densely populated areas.[27] Other wireless providers, such as T-Mobile, also continue to invest in improving the capabilities of their broadband networks.[28]

B. Wireless broadband consumers are well-informed and switch among wireless providers on the basis of price and non-price attributes

20. In this competitive environment, consumers of wireless services evaluate competing offers from multiple providers, and choose the optimal device and plan for their location, data needs, price range, and other factors.

21. The significant competitive rivalry between providers, and the competitive choices available to consumers, is evidenced by the significant rate of switching by wireless broadband

[24] Marguerite Reardon, "Verizon: Our 4G LTE network will soon carry most of our data," CNET, October 9, 2012, *available at* http://www.cnet.com/news/verizon-our-4g-lte-network-will-soon-carry-most-of-our-data/.

[25] Phil Goldstein, "AT&T to launch LTE Sunday, September 18," FierceWireless, September 15, 2011, *available at* http://www.fiercewireless.com/story/att-launch-lte-sunday/2011-09-15. Marguerite Reardon, "Sprint officially launches 4G LTE in 15 cities," CNET, July 16, 2012, *available at* http://www.cnet.com/news/sprint-officially-launches-4g-lte-in-15-cities/; Marguerite Reardon, "T-Mobile launches 4G LTE network," CNET, March 26, 2013, *available at* http://www.cnet.com/news/t-mobile-launches-4g-lte-network/.

[26] Debi Lewis, "XLTE: America's Best Network Gets Even Better," Verizon Wireless, October 16, 2014 *available at* http://www.verizonwireless.com/news/article/2014/05/verizon-wireless-xlte.html. As of June 2014, the XLTE 4G network had been launched in over 300 of Verizon's 500 4G LTE-ready cities. (Angela Moscaritolo, "Verizon Brings Super-Charged XLTE to 300 Markets," PCMag, June 27, 2014, *available at* http://www.pcmag.com/article2/0,2817,2460175,00.asp; "Verizon XLTE IS HERE," *available at* http://s7.vzw.com/is/content/VerizonWireless/eCatalogs/Verizon-XLTE-markets.pdf.)

[27] Angela Moscaritolo, "Verizon Brings Super-Charged XLTE to 300 Markets," PCMag, June 27, 2014, *available at* http://www.pcmag.com/article2/0,2817,2460175,00.asp.

[28] For example, T-Mobile's CEO recently stated that in 2015 T-Mobile plans "on covering more than 150 metro areas with Wideband LTE and deploying 700 MHz spectrum in approximately 350 metro areas." (John Legere, "What's Next in Wireless: My 2015 Predictions," T-Mobile Newsroom, December 30, 2014, *available at* http://newsroom.t-mobile.com/issues-insights-blog/2015-predictions.htm.) T-Mobile's Wideband LTE offers better speeds and performance on T-Mobile's data network, and can top speeds of 100 Mbps. (Neville Ray, "Network-Building Un-carrier Style," T-Mobile Newsroom, December 16, 2014, *available at* http://newsroom.t-mobile.com/issues-insights-blog/uncarrier-8-blog.htm.)

subscribers. Wireless subscriber monthly churn rates in the third quarter of 2014 were 1.0% for Verizon and AT&T, 1.6% for T-Mobile, and 2.2% for Sprint, which means that 12 percent of Verizon and AT&T customers, 19 percent of T-Mobile customers, and 26 percent of Sprint customers, churn each year.[29]

22. Wireless consumers switch among providers not only because of price, but also due to data download speeds, data coverage, and other quality attributes. For instance, an industry study found that "40 percent [of smartphone owners] said they switched operators in the past year to get better data speed and coverage compared with 26 percent who said they switched to get better voice coverage."[30]

23. Wireless subscribers are well-informed with regard to price and non-price attributes of broadband Internet access services. Wireless broadband consumers have access to information about rival offerings including from social media, industry groups and publications, consumer groups, and other third parties.[31] And, wireless providers advertise extensively, which gives

[29] Churn reported for post-paid wireless plans. Rates reflect actual churn as of calendar 2014 3Q. (Bank of America Merrill Lynch, "AT&T Inc., 3Q14 Wrap: Wireless hangs in, lots of moving parts in results," October 23, 2014 at 4; Bank of America Merrill Lynch, "T-Mobile US, 3Q14 Wrap: Don't worry, be subby" October 29, 2014 at 3; Bank of America Merrill Lynch, "Verizon Communications Inc., First look 3Q14 – Higher gross add costs explain penny miss," October 21, 2014 at 3; Bank of America Merrill Lynch, "Sprint Corp., New CEO does what had to be done; stock pricey, PO to $4," November 4, 2014 at 4.) Although some wireline churn results from people moving from an area served by their current provider to an area where that provider does not operate, most wireless broadband suppliers operate nationwide.

[30] Sue Marek, "Study: Data speed is more critical than voice coverage for smartphone users," FierceWireless, July 13, 2012, *available at* http://www.fiercewireless.com/story/study-data-speed-more-critical-voice-coverage-smartphone-users/2012-07-13?utm_medium=nl&utm_source=internal.

[31] See, *e.g.*, Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 203: "For example, websites such as billshrink.com, myrateplan.com, reviews.cnet.com/cell-phone-buying-guide, and prepaidreviews.com, provide consumers with free and user-friendly means to identify the best wireless service to meet their needs." A number of organizations have published detailed reports and studies of wireless data performance, including RootMetrics Data Network Performance Study, PCMag Mobile 3G/4G Network Performance Study, and PCWorld/Novarum 3G/4G Network Performance Study. (Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 196.) Additionally, "J.D. Power publishes a consumer survey study twice a year that measures wireless call quality performance in terms of the number of problems per 100 calls (PP100), where a lower score reflects fewer problems and higher wireless call quality performance. … The Nielsen Company's national service quality benchmark program provides a detailed snapshot of mobile wireless network performance and reliability using its fleet of 35 test vehicles and state-of-the-art mobile wireless network testing equipment. It performs extensive drive tests annually in 264 US markets and provides a detailed voice and data network quality test report." (Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 197.)

consumers information on their services, prices, plans, features, and various aspects of network quality.[32] As the Commission has noted:

> In order to make informed decisions, consumers need detailed information about the price, availability, quality, and features of mobile wireless services. All mobile wireless service providers offer resources on their websites that advertise their products, services, and prices and that give potential customers information on their networks, service plans, and terms of service. A number of third parties – such as *Consumer Reports*, trade associations, marketing and consulting firms, and several websites – also provide consumers with an overview and comparison of the mobile wireless services available in their local areas. In addition, organizations such as *Consumer Reports* and *J.D. Power* publish the results of their wireless user surveys, which rate wireless service providers based on customer satisfaction. … Information on mobile broadband availability can also be found in the National Broadband Map.[33]

24. Despite the significant rate of wireless subscriber switching, some industry observers claim that "competition among wireless broadband providers is limited due to high switching costs at the customer level," pointing to subscriber contracts and the incompatibility of wireless transmission technologies.[34] However, although wireless subscribers may choose to enter into contracts, generally in connection with receiving a significant upfront discount on the price of a mobile device, contracts expire for a large share of wireless consumers every year. The standard two-year wireless contract implies that roughly 50 percent of wireless subscriber contracts expire each year.[35] And, most consumers upgrade their mobile device with the same frequency, likely

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[32] AT&T and Verizon were among the top ten U.S. advertisers from 2010 through 2014 in terms of ad spend including on TV, magazine, newspaper, radio, outdoor and Internet. See "Kantar Media Reports U.S. Advertising Expenditures Increased 0.7 Percent In Q2 2014," Kantar Media, September 16, 2014, *available at* http://kantarmedia.us/press/us-advertising-expenditure-q2-2014; "Kantar Media Reports U.S. Advertising Expenditures Increased 0.9 Percent In 2013, Fueled By Larger Advertisers," Kantar Media, March 25, 2014, *available at* http://kantarmedia.us/press/kantar-media-reports-us-advertising-expenditures-increased-09-percent-2013; "Kantar Media Reports U.S. Advertising Expenditures Increased 3 Percent in 2012," Kantar Media, March 11, 2013, *available at* http://kantarmedia.us/press/kantar-media-reports-us-advertising-expenditures-increased-3-percent-2012; "Kantar Media Reports U.S. Advertising Expenditures Increased 0.8 Percent in 2011," Reuters, March 12, 2012, *available at* http://www.reuters.com/article/2012/03/12/idUS115769+12-Mar-2012+BW20120312; "U.S. Ad Spending Grew 6.5% in 2010 as Auto Surged and Pharma Hit a Low," Advertising Age, March 17, 2011, *available at* http://adage.com/article/media/u-s-ad-spending-grew-6-5-2010-auto-rose-pharma-fell/149436/.

[33] Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 203-204.

[34] Nicholas Economides (2011), "Broadband Openness Rules Are Fully Justified by Economic Research," *Communications and Strategies*, 84(4): 1-25 at 9.

[35] See Federal Communications Commission, 17th Annual Mobile Wireless Competition Report at 66: "the handset subsidy model traditionally used in postpaid service requires customers to sign a contract for a specified period (typically two years) in return for receiving a significant upfront discount on the price of a handset."

when wireless contracts expire.[36] Thus, the existence of long-term service contracts and device incompatibilities across wireless providers does not inhibit subscriber switching or the intensity of competition to sign up subscribers. The Commission's "number portability" rules further reduce switching costs.[37]

25. Moreover, while GSM and CDMA wireless transmission technologies are incompatible, the significance of these incompatibilities has diminished over time with the roll-out of 4G LTE, which is a common transmission technology deployed by all the major wireless providers. And, any incompatibilities related to the use of different spectrum bands also are becoming less important as mobile devices increasingly support multiple frequency bands.[38] For example, "iPhone 6 and 6 Plus buyers in the US can now buy an unlocked and SIM-free model to use on any carrier … This means you can activate the phone on any carrier in the US, including major carriers AT&T, T-Mobile, Verizon or Sprint"[39] All major U.S. wireless providers (Verizon, AT&T, T-Mobile, Sprint and U.S. Cellular) also have committed to allow eligible customers (*e.g.*, customers who have fulfilled their contract) to "unlock" their phones in order to take them to a different wireless provider.[40] Thus, wireless consumers will be able to switch to a technologically-compatible wireless provider after the expiration of their contract without replacing their device.

26. Lastly, several factors reduce switching costs *during* the term of any wireless subscriber contract. For example, major wireless providers pro-rate their early termination fees ("ETFs"), making switching less costly for consumers under contracts.[41] Some competitors, like T-Mobile

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[36] Roger Entner, "Roger's Recon: State of Wireless Union 2014, Part Two," Recon Analytics, February 13, 2014, *available at* http://reconanalytics.com/2014/02/rogers-recon-state-of-wireless-union-2014-part-two/: "Americans upgrade to new devices at a rapid pace (about every 22.4 months in 2013)."

[37] Federal Communications Commission, Portability: Keeping Your Telephone Number When You Change Service Provider, *available at* http://www.fcc.gov/guides/portability-keeping-your-phone-number-when-changing-service-providers.

[38] See, *e.g.*, Brian Hall, "You can legally unlock your smartphone -- so now what?" Tech Hive, August 19, 2014, *available at* http://www.techhive.com/article/2466622/you-can-legally-unlock-your-smartphone-so-now-what.html.

[39] Lance Whitney, "iPhone 6, 6 Plus available unlocked and SIM free," CNET, January 6, 2015, *available at* http://www.cnet.com/news/iphone-6-now-available-unlocked-and-sim-free-in-us/.

[40] "Mobile Wireless Device Unlocking Voluntary Commitment," CTIA (Wireless Association), December 12, 2013, *available at* http://www.ctia.org/docs/default-source/fcc-filings/ctia-letter-on-unlocking.pdf.

[41] Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 120: "In 2012, all four nationwide providers had policies to pro-rate ETFs over the course of the standard two-year contract by progressively reducing the fee postpaid customers pay to terminate their service contracts before the expiration of

and Sprint, pay off ETFs if consumers switch to their wireless service, which means that consumers can switch at little or no cost.[42] As the Commission noted, the "purpose of ETF buyouts is to encourage customers to switch from rivals by reducing switching costs."[43] And, "secondary markets" for mobile contracts and devices also facilitate switching by subscribers, even during the term of their wireless contract, as the Commission also has noted.[44]

III. The "Terminating Access Monopoly" Theory Does Not Apply to the Provision of Wireless Broadband Internet Access

27. Despite the significant competition between wireless broadband providers for subscribers, some parties claim that those broadband networks have a "terminating access monopoly" over online content and service providers, and thus have the ability to set supra-competitive access fees to online providers. Ad Hoc, for example, claims that:

> the level of competition in the consumer broadband market has only limited relevance for purposes of identifying the appropriate regulatory framework for Internet openness and the unimpeded transmission of content of the subscriber's choosing.… Competition in the consumer broadband market, even where it

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their terms." The four major nationwide wireless providers continue to pro-rate ETFs. (See, "Learn about Early Termination Fee," sprint.com, last updated May 9, 2014, *available at* http://support.sprint.com/support/article/Learn_about_early_termination_fee/case-sp061027-20110823-171256; "Early Termination Fees," att.com, *available at* http://www.wireless.att.com/learn/articles-resources/early-term-fees.jsp; "Customer Agreement," verizonwireless.com, last updated November 14, 2014, *available at* http://www.verizonwireless.com/b2c/support/customer-agreement; "About fees & taxes," t-mobile.com, last updated September 26, 2014, http://support.t-mobile.com/docs/DOC-3235#etf.) For instance, Verizon subscribers pay an ETF of $175 or $350 (depending on device type) if they cancel their contract during the first seven months. After that, the ETF declines by $5 or $10 monthly for months eight to 18, with additional monthly declines of $10 or $20 in months 19-23, and $30 or $60 in the final month of the contract. ("Customer Agreement," verizonwireless.com, last updated November 14, 2014, *available at* http://www.verizonwireless.com/b2c/support/customer-agreement.)

[42] "T-Mobile Delivers Contract Freedom for Families By Paying Off Early Termination Fees," January 8, 2014, *available at* http://newsroom.t-mobile.com/news/t-mobile-delivers-contract-freedom-for-families-by-paying-off-early-termination-fees.htm; "For a Limited Time, Customers Who Switch a Number to Sprint on a Family Plan Can Save up to $650," April 4, 2014, *available at* http://newsroom.sprint.com/news-releases/for-a-limited-time-customers-who-switch-a-number-to-sprint-on-a-familysm-plan-can-save-up-to-650.htm; Bank of America Merrill Lynch, "Wireline & Wireless Telecom Services, A baseline for what's to come on the wireless pricing front," August 14, 2014 at 4-5. Over 60 percent of new subscribers to T-Mobile's post-paid plans in second quarter 2014 switched from other wireless providers via T-Mobile's ETF refund program. (Bank of America Merrill Lynch, "T-Mobile US, A new player in the M&A game, code name: Croissant," July 31, 2014 at 6.)

[43] Federal Communications Commission, 17th Annual Mobile Wireless Competition Report at 73.

[44] Federal Communications Commission, 16th Mobile Competition Report at 121: "The emergence of a secondary market segment for mobile wireless service contracts may facilitate consumers' ability to switch service providers. … In addition to the secondary market for cellphone service contracts, there is a secondary market for iPhones and other high-end smartphones and devices."

> exists, cannot constrain the market behavior of a subscriber's ISP towards the businesses seeking to communicate with that subscriber. Once a subscriber selects her ISP, businesses and other edge providers have no option for communicating with the subscriber besides that ISP, regardless of the competitive choices available to the subscriber at the time of selection.[45]

28. In this section, we explain the theoretical basis for the "terminating access monopoly" framework, and its traditional application to telephone networks (Section A). We then explain why the fundamental assumptions of the "terminating access monopoly" framework do not apply to the provision of wireless broadband services. In contrast to the "terminating access monopoly" framework, wireless broadband providers face significant market constraints that limit their ability and incentive to set supra-competitive fees to online providers or to degrade the quality of access to their content or services (Section III.A). These market mechanisms are especially significant due to the propensity of subscribers to switch wireless networks, and the likelihood that they would do so in response to any limitations on the availability and quality of content that can be accessed on the wireless network (Section III.B).

A. The "terminating access monopoly" theory

29. The "terminating access monopoly" framework is based on the economic theory of "competitive bottlenecks."[46] The theory is based on a model of two-sided platforms or networks, in which users on one side of the platform (say, side A) participate in only one platform (*i.e.*, "single-home"), while users on the other side of the platform (side B) participate in all platforms (*i.e.*, "multi-home") in order to reach all members of group A. Because each member of group A single-homes (say, a subscriber), once the platform (a network service provider) has signed up some members of group A, the only way for members of group B (online content and service providers) to reach to those members of group A is to join the platform. It further follows that if a member of group B wants to reach all members of group A, it has to multi-home, *i.e.*, join all the platforms that the members of group A have joined. Thus, according to the theory, once a

[45] *Ad Hoc Comments* at 8-9. See also, Nicholas Economides (2011), "Broadband Openness Rules Are Fully Justified by Economic Research," *Communications and Strategies*, 84(4): 1-25 at 2: "once a customer has subscribed to a broadband access network provider's services, the customer is effectively 'captured' and can be used to extract surplus from the other side of the network. This is akin to the terminating monopoly problem of voice telecommunications networks."

[46] Mark Armstrong, "The Theory of Access Pricing and Interconnection," in HANDBOOK OF TELECOMMUNICATIONS ECONOMICS, Vol. I (M. Cave, S. Majumdar, and I. Vogelsang eds. 2002).

platform has signed up some members of group A (in fact, even a small share of all members of group A) it has a "monopoly" over access to those members.[47] According to the theory, the platform's monopoly over access to its members of group A exists irrespective of the size (or market share) of the platform, or the level of competition in the market for members of group A. The "competitive bottlenecks" theory assumes that there are no effective market mechanisms that constrain a platform's ability and incentive to set high prices to the "multi-homing" side (group B, here, the online content and service providers). Members of group A (here, subscribers) do not switch to other networks in response to high prices or restrictions on access imposed by the network on group B.[48]

30. The "terminating access monopoly" framework traditionally has been applied in the context of landline voice long-distance services. Local exchange carriers ("LECs") were claimed to be "terminating access monopolies" with respect to the termination of long-distance calls to an LEC's customers. This is because inter-exchange carriers ("IXCs") required access to the LEC's network in order to reach the LEC's customers for termination of long-distance calls.[49] LECs were considered to have a terminating access monopoly that allowed them to impose unreasonably-high termination fees on IXCs. This applied historically for the incumbent local exchange carriers ("ILECs"), which had monopolies in their local calling area and, subsequently, also for competitive local exchange carriers ("CLECs"), which entered local markets following the Telecommunications Act of 1996.[50]

31. In that context, there were limited, if any, market constraints on the ability and incentives of LECs to impose supra-competitive termination fees on IXCs because there was no effective market mechanism by which these high fees charged to the IXC could or would affect the choice

[47] Mark Armstrong (2006), "Competition in Two-Sided Markets," *RAND Journal of Economics*, 37(3): 668-691 at 669-670.

[48] In fact, because of inter-platform competition in the market for group A, higher prices charged by the platform to members of group B are competed away in lower prices to members of group A. As a result, in the "competitive bottlenecks" theory, competition compels a platform to charge very high prices to members of group B and low (possibly zero or negative) prices to members of group A.

[49] See, *e.g.*, Noel D. Uri (2001), "Monopoly power and the problem of CLEC access charges," *Telecommunications Policy*, 25 611–623 at 613. As in the "competitive bottlenecks" theory, subscribers of the terminating carrier "single-home"—*i.e.*, subscribe to only one carrier—while an IXC "multi-homes"—*i.e.*, must enter into terminating arrangements with every LEC in order to ensure that subscribers of the originating LEC can reach all users, regardless of the carrier to which they subscribe.

[50] Noel D. Uri (2001), "Monopoly power and the problem of CLEC access charges," *Telecommunications Policy*, 25 611–623 at 612-613.

of a terminating LEC by the called party. The IXC could not constrain the behavior of the terminating LEC or the called party. The IXC had no direct arrangement with the called party, and therefore had no means of passing on termination fees to those customers.[51] Consequently, the terminating LEC's customers had no incentive to switch to a rival, even if there were one. Simply, there were no adverse market consequences for a terminating LEC to impose unreasonably-high termination fees on IXCs.[52]

32. At best, the IXC could try to pass on the higher termination fees to customers of all LECs by increasing long-distance rates. However, although this may have reduced demand for telephone services in general, neither the terminating carrier nor the called party took these costs into account. Because the reduction in long-distance calls could lower demand by all potential parties called by the originating subscriber, including parties that subscribe to other carriers, higher termination fees imposed an "externality" on other carriers that is not taken into account by the terminating carrier in setting those fees.[53]

33. As we discuss below, the fundamental assumptions of the "terminating access monopoly" theory are far removed from the reality of wireless broadband networks, in which online content and service providers "interact" through the network directly with subscribers, and the value of the wireless broadband network itself to subscribers is largely dependent on the availability and quality of the content that can be accessed. As a result, many subscribers likely would switch their wireless broadband network in response to restrictions on the quality or availability of content that they demand.

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[51] The Telecommunications Act of 1996 contains provisions requiring interconnection between carriers, diminishing the ability of an IXC to simply refuse to terminate calls to a customer of an LEC. See, *e.g.*, Federal Communications Commission, Seventh Report and Order and Further Notice of Proposed Rulemaking In the Matter of Access Charge Reform, CC Docket No. 96-262, April 26, 2001 at 37.

[52] In fact, because of competition between LECs and CLECs for subscribers, higher termination fee revenues were passed through to subscribers in *lower* prices for telephone service and, thus, consumers had incentives to choose carriers that imposed high termination fees (and competition therefore compelled carriers to do so). See, *e.g.*, Noel D. Uri (2001), "Monopoly power and the problem of CLEC access charges," *Telecommunications Policy*, 25 611–623 at 614.

[53] Noel D. Uri (2001), "Monopoly power and the problem of CLEC access charges," *Telecommunications Policy*, 25 611–623 at 615. This externality due to the interconnection between independent carriers, which is the basis for the market failure in telephone networks, is highlighted by the fact that the "terminating access monopoly" problem existed only for "off-net" calls (*i.e.*, where senders and receivers belong to different network), and not for "on-net" calls (*i.e.*, where senders and receivers both subscribe to the same network operator). In the latter case, the carrier internalized any costs that high termination fees imposed on originating callers, and the presence of competition limited the ability of the carrier to set supra-competitive termination fees.

B. Wireless broadband providers face significant market constraints in the provision of wireless broadband Internet access

34. In contrast to the "terminating access monopoly" framework, where there was no effective market mechanism that constrained the ability or incentives of a terminating LEC to set monopoly prices, the market feedback in the case of wireless broadband services is direct, and there are competitive alternatives to which customers can switch if a wireless provider degraded the quality of access to online content and services or imposed supra-competitive fees on online providers.

35. Because content is complementary to the wireless broadband network, any restriction on the availability or quality of the content would reduce demand for the wireless broadband network itself. Content, including popular content as well as many new services that are continually being introduced, are valuable to broadband subscribers. In fact, the value to subscribers of the broadband network itself is in large part driven by the availability of high-quality content and the quality of access to that content (*e.g.*, the speed and reliability of transmission). Content also is unique and highly differentiated, and subscriber preferences for content are diverse. Content may be highly valued by some subscribers but not by others. And, users are likely to value the variety of the available content itself. The highly-differentiated nature of content and variegated consumer preferences means that any reduction in the quality or availability of content that can be accessed by subscribers of a particular wireless broadband network would degrade the value of the broadband network itself, and reduce subscriber demand for the network.

36. While this market mechanism would exist even in the case of a hypothetical monopoly Internet access provider, the reduction in demand for the wireless broadband access networks is likely to be especially significant because, as we discuss above, wireless subscribers have good competitive alternatives and switching costs are low. The loss of subscribers would impose significant costs on wireless broadband providers, and this loss provides a powerful competitive constraint in the incentive and ability of providers to impose anticompetitive arrangements on online content and service providers.

37. The evidence indicates that subscriber switching is likely to be highly sensitive to any restriction or degradation of access to content on a broadband network. For instance, a recent

Consumer Reports survey found that 71 percent of consumers would switch to a different Internet service provider ("ISP") if their current ISP started to block or impose extra charges to use high-bandwidth Internet services.[54] A survey by Global Strategy Group found that 74 percent to 91 percent of users (depending on their intensity of Internet use) would be "very likely or somewhat likely" to switch to another ISP if their current ISP prevented access to the user's favorite websites.[55] The same survey found that 76 percent to 90 percent of users would switch if their ISP took actions that caused the user's favorite webpages to load slowly.[56] Another industry survey found that a slow Internet connection will spur a large share of consumers to contact their broadband provider.[57]

38. Other evidence also confirms that consumers are willing to switch providers in response to the unavailability of content they demand. This can be observed during instances of programming "blackouts," when a multichannel video programming distributor ("MVPD") and a programmer have disputes over content carriage terms, and the MVPD temporarily suspends its broadcasts of the programmer's channels. For example, Time Warner Cable lost almost three percent of its video subscribers in the quarter in which it did not broadcast CBS in New York and Los Angeles due to a programming dispute.[58] Similarly, DIRECTV's churn increased due to a programming dispute with Viacom that "blacked out" several channels, including Nickelodeon and MTV, for a few days in July 2012.[59]

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[54] "71% of U.S. households would switch from providers that attempt to interfere with Internet," Consumer Reports, February 18, 2014, *available at* http://consumerreports.org/cro/news/2014/02/71-percent-of-households-would-switch-if-provider-interferes-with-internet-traffic/index.htm#survey.

[55] Global Strategy Group Internet Survey, conducted July 10-14, 2014, cited in Mark A. Israel, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters," September 22, 2014 at 198.

[56] Global Strategy Group Internet Survey, conducted July 10-14, 2014, cited in Mark A. Israel, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters," September 22, 2014 at 198.

[57] For instance, Cisco reported that 38 percent of survey respondents in its Bandwidth Consumption and Broadband Reliability study have called their broadband provider because of a perceived slowness of their Internet connection. (Cisco, "Bandwidth Consumption and Broadband Reliability - Studying Speed, Performance, and Bandwidth Use in the Connected Home," July 2012 at 7.)

[58] Kyle Stock, "The CBS Blackout Was a Horror Show for Time Warner Cable," Bloomberg Businessweek, October 31, 2013, *available at* http://www.businessweek.com/articles/2013-10-31/the-cbs-blackout-was-a-horror-show-for-time-warner-cable.

[59] Liana B. Baker, "Viacom dispute hurts DirecTV in third quarter," Reuters, November 6, 2012, *available at* http://www.reuters.com/article/2012/11/06/us-directv-results-idUSBRE8A50NW20121106.

39. This evidence of subscriber switching in response to the unavailability of specific content highlights the uniqueness and highly-differentiated nature of content, and the fact that some consumers highly value the content and are willing to switch their provider to access it. These characteristics give content providers considerable bargaining power in negotiating with network providers (whether broadband or video networks). In the MVPD industry, the bargaining power of content providers is evident from the fact that content licensing fees make up a very large (and growing) share of MVPD revenues.[60]

40. Since online content and service providers have a direct relationship with subscribers—*i.e.*, subscribers are direct consumers of the content and services of online providers—they are well-positioned to inform the wireless broadband providers' subscribers of any practices by the broadband provider that degrades access to their content, thus bringing substantial customer and public pressure on any broadband provider that engaged in anticompetitive practices.[61] Some online content and service providers currently report the speed ratings of Internet service providers for delivery of the provider's content.[62] Rival wireless providers also would have incentives to inform consumers of any such practices through advertising and other means in order to attract customers that highly value particular content. Thus, subscribers likely would quickly become aware of any practices by a wireless provider that block or degrade access to content that subscribers value.

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[60] According to SNL Kagan, programming costs account for 47.5 percent of video revenue for all MVPDs (cable, DBS and telco) on average in 2014, up from 34.6 percent in 2006. Kagan projects that MVPDs' programming costs will continue to increase as a share of video revenues in the coming years, to over 55 percent by 2017. (SNL Kagan, "Multichannel Programming Fees as a % of Multichannel Video Revenues," 2014.)

[61] This type of information dissemination has been observed in programming disputes between content providers and MVPDs. As mentioned, Time Warner Cable and CBS entered a dispute over carriage fees for CBS networks in August 2013, as well as premium cable networks like Showtime, which resulted in a blackout of the channels for Time Warner Cable subscribers in major metropolitan areas including New York, Los Angeles, Boston and Chicago. Both Time Warner Cable and CBS released public statements and made posts via corporate sites and social media during the month-long battle attacking the other. (Sarah Barry James, "Time Warner Cable-CBS blackout begins," SNL Financial, August 2, 2013.) CBS encouraged Time Warner Cable subscribers to switch to other providers such as Verizon FiOS or DIRECTV in order to view CBS programming. (David Lieberman, "No Deal! CBS and Showtime Go Dark On Time Warner Cable," Deadline, August 2, 2013, *available at* http://www.deadline.com/2013/08/no-deal-cbs-goes-dark-on-time-warner-cable/.)

[62] For instance, Google launched a speed test tool for YouTube videos called Google Video Quality Report, allowing users to compare YouTube video streaming speeds by their service provider versus the speeds of other service providers. (Google Video Quality Report, *available at* http://www.google.com/get/videoqualityreport/; Angela Moscaritolo, "Test Your ISP's Video Quality With YouTube Tool," PCMag, May 29, 2014, *available at* http://www.pcmag.com/article2/0,2817,2458723,00.asp.)

41. Information on broadband provider practices is widely available from other sources. Numerous third-party websites, social media sites, and publications provide detailed information to consumers, and an active online community closely monitors providers' practices. A variety of websites, as well as many broadband providers themselves (including Verizon), offer Internet speed test tools that allow users to test the speed of their broadband connection.[63] Surveys indicate that a large share of broadband customers actually use such tools to monitor the speed of their Internet access service.[64] And, because broadband consumers often "multi-home"—*i.e.*, use various different broadband providers (such as a wireline broadband service at home, a wireline broadband service at work, and one or more wireless broadband services)—consumers readily can compare the performance of broadband networks in terms of the speed and other aspects of the quality of transmission. Consumers therefore can monitor the practices and performance of their broadband network provider and switch to a rival provider if they cannot get adequate access to the content they desire.

42. Moreover, because online content and service providers have a direct relationship with subscribers, some online providers likely would pass on to subscribers added costs or fees imposed by the wireless broadband network in higher quality-adjusted prices for content, which also would reduce demand by subscribers for the broadband network. For instance, Netflix could implement a higher price for subscribers of a particular wireless broadband network that imposed added costs or fees.[65] Textbook economic theory predicts that firms will pass-through at least a portion of marginal cost increases.[66] And, there appear to be no material transaction

[63] See, *e.g.*, CNET Bandwidth Meter Speed Test, *available at* http://www.cnet.com/internet-speed-test/; Charter Communications Speed Test, *available at* http://speedtest.charter.com/; Verizon Speed Test, *available at* http://my.verizon.com/services/speedtest/.

[64] For instance, Cisco reported that 43 percent of survey respondents in its Bandwidth Consumption and Broadband Reliability study have used an online speed test to validate their Internet package service speed. (Cisco, "Bandwidth Consumption and Broadband Reliability - Studying Speed, Performance, and Bandwidth Use in the Connected Home," July 2012 at 6.)

[65] Netflix charges a monthly membership fee to subscribers. Netflix's standard membership fee for existing customers (allowing HD streaming to two devices concurrently) is priced at $7.99 per month. Netflix recently has introduced an additional membership plan which allows streaming to four devices concurrently for $11.99. (Netflix 2013 10-K at 22, 31; "A Quick Update On Our Streaming Plans And Prices," Netflix US & Canada Blog, May 9, 2014, *available at* http://blog.netflix.com/2014/05/a-quick-update-on-our-streaming-plans.html.)

[66] See, *e.g.*, Jeremy I. Bulow and Paul Pfleiderer (1983) "A Note on the Effect of Cost Changes on Prices," *Journal of Political Economy*, 91(1): 182-85. Because content is highly differentiated, and therefore demand for content is not perfectly elastic, online content and service providers would find it profitable to pass through a portion of marginal cost increases even if its rivals do not face similar cost increases.

costs or impediments for online content and service providers to set prices for their services that differ depending on the broadband provider used by the subscriber.[67] These higher quality-adjusted prices for the content or services of online providers would reduce demand by subscribers for a wireless broadband network that imposes supra-competitive charges on the transmission of content, which would lead to lost data revenues, lost customers, or both.

43. The risk of losing customers and revenues presents a substantial economic threat to wireless broadband providers. The provision of wireless broadband Internet access services entails significant fixed (and sunk) costs of deploying the network and relatively low marginal costs of serving existing subscribers. As a result of these fundamental economics of the wireless industry, the expected net present value of revenues from a broadband subscriber during their average expected lifetime of use (referred to as the "life-time subscriber value," or "LTV") is substantial. The lifetime revenue of a wireless subscriber in 4Q 2013 was estimated to be about $2,900.[68] Because of the significant LTV of current subscribers, a fundamental competitive strategy for Verizon and other wireless providers is to attempt to reduce churn, in competition with rival providers which attempt to entice subscribers to switch. Wireless providers reduce churn by giving customers high-quality services, including high-speed and reliable access to content they demand. Wireless broadband providers also spend considerable sums in competing to attract and sign on new subscribers (referred to as "subscriber acquisition costs").

44. As evidenced by the churn data, customers frequently and easily switch among wireless providers. The likelihood of substantial foregone revenues from subscriber defections creates significant incentives for wireless broadband providers to implement business practices that benefit customers. The risk of losing subscribers also provides a significant competitive constraint on wireless broadband providers in implementing anticompetitive service models, pricing arrangements, or network management approaches with regard to online content and

[67] Nicholas Economides claims that "[i]t would be very difficult for content and applications providers to impose fees on broadband customers across the board or to add new fees to their services" because "only a small minority of [content and application providers] have contractual relationships with residential customers." (Nicholas Economides (2011), "Broadband Openness Rules Are Fully Justified by Economic Research," *Communications and Strategies*, 84(4): 1-25 at 8.) However, even for online content and service providers that have no contractual relationship, and for content that has a "zero price," an online content and service provider may implement a higher "effective price" by increasing the number of advertisements shown to users or by reducing the amount of "free" content or services available.

[68] Bank of America Merrill Lynch, "4Q13 US Wireless Matrix," March 26, 2014 at 40.

service providers. The proliferation of social media, consumer review sites, user forums, and blogs intensifies this competitive constraint, by enabling dissatisfied customers to inform and persuade other consumers, thereby putting pressure on wireless broadband providers to offer the optimal service possible for their users.

IV. Verizon Faces Significant Market Constraints in the Provision of Wireline Broadband Internet Access

45. The absence of a terminating monopoly problem is most clear cut in the case of wireless broadband, but the "terminating access monopoly" framework also does not apply to the provision of wireline broadband Internet access by Verizon. While an analysis of the wireline broadband market nationwide is beyond the scope of this paper, we have undertaken an analysis of the wireline broadband Internet access services offered by Verizon in the limited areas of the country where Verizon provides wireline services. As we explain below, based on that analysis, we have concluded that Verizon does not have a terminating access monopoly, particularly when it offers its fiber-based FiOS Internet access service, given the near-ubiquitous competition it faces from next-generation cable broadband providers. Industry observers and commenters claim that, in many areas, cable operators do not face sufficient competition, often pointing to areas where high-speed cable networks compete against DSL networks that offer much lower speeds, or cable networks are the only option.[69] However, because competitive conditions in the wireline industry vary across geographic areas, and wireline broadband providers compete on a local or regional basis, it is inappropriate to draw universal conclusions regarding an alleged lack of competition among wireline broadband providers.[70] Broad claims that broadband access providers do not face sufficient competition ignore the wide variation in competitive conditions facing different providers of wireline Internet broadband access. In the discussion below, we

[69] *Ad Hoc Comments* at 8; *Free Press Comments* at 5, 79-82; *Netflix Comments* at 3.

[70] In comments submitted regarding the Commission's National Broadband Plan, the U.S. Department of Justice stated that "[u]ltimately what matters for any given consumer is the set of broadband offerings available to that consumer, including their technical characteristics and the commercial terms and conditions on which they are offered. Competitive conditions vary considerably for consumers in different geographic locales." ("Ex Parte Submission of the U.S. Department of Justice in the Matter of Economic Issues in Broadband Competition - A National Broadband Plan for Our Future," Before the Federal Communications Commission, GN Docket No. 09-51, January 4, 2010 at 7.)

focus on the nature and degree of competition that Verizon faces within its wireline broadband Internet access footprint.

46. Verizon faces significant competition from next-generation, high-speed cable services in almost all areas in which it offers wireline broadband services.[71] Verizon's all-fiber FiOS network will soon pass approximately 70 percent of the premises in its wireline footprint.[72] Virtually all of the homes passed by FiOS have access to high-speed DOCSIS 3.0 cable services.[73] Thus, within Verizon's wireline footprint, close to 70 percent of homes soon will have access to FiOS *and* high-speed cable services. As discussed below, where FiOS is available, there is intense competitive rivalry between Verizon and cable operators in terms of price and quality attributes, and consumers have access to competitive broadband services offering speeds of hundreds of megabits per second.[74]

47. In other areas where fiber broadband networks such as FiOS are not yet available, some consumers have access to Verizon DSL-based services instead. The vast majority of the areas where Verizon offers its DSL-based services have access to high speed cable modem service.[75] While the speeds and capabilities of DSL services are more limited than those of cable networks, cable providers generally offer "entry level" plans that are priced comparably to DSL (with

[71] While next-generation cable services have greater capacity limitations than fiber networks, particularly for upstream speeds, these services offer high download speeds exceeding the demands of most of today's consumers, with services currently available that offer download speeds of greater than 100 Mbps.

[72] "VZ - Verizon at Jefferies Global Technology, Media & Telecom Conference," Thomson Reuters Streetevents Transcript, May 6, 2014, *available at* http://www.verizon.com/investor/DocServlet?doc=jefferies_conf_vz_trans_2014.pdf.

[73] Data from the National Broadband Map shows that in 97 percent of Census blocks where Verizon FiOS is available, at least one cable firm offers broadband service with maximum advertised speeds of greater than 50 Mbps. (U.S. Department of Commerce, National Telecommunications and Information Administration, State Broadband Initiative, CSV format, December 31, 2013.) The DOCSIS 3.0 infrastructure will facilitate even higher broadband speeds in the near future (so-called "DOCSIS 3.1"), with speeds closer to 1 Gbps. (See, *e.g.*, Jeff Baumgartner, "DOCSIS 3.1 Speeds Ahead," Multichannel News, April 28, 2014, *available at* http://www.multichannel.com/news/news-articles/docsis-31-speeds-ahead/374179; Alan Breznik, "Cable Preps for DOCSIS 3.1 Debut," Light Reading, September 30, 2014, *available at* http://www.lightreading.com/cable-video/docsis/cable-preps-for-docsis-31-debut/d/d-id/711156; Mark Hachman, "Broadcom, Comcast prep for gigabit cable service to begin in 2015," PCWorld, January 6, 2015, *available at* http://www.pcworld.com/article/2864158/broadcom-comcast-prep-for-gigabit-cable-service-to-begin-in-2015.html.)

[74] See *Lerner Declaration* at 17, 19-20.

[75] Data from the National Broadband Map shows that in 84.5 percent of Census blocks where Verizon DSL is available, at least one cable firm offers broadband service with maximum advertised speeds of greater than 50 Mbps. (U.S. Department of Commerce, National Telecommunications and Information Administration, State Broadband Initiative, CSV format, December 31, 2013.)

comparable or greater speeds), making cable a viable competitive substitute for DSL subscribers.[76] Whether or not cable providers that offer high-speed service are sufficiently constrained competitively by the availability of DSL service, there is no reasonable claim that DSL providers such as Verizon do not face sufficient competition from cable services that offer much higher speeds.[77]

48. Some industry observers claim that even where cable operators compete head-to-head against fiber networks such as FiOS, "[r]esidential broadband access competition is limited" due to the "duopoly nature of wireline broadband service competition."[78] However, there is no economic or empirical basis for the proposition that the structure of the wireline broadband industry is not conducive to competition, especially in areas where consumers have access to competitive high-speed broadband services. Industry concentration is especially likely to be a poor indicator of competitive intensity in industries, such as broadband Internet access, in which consumers have the ability and willingness to switch providers in response to lower prices or better quality products, and in which rivals have the ability to increase output rapidly and thereby take share away from other firms. Any assessment of competition must analyze competitive rivalry between providers in price and non-price dimensions, the ability of consumers to switch providers in response to lower prices and/or better quality offered by rivals, the ability of rivals to increase output and take market share, and the potential for innovation and entry.

49. The empirical evidence in the current context contradicts the conclusion that there is limited competition because of the "duopoly nature" of the wireline Internet access industry. There is significant evidence of competitive rivalry between providers of wireline broadband services, particularly where fiber networks such as Verizon FiOS compete head-to-head with

[76] For example, in a recent survey of several areas where Verizon offered DSL packages, at least one cable operator in each area offered its lowest-priced broadband package at monthly prices comparable to Verizon DSL (based on maximum advertised download speed). (SNL Kagan, "Broadband Pricing by Provider," 2014.)

[77] DSL has been steadily losing subscribers to cable over time. An article from 2012, for example, noted that "Telcos have been bleeding legacy DSL subscribers for several quarters now as lower DSL speeds increasingly become less competitive for consumers." (Gaylord Hart, "Telco/CATV High Speed Data and Voice Subscriber Statistics for Q2 2012," Infinera, September 10, 2012, *available at* http://blog.infinera.com/2012/09/10/telcocatv-high-speed-data-and-voice-subscriber-statistics-for-q2-2012/.) See also, Bernie Arnason, "Future of Verizon DSL in Doubt?", Telecompetitor, January 25, 2011, *available at* http://www.telecompetitor.com/future-of-verizon-dsl-in-doubt/; Om Malik, "Hey DSL, It's Time for Goodbye," Bloomberg Businessweek – Technology, November 8, 2012, *available at* http://www.businessweek.com/articles/2012-11-08/hey-dsl-it-s-time-for-goodbye.

[78] Nicholas Economides (2011), "Broadband Openness Rules Are Fully Justified by Economic Research," *Communications and Strategies*, 84(4): 1-25 at 3.

high-speed cable services.[79] The introduction of fiber-to-the-home ("FTTH") broadband networks by Verizon starting around a decade ago ignited the race to make next-generation broadband services available to consumers.[80] Verizon was the first to build a fiber network on a wide scale, starting in 2004, and investing at least $23 billion in its FiOS network.[81] FiOS grew to 6.5 million subscribers by 2014 by providing a superior platform to access online content and services.[82] These investments in deploying FiOS spurred competition to deploy faster and faster broadband, and have compelled cable companies to upgrade their own networks in order to provide high-speed broadband services.[83] Cable providers responded to Verizon's deployment of FiOS by rolling out DOCSIS 3.0 technology.[84] The deployment of FiOS and other fiber networks also incentivized cable operators to compete by lowering prices and improving quality.[85] A recent example of this competitive rivalry occurred in late 2013, with Time Warner

[79] See *Lerner Declaration* at 15-20.

[80] FTTH networks, while expensive to deploy, offer virtually unlimited capacity to meet consumer demand for higher speeds and lower latency, allowing for better consumer access to content, including streaming video. Verizon FiOS offers broadband Internet plans with download speeds as high as 500 Mbps. FiOS's maximum speeds have increased substantially over time, from 20 Mbps in 2007. (Verizon 2007 10-K; Chris Welch, "Verizon rolls out fastest FiOS tier yet with 500Mbps downloads, 100Mbps uploads," The Verge, July 22, 2013, *available at* http://www.theverge.com/2013/7/22/4546286/verizon-rolls-out-fastest-fios-quantum-tier-500-100.)

[81] See, *e.g.*, "Verizon plans more hires as it finalizes new FiOS tech center," Pittsburgh Business Times, June 10, 2011, *available at* http://www.bizjournals.com/pittsburgh/print-edition/2011/06/10/verizon-more-hires-new-fios-tech-center.html?page=all; Peter Svensson, "Verizon winds down expensive FiOS expansion," Seattle Times, March 26, 2010, *available at* http://seattletimes.com/html/businesstechnology/2011449152_apustecverizonfios.html: "The total cost [of building out FiOS] from 2004 to 2010 was budgeted at $23 billion."

[82] "VZ – Q3 2014 Verizon Earnings Conference Call," Thomson Reuters Streetevents Edited Transcript, October 21, 2014 at 7. Google has more recently begun to deploy FTTH in select cities, and is considering the possibility of expanding in many others. Other providers, such as AT&T's U-Verse, have extended fiber closer to the home in order to achieve higher speeds than traditional DSL services (but not as high as FTTH). Other fiber-based deployments—such as "fiber-to-the-neighborhood" ("FTTN," also referred to as "fiber-to-the-node")—also are increasingly available and offer higher speeds than traditional DSL services.

[83] An industry analyst recently noted that "Verizon FiOS and AT&T U-Verse have already started pushing up speeds in other areas to create more pressure on the cable operators. Cable operators are responding, or in some cases leading, by deploying DOCSIS 3.0 solutions with 100Mbps and greater speeds." (Strategy Analytics, "Google Fiber's Impact on US Broadband," October 7, 2013.)

[84] As a *Wall Street Journal* article reported in 2008, analysts believed DOCSIS 3.0 "will allow the cable industry to compete on a more even footing with telecom giant Verizon Communications Inc., which is aggressively marketing a high-performance fiber-optic network called FiOS that offers much faster Internet connection speeds than cable modems can currently deliver." (Vishesh Kumar, "Cable Prepares an Answer to FiOS," The Wall Street Journal, February 14, 2008, *available at* http://online.wsj.com/news/articles/SB120295689385867313.)

[85] See *Lerner Declaration* at 15-20.

Cable cutting the price in half for its low-speed tier broadband offering and doubling the download speeds of both its low- and high-speed tiers in order to compete with Verizon FiOS.[86]

50. The competitive rivalry between fiber network and cable operators also is evidenced by the significant rate of subscriber switching in recent years. A recent survey by Global Strategy Group found that consumers switch broadband providers frequently, with 17.6 percent switching in the past 12 months and 33.1 percent switching in the past 2 years.[87] Because of the high churn rates and the significant expected life-time value of wireline subscribers, retaining customers (*i.e.*, reducing churn) is an important part of the competitive strategy for Verizon and other broadband providers.[88]

51. The significant rate of switching indicates that wireline provider contracts do not inhibit subscriber switching. One reason for this is that contracts are generally fairly short term, and subscriber agreements change to month-to-month at the end of their initial contract term.[89]

52. Subscribers switched wireline broadband providers due to both price and non-price factors. Of those users that switched providers for reasons other than moving, 54 percent stated that getting a better price was a "major reason" to switch, while 55 percent said a major reason for switching was to get higher broadband speeds.[90] A 2011 U.S. government study of Internet

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[86] "TW Cable Boosts Top Internet Speed," Santa Monica Daily Press, October 28, 2013. See also, Deutsche Bank, "A Closer Look at FiOS," April 1, 2014; Evercore Partners, "FiOS Market Level Analysis Points to Further Pressure for Cablevision," September 15, 2013.

[87] Global Strategy Group Internet Survey, conducted July 10-14, 2014, cited in Mark A. Israel, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters," September 22, 2014 at 196. In particular, the survey found the following percentage of survey respondents who have switched ISPs over certain past time periods—past six months: 6.8 percent; past 12 months: 17.6 percent; past two years: 33.1 percent; past four years: 49.4 percent.

[88] A Bain report regarding churn recently noted that "Reducing customer departures and defections has become a high priority for most communications service providers as markets mature and competition intensifies. … Verizon, for instance, has learned that the installation of its FiOS package in the home is a moment of truth. Instead of taking the standard approach of doing the installation as fast as possible, Verizon overinvests. Its well-trained, well-spoken staff often spend four to six hours in a customer's home, running through how the system works and making sure that every application is functioning well." (Tom Springer, Charles Kim, Frédéric Debruyne, Domenico Azzarello and Jeff Melton, "Breaking the back of customer churn," Bain & Company, 2014 at 1, 4.)

[89] A survey of cable bundle packages (all including broadband service) by SNL Kagan found that the longest contract term was 24 months, with some providers offering month-to-month terms, and some contract durations as short as six months. (SNL Kagan, "Bundle Pricing by Provider," 2014.)

[90] Federal Communications Commission, "Broadband Decisions: What drives consumers to switch – or stick with – their broadband Internet Provider," December 2010 at 9, *available at* http://www.fcc.gov/encyclopedia/broadband-speed.

use by U.S. consumers found that of consumers that switched broadband providers, 38 percent did so because of price, 30 percent to obtain faster broadband speeds, 10 percent because of reliability, and 7 percent because of customer service.[91] This significant rate of switching due to non-price factors highlights that consumers are well-informed about the quality attributes, and are sensitive to quality differences between providers.

53. Claims that there is limited competition when consumers have access to two wireline broadband access providers also ignore the fact that wireless broadband services are increasingly becoming a competitive alternative for wireline networks for some consumers. Innovation and investments in both wireless broadband networks and wireless devices have made wireless networks more and more competitive to wireline networks. Significant improvements in speed and capacity of wireless networks have allowed consumers to perform many of the same tasks on wireless devices as they perform on computers connected via wireline networks. Although generally slower than wireline broadband options such as fiber and DOCSIS 3.0, 4G LTE network providers typically offer average download speeds of 5 to 12 Mbps.[92] If wireless broadband providers continue to have the freedom to invest and improve their networks, and as more wireless spectrum becomes available, wireless networks may someday become an alternative to wireline providers for a larger range of users and uses.[93] The advent of advanced wireless devices, particularly tablets, also has blurred the distinction between wireless and wireline *devices*, and how content providers access consumers using those devices. As a result, Internet content and service providers receive a large and growing share of their user traffic from mobile devices rather than computers connected to wireline networks.[94]

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[91] National Telecommunications and Information Administration and Economics and Statistics Administration, "Exploring the Digital Nation: America's Emerging Online Experience," June 2013 at 23.

[92] For instance, Verizon's 4G LTE network offers download speeds of 5 to 12 Mbps. (http://www.verizonwireless.com/insiders-guide/network-and-plans/4g-lte-speeds-compared-to-home-network/.)

[93] For example, recent tests show that Verizon's 4G LTE service can provide between 12.7 Mbps and 53.7 Mbps. (Daniel P. Howley, "Verizon Wins NYC 4G Showdown, Sprint Dead Last," Laptop Magazine, March 14, 2014, *available at* http://blog.laptopmag.com/fastest-4g-nyc.) The Commission's upcoming spectrum auctions will allocate new spectrum bands to wireless use. See, *e.g.*, "FCC Adopts Rules For First Ever Incentive Auction; Will Make Available Additional Airwaves, Increase Competition for Mobile Broadband," Federal Communications Commission News Release, May 15, 2014, *available at* http://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0515/DOC-327100A1.pdf.

[94] Bill Siwicki, "Retailers tackle their mobile to-do list," Internet Retailer, October 1, 2014, *available at* http://www.internetretailer.com/2014/10/01/retailers-tackle-their-mobile-do-list; Marissa McNaughton, "Social Networks See Majority of Traffic Coming from Mobile," The Realtime Report, April 9, 2014, *available at*

54. These facts, which indicate that consumers are increasingly performing the same or similar tasks on multiple broadband platforms, also contradicts claims that once a subscriber chooses a wireline broadband provider such as Verizon, that provider has a "terminating access monopoly" over access to that subscriber. Most broadband consumers "multi-home"—*i.e.*, use various different broadband providers (*e.g.*, such as a wireline broadband service at home, a wireline broadband service at work, and one or more wireless broadband services) and substitute across those providers, even for the same type of tasks.

55. The risk of losing customers presents a substantial economic threat to wireline broadband providers because the lifetime value of wireline subscribers is substantial.[95] And, bundling with video, wireline voice, and wireless voice services increases the potential cost from the loss of subscribers.[96] The ability of consumers to switch wireline broadband providers, and the potential for substantial foregone revenues from subscriber defections, creates strong incentives for Verizon to implement business practices that benefit customers, and provides a significant constraint on Verizon's ability and incentive to implement anticompetitive arrangements.

56. The competitive constraints on Verizon's incentive to degrade access to online content and service providers are especially significant because Verizon built its FiOS business by providing high-quality access to content. FiOS quickly gained subscribers by offering consumers high-quality, high-speed broadband and video services.[97] In fact, FiOS frequently has been recognized in consumer surveys of broadband provider quality for receiving "by far the

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http://therealtimereport.com/2014/04/09/social-networks-see-majority-of-traffic-coming-from-mobile/; "Binging Is the New Viewing for Over-the-top Streamers," Nielsen, September 18, 2013; "What Netflix and Hulu Users Are Watching … And How," Nielsen, July 27, 2011. This may include both smartphones and tablets which connect to the Internet via cellular or Wi-Fi networks.

[95] Degrading the speed of access to some online content and service providers may be costly for wireline broadband Internet access providers even if subscribers do not disconnect. For instance, Cisco reported that 26 percent of survey respondents in its Bandwidth Consumption and Broadband Reliability study have had a technician visit from their broadband provider due to slow broadband speeds, noting that "Considering the Cost for a 'Truck Roll' and the Average Revenue per User, This Presents a Significant Financial Impact for Service Providers." (Cisco, "Bandwidth Consumption and Broadband Reliability - Studying Speed, Performance, and Bandwidth Use in the Connected Home," July 2012 at 8.)

[96] About two-thirds of FiOS subscribers bundle broadband, video and voice. ("VZ - Q4 2013 Verizon Earnings Conference Call," Thomson Reuters Streetevents Edited Transcript, January 21, 2014 at 6.)

[97] See Peter Grant and Dionne Searcy, "Verizon's FiOS Challenges Cable's Clout," The Wall Street Journal, October 24, 2007, *available at* http://online.wsj.com/news/articles/SB119318239126769111.

highest overall satisfaction rating," including top marks for speed and reliability.[98] High-quality access to content is a key component of Verizon's competitive strategy. Claims that Verizon would degrade access to content demanded by its wireline broadband subscribers ignore this fundamental aspect of Verizon's competitive strategy.

V. Conclusions

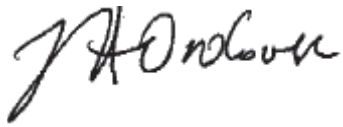
57. Given the vigorous competition that Verizon faces in both the provision of wireless as well as wireline broadband Internet access services, the "terminating access monopoly" theory does not apply and there is little risk that Verizon would adopt anticompetitive business arrangements with online content and service providers. Rather, competition creates incentives for Verizon to implement business models and practices that benefit consumers.

[98] "Readers' Choice Awards 2013: Broadband ISPs, Routers, and Network Attached Storage (NAS) for the Home," PCMag, April 24, 2013, *available at* http://www.pcmag.com/article2/0,2817,2418040,00.asp#verizon: "For the eighth straight year Verizon's fiber-to-the-home Internet service receives a PCMag Readers' Choice Award for ISPs. Verizon FiOS had by far the highest overall satisfaction rating with an 8.6 on a scale of 0 (poor) to 10 (excellent) and likelihood to recommend rating of 8.6 again on a scale of 0 (extremely unlikely) to 10 (extremely likely). FiOS also received top marks in several key measures including satisfaction with initial setup (8.6), speed (8.5), reliability (8.8) and even satisfaction with technical support (7.4) and repairs (7.4)."

I declare under penalty of perjury that the foregoing is true and correct.

Andres V. Lerner
January 15, 2015

I declare under penalty of perjury that the foregoing is true and correct.



Janusz A. Ordover
January 15, 2015