Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Inquiry Concerning the Deployment of	)	GN Docket No. 15-191
Advanced Telecommunications Capability	)	
To All Americans in a Reasonable and	)	
Timely Fashion, and Possible Steps To	)	
Accelerate Such Deployment Pursuant	)	
To Section 706 of the	)	
Telecommunications Act of 1996, as	)	
Amended by the Broadband Data	)	
Improvement Act	)	

COMMENTS OF PUBLIC KNOWLEDGE

Meredith Rose
Public Knowledge
1818 N Street, NW
Suite 410
Washington, DC 20036
(202) 861-0020

September 8, 2015

I. FIXED AND MOBILE BROADBAND ARE BOTH CRITICAL SERVICES AND SHOULD BE REQUIRED FOR A FINDING OF ADVANCED TELECOMMUNICATIONS CAPABILITY.

Wireless technologies are improving at a rapid pace, and mobile connectivity is increasingly important to most users. Still, mobile and fixed (particularly wired) broadband are not substitute products; they serve different roles, and those users who can afford both, buy both. There are several reasons why consumers purchase both services. First, wireless connectivity tends to be more expensive on a per-megabyte basis than wired broadband, and is more likely to be subject to data caps, throttling, and zero-rating measures. While these issues exist for wired options they are less prevalent. More fundamentally, despite continuous improvements to wireless broadband capacity and speed, mobile services are inherently limited compared to fixed services. Wireless connectivity options use only a fraction of the radio spectrum, shared among multiple users. Wired broadband, by contrast, simply has more contention-free bandwidth available. Recent gains in wireless performance are noteworthy but are easily matched or exceeded by modern wired options.

A. Wireless and fixed broadband are complementary, not substitute, products.

Mobile broadband is a critical but unique piece of our nation's telecommunications infrastructure. Consumers have become increasingly dependent on mobile broadband and location-based services such as maps, location-sensitive search results, and other tools to manage their daily lives. The benefits of mobile broadband and smartphone adoption have been extensively documented, and we need not recite them here.[1] But although mobile broadband is

[1] *See, e.g.*, NAT'L TELECOMM. INFO. ADMIN., EXPLORING THE DIGITAL NATION: EMBRACING THE MOBILE INTERNET, at v (2014), *available at* http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_embracing_the_mobile_internet_10162014.pdf ("54 percent of mobile phone users at least 25 years of age reported taking photos or videos with

prolific, it faces unique technical limitations that prevent it from sustaining all of the applications that national broadband policy is designed to foster.[2] These differences stem from both engineering limitations and providers' management decisions.

First, 3G and 4G/LTE antennas are designed to maximize download speed by broadcasting to multiple devices from a single antenna.[3] However, the side effect of this point-to-multipoint model is that they have difficulty fielding large amounts of incoming traffic.[4] While this optimizes download speeds, it also hobbles users' ability to utilize technologies such as video-dependent communication, or even uploading large files to email or web services.[5] A 2014 study notes that

> while it is likely that broadband wireless technology will provide sufficient bidirectional capacity for many additional applications in future years, the capacity of a service over a single pair of fiber optics has consistently been five to 50 times the capacity of comparable carrier-provided wireless links and services over the past 10 years.[6]

Technologies often touted as benefits of increased connectivity, such as telehealth capabilities, are more difficult, or unworkable on mobile broadband. Simply put, mobile broadband cannot offer the same capabilities as fixed wireline broadband.

---

their phones, 43 percent stated they checked or sent email, and 42 percent browsed the Web"); *see also* BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM, CONSUMERS AND MOBILE FINANCIAL SERVICES 2015 (2015), *available at* http://www.federalreserve.gov/econresdata/consumers-and-mobile-financial-services-report-201503.pdf.

[2] James Prieger, *The Economic Benefits of Mobile Broadband* (Pepperdine U. Sch. of Pub. Policy Working Papers, Paper No. 38, 2012), http://digitalcommons.pepperdine.edu/sppworkingpapers/38 (discussing the economic benefits in rural and urban minority communities of mobile broadband adoption);

[3] For a technical discussion of the comparative limitations of fixed and mobile broadband, see NTCA AND VANTAGE POINT, WIRELESS BROADBAND IS NOT A VIABLE SUBSTITUTE FOR WIRELINE BROADBAND (Mar. 2015), *available at* http://www.ntca.org/images/stories/Documents/fixedwirelesswhitepaper.pdf.

[4] CTC TECHNOLOGY & ENERGY, THE STATE OF THE ART AND EVOLUTION OF CABLE TELEVISION AND BROADBAND TECHNOLOGY, at 15 (Nov. 2014), *available at* http://www.ctcnet.us/publications/the-state-of-the-art-and-evolution-of-cable-television-and-broadband-technology/.

[5] CTC TECHNOLOGY & ENERGY, *supra* table 1.

[6] CTC TECHNOLOGY & ENERGY, *supra* at 22.

In part to deal with the technical limitations, pricing and purchasing patterns for mobile broadband are substantially different from wireline. Mobile broadband plans utilize data caps with far greater frequency than fixed broadband providers.[7] This further limits the ability of mobile broadband to be used for data-intensive applications, such as video and music streaming, teleconferencing, and mobile online gaming. As one study noted,

> The various fixed wireless service offerings are not cost-effective compared to cable or fiber-based services that do not assign such low data limits. … due to the inherent limitations in the availability of wireless spectrum and the design principles of wireless carriers – which cater to mobile users who have less intensive data needs—it is unlikely that the value proposition offered by fixed wireless services will lead it to replace wireless in the future.[8]

Research has shown that 30% of smartphone-dependent Americans "frequently" exhaust their data allowance, and 51% report that it happens at least occasionally.[9]

As a result, consumers treat mobile and fixed broadband differently, and primarily treat wireless as a complement to, not a substitute for, fixed broadband.[10] As John Horrigan remarked,

> …most – 83% – of those with Smartphones also have broadband at home. This means these devices tend to be complements to people's access assets, not substitutes. Moreover, those with 'Smartphone only' online access do a narrower range of online activities than those with wireline access.[11]

---

[7] Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, GN Docket No. 15-191, *Eleventh Broadband Progress Notice of Inquiry*, 30 FCC Rcd. ___, para. 14 (2015).
[8] CTC TECHNOLOGY & ENERGY, *supra* at 18-19.
[9] PEW RESEARCH CENTER, THE SMARTPHONE DIFFERENCE at 3 (Apr. 1, 2015), *available at* http://www.pewinternet.org/files/2015/03/PI_Smartphones_0401151.pdf.
[10] "The Facts and Future of Broadband Competition," Speech of Chairman Tom Wheeler, Federal Communications Commission, 1776 Headquarters, Washington, D.C., Sept. 4, 2014, at 2 ("[T]oday it seems clear that mobile broadband is just not a full substitute for fixed broadband, especially given mobile pricing levels and limited data allowances.").
[11] Remarks of John B. Horrigan, Vice President & Director, Media and Tech. Inst., Broadband Adoption and Usage: What Has Four Years Taught Us? (Feb. 7, 2013), *available at* http://moody.utexas.edu/sites/communication.utexas.edu/files/images/content/tipi/Horrigan.FCC_.Summit.02.06.pdf.

A recent survey found that ninety-two percent of consumers said they were "very" or "somewhat" unlikely to cancel their home broadband connection in favor of a purely mobile experience.[12] They also used the two connections for different purposes, favoring their smartphone for social networking and their at-home fixed network for media, shopping, and information searches.[13]

B. In light of recent industry trends, the Commission should re-emphasize the importance of fixed wireline broadband availability.

These distinctions are all the more relevant in light of the movement of many providers to shift their voice and broadband customers from copper DSL to fixed wireless and mobile broadband services. In the realm of voice service, *de facto* copper abandonment—declining to service damaged copper lines in order to try and force customers onto fixed mobile or fiber-based voice offerings—has been well documented both in the press[14] and elsewhere in the

---

[12] JOHN B. HORRIGAN, PHD, SMARTPHONES AND BROADBAND: TECH USERS SEE THEM AS COMPLEMENTS AND VERY FEW WOULD GIVE UP THEIR HOME BROADBAND SUBSCRIPTION IN FAVOR OF THEIR SMARTPHONE at 2 (Nov. 2014).

[13] *Id.*

[14] *See, e.g.*, Jon Brodkin, *Union says Verizon spends $3.50 per year maintaining each landline*, ARS TECHNICA (Aug. 31, 2015), http://arstechnica.com/tech-policy/2015/09/verizon-union-seeks-government-investigation-into-network-deterioration/ (last accessed Sep. 3, 2015); Kate Cox, *Verizon's Refusal To Repair Landline Service Leaves Elderly Man Without Phone For Months*, CONSUMERIST (Jul. 30, 2015), http://consumerist.com/2015/07/30/verizons-refusal-to-repair-landline-service-leaves-elderly-man-without-phone-for-months/ (last accessed Sep. 3, 2015); Jon Brodkin, *How Verizon lets its copper network decay to force phone customers onto fiber*, ARS TECHNICA (Aug. 14, 2014), http://arstechnica.com/information-technology/2014/08/why-verizon-is-trying-very-hard-to-force-fiber-on-its-customers/ (last accessed Sep. 3, 2015); Jon Brodkin, *Verizon, AT&T leaving landline phone networks to rot, complaint says*, ARS TECHNICA (May 13, 2014), http://arstechnica.com/tech-policy/2014/05/verizon-att-forcing-customers-off-landline-phones-complaint-says/ (last accessed Sep. 3, 2015); Peter Svensson, *Telephone companies to abandon land lines*, SALON (Jul. 9, 2013), http://www.salon.com/2013/07/09/telephone_companies_abandon_copper_phone_lines_ap/ (last accessed Sep. 3, 2015); Julie Wernau and Ellen Jean Hirst, *Phone companies would like to cut your landline cord for you*, CHICAGO TRIB., Dec. 16, 2014, *available at* http://www.chicagotribune.com/business/ct-no-more-landlines-1217-biz-20141217-story.html (last accessed Sep. 3, 2015); *et al*.

Commission record,[15] and was a focal point in the Commission's recent Technology Transitions Order.[16]

But copper lines do not only carry voice traffic; they provide DSL connections to consumers without access to fiber. When the copper goes, so too does DSL connectivity—and the potential for a 25 Mbps fixed broadband point. Experience shows that the consumer attitude of "wireless is one thing, wired another" carries over into so-called "fixed wireless" systems that are becoming increasingly common in rural and hard-to-connect areas. The Commission need only look as far as the public outcry from Fire Island to find consumer dissatisfaction with fixed wireless broadband. Home consumers and public safety officials alike criticized the system, calling it "malarkey" and sharply denouncing its technical limitations.[17] The failings of its home broadband component were similarly well documented.[18] In addition, it was attached to a phone system which raised substantial public safety concerns—concerns which would only multiply given the movement toward E911 and other broadband-enhanced emergency services.

Fixed wireless service decreases the incentive for companies to maintain legacy copper networks used to provide DSL connections. Despite the importance of fixed terrestrial broadband

---

[15] *See* 29 FCC Rcd. at 14979, para. 19, 53; *see also* Public Knowledge et al. May 12, 2014 Letter at 1, 2; *also id.*, Attach. A, Emergency Motion of the Utility Reform Network (TURN) Urging the California Commission to Take Immediate Action to Protect Verizon Customers and Prevent Further Deterioration of Verizon's Landline Network at 1 (claiming "Verizon is deliberately neglecting the repair and maintenance of its copper network with the explicit goal of migrating basic telephone service customers who experience service problems. These migrations are often without the customers' knowledge or consent.").

[16] Technology Transitions et al., GN. Docket Nos. 13-5 et al., *Report and Order*, 30 FCC Rcd. at ___ paras. 89-92.

[17] *See, e.g.*, Tess Stuart, *After Hurricane Sandy, Verizon Takes Hostages*, THE VILLAGE VOICE, July 24, 2013, *available at* http://www.villagevoice.com/news/after-hurricane-sandy-verizon-takes-hostages-6438990 (last accessed Sep. 3, 2015); *see also* Letter of Fair Harbor Fire Department, WC Docket No. 13-150 (Jun. 13, 2013).

[18] *See, e.g., Public Hearing in Re: Case 13-C-0197, Temporary Use of Verizon's Voice Link Service on Fire Island*, before N.Y. Dept. Pub. Serv. (Aug. 24, 2013), *available at* http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={44DD1C91-4440-4E75-8E14-342B58DAE568}.

availability, copper lines, which could, with proper maintenance, provide true broadband connections are being abandoned in favor of limited mobile technology. By properly classifying mobile and fixed broadband as complementary, and not substitute goods, the Commission can have a fuller and more accurate sense of the communications landscape, and not merely an artificial coverage map.

II. PUBLIC KNOWLEDGE SUPPORTS THE COMMISSION'S INCLUSION OF NON-SPEED CRITERIA TO EVALUATE BROADBAND AVAILABILITY.

The Commission should move forward with its plan to include non-speed metrics, such as latency, reliability, and data caps in its inquiry. Data caps in particular have powerful effects on user behavior, and artificially restrict the utility of a network. More than half of smartphone users have data caps on their plans, and of these, more than half avoid data-intensive activities over mobile.[19] The very existence of a capacity limit, regardless of its threshold, can create a disincentive to use broadband.[20] The Commission's inquiry should be grounded in the functional, de facto availability of broadband to consumers, and as such must reflect the reality of usage patterns and limitations. We commend the Commission's commitment to take these factors into account and urge them to look closely at industry data going forward.

III. CONCLUSION.

Because they are two separate and complementary services, both fixed and mobile broadband availability should be considered when the Commission determines whether advanced

---

[19] *See, e.g.*, HORRIGAN, *supra* at 3.
[20] *See* U.S. Gov't Accountability Off., *Briefing to the Ranking Member of the Subcommittee on Communications and Technology, Committee on Energy and Commerce, House of Representatives: Internet Usage-Based Pricing* (July 29, 2014), available at http://apps.fcc.gov/ecfs/document/view?id=7521827815.

telecommunications capability is available in a given area. Public Knowledge also commends the Commission's decision to look at non-speed factors such as latency, data caps, and reliability in this and future reports. By doing so, the Commission can create a more robust and complete picture of the state of broadband deployment, and make more informed decisions to promote deployment moving forward.

Respectfully submitted,

/s/ Meredith Rose

Staff Attorney

PUBLIC KNOWLEDGE

September 8, 2015