



Oct 12, 2018

Ex Parte Notice via Electronic Filing

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

Re: EFF response to arguments that wireless broadband can substitute for wireline broadband, GN Docket No. 18-238

Dear Ms. Dortch:

The Electronic Frontier Foundation (EFF) is the leading nonprofit organization defending civil liberties in the digital world. Founded in 1990, EFF champions user privacy, free expression, and innovation through impact litigation, policy analysis, grassroots activism, and technology development. With over 38,000 dues-paying members and well over 1 million followers on social networks, we focus on promoting policies that benefit both creators and users of technology. We work to ensure that rights and freedoms are enhanced and protected as our use of technology grows.

We submit the following letter to refute the notion that wireless broadband is or ever can be an adequate substitute for wireline broadband services. Even emerging 5G wireless services face various technical limitations that currently existing fiber to the home (FTTH) network technology does not face. The future potential of fiber optics already dwarfs even the rosiest of 5G experimental speeds and so as a matter of capacity and future potential for delivering Internet access services, there is no realistic comparison and the FCC should retain its position that one does not substitute for the other.

Dramatic Capacity Differences and Potential Exist Between Wireless and Wireline Technologies

Seven years ago, a single strand of optical fiber was able to transmit 100 terabits of information per second, “enough to deliver three solid months of HD video.”¹ Advancements in expanding capacity in fiber networks, such as time and wavelength division multiplexed passive optical network technologies (TWDM-PON)² enable carriers to increase the capacity of FTTH networks that had been deployed years ago—indeed, 10 gigabit speeds became a reality three years ago.³

¹ Jeff Hecht, *Ultrafast Fibre Optics Set New Speed Record*, NEWSIDENTIST, (Apr. 19, 2011), available at <https://www.newscientist.com/article/mg21028095-500-ultrafast-fibre-optics-set-new-speed-record/#.U4SXbCh9DZZ>.

² Ron Heron, *TWDM-PON: Taking Fiber to New Wavelengths*, NOKIA (Apr. 1, 2014), available at http://origin-prod-blog.nokia.com/en_int/twdm-pon-taking-fiber-new-wavelengths.

³ Lightwave Staff, *EPB Brings 10-GBPS FTTH to Chattanooga*, LIGHTWAVE (OCT. 19, 2015), available at <https://www.lightwaveonline.com/articles/2015/10/epb-brings-10-gbps-ftth-to-chattanooga.html>.

By comparison, LTE is able to transmit between 100 Mbps to 1 Gbps under certain conditions⁴ with 5G tests delivering median user experiences of 490 Mbps up to 1.4 Gbps under certain simulations.⁵ Fiber is faster, period.

Setting aside the wide gulf of transmission speed capacity between the two technologies, the FCC should also recognize the differences between wireless 5G and FTTH in terms of infrastructure costs: FTTH is much cheaper to upgrade. Both networks will require high sunk costs to deploy but future upgrades to capacity are significantly more limited for wireless technologies than for wireline. As a general matter, the capacity of fiber networks can increase if additional advancements can be made in how many signals can be transmitted through the fiber strand. Wireless technologies depend on spectrum allocations and must deal with the limitations of specific frequencies, such as interference and dependency on line of sight. Moreover, 5G towers have an early estimated range of around 1000 feet requiring more towers to be built in order to maintain optimal speeds.⁶

International Markets That Have Both High-Speed Wireline Service and Universal LTE Demonstrate They Are Not Substitutes

A straightforward comparison between where wireline technologies have already advanced towards in transmitting data for years and where wireless services may eventually reach years from now should make it plain that the FCC should avoid assessing them as equivalents. In fact, it may be better to view them as complements: in a handful of markets that have high fiber deployments and high coverage of LTE services demonstrates that consumers value both a ultra-high capacity connection provided by FTTH and the mobility afforded to them by LTE services. For example, the Nordic market has fixed broadband and mobile services that match or exceed US speeds.⁷ Denmark has seen an increase in their fiber deployment despite 98 percent coverage of 4G LTE. Norway and Sweden lead Western Europe in fiber network deployments; at the same time, Norway has 99.3% mobile penetration and Sweden has 120.8 mobile subscriptions for every 100 inhabitants.⁸

The Internet Innovation Alliance (IIA) White Paper Draws the Wrong Conclusions from Its Own Data

As demonstrated above, wireless is not a functional substitute for wireline broadband. A closer look at the data⁹ presented by IIA when asking why consumers are reluctant to switch to “mobile

⁴ INTERNATIONAL TELECOMMUNICATIONS UNION, *Requirements Related to Technical Performance for IMT-Advanced Radio Interface(s)*, available at <http://www.itu.int/pub/R-REP-M.2134-2008/en>.

⁵ QUALCOMM, *Qualcomm Network Simulation Shows Significant 5G User Experience Gains*, available at <https://www.qualcomm.com/news/releases/2018/02/25/qualcomm-network-simulation-shows-significant-5g-user-experience-gains>.

⁶ Marc Vartabedian, *What 5G Will Mean to Consumers – and When*, WALL STREET JOURNAL (Sep. 12, 2018), available at <https://www.wsj.com/articles/what-5g-will-mean-to-consumersand-when-1536804241?redirect=amp#click=https://t.co/5C64nZQYss>.

⁷ See SPEEDTEST, *United States Report*, available at <http://www.speedtest.net/reports/united-states/>; See also SPEEDTEST, *Nordic Countries Report*, available at <http://www.speedtest.net/reports/nordic/>

⁸ *Id.*

⁹ INTERNET INNOVATION ALLIANCE, *Evolving Preferences - Consumer Preferences Tilting Towards Mobile Broadband*, available at <https://ecfsapi.fcc.gov/file/10917363327690/9.17.18%20IIA%20filing.pdf>

only” plans reveals that nearly half do not want to switch because of concerns with speed and reliability. These are precisely the advantages of wireline services: they’re not subject to interference in the same way wireless services are and they’re capable of delivering substantially higher speeds.

In addition, a missing factor in the survey is an assessment of the type of market the surveyed consumers currently reside. For example, as the FCC’s data shows, nearly 85 percent of Americans live in markets where they either have one choice or no choice for speeds in excess of 100 Mbps¹⁰ and about 15 percent of Americans have more than one choice. Residing in a market with competitive high-speed alternatives likely means those consumers have affordable high-speed connections and possibly gigabit services averaging around \$40 to \$80 a month. Such services vastly outpace US LTE services. Facing those options, the prospects of dropping an ultra-fast connection to solely rely on their smartphone service would seem comical. The point being, it seems unlikely consumers would willingly drop affordable superior speeds and the reliability afforded to them by FTTH for a wireless service, even 5G wireless services.

The FCC Should Reject Arguments that Wireless Services are Functional Substitutes for Wireline and Push for More Fiber to the Home Deployments

The fact is, the U.S. market lags in one key metric in comparison to our international counterparts: FTTH deployment. It should not be lost on the agency that major telephone companies poised to exploit advances in wireline technologies that far surpass legacy infrastructure utilized by the cable industry are instead choosing services that are complimentary instead of directly competitive. The fact that nearly half of the U.S. market’s FTTH deployments are being spearheaded by substantially smaller companies and local governments¹¹ with limited budgets should be of concern to the agency. The advent of 5G wireless services, while excellent for fulfilling specific needs in wireless networks such as autonomous vehicles and the Internet of Things, pales in comparison to what FTTH means for the future of Internet access. We urge the FCC maintain the position that wireless and wireline services are not substitutes.

Sincerely,

Ernesto Falcon
Legislative Counsel

Andres Arrieta
*Technology Projects
Manager*

¹⁰ FEDERAL COMMUNICATIONS COMMISSION, Internet Access Services Report (released 2/18).

¹¹ Krista Tysco, *A Mid-Year Roundup of the 2017 Global FTTH Broadband Market*, PPC BROADBAND, PPC BLOG, (Aug. 3, 2017), available at <http://www.ppc-online.com/blog/a-mid-year-roundup-of-the-2017-global-ftth-broadband-market>.