

**Before the
Federal Communications Commission
Washington, D.C. 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 AT&T

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COMMENTS OF AT&T

AT&T Inc. (“AT&T”), on behalf of itself and its affiliates, respectfully submits these comments responding to the Commission’s *Eleventh Broadband Progress Notice of Inquiry*.¹

INTRODUCTION AND SUMMARY

Section 706 requires the Commission to determine each year “whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.”² In its most recent *Broadband Progress Report*, the Commission instead defined “advanced telecommunications capability” based on the extreme bandwidth levels that households with multiple persons simultaneously engaged in bandwidth-intensive entertainment

¹ Eleventh Broadband Progress Notice of Inquiry, *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, FCC 15-101 (rel. Aug. 7, 2015) (“Notice”).

² 47 U.S.C. § 1302(b).

and other activities might want,³ rather than focusing, as the statute requires, on the minimum level of service consumers would need to access the most common and “regularly use[d]” services.⁴ Applying this erroneous standard, the Commission defined advanced capabilities as requiring at least 25 Mbps download speeds. Then, based on a finding that some 17 percent of Americans live in areas where that capability is not currently available, and ignoring that this percentage was declining rapidly, the Commission concluded that advanced telecommunications capability is not occurring in the U.S. broadly or quickly enough.

The Commission now proposes to extend this unlawful approach to the mobile context and, in the process, unreasonably narrow the definition of advanced telecommunications capability even further. Specifically, the Commission asks whether a consumer lacks access to advanced telecommunications capability unless she has access to both a 25 Mbps fixed broadband service *and* a 10 Mbps mobile broadband service.⁵

AT&T does not object to consideration of mobile broadband services in an inquiry as to whether advanced telecommunications capability is being reasonably and timely deployed in the United States. But any such inquiry would have to begin and end with the obvious fact that the wireless industry has deployed the most advanced technology available – LTE – on a nationwide basis. Indeed, the United States is the world leader in deployment of mobile broadband services,

³ 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, *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. 14-126, ¶ 9 (Feb. 4, 2015) (“2015 Broadband Progress Report”).

⁴ *Verizon v. FCC*, 740 F.3d 623, 641 (D.C. Cir. 2014) (noting that Commission previously increased threshold to 4 Mbps to establish a “threshold more appropriate to current consumer behavior and expectations” and that was “enough” to permit what “consumers now regularly use”).

⁵ *See Notice* ¶ 30.

and carriers are investing tens of billions of dollars every year to increase service quality, speed, capacity, and coverage. As the Commission's own annual reports to Congress on the state of the mobile wireless services industry acknowledge, more than 98 percent of Americans live in areas where at least two carriers offer 4G LTE service and more than 80 percent have access to four.⁶ Given that the industry has achieved ubiquitous deployment of the most "advanced" capabilities, the only legitimate conclusion is that mobile advanced services are being reasonably and timely deployed.

Instead of acknowledging this obvious conclusion, the Commission proposes a granular analysis of mobile capabilities based on speed, latency, and other metrics that are arbitrary and unworkable. For example, the 10 Mbps speed minimum the Commission proposes for mobile broadband is literally plucked from thin air; the Commission offers no explanation whatsoever for how it arrived at that proposed benchmark, much less how it can be reconciled with the Commission's (incorrect) hypothesis that consumers use mobile services primarily for low-bandwidth uses like social media and turn-by-turn directions, rather than video. But even if the Commission acknowledges that data usage for video has exploded on mobile networks in recent years, it could not justify a 10 Mbps speed benchmark. For example, both YouTube and Netflix report that their high quality streaming can be done with download speeds far less than 10 Mbps (1 Mbps for YouTube and 5 Mbps for Netflix).⁷ And even these metrics ignore that many video providers offer smaller file sizes optimized for the much smaller screens used with mobile

⁶ Seventeenth Report, *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, 29 FCC Rcd. 15311, ¶ 59 (Table III.A.2) (2014) ("*Seventeenth Mobile Competition Report*").

⁷ See Netflix, "Internet Connection Speed Recommendations," <https://help.netflix.com/en/node/306>; see also YouTube, YouTube Help, "System Requirements," <https://support.google.com/youtube/answer/78358?hl=en>.

devices. Moreover, unlike wireline services which may be shared by multiple users, mobile services are typically used by one person at a time. In short, there is no real world justification for a finding that advanced services over mobile require at least 10 Mbps download speeds.

To make matters worse, the *Notice* proposes to develop some method of mapping “deployment” of advanced mobile capabilities that turns on geographically granular data concerning download and upload speed. But as explained below, the Commission has previously “excluded mobile” from its Section 706 analysis precisely “due to concerns about the quality and reliability of the data for these services,”⁸ and that lack of data still exists. The proposal to fill this data gap with Form 477 data will not work. Form 477 contains only “minimum advertised speeds” for mobile services and the Commission itself has emphasized that it is “actual speeds” that matter. The use of minimum advertised speeds from Form 477 could only systematically undercount locations where actual download and upload speeds exceed the threshold for advanced capabilities. Nor could the Commission fill the gap with the alternative data sources suggested in the *Notice*, which existed when the Commission previously found a

⁸ *Notice* ¶ 5. See also Seventh Broadband Progress Report and Order on Reconsideration, *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*, 26 FCC Rcd. 8008 ¶ 26 (2011) (“*Seventh Broadband Progress Report*”) (“We do not draw conclusions...about mobile wireless services due to our concern that these data do not accurately reflect where mobile wireless subscribers actually are able to obtain services that meets the broadband performance threshold.”); see also Eighth Broadband Progress Report, *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*, 27 FCC Rcd. 10342 ¶ 35 (2012) (“*Eighth Broadband Progress Report*”) (“[W]e do not include the mobile data in our statutory finding in this report for two reasons. First, as detailed below, we have concerns that the available data sources for measuring mobile broadband may overstate deployment to a significant degree.”).

lack of adequate data sources and which do not provide the kind of granular or comprehensive data the Commission would need for its proposed analysis.

The Commission's proposal to develop metrics for various additional under-the-hood metrics, such as latency and consistency, would be even more unworkable and arbitrary. These metrics have trade-offs (making one metric better can make others worse), and providers carefully balance those factors to provide high quality user experiences. Thus, the focus must be on the overall user experience, not individual performance metrics like latency.

In the remainder of these comments, we demonstrate that: (1) the publicly available data easily confirm that the most advanced mobile capabilities available are being deployed in a reasonable and timely fashion; (2) there is no basis for the proposal that consumers require mobile broadband speeds of at least 10 Mbps to have access to advanced telecommunications capability; and (3) measuring mobile broadband "deployment" by means of geographically granular metrics such as speed, latency, and "consistency," as the Commission proposes, is unworkable for mobile technologies, because the Commission does not have the data sources needed to conduct any such analysis.

I. THE PUBLICLY AVAILABLE FACTS EASILY CONFIRM THAT MOBILE ADVANCED CAPABILITIES ARE BEING DEPLOYED IN A REASONABLE AND TIMELY FASHION.

Section 706 requires the Commission to answer a simple question: "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion."⁹ "Advanced telecommunications capability" is defined as "high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality

⁹ 47 U.S.C. § 1302(b).

voice, data, graphics, and video telecommunications using any technology.”¹⁰ AT&T does not object to consideration of mobile broadband services in a Section 706 inquiry, but if the Commission is going to add mobile capabilities and technologies to the analysis, the Commission should answer the question Congress asked. And for mobile capabilities, the answer is easy: publicly available data amply confirm that U.S. mobile deployment far exceeds Section 706’s “reasonable and timely” standard.

In the context of mobile capabilities, the most “advanced” technology that any nation could reasonably deploy today is LTE. The U.S. industry is obviously deploying those capabilities in a “reasonable and timely” manner, because virtually “all Americans” now have access to multiple LTE providers. As the Commission and the White House have rightly touted, the U.S. leads the world in mobile broadband deployment and usage, and by a wide margin. That is why a senior official in Chairman Wheeler’s office recently characterized U.S. “mobile broadband networks” as “the envy of the world.”¹¹ The experts at 4G Americas agree that “[i]n terms of market share, penetration and coverage, the U.S. leads the world and remains at the head of the class in technology and spectrum innovation.”¹² And U.S. mobile deployment is clearly “timely”: a recent White House Report noted that U.S. providers met the President’s

¹⁰ *Id.* § 1302(d)(1).

¹¹ Remarks of Gigi B. Sohn, Counselor to FCC Chairman Wheeler, Moving Towards a Gigabit State (May 4, 2015), *available at* <https://www.fcc.gov/document/remarks-gigi-b-sohn-moving-towards-gigabit-state>.

¹² Year-End 2014: Nearly Half a Billion LTE Connections WorldWide, 4G Americas reports substantial gains for LTE in North America, 4G Americas (March 11, 2015), <http://www.4gamericas.org/en/newsroom/press-releases/year-end-2014-nearly-half-billion-lte-connections-worldwide>.

challenge to deploy 4G technology to 98 percent of Americans “nearly two years ahead of schedule.”¹³

As that White House assessment confirms, the U.S. wireless industry is deploying advanced mobile capabilities at breakneck speed. At the turn of this decade, LTE was still on the standard-setting bodies’ drawing boards. But as the Commission recently found in its Mobile Competition Report, by January 2014, 98.5 percent of Americans were covered by LTE.¹⁴ AT&T’s facilities-based LTE network now covers about 96 percent of the U.S. population,¹⁵ and AT&T covers most other Americans (totaling more than 99 percent) through roaming agreements with other LTE providers. Although AT&T’s efforts alone would satisfy Section 706’s standard for deployment to all Americans, other carriers likewise have deployed extensive LTE networks. Verizon reports that its LTE network “cover[s] more than 98 percent of Americans.”¹⁶ T-Mobile recently stated that its facilities-based LTE network covers about 290 million Americans (about 90 percent), and it expects to cover 300 million Americans by the end of 2015.¹⁷ Sprint has deployed an LTE network that covers about 280 million POPs (about 87

¹³ White House, Office of the Press Secretary, Fact Sheet: Next Steps in Delivering Fast Affordable Broadband (March 23, 2015), *available at* <https://www.whitehouse.gov/the-press-office/2015/03/23/fact-sheet-next-steps-delivering-fast-affordable-broadband>.

¹⁴ *Seventeenth Mobile Competition Report* ¶ 59 (Table III.A.2).

¹⁵ *See* AT&T, “Network,” <http://www.att.com/network/en/index.html> (“Overall, AT&T covers over 320 million people [out of about 321 million people in the U.S.] with its voice and data services, with over 308 million people covered by our 4G LTE network”).

¹⁶ Verizon, “Why It’s Good to Be a Verizon Customer,” <http://www.verizonwireless.com/mobile-living/network-and-plans/why-verizon-customer-exclusives/>.

¹⁷ T-Mobile, T-Mobile Investor Factbook, Q2 2015, at 2, *available at* <http://investor.t-mobile.com/Cache/1500074332.PDF?Y=&O=PDF&D=&fid=1500074332&T=&iid=4091145>.

percent).¹⁸ Regional and local providers have likewise been blanketing their service areas with LTE. For example, U.S. Cellular reports that “94 percent of [its] customers have access to 4G LTE speeds”¹⁹ and that it “plans to cover essentially its entire customer base with LTE by the end of [2015],”²⁰ and nTelos is investing \$175 million to roll out LTE across its footprint.²¹ Thus, as the Commission’s most recent Mobile Competition Report confirms, virtually every American has access to *multiple* LTE broadband providers.²²

The U.S.’s large lead in LTE deployment has translated into a similarly large lead in LTE adoption and usage. The U.S. has the most LTE subscribers (158 million connections) in the world, despite having the third lowest amount of spectrum dedicated to LTE.²³ As reported by CTIA, by the end of 2014, “LTE penetration in the U.S. [was] at nearly 50%,” compared to only 13 percent of mobile connections in Western Europe and 10 percent in the Asia Pacific region.²⁴ About 72 percent of all smartphones in North America (and on AT&T’s network) are LTE-

¹⁸ Sprint, Presentation, FY4Q14 Results Conference Call, at 9, May 5, 2015, <http://investors.sprint.com/Cache/1500071437.PDF?Y=&O=PDF&D=&FID=1500071437&T=&IID=4057219> (“Sprint Conference Call”).

¹⁹ See U.S. Cellular Website, <http://www.uscellular.com/about/index.html>.

²⁰ Phil Goldstein, *U.S. Cellular to expand LTE network cover 98% of its customers by end of 2015*, Fierce Wireless, April 1, 2015, <http://www.fiercewireless.com/story/us-cellular-expand-lte-network-cover-98-its-customers-end-2015/2015-04-01>.

²¹ nTelos, Press Release, *nTelos Announces “4G for All” Network Expansion Plan, First LTE Launch of 2015*, Fierce Wireless, Feb. 2, 2015, <http://www.fiercewireless.com/press-releases/ntelos-announces-4g-all-network-expansion-plan-first-lte-launch-2015>.

²² *Seventeenth Mobile Competition Report* ¶ 51 (Table III.A.2).

²³ See Thomas K. Sawanobori and Dr. Robert Roche, CTIA – The Wireless Association, *Mobile Data Demand: Growth Forecasts Met*, June 22, 2015, at 4, available at <http://www.ctia.org/docs/default-source/default-document-library/062115mobile-data-demands-white-paper.pdf> (“*Mobile Data Demand: Growth Forecasts Met*”).

²⁴ See Comments of CTIA – The Wireless Association, *Wireless Telecommunications Bureau Seeks Comment on the State of Mobile Wireless Competition*, WT Docket No. 15-125, at 66 (June 29, 2015) (“Comments of CTIA”).

compatible, compared to only 51 percent for Western Europe.²⁵ More than 72 percent of data traffic in the U.S. is LTE traffic,²⁶ compared to only 31 percent for Western Europe.²⁷ And, U.S. mobile end users generated an average of 1,503 MB of mobile data traffic per month, compared to only 373 MB for Central and Eastern Europe, and 273 MB for the Asia-Pacific region.²⁸

Indeed, as a result of the prevalence and quality of mobile broadband in the U.S., Americans are increasingly using advanced mobile broadband capabilities to access the same applications as wireline services, especially for the “voice, data, graphics, and video” services that define “advanced services” under Section 706. A recent analysis by Cisco reports that “viewing of mobile video offerings . . . accounted for 60 percent of all mobile data traffic at the end of 2014,”²⁹ and that video will be 75 percent of the United States’ mobile data traffic by 2019.³⁰ “YouTube now reaches more of the 18-49 year-old demographic – on just mobile devices – than any cable television network,” and mobile device viewing averaged about 2.8

²⁵ See *id.*; see also AT&T Investor Briefing No. 289, 2nd Quarter 2015, July 23, 2015, available at http://www.att.com/Investor/Earnings/2q15/ib_final_2q15.pdf.

²⁶ Coleman Bazelon and Guilia McHenry, Substantial Licensed Spectrum Deficit (2015-2019): Updating the FCC’s Mobile Data Demand Projections, at 4-5 (June 23, 2015), available at http://www.ctia.org/docs/default-source/default-document-library/bazelon_mchenry_spectrum-deficit_2015-06-23.pdf.

²⁷ Comments of CTIA, at 66.

²⁸ *Id.* at 68.

²⁹ *Mobile Data Demand: Growth Forecasts Met*, at 5 (citing Cisco, VNI Mobile Forecast Highlights, 2014-2019 (United States – Mobile Applications), http://www.cisco.com/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country).

³⁰ See Cisco, VNI Mobile Forecast Highlights, 2014-2019 (United States – Mobile Applications), available at http://www.cisco.com/c/dam/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country; see also *Mobile Data Demand: Growth Forecasts Met*, at 5.

hours a day in 2015 (compared to only 2.4 hours per day for desktop computers).³¹ Half of AT&T’s “mobile network traffic is video now, and [it is] really growing fast.”³² And Verizon just launched a trial of a new over-the-top mobile service video service called “Go90” “primed with around 100 to 200 hours of exclusive content from online video networks” and “popular shows from Comedy Central, Food Network, ESPN, NFL Network, and Discovery.”³³ As to data and graphics, the Commission itself points out that “[m]obile broadband has become increasingly important for accessing websites, navigating during travel, connecting on social media, communicating with family and friends, receiving timely news updates, and obtaining entertainment.”³⁴

These trends in mobile advanced capabilities are expected to continue. A recent report shows that Americans now spend more of their Internet time on mobile devices (about 60 percent) than on wireline devices (about 40 percent).³⁵ Moreover, an increasing portion of Americans are cutting their wireline usage altogether, relying solely on mobile devices for broadband and voice services. As one recent report shows, “21 percent [of millennials] are no

³¹ Mary Meeker, *Internet Trends 2015 – Code Conference*, KPCB, at 24 (May 27, 2015), available at <http://www.kpcb.com/internet-trends>; see also *Mobile Data Demand: Growth Forecasts Met*, at 5.

³² Jonathan Vanian, AT&T CEO: “Half of our mobile network traffic is video,” *Fortune* (June 12, 2015), available at <http://fortune.com/2015/06/12/att-randall-stephenson-video-traffic>.

³³ Phil Goldstein, *Verizon launches Go90 mobile OTT video service as trial for some VZW subs; full launch coming soon*, *FierceWireless*, Sept. 8, 2015, <http://www.fiercewireless.com/story/verizon-launches-go90-mobile-ott-video-service-trial-some-vzw-subs-full-lau/2015-09-08>.

³⁴ *Notice* ¶ 8.

³⁵ Sarah Perez, *Majority Of Digital Media Consumption Now Takes Place In Mobile Apps*, *TechCrunch*, Aug. 21, 2014, <http://techcrunch.com/2014/08/21/majority-of-digital-media-consumption-now-takes-place-in-mobile-apps/> (“mobile usage as a whole accounts for 60% of time spent, while desktop-based digital media consumption makes up the remaining 40%.”); see also *Mobile Data Demand: Growth Forecasts Met*, at 5.

longer using desktop computers to go online.”³⁶ Similar trends exist for the 55-years-and-older consumer segment.³⁷

In addition, providers of mobile broadband in the U.S. have spent billions of dollars to develop and deploy the next generation of mobile services. For example, AT&T and other providers have begun deployment of next-generation LTE-Advanced mobile broadband technologies,³⁸ which enable even faster and more reliable connections through cutting-edge transmission technologies like carrier aggregation³⁹ and “multi-layer MIMO.”⁴⁰ Similarly, AT&T and others are deploying the next generation of mobile broadband voice services, including Voice over LTE (“VoLTE”).⁴¹ AT&T, Verizon Wireless, and T-Mobile have all deployed VoLTE, and each carrier has used VoLTE to provide superior voice calls via high definition voice services (HD Voice).⁴² At the same time, providers’ investments in the rapid

³⁶ Kate Dreyer, *Mobile Internet Usage Skyrockets in Past 4 Years to Overtake Desktop as Most Used Digital Platform*, comScore, April 13, 2015, <https://www.comscore.com/Insights/Blog/Mobile-Internet-Usage-Skyrockets-in-Past-4-Years-to-Overtake-Desktop-as-Most-Used-Digital-Platform>.

³⁷ *Id.*

³⁸ 4G Americas, “LTE-Advanced,” <http://www.4gamericas.org/en/resources/technology-education/lte-advanced/>.

³⁹ See Dr. John Saw, Sprint, Chief Network Officer, “The Sprint Network is Getting Better Every Day,” May 20, 2015, <http://newsroom.sprint.com/blogs/sprint-perspectives/the-sprint-network-is-getting-better-every-day.htm>; Matt Hamblen, *Sprint to rollout LTE Advanced to Chicago area*, Computer World, March 30, 2015, <http://www.computerworld.com/article/2903874/sprint-to-rollout-lte-advanced-to-chicago-area.html> (Sprint begins its LTE advanced rollout with Chicago in March 2015).

⁴⁰ Phil Goldstein, *Sprint to bring LTE carrier aggregation, multi-layer MIMO to Chicago in investment push*, Fierce Wireless, March 31, 2015, <http://www.fiercewireless.com/story/sprint-bring-lte-carrier-aggregation-multi-layer-mimo-chicago-investment-pu/2015-03-31>.

⁴¹ Sue Marek, *The voice renaissance: VoLTE, HD Voice and Wi-Fi calling bring innovation to voice*, Fierce Wireless, Feb. 20, 2015, <http://www.fiercewireless.com/story/voice-renaissance-volte-hd-voice-and-wi-fi-calling-bring-innovation-voice/2015-02-20>.

⁴² *Id.*

deployment of these advanced mobile technologies have enabled dramatic growth throughout the wireless ecosystem, as evidenced by the enormous growth in the “Internet of Things.”⁴³

In short, the answer to the question whether advanced mobile capabilities are being deployed in the U.S. on a reasonable and timely basis is obviously yes. That is all the more evident given that Section 706 does not merely require a report to Congress; if the Commission concludes that deployment has not been reasonable or timely, Section 706 requires it to “take immediate action to accelerate deployment of such capability.”⁴⁴ It would be absurd on these facts to conclude that deployment has fallen below the Section 706 “reasonable and timely” standard or that special Commission intervention is somehow necessary to “accelerate” the industry’s efforts. In the end, the only possible conclusion is the one dictated by common sense: if the United States has achieved ubiquitous deployment of the most advanced technology available and leads the rest of the world by a wide margin, how can its deployment not be “reasonable” or “timely”?

II. THE COMMISSION’S PROPOSED ALTERNATIVE ANALYSIS IS CONTRARY TO THE FACTS AND THE STATUTE.

Although today’s nationwide deployment of LTE easily satisfies the statutory standard of “reasonable” and “timely” deployment, the Commission proposes an artificial and abstract inquiry that would lead to the facially implausible conclusion that advanced mobile capabilities are *not* being deployed in a reasonable or timely manner. Indeed, the Commission’s proposed 10 Mbps/1 Mbps threshold for mobile capabilities is out of left field. The *Notice* provides no analysis to support this figure at all; it literally does nothing more than ask, “how about 10

⁴³ Deloitte, “United States expands global lead in mobile broadband: How policy actions could enhance or imperil America’s mobile broadband competitiveness,” at 17 (Sept. 2014), <http://www2.deloitte.com/content/dam/Deloitte/us/Documents/technology-media-telecommunications/us-tmt-mobile-index-09262014.pdf>.

⁴⁴ 47 U.S.C. § 1302(b).

Mbps?”⁴⁵ Under the Commission’s theory, however, consumers use mobile broadband for relatively non-bandwidth-intensive tasks like accessing Facebook or using turn-by-turn directions. The Commission makes no attempt to explain why 10 Mbps download speeds would be necessary to use such services. As demonstrated above, more than half of all mobile traffic *today* is related to video, thus vividly demonstrating that today’s mobile broadband services are more than capable of providing even the *most* bandwidth intensive services, making any speed benchmark unnecessary for assessing mobile services under any Section 706 analysis. Moreover, 10 Mbps would be far too high a benchmark for mobile broadband. Both YouTube and Netflix report that their high definition streaming can be done with download speeds far less than 10 Mbps (1 Mbps and 5 Mbps, respectively).⁴⁶ Even these metrics ignore that many video services offer smaller file sizes optimized for the much smaller screens used with mobile devices.⁴⁷ And, unlike wireline services which may be shared by multiple users, mobile services are typically used by one person at a time.

More fundamentally, however, the Commission is repeating the mistake it made last year in redefining the fixed wireline download speed thresholds. Congress intended Section 706 to act as a kind of emergency alarm system; the Commission is supposed to determine whether deployment is lagging materially behind what the industry could reasonably achieve, and if so, the statute requires Commission to try to accelerate deployment by removing barriers to

⁴⁵ Notice ¶ 30 (“would a mobile speed benchmark of 10 Mbps/1 Mbps be appropriate?”).

⁴⁶ See Netflix, “Internet Connection Speed Recommendations,” <https://help.netflix.com/en/node/306>; see also YouTube, YouTube Help, “System Requirements,” <https://support.google.com/youtube/answer/78358?hl=en>.

⁴⁷ See, e.g., Jan Ozer, *The State of Video Codecs 2015*, StreamingMedia.com (March 2015), <http://www.streamingmedia.com/Articles/Editorial/Featured-Articles/The-State-of-Video-Codecs-2015-102806.aspx> (“In 2014, some companies began offering technologies that claim to reduce the delivery data rate of H.264 by as much as 50 percent with minimal impact on visual quality.”).

investment and promoting competition. The Commission, however, has twisted the statute so that advanced telecommunications capability is defined to embody the Commission’s “stretch” goals, effectively judging the industry in relation to download speeds that the most data-intensive users would desire. That reading of the statute is unreasonable, because it essentially guarantees that the Commission will always find deployment falling short of what is reasonable and timely, thus enabling the Commission to perpetually declare for itself authorities that it might not otherwise have. The Commission and the D.C. Circuit have treated the statutory definition as including only the minimum bandwidth necessary to enable “the most popular forms” of Internet uses and the services that consumers “regularly” use,⁴⁸ and the Commission should return to that standard.

III. THE COMMISSION’S PROPOSED INQUIRY FOR MOBILE CAPABILITIES, WHICH WOULD BE BASED ON METRICS SUCH AS ACTUAL SPEEDS AND LATENCY, WOULD BE UNWORKABLE.

Even if it made sense to adopt the type of alternative analysis the Commission proposes in the *Notice*, any such analysis would be completely unworkable. The Commission essentially proposes to develop some method of mapping “deployment” that turns on geographically granular data concerning speed and various other under-the-hood metrics (*e.g.*, latency). The Commission simply does not have the data sources needed to perform this type of analysis. The performance of wireless networks varies substantially from location to location and from time to

⁴⁸ Report, *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*, 14 FCC Rcd. 2398 ¶ 20 (1999) (choosing original 200 Kbps threshold because it was “enough to provide the *most popular* forms of broadband—to change web pages as fast as one can flip through the pages of a book and to transmit full-motion video”) (emphasis added); *Verizon v. FCC*, 740 F.3d 623, 641 (D.C. Cir. 2014) (noting that Commission increased threshold to 4 Mbps to establish a “threshold more appropriate to current consumer behavior and expectations” and that was “enough” to permit what “consumers now regularly use”).

time, depending on a variety of factors (*e.g.*, available spectrum, propagation, terrain, buildings materials, concentration of users, peak usage times, end-user device capabilities, services being used by end-users, and so on), and thus there would be enormous challenges to developing and interpreting the sorts of speed and other metrics as proposed in the *Notice*. In prior reports, the Commission has “excluded mobile . . . broadband service due to concerns about the quality and reliability of the data for these services,”⁴⁹ and those problems still exist.

First, the Commission does not have the data to measure “deployment” as a granular map showing where actual speeds exceed 10 Mbps. The “minimum advertised speeds” reported by providers on Form 477 certainly would not be of any assistance.⁵⁰ As the Commission itself acknowledges, what matters is “actual speeds,”⁵¹ but the advertised minimum available speeds will always be lower than average speeds that consumers experience, thus providing misleading data that will systematically undercount available download and upload speeds for mobile services. For example, AT&T advertises a minimum download speed of 5 Mbps for 4G LTE, which is reflected on AT&T’s Form 477.⁵² But according to RootMetrics, AT&T’s median download speed was between 10-20 Mbps in 79 metro markets and 20 Mbps or faster in 11 markets in the first half of 2015, far higher than the 5 Mbps minimum advertised download

⁴⁹ *Notice* ¶ 5. See also *Seventh Broadband Progress Report* ¶ 26 (“We do not draw conclusions...about mobile wireless services due to our concern that these data do not accurately reflect where mobile wireless subscribers actually are able to obtain services that meets the broadband performance threshold.”); see also *Eighth Broadband Progress Report* ¶ 35 (“[W]e do not include the mobile data in our statutory finding in this report for two reasons. First, as detailed below, we have concerns that the available data sources for measuring mobile broadband may overstate deployment to a significant degree.”).

⁵⁰ *Notice* ¶ 5.

⁵¹ *Id.* ¶ 30.

⁵² See AT&T, Broadband Information, <http://www.att.com/gen/public-affairs?pid=20879>.

speed (and far higher than the Commission’s proposed benchmark of 10 Mbps).⁵³ Consequently, if the Commission were to use AT&T’s minimum advertised speed from Form 477, the Commission would incorrectly conclude that AT&T’s speeds are below the 10 Mbps threshold (or whatever arbitrary level the Commission adopts) needed to qualify as an advanced capability. Moreover, measuring minimum speeds would be inconsistent with how the Commission assesses fixed broadband, which has been based on averages.⁵⁴

The Commission acknowledges that Form 477 data is inadequate and asks whether “other data sources” can be used to fill the gaps.⁵⁵ The *Notice* identifies various candidates, including Measuring Mobile Broadband America, Ookla, RootMetrics, Google M-Lab, and CalSPEED.⁵⁶ To be sure, each of these data sources has independent value for consumers by allowing them to obtain a measure of speed (and sometimes latency) at a specific location and time of day. But these data sources do not provide the sort of comprehensive information that could be relied upon by the Commission to draw conclusions about mobile broadband speeds at granular geographic areas throughout the U.S.

Most of these data sources rely on customer-performed testing using the mobile applications provided by these entities. As a result these data do not account for important factors that may affect the speeds and other metrics. For example, they do not account for whether the user’s device was running other applications using the broadband connection at the same time the speed test was being conducted, whether the device supported the fastest available

⁵³ See Dave Anderson, *Mobile Network Performance in the US: First Half 2015*, RootMetrics, Aug. 18, 2015, <http://www.rootmetrics.com/us/blog/special-reports/2015-1h-national-us> (“RootMetrics First Half 2015 Performance”).

⁵⁴ *2015 Broadband Progress Report* ¶ 44.

⁵⁵ *Notice* ¶ 5.

⁵⁶ *Id.* ¶¶ 7, 67.

speeds (*e.g.*, whether it supported the relevant LTE bands and carrier aggregation), whether the operating system supported the most advanced available technologies, whether the testing occurred in a unique non-representative environment (*e.g.*, tests conducted underground in a parking garage would typically produce slower speeds than at street level). Moreover, many of these data sources are not available at the geographic granularity needed for the proposed Section 706 analysis. For example, CalSPEED only measures broadband speed in one state and RootMetrics only provides statistics for a subset of geographic areas (nationwide, statewide, the 125 largest metro areas, 50 busiest airports, special event venues, busy transit stations, and certain university campuses).⁵⁷

In addition to the lack of data, the Commission’s proposal to assess various additional under-the-hood metrics, such as latency and consistency, would be even more unworkable. In any given wireless network, characteristics such as “latency” reflect a careful balance in deciding how to provide customers the desired mobile broadband experience. Such metrics therefore cannot be legitimately examined in isolation. The proposal to examine latency illustrates the problem. Latency interacts with multiple other network performance metrics, including packet loss. One way to decrease latency is to reduce the size of the buffers in network routers, thus reducing the wait time for each packet when it arrives at the router. But reducing buffer sizes results in *increased* packet loss because packet loss typically occurs when a router’s buffer is full. Excessive packet loss can substantially reduce speed (because packets must be re-sent), and thus can adversely impact speed-sensitive applications and services. Thus, high latency metrics

⁵⁷ See RootMetrics, *A simple premise for a sophisticated methodology*, July 2015 <http://www.rootmetrics.com/us/methodology>.

by themselves – even if reliable latency metrics could be obtained – cannot be evaluated without understanding how they interact with the various other network metrics.⁵⁸

Moreover, a myopic focus on only certain network metrics could harm customers. If the Commission focuses on only certain under-the-hood network metrics, it would create incentives for mobile broadband providers to adjust those metrics to meet certain thresholds, even if doing so results in overall reduced network performance and customer experiences.

There are numerous other challenges to cobbling together reliable speed and other metrics from the data sources identified in the *Notice*. For mobile wireless (and for wireline services), there are many different ways to measure the proposed metrics, and it is not at all clear how the Commission could use any of the proposed data sources identified in the *Notice* or whether they could be combined in an apples-to-apples fashion. As just one example, speed and latency metrics can vary dramatically depending on the endpoints of the connection and each of the data sources appears to use different end points when taking these measurements. Thus, it is not at all clear that cobbling together speed and other metrics from all of these sources is even possible. It is clear, however, that any such attempt would require substantial Commission resources, with no apparent benefits.

⁵⁸ In addition, in the *2015 Broadband Progress Report*, the Commission explained that it had concerns about the use of “other factors, such as latency concerns” when it came to mobile broadband. *2015 Broadband Progress Report* ¶ 9. Earlier, in the *Eighth Broadband Progress Report*, the Commission cited the lack of standards for measuring core characteristics such as latency with respect to mobile broadband services. *See Eighth Broadband Progress Report* ¶ 3 (“[T]he Commission considered latency and capacity as core characteristics that affect what consumers can do with their broadband service. The Commission identified potential standards on latency and usage capacity with respect to fixed broadband services, but did not do so for mobile services, and the latency and capacity of many mobile broadband services may not be comparable to those of fixed broadband services”). None of these concerns have been resolved.

CONCLUSION

For the foregoing reasons, the Commission should conclude that advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.

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