

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Inquiry Concerning the Deployment of)	GN Docket No. 16-245
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)	

**REPLY COMMENTS
of
UNITED STATES CELLULAR CORPORATION**

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September 21, 2016

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SUMMARY

The record confirms concerns expressed by U.S. Cellular that faulty data is compromising the Commission's ability to make accurate evaluations of the extent of mobile broadband deployment, particularly in rural areas. U.S. Cellular proposes a plan to fix these mobile broadband data problems.

There is support in the record for retaining the Commission's decision in the *2016 Broadband Progress Report* that consumers have access to advanced telecommunications capability *only* if *both* fixed and mobile broadband services are available, and for a Commission finding that mobile broadband deployment does *not* meet the availability test established by Section 706 of the Telecommunications Act of 1996.

A New System for Mobile Broadband Data Collection and Analysis

There is substantial evidence in the record that data currently collected by the Commission overstates mobile broadband coverage in rural areas, and that flaws in current data collection mechanisms make carriers' investment decisions difficult and lead to battles of conflicting statistics, producing confusion and uncertainty regarding the actual extent of mobile broadband coverage.

U.S. Cellular suggests that the Commission initiate a proceeding specifically tasked with fixing mobile broadband data problems, and with establishing a standard, uniform, and reliable method for collecting and analyzing mobile broadband deployment data. U.S. Cellular recommends that deployment be determined by the extent of coverage provided by mobile broadband networks delivering 10/1 Mbps speeds, and that coverage be measured by using a drive test methodology.

A 10/1 Mbps Speed Benchmark for Mobile Broadband

Several commenters agree with U.S. Cellular that the Commission should use a 10/1 Mbps mobile broadband speed benchmark for its Section 706 analysis and findings. A few commenters argue against a 10/1 Mbps standard because it would be “forward-looking,” but U.S. Cellular demonstrates that such an approach is both sound policy and within the Commission’s discretion pursuant to Section 706.

Finding that Mobile Broadband Deployment Does Not Meet the Section 706 Test

U.S. Cellular agrees with commenters who demonstrate that prevailing conditions must result in a finding that mobile broadband is not being deployed to all Americans in a reasonable and timely manner, as required by Section 706(b).

A few commenters suggesting otherwise fail to show that mobile broadband deployment, if measured based on a 10/1 Mbps speed benchmark, would pass the Section 706 availability test, and fail to support claims that the Commission’s Section 706 analysis has been reduced to a rote exercise to produce a negative finding that will serve other regulatory objectives.

Applying the Availability Test to Both Fixed and Mobile Broadband

The Commission should reject a proposal made by a few commenters to scrap the new broadband availability test and revert to the old formula that advanced broadband is available if either fixed or mobile networks have been deployed. U.S. Cellular shows that the new test—requiring the availability of both fixed and mobile broadband—is appropriate in light of the Commission’s finding that mobile broadband is an essential service with distinctive functionalities.

Collecting Latency and Service Consistency Data

U.S. Cellular strongly believes the Commission should begin collecting latency and consistency data, using drive testing, to guide the Commission’s future policy direction. It is important

for the Commission to compare speed, latency, and consistency of service in urban and rural environments. It is not necessary, however, for the Commission to include latency and consistency of service metrics as performance benchmarks for Mobility Fund Phase II funding, which should first be focused on extending coverage to areas lacking any 4G LTE service.

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United States Cellular Corporation (“U.S. Cellular”), by counsel, hereby submits these Reply Comments, in response to the Commission’s Twelfth Broadband Progress Notice of Inquiry in the above-captioned proceeding.¹

I. INTRODUCTION.

Sound Commission policies and decisions are driven by accurate, reliable data. For mobile broadband, central Commission policies relate to coverage—promoting network deployment to ensure that all Americans have access to mobile broadband. Achievement of the goal underlying these policies is at risk because the data collection mechanisms the Commission currently has in

¹ *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. 16-245, Twelfth Broadband Progress Notice of Inquiry, FCC 16-100 (rel. Aug. 4, 2016) (“*Notice*”).

place are broken, generating skewed data that overstates mobile broadband deployment, especially in rural America.

The Commission needs to fix this broken system so that informed decisions may be made about how best to address the need for further deployment of mobile broadband networks in rural areas that better data would show are currently inadequately served or not served at all. The best way to do this is to develop a consistent means of collecting and analyzing mobile broadband data, and then apply this new system in a uniform, standardized manner across the various regulatory platforms that apply to mobile broadband.

Drawing from the record in this proceeding, U.S. Cellular outlines a path for accomplishing this task, suggesting a procedural route, the standard the Commission should use to define what constitutes coverage by advanced mobile broadband networks, and the means by which coverage, based on this standard, can be accurately measured.

The price of the Commission's failing to fix the mobile broadband data collection problems is high, and it will be paid by American consumers. Being content with data that overstates mobile broadband coverage skews the Commission's analysis of mobile competition and its evaluation of progress being made in mobile broadband deployment. The corrosive effect of flawed data risks depriving consumers of the benefits of mobile broadband competition, and it threatens to leave rural consumers without any chance of gaining access to mobile broadband in the foreseeable future.

U.S. Cellular urges the Commission to use the broadband progress report that will be issued in this proceeding as a launch pad for an effort to fix the mobile broadband data problems, and to design and implement a new, uniform set of standards and measurements that are applied consistently, and that produce accurate, reliable data concerning mobile broadband coverage.

II. FIXING THE MOBILE BROADBAND DATA PROBLEMS.

“Data underpins every activity at the Federal Communications Commission.”² This is particularly true with respect to the Commission’s activities relating to mobile broadband. The Commission relies on mobile broadband data for purposes of its Section 706³ analysis and findings, and also for the disbursement of universal service support, for determining the extent of competition in the mobile wireless marketplace, and for other purposes.

Two problems, however, are plaguing the Commission’s use of mobile broadband data. As U.S. Cellular has discussed in its Comments,⁴ and as the record in this proceeding confirms,⁵ the Commission’s mobile broadband data is flawed in ways that overstate mobile broadband coverage, particularly in rural areas. More fundamentally, the Commission has not been successful in establishing a standard, uniform, and reliable method for collecting and analyzing mobile broadband deployment data.

A. The Commission Must Establish a Single, Standardized System for Collecting and Evaluating Mobile Broadband Deployment.

There is a lack of a “common language” for assessing the extent of mobile broadband deployment, which leads to confusion and uncertainty. Broadband service providers find it difficult to make investment decisions because of uncertainties regarding their eligibility for universal service support and regarding regulatory obligations that may apply to their operations, and various

² FCC Website, Reports & Research – Data, accessed at <https://www.fcc.gov/reports-research/data>.

³ Section 706 of the Telecommunications Act of 1996 (“Section 706”), Pub. L. No. 104-104, § 706, 110 Stat. 56, 153 (1996), as amended by the Broadband Data Improvement Act, Pub. L. No. 110-385, 122 Stat. 4096 (2008), as codified in Title 47, Chapter 12, of the United States Code, 47 U.S.C. § 1302.

⁴ U.S. Cellular Comments at 7-11. Unless otherwise noted, references herein to comments are to those filed in this proceeding on September 6, 2016.

⁵ See Sec. II.B., *infra*.

stakeholders often tend to talk past each other in debating the extent of mobile broadband coverage. For example, some parties have argued that more than 99 percent of *all* Americans have access to mobile broadband networks,⁶ while others, including U.S. Cellular, point to Commission data showing that 87 percent of *rural* Americans do not have access to mobile broadband.⁷

The Commission should solve this problem, and rid its mobile broadband analyses of the flawed data that currently tends to overstate coverage, by adopting an approach grounded in the consistent use of data that is collected and analyzed pursuant to a uniform, standardized system.

1. The Lack of a Uniform Plan for the Collection and Analysis of Mobile Broadband Deployment Data Has Caused Confusion and Hampered Investment Decisions.

Five years ago, in the *Measuring Broadband America Report*, the Commission, in the context of fixed broadband, concluded that “a standardized set of broadband measurements can be implemented . . . and scaled to support detailed regional assessments of broadband deployment and performance.”⁸ The *Report* also indicated that “the FCC plans to continue to study and acquire

⁶ See, e.g., CTIA–The Wireless Association® (“CTIA”) Comments at 2.

⁷ See, e.g., U.S. Cellular Comments, WT Docket No. 16-137 (May 31, 2016) (“U.S. Cellular May 2016 Comments”), at 10. U.S. Cellular has argued that statistics showing 98 percent or greater mobile broadband coverage:

should be treated as irrelevant for purposes of assessing the state of mobile wireless competition. The statistic that 87% of rural Americans cannot get 10 Mbps/1 Mbps mobile broadband is far more relevant. Many areas have coverage, even adequate coverage, but most consumers using service near a cell’s edge do not receive 10 Mbps/1 Mbps service levels using today’s technology.

Id. at 12.

⁸ *Measuring Broadband America, A Report on Consumer Wireline Broadband Performance in the U.S.*, FCC, Office of Engineering and Technology and Consumer and Governmental Affairs Bureau, 2011 WL 3343075 (Aug. 2, 2011) (“*Measuring Broadband America Report*”), at 28, *quoted in Connect America Fund*, WC Docket No. 10-90, *et al.*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 18045 (para. 1014) (2011) (“*CAF Order*” and “*CAF Further NPRM*”), *aff’d sub nom. In re FCC 11-161*, 703 F.3d 1015 (10th Cir. May 23, 2014). The *Report*, which addressed only wireline broadband performance, stated that “[s]uch measurement capabilities have the potential to provide consumers

data on actual *mobile* broadband performance, which will help consumers, the FCC, and mobile broadband providers better understand actual performance, as the data from this project has done for fixed broadband.”⁹

Unfortunately, the Commission has made little progress toward this goal. A Commission official has admitted as much, conceding at a Senate hearing earlier this year that the Commission’s methodology for determining broadband deployment is “not the most accurate way to measure” coverage.¹⁰ Chairman Wheeler made the same point yesterday, indicating that, “when it comes to measuring wireless coverage in America, our record, quite frankly, is—like coverage in many rural areas—spotty.”¹¹

With respect to mobile broadband data collection, the Commission has failed to develop

with more precise information about their actual service performance and to provide policy makers with an assessment of current and evolving broadband performance.” *Id.*

⁹ *Id.* at 7 (emphasis added).

¹⁰ *The GAO Report on, “Telecommunications: Additional Coordination and Performance Measurement Needed for High-Speed Internet Access Programs on Tribal Lands”*: Hearing Before the S. Comm. on Indian Affairs, 114th Cong. (Apr. 27, 2016) (“April 27 Senate Hearing”), Oral Testimony of Gigi B. Sohn, Counselor to the Chairman, FCC (testimony beginning at 1:36:31), accessed at <http://www.indian.senate.gov/hearing/oversight-hearing-gao-report-telecommunications-additional-coordination-and-performance>, quoted in U.S. Cellular May 2016 Comments at 15. Senator Heidi Heitkamp was critical of the Commission’s inability to accurately measure mobile broadband deployment:

I need to know what the current condition is.... [S]o many people in this demographic area—or this census block—[i.e., Tribal lands] they connect wirelessly.... Their only connection to the Internet is on a cellphone or on a mobile device. So we’ve got to figure out how we [can] fashion a solution for [this] population ... and make sure we’re not building fiber to places where no one is going to use it. They need cell towers.

Id., Oral Statement of Sen. Heitkamp (statement beginning at 1:42:33), quoted in U.S. Cellular May 2016 Comments at 16. In addition to Senator Heitkamp, Senators Maria Cantwell, Al Franken, Tom Udall, Lisa Murkowski, and Jon Tester all expressed concerns during the hearing regarding the unreliability of the Commission’s mapping data. See U.S. Cellular May 2016 Comments at 16.

¹¹ Remarks of FCC Chairman Tom Wheeler, as Prepared for Delivery, Competitive Carriers Association (Sept. 20, 2016) (“Wheeler CCA Speech”), at 2, accessed at <https://www.fcc.gov/document/chairman-wheeler-remarks-competitive-carriers-association-2016>.

uniform and consistent standards and methodologies to be applied across-the-board for the Commission's use of data for measuring mobile broadband deployment progress, for examining mobile wireless competition, for providing universal service support for mobile broadband, and for other purposes. Although it has attempted to develop methods for determining the extent of mobile broadband coverage,¹² the Commission's measurement of mobile broadband deployment has a checkered history, leading to a current situation that is growing increasingly untenable.

The Commission's initial efforts involved utilization of a National Broadband Map ("NBM"), which was developed by the National Telecommunications and Information Administration ("NTIA") pursuant to a statutory directive to create "a comprehensive nationwide inventory map of existing broadband service capability and availability."¹³ The Commission relied on

¹² The National Broadband Plan ("NBP") recommended that the Commission capture user-generated data on network performance and coverage, and continue to work with measurement companies, application designers, device manufacturers, and service providers to create an online database to help consumers make better choices for mobile broadband. The NBP also suggested that the Commission should encourage the wireless industry to create more transparent and standard procedures for the disclosure of network performance and coverage for mobile broadband. FCC, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN (Mar. 16, 2010), at 47. Three months after release of the NBP, the Commission issued a Public Notice "seek[ing] comment on whether and how to pursue a ... measurement program for mobile broadband services given the growing significance of mobile internet access. Additionally, we seek comment on how providers can improve voluntary self-reporting of network performance and coverage." *Comment Sought on Measurement of Mobile Broadband Network Performance and Coverage, Pleading Cycle Established*, CG Docket No. 09-158, et al., Public Notice, 25 FCC Rcd 7069, 7070 (WTB 2010) ("*Mobile Broadband Public Notice*" or "*Public Notice*"). Although the *Public Notice* sought comment on the types of performance characteristics that should be tracked, it did not specifically mention gathering data on mobile broadband speeds. The record produced in response to the *Public Notice* was ultimately incorporated into the *CAF Further NPRM* by the Commission. *CAF Further NPRM*, 26 FCC Rcd at 18045 (para. 1014) (asking: "How should wireless providers measure speed?").

¹³ American Recovery and Reinvestment Act of 2009, § 6001(1), Pub. L. No. 111-5, 123 Stat. 115 (2009), quoted in *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, 2016 Broadband Progress Report, 31 FCC Rcd 699, 703 (para. 8) (2016) ("*2016 Broadband Progress Report*" or "*2016 Report*"). The NBM is available at <http://www.broadband-map.gov/about>. The searchable and interactive website enables users to view broadband availability data.

NBM data to report that, in 2013, mobile broadband with 10 Mbps/768 kbps speeds was available nationwide to 97 percent of the U.S. population.¹⁴

The Commission acknowledged, however, that NBM data likely overstates the extent of 4G and LTE deployment, conceding that the data is “imperfect[,]”¹⁵ it is produced as part of a voluntary data collection,¹⁶ it is “not required to be certified,”¹⁷ it is submitted in filing formats that can vary among jurisdictions,¹⁸ and it “identif[ies] the maximum speed a provider asserts it can deliver, if requested”¹⁹ Although the NBM is no longer being updated, the website tool remains available and continues to be a source of confusion regarding the extent of mobile broadband coverage, prompting Senator Joe Manchin to urge the Commission to “stop citing a wireless coverage map that infers the job is done when people in the real world know it is not.”²⁰

Two years after determining that mobile broadband services with 10 Mbps download speeds were available to 97 percent of the population, the Commission announced that 99.9 percent

The NBM was first published on February 17, 2011, but it no longer is being updated, as a result of funding constraints. *Id.*

¹⁴ *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, 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, 30 FCC Rcd 1375, 1442 (para. 113, Table 15) (2015) (“*2015 Broadband Progress Report*”).

¹⁵ *Id.* at 1412 (para. 68).

¹⁶ *Id.*

¹⁷ *Id.* at 1415 (para. 75 n.291).

¹⁸ *Id.*

¹⁹ *Id.* at 1412 (para. 68).

²⁰ Letter from Joe Manchin III, U.S. Sen., to Tom Wheeler, Chairman, FCC (Sept. 22, 2015), at 2. *See April 27 Senate Hearing*, Oral Testimony of Mr. Mark Goldstein, Director, Physical Infrastructure Issues, U.S. Government Accountability Office (testimony beginning at 1:32:10), *quoted in* U.S. Cellular May 2016 Comments at 15 (characterizing the NBM as “a very large cudgel” because, as a result of using census blocks, “in many places the way [broadband] is being measured is not terribly accurate”).

of the U.S. population lives “in a census block with mobile wireless coverage.”²¹ Much of the underlying data supporting this statistic was derived by the Commission from carrier advertising maps, although it did not take any steps to independently verify whether actual coverage matched the submitted mapping data.²² Additionally, network coverage as measured in the *Eighteenth Report* used the highly questionable centroid method.²³

NTIA’s final collection of mobile broadband data, for use with the NBM, covered data as of June 30, 2014. As NBM data collection ceased, the Commission took steps to revise Form 477²⁴ to collect data relating to broadband availability, as well as broadband subscription. Broadband deployment data as of June 30, 2014, was submitted to the Commission on December 11, 2014, and Form 477 data is now submitted on a semi-annual basis (March 1 and September 1). The Form 477 collection is a single, uniform, national, mandatory system intended “to reduce potential for distortion or misleading comparisons of data.”²⁵

The Commission continues to have difficulty achieving that intended result.²⁶ Most significantly, the Commission has admitted from the outset that “coverage estimates based on Form 477

²¹ *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*, WT Docket No. 15-125, Eighteenth Report, 30 FCC Rcd 14515, 14539 (para. 36) (WTB 2015) (“*Eighteenth Report*”).

²² *Id.* at 14542 (para. 38); U.S. Cellular May 2016 Comments at 4-5.

²³ See Sec. II.B., *infra*.

²⁴ FCC Form 477, Local Telephone Competition and Broadband Reporting (“Form 477”).

²⁵ *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10, Report and Order, 28 FCC Rcd 9887, 9898 (para. 24) (2013).

²⁶ See, *e.g.*, the further discussion of Form 477 in Sec. II.B., *infra*.

data are subject to ... methodological limitations ..., and consequently have the potential to overstate coverage.”²⁷

One of these limitations is the centroid method,²⁸ another is reliance on carriers’ reports of advertised speeds, which are not independently verified, another is the fact that carrier-specific deployment data is not made available to the public for review and comment,²⁹ another is that the data unrealistically assumes that advertised speeds are available at all times throughout a carrier’s entire service area,³⁰ and another is that the methodology for developing advertising maps can vary among carriers.³¹

This current situation regarding the collection and analysis of mobile broadband coverage

²⁷ *Eighteenth Report*, 30 FCC Rcd at 14538 (para. 35). The overstatement of mobile broadband coverage is more than an academic concern. There are significant consequences that affect consumers, particularly those living, working, and traveling in rural America. Specifically, if Form 477 mobile broadband coverage data is overstated (which it is), then rural areas which in fact are not covered by mobile broadband networks will be ineligible for Mobility Fund Phase II support. The absence of support will result in the lack of any mobile broadband infrastructure in these rural areas. This lack of investment will deprive these rural areas of any mobile broadband service for the foreseeable future. In light of this problem, if the Commission continues to insist on relying on data that only approximates coverage in rural areas, then it should at least “err” in the direction of understatement of coverage, with an opportunity for incumbent carriers already providing mobile broadband service in a rural area to challenge the Commission’s coverage data. A better solution, which U.S. Cellular discusses in Sec. II.A.2., *infra*, is to rely on more accurate data depicting actual coverage.

²⁸ See, *e.g.*, the further discussion of the centroid method in Sec. II.B., *infra*.

²⁹ U.S. Cellular Comments at 9.

³⁰ The Commission has indicated that “[t]here is no predefined dBm level associated with the mobile coverage maps. Instead, the coverage areas should reflect where customers can expect to receive service at the reported speeds/bandwidths for the particular technology and spectrum band.” FCC Form 477, “Frequently Asked Questions (FAQs),” at 27, accessed at <https://transition.fcc.gov/form477/477faqs.pdf>, quoted in U.S. Cellular May 2016 Comments at 8. U.S. Cellular has explained that “[c]arriers are required to certify where consumers should expect service, but of course no executive can certify exactly what service is available at any one place, in the absence of a drive test using sophisticated tools.” U.S. Cellular May 2016 Comments at 8-9.

³¹ U.S. Cellular has argued that, “[g]iven that the Commission never adopted rules for how to prepare and submit such maps, it should be self-evident that varying standards used by multiple companies would result in inconsistent results.” U.S. Cellular May 2016 Comments at 8.

data illustrates the need for the Commission to take a different approach. The criteria and data relied upon to make determinations regarding mobile broadband coverage have been moving targets, making it extremely difficult to make these determinations.

To take one example, CTIA claims that, since Form 477 collects minimum advertised speeds from mobile broadband providers, these reported speeds understate actual speeds available to consumers.³² The problem is that the Commission is not collecting any data that could confirm or refute CTIA's claim. The Commission instead simply continues to rely on carriers' advertised speeds and the centroid methodology, notwithstanding all the problems inherent in this approach.

Another example involves the data submission requirements the Commission applies to recipients of Mobility Fund Phase I support, which represent a considerable departure from the approach to data collection taken in Form 477. Specifically, the Commission "requires Phase I support recipients to perform drive testing to demonstrate that network deployment requirements have been met, and the Commission conducts further drive testing to verify performance."³³ Thus, the Commission is using two different types of data collections—minimum advertised speeds and drive testing—for purposes of reviewing mobile broadband coverage.

While it is understandable that the Commission insists upon a highly accurate measurement of actual mobile broadband deployment as part of its evaluation of whether Mobility Fund Phase I funding recipients have met their coverage obligations, it is less obvious why the Commission would be willing to rely on much less accurate and reliable data for purposes of determining areas that will be eligible for carriers' investment of billions of dollars in Mobility Fund Phase II ("Phase

³² CTIA Comments at 23. This issue is discussed further in Sec. II.B., *infra*.

³³ U.S. Cellular Comments at 12. The requirement is codified in 47 C.F.R. §§ 54.1006(a), 54.1006(b).

II”) support going forward.

A further problem is that the *Notice* does not convey a strong sense that the Commission is committed to coming to grips with the difficulties associated with mobile broadband deployment data, or to embarking on a new course that will lead to utilization of a standard, uniform, and reliable method for collecting and analyzing mobile broadband deployment data. In fact, the Commission seeks comment on approaches that could muddy the waters even further.

The Commission’s mobile Measuring Broadband America (“Mobile MBA”) program dataset is a case in point. In the *Notice* the Commission seeks comment on whether it should use Mobile MBA data, or other data sources, in assessing mobile broadband performance, conceding that “[t]hese potential data sources may vary widely with respect to geographic reach, sample size, and sampling methodology”³⁴ Further, as CTIA points out, “the [Mobile] MBA program . . . produces an inaccurate picture of mobile performance because the program only attempts to measure performance of the four largest nationwide carriers.”³⁵

U.S. Cellular urges the Commission to refocus its approach and objectives by using this proceeding as the starting point for creating a more standard and uniform system for collecting and analyzing mobile broadband coverage data. U.S. Cellular makes some specific proposals for moving the ball in this direction.

³⁴ *Notice* at para. 70.

³⁵ CTIA Comments at 29. CTIA discusses other faults with the Mobile MBA program, including the exclusion of manual speed test data, and the use of filtering methods that count some test results but not others. *Id.* CTIA also argues that, because of significant concerns regarding the validity and usefulness of Mobile MBA data, “a safe harbor based on [Mobile] MBA participation would be meaningless and inappropriate in the Open Internet transparency context.” *Id.* at 28 (footnote omitted).

2. Steps the Commission Should Take To Develop and Implement More Effective Mechanisms for Collecting and Reviewing Mobile Broadband Deployment Data.

Given the Commission’s finding that mobile broadband has become an essential service for American consumers, developing a standardized approach to mobile broadband data collection and analysis, which will yield certainty and reliability concerning the extent of mobile broadband deployment, must be the Commission’s priority. The Commission should initiate a proceeding specifically tasked with adopting a uniform framework to govern the collection and analysis of deployment data.

The objective of the proceeding would be to identify the best means for measuring deployment and producing standardized coverage results for use across-the-board in Commission actions affecting mobile broadband, such as determining deployment progress and disbursing universal service support.

Further, the Commission should adopt a 10/1 Mbps speed standard for mobile broadband, and use drive testing as the measure for determining the extent of mobile broadband deployment.

The Growing Importance of Mobile Broadband.—The record provides ample evidence of the fact that mobile broadband, as the Commission itself has concluded, is an essential and important service,³⁶ especially to rural America. CTIA, for example, observes that “wireless connections are ... consumers’ first choice to access the Internet[,]”³⁷ and CCA reports that, “[f]or

³⁶ *2016 Broadband Progress Report*, 31 FCC Rcd at 708 (para. 20).

³⁷ CTIA Comments at 10. CTIA indicates that:

[A]s of 2015, there were 291 million active Internet-capable devices in the U.S., up from 270 million at the end of 2014. Of those, 228 million—over 78 percent—were smartphones, up from 208 million at the end of 2014. Of course, consumer use of wireless devices does not end with smartphones: six million tablets, laptops, and wireless broadband modems were added to wireless networks in 2015, bringing the total number of these smart devices to 41 million by the end of that year.

many people, mobile has become the exclusive means of accessing the Internet.”³⁸

Mobile broadband provides “access to opportunities in employment, education, healthcare, agriculture, commerce, and banking, to name a few[,]”³⁹ “[t]he United States leads the world in the amount of data consumed over mobile networks[,]”⁴⁰ and “[t]he percentage of smartphone users that watched movies or television content on their smartphones ... more than doubled from 15 percent in 2012 to 33 percent in 2015.”⁴¹

All the factors described above that make mobile broadband an essential and important service apply with even greater force in rural America, in part because geography and economic conditions present challenges in many rural communities. Access to mobile broadband can help meet these challenges. For example, a study conducted in 2012 states that “[m]obile broadband ... has tremendous potential to transform economic activity because it is a *general purpose technology*[,]”⁴² and also observes that the:

economic benefits of [mobile] broadband for local [rural] areas ... includ[e] making telemedicine possible and enhancing distance-learning opportunities. There are many more potential benefits of broadband for rural areas than have ever been quantified, such as expanding the access of rural businesses to supplier networks

Id. (footnotes omitted).

³⁸ Competitive Carriers Association (“CCA”) Comments at 11. *See* CTIA Comments at 31 (stating that “[c]onsumers are ... adopting mobile devices as their go-to communication choice for voice, text and data on an almost universal level”).

³⁹ CCA Comments at 2.

⁴⁰ CTIA Comments at 11 (footnotes omitted) (indicating that “U.S. mobile data traffic in 2015 was 749 petabytes per month, a 137 percent increase over 2014’s reported traffic. By 2020, the volume is projected to be six times the volume in 2015, which would make the volume in 2020 150 times the volume in 2010. Reports also show that Americans spend more of their time on mobile devices consuming digital media (about 62 percent) than on wireline devices (about 38 percent).”).

⁴¹ *Id.* at 17 (footnote omitted).

⁴² James Priege, “The Economic Benefits of Mobile Broadband,” Pepperdine University, *School of Public Policy Working Papers*, Paper 38 (May 15, 2012) (emphasis in original), at 7, accessed at <http://digital-commons.pepperdine.edu/cgi/viewcontent.cgi?article=1037&context=sppworkingpapers>.

and increasing the attractiveness of rural tourism⁴³

Further, the Rural Wireless Association has previously explained that “[t]here is a continued need to support mobile communications services in rural areas. Mobile voice and broadband services are critical to public safety communications and economic development, and can help address problems such as the ‘digital divide’ and ‘homework gap’ that are present in rural America.”⁴⁴

Initiate a Mobile Broadband Data Proceeding.—A separate proceeding focusing exclusively on resolving and addressing mobile broadband data problems would be an important step toward breaking down the entrenched digital divide that continues to deprive many rural Americans of the benefits of mobile broadband. As the Commission has found, many Americans living in “rural areas ... are being left behind”⁴⁵

The *Mobile Broadband Public Notice* discussed earlier serves as a precedent for such an initiative. In fact, the proceeding U.S. Cellular is recommending would function as a continuation and retargeting of the process the Commission undertook six years ago. The objective now will be to focus specifically on three issues related to mobile broadband deployment: (1) deciding the most appropriate standard or standards to use in defining what will “count” as mobile broadband deployment; (2) determining the best way to measure actual deployment; and (3) ensuring that the standards and methodologies developed are applied uniformly to various Commission actions and

⁴³ *Id.* As a general matter, the Fiber to the Home Council Americas (“FTTH Council”) notes that “consumers residing in rural areas want and need access to the same caliber of broadband services that is available in urban areas.” FTTH Council Comments at 4 (footnote omitted).

⁴⁴ Ex Parte Letter from Caressa D. Bennet, General Counsel, Anthony K. Veach, Senior Regulatory Counsel & Erin P. Fitzgerald, Regulatory Counsel, Rural Wireless Ass’n, to Marlene H. Dortch, Secretary, FCC (Apr. 13, 2016), at 1 (footnote omitted).

⁴⁵ *2016 Broadband Progress Report*, 31 FCC Rcd at 702 (para. 6), *quoted in* U.S. Cellular Comments at 4.

analyses affecting mobile broadband.

U.S. Cellular notes that CTIA suggests that, while the Commission should consider whether currently available data is sufficient to identify eligible areas for Phase II support, the Commission should nonetheless “move forward to implement a fully funded and permanent Mobility Fund Phase II.”⁴⁶ Although U.S. Cellular has repeatedly stressed the importance of the Commission’s acting to implement Phase II, U.S. Cellular has also explained that the Commission’s goals for mobile broadband deployment will be better served if its funding and implementation of Phase II are driven by accurate and reliable data.⁴⁷

Chairman Wheeler’s dictum that “what gets measured gets managed”⁴⁸ applies to Phase II: The Commission needs to have an accurate and reliable picture of the scope of mobile broadband deployment shortfalls in rural areas, so that it can make informed eligibility decisions and provide sufficient support to drive investment and effectively promote deployment in rural areas. In U.S. Cellular’s view, rural consumers will be better served if the Commission first fixes the mobile broadband data problems so that it is able to make data-driven findings regarding the extent of 10/1 Mbps coverage in rural areas, and then turns to fixing the Phase II budget and implementing the Phase II support mechanism.

Adopt a 10/1 Mbps Speed Standard.—As discussed below, there is considerable support in the record for the adoption of a 10/1 Mbps mobile broadband speed standard. Many Americans living in urban and suburban areas currently have access to mobile broadband at those download

⁴⁶ CTIA Comments at 35.

⁴⁷ U.S. Cellular Comments at 22 (indicating that “the Commission should not implement Phase II until it has fixed the data problems that have led to an overstatement of mobile broadband coverage in rural areas”).

⁴⁸ *2015 Broadband Progress Report*, 30 FCC Rcd at 1481 (Statement of Chairman Tom Wheeler), *quoted in* Deere & Company (“Deere”) Comments at 7.

and upload speeds, and a 10/1 Mbps benchmark would drive universal service policies that will increase investment that, in turn, increases rural consumers' access to mobile broadband.⁴⁹

This speed standard should be applied such that a geographic area is not treated as having access to mobile broadband service unless service meeting the 10/1 Mbps benchmark is available from at least one service provider in the area, and the service meets the benchmark throughout the area, including all measured cell edges within the area.⁵⁰

Applying a standard 10/1 Mbps speed benchmark for mobile broadband across-the-board in the various contexts in which the Commission regulates mobile broadband would result in a clear-cut frame of reference for establishing the extent of mobile broadband deployment, and would end the present confusion and uncertainty concerning whether consumers in given geographic areas do or do not have access to mobile broadband.

Use Drive Testing as a Speed Measurement Methodology.—Chairman Wheeler recently observed that “we need to identify where there’s actually no ... wireless coverage.”⁵¹ The best way to do that is to use drive testing.⁵² Drive testing produces data regarding the actual performance of mobile broadband networks, eliminating the need to make any assumptions regarding the extent of coverage.

U.S. Cellular therefore renews its request that the Commission consider implementing a nationwide drive test program for the purpose of producing accurate information relating to the

⁴⁹ U.S. Cellular Comments at 17-18.

⁵⁰ *Id.* at 17.

⁵¹ Wheeler CCA Speech at 2.

⁵² *See* U.S. Cellular Comments at 11-13.

extent of 10/1 Mbps mobile broadband coverage.⁵³ Drive testing should be used to measure mobile broadband deployment in all areas where Americans live, work, and travel, including croplands⁵⁴ and recreational areas. Requirements applicable to shapefiles that Mobility Fund Phase I support recipients submit in Form 690⁵⁵ would serve as a basis for determining the metrics and other requirements applicable to reporting drive test results.⁵⁶

If the Commission has determined that drive testing is the best means of ensuring accurate measurements of network deployments achieved by Mobility Fund Phase I support recipients, it is reasonable to conclude that the same measurement method should be used for determining the eligibility of geographic areas for Mobility Fund Phase II support, and for deciding how Phase II support should be allocated.

The Commission will disburse a total of \$5 billion in Mobility Fund Phase II support, assuming, as an example, a \$500 million annual budget and a fixed term of support of 10 years for

⁵³ *Id.* at 11.

⁵⁴ See Deere Comments at 3 (emphasis in original) (explaining that, “[f]or many purposes, wireless service will be a necessary technology choice *in addition* to fixed broadband covering the farmhouse to achieve cost effective coverage for many rural areas, including farm-intensive areas with significant tracts of cropland. Those areas, in particular, will benefit from the ability to make real-time data transfers that can minimize the amount of necessary seed, fertilizer and pesticides, reduce costs for fuel, labor, water, and dynamically identify best practices for fields in a given location.”).

⁵⁵ FCC Form 690, Mobility Fund Phase I Annual Report Form (“Form 690”).

⁵⁶ These metrics and requirements include the minimum expected downstream bandwidth in Mbps, the minimum expected upstream bandwidth that is offered with the minimum downstream bandwidth in Mbps, map areas that are closed, non-overlapping polygons with a single, unique identifier, coverage boundaries that have a resolution of 100 meters (approximately three arc-seconds) or better, a comprehensive explanation of the methodology employed to generate the map layer, including any necessary assumptions and an assessment of the accuracy of the finished product, and provision of the propagation model used, along with the appropriate propagation model optimization or fine tuning parameters. See *Guidance on Annual Reports and Other Reporting Requirements for Recipients of Support Under Phase I of the Mobility Fund (Including Tribal Mobility Fund), 2014 Annual Report Filing Deadline Extended to July 31, 2014, Specifications for Shapefile Data To Be Submitted with FCC Form 690*, WT Docket No. 10-208, Public Notice, 29 FCC Rcd 7376, 7380-81 (App. A) (2014).

Phase II. The Commission is responsible for the effective and efficient investment of these public funds. This responsibility can best be met by ensuring that the funds are disbursed for use in deploying mobile broadband networks in areas that are eligible for support because they lack 10/1 Mbps broadband service. The use of drive testing will accomplish this result by providing accurate data regarding actual 10/1 Mbps coverage.

In contrast, if the Commission fails to correct the flaws in its data and methodology for determining mobile broadband coverage before implementing Phase II, these flaws would adversely affect the disbursement of \$5 billion in public funds over a decade. The flawed data and methodology would erroneously send support where it is not needed, and would withhold support from areas that in fact would be eligible because they have no access to 10/1 Mbps mobile broadband. The risk of this misallocation of Phase II support highlights the importance of fixing the flawed data problems first, and only then moving forward with the implementation of Phase II.

B. Unreliable and Inaccurate Data Currently Used by the Commission Is Overstating Mobile Broadband Coverage.

In the *Notice*, the Commission sought comment on its use of Form 477 data, and on the centroid methodology.⁵⁷ U.S. Cellular has explained in its Comments that Form 477 data “is likely to overstate mobile broadband coverage in rural areas[,]”⁵⁸ and that the centroid methodology “unavoidably overstates mobile broadband coverage in rural areas”⁵⁹ The record confirms the concerns raised by U.S. Cellular.

Deere, for example, calls attention to the risks involved if the Commission fails to correct

⁵⁷ *Notice* at para. 62.

⁵⁸ U.S. Cellular Comments at 9.

⁵⁹ *Id.*

problems related to broadband measurement data, noting that, “[w]ithout adequate data collection, the Commission’s Section 706 evaluation may continue to overlook significant rural areas for which access to advanced telecommunications capability is not being deployed to all Americans in a ‘reasonable and timely fashion.’”⁶⁰ CCA urges the Commission to avoid any exclusive reliance on Form 477 data.⁶¹

CCA also agrees with U.S. Cellular that the Commission’s dependence on the centroid methodology dooms its efforts to develop accurate measurements of mobile broadband coverage, especially in rural areas. CCA explains that “this ‘centroid’ method overstates the availability of service especially in rural areas, where census blocks are much larger than census blocks in urban areas.”⁶² A critical flaw in the centroid methodology is that it presumes that coverage is the same at the center point and at the cell edge of a service area, ignoring the fact that “[m]obile connections are fundamentally different than fixed connections [For example,] signals degrade based on distance from a tower, signal strength, and physical barriers.”⁶³

The consequence of the Commission’s dependence on flawed Form 477 data, which relies primarily on advertised speeds reported by carriers and which is not independently verified by the Commission,⁶⁴ is that the Commission is left with the impression that mobile broadband coverage,

⁶⁰ Deere Comments at 7.

⁶¹ CCA Comments at 4 (observing that “[i]t is critically important for the Commission to use accurate data that measure real-world availability of mobile coverage and service, and not rely solely on information reported in FCC Form 477”).

⁶² *Id.* at 5 (footnote omitted). CCA also cautions that “the Commission’s methodology for determining the availability of service in a given census block based on the reported availability of service in the geographic center of the census block also ‘may overstate the deployment of services throughout an area.’” *Id.* (footnote omitted) (quoting *2016 Broadband Progress Report*, 31 FCC Rcd at 730 (para. 75 n.234)).

⁶³ Open Technology Institute (“OTI”) Comments at 14. *See* U.S. Cellular Comments at 10.

⁶⁴ U.S. Cellular Comments at 9.

especially in rural areas, is more extensive than it actually is in the real world. CCA points to this problem, arguing that “the Commission should be skeptical of exaggerated claims of ubiquitous 4G LTE coverage, which are based on calculations that are unsupported by the realities of actual service availability.”⁶⁵

As U.S. Cellular mentioned above, CTIA unsuccessfully attempts to defend data regarding advertised speeds submitted by carriers in their Form 477 reports, stating that “the FCC’s Form 477 data collect only *minimum advertised* speeds, which are typically well below actual network performance levels”⁶⁶ While it is correct that the Commission requires the reporting of minimum advertised speeds (if available) in Form 477,⁶⁷ CTIA provides no documentation that, in fact, this is the data that carriers have actually submitted in their Form 477 filings. This is not CTIA’s fault, however, because the Commission has not made any carrier-specific Form 477 data collected from carriers available for public inspection.⁶⁸ U.S. Cellular reiterates its request to the Commission that it make this Form 477 data available for review and comment.

In any event, Form 477 data, even assuming that it uses only minimum advertised speeds, shows that 87 percent of the rural population lacks access to 10/1 Mbps mobile broadband.⁶⁹ This percentage likely understates the lack of coverage, in part because it is based on use of the centroid methodology. CTIA presents no information suggesting that the use of data from sources other

⁶⁵ CCA Comments at 5 (footnotes omitted). In fact, the record in this proceeding is replete with these exaggerated claims. *See, e.g.*, CTIA Comments at 2; Mobile Future Comments at 2-3; United States Telecom Association (“US Telecom”) Comments at 3.

⁶⁶ CTIA Comments at 23 (emphasis in original) (footnotes omitted).

⁶⁷ *2016 Broadband Progress Report*, 31 FCC Rcd at 708-09 (para. 22).

⁶⁸ U.S. Cellular Comments at 9.

⁶⁹ *2016 Broadband Progress Report*, 31 FCC Rcd at 735 (para. 83, Table 4).

than minimum advertised speeds would show a greater degree of 10/1 Mbps coverage in rural areas.⁷⁰

III. USING A 10/1 Mbps MOBILE BROADBAND SPEED BENCHMARK.

The Commission has sought comment on whether a mobile speed benchmark of 10/1 Mbps would be appropriate “to reflect current customer usage patterns for mobile broadband services ...”⁷¹ Several parties agree with U.S. Cellular’s view that use of a 10/1 Mbps speed benchmark for mobile broadband will be appropriate for purposes of the Commission’s Section 706 analysis and findings.⁷²

ADTRAN, for example, argues that, given the differences between fixed and mobile broadband, the mobile broadband benchmark should be lower than the 25/3 Mbps fixed broadband benchmark,⁷³ and that, “[t]aking into account all of these differences between mobile and fixed broadband, ADTRAN believes that the Commission should adopt a 10/1 Mbps benchmark for

⁷⁰ CTIA cites a recent PC Magazine test that “found that the four national carriers deliver average 4G speeds between 19 and 27 Mbps.” CTIA Comments at 23 & n.94. While the PC Magazine report on testing refers to urban, suburban/rural, and rural areas, the report provides no specific information regarding speeds or coverage in rural areas. The magazine does indicate that its staff “traveled to 30 US cities to test data speeds on AT&T, Sprint, T-Mobile, and Verizon Wireless.” Sascha Segan, “Fastest Mobile Networks 2016,” PC MAGAZINE (June 15, 2016), accessed at <http://www.pcmag.com/article/345123/fastest-mobile-networks-2016/2>.

⁷¹ Notice at para. 39.

⁷² U.S. Cellular Comments at 17.

⁷³ ADTRAN, Inc. (“ADTRAN”) Comments at 12. See CCA Comments at 9 (arguing that “although both fixed and mobile broadband services offer consumers access to advanced telecommunications capability, the services are provided over different networks with different features that also enable consumers to use that capability in very different ways. Accordingly, applying the same performance benchmarks to both types of broadband service would fail to accurately represent the deployment of advanced telecommunications capability available through mobile broadband services.”).

mobile broadband services to be considered ‘advanced telecommunications capabilities’ for purposes of the Twelfth Broadband Progress Report.”⁷⁴ NATOA,⁷⁵ Netflix,⁷⁶ and OTI⁷⁷ also support a 10/1 Mbps mobile broadband benchmark.

CCA and CTIA suggest that the Commission should not adopt any speed benchmark for mobile broadband, with CCA “emphasiz[ing] that it would not be appropriate at this time to conclude that only mobile broadband speeds exceeding 10 Mbps/1 Mbps offer access to advanced telecommunications capability[,]”⁷⁸ and CTIA explaining that it would be difficult for “rigid speed benchmarks” to take into account various environmental factors affecting mobile broadband transmissions.⁷⁹

Although U.S. Cellular is not unsympathetic with the concerns expressed by CCA and CTIA, its view is that the absence of any measurable speed benchmark for mobile broadband would make it difficult for the Commission to reach an objective, data-driven determination regarding whether mobile broadband is being reasonably and timely deployed.

⁷⁴ ADTRAN Comments at 13.

⁷⁵ National Association of Telecommunications Officers and Advisors (“NATOA”) Comments at 3-4.

⁷⁶ Netflix, Inc. (“Netflix”) Comments at 9. Significantly, Netflix explains that, while it:

recommends a download speed of at least 5 Mbps to receive an HD quality picture, consumers do not just do one thing with their mobile device at a given time. Applications in the background may be syncing email, photos, etc. A 10 Mbps download speed provides a buffer so that consumers can stream HD video while their device also uses the broadband connection in the background.

Id. (footnote omitted).

⁷⁷ OTI Comments at 15. Although CCA recommends that the Commission not adopt any speed benchmark for mobile broadband, it also states that a 10/1 Mbps benchmark would be appropriate if the Commission decides to adopt a benchmark. CCA Comments at 10.

⁷⁸ CCA Comments at 10.

⁷⁹ CTIA Comments at 21-22.

U.S. Cellular agrees with the Commission’s observation that a speed benchmark is a reliable proxy for broadband network performance.⁸⁰ Moreover, as the Commission indicates in the *Notice*, “speed is a central factor affecting the user experience of mobile broadband services and is a key determinant of advanced telecommunications capability.”⁸¹

A few commenters object to the Commission’s consideration of a “forward-looking” mobile broadband speed benchmark.⁸² These concerns are not well-founded.

The Commission explains in the *Notice* that its adoption of a speed benchmark for mobile broadband “will be informed by assessing the mobile broadband services and speeds that are available to consumers today, as well as evidence regarding what services consumers are choosing today, and what might be available in the near future”⁸³

Designing a mobile broadband speed benchmark that seeks to anticipate near-future consumer needs and uses is a reasonable policy choice because, otherwise, the speed benchmark could quickly become obsolete. Evaluating broadband deployment based on near-future consumer needs and uses will, by definition, benefit consumers because it will evaluate mobile broadband availability, in part, based on the extent to which deployed networks are capable of accommodating consumers’ needs and Internet use both now and in the near-term future.

⁸⁰ *2016 Broadband Progress Report*, 31 FCC Rcd at 721 (para. 49) (footnotes omitted) (explaining that “the Commission has ultimately defined advanced telecommunications capability primarily in terms of download and upload speeds Speed provides a particularly useful metric for analyzing the deployment of advanced telecommunications capability because it generally provides a good proxy for service capability.”).

⁸¹ *Notice* at para. 38 (footnote omitted), *quoted in* NATOA Comments at 3-4.

⁸² ADTRAN Comments at 12; Mobile Future Comments at 7 (arguing that the *Notice* “offers no policy or legal rationale” for a forward-looking benchmark). As U.S. Cellular has noted, however, ADTRAN supports a 10/1 Mbps benchmark for mobile broadband. See note 74, *supra*, and accompanying text.

⁸³ *Notice* at para. 38.

Further, the Commission can reasonably conclude that it may adopt a forward-looking speed benchmark pursuant to the provisions of Section 706. The statute requires the Commission to determine “whether advanced telecommunications capability *is being deployed* to all Americans in a *reasonable and timely fashion*.”⁸⁴ Nothing in this statutory formulation precludes the Commission from evaluating whether current deployment efforts are anticipating near-future consumer needs and uses. In fact, as the Commission has previously explained:

By requiring the Commission to conduct an inquiry on advanced telecommunications capability, Congress did not intend for the Commission to measure merely what is commonplace and available to all or almost all, but also to identify emerging needs and capabilities. Congress directed that we measure—and take steps necessary to promote—deployment of those advanced offerings.⁸⁵

Thus, the statute gives the Commission the discretion to conclude that deployment is not “reasonable and timely” if it is not anticipating near-future consumer needs and uses.

IV. FINDING THAT MOBILE BROADBAND IS NOT BEING DEPLOYED TO ALL AMERICANS IN A REASONABLE AND TIMELY MANNER.

Some commenters argue that the Commission should find in its forthcoming broadband progress report that broadband *is* being made available to all Americans in a reasonable and timely manner. This argument should be rejected.

U.S. Cellular agrees with CCA that “a significant percentage of the United States population still lacks access to [mobile broadband] services. The availability gap persists even as mobile broadband, and the advanced telecommunications capability it enables, becomes increasingly important in the lives of Americans.”⁸⁶

⁸⁴ Section 706(b), 47 U.S.C. § 1302(b) (emphasis added).

⁸⁵ *2015 Broadband Progress Report*, 30 FCC Rcd at 1405 (para. 49).

⁸⁶ CCA Comments at 10-11 (footnotes omitted).

In U.S. Cellular’s view, the conditions that led the Commission to conclude in the *2016 Broadband Progress Report* that “there is still more work to do”⁸⁷ continue to persist. Moreover, U.S. Cellular agrees with WISPA that the Commission must consider whether “the ongoing gap between urban and rural access to advanced telecommunications services provides an independent basis for determining that these services are not being deployed in a reasonable and timely fashion.”⁸⁸

This analysis suggested by WISPA, in U.S. Cellular’s view, will lead to a finding that mobile broadband is not being deployed to all Americans in a reasonable and time manner. As U.S. Cellular has discussed, the *2016 Broadband Progress Report* (using data that likely overstates mobile broadband coverage) indicated that 87 percent of Americans living in rural areas lack any access to 10/1 Mbps broadband networks.⁸⁹ Unless that staggering percentage has been significantly reduced during the past year, which is unlikely given the lack of sufficient universal service funding to promote and augment investment in mobile broadband networks serving rural areas, the Commission must make a negative finding pursuant to Section 706(b) regarding the availability of mobile broadband services to all Americans.

The percentage of rural consumers lacking access to 10/1 Mbps mobile broadband, and the

⁸⁷ *2016 Broadband Progress Report*, 31 FCC Rcd at 701 (para. 4).

⁸⁸ Wireless Internet Service Providers Association (“WISPA”) Comments at 16 (footnote omitted). WISPA argues that “[t]he Commission should do more in the form of positive steps to facilitate rural and underserved-area broadband construction by moving forward with the CAF Phase II competitive bidding” *Id.* at 8. U.S. Cellular agrees, and adds that this argument applies with even greater force to the need for an increased Phase II budget.

⁸⁹ Chairman Wheeler observed yesterday that “16 percent of all square miles have no LTE coverage or only subsidized coverage. And 1.4 million Americans currently have no access to LTE coverage at all, and 1.7 million live in areas where the only LTE coverage relies on a subsidy.” Wheeler CCA Speech at 3.

gap between 10/1 Mbps mobile broadband availability in rural and urban areas, also provide independent grounds for a negative Section 706(b) finding. Taken together, these two yardsticks of the current state of mobile broadband in rural America should prompt the Commission to take steps to accelerate mobile broadband deployment.

Some commenters, however, argue that the Commission’s Section 706 analysis should result in a finding that broadband services are being deployed in a reasonable and timely manner. CTIA advances this view with respect to mobile broadband services, and ADTRAN contends that the Commission’s overall analysis is flawed because its misreading of Section 706 has resulted in the Commission’s asking the wrong question regarding deployment of advanced telecommunication capability. U.S. Cellular examines each of these arguments in turn.

While CTIA references inflated coverage figures,⁹⁰ and presents nationwide data relating to mobile broadband capital investment,⁹¹ competitive choices for consumers,⁹² advances in technology and in spectrum utilization,⁹³ wireless subscribership,⁹⁴ and consumers’ data usage,⁹⁵ CTIA does not address the central question: Do all Americans—especially those who live, work, or travel in rural areas⁹⁶—have access to 10/1 Mbps mobile broadband networks?

⁹⁰ CTIA Comments at 2 (footnote omitted) (noting that “according to FCC data, 99.6 percent of Americans had access to 4G LTE service from at least one provider as of July 2015”). U.S. Cellular and other commenters have documented the flaws in the Commission’s coverage data. See Sec. II.B., *supra*.

⁹¹ CTIA Comments at 7-9.

⁹² *Id.* at 4 (stating that “[n]early 98 percent of the population has a choice of two or more LTE-based providers”). See Mobile Future Comments at 1.

⁹³ CTIA Comments at 7.

⁹⁴ *Id.* at 9-10.

⁹⁵ *Id.* at 11-16.

⁹⁶ While CTIA does reference Verizon’s “LTE in Rural America Program,” as well T-Mobile, Sprint, and AT&T operations in rural areas, *id.* at 5-7, its discussion does not shed any light on the extent to which 10/1 Mbps mobile broadband networks have been deployed by these or other carriers in rural America.

As U.S. Cellular has discussed, the Commission’s Section 706 analysis should answer this question with a negative finding, especially as its analysis relates to mobile broadband deployment in rural America. With respect to rural deployment, U.S. Cellular emphasizes that the Commission has previously made clear that broadband deployment in rural areas is a key aspect of its Section 706 analysis, stating that “Americans living in rural areas and on Tribal lands disproportionately lack access to [fixed] broadband[.]”⁹⁷ and finding, therefore, that fixed “broadband is not being deployed in a reasonable and timely fashion because it is not yet available to the majority of rural and Tribal Americans and not becoming available quickly enough.”⁹⁸ The Commission explained that:

In addition to examining deployment nationwide, *we take a hard look at whether parts of our country are being left behind*. A digital divide persists between urban and non-urban parts of the country. The data show that this divide exists for [fixed] broadband service at a variety of speeds. The data also show that the problem is one of supply, not demand. Consumers in rural America adopt broadband at the same rates as consumers in urban areas.⁹⁹

Although CTIA’s data and analysis are not pertinent to the issue of whether 10/1 Mbps mobile broadband is being deployed to rural consumers in a reasonable and timely manner, the Commission’s Section 706 review will focus on that issue, and will result in action by the Commission to accelerate mobile broadband deployment.

ADTRAN expresses concern that the Commission’s Section 706 review could “merely [be] a rote exercise to produce a negative finding solely to allow the Commission to continue to

⁹⁷ 2015 *Broadband Progress Report*, 30 FCC Rcd at 1378 (para. 6) (footnote omitted).

⁹⁸ *Id.* (footnote omitted).

⁹⁹ *Id.* at 1378 (para. 5) (emphasis added), *quoted in* U.S. Cellular Reply Comments, GN Docket No. 15-191 (filed Sept. 30, 2015), at 27.

rely on Section 706 for substantive authority to regulate aspects of the Internet[.]”¹⁰⁰ and ADTRAN offers “to guide the Commission to ask the right questions, gather the appropriate data and undertake the proper analyses,” in order to avoid such an exercise.¹⁰¹

ADTRAN’s argument is that the *Notice* suggests that the Commission will avoid answering the statute’s question of whether advanced telecommunication capability is being deployed to all Americans in a reasonable and timely manner, and will instead answer the question of whether we have already reached the “destination” of universal availability of advanced services. In reaching its answer, “the Commission will be using a forward-looking benchmark for ‘advanced telecommunications capabilities,’ but a backwards-looking measure of the progress that has been achieved.”¹⁰²

In U.S. Cellular’s view, however, the Commission *is* asking the right questions and engaging in the proper analysis. For purposes of reviewing mobile broadband deployment, and based on the analytical approach the Commission followed in the *2016 Broadband Progress Report*, the Commission has established a reasonable methodology for its Section 706 analysis and findings.

As U.S. Cellular noted above, the key question for the Commission to examine is whether all Americans—especially rural consumers—have access to 10/1 Mbps mobile broadband networks.

In the *2016 Broadband Progress Report*, the Commission’s examination of fixed broadband produced a determination that advanced telecommunications capability was not being deployed to all Americans in a reasonable and timely manner, because (1) 10 percent of the overall

¹⁰⁰ ADTRAN Comments at 3. *See* TechFreedom Comments at 3.

¹⁰¹ ADTRAN Comments at 3.

¹⁰² *Id.* at ii.

population lacked access to 25/3 Mbps fixed broadband; (2) in urban areas, 4 percent were unserved; (3) overall, 34 million Americans lacked service;¹⁰³ and (4) this lack of service was disproportionate in rural areas.¹⁰⁴ With respect to this last finding, the Commission found that “Americans living in rural areas and Tribal lands disproportionately lack access to advanced telecommunications capability, where approximately 23.4 million (39 percent of the population, or approximately two out of every five residents) lack fixed access”¹⁰⁵

Given the coverage percentages that led the Commission to make a negative Section 706 finding in the *2016 Broadband Progress Report* with respect to fixed broadband deployment, it will be reasonable and appropriate for the Commission, using a 10/1 Mbps mobile broadband benchmark (which ADTRAN agrees is reasonable), to conclude that mobile broadband is not being deployed to all Americans in a reasonable and timely manner, and that there is “a stark contrast in [mobile broadband] service between urban and rural America.”¹⁰⁶

Furthermore, given the flaws in the data gathered by the Commission to date (which almost certainly results in an overstatement of mobile broadband coverage) it would be harmful to the needs of rural Americans for better access to mobile broadband for the Commission to reach any other conclusion but that mobile broadband is not being deployed to all Americans in a reasonable and timely manner.

¹⁰³ *2016 Broadband Progress Report*, 31 FCC Rcd at 750 (para. 120).

¹⁰⁴ *Id.* at 750 (para. 121).

¹⁰⁵ *Id.* ADTRAN expresses concern that the *Notice* does not “ask . . . detailed questions regarding how ‘reasonable and timely’ progress towards the goal of universal availability of advanced telecommunications capability should be defined or measured.” ADTRAN Comments at 4. The statistics and percentages referenced in the *2016 Broadband Progress Report*, and the Commission’s analysis in the *2016 Report*, however, provide a specific frame of reference for how the Commission views what is—and what is not—reasonable and timely progress.

¹⁰⁶ *2016 Broadband Progress Report*, 31 FCC Rcd at 750 (para. 121).

Finally, ADTRAN’s argument regarding the Commission’s use of forward-looking benchmarks and backward-looking measures of progress is not persuasive. The Commission’s analysis simply involves determining whether 10/1 Mbps mobile networks are sufficiently deployed across the country—specifically including rural areas—to meet current and near-term consumer needs and uses. The measure of progress is “backward-looking” only to the extent that it must rely on the most recently available data. Further, as U.S. Cellular has already discussed, employing a forward-looking benchmark in the manner described by the Commission is a reasonable policy and is within the Commission’s discretion under Section 706.¹⁰⁷

ADTRAN’s concern may be a lack of symmetry, such that it would be more appropriate to use forward-looking benchmarks of advanced telecommunications capabilities if the Commission also were to rely on forward-looking projections as the measure to determine the degree of progress being made to accommodate consumers’ near-future needs and uses.

In U.S. Cellular’s view, however, the Commission should concentrate its efforts on ensuring that actual data used in connection with its Section 706 analysis (and for other purposes) is accurate, reliable, and comprehensive, and is collected and analyzed in accordance with standard, uniform, and transparent methodologies and rules. Any attempt to rely on projections as the means of “measuring” broadband deployment, for purposes of the Commission’s Section 706 analysis and findings, would introduce an unacceptable degree of uncertainty and imprecision.

¹⁰⁷ See Sec. III., *supra*.

V. OTHER ISSUES.

A. The Commission Should Retain Its Section 706 Test That Advanced Telecommunications Capability Requires Access to Both Fixed and Mobile Broadband.

A few commenters argue that the Commission should backtrack on its finding in the *2016 Broadband Progress Report* that “consumers have advanced telecommunications capability only to the extent that they have access to *both* fixed and mobile broadband service.”¹⁰⁸ NCTA, for example, characterizes the Commission’s decision to require an area to have access to both fixed and mobile broadband in order for advanced telecommunications capability to be deemed deployed in that area as both “unwise and legally questionable.”¹⁰⁹

U.S. Cellular disagrees with these arguments. *First*, from a policy perspective, as the Commission made convincingly clear in the *2016 Broadband Progress Report*, mobile broadband is as essential as fixed broadband, with “Americans increasingly rely[ing] on mobile devices as indispensable tools of daily life as personal and business interactions have rapidly become interwoven with smartphone- and tablet-based texting, email, social media, and entertainment applications that rely on mobile broadband services.”¹¹⁰

Concluding that “the central importance of mobile broadband use in the United States will only increase[,]”¹¹¹ the Commission explained in considerable detail that “[t]here is little doubt

¹⁰⁸ *2016 Broadband Progress Report*, 31 FCC Rcd at 706 (para. 17) (emphasis added).

¹⁰⁹ National Cable & Telecommunications Association (“NCTA”) Comments at 7. *See Mobile Future Comments* at 4 (arguing that the Commission’s “requiring access to multiple technologies directly contradicts the plain language of the statute”); US Telecom Comments at 7 (arguing that it is not clear that Section 706 “authorizes the Commission to require that multiple ‘capabilities’ be deployed without evidence that a single deployed and available technology is not sufficient to meet the needs of broadband customers”).

¹¹⁰ *2016 Broadband Progress Report*, 31 FCC Rcd at 708 (para. 20).

¹¹¹ *Id.* at 708 (para. 21).

that mobile broadband plays an increasingly influential role in consumers’ lives, and in achieving the Commission’s goal that all Americans will have access to advanced telecommunications capability.”¹¹² In short, it is sound policy for the Commission to conclude that it will make a negative finding pursuant to Section 706(b) regarding the availability of advanced telecommunications capability unless it concludes that mobile broadband networks—apart from, and in addition to, fixed broadband networks—are being deployed to all Americans in a reasonable and timely manner.

And, *second*, from a legal perspective, the Commission has authority under Section 706 to separately take into account access to fixed and mobile broadband services. Although the term “advanced telecommunications capability” is defined in Section 706(c) “without regard to any transmission media or technology[,]”¹¹³ this definition does not preclude the Commission from determining that “advanced telecommunications capability” is not being deployed in a reasonable and timely fashion unless *all broadband functions* needed and used by consumers are being met by the networks that have been deployed.

As the Commission explained in the *2016 Broadband Progress Report*:

Congress intended that our interpretation of “advanced” telecommunications capability evolve to keep pace with technological development and changing consumer needs. This view is supported both by the technologically neutral language utilized by Congress to frame section 706, and the legislative history of the 1996 Act. Therefore, our survey of the deployment of “advanced” telecommunications capability centers on *the functionality broadband services provide to end users*, rather than the underlying technology being utilized. Such an approach avoids undue focus on any subset of broadband services, while also ensuring that our interpretation of the definition of advanced telecommunications capability is consistent with current technological and market realities.¹¹⁴

¹¹² *Id.* at 709 (para. 23) (footnote omitted).

¹¹³ Section 706(c), 47 U.S.C. § 1302(c).

¹¹⁴ *2016 Broadband Progress Report*, 31 FCC Rcd at 705 (para. 13) (footnotes omitted) (emphasis added).

Thus, the Commission has looked at the functions performed by fixed broadband and mobile broadband, and it has concluded that “fixed and mobile broadband services ... have distinct capabilities and characteristics[, that], while fixed and mobile services sometimes provide overlapping functionality, each service has unique attributes[, and that] mobile and fixed broadband services often enhance the quality of one another.”¹¹⁵

Given these functional differences between fixed and mobile broadband that the Commission has determined currently exist, it is reasonable—and consistent with the terms of Section 706—for the Commission to conclude that the functionalities provided both by fixed broadband and by mobile broadband must be available to all Americans in order to avoid a negative determination pursuant to Section 706(b).

B. The Commission Should Collect Latency and Service Consistency Data, But Should Not Adopt Mobility Fund Phase II Latency and Service Consistency Metrics as Public Interest Obligations.

Recognizing that “the user experience for mobile broadband is also dependent on how consistently the service delivers the speeds it can provide,”¹¹⁶ the Commission seeks comment on “establishing consistency and latency benchmarks in measuring access to advanced telecommunications capability ... [and] on the data sources that should guide the Commission’s analysis of these potential benchmarks.”¹¹⁷ As set forth below, U.S. Cellular strongly believes the Commission should begin collecting latency and consistency data using drive testing,¹¹⁸ to guide future

¹¹⁵ *Id.* at 710 (para. 25).

¹¹⁶ *Notice* at para. 44.

¹¹⁷ *Id.* at para. 36.

¹¹⁸ See Sec. II.A.2., *supra*, for a discussion of the merits of using drive testing as a broadband speed measurement methodology.

policy direction, however, it should not incorporate latency and consistency benchmarks into Mobility Fund Phase II public interest obligations unless it first completes testing that is a prerequisite to the accurate targeting of support.

In a mobile environment, many factors affect consistency of service, which for this purpose U.S. Cellular considers to mean how often a consumer experiences speed and latency performance that meets the Commission's benchmark objectives. Moving toward a cell edge, or into an obstructed location, affects both speed and latency. Likewise, an increase in the number of users within a cell site or sector can affect consistency of service, even when a user is not moving.¹¹⁹ These issues can be overcome by constructing additional facilities and by increasing the amount of spectrum available to the user's device.

These solutions can be cost-prohibitive in rural areas lacking necessary population density or commercial development. They may be justified only if the price of mobile broadband service could be increased to a level well above prices in urban areas. Accordingly, supporting such investments is a central universal service objective, to deliver to rural citizens a service that is reasonably comparable in quality and price to those in urban areas.¹²⁰

Accordingly, it is important for the Commission to compare speed, latency, and consistency of service in urban and rural environments. In U.S. Cellular's experience, drive testing is

¹¹⁹ As the Commission properly noted:

Consumers may use their mobile devices for many real time applications and services such as voice calls over the Internet, high-definition video streaming, or video conferencing. As such, latency is an important determinant of measuring access to advanced telecommunications capability, and we should also take into account its interrelatedness with consistency of service.

Notice at para. 46.

¹²⁰ *See* 47 U.S.C. § 254(b)(3).

the only means of gathering data necessary to make such a comparison. By measuring speed and latency throughout an area, the Commission can develop metrics to determine consistency of service.

For example, a drive test measuring ten locations within an urban square mile may reveal nine locations meeting the Commission's 10/1 Mbps speed objective, and eight locations at 100 ms of latency. In a rural setting, the same drive test methodology may reveal only three locations at the 10/1 speed and only two locations at 100 ms of latency. Such a result suggests that consumers will experience a superior consistency of service in the urban setting, and that additional investment is needed in the rural setting to increase performance to a level that is reasonably comparable to performance in the urban area.

U.S. Cellular believes measuring performance is critical to determining the size of the job facing the Commission and where to target available funds. That said, it is not necessary to include latency and consistency of service metrics as performance benchmarks for the next round of Mobility Fund Phase II funding, which should first be focused on extending coverage to the substantial areas and road miles lacking any 4G LTE service. As new investments are made, the Commission should collect latency and consistency measurements, which can be used to determine whether the Phase II funding is achieving reasonable comparability between rural and urban areas, thus driving future universal service investments.

VI. CONCLUSION.

U.S. Cellular respectfully requests the Commission to begin the process of fixing the problems with mobile broadband data collection and analysis that have been documented in the record of this proceeding.

Doing so will help to ensure that the interests of American consumers will be better served

by a standardized and uniformly applied system for collecting and evaluating mobile broadband data that is accurate and reliable, and that eliminates the propensity of data currently relied on by the Commission to overstate mobile broadband coverage, particularly in rural America.

Respectfully submitted,

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September 21, 2016