

WRITTEN STATEMENT
of
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before the

SUBCOMMITTEE ON COMMUNICATIONS AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES ENERGY AND COMMERCE COMMITTEE

“BROADBAND: DEPLOYING AMERICA'S 21ST CENTURY INFRASTRUCTURE”

MARCH 21, 2017

Chairman Blackburn, Ranking Member Doyle, and members of the Subcommittee, my name is LeRoy T. Carlson, Jr., and I am Chairman of United States Cellular Corporation. Thank you for the opportunity to discuss ideas for accelerating broadband investments as a critical part of our nation's commitment to improve its infrastructure in the 21st Century.

Introduction.

U.S. Cellular provides mobile wireless service in nearly 200 markets across 24 states located in regional clusters across the country, including many of the states represented on this Committee such as Tennessee, Oregon, Missouri, Iowa, West Virginia, Illinois, Vermont, New York, North Carolina, and California. The overwhelming majority of the geography we serve is rural in character and as a result, much of our business involves finding ways to build cell towers in small towns and on rural roads, areas where population density, income levels, and commercial development are often well below those in our nation's urban areas. Consequently, we are constantly thinking about ways to address the economics of providing vital services to areas that present financial challenges to build, maintain, and upgrade.

For nearly 240 years, this nation has led the world in creating a business climate that encourages entrepreneurship, development and innovative thinking, as well as public investments that serve the larger community. To that end, much of our business success in the 20th Century was built upon our backbone infrastructure – our rail network, our interstate highway system, our electrical grid, and our fixed line telephone system, which all blossomed with the active engagement of the public and private sectors. Today, we are in competition with every nation in the world to develop broadband, the information and services “highway”

equivalent of the last century, to spur a similar economic boom in every corner of the nation, from Bend, Oregon to Nashville, Tennessee, to Bloomfield, Iowa, to Burlington Vermont.

As the Administration and Congress contemplate investing \$1 trillion in infrastructure, we must include within that amount a significant broadband investment. In my travels around the world, from Korea to China to Europe, and in my interactions with other telecom executives, I learn about how governments are providing their citizens the broadband tools to grow business, create jobs, and expand their markets. In the 21st Century, the United States will only lead the world in the production and export of goods and services if we have world class fixed and mobile broadband networks.

Congress now has an opportunity to make some smart and creative policy choices that will accelerate broadband deployment. Below I will touch upon the importance of accurate and actionable data, improving the federal universal service mechanism, tax policies, empowerment zones, “dig once,” and lowering barriers to deployment, each of which the Subcommittee should explore carefully. First, some perspective on where we are:

The Rise of Mobile Broadband as an Enabler of Public Safety, Education and Economic Development.

While it is important for policymakers to ensure that our nation has high-quality mobile and fixed broadband networks, I will focus my remarks on mobile because it is the fastest growing and most dynamic part of the Internet. Here are some statistics illustrating consumers’ preference for mobile and its explosive growth.

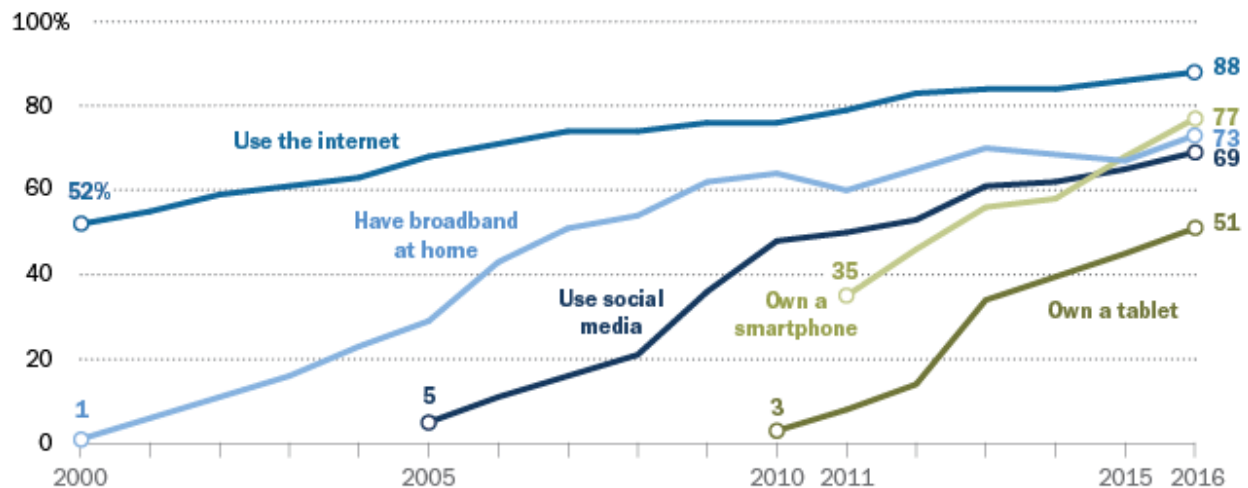
For the 90-day period ending December 31, 2016, Facebook reported: “Mobile ad revenue reached \$7.2 billion, up 61% year-over-year, and was approximately 84% of total ad

revenue....Mobile continues to drive our growth, with 1.15 billion people accessing Facebook on mobile on an average day in December, up 212 million or 23% compared to last year.”¹

A study by the Pew Research Center illustrates dramatic growth in mobile. As shown below, smartphone adoption has more than doubled in five years, while tablet ownership has gone from 3% to 51% in just six.²

The evolution of technology adoption and usage

% of U.S. adults who ...



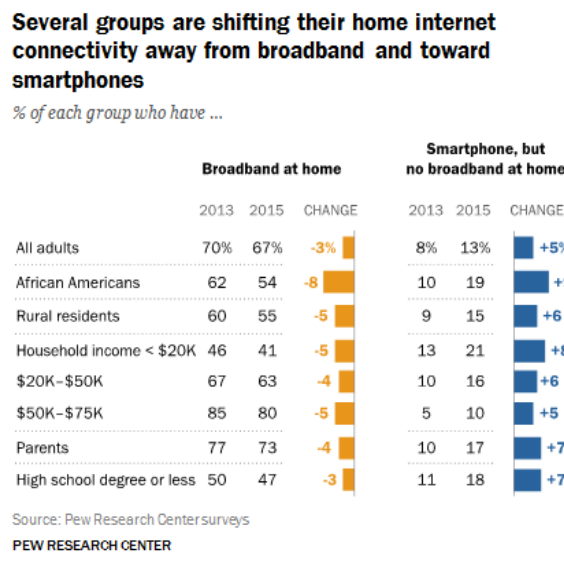
Source: Surveys conducted 2000–2016. Internet use figures based on pooled analysis of all surveys conducted during each calendar year.

PEW RESEARCH CENTER

¹ See, https://s21.q4cdn.com/399680738/files/doc_financials/2016/Q4/Q4'16-Earnings-Transcript.pdf.

² See, <http://www.pewresearch.org/fact-tank/2017/01/12/evolution-of-technology/>.

In addition to smartphone adoption, the number of households that rely solely on a smartphone for broadband has increased dramatically:³



Cisco predicts that between 2016 and 2021, global mobile data traffic will increase seven-fold, and there will be 11.6 billion mobile devices in use, exceeding the world's projected population of 7.8 billion.⁴

A recent study by ReportLinker revealed that 31% of people having no broadband connection at home state they don't need it because their smartphone has unlimited data,

³ See, <http://www.pewinternet.org/2015/12/21/home-broadband-2015/>.

⁴ See, Cisco VNI Global Mobile Data Traffic Forecast, 2016-2021, accessed at: http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.pdf.

while 27% say you can do everything you want with a smartphone, and 15% say it is cheaper to have only one connection.⁵

It is worth updating my testimony to the U.S. Senate from one year ago, to describe how mobile broadband drives so many aspects of our lives. Consumers' and businesses' reliance upon high-quality, ubiquitous mobile broadband deepens every day, and a quick review of why this matters may help explain why Federal policy remains an essential and urgent component of building, operating, and continuously upgrading mobile broadband networks:

- Public Safety. The ability to use 911/E-911/Text-to-911 depends 100% on high quality coverage, to fully enable location-based services.⁶ When disaster strikes, first responders depend on mobile wireless and broadband networks, which are the first to return to service. The value and utility of FirstNet, our nation's mobile broadband public safety network, increase every time a new cell tower is constructed, as it provides a place to locate critical public safety communications equipment.
- Health Care. Mobile devices and applications capable of diagnosing, monitoring and treating various conditions are exploding into the marketplace and revolutionizing health care.⁷ These advances improve patient outcomes, and increase efficient delivery of services. It is now possible for a diabetic patient to continuously monitor, store, and transmit glucose levels to health care providers through a mobile device.⁸ Mobile video conferencing is increasingly important

⁵ See, ReportLinker, *Wired, Wireless or Both? Americans Rethink Their Internet Connections*, (Mar. 9, 2017), accessed at: <http://www.reportlinker.com/insight/internet-connections.html>.

⁶ The FCC estimates that 70% of 911 calls are placed from wireless phones, and that percentage is growing. See, <https://www.fcc.gov/consumers/guides/911-wireless-services>.

⁷ An updated list of hundreds of approved mobile medical applications can be found at: <https://www.fda.gov/MedicalDevices/DigitalHealth/MobileMedicalApplications/ucm368784.htm>.

⁸ <http://www.dexcom.com/g5-mobile-cgm>. Someday soon, patients may wear a contact lens that constantly measures glucose level through tears, transmitting the data to attending physicians. See, <https://verily.com/projects/sensors/smart-lens-program/>.

to emergency medical services and in delivering health care to remote areas where facilities are not easily accessible.⁹ These applications are but a small fraction of the incredible health care tools enabled by mobile broadband.

- The Internet of Things. Soon, almost any object will be capable of connecting to the Internet. Gartner expects nearly 21 billion IoT devices to be deployed by 2020.¹⁰ According to General Electric, the Industrial Internet, defined as the combination of Big Data and the Internet of Things, may be responsible for \$15 trillion (not a typo) of worldwide GDP by 2030.¹¹
- Education. Students are increasingly using mobile devices to access learning materials, do homework, create presentations, and communicate with teachers. Students with connectivity throughout the community are more likely to meet educational goals, especially in an age where learning through the Internet is essential.
- Agriculture. Connected tractors, irrigation systems, livestock management, commodity tracking, and many more applications depend upon mobile wireless connectivity. By definition, these services require networks that are not measured by “road miles covered” but by actual services reaching their acreage.
- Low-income households. For households that cannot afford to purchase a desktop computer, a router, a WiFi access point, and subscribe to both mobile and fixed networks, a single mobile device is capable of meeting voice communications and Internet needs.

⁹ The FCC’s Connect2HealthFCC initiative is a powerful example of how broadband data can be used to improve health care. See, <https://www.fcc.gov/about-fcc/fcc-initiatives/connect2healthfcc>; http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0316/DOC-343926A1.pdf; and <https://www.fcc.gov/document/commissioner-clyburn-continuation-connect2health-task-force>.

¹⁰ See, <https://www.gartner.com/doc/3558917/forecast-internet-things--endpoints>.

¹¹ See, <http://www.ge.com/digital/sites/default/files/industrial-internet-insights-report.pdf>.

If the Committee takes nothing else away from these examples of how critical mobile broadband is to rural America, it should be this: None of the benefits described above will help rural Americans unless high-quality mobile broadband coverage is available everywhere they live, work, and travel. In areas where emergency calls cannot connect, or where medical devices cannot transmit data, lives will be lost. In areas where tablets and laptops don't work, educational opportunities will be foreclosed. The enormous power of the Internet of Things cannot be fully realized without ubiquitous mobile broadband. As Deere & Company has previously noted to the FCC, a lack of connectivity on our nation's farmlands costs productivity and wastes water and fertilizer.¹² The lack of mobile broadband denies low-income households the opportunity to fully participate in our nation's economy.

As you can see, there are enormous opportunities here to grow our economy, increase public safety, improve education, reduce health care costs, and make our nation more competitive. Here are some observations and ideas for what Congress can do to accelerate mobile broadband deployment throughout the nation.

Making Smart, Targeted Investments Begins With Accurate Measurement.

There are differing opinions regarding the state of mobile broadband deployment in America. Some FCC statistics say 99.1% of Americans are covered by at least one carrier

¹² See, <http://apps.fcc.gov/ecfs/document/view?id=7521752479>.

providing 4G LTE service.¹³ Other data, such as the FCC table below, suggest that 53% of all Americans and 87% of rural Americans lack access to mobile broadband at 10 Mbps/1 Mbps:¹⁴

Table 4
Americans Without Access to Mobile Broadband Services (Millions)

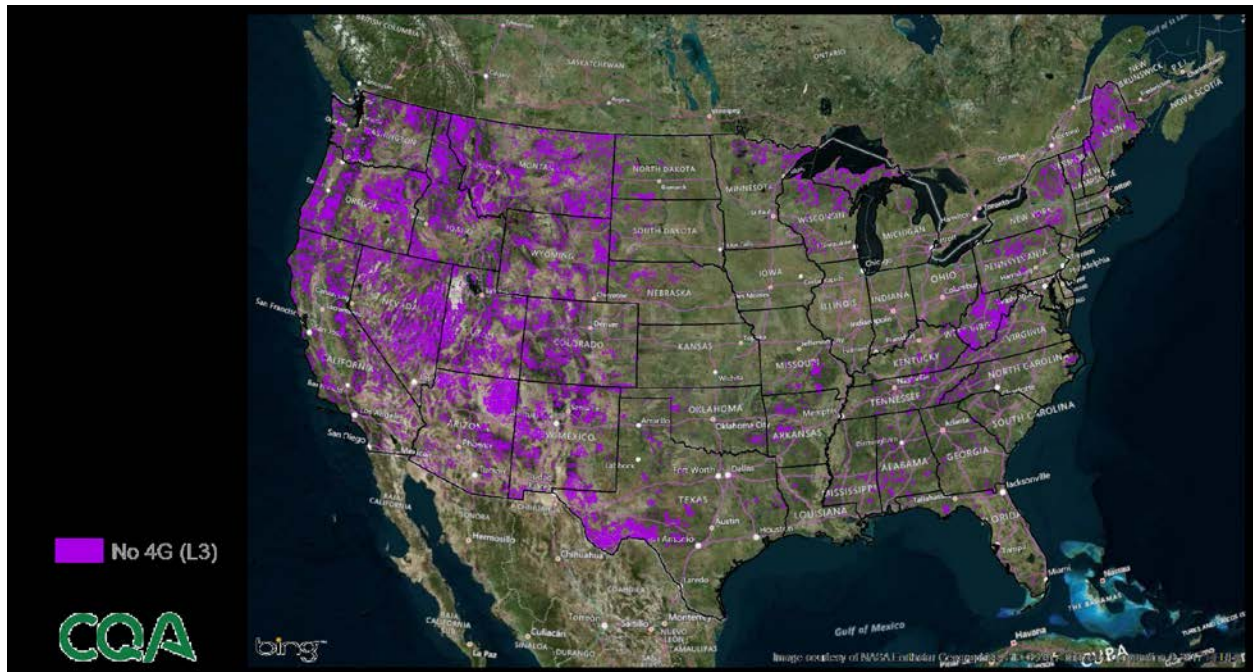
	LTE Technology		10 Mbps/1 Mbps	
	Population	Percentage of Population	Population	Percentage of Population
United States	1.682	1%	171.486	53%
Rural Areas	1.519	3%	52.231	87%
Urban Areas	0.163	0%	119.255	45%

So, 4G service may be available, but high-quality service needed to compete with the rest of the world may not. In conversations with many policy makers from across the country, they understand from firsthand usage that dropped calls, dropped data sessions, and poor quality remain a problem in their districts regardless of what a map may show.

Over the past several years, the FCC has attempted to improve its data collection by requiring mobile carriers to submit reports of broadband coverage and speeds on FCC Form 477. Compiled together, the Form 477 data has the potential (if the data were accurate and consistent) to provide a useful picture as to where coverage exists, and at what speeds, allowing policymakers to direct federal universal service funds to areas that need new investments. Using the FCC's Form 477 data, released in September 2016, we commissioned CostQuest Associates to compile a U.S. map depicting where 4G service is lacking:

¹³ See, Wireless Telecommunications Bureau, Working Toward Mobility Fund II: Mobile Broadband Coverage Data and Analysis (Sept. 30, 2016) at https://apps.fcc.gov/edocs_public/attachmatch/DOC-341539A1.pdf.

¹⁴ See, Inquiry Concerning the Deployment of Advanced Telecommunications Capability to all Americans, 2016 Broadband Progress Report, FCC 16-6 (Jan. 29, 2016), at Table 4, accessed at https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-6A1.pdf.

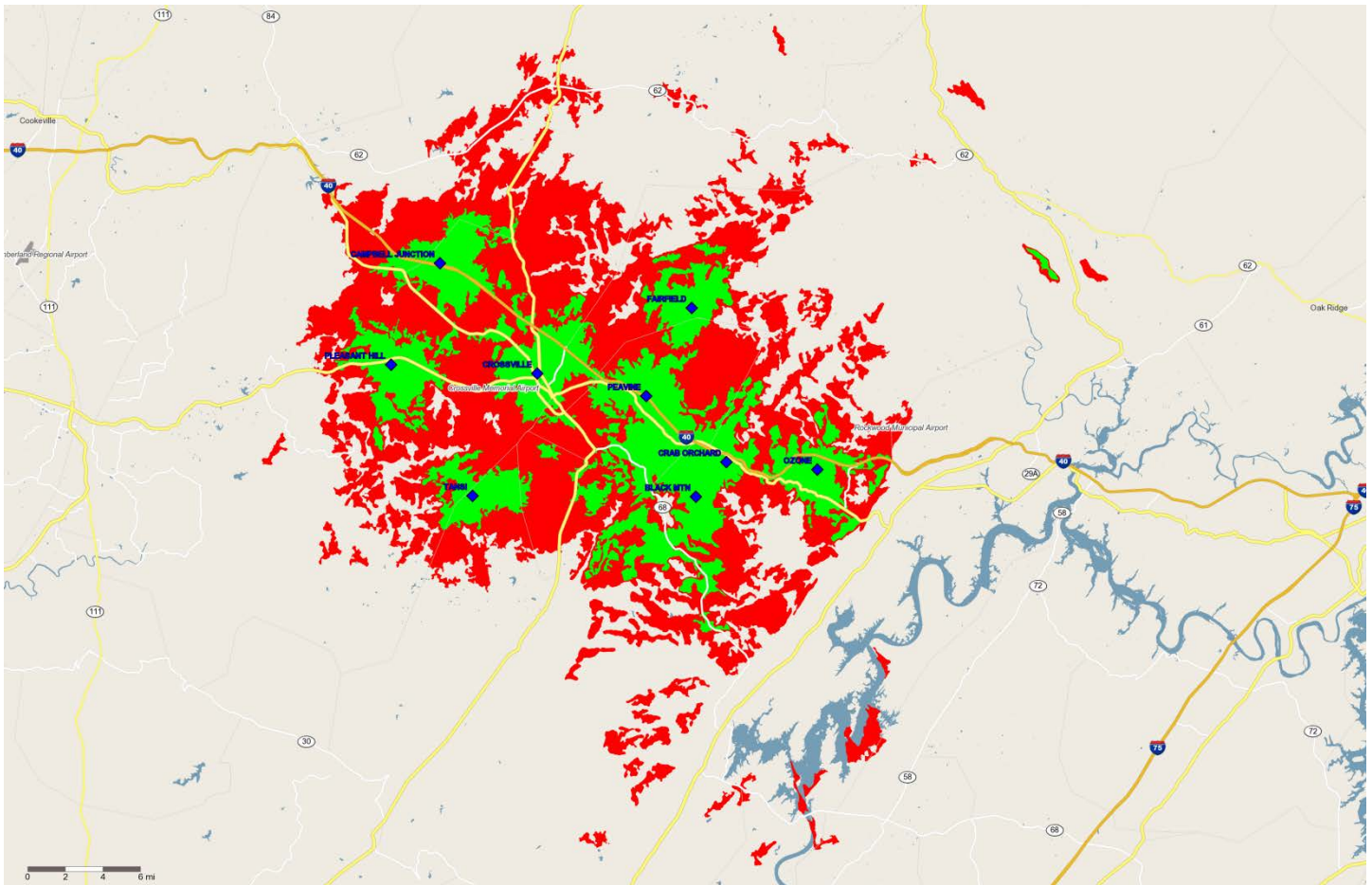


While we don't disagree that the purple areas probably lack 4G service, our experience in states like Oklahoma, Tennessee, Illinois, North Carolina, Iowa, Wisconsin, Vermont, Kansas, Nebraska, and West Virginia tells us that this map overstates 4G availability. To be clear, we do not believe carriers are misrepresenting their coverage to the FCC. Instead, they are depicting coverage accurately within the loose guidelines set forth for how to submit coverage data. Let me explain the problem and propose a solution.

Below is a two-color coverage map of several U.S. Cellular towers in rural Tennessee:

USCC Tennessee

March 20, 2017



- ◆ Sites
- USCC High Quality Service Area (161 Square Miles) *
- USCC 4G Service Below 10Mbps (366 Square Miles) *

Maps created by the GIS Services Group @ U.S. Cellular 2017 - GISservices@uscellular.com

* Total coverage area based on 477 data filed by U.S. Cellular

The green area is where signal is strong and customers can expect to experience high-quality service that is reasonably comparable to that which is available in urban areas. We would expect users in the green areas to receive download/upload speeds of approximately 10 Mbps/1 Mbps or better, and that calls will rarely drop.

The red area is where customers can expect to get service, but it may be less reliable. Calls will drop more often as handsets move around and data speeds may slow down. In the red area, vagaries such as distance from the tower, foliage, obstacles, and terrain, can all affect the quality of service, more so than in the green areas where signal strength is greater. As a result, users would expect to receive speeds below 10 Mbps/1 Mbps.

In areas with higher population density or where demographics demand it, carriers can afford to build networks out so that customers only experience the green areas. A rural carrier would need to invest in additional "fill-in" cell sites in the red areas in order to bring these areas up to the urban/suburban quality standard. Unfortunately, in many or most rural areas, there is no business case for investing hundreds of thousands, or even millions in additional cell sites to increase reliability and speeds.

When submitting data to the FCC on Form 477, carriers are not required to distinguish between their green and red areas. When the FCC inaugurated its Form 477 data collection, it issued instructions for carriers to "[r]eport a list ... of census tracts, "in which your mobile wireless broadband service is advertised and available to actual and potential subscribers."¹⁵ The instructions define mobile wireless broadband service as a service that, "allows end users

¹⁵ See, <https://transition.fcc.gov/form477/477inst.pdf>, at p. 25 (emphasis mine).

to receive information from and/or send information to the Internet from a mobile device and using a mobile network at information transfer rates **exceeding 200 kbps in at least one direction.**¹⁶ Service is advertised and available in a census tract if the provider “is advertising and actively making mobile broadband service available to actual and potential subscribers **anywhere in the tract**”.¹⁷

This listing of census tracts reported by carriers overstates where service is available since tracts reported as having service available may contain large areas in which service in fact is *not* available. In addition, including tracts with throughput at 200 kbps in one direction serves to overstate service coverage and misclassify low speed areas as “broadband available.”

In addition to submitting a list of census tracts, each carrier must submit a shapefile for each technology deployed in each frequency band, which allows the creation of nationwide coverage maps. The FCC’s instructions state that carriers should:

indicate the minimum advertised upload and download data speeds associated with that network technology in that frequency band ... and the coverage area polygon should depict the boundaries where, according to providers, users should expect to receive those advertised speeds.¹⁸

The problem with this Form 477 instruction is that it produces maps that do not differentiate between the green areas and red areas. That is, the instructions require carriers to report geographic coverage areas nationwide where customers can expect to receive service

¹⁶ See, <https://transition.fcc.gov/form477/477inst.pdf>, at p. 24 (emphasis in original).

¹⁷ See, *id.* (emphasis mine).

¹⁸ See, <https://transition.fcc.gov/form477/477inst.pdf>, at p. 24 (emphasis in original).

at the minimum advertised speeds for the technology involved. These coverage areas include the red areas of lower service quality.

We believe the solution to this is to improve the quality of data submitted to the FCC, so that Form 477 maps only depict the green areas. Red areas would no longer be considered to be providing mobile broadband for universal service purposes. Instead they would be made eligible for federal universal service support, as they should be, because there is rarely a chance to make a return on investment by building more towers in those areas. Citizens living in those areas would receive improved service levels, comparable to those living in urban and suburban communities.

Many stakeholders have raised these concerns, and to its credit, the FCC has acknowledged that the data needs improvement. However, the FCC is moving forward with the Mobility Fund II auction that will commit \$450 million in annual funding over the next ten years, without first fixing the Form 477 data. In order to determine which areas are eligible for investment, they are relying on a “challenge process,” essentially shifting the burden to each carrier to figure out where the coverage maps of competing carriers reflect inaccuracies. That is an enormous and expensive task, one which carriers are not well-equipped to perform.¹⁹ Nor would it make the red areas above eligible for investment.

The far better course would be to improve Form 477 instructions so that all of the data submitted is based on more conservative and consistent standards that do not overstate

¹⁹ For example, U.S. Cellular estimated that testing its 14-state universal service network, comprising approximately 500,000 census blocks, would take 27,750 days at 18-hours per day. That works out to 2,000 testing teams, each working a 9-hour shift per day, for 28 days.

coverage in rural areas. We realize that taking such a course of action would introduce approximately a one year delay in commencing the Mobility Fund II auction, however moving ahead with poor data risks misallocating a substantial portion of \$4.5 billion in support funds.

Last week, Senators Capito and Klobuchar introduced a bill in the Senate entitled “The Measuring Economic Impact of Broadband Act,” seeking to provide Congress with reliable, publicly available economic data that it needs to make informed decisions about expanding broadband. The law would require the Bureau of Economic Analysis to conduct a study of the effects of broadband deployment and adoption on the U.S. economy.²⁰ Should that bill become law, it will benefit the public to a far greater extent if the quality of data collected through the Form 477 process is improved.

Additionally, last week Congressman Loeb sack introduced H.R. 1546, “The Rural Wireless Access Act of 2017,” a bill requiring the FCC to use standard definitions, collect coverage data in a consistent and robust way, improve the reliability and validity of its data, and increase the efficiency of its data collection. We support this bill because the Commission has for many years struggled to accurately measure where broadband of all technologies exists, and the characteristics and quality of such services.

We applaud the FCC’s recognition of its data problem and intend to work with the FCC to develop a workable challenge process in advance of the Mobility Fund II auction. That said, we remain concerned that a challenge process may fail to uniformly correct the data issues,

²⁰ See, <https://www.klobuchar.senate.gov/public/index.cfm/news-releases?ID=4D34DD69-D5E5-4A76-9707-C4B635F14541>. The bill is co-sponsored, by a bipartisan group of Senators including King, Boozman, Heitkamp, Franken and Sullivan.

especially if much of the country goes untested due to the burdens of the challenge process.

We and others have urged the FCC to first fix the Form 477 data before making decisions about how Mobility Fund II support should be invested.

We urge Congress to continue to encourage the FCC to improve the 477 data collection process before committing \$4.5 billion in universal service funding.

Accurately Measuring Mobile Broadband Availability Enables Policymakers to Determine How Much Investment is Needed and to Accurately Target Support.

In its Mobility Fund II Order, the FCC claimed without support that a budget of \$453 million per year, “will allow MF-II to achieve **its objectives** in a fiscally responsible manner (emphasis added).”²¹ However, this is not the correct assessment of objectives. The FCC has no basis to conclude that its budget will accomplish the objective that **Congress** gave the FCC, namely, to provide rural citizens with access to high-quality telecommunications services that are reasonably comparable to those in urban areas.²² Respectfully, without accurate Form 477 mapping data, nobody understands the size of the task at hand, or whether any objective is being achieved.

If the Form 477 data were improved as discussed above, exposing the red areas for investment, it may lead policymakers to prioritize Mobility Fund II funds for those rural areas where far more people live, work, and travel. In addition, the FCC’s recent order excludes from

²¹ See, Connect America Fund, FCC 17-11, *Report and Order and Further Notice of Proposed Rulemaking* (Mar. 7, 2017), at para. 25.

²² See, 47 U.S.C. § 254(b)(3).

eligibility for Mobility Fund II support any area where at least one carrier offers 5 Mbps/1 Mbps or greater of mobile broadband service. Yet, carriers that win Mobility Fund II support must build out to a 10 Mbps/1 Mbps standard. This means areas with 5 Mbps/1 Mbps of service will get no federal support to improve networks for ten years.

Today, a 5 Mbps/1 Mbps service level falls short of Congress' objective that the FCC ensure that services in rural areas are reasonably comparable to urban areas. According to OpenSignal, the overall speed that Americans experience from mobile broadband networks is 12.34 Mbps download.²³ That figure implies that consumers experience significantly faster speeds in urban areas. Ineligible rural areas relegated to 5 Mbps cannot be considered reasonably comparable to urban and in ten years they will be much farther behind. Moreover, investments that increase speeds in rural areas would undoubtedly improve our ranking worldwide.²⁴

By fixing the Form 477 and opening up for support areas with less than 10 Mbps/1 Mbps of service, the FCC would focus its Mobility Fund II budget in the areas where investment will help the most rural citizens. This is not to say that the Commission should ignore remote areas that are extremely high-cost to serve. The remaining areas should be dealt with in the FCC's Remote Areas Fund (RAF), which remains in development.

²³ See, Open Signal, *Global State of Mobile Networks (August 2016)*, accessed at: <https://opensignal.com/reports/2016/08/global-state-of-the-mobile-network/#speed>. According to OpenSignal, the U.S. ranks 38th worldwide in overall mobile broadband speed, behind South Korea (1st at 41 Mbps), Japan (9th at 21 Mbps), China (15th at 18 Mbps), Estonia (24th at 15 Mbps), and Slovenia (27th at 14 Mbps).

²⁴ While some may argue the FCC's low ranking reflects the geographic size of our nation, that gives me no comfort. We trail some developing countries that have clearly made mobile broadband a priority.

CostQuest has estimated that providing 4G service to the areas that the FCC shows to be unserved (an area we believe to understate the need) will require approximately 37,500 new towers, at a cost of \$12.5 billion.²⁵ In addition, annual operating expenses for these towers will cost approximately \$21 billion over ten years, for a total of approximately \$33.5 billion. These estimates budget nothing for the red areas discussed above. Nor do they include 5G investments, which are only a few years away.

Given the explosive growth in demand for mobile broadband and the large amount of work yet to be done, the FCC's proposed \$450 million dollar universal service investment in mobile technology, which is only 10% of its \$4.5 billion dollar annual investment in wireline technology, is inadequate. As shown in the FCC's Mobility Phase I auction results map,²⁶ \$300 million doesn't go very far in rural areas.²⁷ To illustrate, we have gone to extraordinary lengths to build towers in remote areas using federal universal service support. Attached as Exhibit 1 are photographs of cell sites in Washington and Wisconsin, showing the construction of roads, clearing of forest, and even the use of work horses to transport equipment.

We conclude that the FCC's budget comes up far short of what's needed to make a significant portion of rural America's mobile broadband capability reasonably comparable to

²⁵ See, CostQuest Associates, *Cost Study for 4G Unserved Areas*, accessed at: <https://ecfsapi.fcc.gov/file/10217086509033/2017%200216%20CQ%20Cost%20Study%20for%20Unserved%20Areas%20FINAL.pdf>.

²⁶ See, http://apps.fcc.gov/auction901/map/auction_result_ext.html.

²⁷ It should be noted that nearly a third of Mobility Fund I support was returned for non-performance, some due to an inability to obtain right of way approvals on Federal lands.

urban areas.²⁸ Perhaps the FCC's budgetary constraint flows from the intractable problem of fixing the way consumers contribute to the universal service mechanism. Whatever the case, it is time for Congress to make a bigger commitment to mobile broadband.

The Nation Needs a Big Broadband Infrastructure Bill.

It is difficult to overemphasize how important it is for Congress to foster development of robust mobile broadband networks in rural areas right now. New investments in mobile broadband infrastructure each year will have multiplier effects, creating jobs and stimulating economic growth.²⁹ One wireless industry job supports over six additional jobs in the economy, almost one and one half times higher than U.S. manufacturing sector jobs support.³⁰ Each dollar of investment in wireless results in \$2.32 of economic activity.³¹ We hear directly from our employees and customers that managers and educated professionals no longer consider rural areas that lack high-quality mobile broadband services attractive enough to relocate to, or to stay in.

²⁸ Indeed, this amount is about 10% of what the FCC has proposed to invest in wireline broadband networks in rural America.

²⁹ See, <http://www2.deloitte.com/content/dam/Deloitte/us/Documents/technology-media-telecommunications/us-tmt-impactof-4g-060612.pdf>.

³⁰ See, Coleman Bazelon and Giulia McHenry, *Mobile Broadband Spectrum, A Vital Resource for the U.S. Economy*, at pp. 19-20 (May 11, 2015), available at: http://www.brattle.com/system/publications/pdfs/000/005/168/original/Mobile_Broadband_Spectrum_-_A_Valuable_Resource_for_the_American_Economy_Bazelon_McHenry_051115.pdf?1431372403.

³¹ *Id.*

As you know, cell towers and fiber networks are the building blocks of a broadband economy. Cell tower and fiber constructed today are capable of transporting data at today's speed limit. Within a few years, as 5G technology is introduced, new electronics and software upgrades will use the same towers and fiber to greatly increase network capabilities. As the Cisco and Gartner projections show, our nation's data capacity needs continue to explode. In order to keep up with this demand, especially in rural areas where it is more difficult to justify investments, I urge Congress to include robust fiber and mobile broadband investments within any infrastructure bill that is developed this year.

Last week in Pittsburgh, FCC Chairman Pai suggested that direct funding for broadband infrastructure appropriated by Congress as part of a larger infrastructure package should be administered through the FCC's Universal Service Fund (USF) and targeted to areas that lack high-speed Internet access.³² Provided the FCC has accurate data on where support should be targeted, and that sufficient funds are made available to close the mobility gap in rural America, we support Chairman Pai's suggestion. In our experience, the federal high-cost mechanism has historically been an effective means of accelerating infrastructure development. Given the opportunity, we would welcome the opportunity to work with the Committee to develop this idea further, which could significantly expand direct investment by carriers in rural areas.

³² See, Remarks of FCC Chairman Ajit Pai At Carnegie Mellon University's Software Engineering Institute *"Bringing the Benefits of the Digital Age to All Americans"* Pittsburgh, Pennsylvania March 15, 2017, accessed at: https://apps.fcc.gov/edocs_public/attachmatch/DOC-343903A1.pdf.

I urge this Committee to consider legislation to substantially increase investment in mobile broadband networks serving rural America, either through a direct program or by increasing funding for the federal universal service mechanism, as suggested by Chairman Pai.

In addition to direct investment, there are tax provisions that can help to accelerate investment, such as tax credits and depreciation allowances. We commend Congress for extending the bonus depreciation for property acquired and placed into service through 2019. These rules have allowed us to make investments in towers, network equipment, and other qualifying property that create jobs and produce economic multiplier effects. We urge you to work with the Ways and Means Committee to develop effective and responsible tax credits and other cost recovery rules that will provide business with the incentive to build infrastructure, especially in rural areas.

Separately, Congress can make all universal service fund support go farther by passing legislation to exclude universal service support from taxable income, similar to funds provided under the American Recovery and Reinvestment Act. By excluding support from taxation, we will be able to use 100% of the support received for investments in rural areas and not just the net amount after taxes.

Last September, then Commissioner Pai suggested the creation of “Gigabit Opportunity Zones,” where financial incentives would be provided for Internet service providers to deploy gigabit broadband services in low-income neighborhoods. State and local governments willing to adopt deployment-friendly policies could apply to the federal government for designation as a Gigabit Opportunity Zone. Designation would allow ISPs to capture federal tax incentives for building networks, such as being able to expense capital investments, or carrying over losses for

an extended period. Startup companies using the Gigabit network could receive tax credits to stimulate business development. We believe these ideas have merit and should be developed further. At the very least, Congress should authorize a robust pilot program to test them in both urban and rural areas.

We support “dig once” policies for any federal infrastructure investment that supports installation of underground conduit and fiber when building or renovating roads, railways, pipelines, utility infrastructure, and energy distribution channels. I understand that dig once can reduce the cost of fiber installation by as much as 90%. Chairman Walden and Congresswoman Eshoo have previously introduced dig once legislation and we fully support a requirement that projects using federal infrastructure funds include underground fiber.

Lastly, an infrastructure bill should reduce barriers to entry for mobile broadband. Over three decades after the inauguration of cellular telephone service, the ability to obtain rights of way on Federal lands continues to be a significant burden for carriers. We note that the Majority Staff’s Report for this hearing includes a provision requiring the Bureau of Land Management and Forest Service to undertake a rulemaking designed to standardize their requirements for obtaining rights of way. The costs, uncertainties, and delays involved in operating on Federal lands significantly delay or preclude mobile broadband deployment. Citizens living in, visiting, and traveling through these areas face needless risk and inconvenience. We support proposals set forth in the discussion draft that will streamline these processes and lead to consistent and predictable outcomes.

Closing Remarks

In closing, we have an administration and both parties on the same page that it is time to invest in our nation's infrastructure. As someone who has participated in the development of mobile wireless since its inception, I state to you without hesitation that some of the greatest advances in public safety, health care, education and economic development are happening as we speak, and will continue to develop in the coming years. Whether these advances make it to rural America largely depends on choices that you make today.

Congress and the FCC must ensure that the towers, fiber, and related equipment are constructed in rural areas where carriers cannot make a business case to invest. The FCC's contemplated \$4.5 billion dollar investment over the next ten years is not enough to keep the digital divide from widening. We need a coordinated strategy to address the digital divide because there never comes a time when we can say the job is completed.

To stay ahead of the curve and make smart policy choices, you must know at all times the state of our nation's mobile broadband network - where service is available and its quality. The National Broadband Map that you authorized in 2009 was a great start, and we need to build on it and have something comparable for mobile broadband that gives policymakers appropriate visibility.

You must have reasonable estimates as to what it will cost to keep rural areas reasonably comparable urban. Understanding costs underpins any budget you may develop; indeed it informs you how long it will take to accomplish a legislative goal.

To succeed, you must appropriate funds to help carriers build more fill-in facilities, in an amount sufficient to bring rural areas up to a reasonably comparable standard, and include future support for 5G technology.

Finally, this industry is quintessentially interstate – it requires federal oversight and action to ensure our citizens have access to the best telecommunications infrastructure in the world. We need tax policies, incentives, and for various approval processes to be streamlined and made more efficient.

All of this is within your sight right now, and I encourage you in the strongest possible way to seize this moment to significantly advance our nation's critical telecommunications infrastructure.

Exhibit 1

Photographs of Tower Construction in Remote Areas



10/25/2014



12/15/2014



05/07/2015



