

WRITTEN STATEMENT
of
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before the

UNITED STATES HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON COMMUNICATIONS AND TECHNOLOGY

**“LEGISLATING TO CONNECT AMERICA: IMPROVING THE NATION’S
BROADBAND MAPS”**

SEPTEMBER 11, 2019

Chairman Doyle, Ranking Member Latta, and members of the Subcommittee, my name is Grant B. Spellmeyer, and I am the Vice President - Federal Affairs and Public Policy at United States Cellular Corporation. Thank you for the opportunity to discuss your legislative efforts to improve the nation’s broadband mapping. As discussed below, U.S. Cellular fully supports legislation to improve mapping, including the bills before this Committee today.

I. Introduction

U.S. Cellular is the 5th largest wireless carrier and provides mobile wireless telephone and broadband services across 21 states, located in regional clusters across the country. We serve overwhelmingly rural areas in many states represented on this subcommittee, such as Iowa, California, New Hampshire, Vermont, Oregon, Washington, Illinois, Missouri, Virginia, West Virginia, North Carolina, and Texas.

U.S. Cellular is a member of the Competitive Carriers Association, and like many CCA members, much of our business involves finding ways to build towers and provide service 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 service.

In order to accelerate our investments in rural areas, we participated in the FCC's Mobility Fund Phase I auction process. U.S. Cellular and its subsidiary companies succeeded in winning approximately \$40 million in support, which we have leveraged with our own funds to build new towers and upgrade 4G LTE networks serving places we could never make a business case to construct on our own. Today, consumers in these areas have access to 4G LTE mobile broadband that they would not have but for the FCC's universal service fund mechanism. For them, the program is a huge success.

Recently, we have participated actively in the development of the FCC's Mobility Fund II ("Phase II") program in which the FCC pledges to distribute \$4.5 billion over a 10 year period for further rural wireless broadband deployment. Our experience in both the FCC's Mobility Fund Phase I and Phase II processes has shaped our views on how the universal service fund mechanism can and must be improved. Foremost is the strong belief that scarce public funds must be accurately targeted to the areas most in need. To accomplish this, we need reliable broadband maps, which makes today's hearing and accompanying legislation vitally important.

II. The State of Broadband Mapping for Mobile Services

Accurately mapping mobile broadband coverage is difficult because many different technical and environmental factors, such as terrain, foliage, power levels, and equipment, affect how a radio signal travels and what signal quality a consumer may experience. That said, today's broadband coverage maps are woefully inaccurate and, unfortunately, skew policies used to direct scarce funds. Accordingly, today's action by this Committee is extremely important because improving maps will help both federal and state policymakers recalibrate policies that impact investments in our nation's rural infrastructure.

A bit of history will illuminate why your attention to this problem is necessary. The FCC's historically flawed Form 477 process for mapping mobile broadband contained very broad standards for reporting signal coverage. Without consistent reporting standards, the service availability data submitted on FCC Form 477 can vary significantly from the actual coverage that rural consumers experience on the ground as well as from carrier to carrier, who may report Form 477 using different parameters. To be clear, I'm not talking about carriers misreporting data, but rather legitimate differences that radiofrequency engineers, equipment vendors, and mapping technicians may have when predicting signal coverage that allow for wide variations.

To its credit, the FCC recognized in 2017 that it could not conduct Mobility Fund Phase II unless it improved its mobile broadband map. Under Chairman Pai's leadership, the Commission ordered a "one-time" collection of mobile broadband mapping data using narrower engineering and reporting standards, as well as establishing a challenge process to provide the Commission with data identifying areas that experience service availability inconsistent with the one-time data maps.

As you well know, this is not the first Congressional hearing on the topic of broadband mapping. But one of the major lessons learned by this Committee's oversight has been that it now seems to be universally accepted that the one-time mapping data overstated coverage in rural areas, sometimes significantly. As a result, the areas of controversy were so large that it made the Commission's challenge process very difficult. We believe the primary issue with the one-time data collection is that the standards adopted were not consistent with how carriers design and construct networks.

Again, to the FCC's credit, they heard these complaints and late last year they suspended the one-time data challenge process to review carrier submissions and to consider next steps. Now, we are at a critical time, because almost everyone agrees that the maps are not good

enough to conduct an auction and distribute funds, while rural consumers are waiting for improved mobile broadband and the health, safety, educational, and economic development benefits that are happening in rural areas where such services are available. Phase II of the Mobility Fund will distribute funds for ten years, and if support is targeted to the wrong places, those rural areas most in need will fall much farther behind.

We support each of the bills being considered here today. For U.S. Cellular, H.R. 4229 - the Broadband DATA Act, as well as S. 1822 - the DATA Act, sponsored by Senator Roger Wicker (R-Miss.), arrive at this critical time. With the passage of S. 1822 out of the Senate Commerce Committee in July, we are eager for this Committee approve comparable language as soon as possible in order to see these standards enacted into law.

III. H.R. 4229 - The Broadband Deployment Accuracy and Technological Availability Act.

The Broadband Deployment Accuracy and Technological Availability Act (“Broadband DATA Act”) will significantly improve broadband mapping for both fixed and mobile services.

With respect to mobile broadband, the bill has a number of features that will enable policymakers both at the federal and state level to more accurately target universal service support and other broadband funding programs, so that consumers can see the benefits of modern infrastructure at the earliest possible date. These benefits will extend to 5G technology, which is beginning to be deployed in urban areas as we speak. With respect to mobile broadband, the bill would:

- Define key radiofrequency engineering terms used to build propagation maps, such as Cell Edge Probability, Cell Loading, Propagation Model, and Clutter. These definitions are essential to creating common standards.

- Require the FCC to:
 - Take into consideration the effects of clutter,
 - Establish for 4G LTE a requirement that propagation maps depict a “5/1” speed, with a cell edge probability of 90 percent and cell loading of 50 percent, and
 - Establish any other technical parameter that creates a map more precise than the one created through the one-time data collection for Mobility Fund II.

- Require the FCC to issue final rules within 180 days requiring the collection and dissemination of granular data on fixed, mobile, and satellite services, and related processes needed to build accurate broadband maps.

- Require the FCC to implement a user-friendly challenge process, open to the public, and other governmental entities.

- Include accountability, by requiring officer certifications of submissions.

- Direct the FCC to reform FCC Form 477 to achieve the purposes of this bill.

- Require the FCC to revise its rules in the future, to reflect changes in mapping-related technologies, so as to ensure the continuing accuracy of propagation maps mandated by this legislation.

All of these components are essential to a successful legislative effort, but none more important than standardizing cell edge probabilities and cell loading, so that what appears on the map more closely aligns with what people experience when they use their devices. To illustrate,

when you design a network with an 80 percent cell edge probability, you get a map that shows significantly larger geographic coverage than when you design it with a 90 percent cell edge probability, all else equal.

It is good policy to narrow the number of variables and establish parameters conservatively, because overstating coverage denies rural consumers investments flowing from universal service and other broadband programs, perhaps for a very long time. To provide some context, the FCC's one-time data collection used a cell edge probability of 80% and a cell loading factor of 30%. Consistent with how we engineer our networks, this bill would properly direct the use of 90% and 50%, respectively.

Experts have indicated that for a rural cell site, using 80% probability extends the cell radius by about 27% and increases the "covered" area by about 60%. This additional 60% could represent hundreds of square kilometers of additional "coverage" per site that is mostly insufficient to support reliable high-speed data and voice service. Put simply, designing at a higher level increases costs, but it also increases service quality. The bill's proposed cell edge probability and cell loading factors will result in significantly improved propagation maps that more closely resemble consumer experiences on the ground and result in acceptable service levels out at the cell edges.

In addition, by legislating more realistic mapping, Congress will significantly improve the challenge process. For U.S. Cellular, the Mobility Fund II challenge process was an all but impossible task. Those challenges are documented in a YouTube video available at <https://youtu.be/L2rM7i3ivas>. I've attached to my testimony a couple of examples demonstrating the abysmal results we found in Iowa and Oregon. We invested over \$2 million in drive testing to challenge areas we believed to be incorrectly shown as served. We exhausted our budget and ran out of time, succeeding in testing only a small fraction of the areas we believed necessary. In discussing this with other CCA member carriers focused on serving rural areas, we believe this to have been a common experience. The collective time and money invested by the wireless community in the challenge process represent funds that could have been invested in much needed infrastructure.

We believe the primary reason for so many rural areas showing overstated coverage, making the challenge process unwieldy, was because the parameters established in the one-time data collection were too loose. For a challenge process to be effective, the areas of controversy should be small, so that the public's task to improve the final product with crowd sourced or other data is manageable, and people invested in the process believe filing a challenge to be worthwhile. We also believe the mapping parameters contained in the bill accomplish this, and will result in more accurate maps with far fewer areas where challenges need to be filed.

IV. This is an Important Moment for Congress to Act.

Passage of H.R. 4229 would standardize the mapping process and result in an output that is usable by the FCC and other federal agencies, as well as by states looking to improve the targeting of their broadband program funds. In an ideal world, standardization of this sort would have been in place years ago, but it is not too late. There must be an urgency to get beyond where we are today, to a world where our federal government can confidently point to a map that, with reasonably accuracy, tells the public where broadband is, and where it is not.

We strongly believe that getting the mapping right is the biggest factor in determining whether the greatest possible number of rural consumers get access to high-quality mobile broadband or not. The FCC has properly noted, on multiple occasions, that it should not be investing universal service support in areas that already have unsubsidized service. Without high-quality maps, that's bound to happen. But what would be worse would be maps overstating coverage, causing citizens living in areas without coverage to be blocked from universal service or other federal and state broadband program investments for a decade or longer.

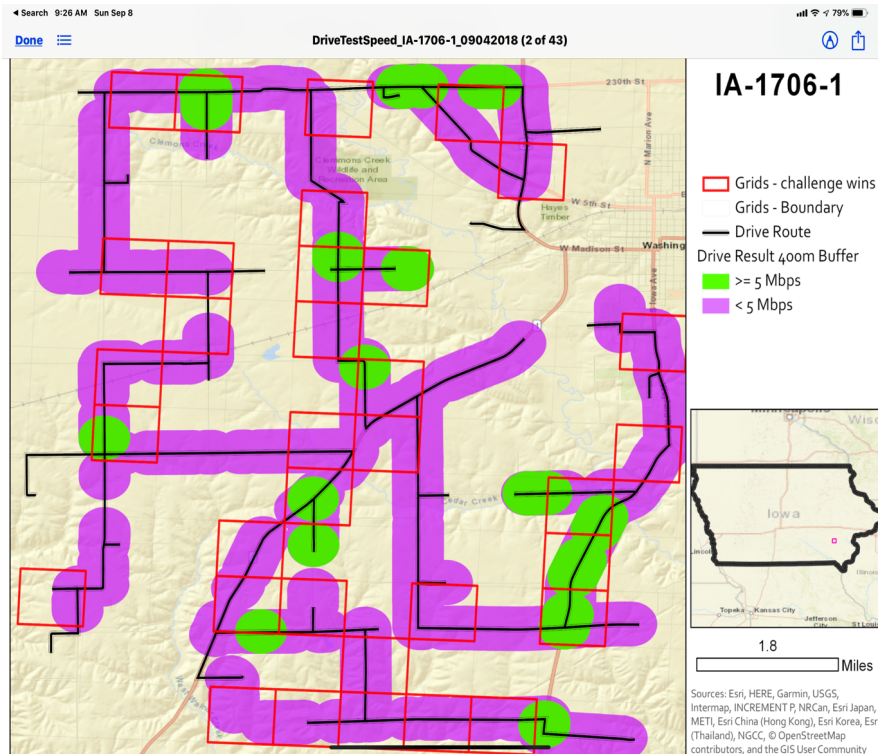
In short, we have to get this right because ten years of federal universal service funding are riding on this map. In the fixed broadband world, that's over \$20 billion of taxpayer funds and in the mobile world it is \$4.5 billion more. Every study indicates that it is going to take much more than \$25 billion over ten years to achieve high-quality fixed and mobile broadband

throughout our nation, and that doesn't even begin to account for the costs of rolling out 5G. We can't afford to waste a dollar.

With respect to 5G, although it does not exist today in America's rural areas, over the next decade billions will be invested. The wireless industry needs to build towers, increase transport capacity, and upgrade switching and other facilities to deliver what Congress set as a goal in the 1996 Act – that rural citizens should have access to telecommunications and information services that are reasonably comparable in quality and in price to those available in urban areas (47 U.S.C. § 254(b)(3)). Accomplishing this goal will not be possible without a robust universal service fund mechanism that stands on a strong knowledge base – an accurate broadband map. That is what this bill can deliver.

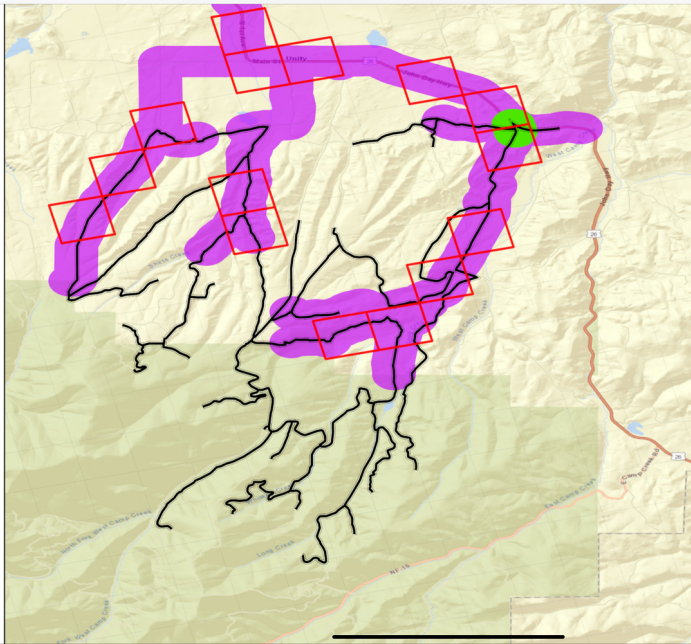
This Committee should adopt H.R. 4229 quickly so we can get on with the task at hand. It is important to note that although this will help fix the maps, we have a larger task remaining before us... that of filling in the maps. We look forward to working on that project next.

Thank you for the opportunity to testify today and for holding this vitally important hearing. I welcome any questions you may have.



MF2 – Sample Drive Test Results

“This map depicts an area that one or more wireless carriers show to be “served” in the FCC’s one-time data collection. U.S. Cellular’s tests revealed that a download speed of 5 Mbps could not be achieved on the vast majority of roads driven, as shown in purple above.”



OR-1757-1

- Grids - challenge wins
- Grids - Boundary
- Drive Route
- Drive Result 400m Buffer
- ≥ 5 Mbps
- < 5 Mbps



2.3
Miles

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

“This map depicts an area that one or more wireless carriers show to be “served” in the FCC’s one-time data collection. U.S. Cellular’s tests revealed that a download speed of 5 Mbps could not be achieved on the vast majority of roads driven, as shown in purple above.”