**In the Matter of "Improving the Quality and Accuracy of Broadband Availability Data"**
**Docket No. 180427421–8421–01**

To the National Telecommunications and Information Administration
Washington, D.C. 20230

# COMMENTS OF NEW AMERICA'S OPEN TECHNOLOGY INSTITUTE, ACCESS HUMBOLDT, BENTON FOUNDATION, CENTER FOR RURAL STRATEGIES, INSTITUTE FOR LOCAL SELF-RELIANCE, NATIONAL DIGITAL INCLUSION ALLIANCE, NATIONAL HISPANIC MEDIA COALITION, NEXT CENTURY CITIES, PUBLIC KNOWLEDGE, AND X-LAB

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## I. Introduction

New America's Open Technology Institute ("OTI"), Access Humboldt, Benton Foundation, the Center for Rural Strategies, Institute for Local Self-Reliance, National Digital Inclusion Alliance, National Hispanic Media Coalition, Next Century Cities, Public Knowledge, and X-Lab ("Commenters") respectfully submit these comments in response to NTIA's notice and request for comments on improving the quality and accuracy of broadband availability data. Robust data is a vital component of informed policymaking and efforts to close America's persistent digital divide. The best way to ensure access to such data is to establish a program that improves upon prior attempts to gather broadband access and adoption data. Commenters support efforts to aggregate datasets and then identify and fix gaps that exist in those datasets, but the ultimate goal of NTIA's work in this area should be for the agency to create, or lead the creation of, a comprehensive data collection scheme that is timely, accurate, granular, and sustainable. Combining third party data may provide a marginal benefit—and some progress could be made with $7.5 million—but this limited approach would likely create too many inconsistencies that would make those datasets, and analyses based on those datasets, insufficiently robust. Without better data, federal policy and subsequent resource allocation may reflect an inaccurate understanding of the digital divide.

In these comments, commenters argue that broadband availability data is imperative to many government activities, ranging from funding allocation of Federal Communications Commission (FCC) subsidies to the administration of the Census. The current open sources of federal data, namely the FCC's Form 477 data, are unreliable and flawed. Importantly, a holistic understanding of the digital divide requires more in-depth work that the recent Congressional appropriation cannot adequately fund. Specifically, any new data collection regime must measure barriers to broadband adoption—particularly the cost, a key metric for which very little

data exists. Any new regime should combine this data with measurement of broadband performance, potentially including Measurement Lab ("M-Lab") data and tools. Lastly, NTIA could use the $7.5 million allocation to aggregate and improve upon third party datasets, but it should not stop there. NTIA should continue seeking funding from Congress for a better broadband data collection system.

## II. Broadband data is essential for good policymaking, but better data requires increased funding

Accurate broadband availability data is essential to bridging the digital divide in the United States. For many years, local, state, and federal officials have worked to connect communities that are stuck on the wrong side of the digital divide. These efforts rely on broadband availability data to efficiently direct resources to areas in the greatest need. At the federal level, these programs include the FCC's Universal Service Fund programs (Connect America Fund, Lifeline, E-Rate, and the Rural Health Care fund), toward which the FCC plans to invest more than $8 billion over the next decade.[1] The federal government cannot adequately and effectively allocate these funds without accurate and comprehensive data collection techniques.

Broadband data is also increasingly important beyond the responsibilities of the FCC, as other government agencies continue to invest in online outreach. For example, the Census Bureau plans to conduct its first-ever internet-based U.S. Census in 2020.[2] Households that lack internet access will be sent paper forms via the U.S. Postal Service; good federal data about the

[1] *Universal Service*, FCC.gov, https://www.fcc.gov/general/universal-service. *See Connect America Fund Phase II Auction (Auction 903)*, FCC.gov, https://www.fcc.gov/auction/903; *Mobility Fund Phase II (MF II)*, FCC.gov, https://www.fcc.gov/mobility-fund-phase-ii-mf-ii.

[2] *See* James Barron, "Preparing for the 2020 Census, One Address at a Time," N.Y. Times (Mar. 8, 2018), https://www.nytimes.com/2018/03/09/nyregion/census-2020-new-york.html.

digital divide could help the Census Bureau identify and target such households to ensure that they are counted. However, if the Census Bureau were to rely on the government's current broadband maps, it would almost certainly fail to identify millions of Americans. This gap could severely undermine the accuracy of the 2020 Census and the wide range of activities that depend on Census data, including Congressional reapportionment, allocation of federal funding, and billions of dollars in business activity and research.

Nearly a decade ago, NTIA embarked on an ambitious effort to create a broadband data collection system known as the State Broadband Initiative ("SBI"). An outgrowth of the Broadband Data Improvement Act of 2008 and the American Recovery and Reinvestment Act of 2009, the SBI granted $293 million to states, territories, and their designees to collect data on the availability, speed, and location of broadband service.[3] That data was updated every six months until 2014, when the program ran out of funding. While the SBI collected data from many sources, it struggled to achieve its full potential due to inconsistent collection methods and reliance on voluntary ISP participation.

After the SBI program concluded, the FCC's Form 477—a mandatory, semi-annual filing for internet service providers (ISPs)—became the primary source of broadband mapping data.[4] Form 477 improves upon the NTIA's SBI data in two crucial respects: the data collection methods are consistent and ISP responses are mandatory. However, Form 477 asks ISPs to disclose where they provide service by census block. This measure of reporting has two significant problems. First, the approach leads to over reporting. In accordance with the FCC's policies, an ISP need only provide service to one home in a given census block for that census

[3] *See* Pub. L. No. 110-385, 122 Stat. 4096; Pub. L. No. 111-5, 123 Stat. 128; *State Broadband Initiative*, NTIA, https://www2.ntia.doc.gov/sbdd.
[4] *Modernizing the FCC Form 477 Data Program: Report and Order*, WC Docket No. 11-10, FCC 13-87 (2013). The FCC used Form 477 data to create a new broadband map in February 2018.

block to be considered fully served. The FCC has acknowledged that this practice could overstate the availability of broadband and the number of providers in a given area.[5] The second problem is that ISPs are not required to report actual broadband speeds experienced on the ground. Instead, ISPs only disclose the speeds that they could *feasibly* provide. These problems make it exceedingly difficult for the FCC and other policymakers to get an accurate picture of broadband availability and effectively discern where to target resources.

Many officials have expressed concern over the map's methodology and the impact of inaccurate data on public perception.[6] For example, the FCC's broadband map shows that seven counties in West Virginia have 100 percent fixed broadband access—an estimate that is grossly inaccurate, according to the chairman of West Virginia's Broadband Enhancement Council.[7] By overestimating broadband access, problem areas of West Virginia may go overlooked when the government allocates broadband subsidies.

Thus, the current broadband mapping situation is bleak. Congress' directive to NTIA is an important step in the right direction, but the path to accurate data collection will require more than the $7.5 million currently appropriated to the effort. Congress appropriated $350 million for the National Broadband Map, and the Trump Administration requested $50 million for broadband mapping in fiscal year 2018.[8] Congress' current appropriation will not go far.

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[5] Federal Communications Commission, "Fixed Broadband Deployment Data from Form 477," https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477 ("A provider reports deployment of a particular technology and bandwidth in a census block may not necessarily offer that service everywhere in the block. Accordingly, a list of providers deployed in a census block does not necessarily reflect the number of choices available to any particular household or business location in that block, and the number of such providers in the census block does not purpose to measure competition").

[6] *See* Federal Communications Commission, "Statement of Commissioner Jessica Rosenworcel re: Demonstration of the New National Broadband Map" (Feb. 22, 2018), www.fcc.gov/document/fcc-updates-national-broadband-map/rosenworcel-statement.

[7] Max Garland, "WV broadband council chairman blasts FCC report, says data isn't correct," Charleston Gazette-Mail (Feb. 8, 2018), www.wvgazettemail.com/business/wv-broadband-council-chairman-blasts-fcc-report-says-data-isn/article_d98cf35b-e9ac-5f82-93a9-b214770656db.html.

[8] *See* Congressional Research Service, "Broadband Data and Mapping" (July 3, 2018), https://fas.org/sgp/crs/misc/IN10925.pdf.

## III. The government should collect data on pricing and other barriers to broadband adoption

To fully understand the state of broadband availability in the United States, the government must also understand the barriers to broadband adoption. These barriers include cost, perceived lack of relevance, and poor service. However, the government so far has not collected these types of data in a systematized way.

Research has long established cost as a primary barrier to broadband adoption, but there is a dearth of reliable data on the actual price of broadband service.[9] A Department of Education report found that in 2015, 38 percent of 3- to 18-year-olds lacked home internet access because it was too expensive.[10] A 2013 Pew Research Center Survey found that 19 percent of people who do not use the internet did not do so because the cost of broadband service and owning a computer was too high.[11] The FCC reported that the average fixed monthly price for standalone broadband products at speeds between 0.2 Mbps and 10 Mbps in the U.S. was $47.08, which adds up to $564.96 annually.[12] Low-income individuals are acutely aware of the often unpredictable costs of internet access, which include not just monthly fees, but also hardware and software costs, installation costs and deposits, equipment maintenance fees, transaction costs for disconnecting, and frequent changes to subscription pricing.[13] Capturing the complexity of costs

[9] "Research Shows Cost is Biggest Barrier to Broadband Adoption," Benton (Jan. 11, 2016), https://www.benton.org/blog/research-shows-cost-biggest-barrier-broadband-adoption.
[10] "Student Access to Digital Learning Resources Outside of the Classroom," U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (Apr. 2018), https://nces.ed.gov/pubs2017/2017098.pdf.
[11] Kathryn Zickuhr, "Who's Not Online and Why," Pew Research Center (Sept. 25, 2013), http://www.pewinternet.org/2013/09/25/whos-not-online-and-why/; *see also* "Research Shows Cost is Biggest Barrier to Broadband Adoption," Benton Foundation (Jan. 11, 2016), https://www.benton.org/blog/research-shows-cost-biggest-barrier-broadband-adoption.
[12] Federal Communications Commission, International Broadband Data Report (Sixth) (Feb. 2, 2018), Appendix C, Table 1b, www.fcc.gov/reports-research/reports/international-broadband-data-reports/international-broadband-data-report-4.
[13] Dharma Dailey et al,, "Broadband Adoption in Low-income Communities," Social Science Research Council (Mar. 2010), http://webarchive.ssrc.org/broadband_adoption.pdf.

as a barrier to broadband adoption therefore requires collecting reliable pricing data across multiple layers of costs for consumers.

For many Americans, especially among low-income communities and communities of color, the deterring costs of a home internet connection mean that they have to rely on mobile connections instead. The FCC has acknowledged that people who exclusively rely on mobile broadband often lack the means to purchase both broadband and mobile services.[14] To subscribe to both broadband and mobile services would cost an average of $123.62 per month.[15] The number of Americans who were smartphone-only internet users at home—meaning that they owned a smartphone but did not subscribe to traditional broadband service where they live—grew from 13 percent in 2015 to 20 percent in 2018.[16] Individuals who were low-income, younger, and non-white were especially likely to be smartphone-dependent.[17] In 2015, Pew found that nearly half of smartphone-dependent users have had to cancel or suspend their cell phone service for an intermittent period because of the financial hardship of paying for the cost of maintaining the service.[18]

Against this context, the low rate of Lifeline-eligible Americans who actually participate in the program suggests that, even with the monthly Lifeline subsidy, many low-income households still face barriers to broadband adoption. Of the nearly 39 million households that

[14] Federal Communications Commission, 2016 Broadband Access Report (Jan. 28, 2016), ¶ 39.
[15] Federal Communications Commission, International Broadband Data Report (Sixth), (Feb. 2, 2018), Appendix C, ¶ 6, www.fcc.gov/reports-research/reports/international-broadband-data-reports/international-broadband-data-report-4.
[16] Aaron Smith and Kenneth Olmstead, "Declining Majority of Online Adults Say the Internet Has Been Good for Society," Pew Research Center (Apr. 30, 2018), www.pewinternet.org/2018/04/30/declining-majority-of-online-adults-say-the-internet-has-been-good-for-society.
[17] "Internet /Broadband Fact Sheet," Pew Research Center (Feb. 5, 2018), http://www.pewinternet.org/fact-sheet/internet-broadband.
[18] Aaron Smith, "U.S. Smartphone Use in 2015," Pew Research Center (Apr. 1, 2015), http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/.

qualified for Lifeline in 2017, only about 28 percent participated in the program.[19] Such a low participation rate suggests that even the monthly Lifeline subsidy does not sufficiently overcome every barrier to adoption. Based on OTI's research on the cost of connectivity, a $9.25 monthly subsidy only covers a small portion of the average price of broadband service plans.[20] Research demonstrates that a lack of perceived relevance is also a significant barrier to adoption, which some researchers have suggested is often rooted in other barriers such as cost.[21] Understanding these barriers, and the relationships between them, requires more reliable data.

## IV. The government should measure broadband performance

It is appropriate and necessary for the government to collect information about broadband performance, in particular because it would provide immense consumer benefit. Consumers are most concerned about two factors when choosing an internet service plan: price and speed.[22] However, consumers have few available tools to compare internet service providers or detect performance problems.[23] OTI has previously recommended best practices for measuring broadband performance.[24]

Broadband performance problems can arise in several areas in the network, which data collection can help identify. Broadband connection quality issues can also arise within a certain

[19] "Eligible Lifeline Population Statistics," Universal Service Administrative Co., https://www.usac.org/li/about/process-overview/stats/default.aspx.
[20] The Cost of Connectivity 2014, New America's Open Technology Institute (Oct. 30, 2014), https://www.newamerica.org/oti/policy-papers/the-cost-of-connectivity-2014 (in some major US cities, the least expensive broadband plans were $39.99 per month in 2014).
[21] Colin Rhinesmith, "The Complexity of 'Relevance' as a Barrier to Broadband Adoption," Benton Foundation (Jan. 6, 2016), https://www.benton.org/blog/complexity-relevance-barrier-broadband-adoption.
[22] Russo et al., Cost of Connectivity 2014, New America's Open Technology Institute, https://www.newamerica.org/oti/the-cost-ofconnectivity-2014/.
[23] "Broadband Performance: Additional Actions Could Help FCC Evaluate Its Efforts to Inform Consumers," U.S. Government Accountability Office (Apr. 17, 2015), https://www.gao.gov/products/GAO-15-363.
[24] "Getting Up to Speed: Best Practices for Broadband Performance Measurement," Open Technology Institute (June 2016), https://na-production.s3.amazonaws.com/documents/MeasuringBroadband.pdf.

network segment, at the very last mile, or within a local network.[25] When multiple users, devices, or data-intensive applications try to access content simultaneously, connection speeds can also degrade.[26] Congestion at interconnection points (the links between a service provider's network with equipment, facilities, or another network not belonging to that service provider) is also a leading cause of poor wireline broadband performance.[27] Therefore, any good measurement regime must include peak-hour performance and interconnection activity.

Measuring mobile broadband performance may require different approaches. Cell towers facilitate the delivery of mobile internet content to cell phones wirelessly over spectrum channels.[28] Wireless connections are susceptible to interference by radio waves emitted by other objects, and connection quality can also vary according to distance from the tower, signal strength, and the presence of physical barriers like walls or buildings.[29] Similar to wireline broadband performance, the number of individuals in a geographic area simultaneously attempting to use a mobile network can also have a significant impact on performance, creating intermittent periods of congestion on the network on an inconsistent schedule.[30] Mobile broadband performance varies significantly depending on time and location. Measuring its performance requires defining appropriate geographic areas and the possibility of disclosing

[25] "Getting Up to Speed: Best Practices for Broadband Performance Measurement," Open Technology Institute (June 2016), https://na-production.s3.amazonaws.com/documents/MeasuringBroadband.pdf.
[26] Government Accountability Office, "Broadband Performance: Additional Actions Could Help FCC Evaluate Its Efforts to Inform Consumers," (Apr. 2015), at 12, http://www.gao.gov/assets/670/669739.pdf.
[27] *See* Measurement Lab, "ISP Interconnection and its Impact on Consumer Internet Performance" (Oct. 28, 2014), www.measurementlab.net/static/observatory/M-Lab_Interconnection_Study_US.pdf; Stacey Higginbotham, "There's something rotten in the state of online video streaming, and the data is starting to emerge" GigaOm (Feb. 6, 2014), https://gigaom.com/2014/02/06/theres-somethingrotten-in-the-state-of-online-video-streaming-andthe-data-is-starting-to-emerge/.
[28] "Getting Up to Speed: Best Practices for Broadband Performance Measurement," Open Technology Institute (June 2016), https://na-production.s3.amazonaws.com/documents/MeasuringBroadband.pdf.
[29] Government Accountability Office, Broadband Performance: Additional Actions Could Help FCC Evaluate Its Efforts to Inform Consumers (Apr. 2015), at 7, http://www.gao.gov/assets/670/669739.pdf.
[30] "Getting Up to Speed: Best Practices for Broadband Performance Measurement," Open Technology Institute (June 2016), https://na-production.s3.amazonaws.com/documents/MeasuringBroadband.pdf.

speed ranges rather than integer numbers.[31] All of these constraints must be taken into account when measuring mobile connections.

Commenters encourage NTIA to consider Measurement Lab as an example of good broadband performance measurement. M-Lab is the largest open source internet measurement effort in the world, a platform that hosts hundreds of servers throughout the world that allows anyone with an internet connection to test that connection.[32] Its data is publicly available and its tools are open source. Key to M-Lab's platform is that, unlike ISP-hosted speed tests, the servers are located outside of an ISP's network (as is much of the content that consumers access online), thus the M-Lab tests provide a more realistic measure of the consumer experience than an ISP-hosted test. The test collects approximately two million measurements per day throughout the world and the M-Lab dataset is large and getting larger by the day.

M-Lab's platform has been used to measure broadband speeds throughout the United States. Last year, the city of Seattle partnered with OTI to create a citywide map of broadband speeds that leverages the M-Lab platform.[33] However, the Seattle map does not just collect speed information. Prior to running the test, the user is asked for information about their internet connection, like who their ISP is, what speed they subscribe to, and how much they pay for it. That data is then sent to the city of Seattle, along with the speed measurement.[34] The city then uses that information to populate a broadband availability map (not based on self-reported, unverified data like the FCC's Form 477 data) and to create policy. It also allows the community to be involved in broadband policy and ensuring that the entire community is served sufficiently.

[31] *Id.*
[32] OTI is a partner in the consortium that runs the M-Lab platform. *See* "Who We Are," Measurement Lab Website, https://www.measurementlab.net/who.
[33] Seattle Broadband Map, https://broadbandmap.seattle.gov.
[34] About the Broadband Speed Test, Seattle Information Technology, https://www.seattle.gov/broadband-speed-test-about.

Similarly, in Louisville, the city used the M-Lab measurement tests to create its own mapping tool called "SpeedUpLouisville" in partnership with a local civic technology company.[35] Like Seattle, Louisville allows users to test their internet connection and that information populates their map. Louisville also allows anyone to explore the data they have collected and have created various visualizations of that data. The SpeedUpLouisville data has informed local policy and funding decisions.

M-Lab tools and data were also part of an OTI research project to collect broadband speed data for Alexandria, Virginia public schools. That project included a thorough examination of the schools' technology and the types of technology that are available to high school and middle school students, how often technology is used in teaching, and how often technology and connection problems get in the way of teaching.[36] Then, using M-Lab tools, the schools tested their connections nearly 17,000 times over the course of two months in 2016.[37] The findings in this study pointed to the need for more nuanced benchmarks for student connectivity needs than simple per pupil speeds as a multiplier for purchasing bandwidth for the school district. The study also suggested that a school's bandwidth may also be blamed inordinately for poor application performance that could be caused by other factors such as a content provider's hosting choices or bugs in the application itself. All of these findings confirm that schools need

[35] SpeedUpLouisville, https://www.speeduplouisville.com/all-results.
[36] "Measuring Broadband in Alexandria City Schools," III. Teacher Survey and Discussions, New America's Open Technology Institute, https://www.newamerica.org/in-depth/measuring-broadband-alexandrias-schools/iii-teacher-survey-and-discussions.
[37] "Measuring Broadband in Alexandria City Schools," IV. Broadband Measurement, New America's Open Technology Institute, https://www.newamerica.org/in-depth/measuring-broadband-alexandrias-schools/broadband-measurement.

measurement tools to ensure they are getting what they pay for and that they are appropriately provisioning their networks based on real assessment.[38]

M-Lab is currently being used in another measurement project led by Simmons College, where it will test the connections of approximately 65 libraries over two years.[39] The importance these anchor institutions play in everyday society cannot be overstated. Their internet connections play a vital role in ensuring citizens can stay connected and informed. Without an ability to test those connections, libraries will not be able to maximize their impact on their communities. M-Lab is also partnering with Penn State and the Institute for Local Self-Reliance to do extensive analysis and assessment of Pennsylvania's broadband access for the Center for Rural Pennsylvania.[40]

NTIA can also learn from the FCC's Measuring Broadband America program ("MBA"), which is an important program but has some drawbacks. For example, MBA's methodology and the data it collects from the SamKnows measurement platform are not open. If the data and methodology were open, it would be much more useful and powerful as a data collection and verification tool. Further, the program releases annual reports, but those reports should be more frequent, as the state of broadband can change quickly.[41] Policy and resource allocation decisions must be made with the most up-to-date information. For now, the MBA program remains a black box that has significant compatibility problems with other datasets.

[38] "Measuring Broadband in Alexandria City Schools," V. Measurement Findings, New America's Open Technology Institute, https://www.newamerica.org/in-depth/measuring-broadband-alexandrias-schools/v-measurement-findings.
[39] Chris Ritzo, "Supporting Broadband Measurement in Libraries," New America's Open Technology Institute (Apr. 27, 2018), https://www.newamerica.org/oti/blog/supporting-broadband-measurement-libraries.
[40] Center for Rural Pennsylvania, http://www.rural.palegislature.us/grants_current_projects.html (see Broadband Availability and Access).
[41] "Getting Up to Speed: Best Practices for Broadband Performance Measurement," Open Technology Institute (June 2016), https://na-production.s3.amazonaws.com/documents/MeasuringBroadband.pdf.

## V. NTIA should build upon the Community Connectivity Initiative and seek funding for a sustainable, high-quality dataset

The notice requests information about alternative datasets beyond Form 477 and Census data. M-Lab is one such source. But NTIA should focus on building up its prior Community Connectivity Initiative work while also thinking of ways it can improve upon or augment third party datasets (rather than rely on them exclusively). It should also be asking Congress for more funds to improve on current data collection techniques.

NTIA is already familiar with data collection and aggregation techniques and efforts. It ran one such effort, the Community Connectivity Initiative, starting in 2016 and of which OTI was a partner.[42] With the small amount of new appropriations, NTIA could continue to build on that prior work, perhaps with more pilot projects, to help localities determine broadband needs and ensure quality data from those communities. It should also make that data public as it seeks to aggregate other datasets. In particular, NTIA should continue working on the BroadbandUSA Connectivity Assessment Tool (BCAT).[43] It could also work with stakeholders such as former Presidential Innovation Fellow Robert Ballance, who is working on the "Internet is Infrastructure" project,[44] which aims to integrate third party datasets with government data in ways that support and amplify NTIA's efforts. As part of this comment process, NTIA should review that project to better understand how to work with combining the publicly available datasets as part of a review of what data sets are most useful in understanding broadband access in the US.

[42] "NTIA Launches Community Connectivity Initiative with Backing from Major Community Groups," National Telecommunications and Administration Blog (Mar. 9, 2016), https://www.ntia.doc.gov/blog/2016/ntia-launches-community-connectivity-initiative-backing-major-community-groups.
[43] "BroadbandUSA Connectivity Assessment Tool (BCAT)," BroadbandUSA, https://www2.ntia.doc.gov/BCAT.
[44] Internet is Infrastructure, https://internet-is-infrastructure.org (last visited July 16, 2018).

NTIA should also use this opportunity to identify all third party datasets and determine where gaps exist. Once it identifies those gaps, it should put out a further request for comments on how to address those gaps, especially through the use of currently-existing tools (such as BCAT) or creation of new tools. These would be reasonable starting points for using the very limited new money from Congress.

Yet, these are merely starting points, and NTIA's work should not stop with a survey of current data. In part, there are many drawbacks to focusing exclusively on these approaches. First, third party datasets may be difficult to merge based on differences between data collection and labeling practices. For instance, as mentioned above, M-Lab in Seattle collected information based on surveys that accompanied the speed tests, but those would be available only for Seattle data and may not fit well in aggregated datasets. One way to address that inconsistency would be to adopt a similar data collection approach throughout the U.S., which M-Lab could do with proper funding.

Second, the third party datasets are updated at different times, and they may only exist at one point in time, while other sets may be updated periodically (but also at different intervals). For instance, M-Lab data is updated whenever a person runs a speed test. SBI data was updated semi-annually, and most states have not been updated since 2014.[45] Form 477 data is also updated semi-annually, though the FCC is seeking comment on extending that interval to one year.[46]

[45] Some states have continued to update their data (some using Form 477 data), including New Hampshire (http://www.iwantbroadbandnh.org), Michigan (https://connectednation.org/michigan), Massachusetts (http://broadband.masstech.org/news-and-updates/map-gallery/last-mile-maps), New York (https://map.nysbroadband.ny.gov/html5viewer/?viewer=broadband), Virginia (https://broadband.cgit.vt.edu/IntegratedToolbox/), and Wisconsin (https://maps.psc.wi.gov/apps/WisconsinBroadbandMap/),

[46] Federal Communications Commission, Further Notice of Proposed Rulemaking, *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 17-199 (Aug. 24. 2017).

Thus, NTIA should aggregate and improve upon existing initiatives as it sought comment on, but it should also seek more funding from Congress for what is truly needed—a comprehensive, accurate, granular, and sustainable data collection program that provides a long-term solution to the problems underlying this request for comment.

## VI. Conclusion

Commenters thank NTIA for the opportunity to engage in this process and welcome further opportunities to discuss how to improve federal data about the state of broadband in the United States.