



August 2, 2018

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

Re: Modernizing the FCC Form 477 Data Program
WC Docket No. 11-10

Madam Secretary:

This letter provides notice of an oral ex parte presentation to the Commission in the above-captioned docket. Paula Boyd, Paul Garnett, and Allen Kim of Microsoft Corporation met with Erin McGrath in Commissioner O’Rielly’s office on July 31, 2018, and with Umair Javed in Commissioner Rosenworcel’s office on August 1, 2018.

In these meetings, Microsoft offered suggestions to improve the quality, accuracy, and utility of FCC Form 477 data, with the objective of assisting the Commission’s ongoing efforts, “to comply with statutory requirements and develop, evaluate, and revise policy, and provides important benchmarks for Congress, the Commission, other policy makers, academic researchers, and consumers.”¹ FCC Form 477 is the Commission’s principal tool to gather data on communications services, including broadband subscribership and deployment, as provided by service providers.²

Microsoft is supportive of the Commission’s approach to strike a balance between collecting more granular and more accurate information on Form 477 to increase its usefulness to the Commission and a diverse audience of data users, while ensuring the filing requirements are not overly burdensome. A summary of our discussion points, along with additional observations and comments, follows.

1. Broadband Deployment Data For Purposes of Form 477 Should Only Include Census Blocks Where Broadband Has Actually Been Deployed

In order to improve data accuracy and make the resulting maps more useful to policymakers, Microsoft recommends limiting the broadband deployment dataset only to those

¹ *Modernizing the FCC Form 477 Data Program*, Further Notice of Proposed Rulemaking, FCC 17-103 (rel. Aug. 4, 2017) (“Further Notice”).

² Further Notice at 1.

census blocks where broadband has been actually deployed. Under the current Form 477 instructions, a census block is considered to have fixed broadband when a carrier “could, within a service interval that is typical for that type of connection,” deploy service to a requesting customer “without extraordinary commitment of resources.”³ Since the Form 477 instructions provide no guidance, it is unclear how a particular filer would or should define terms like “could”, “typical”, “extraordinary”, “commitment”, and “resources.”

This shortcoming leads to a potentially systematic overstatement of where broadband is actually available, as carriers using fiber, copper, coax, or wireless can all draw maps showing broadband availability that is larger than the actually deployed area, even if they have no near-term intention of actually extending service to the outlying unserved areas. In fact, an entire census block could be considered “covered” when a carrier “could” serve a very small portion, but in fact serves none of it. As a result, there are likely to be numerous instances in which rural census blocks are misleadingly reported as having access to broadband.

To highlight the situation, we are aware of a rural county in which the FCC’s data reports six fixed broadband providers and 100% of the census blocks as having broadband access meeting the FCC’s 25/3 Mbps definition. Interestingly, about two-thirds of the census blocks in that county have a population of zero. Although two broadband providers have reported to the FCC that they can provide broadband service exceeding the FCC’s 25/3 Mbps definition throughout this county, neither of those providers offer services to residential customers, and neither include this county as being served on their websites. Further, the customer service representatives for these providers confirmed that they do not provide residential services in these communities.

Upon closer examination, we were able to confirm that small businesses in a very small number of the county’s census blocks actually have access to broadband. One of the broadband operators provides service to a small number of small businesses in the county’s only large town. We also note that if a residential customer favorably located in the town’s center were to order services from one of these broadband providers, they would be required to pay over \$250 per month for 25/3 Mbps broadband service.

This situation is all too common in rural America and is frustrating for the people who live there. A local real estate agent in the rural county explains that the availability of broadband access (or lack thereof) guides whether people will move to his county and is causing many people to leave to better connected areas: “As a realtor I can tell you one of the first things people ask about is if high-speed Internet is available.” The following comment from a local citizen on a community chat board sums up the situation, “Our internet is pathetic! Literally one step above dial up. It is through [company name removed], but there wouldn't be any way that you could run a business off of this service. Slow.... Trying to watch a video is painful!”

³ See FCC Form 477 Instructions, at <https://transition.fcc.gov/form477/477inst.pdf>.

When, as shown above, FCC Form 477 data does not match broadband availability on the ground, the FCC's CAF and Mobility Fund universal service support mechanisms are compromised, as well as other federal and state programs that, now or in the future, depend on Commission data to decide where to invest broadband deployment funds to deliver service quality in rural areas that is reasonably comparable to that which is available in urban areas.⁴ Accurate broadband availability data is especially important to the FCC, which has been entrusted with distributing over \$4 billion annually in Connect America Fund and Mobility Fund universal service support (nearly \$80 billion since 2000). Having accurate broadband data can determine whether a rural community is able to participate in the 21st century economy, because any location or area incorrectly considered to be "served" becomes ineligible for universal service investment, and perhaps other government programs as well, for the foreseeable future.

For these reasons, Microsoft recommends modifying Section 5.3 of the FCC Form 477 instructions as follows:

fixed broadband connections are available in a census block if the provider ~~does or could, within a service interval that is typical for that type of connection — that is, without extraordinary~~ provisions ~~commitment of resources —~~ two-way data transmissions to and from the Internet with advertised speeds exceeding 200 kbps in at least one direction to end-user premises in the census block.

The recommended modification removes guesswork and subjectivity inherent in determining what is considered to be a typical service interval, or what constitutes an extraordinary commitment of resources. With this change, it will no longer be possible for an entire census block to be considered "covered" when a carrier "could" serve a very small portion, but in fact serves none of it.⁵ Moreover, areas that do not have service will no longer show up on the map as "served."

Microsoft recognizes that there is value in understanding where broadband service could be provided without the need for an extraordinary commitment of resources. Accordingly, the Commission could separately request filers to identify census blocks where they could provision broadband service upon a reasonable request. This would allow the Commission to retain the same level of detail it has today, while increasing the accuracy of maps depicting where broadband is actually available.

⁴ See 47 U.S.C. §254(b)(3).

⁵ See Ex Parte Comments of NTIA, *supra*, at pp. 6-7; FCC Form 477 Frequently Asked Questions, at p. 20 ("Should we include blocks that we can offer service in and where there is population, but we currently have 0 subscribers? A. Yes.") <https://transition.fcc.gov/form477/477faqs.pdf>.

2. The Commission Should Consider Online Visualization and Analytics Tools to Improve Data Accuracy

Microsoft agrees with the National Telecommunications Information Administration's ("NTIA") submission to the Further Notice that the Commission should, "expand the audience for [Form 477] data by enhancing their accessibility with tables, charts and maps, granular visualization tools for both localized areas and specific technologies, and other mechanisms that summarize the information."⁶ Microsoft has a variety of visualization and analytics tools that can help users understand broadband availability, assist the Commission in identifying outlier submissions from providers and, more generally, accelerate the process of cross-checking data.⁷

Microsoft can imagine a simpler visualization and analytics tool that can reduce data input errors, provide near real time data analytics and aid in the Form 477 data submission process. According to the Form 477 filing instructions, a filer's census block- or census tract-level data for the entire nation can be uploaded in a single delimited, plain text file using a comma-separated value (CSV) – a file format used to store tabular data in plain-text form. We believe that an online and near-real time visualization and analytics tool that shows a filer the geographic areas corresponding analytics for census tracts and census blocks prior to transmitting the file to the Commission could increase accuracy of the Form 477 data. The Commission could also use such a visualization and analytics tool to identify outlying census tracts and census blocks with data anomalies based on the respective 10 or 15 digit code CSV transmitted by the filer.

More broadly, data visualization and analytics tools can be used to aggregate, disaggregate, and mash up the information on the Form 477 with other sources and identify patterns – all with the goal of identifying outlier data entries regarding broadband deployments, speeding up the cross-checking process and improving data accuracy. We have enclosed copies of a slide presentation delivered at the meetings explaining how an intelligent mapping tool, (i) can improve broadband analysis and make raw data more visually accessible, and (ii) allows a Form 477 filer to identify served counties visually, increasing accuracy and improving the process for both filers and the FCC. These tools can be used to produce a wide variety of visualizations that will assist policymakers in making sound decisions.

⁶ Ex Parte Comments of NTIA, supra, at p. 10.

⁷ For example, Microsoft's Power BI is a suite of business analytics tools that deliver insights, allowing users to connect to hundreds of data sources, simplify data prep, and produce reports that are available on the web or mobile devices. <https://powerbi.microsoft.com/en-us/>. Microsoft's PowerApps allows users to build and use custom business apps that connect to user data and work across the web and mobile, without the time and expense of custom software development. <https://powerapps.microsoft.com/>.

3. Form 477 Data Should be Collected Annually

The Commission seeks comment on whether collecting FCC Form 477 data on a twelve-month cycle would render the data less useful.⁸ The process of preparing and checking Form 477 data confers a significant burden on carriers, so the question is whether users accessing data in months 7-12 after a submission would find it so unusable as to require continuing on a six-month cycle. Microsoft believes the diminution in data quality flowing from a twelve-month cycle is not significant, while the reduction in burden for carriers would be significant, and therefore moving to a twelve-month cycle is advisable.

4. The Commission Should Not Complete its Form 477 Further Notice Until NTIA Completes its Comments on Improving Broadband Availability Data

Earlier this year, Congress directed the NTIA to identify regions of the country with insufficient broadband capacity, particularly in rural areas.⁹ NTIA is tasked with updating the National Broadband Map in coordination with the FCC and partnerships developed previously with the states under its State Broadband Initiative program. On May 30, 2018, NTIA published a Notice and Request for Comments (“RFC”) seeking comment on actions that can be taken, including specific requests for methodologies and technologies, to capture broadband availability data, particularly in rural areas.¹⁰ Among other things, NTIA seeks to acquire relevant third-party data sets it can obtain through negotiation, to supplement FCC data obtained through its Form 477 program, and data from other federal government agencies, state government, and other sources.¹¹

Judging from its data requests, it is apparent that NTIA is searching for entirely new approaches to analyzing broadband availability data. For example, NTIA asks for sources of additional data, details about how such data is compiled and formatted, new approaches that could be used to capture availability data, how such data can be validated, and what data improvements the government can implement to identify areas with insufficient broadband.¹²

Microsoft suggests that the Commission would be well served to keep this proceeding open while NTIA identifies other third-party data sources and develops information that may increase the accuracy of broadband mapping. In addition, coordination provides an opportunity to identify, adopt and implement best practices for data collection, analysis and

⁸ Further Notice at para. 57.

⁹ Consolidated Appropriations Act, 2018, Pub.L. 115-141. See, <https://www.congress.gov/115/bills/hr1625/BILLS-115hr1625enr.pdf>.

¹⁰ Improving the Quality and Accuracy of Broadband Availability Data, 83 Fed. Reg. 24747 (May 30, 2018).

¹¹ Id.

¹² Id., at 24749.

Hon. Marlene H. Dortch
August 2, 2018
Page 6

visualization, which will inform the FCC's upcoming decisions about how new Form 477 data should be collected and displayed.

A copy of this letter and enclosure are being submitted into the above-referenced docket. Should you have any questions, please contact the undersigned directly.

Sincerely,

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Enclosure

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Airband Initiative

Broadband Mapping Meeting

July 31, 2018



Agenda

- Review the data sources the team uses
- Demonstration of how we use the data
 - Excel, Power BI, and ArcGIS
- Opportunities to increase data accuracy
 - Comparison of data sets in a few counties
- Next steps

Data sources we use

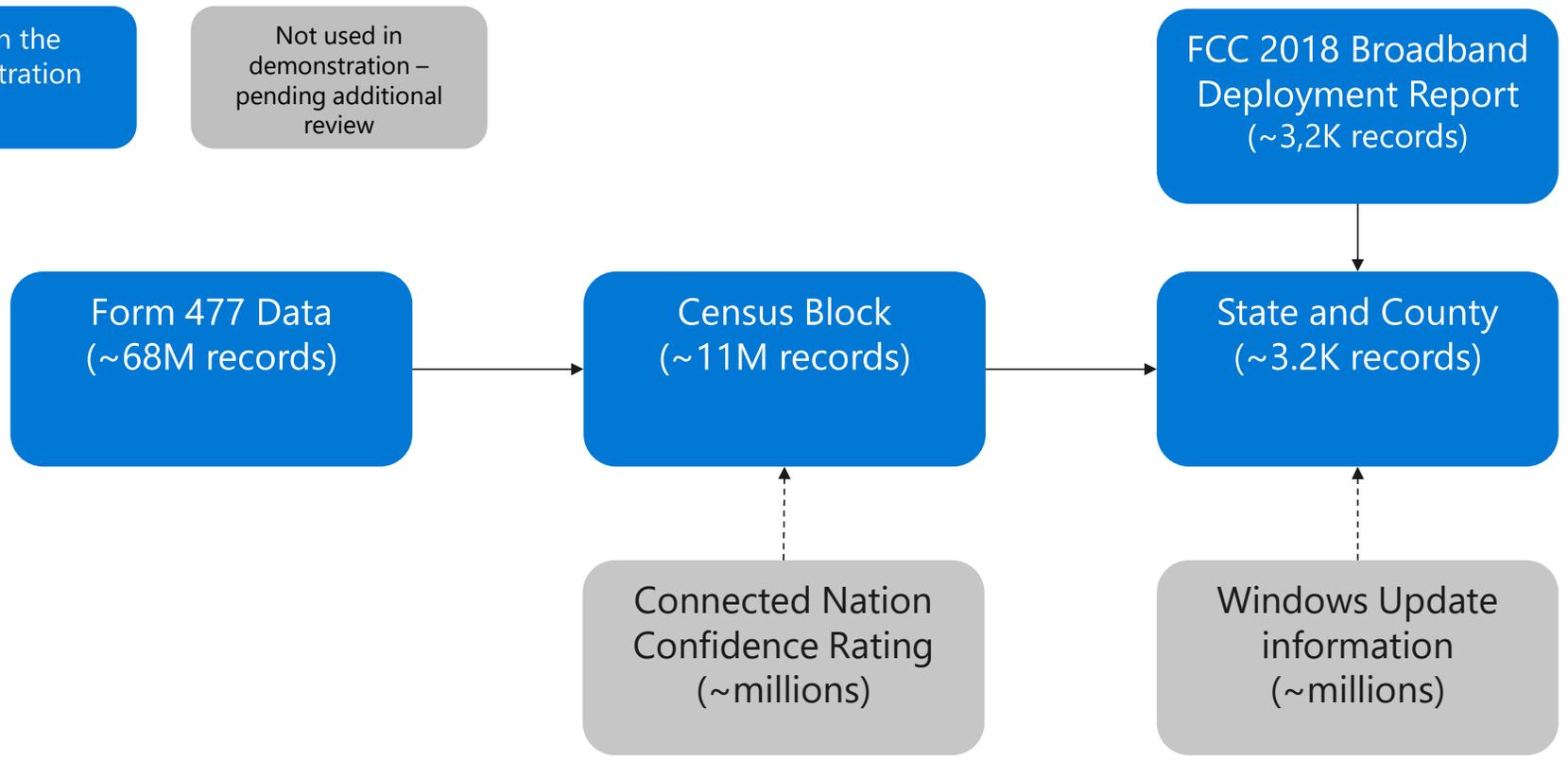
- Included in today's demonstration
 - FCC 2018 Broadband Report
 - <https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2018-broadband-deployment-report>
 - Form 477 data
 - <https://opendata.fcc.gov/Wireline/Fixed-Broadband-Deployment-Data-December-2016-Stat/b5f4-szwq>
 - Census data
- Pending additional review
 - Connected Nation confidence rating
 - CN has developed a scoring algorithm to take into account multiple criteria (e.g. census block size, household density, etc.)
 - Windows update data
 - Analyzing download speed and download speed distribution

Data sources we use and how they are related

Legend

Used in the demonstration

Not used in demonstration – pending additional review



Demo

Allen Kim

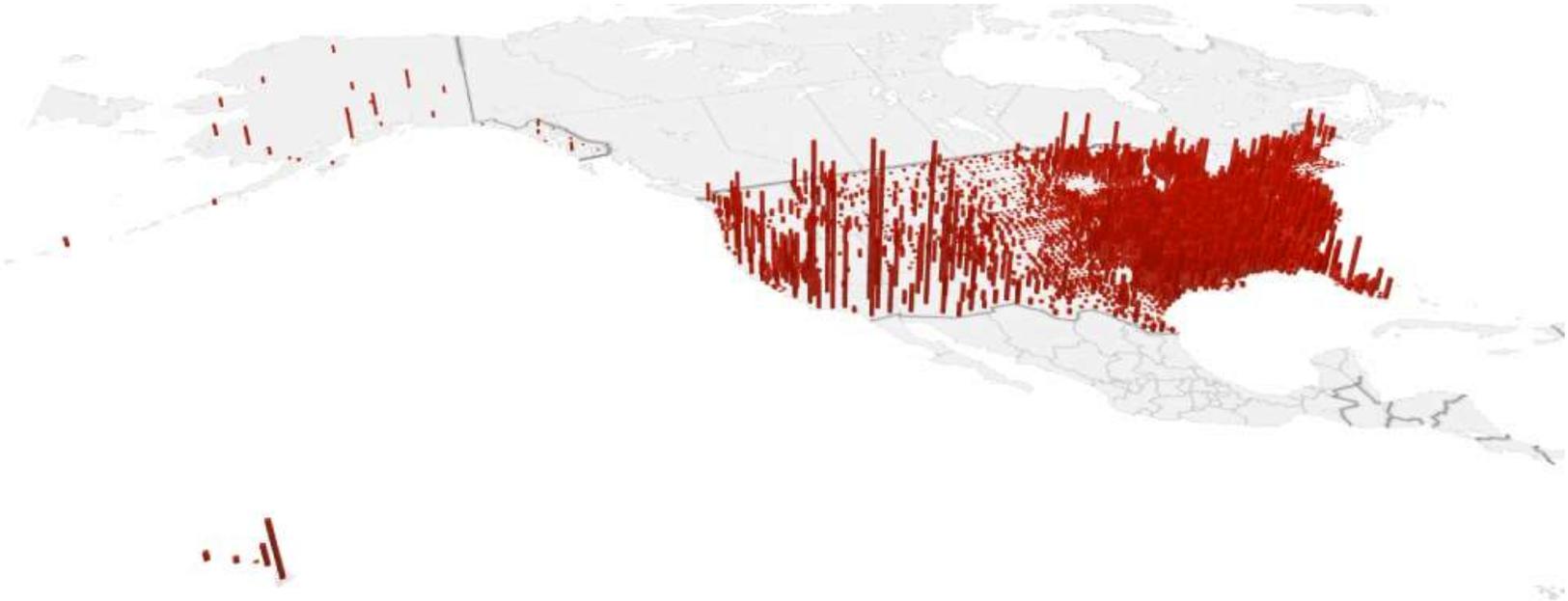
Visualizing Broadband Access Data using Excel

FCC 2018 Broadband Deployment Report

Fixed Broadband as defined by the FCC

25 MBPS DOWNLOAD · 3 MBPS UPLOAD

■ Number of people in US rural areas per county **without access** to fixed broadband



Data source: FCC 2018 Broadband Deployment Report, Appendix F2

