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June 25, 2018

National Telecommunications and Information Administration
U.S. Department of Commerce
Attn: Mr. Douglas Kinkoph, Associate Administrator
1401 Constitution Avenue NW, Room 4887
Washington, DC 20230

RE: RIN 0660-XC042, Improving the Quality and Accuracy of Broadband Availability Data, *notice published in the Federal Register, Vol. 83, No. 104, Wednesday, May 30, 2018.*

Dear Mr. Kinkoph:

Staff at the Centre County Planning and Community Development Office greatly appreciates the opportunity to respond to your agency's request for comments. Broadband deployment is a priority issue identified at all government levels in our Commonwealth¹. The Center for Rural Pennsylvania² is advocating for broadband deployment and provided funding to Pennsylvania State University researchers to further explore broadband data availability issues. We hope that the comments provide your agency leads on supplemental data acquisition.

Best regards,

Elizabeth Lose

Senior Planner

Cc: Margaret N. Gray, County Administrator
Robert B. Jacobs, AICP, Director
Mike Bloom, Assistant Director

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¹ Pennsylvania Governor Tom Wolf established the Office of Broadband Initiative in March 2018 in partnership with the PA Department of Transportation to administer the Broadband Investment Incentive Program (<https://www.governor.pa.gov/broadband/>) which pairs potential funding with the FCC's Connect America Fund Phase II Auction.

² The Center for Rural Pennsylvania (<http://www.rural.palegislature.us/>) was founded under the Rural Pennsylvania Revitalization Act to advance education on rural matters and administer research grants. The Center's Board of Directors accepted written comments as part of testimony on Pennsylvania rural broadband internet issues on April 5, 2018.

1. Identifying additional broadband availability data: part a & b.

State: Department of Transportation³, Public Utility Commission⁴, Statewide Radio Network⁵
 Not-for-Profit: KINBER⁶
 County/Local Governments: Mifflin County Internet Advisory Committee⁷
 Academic: The X-Lab, Penn State Department of Communications⁸

The Congressional directive to the NTIA to coordinate with the FCC and use partnerships previously developed with the States⁹ is a clear indicator that the State Broadband Initiative method of voluntary data submittal is being reconsidered to supplement the Form 477 reporting requirements. It is common knowledge that there are few federal-level broadband availability datasets and, the majority of the private-sector broadband data is based upon the FCC’s reports. The collaborative use of data produced and/or acquired by the above will be subject to both privacy and confidentiality concerns specifically if the dataset can be linked back to a physical address.

2. Technology type, service areas, and bandwidth: parts a through d.

Source	Technology	Bandwidth	Service area	477 Form	File format
PA Department of Transportation	Wireline	Varied based on PennDOT district	Statewide, but limited to major highway corridors	Attempting to match will likely only result in overestimation of availability if tied back to Census blocks	GIS
PA Public Utility Commission	Wireline, cable	N/A	Statewide; franchise and/or tariff boundary		Excel, listing the municipality in which the company operates
PA State Police	Wireless	N/A	Statewide		GIS
KINBER	Wireline	Achieving 1Gbps downloads	Statewide		GIS
Mifflin County	Multiple	N/A	Mifflin County; collected point survey data		GIS
The X-Lab @ Penn State	Multiple	N/A	Statewide; on-going research		TBD

³ <http://www.penndot.gov/>. PennDOT owns and operates a limited fiber optic network which serves their infrastructure (electronic messaging boards, for example).

⁴ <http://www.puc.state.pa.us/>. The Pennsylvania Public Utility Commission may be willing to partner to secure more detailed telecommunications companies wireline networks; however, it is not a regulatory requirement that companies do so.

⁵ <http://www.psp.pa.gov/about%20us/pages/pastarnet.aspx>. The Pennsylvania State Police (PSP) owns an extensive network of radio communication facilities that may be available for third-party internet service providers to lease and collocate equipment on.

⁶ <https://kinber.org/>. KINBER is a consortium representing the universities in Pennsylvania’s state-system of higher education. The board oversees the activities of KINBER staff to operate, manage and market the PennREN fiber optic network. The network has expanded to serve the Centre Region Council of Governments in Centre County, PA.

⁷ <http://www.co.mifflin.pa.us/dept/PlanningDev/Pages/Mifflin-County-Internet-Advisory-Committee.aspx>. The Mifflin County Internet Advisory Committee collected local level broadband information with assistance from Penn State’s Cooperative Extension in a survey of Mifflin County residents and business-owners. The information collected was mapped by the County’s GIS department to depict served and unserved areas. Other PA counties are performing similar surveys by which the data will be put in a spatial format and compared with other available data.

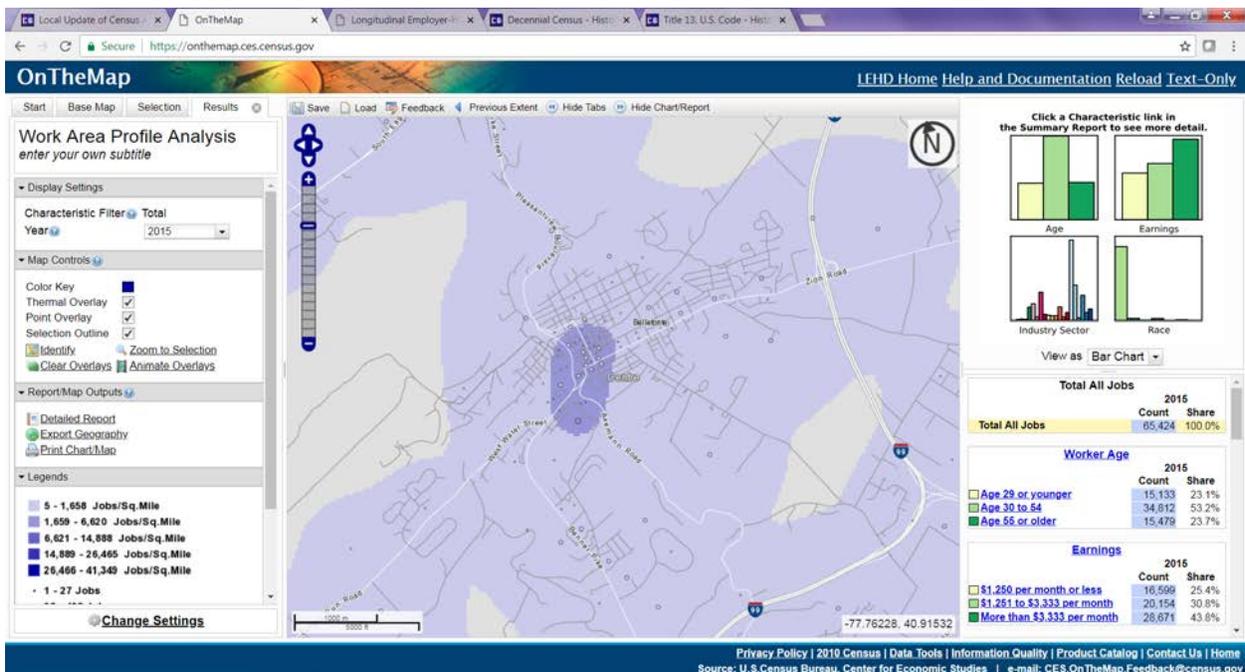
⁸ <http://thexlab.org/team>. Dr. Sascha Meinrath (sascha@thexlab.org) is leading a state-wide research project to address similar broadband availability data gaps. He is likely prepared to release results in early 2019.

⁹ The Consolidated Appropriations Act of 2018, online at <https://www.congress.gov/bill/115th-congress/house-bill/1625/text>.

3. New approaches

a. Continue incorporation of U.S. Census Bureau data that is specific to point address locations collected through the Local Update of Census Addresses Operation¹⁰ that could potentially be used to generate a “heat map” of broadband availability, similar to those schematics from the On the Map Application¹¹ using the Longitudinal Household-Employer Dynamics¹² data.

County and local governments voluntarily submit residential addresses to the U.S. Census Bureau in advance of the decennial survey to assist field enumerators locate and count individuals. The residential locations and all information collected is protected under U.S. Code, Title 13¹³ however, there are measures that can be applied to display useful data that ensures confidentiality. The Bureau’s Center for Economic Studies pairs information collected on both employees and employers at their locations but produces a data set that displays the density of businesses and workers based on an attribute or a set of parameters in a user-defined geography. That same methodology could be applied to the American Community Survey’s three household broadband adoption questions to define geographies with “high connectivity” rates: the presence of wired broadband devices, the presence of mobile broadband devices, and a broadband internet subscription. In rural areas where residential densities are low, this approach would better depict underserved broadband households. A screen-capture from the On the Map application is shown.



A “heat map” of broadband availability would be a much more useful overlay by which end-users could explore the level of connectivity in their communities. The overlay could be paired with Census Tract geography but would be an independent check to the Form 477 process.

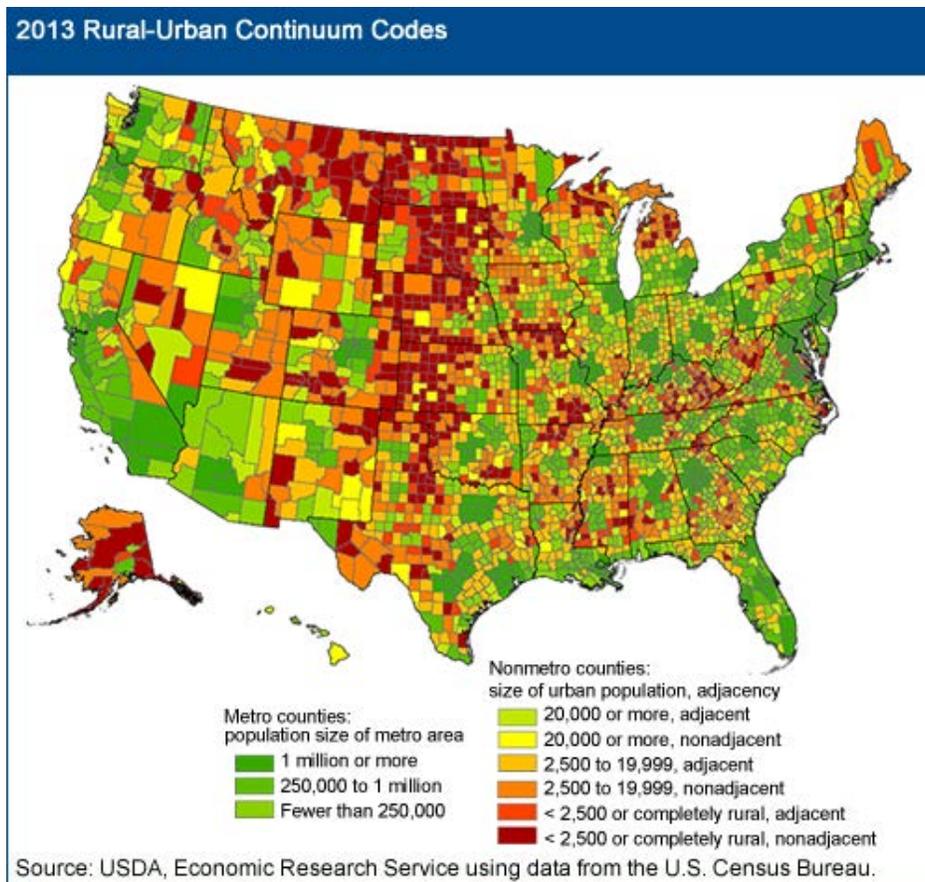
¹⁰ <https://www.census.gov/programs-surveys/decennial-census/about/luca.html>.

¹¹ <https://onthemap.ces.census.gov/>.

¹² <https://lehd.ces.census.gov/>.

¹³ https://www.census.gov/history/www/reference/privacy_confidentiality/title_13_us_code.html.

b. Better align the Connectivity Continuum¹⁴ with the USDA-Economic Research Service’s Rural-Urban Continuum¹⁵ to assess if community broadband access issues correlate to the definition of rural and if rural communities are being targeted for broadband deployment.



The definition of rural and urban can have vastly different meanings according to the data-producing agency. A population of less than 2,500 is almost universally recognized as the rural threshold. The United States Office of Management and Budget (OMB) was a party to defining the USDA’s data by first defining metropolitan and non-metropolitan counties which considered population and worker commuter patterns from the American Community Survey. The Rural-Urban Continuum Codes were updated between 2003 and 2013 with a scheduled update in 2023. Thom File’s connectivity continuum was applicable only to the states while the rural-urban continuum captures counties. Could File’s approach be driven-down to county-level data? Quite possibly in the next Current Population Survey Supplement, if the NTIA feels the need to collect and disseminate that geographic detail. On that note, the 3 questions posed by the ACS by which “high connectivity” is defined are available for some counties which could align with File’s classifications¹⁶.

¹⁴ File, T. *Digital Divides: A Connectivity Continuum for the United States*. Princeton University, 2012. White paper available online at <http://paa2013.princeton.edu/papers/130743>. The research utilized data from the 2011 Current Population Survey which was later published by the U.S. Census Bureau in circular P20-569.

¹⁵ <https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/documentation.aspx>.

¹⁶ Table S2801, Types of Computers and Internet Subscriptions.

4. Validating broadband availability data: parts a through c.

- a. Collecting citizen input to compare with telecommunications' companies coverage data.

North Carolina's technology agency created an online crowdsourcing platform by which citizens can share their broadband availability¹⁷. This effort has helped to further refine broadband availability at the state-level.

- b. Validation studies

Broadband availability validation studies are slowly emerging and the empirical research typically concentrates on survey instruments or pre-testing methods related to broadband consumer behaviors¹⁸. Researchers have predicted a new digital divide emergence based on speed thresholds that will continue to drive broadband disparity at the rural-urban boundary and on the suburban fringe¹⁹. Moving forward with a national broadband map plan update, one should be mindful that when the FCC changes the definition and speed threshold of broadband that data validation will become increasingly complicated.

- c. Thresholds

Broadband speed remains the top metric by which "good" internet service is classified²⁰. Several independent broadband internet speed test sites are available for both public and private use however, the test methodologies are usually proprietary. Some clarity and thought needs to be given to conformance standards regarding speed when evaluating broadband availability data because it may apply to hardware tests, non-hardware tests, or both. In terms of geography – which is a key factor in broadband deployment – is a provider really serving an entire Census block if only one address is registered in that area? Is it feasible to distinguish between true coverage and potential coverage, without putting additional burden on the telecommunications companies?

5. Identifying gaps in broadband availability: parts a & b.

- a. Devise a method to determine if broadband competition exists.

A concern among broadband researchers is that the service coverage submitted by telecommunications providers overestimates the areas served. Even if we make the assumption that broadband is highly demanded, the supply side is grossly misrepresented. The barriers to entry into the broadband market are high. Incumbent providers are obviously at an advantage if we subscribe to similar utility models where the incumbent provider is the "provider of last resort" (POLR). More often than not, the incumbent provider is the primary provider when no competition exists. The POLR model is common to electric and

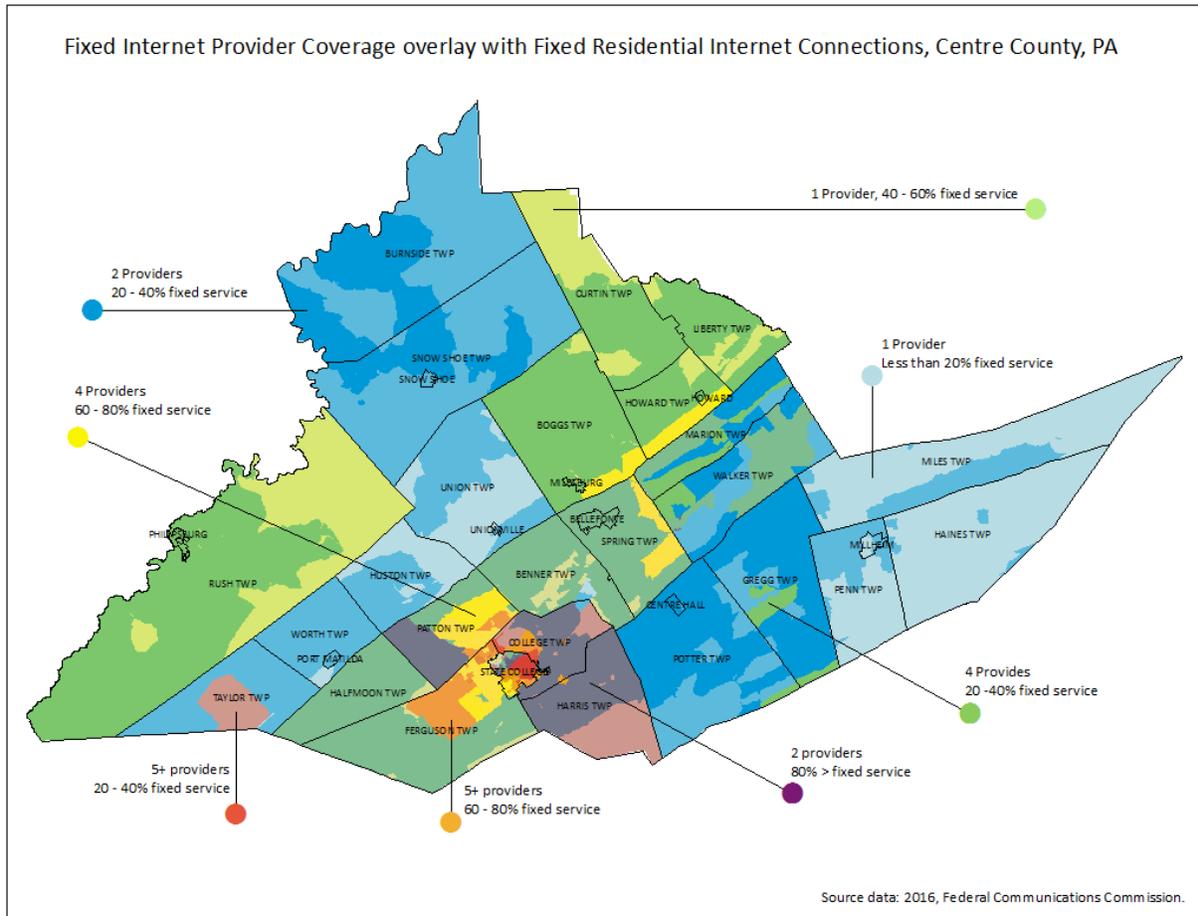
¹⁷ <https://statescoop.com/crowdsourced-broadband-mapping-helps-north-carolina-clean-its-data>.

¹⁸ Chourdie, J. and Y.K. Dwivdi. *Investigating Broadband Diffusion in the Household: Towards Content Validity and Pre-Test of the Survey Instrument*. Brunel University, United Kingdom. Research in progress.
<https://pdfs.semanticscholar.org/add2/a22c1eb463b7bb766046b2a6d2e15e458e00.pdf>.

¹⁹ Riddleston, D. and A.D. Singelton. *A new digital divide?* *Applied Geography*, Vol. 52, pp. 25-33. August 2014.
<https://www.sciencedirect.com/science/article/pii/S0143622814000782>.

²⁰ Bauer, S., D. Clark and W. Lehr. *Understanding broadband speed measurements*. Massachusetts Institute of Technology, 2010.
https://groups.csail.mit.edu/ana/Publications/Understanding_broadband_speed_measurements_bauer_clark_lehr_TPRC_2010.pdf.

natural gas distribution companies. Consumer choice options for electric and natural gas distribution has increased with assistance from public utility commissions. If the Form 477 data was accurate and both the fixed internet provider coverage and the fixed residential internet connections estimates were the same geography, it would make for more purposeful broadband planning. In the map, below, the areas shaded in blue have both low percentages of fixed residential broadband connections and 1 or 2 providers. The blue shaded areas reflect those county geographies where limited or no competition exists. This is a non-statistical approach with the knowledge that the geographic units are different.



2. Data-driven policy and decision-making inputs

In addition to exploring if broadband gaps exist due to a lack of provider competition, it is also imperative for broadband deployment planning to consider demographics of the population being served (or to be served) with respect to low-moderate income households, unemployment, and educational attainment. Engaging the business community is critical and agribusinesses should not be overlooked. Advances in precision farming, livestock monitoring, and product diversification will rely on broadband internet to an extent. Being able to roll-out dual purpose broadband projects in rural areas – for example, constructing an emergency communications tower on which provider’s service equipment can be collocated – demonstrates fiduciary responsibility for county and local government. The transition to the Next Generation Emergency 911 for enhanced public safety involves cross-county collaborations and may offer the greatest opportunity to jumpstart broadband deployment in Centre County, Pennsylvania.