

Appendix 4
Supplemental Information—Broadband Data and Mapping

Initial Broadband Data Subcommittee Findings

March 21, 2019

Broadband Data Subcommittee

On October 15, 2018, the Rural Broadband Task Force formed the Broadband Data Subcommittee to address issues related to broadband data. The subcommittee was asked to answer the following questions:

- What data we currently have?
- What data we need?
- How can we get the data we need but don't have?

Subcommittee members include Senator Bruce Bostelman, Dan Spray, Andrew Buker and Anna Turman. Additionally, the subcommittee invited a number of interested stakeholders and subject matter experts to share information, including:

- Ansley Mick, Nebraska Farm Bureau
- Dr. Angela Hollman, University of Nebraska Kearney
- Dr. Matthew Miller, University of Nebraska Kearney
- Dr. Tim Obermier, University of Nebraska Kearney
- Nick Paden, Remboldt Law
- Cullen Robbins, Nebraska Public Service Commission
- John Watermolen, State of Nebraska Office of the CIO
- Tim Erickson, Nebraska Legislature
- Johnathan Hladik, Center for Rural Affairs

What Data on Broadband Availability Do We Currently Have?

Form 477 Data

Nebraska's [broadband map](#) currently utilizes Form 477 data released by the FCC. Providers of fixed broadband (which includes providers of services via DSL, coaxial cable, fiber optic cable, fixed wireless, and satellite) report the type of technology, maximum advertised speeds in Mbps up and down, and whether the service is residential, business, or both by census block to the FCC. Providers must report every census block where service is provided or could be provided within a reasonable amount of time without an extraordinary commitment of resources. Form 477 also asks providers to report the total number of subscribers by technology companywide, but not by census block. The FCC collects the data twice per year (March 1 for broadband availability as of Dec. 30 and September 1 for broadband availability as of June 30). There is not a set schedule for data releases, but data is usually released a year or more after the reporting date.

Mobile wireless providers provide polygons of their service area and the minimum speeds that are publicly available.

The FCC also publishes a [broadband map](#) based on Form 477 data it collects from providers. The map includes functionality to analyze broadband availability by state, county, Congressional District, census place, tribal area, and MSA.

Advantages. There are several advantages to using FCC Form 477 data. The data is currently available and does not require additional reporting by providers. Since existing data is used, there is no cost to the state for acquisition of the data.

Limitations/Concerns. The use of census block reporting can overstate broadband availability in large census blocks. Census blocks are statistical areas that can be as small as 1/1,000 of a square mile up to 200 square miles. Census blocks which are greater than two square miles cover about 50% of Nebraska geographically. See the table below.

Census Block Size	# Blocks	% of Blocks	Total Sq. Miles	% of Sq. Miles
<=1	176,107	91%	23,868	31%
1-2 sq. miles	11,371	6%	14,342	19%
2-3 sq. miles	2,304	1%	5,437	7%
3-4 sq. miles	1,062	1%	3,692	5%
> 4	2,508	1%	30,021	39%
	193,352		77,359	

Additionally, census blocks are updated only every 10 years.

The propagation maps submitted by at least one major wireless carriers may be overstating coverage. These coverage area maps are the basis of the FCC's Mobility Fund, which has been challenged by a number of parties in a number of states. On Dec. 7, 2018, the FCC announced that it was opening an investigation into whether one or more major carriers overstated their coverage.

The time lag between reporting and release of Form 477 data is also a limitation. Eighteen months can lapse between when broadband deployment actually occurs and when it is reflected in a publicly released Form 477 dataset.

Speed Test Data

UNK BOB Study. Dr. Tim Obermier, Dr. Angela Hollman, and Dr. Matthew Miller are currently conducting a residential fixed broadband speed test study sponsored by Nebraska Public Power District, Nebraska Rural Electric Association, CoBank, and Tri-State. Participating households receive a BOB (Big Operation Bandwidth) unit which collects multiple speed tests per day. Users also take a survey on internet type, cost and satisfaction. As of February 2019, results have been collected from 320 participants. The project team intends to continue collecting data. The State of Nebraska Office of the CIO has offered mapping assistance to the UNK team.

Nebraska Farm Bureau Mobile Wireless Speed Tests. The Nebraska Farm Bureau collected over 2,000 mobile speed tests using the FCC’s speed test app. However, only 605 (27.5%) of the tests were usable/mappable. The Nebraska Farm Bureau intends to continue collecting data. A map developed by the State of Nebraska Office of the CIO is available at <https://nebraska.maps.arcgis.com/apps/opsdashboard/index.html#/3fd4e11eb7e04b31a0eb0b7adec710e4>

Microsoft. Using download data from September 2018, Microsoft identified the number of people at a county level who are using the internet at broadband speeds (25mbit down/3mbit up). [Microsoft’s analysis](#) also identified counties where there are particularly large disparities between the FCC and Microsoft’s data.

Ookla/Speedtest.net. Ookla publishes annual speed test reports on [fixed](#) and [mobile](#) broadband speedtest data which includes average download speeds by states and the 100 largest U.S. cities. Some states and organizations contract with Ookla for speed tests and network analytics.

NACO, RURAL LISC, and RCAP. On March 4, 2019 the National Association of Counties (NACo), the Rural Community Assistance Partnership (RCAP) and Rural LISC (Local Initiatives Support Corporation) [announced the development of the TestIT mobile speed test app](#). Snapshots of individual tests will be collected within a database, allowing partners to analyze connectivity data across the country.

Broadband Adoption Data

Computer and Internet Use Supplement. The NTIA has periodically sponsored the Computer and Internet Use Supplement to the Current Population Survey since 1994. It includes over 50 questions about internet use, including devices and internet access locations, locations of use, online activities, reasons for non-use, and privacy and security concerns. The [Digital Nation Data Explorer](#) enables tracking of metrics on computer and internet use over time.

American Community Survey 5-Year Estimates—Computer and Internet Use. Tables for 5-year estimates of computer ownership and internet subscription were made available for the first time on Dec. 6, 2018, enabling data analysis for smaller geographic areas. The data includes estimates on all geographic areas down to the tract and block group level. Users can search for data and create maps at [American Fact Finder](#).

2018 Nebraska Rural Poll conducted by the University of Nebraska included a number of questions on internet access, satisfaction and use.

Gauging the Digital Readiness of Nebraska Households. This [2018 survey](#) of internet users includes information on device ownership, internet access and usage.

What Data Do We Need?

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The subcommittee discussed mapping and data collection at address level, land parcel and road segment level, before recommending moving toward address level data collection and mapping. Information on these three levels of mapping are listed below.

Address Level. There is a mailing address for every household in the state. Providers have addresses for their customers and could provide the data. Mapping/geocoding can be trickier depending upon how clean the data is—especially in rural areas. The NextGen 911 address point database is expected in 12-18 months and could possibly help with geocoding.

Advantages: There is a mailing address for every household in Nebraska.

Address level data provides the necessary level of granularity.

Providers are likely to have service addresses for their customers.

The NextGen 911 address point database, expected to be completed in the next 12 to 18 months, could be leveraged.

Disadvantages: Geocoding addresses works less well in rural areas although the NextGen 911 address point database would help.

Additional state funding may be required.

Providers may incur additional costs to prepare and submit broadband service data by address points.

Federal agencies do not have access to a database of address points. Both the U.S. Census and Postal Service are prohibited by law from sharing address data. This limits federal mapping efforts and the ability of states to leverage the federal broadband maps to create address level maps.

Land Parcel Level. Parcel data is available for every county in Nebraska. Counties are the source of the data. The Department of Revenue uses the data for tax districts. The OCIO is working with the Department of Revenue to collect the land parcel data yearly. Counties have the most current data. Some parcels do not have households in them. The data lacks that information.

Advantages: Land parcel data is available for every county in Nebraska.

Disadvantages: Land parcel data lacks some information such as if a household is in them.

Additional state funding may be required.

Providers may incur additional costs to prepare and submit broadband service data by land parcels.

Road Segment Level. The Department of Transportation uses linear referencing such as mile marker to mile marker. The data could be analyzed to give an average score to a road segment. Road segment data may work better for mobile and 5G data.

Advantages: This data could be reported in a way which is granular enough.

Disadvantages: The Nebraska Department of Transportation only has data on state and federal roads.

Additional state funding may be required.

This method may be more difficult for providers to report.

Providers may incur additional costs to prepare and submit broadband service data by road segments.

How Do We Get the Data We Need

The Broadband Data Subcommittee identified several strategies which may be utilized to develop an address level data and mapping program for fixed broadband providers.

Collect Address Level Data From Providers. The Subcommittee recommended asking providers to submit address level data annually. Several states are currently collecting address level data from fixed broadband providers. Since states do not have the authority to compel providers to report broadband availability, it can be challenging to get telecommunications providers to voluntarily provide data on where they are providing broadband. Several state broadband mapping programs report that they are missing data from a number of providers. For example, Kansas awarded Connected Nation a \$300,000 contract to update the state broadband map. Several ISPs, including AT&T, are not providing coverage data for the map. Connected Nation reported having data from 70% of providers in Kansas. Colorado also collects broadband availability data from providers, but reports that only about 50% of providers submit data. An outreach effort which clearly identifies the benefits to providers can help improve participation.

At this time, the subcommittee recognizes that there are significant issues with the data submitted to the FCC by mobile wireless providers. The subcommittee recommends that the FCC approve more stringent and comprehensive mapping requirements for mobile wireless providers. Until such a time as this is accomplished, the existing FCC Form 477 data can be used as a rough estimate of coverage.

Supplement Address Level Data from Providers with Additional Sources of Data. Several states supplement their broadband maps with additional sources of data. Colorado and several other states use Form 477 data for non-reporting providers to supplement their data collection efforts.

A number of states also use speed tests to provide information on the speeds that consumers are actually experiencing. Nebraska could explore incorporating or speed test data from the UNK or Nebraska Farm Bureau speed test projects or in contracting with Ookla. Involving local community leaders and organizations in speed test collection efforts can improve the number of tests submitted.

Some states have implemented a challenge process to correct known deficiencies in the map—particularly if the map is used for eligibility for grants or tax exemptions.

The Universal Service Administrative Corporation (USAC) High Cost Universal Broadband (HUBB) could also potentially be used to supplement address level data submitted by carriers. Carriers participating in the Connect America Fund programs must file deployment data with USAC's HUBB (High Cost Universal Broadband) portal showing where they are building out broadband by precise location. Not all carriers are required to report using HUBB and carriers only report data on new deployments so this data set is incomplete. The Nebraska Public Service Commission can access this data, but the data is confidential. The confidentiality requirements may limit how this data may be used or displayed.

Leverage NextGen 911 Address Point Database. To support NextGen 911, the PSC is developing an address point database. The database could potentially be used to support broadband mapping efforts as well.

Leverage Federal or National Data Collection Efforts If Possible. There are several federal or national efforts which may potentially be leveraged.

On March 21, 2019, USTelecom announced a broadband mapping pilot with Missouri and Virginia. The pilot project is expected to take 4-6 months. The results of the pilot will be reported to the FCC. If the initiative is adopted by the FCC, a comprehensive map would take 18 months to 2 years to develop. The pilot will use multiple sources of address, building and parcel data to develop a database of broadband serviceable addresses. The pilot will test different methods for reporting service availability. The pilot will also develop and test a crowdsourcing platform to enable consumers to report information.

There may be opportunities to partner with the NTIA on its broadband map. The NTIA recently received \$7.5 million to improve the broadband map. However, the NTIA was not given the authority or budget to undertake a new data collection effort so it is using existing Form 477 data from the FCC, other federal agencies, and states. The NTIA also does not have access to a national database of address points which further limits its ability to create an address level map. In February 2019, NTIA announced that it is partnering with eight states – California, Maine, Massachusetts, Minnesota, North Carolina, Tennessee, Utah, and West Virginia – to supplement Form 477 data with data collected by these states. The NTIA broadband map may also contain layers from other Federal partners such as the Department of Interior. The map is expected to be available in September of 2019.

Additionally, Nebraska should monitor any changes to the data collection efforts of the FCC and USCAC to see if these data collection processes could be leveraged. The FCC updates Form 477 every four or five years. It is about time for an update. However, the FCC has concerns about the reporting burden on providers. FCC staff have indicated that a move to address level data collection is not likely. If changes were made to Form 477, it would likely take 18 months from the date an order is issued before providers would be required to meet any new reporting requirements. If additional carriers were required to report via USAC's HUBB and issues surrounding confidentiality requirements were resolved, HUBB data could also be potentially leveraged.

Cost Estimates

There would likely be additional costs incurred in moving to an address level map. Although the approach outlined by the subcommittee differs in some respects from the approach in the broadband mapping bill (LB 549) introduced in 2019, LB 549's fiscal note provides an estimate of the expected cost of moving to an address-level map. The fiscal note estimated that \$841,667 would be required in year one and \$881,896 in year two. Connected Nation's contract to develop the Kansas Broadband Map was for \$300,000 and provides an additional estimate. It should be noted that the Kansas map provides less functionality than Nebraska's current broadband map. For example, the map doesn't show speed tiers just if an area has at least 25 Mbps down/3 Mbps up or not. There could be additional costs for obtaining or incorporating speed test data.