Before the
UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Utilities Service
Washington, D.C.

In re	)	
	)	
Broadband e-Connectivity	)	
Pilot Program	)	Docket No. RUS-18-TELECOM-0004
	)	
Notice of Inquiry and	)	
Request for Comments	)	

COMMENTS OF MICROSOFT CORPORATION

I.   Introduction.

Microsoft Corporation ("Microsoft") provides the following comments in response to the U.S. Department of Agriculture's ("USDA") and Rural Utilities Service's ("RUS") Notice of Inquiry and Request for Comments, 83 Fed Reg. 35609 (July 27, 2018) ("Notice").

Section 779 of the recently enacted Consolidated Appropriations Act of 2018 (Pub. L. 115-141) appropriated $600 million for USDA to create a pilot broadband program ("e-Connectivity Pilot") intended to expedite loans and grants for the costs of construction, improvement, and acquisition of facilities and equipment for broadband service in eligible rural areas.[1]

The Notice seeks input on questions concerning the development of the e-Connectivity Pilot including: (1) what types of technologies and services should be defined as providing "sufficient access"; (2) whether affordability of service should be included in evaluating

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[1] *See*, Notice, 83 Fed. Reg. at 35609.

whether an area already has 'sufficient access'; (3) the 'challenge process' to provide incumbents the opportunity to comment if 10 Mbps downstream and 1 Mbps upstream ("10/1") service exists for households in the proposed service area; and (4) how to evaluate the viability of applications that include local utility partnerships arrangements, including locally-owned telecommunications companies.

Potentially assisting USDA's effort, Microsoft's Airband Initiative seeks to partner with private and public-sector organizations to close the broadband gap in rural America for homes, farms, schools, and small businesses.[2] Microsoft and its network operator partners currently have 24 projects up and running in 15 states plus Puerto Rico and the US Virgin Islands. In the next three years, this initial group of projects intends to deliver broadband access to almost 4 million people living in unserved, underserved, and served areas, with almost 750,000 of those in rural areas that currently lack any access to broadband.

Three core elements of these partnerships are investment in deployments targeted at rural areas lacking access to broadband, extension of digital skilling content and programs in impacted communities, and royalty free access to intellectual property on Television White Spaces ("TV White Spaces" or "TVWS") technologies. When appropriate, Microsoft is willing to co-invest in the upfront capital expenses needed to expand broadband coverage, seek a revenue share from operators to recoup its investment, and then use these revenue proceeds to invest in additional projects to expand coverage further. Our goal is not to enter the telecommunications business itself or profit directly from these projects. The one characteristic

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[2] See, https://www.microsoft.com/en-us/airband.

these and future Airband deployments share is that they all include fixed wireless technologies leveraging TV White Spaces.

As USDA knows, precision agriculture is fast becoming a critical component of our nation's ability to improve agricultural production, with smart farm equipment, tractors, drones, sensors, meters, and appliances utilizing fixed and mobile broadband connections to increase agricultural efficiency.[3] Today, the average US farm feeds 165 people, of whom 64% are in the US and 36% are outside of the US.[4] By 2050, the global population is expected to increase by 2.3 billion, requiring the world's farmers to grow about 70 percent more food.[5] Precision farming, enabled by ubiquitous and affordable broadband connectivity, along with access to cloud-based services, is essential to increasing the productivity of American farms. To enable America's farmers to increase their productivity while reducing their costs, Microsoft urges that all or a substantial portion of the $600 million be set aside for funding for broadband connectivity *to* farms, and *on* farms.

II.   Comments of Microsoft.

A.   Providing Rural Areas With Sufficient Access to Broadband.

RUS should retain the existing definition of eligible rural areas, i.e., where 90% of households lack access to 10/1 service. Microsoft suggests a supplemental definition of eligible area that includes croplands and working ranch lands. An applicant should be eligible to

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[3] *See, e.g., Comments of Deere & Co.*, GN Docket No. 17-199 (FCC Sept. 21, 2017) at https://ecfsapi.fcc.gov/file/109212496527376/FINAL_Deere%20Comments%20on%20Section%20706%20NOI.pdf.

[4] http://www.agfoundation.org/files/FFF_Graphic_US_Farm_Feeds.jpg (visited August 22, 2018).

[5] *Id.*

receive an e-Connectivity loan or grant if it can demonstrate that productive agricultural land lacks high-quality access to 10/1 service, irrespective of how many households are located within the target area.

As RUS determines what types of technologies and services are capable of providing sufficient access, Microsoft urges the RUS to take a technology-neutral approach in order to attract the widest possible group of participants. Today there are various broadband technologies and each discrete geographic area has one or more broadband solutions best suited to consumers' needs. By not precluding any technology that satisfies basic throughput and latency parameters, potential applicants will be able to choose the most cost-efficient solutions that maximize the impact of program funds.

For these reasons, Microsoft also urges the RUS to specify that applicants seeking to provide broadband via TVWS spectrum are eligible for funding. Throughput on TVWS devices exceeds the RUS's 10/1 threshold for service speeds in its existing programs and, in fact, can meet the FCC's 25/3 service speed threshold for broadband. Indeed, the FCC has already ruled that participants in the Connect America Fund Phase II auction may use equipment leveraging the TVWS to meet their rural broadband deployment obligations.[6] In addition, we are aware that recent recipients of RUS loans and grants are using TVWS technologies, alongside other fixed wireless technologies, to cost-effectively extend broadband access to rural communities.

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[6] *See, Connect America Fund Phase II Auction Scheduled for July 24, 2018, Notice and Filing Requirements and Other Procedures for Auction 903,* Public Notice, FCC 18-6 (Feb. 1, 2018) at para. 92. https://docs.fcc.gov/public/attachments/FCC-18-6A1.pdf.

TVWS spectrum is particularly well-suited for broad coverage of unserved rural areas –

both *to farms* and *on farms* – because it has excellent propagation characteristics as compared

to higher frequency spectrum. Signals travel over longer distances and have better penetration

through walls and obstacles, including heavy foliage and planted crops. Using these low-band

frequencies, line of sight communication is not always required, which allows continuous

coverage along some hills, which could not otherwise be provided at higher frequencies. TVWS

technology is often used within a heterogenous network that includes other broadband-

capable technologies.

The challenge continues to be how to get fiber infrastructure cost-effectively deployed

further out to anchor institutions, central business locations, and beyond, in rural areas. As

fiber continues to be deployed in rural America, fixed wireless technologies, including TVWS,

can be used to cost-effectively extend broadband further out into remote areas. For example,

fiber may be deployed to and within a small town, with TVWS extending broadband into

sparsely populated surrounding areas and farmlands. Or, TVWS may overlay fiber service to

locations needing wide-area broadband coverage.

With respect to affordability, Microsoft believes that one reason the FCC's broadband

subscribership data is often lower than the broadband availability data for a given rural area is

pricing. Prices for different broadband speeds and capacity are determined by the local market.

That should not change. But the fact is that even if 25/3 broadband service is available in a

rural area, if the price is deemed prohibitively high by potential rural industrial and residential

customers, they will gravitate to different plans that may provide a lesser level of service, but

are more affordable. Accordingly, RUS should consider affordability in its evaluation of

sufficient access for each rural area proposed by an applicant. A proposal to serve areas

predominately consisting of rural industries, including farms, may have a different affordability

analysis than a proposal to serve rural residences. The affordability analysis should also be

made part of the RUS 'challenge process'.

For residential service affordability, RUS may look to the work done by the FCC's Urban

Rate Survey Data and Resources, found at https://www.fcc.gov/general/urban-rate-survey-

data-resources. There, the FCC provides a wealth of data, along with an online tool to calculate

the reasonable comparability benchmark for universal service purposes.[7] For example, the US

benchmark rate for 25/3 speed with an unlimited data usage allowance is currently $94.32. In

assessing applications for residential service, the RUS may wish to require applicants to include

in their applications the benchmark rate for the throughput (up/down) and monthly usage

allowance, as specified by the FCC's online tool. This would allow RUS to efficiently assess

affordability for residential users as part of the application process.

In determining what's affordable, Microsoft also urges the RUS to consider barriers

faced by program participants in accessing the Internet. Interconnecting a local broadband

network, such as one serving local farms, into the middle-mile plant needed to transport traffic

can be very expensive in rural America. The lack of competition for middle-mile fiber in rural

areas increases the cost of transporting traffic and is a significant factor in the higher charges

that end users in rural areas experience. RUS may need to accept higher prices to end users if

the program participant is in an area where transport costs are high, and alternatives are not

available.

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[7] *See,* https://www.fcc.gov/general/reasonable-comparability-benchmark-calculator.

2.   **Verifying Data Speeds and Identifying Source of Data Availability.**

In seeking to determine where 10/1 service is available throughout the nation, RUS may wish to supplement data available through its online mapping tool by looking to the work currently underway by the National Telecommunications and Information Agency ("NTIA") to improve broadband data. On May 30, 2018, NTIA requested comment on, "ways to improve the nation's ability to analyze broadband availability, with the intention of identifying gaps in broadband availability that can be used to improve policymaking and inform public investments."[8]

In its comments to NTIA's proceeding, Microsoft described how visualization and analytic tools can aggregate, disaggregate, and mash up information, identify patterns and outlier submissions, and accelerate the process of cross-checking data submissions.[9] These tools can help users better understand broadband availability and RUS may find them useful to improve data accessibility for users.[10]

3.   **Ensuring that Projects Improve Rural Prosperity.**

The RUS seeks effective methods of measuring leading indicators of potential project benefits and improving rural economies. In Microsoft's experience, the leading indicator of economic benefit to rural communities is the availability of <u>high-quality</u> broadband, both fixed

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[8] *Improving the Quality and Accuracy of Broadband Availability Data*, Docket No. 180427421-8421-01, 83 Fed. Reg. 24747 (May 30, 3018).

[9] *See, Comments of Microsoft Corporation* in Docket No. 180427421-8421-01 (NTIA, July 16, 2018) at https://www.ntia.doc.gov/files/ntia/publications/microsoft_2018_0716_ntia_comments_final.pdf.

[10] 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/.

and mobile. At a high level, RUS should set as a goal the delivery of at least 10/1 speed to

farmlands and every farm house in rural America, and use the e-Connectivity program as a

stepping stone to achieve it. A 10/1 goal will stretch program dollars the farthest, to areas that

have no service, while a 25/3 goal will deliver higher benefits to a smaller area, as the cost of

delivering a higher speed service will be greater.

      With respect to program eligibility, Microsoft favors an agnostic approach that does not

favor incumbent telecommunications companies. Each project proposal should stand on its

own and be evaluated on its merits. As a general matter, local involvement can be valuable, as

people living in areas lacking broadband are more likely to invest the time and effort needed to

see a project through to success.

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Respectfully submitted,

MICROSOFT CORPORATION

Paul Garnett, Senior Director
Microsoft Airband Initiative
425-704-9269

Paula Boyd, Senior Director
U.S. Government and Regulatory Affairs
202-263-5946

Michael Daum, Director
Privacy and Regulatory Affairs
425-538-5578

901 K Street, N.W., 11th Floor
Washington, DC 20001

David A. LaFuria
Lukas, LaFuria, Gutierrez & Sachs, LLP
8300 Greensboro Drive, Suite 1200
Tysons, VA 22102
703-584-8678
dlafuria@fcclaw.com

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September 4, 2018   *Counsel to Microsoft Corporation*