ENERGY &
COMMERCE
CHAIR RODGERS

MEMORANDUM

To:	Members, Energy and Commerce Committee
From:	Majority Staff
Re:	Communications and Technology Subcommittee Field Hearing

I.   INTRODUCTION

The Subcommittee on Communications and Technology has scheduled a **field hearing** on Friday, May 10 at 10:00 a.m. (PT). The hearing will take place at the following address: **1001 Truxtun Avenue, Bakersfield, CA 93301**. The hearing title is "Perspectives from the Fields: The State of Rural Broadband in America."

II.   WITNESSES

- Don Cameron, Vice President/General Manager, Terranova Ranch
- Troy Klinger, Director of Network Operation, Unwired Broadband, LLC.
- Morgan Trembush, Integrated Solutions Manager, Kern Machinery
- Eric Votaw, CEO, Varcomm Holdings, Inc.

III.   BACKGROUND

According to recent reporting from the Federal Communications Commission (FCC), 28 percent of Americans living in rural areas do not have access to fixed terrestrial broadband service.[1] Providing connectivity to rural communities has always been a challenge in the United States. Connecting urban, populated areas is often preferred by providers because they are able to access existing infrastructure and low cost-per-mile rates.[2] Serving rural areas is difficult due to terrain and the economics of sparse population density. Mobile connectivity, given its broad reach, sees a higher percentage of coverage with 67.4 percent of Americans having access to 4G and 26.8 percent having access to 5G with 35/3 Mbps speeds. Mobile providers now have their sights set on bringing 5G service to all corners of the country. To address this digital divide, Congress tasked multiple agencies with providing financial support to aid the deployment of broadband to unserved areas.

Enhanced connectivity to rural communities provides opportunity for economic development, including innovation in precision agriculture. Precision agriculture technologies benefit farmers by improving management of key resources such as water, fertilizer, and feed,

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[1] *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 22-270, 2024 Section 706 Report, FCC-CIRC-2403-02, (circ. Feb 22, 2024), https://docs.fcc.gov/public/attachments/DOC-400675A1.pdf (excluding satellite connectivity).
[2] Liz Cooper, *The Stakes Are Too High to Not Solve the Rural Digital Divide,* human-i-t (Oct. 6, 2023), https://www.human-i-t.org/why-bridge-rural-digital-divide/.

leading to more efficient production.[3] But only 27 percent of U.S. farms or ranches use precision agriculture practices to manage crops or livestock.[4] Providing rural America with the digital tools enabled by access to high-speed internet allows rural America to utilize precision agriculture technologies and modern data analytics, improving our agricultural economy. Thus, connecting rural and agricultural communities provides a lasting benefit to all Americans.

IV.   SELECTED ISSUES

1. *Efforts to Connect Rural America*

According to the Government Accountability Office (GAO), there are more than 130 federal programs—administered by 15 agencies—aimed at expanding connectivity in rural America.[5] Most prominently, Congress charged the FCC, the National Telecommunications and Information Administration (NTIA), and the Department of Agriculture (USDA) to manage these programs.

The FCC's Universal Service Fund (USF) is a user-fee-based support program that subsidizes broadband and telephone services for high-cost, typically rural, areas.[6] The High-Cost program originally supported the deployment and operation of voice-service networks in high-cost areas.

Connect America Fund. In 2011, the FCC created the Connect America Fund (CAF), its first program to support networks capable of providing both voice and broadband services.[7] Since that time, the High-Cost program has adapted to accommodate the updated speed requirements and service needs of rural America.

Alternative Connect America Cost Model. The FCC followed the CAF program in 2016 with the Alternative Connect America Cost Model (ACAM) program, providing funding to rate-of-return carriers that voluntarily elected to transition to a new cost model.

Rural Digital Opportunity Fund. In 2020 with the $20.4 billion Rural Digital Opportunity Fund (RDOF), a two-phase reverse auction of ten-year support to assist in the deployment of fixed broadband in rural, unserved areas.[8] The Phase I auction was completed on December 7, 2020, with 180 bidders winning $9.23 billion in ten-year support to serve 5,220,833

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[3] A Case for Rural Broadband, United States Department of Agriculture (April 2019), https://www.usda.gov/sites/default/files/documents/case-for-rural-broadband.pdf.

[4] *Precision Agriculture*, GAO (Jan. 2024), https://www.gao.gov/assets/d24105962high.pdf.

[5] *National Strategy Needed to Guide Federal Efforts to Reduce Digital Divide*, GAO (May 31, 2022), https://www.gao.gov/products/gao-22-104611.

[6] *Universal Service*, Federal Communications Commission (accessed April 18, 2024), https://www.fcc.gov/general/universal-service (The FCC's Universal Service Fund also provides funding for low-income households (Lifeline Program), in schools and libraries (E-Rate Program), at rural health-care facilities (Rural Health Care Program)).

[7] *Connect America Fund et al.*, Report and Order and Further Notice of Proposed Rulemaking, WC Docket No. 1090 et al., 26 FCC Rcd 17663 (2011).

[8] *ACAM,* Universal Service Administration Co. (accessed Apr. 22, 2024), https://www.usac.org/high-cost/funds/acam/; *Rural Digital Opportunity Fund,* Report and Order, WC Docket No. 19-126 et al., 35 FCC Rcd 686, (2020), https://docs.fcc.gov/public/attachments/FCC-20-5A1.pdf.

locations in 49 states and one territory.[9] The high-cost fund operates with a combined budget of $4.5 billion annually.[10]

5G Fund. The FCC also plans to support mobile broadband providers' deployment in high-cost areas. In 2020, the FCC approved rules creating a 5G Fund, which would auction up to $9 billion in USF support to carriers to deploy 5G-capable networks in rural America.[11] After originally planning to begin the auction upon the release of new broadband maps, the FCC elected to pause the 5G fund, citing new mobile broadband availability data and the need to consider "the impact of programs like [the Broadband, Equity, Access, and Deployment Program], before moving forward with new approaches to long-term support for mobile broadband."[12] Despite claims that the challenge process for the mobile broadband availability data is flawed, and the lack of clarity of the locations of other ongoing broadband deployments, the Chairwoman of the FCC is calling for the agency to move forward with the 5G Fund.[13]

Broadband, Equity, Access, and Deployment Program. The Infrastructure Investment and Jobs Act (IIJA) tasked the NTIA with managing the $42.45 billion Broadband Equity, Access, and Deployment (BEAD) Program.[14] This program, the largest investment in broadband connectivity to date, provides funding to areas deemed unserved (lack access to fixed broadband at speeds of 25 Mbps download/3 Mbps upload) and underserved (lack access to fixed broadband at speeds of 100 Mbps/20 Mbps). The BEAD program distributes these funds directly to the states and territories, who are responsible for administering the funding to providers to close the gaps in current service.[15]

To date, little of the $42.45 billion in funding has been made available for deployment. States are still drafting initial proposals for funding, which must be approved by NTIA before a minimum of 20 percent of the funding is released to states. This initial proposal is approved in two phases, each of which must be approved by NTIA. On December 15, 2023, Louisiana was the first state to receive approval for its second phase.[16] Once receiving approval of its initial proposal, the state will have one year to award funds and submit its final proposal for approval. Upon approval, the entire amount allocated to each state will be available to the state.

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[9] *Rural Digital Opportunity Fund Phase I Auction (Auction 904) Closes,* WC Docket No. 19-126 et al., Public Notice, 35 FCC Rcd 13888 (2020), https://www.fcc.gov/document/auction-904-winning-bidders.

[10] *Program Overview*, Universal Service Administration Co. (accessed April 18, 2024), https://www.usac.org/high-cost/program-overview/#:~:text=High%20Cost%20is%20one%20of,of%20the%20four%20USF%20programs.

[11] *Establishing a 5G Fund for Rural America*, GN Docket No. 20-32, Report and Order, 35 FCC Rcd 12174 (2020), https://docs.fcc.gov/public/attachments/FCC-20-150A1.pdf.

[12] Letter from Jessica Rosenworcel, Chairwoman, FCC, to The Hon. Roger F. Wicker, Ranking Member, S. Comm. on Commerce, Sci. & Transp. (Nov. 10, 2022), https://docs.fcc.gov/public/attachments/DOC-389366A2.pdf.

[13] https://docs.fcc.gov/public/attachments/DOC-401369A1.pdf

[14] Infrastructure Investment and Jobs Act, P.L. 117-58, div. F, tit. I-V (2021), https://www.congress.gov/bill/117th-congress/house-bill/3684.

[15] Kathryn de Wit, *What States Need to Know About Federal BEAD Funding for High-Speed Internet Expansion,* Pew Research Center (Jan. 9, 2023), https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2023/01/what-states-need-to-know-about-federal-bead-funding-for-high-speed-internet-expansion.

[16] Jake Neenan, *In a First Louisiana Receives NTIA Approval of Both BEAD Initial Proposals,* Broadband Breakfast (Dec. 17, 2023), https://broadbandbreakfast.com/in-a-first-louisiana-receives-ntia-approval-of-both-bead-initial-proposals/.

In addition to the BEAD Program, the Consolidated Appropriations Act, 2021 provided NTIA $1.3 billion for broadband grants: $1 billion for Tribal areas and $300 million for broadband deployment in unserved areas.[17] The Tribal grants may be used by Tribal governments for broadband deployment on Tribal lands, as well as telehealth, distance learning, broadband affordability, and digital inclusion. The broadband expansion grants support broadband infrastructure deployment to areas lacking broadband, especially rural areas.

ReConnect. The USDA also offers funding for broadband deployment through the Rural Utilities Service (RUS): the Telecommunications Infrastructure Loan Program, the Community Connect Grant Program, the Rural Broadband Access Loan and Grant Program, and the Rural e-Connectivity Pilot Program (ReConnect).[18] The ReConnect Pilot Program targets areas where at least 90 percent of the households to be served by a project are in a rural area that lacks sufficient access to broadband, defined as 10/1 Mbps. Congress established the program in 2018 through the Consolidated Appropriations Act, 2018,[19] and appropriated over $7 billion for it total.[20]

2. *Connectivity Enables Precision Agriculture*

Precision agriculture allows farmers to monitor and tend to their crops with accuracy. For example, to know the exact amount of fertilizer, water, and space needed to optimize plant growth. One of the most widely used precision agriculture technologies operates using real-time kinematic (RTK) positioning signals. RTK is used in a myriad of farming activities, such as tillage, planting, harvesting, and spraying.[21] RTK is used to collect data on soil temperature, moisture, and yield, all as a passive side effect of regular farming activity.[22] This data enables the utilization of less water and fertilizer, creating efficiencies that are friendly both to the environment and the farmers' bottom lines.

Many traditional precision agriculture technologies have made use of satellite connectivity and imagery, and there is a growing industry trend towards connectivity demanding larger bandwidth and higher speeds.[23] Data-intense harvesting technologies, like remote sensing,

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[17] Consolidated Appropriations Act, 2021, P.L. 116-260, div. N, tit. V, § 905 (2020).

[18] RUS, Telecom Programs (accessed Apr. 18, 2024), https://www.rd.usda.gov/programs-services/telecommunications-programs#:~:text=The%20RUS%20Telecom%20Program%20is,and%20Outreach%20Division%20(POD).&text=LOAD%20is%20the%20primary%20contact%20for%20all%20telecom%20borrowers%20and%20grant%20applicants.

[19] Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, div. A, tit. VII, § 779 (2018); see also Coronavirus Aid, Relief, and Economic Security (CARES) Act, Pub. L. No. 116-136, div. B, tit. I, § 11004 (2020); and IIJA, div. J, tit. I.

[20] *USDA's ReConnect Program: Expanding Rural Broadband,* Congressional Research Service (Dec. 14, 2022), https://crsreports.congress.gov/product/pdf/R/R47017.

[21] *Id.*

[22] *Id*.

[23] *How does hyperspectral satellite imagery help precision agriculture?*, GeoPard Agriculture (accessed Apr. 18, 2024), https://geopard.tech/blog/how-does-satellite-imagery-help-precision-agriculture/; *Connectivity Challenges Limit Agriculture's Economic Impact and Sustainability,* United Soybean Board (April 18, 2024), https://api.unitedsoybean.org/uploads/documents/58546-1-ruralbroadband-whitepages-final.pdf.

are becoming more attainable for smaller farms.[24] For example, automated mechanical weeders make use of machine learning to start and stop weeding blades to avoid damaging growing crops,[25] drones and ground robots provide up close and real-time monitoring of crops,[26] and the modern tractor has transformed into a roving data center.[27] As a result of these technological advancements, rural America feels the pain of the digital divide at an even deeper level than before.

The current issue facing rural connectivity is two-fold. First, total connectivity to the farmhouse remains insufficient with nearly 18 percent of U.S. farms lacking broadband internet.[28] Due to this lack in connectivity, they are unable to take advantage of cutting-edge precision agriculture technology. The programs mentioned above seek to solve this disparity by providing last-mile high-speed connectivity through broadband internet.

Second, connectivity must not only reach the farmhouse, but also the tractor in the field. Modern, often autonomous tractors maintain a connection to the farmhouse or barn with satellite or mobile connectivity.[29] These tractors are constantly gathering data as they plant, water, and harvest crops over the course of a season. As stated in the FCC's most recent Precision Agriculture Connectivity Task Force report, "Farm fields are typically remote, and farm machines are typically mobile; therefore, wireless networks that enable broadband data transmission across the farm's last acre are essential to modern agriculture."[30] With this increase in connectivity, tractors are able to stay in the field longer and seamlessly transmit massive amounts of critical agricultural data. This further increases farming efficiency, accuracy, and sustainability of farm equipment, a benefit felt by both the farmers and the American public.

IV.   KEY QUESTIONS

- What are local providers of wireless and wireline connectivity taking into consideration as they decide whether or not to participate in the NTIA's BEAD program?

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[24] Gonzalo Cucho-Padin, Hildo Loayza, Susan Palacios, et al., *Development of low-cost remote sensing tools and methods for supporting smallholder agriculture*, Applied Geomatics (Dec. 26, 2019), https://link.springer.com/article/10.1007/s12518-019-00292-5.

[25] *AI-directed mechanical weeder promises improved blackgrass control,* Agri-TechE (Sept. 26, 2024), https://www.agri-tech-e.co.uk/ai-directed-mechanical-weeder-promises-improved-blackgrass-control/.

[26] *Drone Technology in Agriculture,* Croptracker (accessed Apr. 18, 2024), https://www.croptracker.com/blog/drone-technology-in-agriculture html.

[27] *Telematics & Connectivity,* John Deere (accessed Apr. 18, 2024), https://www.deere.com/en/electronics/telematics/

[28] *Rural Broadband,* American Farm Bureau Federation (accessed Apr. 22, 2024), https://www.fb.org/issue/infrastructure/rural-broadband#:~:text=However%2C%2018%20percent%20of%20U.S.,Usage%20and%20Ownership%2C%202021.%E2%80%9D.

[29] *GPS Correction Technology Lets Tractor Drive Themselves,* NASA Spinoff (2017), https://spinoff.nasa.gov/Spinoff2017/ee_1.html.

[30] *Task Force for Reviewing the Connectivity and Technology Needs of Precision Agriculture in the United States Report,* FCC Precision Ag Connectivity Task Force (Nov. 6, 2023), https://www.fcc.gov/sites/default/files/2024-Report-PrecisionAg-Task-Force-without-Signatures.pdf.

- What equities should the FCC consider when rolling out the 5G Fund?

- How does connectivity benefit rural agriculture communities differently than urban communities?

- Which precision agriculture technologies do you think benefit the most from high-speed broadband connectivity?

V.   STAFF CONTACTS

If you have any questions regarding this hearing, please contact Kate O'Connor or Slate Herman of the Committee Staff at (202) 225-3641.