Statement before the Senate Committee on Commerce, Science and Transportation
Subcommittee on Communications, Technology, Innovation, and the Internet
On “The Impact of Broadband Investments in Rural America”

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# UNITED STATES SENATE

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Chairman Thune, Ranking Member Schatz, and members of the subcommittee, thank you for the opportunity to appear before you at today's hearing on "The Impact of Broadband Investments in Rural America."

I have had the opportunity to study communications, media, and internet policy issues over many years and in several capacities, including in my current positions as a visiting scholar at the American Enterprise Institute and as the director and Gunter Professor of the Public Utility Research Center at the University of Florida, where I am also the director of the newly launching Digital Markets Initiative. While I am proud to be affiliated with these organizations, I am appearing today solely on my own behalf, and the views and opinions I express should not be attributed to any of the organizations with which I am or have been affiliated. Earlier in my career I served on the staffs of two state utility regulatory agencies: The Kansas Corporation Commission and the Iowa Utilities Board. One of my duties while working for the state of Iowa was to serve the staff of the Federal-State Joint Board that dealt with an issue called separations, which was the system that provided rural telecommunications subsidies for many years.

I can summarize my testimony in four sentences. First, promoting universal access to modern communication services and the internet is an appropriate and pragmatic objective. Second, the Federal Communications Commission's (FCC) recent policies to improve the effectiveness of its rural broadband programs are based on sound economic thinking and empirical evidence. Third, the FCC's parallel

deregulatory efforts to allow internet service providers to increase the value of their service offerings may be just as important as the agency's subsidy programs. Lastly, it is crucial that overlap across federal and state universal service programs be diminished and that coordination be improved.

Let me address each in turn.

**Importance of Rural Broadband**

First, it is well-known that broadband infrastructure is an essential feature of a modern economy. As my AEI colleague Jeffrey Eisenach said testifying before the Committee on Commerce, Science and Transportation of the United States Senate on September 6, 2017:[1]

> There is a broad and deep literature on overall economic effects [of broadband communications services] which has consistently demonstrated a positive relationship between broadband and economic growth, employment and productivity.[2] Research is also increasingly demonstrating the socioeconomic benefits of broadband for disadvantaged populations. For example, new research published in the Journal of Medical Internet Research shows that when people from low socioeconomic positions begin using the Internet they use it for a variety of capital enhancing activities, including education, job seeking and obtaining health information.[3] Recent research from the Pew Internet Center also shows that broadband plays an important role in facilitating job search activity.[4] There is also substantial research demonstrating the benefits of broadband expansion in rural areas. For example, Atasoy found that gaining access to broadband in a county increased the employment rate by approximately 1.8 percentage points, with larger effects in rural areas.[5] A 2016 Hudson Institute study found that the rural broadband industry supported over 69,000 jobs and $100 billion in e-commerce in 2015.[6] (Brackets added. Endnotes in original.)

The FCC has committed considerable resources to promoting universal service. According to the agency's 2017 report[7] on universal service programs, the programs spent over $42 billion from 2012 through 2016 on high cost, Lifeline, schools and libraries, and rural health care programs. The high-cost program, which covers the rural subsidies that are the subject of this hearing, made up slightly more than half of this $42 billion.

While this $42 billion subsidy clearly benefited the service providers and some

customers, it came at a cost. If, for example, the households that funded the $42 billion had spent that money themselves, they might have spent an additional $16 billion on housing, $4 billion on health care, and $672 million on education among other important items (assuming their additional spending was in proportion to how they spent their household incomes in 2015).[8]

Given the importance of rural broadband infrastructure, the magnitude of resources committed to its expansion, and the sacrifices that Americans make to provide the subsidies, it is vital that universal service programs be efficient. By this I mean that they be well targeted and provide Americans with great value for their dollars.

## Improved Efficiency and Effectiveness of the FCC's Rural Broadband Programs

This takes me to my second point, which is that the FCC's recent policy changes to improve the effectiveness of its rural broadband programs are based on sound economic thinking and empirical evidence. To be efficient, a rural broadband program should target the right services and should support them at minimal cost.

**Targeting.** The FCC, regarding its rural target, is using as its benchmark internet services that customers are demonstrating they want and are willing to pay for. The FCC's target speed is 25/3 megabits per second (Mbps), which means that customers are to receive 25 Mbps downstream and 3 Mbps upstream. The agency found in its 2018 broadband report that 59 percent of residential fixed connections equaled or exceeded that speed,[9] indicating that 25/3 Mbps is now normal service. That it is a norm makes 25/3 Mbps an appropriate standard for universal service obligations. However, that 59 percent of these customers are buying 25/3 Mbps does not mean that all customers should have this service: Different customers have different preferences, which should be respected. So it is also appropriate that the FCC's standards allow for differing speeds.

My understanding from reviewing FCC documents is that the agency will revise its targets as customer preferences evolve. This is appropriate, and it is important that the FCC made this explicit in its December 13, 2018,[10] decision regarding rural broadband. By being explicit the FCC effectively told carriers that they need to ensure that their systems can economically scale as the FCC's consumer-based requirements change. I would like for the FCC to further hone its targeting to allow for differences between urban and rural customer preferences, but that is simply a refinement of the FCC's already appropriate regulatory direction.

**Using Competitive Auctions to Minimize Cost.** Regarding ensuring that the chosen target for rural broadband is supported at minimal cost, the FCC has taken important steps to use competition where it can and to use regulatory incentives where competition is impractical. The FCC introduced competition by adopting a reverse auction process for determining which carrier would receive a universal service subsidy. This was done in 2018 with great success. As economist Joseph Gillan observed, the auction process resulted in a 70 percent savings—or $3.51 billion over 10 years—over the amount of subsidy the agency projected that it would need to provide.[11] This savings will allow Americans to purchase about $1.2 billion more in housing, $326 million more in health care, and $38.6 million more in education, as well as other additional household essentials, over the next 10 years.[12]

**Using Regulatory Incentives to Minimize Cost.** For instances in which the FCC has determined that a competitive reverse auction is impractical, the agency has taken other steps to encourage carriers to control their costs. In the past the FCC largely used rate of return regulation—the traditional US system for regulating utility and telephone company prices—to estimate amounts for universal service subsidies. It is well-known that rate of return regulation provides poor incentives for companies to operate efficiently and that alternative forms of regulation, such as price cap regulation, provide better results.[13] The problem with rate of return regulation has been that it allows service providers to flow through to customers whatever investments, operating expenses, taxes, and other costs that the providers incur unless the regulator can find and demonstrate that a provider has made wasteful, inappropriate management decisions. Research has found that regulators have not caught many of the companies' management inefficiencies and that incentive schemes, such as price cap regulation, have improved efficiency. Properly performed, these incentive schemes reward providers for improving efficiency by allowing them to keep some portion of the profits that occur with improved efficiency.

The FCC has appropriately reflected these economic lessons in its rural broadband programs. One method the FCC adopted has been using cost models for estimating subsidy needs and using these estimates as a form of subsidy cap. Rather than allow companies to recover from the subsidy system the costs the companies report to the FCC, the cost model system estimates what costs should be and then the FCC caps subsidies at those levels. To the extent companies accept these subsidy estimates, the system results in savings for those who fund the subsidies.

This modelling approach for determining costs has been used extensively around the world for determining prices for telecommunications and other types of regulated

companies. One of the lessons is that it is hard for a computer model to provide realistic cost estimates. That is one of the reasons why the FCC auction provided the 70 percent savings previously mentioned. This problem of missing the mark is especially true when services are to be provided in areas that are fairly unique. The reason for this is that a computer model needs large amounts of relevant data to accurately project costs, and unique or rare circumstances that provide too little data. Another reason is that the model builders need to understand the geographic areas for which they are making estimates. That is hard for the model builders to do when there are many diverse features and areas. What regulators do in such circumstances is use other tools, such as earnings sharing, limits on particular costs or cost changes, and benchmarking to provide incentives for efficiency. The specific tool or tools chosen depend on the regulator's and providers' circumstances.

The FCC has chosen a combination of tools—including the cost-model based caps and limits on certain types of cost recovery—to create incentives for efficiency while anchoring the subsidy amounts in the real world. This is an appropriate approach. I am not in a position to assess whether the FCC has made optimal decisions with respect to its chosen combination of tools, but I am confident that the agency's new emphasis on economic analysis will inform the commission as it adjusts and fine-tunes its program.

**Eliminating Overbuilds.** It is normal in competitive markets for rivals to duplicate each other's infrastructure. This duplication is important for rivals to be able to compete for customers and for companies to test alternative services for the future. This duplication of infrastructure can be wasteful at best, and perhaps even destructive, when the government is subsidizing one of the providers.

This is why it is important that subsidies be provided only in places where there is no service and where service would not be commercially viable absent the subsidy. The FCC has taken steps to avoid subsidizing overbuilds—that is, situations where broadband service is already in place and the subsidy is provided to another competitor. Broadband mapping is central to this effort.

Other federal subsidy systems in the past have not been as focused on eliminating subsidies for overbuilds. For example, Jeffrey Eisenach and Kevin Caves examined the effectiveness of the $2.5 billion provided in the American Recovery and Reinvestment Act (ARRA) to the Rural Utilities Service (RUS) for the ARRA-created Broadband Initiatives Program (BIP).[14] Focusing on three case studies, Eisenach and Caves found that "more than 85 percent of households in the three project areas are already passed by existing cable broadband, DSL, and/or fixed

wireless broadband providers. In one of the project areas, more than 98 percent of households are already passed by at least one of these modalities." This was a waste of taxpayer dollars, so much so that the study estimated the cost of providing service to a home that had no service before was "$30,104 if existing coverage by mobile broadband providers is ignored, and $349,234 if mobile broadband coverage is taken into account."

Such problems were not unique to the BIP program. Economists Janice Hauge and James Prieger examined the effects of the US Department of Commerce's Broadband Technology Opportunities Program (BTOP), which was also funded by ARRA. Their study could find no clear correlation between funds spent and increased broadband penetration.[15] Some BTOP projects were also overbuilds.

**Importance of Deregulatory Efforts**

Customers choose what they purchase based on their perspectives on the value the various services offer and the prices charged. Historically, residential telecommunications services were all the same, so universal service programs focused only on the cost side, presuming that subsidizing telecommunications companies would result in affordable prices. The value side of the consumer equation was ignored.

This one-dimensional approach is no longer appropriate. Today's broadband service providers offer a myriad of value propositions, including different speeds, payment methods, and quality commitments, and offer them to both consumers and content providers. Exploiting this opportunity to gain value from multiple services and sources is how companies such as Google and Facebook have been able to build internet access networks in poor areas: They leverage revenues from advertising to help make the infrastructure commercially viable.

The FCC's recent deregulatory path—the highlight of which is its decision to restore internet freedom—allows internet service providers the opportunity to enhance their revenue by offering greater varieties of services to more types of customers. This may not be feasible for all service providers, but at least some will be able to enhance the commercial viability of their broadband offerings.

For example, it might cost a broadband provider $100 million to provide service in a rural area. The consumers in the area may be able to pay only $90 million for the service, implying that the provider needs $10 million in subsidy to make the service commercially viable. But if the carrier can offer fast lanes or other enhanced services

and receive say $15 million from customers who are willing to pay for these services, then the need for the subsidy is eliminated because the total revenue—$105 million—exceeds the $100 million cost.

**Diminishing Program Overlap**

In the portion of my testimony addressing the efficiency of the FCC's programs, I mentioned historic problems with BIP and BTOP, two federal programs that have also subsidized rural broadband. Rural broadband customers and the citizens that subsidize rural broadband would benefit from diminishing or eliminating this overlap.

One reason that overlap is counterproductive is that it allows companies to receive duplicative subsidies. For example, it is my understanding that a company receiving an FCC subsidy could still qualify for a low interest loan from RUS. It would be useful for the FCC staff and the RUS staff to coordinate to ensure that companies are not effectively receiving two subsidies for the same thing. I do not know of situations in which the new programs are duplicating subsidies, but it did happen under the old system.

Perhaps even better than staff coordination would be a consolidation of the federal broadband programs so that there is a single system that is focused, provides a single point for reporting and enforcement, and applies a coherent incentive system. Optimally, this would be conducted by an independent regulatory agency to restrict political interference. The FCC is now well positioned to do this, but a future system could be managed by state utility regulators that apply the FCC's approach, or cooperatively managed by federal and state regulators.

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Chairman Thune, Ranking Member Schatz, and members of the subcommittee, this completes my written testimony. I look forward to answering any questions you may have.

[1] Jeffrey Eisenach, "Testimony of Jeffrey A. Eisenach, Ph.D.," statement before the Committee on Commerce, Science and Transportation on Addressing the Risk of Waste, Fraud and Abuse of the Federal Communications

Commission's Lifeline Program, US Senate, September 6, 2017, http://www.aei.org/wp-content/uploads/2017/09/090617-Eisenach-Senate-Commerce-Testimony-on-Lifeline.pdf.

[2] See, for example, I. Bertschek et al., "The Economic Impacts of Broadband Internet: A Survey," *Review of Network Economics* 14, no. 4 (2015): 201–27 at 222. "In sum, we find strong evidence for positive impacts of broadband internet on economic outcomes."

[3] See R. McCloud et al., "Entertainment or Health? Exploring the Internet Usage Patterns of the Urban Poor: A Secondary Analysis of a Randomized Controlled Trial," *Journal of Medical Internet Research* 18, no. 3 (2016), http://www.jmir.org/2016/3/e46/f. The study also finds that "familiarity and skills in using the Internet enhance the capacity to use it for diverse purposes, including health and to increase capital."

[4] See Aaron Smith, "Lack of Broadband Can Be a Key Obstacle, Especially for Job Seekers," Pew Research Center, October 28, 2015, http://www.pewresearch.org/fact-tank/2015/12/28/lack-of-broadband-can-be-a-keyobstacle-especially-for-job-seekers/; and Council of Economic Advisers, "The Digital Divide and Economic Benefits of Broadband Access," March 2016.

[5] See Hilal Atasoy, "The Effects of Broadband Internet Expansion on Labor Market Outcomes," *ILRReview* 66, no. 32 (April 2013): 315–45.

[6] See Hanns Kuttner, *The Economic Impact of Rural Broadband*, Hudson Institute, 2016, https://s3.amazonaws.com/media.hudson.org/files/publications/20160419KuttnerTheEconomicImpactofRuralBroad band.pdf.

[7] Federal Communications Commission, *Universal Service Monitoring Report*, 2017, https://www.fcc.gov/sites/default/files/2017_universal_service_monitoring_report.pdf.

[8] Calculations are derived from the Bureau of Labor Statistics, "Consumer Expenditure Survey," 2015, https://www.bls.gov/cex/2015/combined/income.pdf.

[9] Federal Communications Commission, "Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion," February 2018, https://www.fcc.gov/document/fcc-releases-2018-broadband-deployment-report.

[10] Federal Communications Commission, "In the Matter of Connect America Fund, ETC Annual Reports and Certification, Establishing Just and Reasonable Rates for Local Exchange Carriers, and Developing a Unified Intercarrier Compensation Regime," December 13, 2018.

[11] Joseph Gillan, "Lessons from the CAF II Auction and the Implications for Rural Broadband Deployment and the IP Transition," National Regulatory Research Institute, forthcoming.

[12] Calculations are derived from the Bureau of Labor Statistics, "Consumer Expenditure Survey."

[13] See, for example, D. Kridel, D. Sappington, and D. Weisman, "The Effects of Incentive Regulation in the Telecommunications Industry: A Survey," *Journal of Regulatory Economics* 9, no. 3 (May 1996): 269–306; C. Ai and D. Sappington, "The Impact of State Incentive Regulation on the U.S. Telecommunications Industry," *Journal of Regulatory Economics* 22, no. 2 (September 2002): 133–59; and D. Sappington, "The Effects of Incentive Regulation on Retail Telephone Service Quality in the United States," *Review of Network Economics* 2, no. 4 (December 2003): 355–75.

[14] J. Eisenach and K. Caves, *Examining the Cost-Effectiveness of RUS Broadband Subsidies: Three Case Studies*, Navigant Economics, April 13, 2011, https://prodnet.www.neca.org/publicationsdocs/wwpdf/41311rus.pdf.

[15] J. Hauge and J. Prieger, "Evaluating the Impact of the American Recovery and Reinvestment Act's BTOP on Broadband Adoption," *Applied Economics* 47, no. 60 (2015): 6553–79.