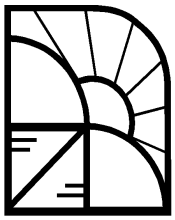

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Written Statement of

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Before the

House of Representatives

Committee on Energy and Commerce

Subcommittee on Oversight and Investigations

Hearing on "Closing the Digital Divide: Overseeing Federal Funds for Broadband Deployment."

May 10, 2023

Testimony of George S. Ford, PhD

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I. Introduction

Committee Chair McMorris Rodgers, Committee Ranking Member Pallone, Subcommittee Chair Griffith, Subcommittee Ranking Member Castor, and members of the Subcommittee, good morning and thank you for inviting me to testify today. My name is Dr. George S. Ford. I am the Chief Economist of the Phoenix Center for Advanced Legal and Economic Public Policy Studies. I appreciate the opportunity to share my thoughts with you.

I have been involved in the economics and regulation of the telecommunications sector for my entire professional career, now exceeding a quarter of a century. Prior to my present position as Chief Economist at the Phoenix Center, I worked as an economist for the Federal Communications Commission (FCC) and for private sector telecommunications firms. Over my career, I have published widely on communications policy including broadband policy and universal service.

The purpose of this hearing, as described by Chairs Rodgers and Griffith, is to ensure there is "robust oversight over broadband funding to minimize risks of waste, fraud, and abuse" so that the billions of dollars now allocated to expanding broadband

availability "go where they are needed so we can close the digital divide once and for all."[1] I wholeheartedly agree. For a quarter of a century before Covid we talked about, and threw money at, the "digital divide." Now, post Covid, we are still talking about a digital divide (or divides) and we are still throwing unprecedented sums of money at it. Summing across the subsidy programs available in recent years, over $150 billion is available to subsidize broadband services, and over $500 billion of other, Covid-related funding can be used for broadband services (among other uses).[2] Every dollar should be accounted for in the public record with sufficient details to evaluate the effectiveness and prudence of programs supported by federal dollars.

I have lost count of how many digital divides advocates have identified.[3] In my testimony, I will focus on the fact that there are locations in the U.S. where the traditional, land-based broadband networks are unavailable. This *Deployment Divide* is probably around 10% nationally, though we will have a better estimate of its size when the new mapping effort is complete.[4] Given the high-cost of deploying and maintaining

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[1] Available at: https://energycommerce.house.gov/posts/chairs-rodgers-griffith-announce-oversight-hearing-on-broadband-deployment.

[2] *BroadbandUSA Federal Funding Guide, Fiscal Year 2023*, BroadbandUSA (May 2023) (available at: https://broadbandusa.ntia.gov/sites/default/files/2023-05/Federal_Funding_PDF_Guide_5_1_23.pdf).

[3] I provided the basic economics of allocating subsidies across various demand- and supply-side programs in a paper entitled *Bridging the Digital Divide: An Empirical Analysis of Public Programs to Increase Broadband Adoption*, 67 TELEMATICS AND INFORMATICS (February 2022) (available at: https://doi.org/10.1016/j.tele.2021.101754).

[4] Some evidence from new mapping efforts is provided in G.S. Ford, *Overstating Broadband Availability: An Assessment of the "All-In" Assumption for FCC 477 Data*, PHOENIX CENTER POLICY PERSPECTIVE No. 22-04 (September 14, 2022) (available at: https://www.phoenix-center.org/perspectives/Perspective22-04Final.pdf).

broadband networks, this small share of unserved locations is impressive. Still, the goal of deployment subsidies is, obviously, to shrink that number even further.

As for waste, fraud, and abuse, they are inherent to any subsidy scheme. Reasonable efforts should be made to minimize them. Program design and administration may be informed by experience, and the FCC appears to be making some progress reducing such abuses. In many respects, focusing on the waste, fraud, and abuse of scammers on both the supply- and demand-side of a broadband subsidy scheme often pales in comparison to the waste perpetrated by some government agencies in their subsidy decisions. More attention is warranted on the subsidy decisions of federal agencies—an effort that requires detailed, publicly-available and easily-accessible data on their activities. For every subsidized project, the federal agencies, or state agencies using federal funds, should report on the location of the project, the recipients of those funds, how much funding was given, what was to be accomplished, and whether it was accomplished, among other data points of interest. When per-connection subsidies are large, then a rigorous and sensible cost-benefit analysis should be provided.

II. The Deployment Divide

The mission statement with respect to the Deployment Divide for the agencies assigned the task of spending subsidy dollars is plain: *maximize economically-sensible connectivity subject to the amount of funding available*. An *economically-sensible* connection means the value of the connection is at least as great as the cost of that connection.

This mission statement has several implications. To begin, as a rule of thumb, subsidies should go first to areas without service and, if any funding remains available, secondly to areas where service fails to meet basic modern needs. A dollar spent in unserved areas likely has a higher payoff than the same dollar spent in areas with some service (even a poor connection is better than no connection), though there may be exceptions. For example, it may be that in some cases it would be more cost effective to combine both unserved and underserved areas, and that should be considered. There is no economic justification for subsidizing multiple providers in unserved areas—subsidizing multiple providers in an area that is uneconomic reduces social well-being, as the additional costs exceed the benefits.[5] Even if there are residual subsidy dollars available, competition should not be subsidized. Whatever competitive benefits are obtained from overbuilding are artificial and more than offset by the tax burden on other people.

Second, if the subsidy budget is inadequate for all economically-sensible connections, then proposed projects should be sorted by their subsidy-per-connection and the lowest-cost connections targeted first. To do otherwise reduces the total number of connections from the subsidies (in violation of the mission statement) and reduces the return on the government's investment.

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[5] *See* T.R. Beard, G.S. Ford, L.J. Spiwak, and M. Stern, *The Law and Economics of Municipal Broadband,* 73 FEDERAL COMMUNICATIONS LAW JOURNAL 1, 29-30 (2020) (available at: http://www.fclj.org/wp-content/uploads/2020/09/MunicipalBroadbandArticleFINAL.9.2.20.pdf).

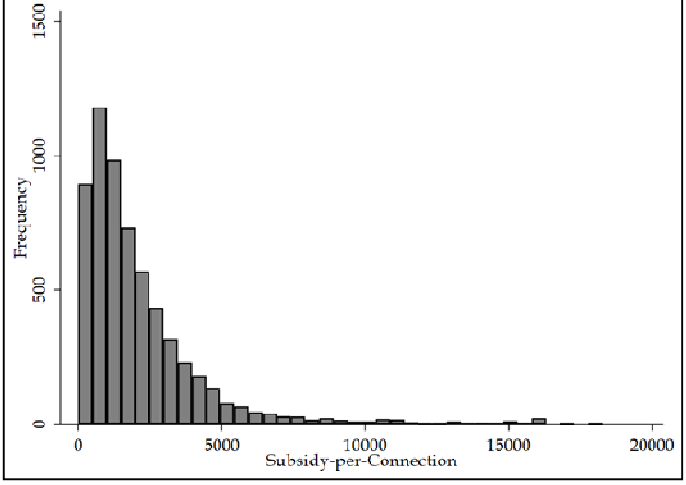
Third, broadband is valuable, but not infinitely so, and most of that value is of a private rather than social nature. Subsidies are justified by the social benefits, not the private ones. It is difficult to justify a tax-subsidy scheme so that people can binge watch videos or shop online; those are private benefits. Education and healthcare have social returns, though they are less than their private benefits, and efficiencies in the provision of government services may also represent a societal benefit. The costs of providing connections to some areas, especially fiber connections, vastly exceed even a generous estimate of the expected social benefits. In my estimation, the present value of an average household broadband connection has a social value of not more than about $20,000 over twenty years.[6] One may take issue with that estimate (but owe us an alternative), but undeniably there are limits to how much it is worth spending to obtain a connection.

At some point, the costs of providing a land-based connection are simply too high and other options need to be considered. For instance, in 2022, the Department of Agriculture gave a $33 million grant to deploy a fiber-optic network to 211 homes and five businesses, for an average cost of over $150,000 per passing. I have seen worse cases, with per-location costs of $400,00 and $500,000. There is no hope of a positive return on such large public investments and giving that much money for a single

[6] To compute the surplus of a broadband connection, I assume a linear demand curve, an own-price demand elasticity of -0.50, a mean price of $60, and a gross margin of 50%. The reservation price is calculated to be $180 per month, so the net benefit of a connection is $90 monthly. These are private returns that do not justify a subsidy. I assume a social premium to be no more than (and equal to) the private value of the connection, which is generous. The discount rate is 4%.

connection is irresponsible and disrespectful of the tax-subsidy burden imposed on Americans. In contrast, Georgia awarded $234 million in broadband grants to serve 76,700 locations at an average subsidy of $3,050 per passing, which seems reasonable.[7] The FCC's Auction 904 (the Rural Digital Opportunity Fund, RDOF) resulted in a mean subsidy of about $2,100 per connection, a maximum subsidy per connection of about $18,000, and with 90% of subsidy levels per connection between $159 and $6,100.[8] A histogram is provided in Figure 1. These subsidy levels seem reasonable.

Figure 1. Histogram of RDOF Funding



When the subsidy costs exceed something in the ballpark of $20,000 per connection (or some other reasonable estimate of the value of a connection), then other options should be considered, or a thorough accounting of costs and benefits should be provided. Fortunately, modern satellite broadband networks, which are being deployed

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[7] D. Goovaerts, *Comcast, Charter Win Big as Georgia Awards $234M for Broadband Expansion*, FIERCETELECOM (January 6, 2023) (available at: https://www.fiercetelecom.com/broadband/comcast-charter-win-big-georgia-awards-234m-broadband-expansion).

[8] Data available at: https://www.fcc.gov/auction/904.

at an increasing rate, make broadband service available in even the most remote areas where land-based networks are very costly. Modern satellite services offer a good broadband experience and should be used. Speed-test data from Ookla demonstrate that Starlink's satellite service, for instance, has a median service level of 85 Mbps.[9] With an annual subscription rate of no more than $1,500, satellite services establish an upper bound on reasonable subsidy levels. It would be far more efficient—and more respective of the tax burden of subsidies—to pay for all or part of a satellite connection for ten years ($15,000) than to spend $150,000 to deploy fiber to a single location. The same is true for mobile broadband providers, and their fixed wireless broadband offerings, which offer high-quality broadband services. If a mobile provider can provide a quality service at lower costs, then that service should be chosen for subsidies to reduce the costs of closing the Deployment Divide. Today, the narrow attention on fiber broadband networks for *every* scenario is unjustified, especially when the costs of fiber networks are often so large that their deployment fails to pass, by nearly any standard, a cost-benefit test.

Fourth, if the government is going to cover the shortfall in private returns through subsidies, then there is no economic justification for subsidizing municipal broadband networks—at least new ones. Local governments are not experts in the

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[9] Available at: https://www.ookla.com/articles/starlink-hughesnet-viasat-performance-q3-2022. Other companies are deploying modern satellite broadband networks capable of offering sufficient speeds to reap the benefits of broadband connectivity. *See, e.g.*, A. Jones, *Amazon Gets A Green Light To Launch 3,000-Satellite Kuiper Constellation*, SPACE.COM (February 23, 2023) (available at: https://www.space.com/fcc-approves-amazon-constellation-kuiper); *Microcom and Pacific Dataport Celebrate Successful Launch of 36 Satellites*, ALASKA BUSINESS (July 6, 2021) (available at: https://www.akbizmag.com/industry/telecom-tech/microcom-and-pacific-dataport-celebrate-successful-launch-of-36-satellites).

provision of broadband services and have enough on their plates. The history of municipal networks is abysmal, costing local and other taxpayers millions in waste.[10]

Federal agencies responsible for subsidizing broadband have contributed to the problem. In 2010, for instance, the Department of Agriculture provided loans and grants to a municipality in Minnesota to build a network in areas where three private providers already offered service.[11] The FCC also provided millions to support the network. The municipality defaulted on the loan a few years later, leaving Americans outside the area holding the bag (of at least $45 million). To maximize the return on subsidy dollars, the costs of deployment should be minimized, and subsidies should be directed to firms in the business of deploying and operating broadband networks today (largely, to extend their existing footprint to unserved areas), not local governments and interlopers looking for a government handout.

Fifth, it makes no sense to have a subsidy program to increase deployment that includes cost-increasing provisions, since doing so is incompatible with the mission. The NTIA is prone to such excesses and its cost-increasing proclivities need to be reeled-in. For instance, there is no middle-class affordability requirement in the statute, yet the

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[10] *See The Law and Economics of Municipal Broadband, supra* n. 5; *see also* G.S. Ford, *Electricity Rates and the Funding of Municipal Broadband Networks: An Empirical Analysis,* 102 ENERGY ECONOMICS (October 2021).; G.S. Ford and R.A. Seals, *The Rewards of Municipal Broadband: An Econometric Analysis of the Labor Market,* 45 TELECOMMUNICATIONS POLICY ((31 July 2021).

[11] J. Malcomb, *Rural Minnesota County Built a Fiber Network, but Now Taxpayers Face Huge Bills*, GOVERNMENT TECHNOLOGY (2018) (available at: https://www.govtech.com/network/rural-minnesota-county-built-a-fiber-network-but-now-taxpayers-face-huge-bills.html).

NTIA has imposed one.[12] Also, the statute is explicitly technology neutral, yet the NTIA has expressed a preference for fiber.[13] And, the NTIA has expressed a preference for union labor.[14] The NTIA also seeks to establish a *de facto* open-access unbundling regime that loosely echoes Section 251 of the Telecommunications Act, ignoring the basic Fifth Amendment due process rights of providers.[15] These extra-statutory provisions, among others, are incompatible with the mission—they raise the cost of deployment. The NTIA appears to have learned nothing from its bungling of the Broadband Technology Opportunity Program (BTOP), which accomplished very little.[16] The agency squandered billions, to the point that one fiber network was built *and then totally forgotten about for ten years!*[17] NTIA needs to keep its eyes on the prize, use professionals to build networks, and avoid burdening broadband providers and the agency's state partners with demands that are difficult to comprehend, implement, or administer. Congress should encourage the NTIA, and its state partners, to stay on task.

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12 *Notice of Funding Opportunity*, BROADBAND EQUITY, ACCESS, AND DEPLOYMENT PROGRAM, NTIA (May 13, 2022) (available at: https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/BEAD%20NOFO.pdf) at p. 66; *and c.f.,* G.S. Ford, *Middle-Class Affordability of Broadband: An Empirical Look at the Threshold Question*, PHOENIX CENTER POLICY BULLETIN No. 61 (October 2022) (available at: https://phoenix-center.org/PolicyBulletin/PCPB61Final.pdf).

13 NTIA *NOFO*, *id*. at p. 7.

14 *Id*. at p. 58.

15 *Id*. at pp. 14, 44. For a detailed explanation of rise and fall of the U.S. unbundling regime of the 1996 Telecommunications Act, *see* G.S. Ford and L.J. Spiwak, *Lessons Learned from the U.S. Unbundling Experience*, 68 FEDERAL COMMUNICATIONS LAW JOURNAL 95 (2016) (available at: http://www.fclj.org/wp-content/uploads/2016/01/68.1.3-Spiwak-and-Ford.pdf).

16 *Bridging the Digital Divide, supra* n. 3.

17 *See* N. Benson, *New York State Fees And Willingness to Connect Are A Big Hurdle For High-Speed Broadband In The Southern Tier,* WGRZ (December 4, 2020) (available at: https://www.wgrz.com/article/news/local/high-speed-broadband-within-reach-in-new-york-state-southern-tier/71-23ac797c-4f56-4d4a-8738-07232faf72e9).

Sixth, attention should be focused on end-user connections, not middle-mile networks. A connection requires backhaul to function, so middle-mile infrastructure is part-and-parcel of providing a connection. Funding middle-mile networks, absent some compelling justification, should be avoided and those backhaul networks should be left to the broadband providers to construct.

Seventh, agencies tasked with subsidizing broadband availability should not adhere strictly to arbitrary choices of technology or speed levels. If you can get an acceptable level of service at a location for $1,000, then you don't spend $10,000 because of some arbitrary speed threshold. For instance, if a location can be served at 50 Mbps for a $1,000 subsidy then it makes no sense to spend $50,000 for a 100 Mbps service, absent compelling evidence the additional benefits are worth $49,000 (a long shot, for sure). If the subsidy differences are small among varying alternatives, such as fiber or other high-quality fixed networks, then paying a little more may be reasonable, but marginal differences in speed should not otherwise justify large differences in subsidy amounts. Also, paying for gold-plated networks risks the subsidy budget being exhausted before many lower-cost locations are served.

Eighth, while Congress certainly wants evidence of success, patience in broadband deployment is warranted. It is not feasible to dump billions of dollars in deployment and expect networks to be built in short order. Equipment and labor are in insufficient supply for too rapid a deployment schedule. Also, it is more costly to deploy faster, reducing the returns on the investment. The same is true for the "Buy American" provisions of the IIJA. Given the supply-chain chaos following the Covid

outbreak, it is hard not to be sympathetic to increasing U.S. production of vital technology. Still, expanding domestic production takes time, so such a requirement delays deployment and raises the cost of deployment. Broadband networks will be deployed faster and more widely if providers are permitted to purchase inputs according to their own price/quality preference without too much interference from Congress, apart from national security concerns. Waivers for the requirement should be readily available when necessary.

Finally, by the Government Accountability Office's (GAO) count, there are 130 separate broadband subsidy programs spread out across 15 agencies.[18] What's done is done, but in the future, Congress needs to consolidate subsidy programs in a few agencies, if not one agency. It is worth considering how many of these programs can be retired after the large subsidy amounts now available are spent over the next few years. Also, allocating large subsidies efficaciously requires expertise and experience. Dropping hundreds of millions of dollars, if not billions of dollars, on an agency with no experience funding broadband networks is ill advised. It is also difficult to obtain consistent data that permits a systematic review of subsidized activities because so many agencies are involved. Still, some effort should be made to ensure that any agency presently allocating subsidies provides a thorough accounting of their activities. Such information should be comparable across agencies, to the extent feasible, as well as publicly-available and easily-accessible for third-party review.

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[18] *National Strategy Needed to Guide Federal Efforts to Reduce Digital Divide*, Government Accountability Office GAO-22-104611 (May 2022) (available at: https://www.gao.gov/assets/gao-22-104611.pdf).

III. The Adoption Divide

While my attention has mainly been on the Deployment Divide, there is also the issue of an *Adoption Divide*. Not all Americans use broadband in the home even when it is available. Many Americans are not interested in having a broadband connection in the home, and often for good reasons.[19] Broadband has benefits but it has a dark side too. Many people find a mobile connection to be perfectly adequate, so a singular focus on home-based broadband services, which is common, is misguided. A modern mobile device is capable of nearly anything a fixed connection can do. Between fixed and mobile broadband, census data indicate that all but about 1% of persons have access to the Internet, though millions of these connections are subsidized in some way. About 15% to 20% of households do not have a fixed broadband connection in their homes, and that number will never be 0% so that prospect should be set aside.

Broadband is expensive to provide, requiring large up-front and maintenance costs. Some lower-income households may not be able to afford the price, at least consistently over time. Several subsidy programs aim to address such cases, including the FCC's Lifeline Program and Affordable Connectivity Program (ACP). ACP is more generous in its subsidies and, naturally, has proven to be popular. The program permits lower-income households to acquire fully-featured services as broadband providers

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[19] *See, e.g., Digitally Unconnected in the U.S.: Who's Not Online and Why?*, NTIA (2016) (available at: https://www.ntia.doc.gov/blog/2016/digitally-unconnected-us-who-s-not-online-and-why); G.S. Ford, *Challenges to Universal Adoption: A Look at NTIA's New Data*, PHOENIX CENTER POLICY PERSPECTIVE No. 22-03 (June 9, 2022) (available at: https://www.phoenix-center.org/perspectives/Perspective22-03Final.pdf); G.S. Ford, *Confusing Relevance And Price: Interpreting And Improving Surveys On Internet Non-Adoption*, 45 TELECOMMUNICATIONS POLICY (March 2021) (available at: https://doi.org/10.1016/j.telpol.2020.102084).

offer good services at low prices to eligible households. Some providers also offer free or nearly free services to Lifeline customers, though these services are often limited in ways to keep the costs down due to match the relatively low monthly subsidy. Still, such services are adequate for many customers, especially given the price.

As for the demand-side subsidies, Congress might consider consolidating these two programs if they are to continue to be funded, though I would not roll it into the FCC's Universal Service Fund, which is a mess and in desperate need of a major overhaul. The funding should come from the general budget so it can be re-evaluated by Congress on a regular basis (but not too regular, as uncertainty reduces the incentive to participate on both sides of the market). It is my understanding that ACP is a better-designed system and more resilient to waste, fraud and abuse, and its higher subsidy level permits providers to offer high-quality services, so it should serve as the benchmark. In such a consolidation, the subsidy levels should be sufficient to meet the needs of low-income households and attract the major providers of broadband services.[20] The subsidies should not be so low, or so onerous to obtain, that the primary providers of broadband service are discouraged from participating. Of course, addressing waste, fraud, and abuse increases the productivity of such expenditures, and the FCC should monitor any demand-side subsidy program on an ongoing basis. I do

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[20] T.R. Beard, G.S. Ford, L.J. Spiwak, and M. Stern, *Regulating, Joint Bargaining, And The Demise of Precedent*, MANAGERIAL AND DECISION ECONOMICS (27 June 2018) (available at: https://onlinelibrary.wiley.com/doi/abs/10.1002/mde.2934) (originally released as PHOENIX CENTER POLICY PAPER NO. 49: *Eroding the Rule of Law: Regulation as Cooperative Bargaining at the FCC*) (available at: https://www.phoenix-center.org/pcpp/PCPP49Final.pdf).

think, at this point, that the issue of agency waste in allocating deployment subsidies is a larger problem.

IV. Summary

Laws affecting the broadband business may change, but the underlying economics of the business have remained the same. Broadband is a service—consumers demand it; providers supply it, and at great cost. How public policy affects broadband deployment is largely predictable. By reducing costs, or increasing demand, more broadband will be deployed, and more Americans will use the service, other things constant. The efficacy of such policies depends, of course, on how sensibly the funding is allocated, which I believe is the focus of this hearing. Raising the cost of building networks through extraneous pet projects, several of which the NTIA has proposed, is not helpful. The mission is simple: *maximize economically-sensible connectivity subject to the amount of funding available*. Any actions inconsistent with this goal should be avoided.

Going forward, the responsibility for broadband subsidies should be restricted to a few agencies. Several programs might be retired altogether, as the large subsidies now available should close the deployment gap. Congress should provide a clear statement of purpose and demand a rich set of publicly-available performance metrics including, on a project specific basis, how much money was granted and to whom, the target number of connections, the achieved number of connections over time, and other relevant data points. Absent such data, we will be in the dark on the efficacy of the subsidies and on the wisdom of the agency's choices. If feasible, existing programs

should be merged when they serve a similar purpose, and agencies with a history of poor decision-making should be left out of the consolidation. Success and failure are easier to quantify when the subsidies are consolidated, good data are collected, and those data are made available to the public. Billions of dollars more have been allocated to broadband availability and much of this money is yet to be spent. Surely, it is not too much to ask for a full accounting of how and where the money was spent and whether the intended goal was satisfied.

V. Conclusion

Mr. Chairman, thank you again for the invitation to testify today. I hope that my testimony aids in the development of effective policies to improve our broadband infrastructure. I look forward to answering any questions the Subcommittee may have.