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PUBLIC INTEREST COMMENT

THE FCC SHOULD CONSIDER AUTHORIZING BROADBAND VOUCHERS TO RURAL HOUSEHOLDS

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Report on the Future of the Universal Service Fund
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I welcome the opportunity to submit comments regarding the notice of inquiry about how the Federal Communications Commission (FCC) should improve its universal service goals and its High-Cost Support program (now known as the Connect America Fund) for broadband deployment. In this comment, I propose that the FCC consider authorizing broadband vouchers to rural households. Attached is a study illustrating that High-Cost Support could provide vouchers worth $5 to $45 monthly to every rural household in the United States. This voucher framework has many benefits over traditional grant programs:

- *Consumer choice*. Rural broadband users determine which providers ultimately receive program funds.
- *No crowding out or overbuilding*. No provider faces a competitive disadvantage owing to FCC funding because all providers have equal access to consumers' vouchers.
- *No new mapping*. Providers need not perform time-consuming and contentious broadband mapping, given that overbuilding is precluded. Federal and state officials can use currently

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available map data and maps, such as the Census Bureau's map of rural areas,[1] to determine eligible geographic areas.

- *Compatibility with concurrent rural broadband programs.* No provider who participates in existing programs (such as the US Department of Commerce's Broadband Equity, Access, and Deployment [BEAD] program or state programs) is penalized or excluded from receiving consumer vouchers.

The notice asks, "What changes, if any, should we consider to the High-Cost program in light of the Infrastructure Act and other recent developments?"[2]

The new BEAD program offers over $40 billion to states and cities to expand broadband services in rural areas. As the FCC recognizes, it is important that High-Cost Support and BEAD program funding not be duplicative. One way for High-Cost Support funds to complement BEAD funds is to distribute broadband vouchers to rural households.

The FCC's Universal Service Fund's statutory language about use of funds is broad and seems to permit vouchers to households.[3] Such a voucher, if authorized, would operate much like the FCC's Affordable Connectivity Program, a $30–$75 monthly benefit to low-income households.[4]

If the FCC were to authorize voucher programs, federal and state officials could identify unserved or underserved geographic areas and issue vouchers to every household in those areas. With a voucher, households could simply choose the internet service provider that works best for them—whether it is a rural cable company, wireless internet service provider, phone company, electric co-op, satellite company, or cellular provider. There would be no subsidizing of monopolists and no risk of anticompetitive overbuilding.

Providers—large or small; for-profit or nonprofit—would compete to be the recipient of those households' FCC-funded monthly bill credits. Regional and local governments could easily supplement or match the FCC funds with local funding, much like as the UK voucher program has done,[5] increasing the voucher amount to rural households.

State and national governments have successfully used broadband vouchers. At least two states—Alabama and Delaware—have used Coronavirus Aid, Relief, and Economic Security (CARES) Act funding to create broadband voucher programs that extend broadband coverage to households with students. Under the Delaware voucher program, AT&T, Comcast, Mediacom, and Verizon have provided landline service and mobile hotspots to eligible households with

1. "At the time of the 2010 Decennial Census, almost 60 million people, about 19 percent of the population, lived in rural areas of the United States." "Rural America," Census Bureau, accessed January 24, 2022, https://mtgis-portal.geo.census.gov/arcgis/apps/MapSeries/index.html?appid=49cd4bc9c8eb444ab51218c1d5001ef6. The Census Bureau generally defines a town, village, or area as rural if it has a population smaller than 2,500. "2010 Census Urban and Rural Classification and Urban Area Criteria," Census Bureau, last updated October 8, 2021, https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural/2010-urban-rural.html.
2. Federal Communications Commission, "Report on the Future of the Universal Service Fund" (report no. FCC 21-127, Federal Communications Commission, Washington, DC, December 15, 2021), 14.
3. The principle for high-cost funding given by statute is that "consumers in all regions of the Nation, including . . . those in rural, insular, and high cost areas, should have access to telecommunications and information services . . . that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas." 47 U.S.C. § 254(b)(3). Vouchers for rural households would satisfy this principle.
4. "Affordable Connectivity Program," Federal Communications Commission, last updated Friday, January 21, 2022, https://www.fcc.gov/acp.
5. Mark Jackson, "Gov Hails £22m Top-Up for UK Rural Gigabit Broadband Vouchers," *ISP Review*, September 12, 2020.

students.[6] Over 20,000 students have benefited.[7] Alabama's emergency broadband voucher program for students began in the summer of 2020 and, within 10 months, connected over 200,000 students.[8] Program costs were lower than expected and participation by small phone and electric co-ops was significant.[9]

A common objection to broadband vouchers is that they cannot induce buildout to unserved areas. Nevertheless, the experience with vouchers in the United Kingdom suggests that vouchers encourage service expansion to rural areas. The United Kingdom established a rural voucher program around 2014, and providers found "great success" in voucher take-up by encouraging neighbors and communities to pool their vouchers together and commit to a fixed term of service (for instance, a one-year agreement).[10] Voucher pooling is now required by the UK government, and that reliable stream of new revenue and customers induces providers to build out to new areas, including with fiber optics in many cases.[11]

A 2020 study by Michael Kotrous and me illustrates how a rural voucher program could operate.[12] That study is attached. We estimate that with the $4.6 billion budget of High-Cost Support in 2019, regulators could have assigned a sizable voucher—between $5 and $45 monthly—to every rural household in the United States.[13]

A handful of states have shown interest in and the capacity for operating a broadband voucher program. High-Cost Support's statutory language seems broad enough to authorize voucher programs. The FCC should consider disbursing some or all High-Cost Support funds to rural households as vouchers to upgrade and extend broadband networks in rural areas. Based on real-world outcomes of voucher programs, large and small providers would participate and expand their network coverage.

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6. Delaware Department of Technology and Information, *Connect Delaware—Needs Assessment*, n.d., 4.
7. Delaware Department of Education, *American Rescue Plan ESSER Funding*, July 13, 2021, 8.
8. Trisha Powell Crain, "Alabama Internet Voucher Program for Students Extended through Spring 2021," *AL.com*, December 28, 2020. "Over 200,000 Alabama students were connected to broadband service through the ABC for Students Program." Alabama Broadband Connectivity for Students (website), accessed January 24, 2022, https://abcstudents.org/.
9. "Over the summer time, state officials expected the program to cost $400 per student. Current estimates . . . peg it at closer to $225 per student." Brian Lyman, "State Officials Hope for Extension of Broadband Student Voucher Program," *Montgomery Advertiser*, November 26, 2020. The *Times-Journal* of Fort Payne, Alabama, lists several participating rural phone and electric co-ops. "Alabama Broadband Providers Connecting Eligible K–12 Students This Fall," *Times-Journal*, September 4, 2020.
10. UK Government, Department for Culture, Media, and Sport, *Supplier Guidance: Gigabit Broadband Voucher Scheme*, November 7, 2018, 7. "Residents are asked to commit to ordering a full fibre service from a provider of their choice for at least 12 months once the new network is available." Openreach, "Cambridgeshire Residents Urged to Pool Government-Backed Vouchers to Secure Ultrafast Broadband," news release, February 2, 2021, https://www.connectingcambridgeshire.co.uk/2021/02/cambridgeshire-residents-urged-to-pool-government-backed-vouchers-to-secure-ultrafast-broadband/.
11. "Residents of the village of 55 properties—including five farms and around 20 other small businesses—clubbed together to pool vouchers provided through the government's £200m Rural Gigabit Connectivity (RGC) programme." Alex Scroxton, "Buckinghamshire Village Pools Broadband Vouchers to Fund Full-Fibre Dig," *Computer Weekly*, July 8, 2019. "After circulating leaflets and door-knocking to get the required buy-in, some 30 houses agreed to apply for vouchers via Openreach. The system went live in early 2020 and final connections were completed in May." "How Connected Was My Valley?," Gigabit Broadband Voucher Scheme, accessed January 24, 2022, https://gigabitvoucher.culture.gov.uk/for-businesses/case-studies/how-connected-was-my-valley/.
12. Brent Skorup and Michael Kotrous, "Narrowing the Rural Digital Divide with Consumer Vouchers" (Mercatus Policy Brief, Mercatus Center at George Mason University, Arlington, VA, October 2020).
13. Skorup and Kotrous, "Narrowing the Rural Digital Divide." Using Census Bureau data from 2010, we estimate there are around 23.2 million households in rural areas. Skorup and Kotrous, "Narrowing the Rural Digital Divide," 10, table A1.

ATTACHMENT

Brent Skorup and Michael Kotrous, “Narrowing the Rural Digital Divide with Consumer Vouchers” (Mercatus Policy Brief, Mercatus Center at George Mason University, Arlington, VA, October 2020)

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POLICY BRIEF

Narrowing the Rural Digital Divide with Consumer Vouchers

Brent Skorup and Michael Kotrous

October 2020

Rural broadband became an issue of national conversation in January 2018 when President Trump signed an executive order instructing agencies to prioritize pro-deployment policies in rural areas.[1] Further, recently in the wake of nationwide school and business closures in 2020, millions of Americans have found themselves more reliant than ever on home broadband service in order to engage in remote work or distance learning. This has made measures to close the rural "digital divide"—the gap between wealthier, urban households and poorer, rural households in broadband service quality—more urgent for policymakers and industry members. Congressional leaders and the Trump administration, for instance, have identified rural broadband support as a priority of proposed coronavirus relief legislation.[2]

Congress has debated and legislated rural telecommunications funding before. The Telecommunications Act of 1996 added a statutory "universal service" objective that the Federal Communications Commission (FCC) ensure that telecom services in rural areas (1) "are reasonably comparable to those services provided in urban areas" and (2) "are available at rates that are reasonably comparable to rates charged for similar services in urban areas."[3] Congress required interstate telecommunications providers to set aside a portion of their revenues to subsidize, according to FCC guidance, telecommunications in rural areas consistent with these statutory objectives.[4]

Since 1996, the FCC, regardless of which party has led it, has determined that rural areas don't have reasonably comparable services to urban areas. In 2018, for instance, 98 percent of urban households had access to fixed, high-speed broadband (typically via coaxial cable or fiber-optic lines), but only 78 percent of rural households had access to such services.[5] The rural digital divide persists, even though efforts to close it have received bipartisan support and substantial public

public outlays. Over two decades, the federal government has granted more than $100 billion in subsidies to telecommunications and broadband providers in high-cost areas under the Universal Service Fund's (USF's) Connect America Fund program, also known as High-Cost Support.[6]

We argue that the structure of rural broadband support programs merits change. The digital divide, while shrinking, requires a new approach to minimize wasteful overhead spending, complex eligibility requirements for providers, and substantial inequities in fund disbursements between similarly situated states and regions. Congress has delegated funding decisions to the FCC, which has delegated disbursement decisions to the private Universal Service Administrative Company, which has relied on a proprietary model developed by another private firm to define major program funding mechanisms.[7] These convoluted subsidy programs, which have built up over 25 years, defy accountability to the public and government auditors.

As an alternative to directly subsidizing telecom providers in rural areas through these complex mechanisms, we propose that the FCC convert most High-Cost Support into a broadband voucher program for rural households. Essentially, the rural telecom subsidy programs should resemble Lifeline, the long-running program which credits $9.25 toward every eligible low-income user's monthly smartphone or phone bill. By converting High-Cost Support into a voucher program, tens of millions of rural households could receive a substantial monthly rebate on their broadband and wireless bills. Using today's High-Cost Support budget to illustrate the principle, we show that every rural household in the United States could receive between $5 and $45 per month ($60 to $540 annually) depending on how High-Cost Support funding is currently disbursed among the states. If participation by eligible households resembles participation rates in Lifeline, these rebates could be higher.

This rural broadband voucher idea has circulated for years. Rural broadband vouchers have proved popular in the United Kingdom and are gaining attention in the United States.[8] The idea was recently endorsed, for instance, by Pennsylvania's Communications and Technology Committee.[9] Former FCC Commissioners Mignon Clyburn and Robert McDowell, a Democrat and a Republican, respectively, in May 2020 called for a temporary $100 voucher program for households struggling to pay bills because of the COVID-19 pandemic.[10] Telecommunications experts Blair Levin and Larry Downes endorsed a similar temporary voucher program that same month.[11] Finally, a novel broadband policy was recently announced in Arkansas that resembles a broadband voucher: in July 2020, Governor Asa Hutchinson created a statewide program that would use $10 million in federal funding from the Coronavirus Aid, Relief, and Economic Security (CARES) Act to provide wireless hotspots (and internet access) to up to 20,000 homes with children for two years.[12]

Rather than propose a new law and new funding, we apply this idea using today's High-Cost Support budget and current law as constraints. First, we summarize the state of the rural-urban broadband deployment gap. Second, we highlight deficiencies with the current subsidy programs, particularly their complex structure, perverse incentives, and inequitable disbursements. Finally, we illustrate

a simple consumer voucher scheme using today's High-Cost Support subsidies. Though a voucher program would represent an abrupt policy change, it would accomplish statutory goals while being less costly to administer and more transparent than today's broadband subsidy programs.

THE STATE OF THE DIGITAL DIVIDE

Rural broadband deployment has improved considerably in the past few years. The FCC tracks the number of people in rural and urban areas who lack options for fixed, high-speed broadband (25 megabits per second or greater) . In 2013, according to the FCC, most Americans living in rural areas in the 50 states—nearly 32 million people—had no fixed, high-speed options.[13] By 2018, those numbers had shrunk to just 22 percent of the total rural population in the 50 states—over 14 million people—with no fixed, high-speed options.[14] As the FCC acknowledges,[15] the agency does not measure how much of this coverage expansion is caused by the disbursement of High-Cost Support funding;[16] much of the broadband expansion into rural areas in recent years has been from unsubsidized cable operators.[17]

Nevertheless, high-speed buildout in rural areas lags behind the buildout occurring in urban areas. In 2013, for instance, only 8 percent of urban residents in the 50 states and the District of Columbia—just over 20 million people—had no fixed, high-speed options.[18] At the end of 2018, only 2 percent of urban residents, about 4 million people, had no fixed, high-speed options.[19] That gap—22 percent in rural areas having no options versus 2 percent in urban areas having no options (or about 10 million more rural people having no options, in absolute terms)—is the rural digital divide.

In total, about 6 percent of US households lack fixed, high-speed options.[20] However, bringing landline services (namely, fiber optics) to those final few unconnected homes raises costs exponentially, likely exceeding $30,000 per subscriber.[21] According to 2017 FCC estimates, providing fiber broadband to the last 2 percent of US households would cost $40 billion up front and require $2 billion of subsidies annually for operational costs.[22] Since the Telecommunications Act of 1996 instructs the FCC to ensure that telecommunications rates and service options in rural areas are "reasonably comparable" to those of urban areas, the FCC will continue to disburse billions of dollars annually to narrow that urban-rural gap. Before spending those billions, the FCC should consider whether existing programs are up to the task of bringing broadband to the most rural households in a fiscally responsible way.

DEFICIENCIES WITH HIGH-COST SUPPORT

While the COVID-19 pandemic has brought the digital divide into the limelight, a tremendous amount of public resources, over $100 billion, has been spent to connect rural households to telecommunications service over the past two decades.[23] Under High-Cost Support, the FCC distributed about $4.8 billion dollars to providers in 2018 with the aim of stimulating rural broad-

band deployment, about 30 percent more than the $3.7 billion in High-Cost Support funding disbursed in 2001, adjusted to 2018 dollars.[24] While drafters of the relevant statutes believed subsidies would eventually decrease,[25] deployment costs rise exponentially as the percentage of households served increases,[26] which makes the goal of reasonably comparable services and rates in rural areas extremely costly to achieve.[27]

Inefficient Funding Design

When Congress passed the Telecommunications Act of 1996, Congress left the particulars of the USF to the FCC. The FCC chose to require telecommunications providers to pay into the fund on the basis of the amount of their long-distance phone revenues.[28] As a result, USF programs currently suffer from a puzzling and counterproductive funding design: retail rates subsidized by long-distance telecommunications revenues.[29]

This funding design extends what had occurred before the AT&T breakup: regulators reducing local phone rates by shifting long-distance revenues to local phone companies. As Milton Mueller points out, this cross-subsidization policy was more an accident of history driven by political realities than a coherent universal service policy. State lawmakers, who regulated intrastate phone rates that were highly visible to consumers, had more success in driving down local phone rates than the FCC, which regulated interstate phone rates, had in driving down long-distance phone rates. In the years preceding the AT&T breakup and the Telecommunications Act of 1996, local phone services were increasingly subsidized by long-distance revenues.[30]

Excessive Complexity

High-Cost Support has numerous moving parts in its funding model. When the FCC introduced the Connect America Cost Model a few years ago, for instance, which represented a major change to the program, the commission noted that the model is "considerably more complex . . . and relies on more extensive data sets" than prior funding models.[31] According to FCC documents, modelers participated in workshops for 10 months to incorporate "twenty-eight topics related to economic and engineering assumptions and input values" into the initial Connect America Cost Model.[32] Constructing the model took an additional 16 months and 11 further iterations to complete.[33] Furthermore, elements of this model are nonpublic and subject to protective orders, which makes independent review and validation difficult.[34]

The FCC's bespoke funding model incorporates highly specific inputs—occasionally modified at the level of individual rural telecommunications companies[35]—which drove the more than two years of development, derivative models, and regulatory overhead described later.[36] The result is a model that, per the FCC, includes "assumptions about literally hundreds of individual inputs."[37] This complexity in design drives some of the inexplicable disbursements and overhead waste.

Inequity in Disbursements

There is currently substantial variance in the distribution of High-Cost Support funding among the states. Given the other weaknesses of the program, this variance suggest a distorted funding system where providers serving a small number of households receive a disproportionate amount of subsidies. Some variance in benefits is to be expected given differences in population density and geography among the states. However, a handful of states see huge amounts of High-Cost Support funding flow in.

For instance, Alaska received over $2,100 in High-Cost Support funding per rural household in 2018. By contrast, Rhode Island received $0.76 per rural household in 2018.[38] This disparity exists despite the fact that increasing the total amount of subsidy support per household has little effect on overall penetration rates.[39]

These excessive disparities are likely caused by the existing subsidy model formulas, which incorporate the costs to provide landline service in low-population areas. Other inequities abound. Pennsylvania residents, for instance, have in recent years seen $800 million in federal USF fees (on net) leave the state despite Pennsylvania facing significant rural deployment challenges.[40] In 2018, less than half of the estimated $384 million in USF fees collected from Pennsylvania residents was used to support Pennsylvania telecom providers participating in the four USF programs, including High-Cost Support.[41]

States with similar numbers of rural households and similar geography have hard-to-explain discrepancies in High-Cost Support funding. For instance, Alabama has about 34 percent more rural households than Mississippi and similar geography, yet the providers serving rural Mississippi received almost two times as much total High-Cost Support funding as the providers serving rural Alabama in 2018. Similarly, New Hampshire has about 30 percent more rural households than neighboring Vermont, yet providers in Vermont received over 60 percent more total High-Cost Support funding for rural broadband. Table A1 in the appendix shows our estimate of rural USF support per rural household for all 50 states in 2018.

Excessive Overhead

These disparities do not necessarily mean that customers in states such as Alaska, with greater amounts of subsidies per rural household, are benefiting meaningfully more than those in states such as Rhode Island, with low subsidy-to-rural-household rates. Much of the subsidies never result in increased deployment for rural customers because the subsidies are spent on regulatory compliance and firm overhead. The design of High-Cost Support encourages significant waste and excess, despite regular efforts by the FCC to reform and restructure the program.

Scott Wallsten estimates that of all High-Cost Support subsidies between 1998 and 2008, 59 percent went to eligible providers' "general and administrative expenses."[42] With expenditures under

High-Cost Support totaling around $45 billion over those 10 years, that means about $26 billion was directed to overhead expenses, not to capital upgrades and network expansion. Even the estimates of spending on capital improvements should be viewed skeptically. Three studies of carriers receiving High-Cost Support funding in the 1990s and early in the following decade indicate that carriers were inflating their fixed costs in order to receive more subsidies.[43] This "goldplating" technique—using public funds to make eligible but unneeded network upgrades—is difficult to identify and estimate. Poor oversight and a lack of measurement for analysis of program effectiveness remain problems with contemporary USF funds.[44]

BROADBAND VOUCHERS PUT CONSUMERS IN CHARGE

An alternative mechanism for the federal government to encourage broadband adoption in high-cost rural areas is to offer broadband vouchers that households could use as an internet coupon. Subsidizing consumers, rather than providers, would better align the program with economic theory and the principles of public finance. Three factors are relevant for this proposed change:

1. high-speed broadband is near universal, exceeding 90 percent coverage of US households;
2. the costs of extending fiber broadband to the last small percentage of households rise exponentially; and
3. wireless solutions such as fixed wireless, cellular, and satellite broadband are increasingly a substitute for wired broadband.

In practical terms, vouchers reduce the risk of disbursements being used for gold-plated services or being sunk in inflated operating costs. Vouchers also allow consumers to purchase cellular, fixed-wireless, and satellite broadband subscriptions, which provide service in rural areas at much lower costs than fiber-optic broadband but have been historically excluded from FCC programs to serve high-cost areas.

We illustrate how a tiered voucher system could be established, using the High-Cost Support disbursements across the United States in 2018 as a benchmark.[45] Rural households in states that have received the most support historically (on a per-rural-household basis) receive the biggest coupons in our proposal. Historically, High-Cost Support subsidies have been based in part on "ruralness" and actual costs of buildout (i.e., areas receive more funding as the geographic distance between subscribers increases).[46] Any rural telecommunications subsidy plan needs to recognize that rural households in a state such as Montana cost more to serve on average than rural households in Connecticut, and our tiered program does so by classifying today's high-subsidy states in tier 1 and today's low-subsidy states in tier 6. Also, there are statewide reliance interests that would be undermined by a sudden move toward strictly equal support among rural households across the states. The disparities we discussed earlier cannot be eliminated overnight, but in time some of the more puzzling disparities (like Alabama vs. Mississippi) should be smoothed.

Basing our calculations on the total High-Cost Support disbursements of $4.6 billion to the 50 states in 2018 and assuming 100 percent uptake among rural households in each state,[47] we find that rural households in Alaska, Kansas, Montana, North Dakota, and South Dakota could be eligible for a monthly discount of up to $45, and rural residents in the remaining tiers of states would be eligible for $30, $19, $13, $9, and $5 monthly coupons.[48] We arrive at these amounts by grouping like states together (based on historical disbursements) and stipulating that total voucher program costs would be equal to or slightly less than the current High-Cost Support budget. Table 1 shows the proposed tiers and states eligible for each tier.

A $5 monthly coupon may not seem like much for rural residents of the lowest-tier states (mostly small states in the Northeast), but the $39 million those states receive under our plan (again, if uptake equals 100 percent) represents a big increase over the current subsidy level to those states, which was about $4 million in 2018. The FCC's Connect America Cost Model assumes average revenue per user of $75 monthly,[49] which means that our most generous voucher—$45 monthly—reduces rural households' expected out-of-pocket expense to $30 monthly.

Overall, the voucher system would be much more equitable among the states. A consumer voucher ensures that public funds are not spent disproportionately on a tiny percentage of rural households—a very real possibility as FCC subsidies under the current system increasingly go to the remaining households that are most expensive to serve.

Table 1. Structure of $4.6 Billion Broadband Voucher Program for Rural Households

TIER	MONTHLY COUPON	STATES
Tier 1	$45	Alaska, Kansas, Montana, North Dakota, South Dakota
Tier 2	$30	Arizona, Iowa, Minnesota, Mississippi, Nebraska, New Mexico, Oklahoma, Utah, Wisconsin, Wyoming
Tier 3	$19	Arkansas, California, Colorado, Idaho, Illinois, Kentucky, Missouri, Nevada, Oregon, Texas
Tier 4	$13	Alabama, Georgia, Hawaii, Indiana, Louisiana, South Carolina, Vermont, Virginia, Washington, West Virginia
Tier 5	$9	Florida, Maine, Maryland, Michigan, New Hampshire, New York, North Carolina, Ohio, Pennsylvania, Tennessee
Tier 6	$5	Connecticut, Delaware, Massachusetts, New Jersey, Rhode Island

Note: To establish tiers of support for rural households, we use FCC data on 2018 High-Cost Support disbursements for each state. We estimate the number of rural households in each state by dividing each state's total rural population by its average household size.
Sources: Authors' calculations. **High-Cost Support Disbursements:** Federal Communications Commission, *Universal Service Monitoring Report*, 2019. **Total Rural Population:** Census Bureau, "Summary File 1" (dataset), 2010 Decennial Census, accessed June 26, 2020, https://data.census.gov/cedsci/table?q=urban%20and%20rural&g=0100000US.04000.001&tid=DECENNIALSF12010.P2&vintage=2010&hidePreview=true&tp=true, table P2. **Average Number of People per Household:** Census Bureau, "5-Year Estimates Detailed Tables" (dataset), 2018 American Community Survey, accessed June 26, 2020, https://data.census.gov/cedsci/table?q=B25010%3A%20AVERAGE%20HOUSEHOLD%20SIZE%20OF%20OCCUPIED%20HOUSING%20UNITS%20BY%20TENURE&g=0100000US.04000.001&tid=ACSDT5Y2018.B25010&hidePreview=true&tp=true&moe=false&vintage=2018&y=2018, table B25010.

Consider that currently under High-Cost Support, carriers in the most supported state (Alaska) receive over 2,500 times more in disbursements per rural household than carriers in the least supported state (Rhode Island). Under our proposed voucher system, Alaska's rural households would receive only nine times more support than rural households in Rhode Island. Our proposed coupons compress those disparities (here, 9:1 rather than 2,500:1) in order to bring more equity between rural households and to give rural households incentives to use lower-cost, wireless broadband substitutes to fiber optics.

The voucher program treats all market participants equally. Subsidies are portable between competitors, and consumer preferences, not local or federal regulators, determine which providers succeed in the program. Another benefit of consumer vouchers is that they would make it administratively easier for consumers to add state USF vouchers or existing Lifeline vouchers, further reducing the out-of-pocket cost of service and increasing consumer demand for services. If participation is 50 percent or less for these vouchers, which is plausible given the participation rates in Lifeline, the program would have hundreds of millions of dollars unspent. Therefore, the FCC could either increase the subsidy to eligible households, refund subsidies to the states, or reduce USF fees. In time, the voucher program could simultaneously fulfill statutory goals and decrease public expense.

CONCLUSION

The gap in broadband access and quality between rural and urban households remains a pressing concern for state and federal policymakers, made even more urgent by the demands of social distancing during the COVID-19 pandemic. A lack of public investment or "political will" is not the reason that the digital divide persists. Up to $100 billion has been disbursed under various rural telecommunications programs over the past two decades, but a sizable share of those subsidies has gone to overhead or gold-plating costs that divert public funds from investment that benefits underserved and unserved rural households.

In its efforts to address the digital divide amid the COVID-19 pandemic, a future FCC ought to pursue an alternative plan that provides assistance to rural households that want a broadband connection, rather than disbursing public funds with the current complex programs. A monthly broadband voucher would align consumer preferences with subsidy disbursement and simplify the current administrative processes. Accordingly, we expect that this voucher program would see considerable uptake, and it would more efficiently and equitably disburse funds among the states and residents that fund these programs.

ABOUT THE AUTHORS

Brent Skorup is a senior research fellow at the Mercatus Center at George Mason University. His research areas include transportation technology, telecommunications, aviation, and wireless policy. He serves on the Federal Communications Commission's Broadband Deployment Advisory Committee and on the Texas Department of Transportation's Connected and Autonomous Vehicle Task Force. He also served on the advisory committee for the Arkansas State Broadband Plan.

Michael Kotrous is a program manager for Innovation and Governance at the Mercatus Center at George Mason University. He manages research projects that focus on regulatory processes, technological innovation, and entrepreneurship, and his writings have appeared in *Politico Magazine*, *USA Today,* and *U.S. News & World Report*. Kotrous earned his BA in economics and journalism-advertising at Creighton University in 2015.

APPENDIX

Table A1. Rural High-Cost Support Funding per Rural Household in the 50 States (2018)

STATE	RURAL USF SUPPORT (THOUSANDS)	RURAL HOUSEHOLDS (ESTIMATED)	RURAL USF SUPPORT PER RURAL HOUSEHOLD (ESTIMATED)
Alaska	$183,794	85,885	$2,139.99
North Dakota	$140,261	116,761	$1,201.26
South Dakota	$108,351	145,240	$746.01
Montana	$134,876	182,595	$738.66
Kansas	$173,189	292,126	$592.86
Wyoming	$45,262	80,745	$560.55
Nebraska	$110,616	199,453	$554.60
Utah	$40,861	83,160	$491.36
New Mexico	$82,330	176,067	$467.60
Iowa	$201,286	454,813	$442.57
Minnesota	$215,340	569,323	$378.24
Wisconsin	$222,379	707,228	$314.44
Arizona	$75,380	242,141	$311.31
Oklahoma	$151,946	490,822	$309.57
Mississippi	$173,907	573,692	$303.14
Nevada	$17,408	58,490	$297.62
Idaho	$50,566	172,094	$293.83
Oregon	$83,908	289,519	$289.82
Missouri	$176,962	716,824	$246.87
California	$144,059	635,253	$226.77

Table A1 (continued)

STATE	RURAL USF SUPPORT (THOUSANDS)	RURAL HOUSEHOLDS (ESTIMATED)	RURAL USF SUPPORT PER RURAL HOUSEHOLD (ESTIMATED)
Arkansas	$113,567	507,273	$223.88
Colorado	$59,709	272,045	$219.48
Texas	$283,776	1,345,287	$210.94
Illinois	$119,548	570,301	$209.62
Kentucky	$148,722	725,311	$205.05
Washington	$85,164	420,655	$202.46
Louisiana	$83,914	465,734	$180.18
South Carolina	$109,496	613,211	$178.56
Indiana	$118,014	706,206	$167.11
West Virginia	$57,370	392,638	$146.11
Georgia	$114,949	891,329	$128.96
Vermont	$21,306	165,522	$128.72
Hawaii	$4,418	36,362	$121.50
Alabama	$90,555	767,816	$117.94
Virginia	$87,911	752,464	$116.83
Michigan	$110,050	1,009,511	$109.01
Tennessee	$89,610	843,028	$106.30
Maine	$33,602	349,708	$96.09
Florida	$55,575	626,968	$88.64
Ohio	$84,335	1,048,070	$80.47
New York	$62,037	903,845	$68.64
New Hampshire	$13,200	212,438	$62.14
Pennsylvania	$63,748	1,102,070	$57.84
North Carolina	$70,293	1,283,225	$54.78
Maryland	$3,610	276,862	$13.04
Massachusetts	$2,333	207,763	$11.23
New Jersey	$1,030	172,608	$5.97
Delaware	$228	58,134	$3.92
Connecticut	$439	168,959	$2.60
Rhode Island	$30	39,483	$0.76
US state total	$4,621,220	23,207,059	$199.13

Note: High-Cost Support disbursements for each state are from 2018. We estimate the number of rural households in each state by dividing each state's total rural population by its average household size.
Sources: Authors' calculations. **High-Cost Support Disbursements:** Federal Communications Commission, *Universal Service Monitoring Report*, 2019. **Total Rural Population:** Census Bureau, "Summary File 1" (dataset). **Average Number of People per Household:** Census Bureau, "5-Year Estimates Detailed Tables" (dataset).

NOTES

1. Exec. Order No. 13821, 83 Fed. Reg. 1507 (January 8, 2018).

2. In an April 21 White House press conference, US Treasury Secretary Steven Mnuchin said, "Well, first of all, I very much appreciate the President's support for phase four. . . . The President has been talking about infrastructure since the campaign: roads, bridges, broadband. Especially, broadband now to rural America is very important." "Remarks by President Trump and Members of the Coronavirus Task Force in Press Briefing," White House, April 21, 2020, https://www.whitehouse.gov/briefings-statements/remarks-president-trump-members-coronavirus-task-force-press-briefing-3/. See also John D. McKinnon and Ryan Tracy, "Pandemic Builds Momentum for Broadband Infrastructure Upgrade," *Wall Street Journal*, April 23, 2020.

3. Telecommunications Act of 1996, 47 U.S.C. § 254(b) (2018).

4. 47 U.S.C. § 254(d).

5. Federal Communications Commission, "In the Matter of Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion" (FCC 20-50, Federal Communications Commission, Washington, DC, April 2020), 19, figure 1.

6. Scott Wallsten and Lucía Gamboa, *Public Investment in Broadband Infrastructure: Lessons from the U.S. and Abroad* (Washington, DC: Technology Policy Institute, 2017), 4.

7. The FCC notes that the Wireline Competition Bureau refers parties to CostQuest when they have technical questions about disbursement amounts. Federal Communications Commission, "In the Matter of Connect America Fund High-Cost Universal Service Support" (DA 15-534, Federal Communications Commission, Washington, DC, April 22, 2014), 31.

8. Mark Jackson, "Government's UK Gigabit Broadband Voucher Scheme Ends Today," *ISPreview*, May 14, 2020. The UK rural broadband program provides a £1,500 voucher to homeowners and a £3,500 voucher for businesses. Resident applications and funds are pooled to make fiber-to-the-premises services economical. As of August 2020, about 45,000 applicants had been approved and nearly 30,000 had received services. "Gigabit Broadband: Rural Households Urged to Claim Upgrade Cash," *BBC*, August 8, 2020.

9. The Pennsylvania State Senate Communications & Technology Committee called on the FCC "to transform the Universal Service Fund program into a rural broadband voucher program that would directly benefit rural customers." Pennsylvania State Senate, Communications & Technology Committee, *Closing PA's Digital Divide*, November 2019, 2.

10. Mignon Clyburn and Robert McDowell, "Congress Can Help America Stay Connected during the COVID Crisis," *Morning Consult*, May 15, 2020.

11. Blair Levin and Larry Downes, "Keeping Americans Connected after 'Keep Americans Connected' Expires," *The Hill*, May 18, 2020.

12. Arkansas Governor's Office, "Governor Hutchinson Announces $10 Million for Wi-Fi Access Devices for Arkansas Schools," press release, July 27, 2020, https://governor.arkansas.gov/news-media/press-releases/governor-hutchinson-announces-10-million-for-wi-fi-access-devices-for-arkan.

13. Federal Communications Commission, "Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act" (FCC 15-10, Federal Communications Commission, Washington, DC, January 29, 2015), 97, appendix D.

14. Federal Communications Commission, "In the Matter of Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion" (FCC 20-50, Federal Communications Commission, Washington, DC, April 2020), 19, figure 1.

15. Federal Communications Commission, "In the Matter of Connect America Fund; A National Broadband Plan for Our Future; Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing an Unified Intercarrier Compensation Regime; Federal-State Joint Board on Universal Service; Lifeline and

Link-Up; Universal Service Reform – Mobility Fund" (FCC 11-161, Federal Communications Commission, Washington, DC, November 18, 2011), 19.

16. Jerry Brito and Jerry Ellig, "Public Interest Comment on the Connect America Fund" (Public Interest Comment, Mercatus Center at George Mason University, Arlington, VA, April 15, 2011); Scott Wallsten, *How to Create a More Efficient Broadband Universal Service Program by Incorporating Demand and Cost-Effectiveness Analysis* (Washington, DC: Technology Policy Institute, September 2011).

17. Cable operators rarely participated in High-Cost Support before 2017, but internet access subscriptions have increased in rural areas in large part because of adoption of cable broadband. Compare Federal Communications Commission, *Internet Access Services: Status as of December 31, 2014*, March 2016, 61, figure 51; and Federal Communications Commission, *Internet Access Services: Status as of December 31, 2017*, August 2019, 53, figure 48.

18. Federal Communications Commission, "In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act" (FCC 15-10, Federal Communications Commission, Washington, DC, January 29, 2015), 97, appendix D.

19. Federal Communications Commission, "In the Matter of Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion" (FCC 20-50, Federal Communications Commission, Washington, DC, April 2020), 19, figure 1.

20. Federal Communications Commission, "In the Matter of Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion" (FCC 20-50, Federal Communications Commission, Washington, DC, April 2020), 19, figure 1.

21. Steve G. Parsons and James Stegeman, *Rural Broadband Economics: A Review of Rural Subsidies* (Cincinnati, OH: CostQuest Associates, July 2018), 20–23.

22. Paul de Sa, *Improving the Nation's Digital Infrastructure* (Washington, DC: Federal Communications Commission, 2017), 3, figure 1.

23. Thomas W. Hazlett and Scott J. Wallsten, *Unrepentant Policy Failure: Universal Service Subsidies in Voice & Broadband* (Clemson, SC: Arlington Economics, June 2013), 6.

24. Federal Communications Commission, *Universal Service Monitoring Report*, 2019, 21, table 1.10.

25. Telecommunications Act of 1996, 47 U.S.C. 254 (2018).

26. Paul de Sa estimates that exponential increases in cumulative investment are required to deploy fixed broadband in unserved locations. De Sa, *Improving the Nation's Digital Infrastructure*, 3, figure 1. See also Parsons and Stegeman, *Rural Broadband Economics*, 20–23.

27. When the USF was created by the Telecommunications Act of 1996, members of Congress and the Congressional Budget Office (CBO) expected it to require less public funding over time. Senator Ted Stevens said during debate on the act, "In fact, I find it interesting that the Congressional Budget Office has said that this bill will reduce the cost of universal service from the existing system by at least $3 billion over the next five years." 141 Cong. Rec. S7,881 (1995). Arnold & Porter Legislative History, S. Rep. No. 104-104, at 210 (1995); "Over time, CBO expects . . . the total amount of [USF] subsidies necessary would decline." Arnold & Porter Legislative History, S. Rep. No. 104-204, at 60 (1995).

28. Federal Communications Commission, "In the Matter of Federal-State Joint Board on Universal Service" (FCC 98-67, Federal Communications Commission, Washington, DC, May 8, 2001). Other funding options include a per-line charge, a per-account charge, and a per-assigned-phone-number charge.

29. Hazlett and Wallsten, *Unrepentant Policy Failure*, 6.

30. Milton Mueller shows that local subscriber costs were increasingly cross-subsidized by long-distance revenues from 1965 to 1982. Milton Mueller, *Universal Service: Competition, Interconnection and Monopoly in the Making of the American Telephone System* (Washington, DC: AEI Press, 1997), 162–65.

31. Federal Communications Commission, "In the Matter of Connect America Fund; High-Cost Universal Service Support" (DA 14-534, Federal Communications Commission, Washington, DC, April 22, 2014), 6.

32. Federal Communications Commission, "In the Matter of Connect America Fund; High-Cost Universal Service Support" (DA 14-534, Federal Communications Commission, Washington, DC, April 22, 2014), 5–6.

33. Federal Communications Commission, "In the Matter of Connect America Fund; High-Cost Universal Service Support" (DA 14-534, Federal Communications Commission, Washington, DC, April 22, 2014), 7.

34. There appears to be a certification process to access the nonpublic model elements. Federal Communications Commission, "In the Matter of Connect America Fund; High-Cost Universal Service Support" (DA 14-534, Federal Communications Commission, Washington, DC, April 22, 2014), 15–16.

35. "This version . . . modified the OCNCoSize table to change the size categorization of Fremont Telephone from medium to small." Federal Communications Commission, "In the Matter of Connect America Fund; High-Cost Universal Service Support" (DA 14-534, Federal Communications Commission, Washington, DC, April 22, 2014), 11.

36. The FCC notes "the more than two year model development process." Federal Communications Commission, "In the Matter of Connect America Fund; High-Cost Universal Service Support" (DA 14-534, Federal Communications Commission, Washington, DC, April 22, 2014), 15.

37. Federal Communications Commission, "In the Matter of Connect America Fund; High-Cost Universal Service Support" (DA 14-534, Federal Communications Commission, Washington, DC, April 22, 2014), 19.

38. Brent Skorup, "Reform Proposals for Broadband Policy in Pennsylvania" (Testimony before the Pennsylvania Senate Communications & Technology Committee, Mercatus Center at George Mason University, Arlington, VA, September 23, 2019).

39. "At current expenditure levels, these results imply that each additional household is added to voice networks at an annual USF cost of about $25,000 or, just factoring in the HCF expenditures, some $14,000." Hazlett and Wallsten, *Unrepentant Policy Failure*, 24–25; Christopher Garbacz and Herbert G. Thompson Jr., "Universal Telecommunication Service: A World Perspective," *Information Economics and Policy* 17, no. 4 (2005): 495, 505.

40. Skorup, "Reform Proposals for Broadband Policy in Pennsylvania," 2.

41. Providers received just over $172 million in payments from the four USF programs in Pennsylvania in 2018, $64 million of which came from High-Cost Support. Meanwhile, USF contributions from Pennsylvania in 2018 are estimated to total $384 million, meaning the net dollar flow of all USF programs was about −$212 million. Federal Communications Commission, *Universal Service Monitoring Report*, 19, table 1.9.

42. Scott Wallsten, *The Universal Service Fund: What Do High-Cost Subsidies Subsidize?* (Washington, DC: Technology Policy Institute, February 2011).

43. Sanford V. Berg, Liangliang Jiang, and Chen Lin, "Universal Service Subsidies and Cost Overstatement: Evidence from the US Telecommunications Sector," *Telecommunications Policy* 35, no. 7 (2011): 583; Sanford Berg, Liangliang Jiang, and Chen Lin, "Incentives for Cost Shifting and Misreporting: US Rural Universal Service Subsidies, 1991–2002," *Information Economics* 23, no. 3 (2011): 287; James O. Zolnierek, "Loop Density and Telephone Company Cost: Panel Data Evidence," *Telecommunications Policy* 32, no. 3-4 (2008): 262.

44. "In particular, FCC has not addressed its inability to determine the effect of the fund and lacks a specific data-analysis plan for carrier data it will collect. Such analysis would enable FCC to adjust the size of the Connect America Fund based on data-driven evaluation and would allow Congress and FCC to make better informed decisions about the program's future and how program efficiency could be improved." Government Accountability Office, "FCC Has Reformed the High-Cost Program, but Oversight and Management Could Be Improved" (GAO-12-738, Government Accountability Office, Washington, DC, July 2012).

45. Brent Skorup, "'Tech Vouchers': Putting Consumers in Control of the FCC's $4.5 Billion Rural Telecom Fund," *Tech Liberation Front*, August 27, 2018.

46. High-Cost Support funding models, for instance, are driven in large part by "wire center boundaries," which are a unit of measurement for geographic coverage by telecommunications providers, and "plant mix," which is a function

of cheaper, aerial deployment and more expensive, underground deployment. The FCC incorporates wire center boundaries and plant mix in the Connect America Cost Model in Federal Communications Commission, "In the Matter of Connect America Fund; High-Cost Universal Service Support" (DA 14-534, Federal Communications Commission, Washington, DC, April 22, 2014), 33–36.

47. The total of $4.8 billion in High-Cost Support disbursements in 2018 includes just over $200 million in disbursements to American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the Virgin Islands. The sum total of High-Cost Support disbursements in the 50 US states equals $4.62 billion. Washington, DC, received no High-Cost Support funding in 2018. Federal Communications Commission, *Universal Service Monitoring Report*, 19, table 1.9.

48. A $45 monthly coupon, which would reduce annual broadband subscription expenses by $540 annually, would put this broadband voucher program on par with the "Better Broadband Subsidy Scheme" in the United Kingdom. That program allowed underserved rural households to save £350 in 2017 on installation and subscription fees, which is about $500 in current US dollars. UK Government, *Guide to the Better Broadband Subsidy Scheme*, 2017, https://basicbroadbandchecker.culture.gov.uk/guide-to-better-broadband-subsidy-scheme.pdf. Those subsidies were supplemented by local or regional subsidies, £1,500 for households in Cornwall, for instance. "Alternative Solutions and Grants," Superfast Cornwall, accessed June 26, 2020, https://www.superfastcornwall.org/getting-connected/alternative-solutions/.

49. Federal Communications Commission, "In the Matter of Connect America Fund; High-Cost Universal Service Support" (DA 14-534, Federal Communications Commission, Washington, DC, April 22, 2014), 14.