

Issue: Rural Broadband

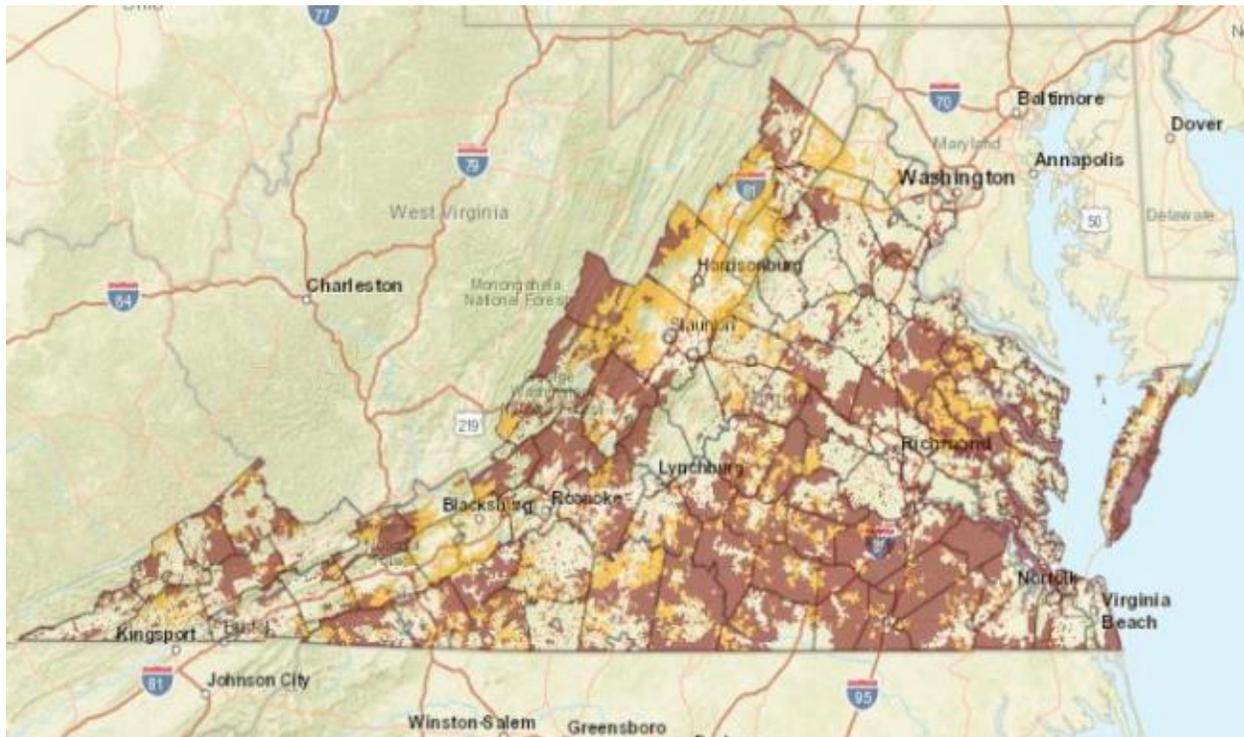
Rural Broadband

Much of Virginia is Underserved

What electricity did to improve rural life 100 years ago and telephone connections did 75 years ago, broadband connections could do today. When compared to rural residents of nearly every other East Coast state, rural Virginians are losing out when it comes to wired broadband access.¹ Among many other examples, what this means in practical terms is that parking lots at rural libraries and fast-food outlets fill with cars in the evening so students can do basic homework requiring internet access.² It hampers telemedicine, since charts and x-rays can't be easily sent to urban clinics.³ And it strangles local businesses seeking new markets around the world.

The most recent data from Gov. Northam's "Commonwealth Connect" report⁴ indicates 660,000 homes and businesses lack access to broadband, with the highest concentrations in Southern Virginia and the Appalachians. Broadband infrastructure also boosts employment⁵ by creating jobs to put in new lines and service them and by giving rural residents access to jobs anywhere, including those they can perform working from home, often for significant wages.⁶ Why should a customer service call center be in Bangalore, India, if it could be in Buckingham, Virginia?

Broadband Infrastructure Leaves Rural Virginians Far Behind



Underserved Areas (Dec. 2016)
 [greater than 10 Mbps download and 1 Mbps upload and less than 25 Mbps download and 3 Mbps upload]
 Unserved Areas (Dec. 2016)
 [below 10 Mbps download and 1 Mbps upload]

"Blueprint for Broadband," Virginia Association of Counties⁷

Depending on how “broad” the access speed—the definition is moving from 10 megabits per second (Mbps) download times and 1 Mbps upload to 25 Mbps download and 3 Mbps upload—a large swath of Virginia is in the slow lane, as this map from a 2018 Virginia Association of Counties report⁷ shows.

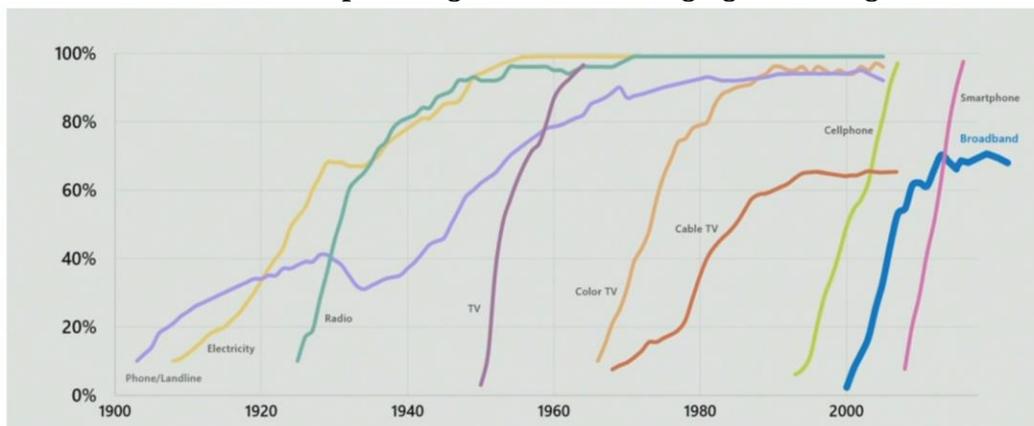
Recognizing the critical need for broadband expansion, U.S. Representative Abigail Spanberger, a Democrat from Virginia’s 7th District, leads a bipartisan effort to have Congress push for greater access to broadband in rural areas. Her group’s letter, signed by 73 House members, says, “Affordable broadband access is critical for economic development of rural communities, enabling them to fully participate in the internet-based economy. It enables farmers to use precision agricultural techniques, patients to access medical care remotely via telemedicine, children to conduct research for school projects and business to engage with customers.”⁸

Once, the Federal Government Effectively Pushed Rural Access to Tech

A 2016 study by the Virginia Chamber of Commerce showed that about 53 percent of rural Virginians have access to broadband,⁹ compared to more than 96 percent in urban areas. The rate of rural adoption of broadband does not compare favorably with the spread of other new technologies, from electricity to telephones to smartphones. There are many reasons for this slow rate of adoption; one key difference is that federal broadband programs have largely been ineffective. Federal broadband ‘initiatives’ like the Federal Communications Commission’s Connect America Fund have favored big for-profit incumbent providers over the kind of home-grown alternatives that grew up with emerging technologies during the New Deal. In the 1930’s and 1940’s, federal laws supported smaller rural electric cooperatives and telephone co-ops.¹⁰

Now federal agencies like the FCC and USDA have provided billions of dollars “in subsidies and grants to [existing] carriers to extend and improve broadband...” a Microsoft blog reported in April 2019.¹¹ “But,” the report continues, “adoption has barely budged.” Given that these incumbent carriers are for-profit entities, it is not too surprising that they are not interested in extended broadband to rural populations, who are by definition, more remote to reach, hence more expensive to provision—regardless of their need.

Broadband Adoption Lags Behind in Emerging Technologies



Source: Our World in Data

Microsoft/On the Issues¹²

Exacerbating the issue, the FCC is also failing to obtain accurate and timely deployment data.¹³ It voted in midsummer 2019, to require service providers like Comcast to give more precise information about their coverage; opponents say existing provider data greatly overstates the reach

of their services.¹⁴ As PBS NewsHour reported, “On one end, the FCC says that more than 24 million people lack access to broadband at home. On the other, a study by Microsoft... found that 162.8 million Americans don’t use the internet at broadband speeds.”¹⁵ The discrepancy illustrates how hard it is to measure access, yet how imperative it is to use an objective measure of the need, one that is not defined by for-profit entities who have had limited success expanding rural access.

Do States Help or Hinder Progress?

As stated, the basic problem hampering rural service is that the largest telephone companies, which have often received subsidies to improve rural access, have little incentive to invest significantly in communities where customers are widely dispersed. “It’s not a very cost-effective model for large service providers,” said Melissa Gay of the Central Virginia Electrical Cooperative.¹⁶ Haphazard broadband deployment is a classic market failure.¹⁷ That puts a burden on states and localities to find creative solutions, whether through go-it-alone municipal efforts, or existing rural electric or telephone cooperatives, or private-public partnerships.

Often municipally-created networks offer better technology and are cheaper and faster than what major companies provide in rural neighborhoods. Given the lack of competition, large internet service providers sometimes use slow, outdated technology unable to meet growing load and the speeds demanded. And over-the-air connections via cell phone networks—often the only means of accessing the internet for rural populations—have bandwidth caps, meaning they get bogged down as more people sign on. They can have iffy reception, at best, if the base is distant.¹⁸

Even in light of these provisioning failures by large providers, across the country there has been a movement by some states to make it more difficult for communities to create their own networks using public funds or public bonding authority. This benefits existing telecommunications companies, like AT&T and CenturyLink, and cable internet providers like Comcast. Virginia is one of 19 states that put overwhelming obstacles before municipal groups seeking to provide their own broadband services.¹⁹

Why? In 2016, a federal appeals court ruled the FCC had no power to preempt states’ rules for broadband²⁰ and the FCC did not try to appeal the decision. It had clearly cooled on supporting community broadband. Thereafter, Republicans in the Virginia legislature tried to double down on restrictions to public services. There were fights, though. In 2017, there was a rural uprising against legislation sponsored by Kathy Byron, the Republican from Bedford (HD22). Her bill would have made it more cumbersome for local governments to offer new broadband services or existing government services to expand.²¹ Confronted by the revolt, Byron watered down the bill, which passed with a bipartisan majority. Byron has received campaign donations from Verizon (\$43,000), Verizon (\$11,500), CenturyLink (\$8,000) and Comcast (\$5,000).²²

In the 2019 session, a Republican freshman delegate, Bob Thomas, Jr.—later defeated in a primary election in HD28—sponsored a bill (HB2141)²³ to expand local authority in the broadband space. He focused on a similar power granted to local governments for creating service districts for garbage disposal or sewers. These have special taxing authority. Thomas’s bill would have granted municipalities the right to start service districts to provide broadband. The House passed the bill, but the Senate eviscerated it. The final version that passed by a vote of 79-13 required that only “nongovernmental broadband service providers” could work with local entities to provide broadband, once again ensuring that the large incumbent service providers retained their exclusionary rights.²⁴

Also in 2019, Republican Delegate Israel O’Quinn of the 5th District had his broadband proposal enacted. It provides for pilot programs allowing the state’s two major electricity providers, Dominion Energy and Appalachian Power, to spend up to \$60 million to install cables reaching remote areas.²⁵ These would not serve individual customers—the “last mile” in telecommunications talk—but would get the fiber so close that smaller internet providers could finish the job.²⁶ Increasing the amount of “middle-mile” cable holds some promise for rural residents as long as the legislature takes positive steps to protect the ability of smaller service providers to hook into it and meet the local demand to connect that essential “last mile.”

Local Public Broadband Experience in Virginia

To understand what makes some rural broadband offerings reliable and others hit or miss, it helps to be broadly familiar with the technologies. This paper focuses on signals carried over wires—whether cable television wires or advanced high-speed fiber wires. The reason for this particular focus is that these industry-specified technologies provide the most reliable signals, although they can also be the most expensive to build. Fiber optic networks are the gold standard, with lots of capacity for future upgrades, despite a hefty upfront cost to install. Some providers in Virginia used fixed wireless, which requires a device on the home that is often fixed to the roof or side of house. This can receive a signal and provide broadband speeds, depending on local terrain and trees. Some networks use a mix of fiber optics and fixed wireless to deploy broadband capacity rapidly; fixed wireless can be a stopgap during the years it takes to get fiber across a wide area.

The local governments that have built municipal broadband systems have often started with an institutional network. Fiber is connected to anchor institutions—the library, the fire department, the hospital, for instance. Some communities then extend that network to businesses and/or residents with fiber. Others install nearby towers to connect the end users. The Institute for Local Self-Reliance, a promoter of municipal efforts, reports that 55 municipal networks have been using a fiber-to-the-home network through which they serve 108 communities. Another 76 communities now offer access to a locally owned cable network touching most of the community. Rural electrical cooperatives (we explain more about them below) serve more than 258 communities.²⁷

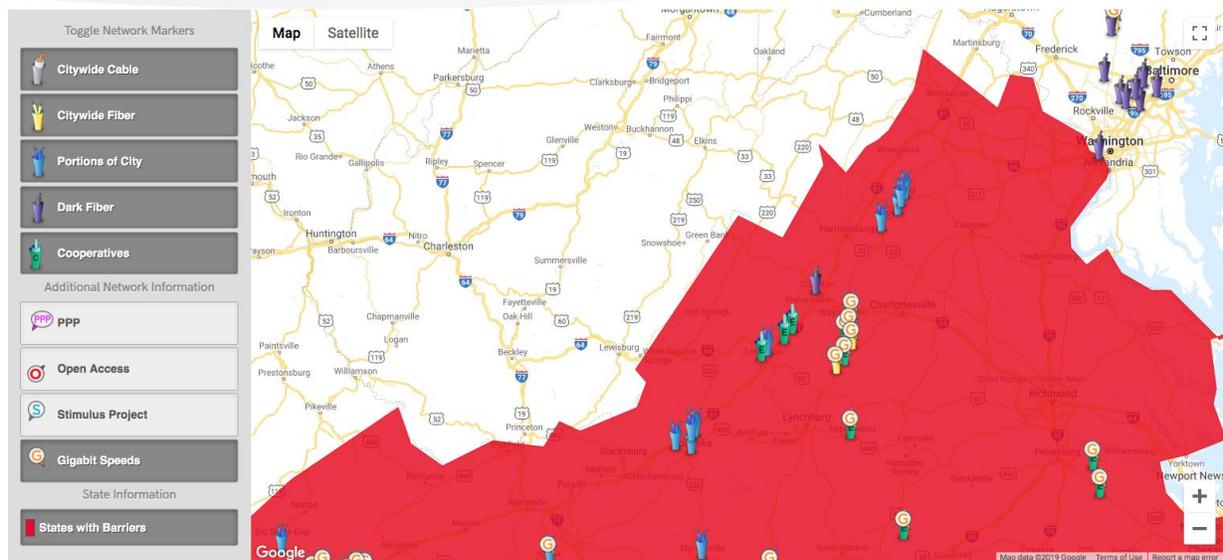
Around the country there are many examples of local solutions to improve broadband access, including those listed in a report by the organization Next Century Cities.²⁸ One of the states with the best record of expanding rural broadband is Minnesota, where 91 percent of households and businesses have high-speed broadband, a figure that includes 87 percent of rural customers.²⁹ Like Virginia, Minnesota faces the challenge of having rural populations scattered throughout a large state.

In Virginia, however, rural communities are getting broadband access in fits and starts. The most recent announcement of a new system came from Microsoft and Declaration Networks, which partnered to provide broadband to about 65,000 customers on Virginia’s Eastern Shore and in Maryland’s Garrett County.³⁰

Earlier efforts at municipal broadband offerings—some of which were grandfathered in when the legislature created impediments to municipal broadband and others that navigated the state challenges—have had significant success in Virginia. These include the Roanoke Valley Broadband Authority, which was born from collaboration between the cities of Salem and Roanoke and two surrounding counties, Roanoke County and Botetourt County. The four founded the authority in 2013. Financial support came from a \$6.2 million in a bond from the state’s Virginia Resources Authority.³¹ In 2007 the city of Danville embarked on construction of its network, based on a local utility’s lines.³² The result is in Danville, its 135 miles of fiber connect local businesses.^{33,34}

One public effort centered in Bristol created significant jobs, but those responsible for it were accused of unjustly enriching themselves; thereafter, the utility was privatized. The issue was not technological or financial, it was fraud: misuse of public funds, rigging bids, and failing to pay employee taxes.³⁵ Using Bristol as an argument to limit municipal broadband, as has been done by established internet service providers, is the equivalent of restricting small-town bank branches because embezzlement caused one to fail. Strict auditing is the answer, not onerous restrictions on municipal ownership.

Community Network Map



Map of Rural Broadband Barriers published by the Institute for Local Self-Reliance.³⁶

One key development across rural America, including Virginia, has been the positive role that rural electric cooperatives—like the Central Virginia Electric Cooperative—have played in spreading broadband availability. These cooperatives face fewer legal obstructions than municipal networks. A former FCC official, Jonathan Chambers, has worked with executives at CVEC to run fiber to the homes and businesses of its 37,000 members.³⁷ Firefly, a CVEC subsidiary, operates the system, which will cost \$110 million over five years.^{38,39} A decade earlier, the Old Dominion Electric Cooperative formed the Mid-Atlantic Broadband Cooperative, using money provided to the state in the settlement of its claims on the tobacco industry. It claims to have helped create more than 1,300 jobs and was a factor in attracting Microsoft’s Virginia data center.⁴⁰ In the Shenandoah Valley, BARC provides another successful broadband service for 12,500 customers.⁴¹

Sources for Financing Rural Broadband

The FCC is the source of federal broadband grants totaling \$4.5 billion annually; grants could be delayed as existing maps of broadband availability are recalibrated. The Connect America Fund Phase II, to “reform and modernize” service, is the main grant program.⁴² The FCC earmarks more than half of its \$8.8 billion in annual broadband subsidies for rural areas. This chart shows how FCC grant awards favor major telecommunications companies.⁴³

Recipients of Connect America Fund II⁴⁴

Company	Amount Given (per year)	Total Given (over 6 years) (2015-2020)
CenturyLink	\$505,702,762	\$3.03 billion
AT&T	\$427,706,650	\$2.56 billion
Cincinnati Bell	\$4,449,130	\$26,694,780
Consolidated Communications	\$13,922,480	\$83,534,880
Fairpoint Communications	\$37,430,669	\$224,584,014
Hawaiian Telecom Inc	\$4,424,319	\$26,545,914
Micronesian Telecom	\$2,627,177	\$15,762,702
Verizon	\$48,554,986	\$291,329,916
Windstream	\$174,895,478	\$1.04 billion
TOTALS	\$1,500,895,507	\$7,318,282,218

Connect America is part of the FCC’s main fund supporting rural broadband, which is called the Universal Service Fund (USF). It also has three other programs:

- The Lifeline Program supporting \$1.6 billion annually in aid to low-income families
- The Rural Health Care Program with \$400 million in annual grants supporting eligible rural health care providers that qualify for reduced rates for high-speed broadband access
- The E-Rate program, with grants capped at \$3.9 billion annually, for schools and libraries⁴⁵

The other major federal donor is the Rural Utilities Service, the successor to the Rural Electrification Administration. This agency, part of the USDA, gives loan and grants worth \$800 million annually, to which Congress added \$600 million in a 2018. Also, the 2009 Recovery Act provides \$7.5 billion in loans and grants given out by two Commerce Department programs.^{46,47,48} The Economic Development Administration gives out \$184.5 million in grants, mostly for local water and sewer operations but some for broadband.⁴⁹ The Institute for Museum and Library Sciences also has given broadband grants.⁵⁰ A 2015 Guide by New York Sen. Gillibrand lists the federal programs.⁵¹

The Virginia Telecommunications Initiative (VATI) was authorized to grant \$4 million a year for last-mile services in rural areas.⁵² In 2018 Gov. Northam proposed raising this to \$50 million. In 2019 the Republican-controlled legislature cut this; and the grants for “last-mile” service are capped at \$19 million.⁵³ Other state agencies include the Virginia Tobacco Region Revitalization Commission for last-mile grants for public-private partnerships between localities and service providers, and the Virginia Resources Authority.^{54,55} Appendix A of the Commonwealth Connect report has a full list of federal and state programs funding broadband.⁵⁶

In terms of private sources for potential broadband infrastructure funding, the Rockefeller Foundation-supported Post Road Foundation recently partnered with local governments to create rural services in their “Pilot Program on Digital Inclusion and Intelligent Infrastructure.”^{57,58} The first partners selected were in Maine, Georgia, North Carolina, and Michigan.

Legislative Priorities

Christopher Ali, an assistant professor at the University of Virginia and an expert on rural broadband, pointed out in a New York Times op-ed that, even though large corporate communications companies have benefited most from federal grants, their performance has been mediocre at best.

The FCC sent \$550 million annually to CenturyLink, a big provider of internet services in Virginia, but the law only requires the company to provide subpar service: 10 Mbps download/1 Mbps upload.⁵⁹

Before the Senate watered it down, Rep. Thomas's bill (HB-2141), would have given municipalities another tool to create, own, and manage broadband networks. Additional bills in this vein need to be advanced. Another option is eliminating the unnecessary requirements in these sections of the Virginia Code: § 56-265.4:4, § 56-484.7:1, and § 15.2-2108.6. Finally, it's crucial to support Gov. Northam's efforts to spend \$50 million in annual VATI payouts to pay for last-mile service.

For the first time in 100 years—when the nation was literally illuminated as the 20th century emerged—technology is available with the potential to narrow the urban-rural economic divide across this country. In today's global economy, internet access to goods, services, jobs, data, healthcare provisioning and tools makes everyday tasks—from farming to construction to working from home—more efficient. Should legislators fail to ensure the availability of broadband technology to *all* of their constituents, they will ensure the continuation of a persistent gap between early-adopters and their rural peers, as ever-newer, ever-faster technology becomes available. Available, that is, to *most* of the people in a country that claims to lead the world in technical innovation.

¹ <https://docs.fcc.gov/public/attachments/FCC-19-44A1.pdf>

² <https://www.aspeninstitute.org/blog-posts/the-homework-gap/>

³ <https://annals.org/aim/article-abstract/2734029/limitations-poor-broadband-internet-access-telemedicine-use-rural-america-observational>

⁴ <https://www.commonwealthconnect.virginia.gov/sites/default/files/CIT%20Documents/Commonwealth%20Connect%20Report.pdf>

⁵ <https://link.springer.com/article/10.1007/s00168-014-0637-x>

⁶ https://repository.library.georgetown.edu/bitstream/handle/10822/760957/Lapointe_georgetown_0076M_12924.pdf?sequence=1&isAllowed=y

⁷ <https://www.vaco.org/blueprint-for-broadband/>

⁸ https://www.fredericksburg.com/news/local/spanberger-leads-bipartisan-push-for-extending-rural-broadband-copy/article_18b36b70-a67f-5a91-9604-a363e4a56ae6.html

⁹ <https://www.usnews.com/news/best-states/virginia/articles/2019-03-18/virginia-electric-utilities-wiring-rural-areas-for-broadband>

¹⁰ <https://www.ntca.org/ruraliscool/history-rural-telecommunications>

¹¹ <https://blogs.microsoft.com/on-the-issues/2019/04/08/its-time-for-a-new-approach-for-mapping-broadband-data-to-better-serve-americans/>

¹² <https://news.microsoft.com/on-the-issues/2019/07/16/telephones-television-adoption-broadband/>

¹³ <https://ilsr.org/when-you-cant-trust-the-data-flaws-in-the-federal-communications-commissions-broadband-forms/>

¹⁴ https://www.axios.com/fcc-broadband-maps-service-providers-7d1622d0-4cee-4eaf-9a17-dcc231acdcbf.html?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axioslogin&stream=top

¹⁵ <https://www.pbs.org/newshour/nation/questions-over-coverage-plague-rural-broadband-expansion>

¹⁶ <https://muninetworks.org/tags-63>

¹⁷ <https://www.brookings.edu/book/the-broadband-problem/>

¹⁸ <https://muninetworks.org/sites/www.muninetworks.org/files/2017-01-why-local-solutions1.pdf>

¹⁹ <http://www.baller.com/wp-content/uploads/BallerStokesLideStateBarriers.pdf>

²⁰ <https://arstechnica.com/tech-policy/2016/08/fcc-admits-defeat-in-municipal-broadband-wont-appeal-court-loss/>

²¹ https://www.newsadvance.com/news/local/byron-bill-could-negatively-affect-effort-to-expand-internet-access/article_276d3ea3-9004-533a-bcf0-927cb756d0ca.html

²² https://www.vpap.org/candidates/18300/top_donors/?page=1

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- ²⁴ <https://muninetworks.org/content/three-states-their-local-communities-and-broadband-funding-denied>
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- ²⁶ <https://rvamag.com/tags/israel-oquinn>
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- ²⁹ <https://finance-commerce.com/2019/03/deed-seeks-70-million-for-rural-broadband/>
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- ³³ <http://www.ndanville.com/>
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- ³⁵ <http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-content/uploads/sites/169/2013/08/ACLP-Bristol-Case-Study-Update-December-2016.pdf>
- ³⁶ <https://muninetworks.org/communitymap>
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- ⁴⁵ <https://www.fb.org/issues/technology/broadband/>
- ⁴⁶ Broadband Technology Opportunities Program
- ⁴⁷ <https://www2.ntia.doc.gov/SBDD>
- ⁴⁸ <https://www.nytimes.com/2019/02/06/opinion/rural-broadband-fcc.html>
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- ⁵⁰ <https://www.imls.gov/our-work/priority-areas/broadband>
- ⁵¹ <https://www.gillibrand.senate.gov/imo/media/doc/Gillibrand%20Broadband%20Funding%20Guidebook%202015.pdf>
- ⁵² <https://www.cspdc.org/2018/10/16/virginia-telecommunications-initiative-grant-announced/>
- ⁵³ <https://www.governor.virginia.gov/newsroom/all-releases/2019/march/headline-839788-en.html>
- ⁵⁴ <https://www.revitalizeva.org/grant-loan-program/grantprograms/researchdevelopment-grant-program>
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