"Everything is better with better broadband" featuring Christopher Ali

BROADBAND DEPLOYMENT IN RURAL AMERICA

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Hi, everyone. Thank you for joining us today this afternoon for our Berkman Klein luncheon. I just wanted to remind you that this is being recorded and live streamed. So keep that in mind if you choose to participate in the Q&A session at the end. And also a reminder that you can tag us on Twitter at @bkcharvard and Ali_Christopher.

I'm thrilled to introduce you to Christopher Ali, an associate professor in the Department of Media Studies at the University of Virginia and a faculty fellow with the Benton Institute for Broadband and Society.

Great.

[APPLAUSE]

Well, thank you all very much for having me today. It's an absolute honor to be here and a bit of a dream come true for someone who's course researching broadband. My talk today is based on four years of research into rural broadband and rural broadband policy that's going to become part of my new book called Farm Fresh Spectrum-- Rural Broadband and the Future of Connectivity, which is going to be out next year with MIT Press.

And what I want to talk about today is actually the conclusion of my book-- so there's going to be a spoiler, so you don't have to go out and buy it now-- where I argue for the need for a comprehensive national rural broadband plan. And to get us there, though, I want to start with a little bit of background about rural broadband in the United States.

So rural broadband is having a bit of a moment in contemporary American political discourse. The lack of connectivity in rural areas is a key issue amongst rural residents, a frequent talking point for rural representatives.

And terms like the homework gap, digital deserts, and digital distress have become common phrases while industry associations and researchers, local and state officials, and the Federal Communications Commission are grappling with the disaster that has been broadband mapping.

Taking heed, the FCC recently announced a $20.4 billion funding program for rural broadband called the Rural Digital Opportunity Fund or RDOF and a $9 billion program for rural 5G deployment. Joining the FCC, five presidential candidates have released plans to connect the country's unconnected. The most ambitious of these is Bernie Sanders, which would see $150 billion in grants and assistance for publicly owned municipal fiber systems.

So in short, this country is about to spend more money on rural broadband than any other telecommunications program in history. And this is certainly needed as the statistics paint a rather disappointing picture-- a rural urban digital divide that has not only failed to shrink despite billions of dollars of yearly investment but is set on growing with the deployment of 5G in major urban centers. If things do not change, rural America will be left once again unconnected and underconnected.

The federal government spends roughly $6.5, $6.4 billion a year specifically on rural broadband deployment that is subsidizing private providers to connect rural communities where no market rationale exists. It is estimated that it will take somewhere between $61 and $150 billion to connect every home and business with fiber or roughly $300 billion to connect us all with 5G.

But I want to argue today-- and I'm going to argue in my book-- that simply throwing money at this problem will not solve the issues that exacerbate the rural urban digital divide. Instead, it tends to replicate the existing inequalities inherent within our current rural broadband funding programs.

And these include a definition of broadband that fails to account for current let alone future needs and usage, a dreadfully inaccurate broadband map, a naive commitment to the policies of technological neutrality, preferential treatment for the largest telecommunications providers, a 5G strategy that is only suitable for rural centers, and a failure to recognize municipalities, cooperatives, and local communities as local digital champions.

So the overarching issue facing the rural urban digital divide is not about technology, nor is it about money. It's about policy and politics or rather the lack of policy and the abundance of politics.

It's the politics of incumbency that allows CenturyLink and Frontier to garner millions of dollars a year in subsidies and then fail to live up to their commitments. It's the politics of technological neutrality that allowed ViaSat to come out as one of the largest winners in a recent incentive auction despite offering connections that failed to live up to the definition of broadband.

It's the politics of power that has stymied attempts to revive broadband mapping and replace the dreaded form 477 where ISPs exaggerate their rural connections. And these politics coupled with a lack of policy have allowed the status quo to go on for far too long. A comprehensive rural broadband plan is needed. And that's what I'll be outlining today.

So in many ways, my book and research is one of classic critical political economy of communication in the tradition of scholars like Vincent Mosco, Leslie Shade, Robert McChesney, and Victor Pickard. And I address the kind of deceptively complicated question of how the US allocates the $6.5 billion it spends on rural broadband. So to put it more crudely, I literally follow the money.

I address this issue and others through a triangulated method of thematic coding analysis of policy documents and public comments to regulatory dockets, in-depth interviews with key stakeholders, and site visits and participant observation with rural broadband providers.

And the hallmark of my research has been what I called the rural broadband road trip where my hound dog Tuna and I drove 4,000 miles across the American Midwest meeting with, talking to, and learning from rural residents, providers, officials, and state representatives.

And I call this a method and a process of lived policy-- boring from lived theology and contextual theology, a method to understand how public policy decisions are lived on the ground. I argue in my book that rural broadband policy or broadband policy more generally is both broken and incomplete.

It is incomplete and broken because it lacks coordinated federal leadership and is mired in a battle between regulators, a bewildering array of rules, inconsistent state intervention, the dominance of large providers, and a policy process that favorites these large providers. So to be sure, the $6 billion we spend on rural broadband is being spent on rural broadband, but it's not being spent efficiently or democratically.

So let's talk a little bit about the basics of rural broadband. Right now the FCC reports that about 26.4% or 16.9 million people in rural America lack access to broadband, which is defined as 25 megabits per second download, three megabits per second upload.

This compares with 1.7% of urban Americans and 35.4% of First Nations people living on tribal lands. In terms of adoption, about 63% of rural Americans have a home broadband subscription while 15% of rural adults say they never go online.

Rural Americans also pay more for broadband and have fewer broadband options. Only 19% of rural Americans have a choice in broadband provider. And this lack of competition drives up prices to amounts unfathomable in urban centers. The lowest density population areas pay upwards of 37% more on average for broadband than the densest centers.

And here's an example. In Messina, Iowa, population 345, residents pay $145 a month for 25 megabits per second download for a fixed wireless connection while the national median is $80 a month. So in sum, even when it's available, rural Americans pay more for worse connections and fewer options than their urban counterparts.

But why do we need broadband in the first place? I think we've maybe all heard this question before. And my snarky answer is usually that this was the same question that was asked about electricity in the 1930s. Today, internet and broadband access are not luxuries. They are necessities and public utilities.

And in my work, I have developed what I call the five pillars of rural broadband to answer some of these questions. So broadband is necessary for economic development, which includes both business and residential growth. For instance, did you know that a fiber optic connection to your home raises your home's value by 3.1%? True.

The next is education. 70% of teachers assign homework online, but 18% of rural students lack broadband access. Health and telehealth-- rural America is older and sicker than urban America but suffers from fewer doctors and fewer health centers. Civic engagement-- access to news and

information and local leaders. And lastly, quality of life-- because quite frankly, we all hate it when the recent episode of Sabrina is buffering.

So I'm not trying to make a technologically determinist argument here. The mere existence of fiber optic cables or fixed wireless in a community does not solve rural inequality, but the lack of connectivity certainly does not help. So said differently, and to borrow a great phrase from one of my interviewees, Bernadine Joselyn from the Blandin Foundation of Minnesota, "Everything is better with better broadband."

So the reasons for the digital divide are myriad, income, age, interest, location, and race prevalent amongst them. The fact of the matter, however, is that the digital divide exists because of a failure of the private market to provide the essential service and a failure of policy to create the necessary market conditions or better yet categorize broadband as a basic utility.

Economists would call this a market failure. That is a condition that exists when the private market is unable or unwilling to provide for a basic social or public good because of a lack of return on investment. There is simply not enough people living in rural America to merit private market investment in broadband.

Piling on top of this, the lack of broadband also becomes part of what is known as the rural penalty, which describes the material and figurative costs paid by rural residents and businesses for their geographic distance away from the centers of commerce and culture.

It has been hoped first with electricity then telephony and now broadband that a, quote, "distance-killing technology" would abate the rural penalty. That the urban rural digital divide persists into the broadband age suggests, however, that the digital divide is not a technological or a neutral or a natural problem, but rather a problem of political economy and of policy. And in this case, public policy has failed.

And actually, I want to spend the kind of meat of my talk talking about what I call the three failures of rural broadband policy. And these are meaning, mapping, and money. So let's start with meaning.

Like I said, the FCC currently defines broadband as an always-on connection of 25 megabits per second download and 3 megabits per second upload. This definition is woefully inadequate. It is estimated that our digital lives require about 54 megabits per second to adequately power. Moreover, the average download speed according to Oookla in the country is now 93.98 megabits per second.

Upload speeds are even more worrying. If download is about consumption, streaming, gaming, chatting, upload is about production from Skype and FaceTime to precision agriculture and telecommuting. And our asymmetric definition of broadband privileges consumption over production.

And there are, of course, many ways that Americans can access the internet. There's DSL, fixed wireless, cable, fiber, satellite, and cellular among them. And of course, 2.1 million Americans still use dial-up.

In an effort to privilege one technology-- in an effort not to privilege one technology over another, however, and potentially exclude a yet-to-be-invented technology, the FCC has adopted a policy of what they call technological neutrality. Technological neutrality means that policy and policy makers should not favor one broadband technology over another, more specifically, that companies deploying a particular technology will have an equal chance to compete for funding.

But not all connections are created equal. And instead of being technologically neutral, I argue that our current policy infrastructure is technologically blind. The problem with technological neutrality as a policy principle is that it equalizes technologies, suggesting that it doesn't matter how you access the internet, only that you do.

So for instance, it ignores the fact that the median download and upload speeds for DSL, which is the most common technology in rural America for broadband-- these are the copper wires from your telephone company-- that median upload is only 10-1.

It also ignores that a fixed wireless system are subject to weather conditions and line of sight, or that coaxial cable dramatically favors download over upload, or that satellite internet is prohibitively expensive, contains notoriously low data caps, is vexingly slow, and plagued by latency. To the FCC, however, all of these are broadband. And all of these are good enough.

Susan Crawford in her book Fiber argues that fiber is the only way to go, stating, "Money spent on wires other than fiber is wasted." Fiber is fast. Fiber is symmetric. And fiber is future proof. The problem-- fiber is expensive averaging about $27,000 per mile if strung up aerially or $100,000 per mile if buried under the ground.

This is the rock and a hard place that unconnected communities find themselves. Use an outdated technology because it's cheaper, or do you take the risk and invest in fiber?

Telecommunication companies in rural America, most notably CenturyLink, AT&T, and Viasat, meanwhile, have been incredibly successful in lobbying for technological neutrality because it keeps their technologies, most notably DSL, the old copper lines or satellite, in the mix for funding. In fact, current funding programs dramatically favorite telephone companies over all other providers.

So when we look at the problem of meanings, then, we find two issues-- the definition itself of broadband and that of technological neutrality. Let's move on to the second failure policy, which is that of mapping.

Remember when I said that 26.4% of rural Americans lack broadband? Well, we're actually not sure about that number. There are numerous flaws in how the FCC collects broadband data, which has led to confusion, frustration, and accusations.

Recent studies by Penn State University, for instance, found that the FCC's data is off by at least 50%. And a shocking release from Microsoft found that 50% of all Americans, 162.8 million people, lack access to broadband speeds.

Part of this confusion comes from what the data is actually reported to the FCC from broadband providers. So currently, the FCC uses something called form 477, which is filled out and submitted biannually by ISPs.

Currently, broadband deployment is not reported at the individual location, however, but rather by the census block. And here a provider simply has to claim that one building in an entire census block is served or has the potential to be served in 10 days. And the entire census block is considered served by the Federal Communications Commission.

Making matters worse, ISPs only have to report advertised speeds rather than actual speeds, leading to distortion as to who of the connected are actually receiving broadband. And thanks to the policy of technological neutrality, the FCC also considers satellite internet as a broadband technology where anyone who has satellite knows that this is furthest from the truth.

This has led as I've previously stated to a gross exaggeration of broadband connectivity in the United States, specifically in the sparsely populated but geographically vast census blocks of rural America.

But in addition to being overcounted, there is also the issue of funding eligibility. Once a community or a census block is considered served by the FCC, it is ineligible for future funding consideration. So these communities are either unconnected or stuck in the dial-up age.

And I want to take us through an example from Louisa County, Virginia. Louisa County is about an hour away from Charlottesville south located in central Virginia, a county of about 10,000 people and a largely agrarian community with no major towns. According to the FCC, Louisa is 100% served with at least one broadband provider offering 25-3-- 25 megabits per second down, three megabits per second up. That's the map. Blue is good. We like blue.

If we take satellite out of the equation, we suddenly find that 40% of the county is unconnected. Now, if we look at a table from M-Lab, which uses crowdsourced data, they found that the average download speed of Louisa County is 3.91 megabits per second or download and 1.69 megabits per second download.

This does not meet Netflix's minimum standards of broadband, let alone our standards of broadband in 2015, let alone our standards of broadband today. Louisa County, however, is ineligible for any FCC money. They are left behind.

So let's talk about money for a second. Despite these flaws and drawbacks, the United States spends like I said about $6.4, $6.5 billion a year on subsidizing rural broadband deployment and about $10 billion a year in total on broadband deployment writ large. This money originates with two sources-- the Universal Service Fund managed by the FCC through the Universal Service Administration Company or USAC and the United States Department of Agriculture.

The FCC through three different programs controls roughly $4.9 billion. And USDA controls upwards of $800 million in loans and grants, plus $600 million appropriated for Congress in a new program called the ReConnect program.

The problem here, in my mind, is not the amount of money that is being spent but how it's being spent. All of the FCC programs disproportionately favor legacy telephone companies and the largest of those specifically. Let's look at a couple of FCC programs for a second.

The first one is the Connect America Fund Phase II, which allocates roughly $1.2 billion a year from 2015 to 2020 to the nine largest telecommunication companies like AT&T, CenturyLink, Frontier, and Windstream.

In return, they have minimal buildout standards. They only have to connect to 10-1 and don't have to upgrade their connections. In short, they are still able to connect rural America with old copper wires in exchange for billions. Both CenturyLink and Frontier, meanwhile, also failed to meet their 2018 buildout requirements in certain states but face no discernible consequences. That's $1.2 billion for nine companies.

A second pot of money called the Alternative Connect America Model spends $1 billion between 200 smaller telecommunications companies who have higher buildout requirements. They have a 25-3 buildout. And most are laying fiber rather than copper. And these are typically local telephone cooperatives, particularly the American Midwest. That's $1 billion spread amongst 200 companies versus $1.2 billion spread around nine companies.

And there's a final pot of money, just $148 million a year called the Connect America Fund Phase II Auction. And that's shared between 103 companies including cooperatives and satellite-- electric cooperatives and satellite providers.

So both the mapping of rural broadband and the funding of rural broadband, in sum, the policies of rural broadband, drastically and unequally favor the largest incumbent telecommunications providers. As one of my interviewees said to me, no one ever got in trouble at the FCC for supporting the telephone industry.

Meaning, mapping, and money all represent policy failures in the realm of real broadband and therefore stymie any and all attempts at deployment and digital inclusion. My solution to this gridlock is a national rural broadband plan.

We actually had a national rural broadband plan in 2009, something that was ordered by the 2008 Farm Bill. The plan was authored by then FCC acting chair Michael J. Copps, who's a personal hero of mine. And it was written after extensive public consultation.

Unfortunately, it was eclipsed and made redundant the following year by the 2010 national broadband plan, which laid out America's digital future but shifted the conversation away from the rural and towards our more national ambitions. I want to suggest to everyone in this room that we need to reclaim this plan and reinvent it for the 2020s.

And for precedent, I look to the 1930s and the rural electrification administration, a New Deal-era agency tasked with wiring rural America with electricity through loans and grants to local cooperatives coupled with outreach to local consumers and the most amazing posters and advertisements you have ever seen.

Founded in 1935, it took the rural electrification administration 15 years to move rural electricity from 10% to 90%. In 1949, it was given authority to finance rural telephony. And within 20 years, penetration rates were near universal.

So strong is this parallel that one of my interviewees, a rural broadband provider, simply said, broadband is the next electricity. When it comes to broadband, however, the FCC has been at it for now 10 years and has come nowhere close to the success of REA for either electricity or telephony. And I argue that we need to reclaim the zeitgeist and the purpose of the rural electrification administration.

To do this, Congress needs to appoint a lead agency to cut through the regulatory clutter. And I have long suggested that this agency be USDA rather than the Federal Communications Commission, as it removes partisan politics from the issue and harnesses USDA's presence across the country.

Now, to be sure, USDA suffers from its own political maneuvering. Many of you may be aware that the current administration is carving up USDA and moving its research division to Kansas City apparently because it disagrees with its findings and conclusions.

But the FCC has demonstrated in its most current iteration that it cannot be trusted with the public interest and the public good. Its structure, meanwhile, tight as it is to the fortunes of the presidency make it unpredictable and contrarian. Despite its flaws, meanwhile, USDA has a trusted presence across the country unparalleled by any other federal agency. It also has a legislative mandate to champion rural America.

So to be sure, USDA, FCC, NTIA all have important roles to play. The FCC, of course, controls the bulk of the money to rural broadband deployment while NTIA sets national policy. But we need an agency to lead the charge, to require data and knowledge sharing, and to author America's rural broadband plan. And this plan would ideally include a number of elements.

First and foremost, it would set a realistic but ambitious definition of broadband, one that maintained maybe an ethos of technological neutrality but would set forward-looking speed thresholds like 100-100 as recommended by John Sallet of the Benton Institute.

That way, technologies are not excluded on the surface but must be able to deliver these speeds on day 1. This is actually the policy of Minnesota. Minnesota will fund any technology for broadband deployment so long as you can offer 100-100 on day 1.

A national rural broadband plan would also revise the broadband mapping methodology and stop relying on industry self reports. Instead, it would amalgamate a host of different data sets, including leveraging the crowdsourcing that M-Lab has found so valuable.

It would also include a challenge process so that rural communities would have an avenue to protest if they are overcounted. It would eliminate state barriers to co-operative and municipal broadband that have by and large been passed at the behest of large telecommunications companies. It would democratize the funding process and stop privileging the largest telecommunication companies.

This would also include allowing cooperatives, municipalities, and new entrants to bid on funding and draft strong punishments for defaults. It would streamline the funding process. And throughout my research, one theme that I've heard repeatedly was the difficulty of applying for loans and grants specifically if you're a small local ISP.

I have a great quote that I just want to read you all. This is from a rural broadband provider in Minnesota. "You know, of all the things I've tried to do in my life, the hardest I've ever had to try to do is navigate how to get USDA funding, how to get federal grant funding.

I cannot, a, afford to figure out how to navigate it, nor can I hire someone to figure out how to write the grant such that we would receive grant money, nor can I figure out how to navigate how to put myself in the position to either receive grants or loan guarantees. And if you can tell me today how to do that, I'm all ears." We need to make it easier for rural broadband providers to apply for this money.

A rural broadband policy would also include funding for digital inclusion, specifically computer access and skill development. Like I said, broadband that just sits there unused is all but worthless. And lastly, but certainly not least, it would give serious reconsideration to 5G deployment.

Right now, the FCC is mobilizing 5G through what's called high band spectrum or millimeter waves. While this bandwidth delivers ultra-fast connectivity and low latency, the signal reaches roughly 800 to 1,500 feet before requiring a boost. As such, we've heard a lot in recent months about small cell deployment.

Because of its geographic limitations however, millimeter wave 5G is unfeasible for rural America. I mean, imagine if you had a two-mile driveway. You would need a small cell repeater every 1,500 feet. The FCC needs to reconsider its prioritization of high band spectrum and begin experimenting more with mid band to deploy 5G in rural America.

I'm not arguing for a nationalized broadband system but rather for a multi-stakeholder broadband system guided by insightful public policy and funded through numerous democratized revenue streams. A national rural broadband plan would show that this country is serious, both about global competition and quality of life of rural communities.

As it stands today, a lack of universal broadband means rural communities are suffering. We are failing to ameliorate these conditions because we are not taking all stakeholders into account. We are failing because of a lack of coordinated and coherent policy. We are failing because major telecommunication companies get the bulk of funding and fail to deliver.

We are failing because the agencies in charge of rural broadband do not even know who has broadband and who doesn't. A renewed federal commitment to rural broadband would encourage states to take on greater coordination roles, which would then empower local communities to make informed choices about their connectivity.

It's this last point on which I want to end my talk. Despite of what I've just said, rural broadband will not be solved by incumbents, by regulators, or by states. The rural urban digital divide is going to be solved by local communities, local companies, and local digital champions.

That said, robust, coherent, and comprehensive federal policy can make their efforts so much easier. We've done it before both with electricity and telephony. And we can do it again with broadband. Thank you.

[APPLAUSE]

So I was told to maybe have some good prompting discussion questions for us, but I'm also happy to take questions from the audience. But a couple of the questions that I thought to get everyone thinking about your own broadband experiences is to think about who is your provider? How much do you pay? How frustrated do you get when things don't work?

Another question I would have for you all to think about is should broadband deployment be about immediacy? That is to say, should it be about connecting the unconnected with something just as long as something is there? Or should it be future and forward looking, which would be much more expensive and which may delay deployment?

And lastly, something to think about is that both the United Nations and the European Union have declared broadband access to be a human right. In Finland, broadband is a legal right with government obligations to ensure that every Finn has access to broadband.

Is this something we should do? Should we follow their lead? And if so, what are our obligations if we do so? So this is just a little food for thought, but of course I'm happy to take any questions or comments about anything we've talked about or things we haven't talked about. Yes.

Is there a mic? Have a mic five seconds.

I'm just going to--

Thank you so much for the talk. My name is Dave Caruso from Boys and Girls Clubs of America.

Great.

This resonates. We serve about 4,700 sites across the country. And quite a few of them lack access. My question has to do with your recognition that champions are necessary to help connectivity. My wonderment is given that ISPs are challenged in their spaces, who are those

good champions? Who are the people who can work across the network of local communities, providers, and probably the government to really push this through?

That's a great question. In my research and in my travels, the two that I can really point to, the first are libraries and librarians who have been incredible in rural America both to-- oftentimes, they're the only place in a town that might have a broadband connection outside of maybe a McDonald's. So the libraries and librarians have been incredibly valuable.

The other thing has been county board of supervisors. When they take up the challenge, they're actually eligible for a number of grants and loans if they can partner with a private provider. Now, part of the problem has been convincing certain boards of supervisor that this is an important issue to take up because it's expensive. It's expensive to even get started.

But I've found that librarians and libraries and county board of supervisors for rural America have an incredible champion connectivity in their communities. Yeah. Thank you.

Hi. When you listed the incumbent providers who were benefiting from current policies, some of whom I've never heard of, I noticed one famous company that was definitely not listed, which was Verizon. Are they totally absent from this space?

They're not totally absent, but their rural footprint is less. Verizon sold off a number of their rural connections to Frontier Communications about 10 years ago, a lot of the copper wires. So Frontier has taken up a lot of that. Now, Verizon will be eligible, for instance, for the 5G Fund if it ever develops such as it is so.

Fios.

Well, but Fios doesn't exist in rural America.

Is there any plans for them to try to bring it there?

I would sincerely doubt it, yeah, again because of this market failure. There's no incentive. There's no market reason for them to go to rural America. Sorry.

Hi. I'm from Europe. And I just wanted to point out while I think it's a great idea to declare broadband access a human right, that doesn't mean it's the reality on the ground. Like in Germany, we have a very similar situation where copper-based technologies, vectoring in particular, is just declared a broadband technology because the incumbent technology company happens to own all the copper wires.

And so one thing that I think has worked pretty well in Finland is for municipalities to actually build the fiber network and then to have market competition on the network. So I wanted to ask if anybody in the US is doing this or whether that might be an approach that still it's not a public or state-owned telecoms provider. It's just a state-owned network, but then the providers are operating on the market.

That's a great question. Thank you very much for bringing that up. Municipal broadband is definitely an option. What's happened, however, well, I'll give you a good case study. Ammon, Iowa is amazing. Idaho, excuse me, Ammon, Idaho. Someone said Iowa. And they have actually built out a fiber network and then allow private ISPs to sit on top of the network. So you can actually switch your broadband provider online, which is pretty cool.

19 states, however, in this country have either prohibited or inhibited municipalities from investing in their own broadband networks because it distorts the quote, unquote "free market." So that's one of the reasons why I would argue that Congress actually needs to step in and preempt a lot of these laws to allow communities where there is no provider coming in and servicing them in the first place to do it themselves.

And I'll give you a great example. In Minnesota-- Minnesota is kind of the hero of my research-- there's a county called Rock County, Minnesota. It's in the Southwestern-most pocket. Population roughly 9,993 people. Sits on the border of South Dakota.

They bonded themselves for a million dollars, got a $5 million grant from the state, partnered with a South Dakota telecom company, and now have 99% fiber to the home in a rural county. I mean, this was amazing, but Minnesota has a state legal system that would allow municipalities to do it, whereas, for instance, Texas outright prohibits it.

Hi.

Hi.

I previously read that-- I think this kind of goes into what you were just talking about with the last question-- but that there's like predeployment barriers and local regulations that often make it a lot more difficult for these internet service providers to even kind of launch in those areas. And so I was just wondering if you came across that in your fieldwork and your research as well if you could talk about that.

Yeah, absolutely. I mean, I go on the same thing that there's a lot of state barriers against municipal investment in broadband networks. Virginia, for instance, one of the odd laws-- so it's one of the states that I would say inhibits but doesn't prohibit. So in Virginia, you're allowed to-- a municipality is allowed to fund its own broadband deployment, but its prices cannot be lower than the incumbent. So it kind of defeats the purpose.

Because oftentimes, when municipalities do it for themselves, it's a faster connection and a lower cost-- or a lower price. Excuse me. But Virginia doesn't allow that to happen. So that's really a disincentive for municipalities. Because when they do their feasibility studies, one thing they need to be able to promise is kind of a take rate. So that's been a major barrier to entry.

There's also a number of states, although this number is dwindling, that prohibit or make it a rather legal gray area for electric cooperatives to become retail ISPs. Why electric cooperatives, you might ask?

Well, because smart grids. In electricity, the electric cooperatives are connected by fiber. So they have a middle mile fiber network. And a lot would like to get into offering retail broadband to their residents. We see this a lot in Virginia.

But there's a number of state laws that prohibit it or make it a legal gray area for them to move into an industry outside of electricity. And so again, thinking through the laws and state policies that we need to get rid of or preempt, that would be one as well. Thank you.

Hi there.

Hi.

My name is David. I'm from Wisconsin. And this is a big issue in many parts of Wisconsin. You mentioned that to string up a mile of fiber in the air is $27,000 and on the ground $100,000. Can you just dissect a little bit that cost, and where the biggest part of that expense comes from, and if you've seen any communities that are doing something to address a big part of that expense and bring the cost down?

Right. A lot of the cost is the labor. Because if, for instance, if you're going to dig up a mile of ground, it's going to cost you more. Getting permission to string fiber on poles has been a major issue as well. Who owns those poles? Do you have to negotiate with them? Does every company that owns every wire have to bring someone out there in order to figure out how to reconnect those-- or restring those wires has been incredibly expensive.

The other thing that's been incredibly expensive is railroads, getting rights of way to either go above or beneath a railroad. And railroads have been pretty hostile with communities trying to connect themselves.

I think the best way that I've seen communities be able to defray some of these costs is actually with state money. A number of states have gotten into funding broadband to a modest degree, although Illinois just recently announced a $420 million rural broadband investment, which is kind of exceptional. But being able to kind of parlay that state money has been useful to defray some of those costs.

I'll caveat that, however, by saying that the FCC in their new Rural Digital Opportunity Fund or RDOF has said that any community that receives state money for broadband is ineligible for FCC money. So they are now ineligible for that $20 billion that the FCC made available. So they're not making it easy for rural communities to connect to the speeds that we all take for granted. Thank you for the question.

Hi Christopher.

Hi.

It's good to see you in our fair city. I'm Saul Tannenbaum. I'm from Cambridge. I am a co-founder of Upgrade Cambridge, upgradecambridge.org, which is trying to build municipal broadband here in Cambridge.

And to answer your discussion questions for us, my broadband experience-- terrible. Our provider is Comcast. It is the monopoly provider here. There are edge cases where you can get something else. If you happen to live in a big, tall building with line of sight to the Prudential Center, you can get fixed wireless. But if that's not the case, forget it.

So we do, even in Cambridge, have a significant number of people still on DSL. And when you go track them down, either Verizon has been lying to them and telling them that this is broadband-- what are you complaining about-- or they hate Comcast so much they're willing to put up with the slow speeds.

But like every other community, Verizon is decommitting from copper wires. There's an old copper switching station about 1/2 miles from here on the other side of the Harvard campus that used to be full of switches. It's now a coworking space because they've just taken out the space. It's really crazy. And if your copper breaks, you can wait a couple of weeks.

How frustrated do you get? Well, I think I've just answered that. But this is real. And this is repeated around the urban areas. And I'll ask you the same question we're chatting about earlier. What happened to the urban digital divide? Has that just simply disappeared as a political issue? Is there any government work on that? Or is it up to folks like us to actually get local governments to do something?

That's a great question, Saul. Thank you for sharing your experiences. I would imagine that a lot of us can relate to the frustration of working with our broadband provider, potentially just Comcast. If everyone wants a little fun YouTube video, I would recommend Googling or YouTube-ing Comcast call from hell, which is a half an hour-long customer service call.

No, but you raise a really good question. And it's something I didn't address in my talk, which is that the rural urban digital divide is one of many that exist. The urban digital divide certainly exists. The low income digital divide, digital divides amongst minority communities, amongst newcomer communities all exist, and they are not separate.

They're intersectional, right? African-Americans living in rural communities, for instance, are dramatically less connected than wealthy and white communities in rural America.

I think we've seen though-- and this is kind of where I started off this talk-- that with this current administration, a focus on the rural to the detriment of all of these other digital divides that I just mentioned.

In terms of our policy apparatus, there is it's called the Erate program, which is for schools and libraries. And there is some money from the NTIA for the National Telecommunications Information Administration-- lots of acronyms, I know, I'm sorry-- that offer a modest amount.

But it's really been an ignored issue both at the policy level but also just kind of at the popular conversation level. If you look at what the Wall Street Journal or Washington Post or New York Times are publishing, they're publishing about rural. And I published about rural in the New York Times. So that's captured this political imagining.

I think where we are seeing some change though-- and this is not great for anyone living in a big city-- but kind of in mid-sized cities is the push for municipal broadband, which isn't really viable in anything lower than a county seat. There's just not enough people there. But Chattanooga is the town, the city, that everyone holds up as the example of being a gig city in Tennessee.

So I think some of these mid-sized to smaller cities are finding the benefits of being able to come together to deploy their own networks. It's certainly a risk. It's certainly a financial risk for the town or for the city. Not really viable in big cities though. And that's part of the problem. So urban, those living within an urban digital divide have really found themselves without a voice.

But without money is the potential for money as well. And that's been frustrating. There's been a couple of companies though. I know you're working on this, a company called Monkey Brains on the west coast is doing a lot to solve the urban digital divide as well, but it's certainly not getting the attention.

If I could just parlay that into say that the other digital divide that's not getting attention is the tribal digital divide. First Nations people in the United States are dramatically disconnected and are dramatically undercounted. So perhaps next book for me will be a deeper dive into the digital divides that didn't make it into this research. Thank you.

Hi, my name's Heather. I'm one of the people Saul was talking about. I have Verizon DSL. My switch-- I live two miles from here on the other side of Cambridge. And my switch is in the building that Saul was just talking about. And I will not have Comcast on my property. They vandalized it several times. And I will not pay them money since they've done that.

And I agree, there's a huge problem. I grew up in the sticks. And I suspect that where I grew up has better service than Cambridge does. And every single person in the government of Cambridge should be ashamed of that.

Thank you for sharing.

Hi.

Hi.

My name's Glenn from rural Nebraska. And this what you're basically explaining was very much resonant with my experience with fixed wireless like trying to do my law school applications on fixed wireless. Yeah, good time.

But I think to kind of more to your second point, I don't think internet that's inconsistent is internet at all that you can rely on and use. I think my parents are getting fiber in they said their timeline is three years. And they're really excited about that three-year wait because at least they're on their radar.

So I think, yeah, you're right in that the solution going forward is fiber and not the previous. But I'm curious what you think about how do you educate those county seats and things about the opportunities and all the funding that is available through USDA and those things?

That's a great question. Thank you for asking that. It has been rather difficult. You've got some that have tech-savvy folks who are maybe on a board of supervisor. And that makes it a whole lot easier. For those that aren't, one of the major challenges that I found-- and I'm starting to increasingly work with some counties-- is a general confusion about what broadband is and the different technologies.

Because a company-- a major company like CenturyLink will come out and say, well, we do broadband. And we'll roll out DSL. Give us six million bucks, and we'll help you out. But then you find out that you're ineligible for all these other grants because you're now connected according to the FCC.

So part of the work that I've been doing is just going out to counties and having a conversation about the different technologies and giving them a space to ask what questions that a consultant-- that they're concerned about asking to a consultant. No one wants to look stupid, right? But everyone-- a lot of folks will understand that we need broadband, but part of the conversation is, well, what exactly does that mean?

And this is where I actually think USDA could play a much larger role, but they need the resources to be able to play that role. They are embedded in rural communities across this country. And in the 1930s and 1940s and 1950s, they had-- every extension office had an electrification person and a telephone person. Imagine if we had a broadband person to answer some of these questions.

The other thing I found that's been incredibly valuable both for communities to vent their concerns but also to have are town halls. There's been a number of town halls. There's a scholar by the name of Roberto Gallardo who's working in Mississippi and Indiana crisscrossing those two states holding town halls, and talking to folks about their broadband experience, and asking questions like, what is your connection like? Why are you frustrated? What can't you do?

And those I found have been a particularly valuable way to figure out who could be the digital champion in the community? And then can we empower that person or that group of people to go forward?

This is a plug, but there's a great organization called Next Century Cities that also will work with communities to figure out their broadband needs or the connectivity needs to empower them to at least be able to make those choices. But it starts at the grassroots level. And I think it starts with

conversations like this, like town halls. But I wish, again, USDA were empowered to be able to answer some of those questions. Thank you.

I'm perfectly happy to dismiss class early if we're out of questions. I'm going to stick around. Any final thoughts? Well, if not, in that case, I want to thank you all for your attention. Thank you all for inviting me here today and happy to stay around and keep the conversation going. Thank you so much.

[APPLAUSE]