Technology Policy Institute

The Policy Implications of New Broadband Competition

2024 TPI Aspen Forum

Panelists:

Will Adams, Vice President, Strategic Policy and Planning, T-Mobile US

Johannes Bauer, Quello Chair in Media and Information Policy, College of Communication Arts & Sciences, Michigan State University

Michelle Connolly, Professor of Economics, Duke University

Jay Schwarz, Vice President, Global Public Policy, Comcast NBCUniversal

Moderator:

Scott Wallsten, Senior Fellow & President, Technology Policy Institute

Monday, August 19, 2024

10:50 AM-11:35 AM

Event page: The Economic Implications of New Broadband Competition (youtube.com)

Scott Wallsten:

Before we start the panel, I want to mention that with sort of uh the panel the discussion is inspired by an article I, I wrote recently on the topic, where I argued that 5G fixed wireless and low Earth orbit satellites are rendering many of our current broadband policies on competition and universal service outdated and potentially counterproductive. While I believe this to be true, I'm not—my point is not to argue that here; I want to be the unbiased um moderator, uh impartial moderator. So, feel free to call me out if I appear to not be doing that, um even though I'm right, of course.

But, uh and so but we will today explore how changes and advancements in technologies are challenging our traditional approaches to broadband competition, Universal Service, BEAD, and regulatory frameworks. Uh and so we have a great panel to discuss it. Uh, just quickly, I think they even sat in alphabetical order uh: Will Adams, Vice President of Strategy, Policy, and Planning at T-Mobile; Johannes Bauer who's the Quello Chair in Media and Information Policy at the College of Communications Arts and Sciences at Michigan State University and the current Chief Economist at the FCC; Michelle Connelly, Professor of Economics at Duke University; and Jay Schwarz, uh Vice President of Global Public Policy at uh Comcast NBC.

So, let's start with the big questions. Uh at the highest level, how have new technologies changed the broadband and competitive landscape? Who wants to start?

Johannes Bauer:

Alright, I, I can't give it a correct um, so it's good to be here; it's my first time at TPI Aspen. Thanks for the invitation, Scott, and uh, nice to see you all. I should start with an improvisor and that is that uh, I'm speaking as myself and not as the Chair um, uh, of the Quello or as the Chief Economist at the Federal Communications Commission.

I also should uh sort of mention that before I started the Federal Communications Commission, I was the lead in, in a large NTIA grant to uh Michigan State University and, and an internet service provider to upgrade Michigan's uh middle-mile infrastructure. The, the project I had to recuse myself from the project, its completed by now. Uh but certainly was, was a, was a major experience in being part of the project. So, this may cloud my, my, my take on some of the questions that we ask here. I also want to start by saying we need to broaden the questions that we ask here.

Right, I mean to, to give a good answer to your question to which my answer is actually, yes with a couple of uh nuances and provisors, probably. Um we need to answer really three interrelated questions. One is, under which conditions uh does competition work in infrastructure markets—which are sort of very unique markets in many ways. They have a highly spatial structure. They have various cost conditions. Uh, they, they have heterogeneous demand conditions.

Um often, uh I think our traditional theories of, of uh competition that come from IO that are highly abstract and stylized and very powerful at an analytical level. They do not capture the nature of entrepreneurship that we see in those local markets. So, I'm suggesting that we should extend our theories of competition with sort of theories of entrepreneurship and uh in ideas that come out of strategic management, but they are much, much more closely debated.

Secondly, once we answer the first question, right, we have to ask a related question. How well competition achieve outcomes that we envision for those infrastructure industries? They're typically, a mix of efficiency goals and equity goals, and both are legitimate in their own ways. But economists have historically had more to say about efficiency uh than about equity.

And, and thirdly, uh the third question that we need to ask is if we feel that, that markets are and entrepreneurship and competition are deficient or fail completely; what's the best response that policy can make uh to those? And uh my answer to that third question is the current sort of a plethora of different approaches is probably not the best answer to, to the problem that we're facing. But let me come back to the first one uh and then uh, uh in the interest of time hand it on to, to the other uh panelists.

Fixed wireless and, and the satellites have clearly been competitors in that space, right? I mean they have exerted competitive pressures. They have driven new types of innovations into those markets. They're probably not completely uh equal substitutes for other types of broadband and services that we have, right? I mean now. So, fixed wireless definitely is, is a very, very strong competitor to, to other types of fixed services and mobile services. And in fact, uh fixed wireless is the fastest growing area. And interestingly, T-Mobile has now the largest footprint of any carrier that provides fixed service in the United States— covering almost two- thirds of, of, of the market. Uh, satellite is, is a is, is in a slightly different camp, right. But it is a substitute, but it is more limited for some areas. And I think we can go into those. I'll leave it at this for now and look forward to our discussion.

Jay Schwarz:

I went back to 2010 and looked at this panel uh from TPI Aspen, excellent. First minute Scott, you explain that you just gave yourself a haircut and forgot to put on the guard. And so, I guess you're explaining why you had a wacky haircut.

Scott Wallsten:

I yeah, I had a, I had a strip of head on the on the back.

<Laughter>

Jay Schwarz:

But, but I thought it'd be helpful to sort of go back to the time capsule and see how were people talking about broadband competition in 2010. And, and what were people foreseeing and not for

seeing and you know it— it was really how much are the Telco is going to upgrade from DSL to fiber.

What's going to happen with DOCSIS 3.0 upgrades? And then there was a little bit of discussion, and this was also the same year that the National Broadband Plan came out. And so, there was discussion about what role would the wireless players ultimately um, play in the, in the, in the sort of home broadband market. But I, I would guess that if you took a survey of everyone in the room there, the panelist, like and said, "In 2024—you, what's the median number of choices that you think Americans are going to have for home broadband providers?" I think people would say maybe two.

It seemed like that was about right, and today, you know, I think the number is probably three or four—something like that—for some of the reasons that have already been mentioned. Um, so, you know, certainly it's made a huge impact because of some of these technologies, but also, obviously, the upgrades that have been made by companies like mine and, and Telos and so forth. I'll give you um one bit of more anecdata: I live in a rural area on a farm. We moved out there in 2019, so before COVID. But the experience that I've had with— um the broadband experience living out there. I think really illustrates the impact that these technologies have had. So, just to tell you, I started out in 2019; uh the only option available was what I call a mom-and-pop whisp, right? So, a rel- relatively small company— um, not great service. We were talking maybe about 82 on a good day, you know, but just enough to survive—uh, enough for us to actually buy the house, which you know, had to you know, really think about. But then that um year or so uh later, uh a 5G home product came out. Um it was it was like had this like pink modem or something—anyway, but that showed up. And then maybe a year and a half after that, uh, I got SpaceX or star, Starlink, right? So, LEO showed up and so even in the course of five years that we've left out there. Um we are starting to see competition in rural areas that in 2019, had very, very limited you know, broadband options.

And, and for what it's worth, you know the definition of broadband at the time in 2019, there was no broadband. So, so you I think it's worth pointing out. I know we're going to talk about USF in a little bit. But these technologies have had an enormous impact, particularly in rural areas. In I think doing something that we probably didn't imagine in 2010 — is that you could have competition. For instance, uh in areas that we always kind of had thought, "hey we're going to have to subsidize them and then they're just going to be monopolies forever."

Michelle Connolly:

So, I would just add something, and you know in full disclos- disclose, like Johannes was saying um, I have received two of these from SpaceLink over the last two years. So, you know full disclosure. Oh, it's this really cool luggage tag.

<Laughter>

Um, but in just the last two years, the change in deployment by— so I'm going to use the word Starlink, but I should use low Earth orbit satellites. Really, it's just that Starlink is the one that's already doing it. The image of their availability a year and a half ago, you could see W- you know vast areas that weren't covered. And I just looked up where they're available—not even on wait list, and a majority of the countries covered. I mean that's a huge change in, in availability. I think it's a huge change for unserved areas underserved areas. And the fact that uh, the FCC very much wishes to ignore that, that fact is, is stunning.

Scott Wallsten:

So, but just before you go well, because I think it —you'll have the part of the answer to this. So, there's one question so far in Slido and which says assume— we assume competition but there's only one broadband choice of broadband providers. Why do people still think that? Um, I mean is it because that, that there's uh that. When people like look at the different options, there really is only one that works?

Michelle Connolly:

It's not, it's not for lack of advertising.

Scott Wallsten:

<Laughs>

Will Adams:

I'll chime in on the first question, although maybe I shouldn't. The FCC's Chief Economist knows our stats, my company's stats better than I do. And we've got the Comcast Guy saying he was a T-Mobile customer. So, maybe I should— just I don't know about the SpaceX thing. Um, so as to competition, right? The, the fixed wireless um growth and really birth as a major broadband competitor is only like two and a half years in the making. So, I go back to 2022 when we launched um commercially Verizon is there right behind us in AT&T, is has a pretty robust fixed wireless offering today. And if you look over the last 10 quarters in the in-home broadband industry, there have been about 8.6 million uh new subscribers. That's been the growth of the industry 8.7 million of those were fixed wireless and other words x-fix wireless.

The in-home broadband industry has contracted by 100,000 subscribers in that time. It shows you how important fixed wireless has been um to, to the in-home broadband industry in the US. And I think Scott, I'm the only non-PhD economist on this panel. So, I'll give you the Everyman Common Man, uh color on this, my uh wife is from Tennessee. They're in Spectrum charter territory and when I go visit them, I see these really cute commercials that make fun of T-Mobile. I think they say something like, “don't trust your mobile phone company with your in-home broadband.” And I think they're really funny. And I think they're really encouraging as well because, when you have— and I think maybe your company, Jay, has a few of those commercials, commercials, too. But uh, what they show is that that's like real evidence right of

fixed wireless impact on the in-home broadband uh industry. And it shows that we're making a real, real impact.

I'd say two caveats. And I, I think we almost all agree on this. But two caveats and these are important to our ability to continue to compete um in, in-home broadband. And the first is that we are very limited and capacity that's real and that's primarily a spectrum issue. Um but it's also a bit of an infrastructure issue and —get into some of the math um, on that. And secondly, is as my company at least has been in this market now for a couple of years. What we've noticed is not all broadband is broadband or rather, not all use cases are the same. So, there are some customers uh, for whom you know, fiber and its various advantages —um, is the name of the game. They, they won't consider us. There is a good portion of the market —is very interested in what we have to offer. And I could run through the commercial of the simplicity and the value and, and you can look at ARPU and say that we offer some discount, um but it's not a monolithic market. And so, I think your question —your original question about competition and substitutability is actually kind of complicated. It's not clear.

Johannes Bauer:

So, I want —

Jay Schwarz:

Sorry go ahead.

Johannes Bauer:

I wanted to come back to the first question. That uh, it's not going, I can't see it on the screen anymore. Uh, about the assumption that there is competition and this it leads to that second point that I mentioned, right? I mean, it's necessary to really have a very sort of keen view as to where competition works and then where its limitations are and its deficiencies are.And there is a especially— there is a there's a, a gradient between uh, markets, right? I mean, there is still some uh, large regions of the country, rural markets. Um, but you can also look at other, other demographics, like uh, lower income populations. And so, forth right where, where there's only perhaps one competitor. Maybe even no competitor, all hinges on, on whether we count satellite as, as a feasible competitor. Which I tend, tend to do although the, the price of course of satellite service and the fix cost of getting it started. Uh, are prohibitive for many customers. In that sense it's not, not an effective competitor but, but we have to recognize that competition has not worked equally. Well, across all different areas of the United States and uh, but the, the, the good news is, is this. I mean since 2022, we have more granular data available um, that are sort of more accurate than, than the previous 477 data. And what we see is that there's actually improvements in all dimensions, right? I mean if you look at the number of competitors as your indicator, you see that the number of areas where there's no competitor, only one is decreasing very rapidly. That the number of places where there's now three or four is increasing very rapidly. Uh, the places that have higher quality service uh, the numbers are increasing. If you

look at different social demographic variables, um, you know, income or, or, or um ethnicity and so forth. You also see improvements, but it doesn't mean that the problem has gone away, right? There's some areas— some populations for which competition is not sufficiently effective to really solve the, the, the equity problems that we envision when it comes to infrastructure services.

Scott Wallsten:

Yeah. Michelle.

Michelle Connolly:

So, I totally plagiarize Scott and Greg Roston all the time. But I'm trying to be honest um, because I learned this.

Scott Wallsten:

Plagiarize, use—

Michelle Connolly:

So, it's per, it's a, it's a loop. Um, they brought up the case of Nebraska on the BEAD programming and how much uh—so they did a reverse auction. Which is a good thing, but again we're focusing on fiber and things like that. And so according to this email exchange, uh, the winners you know, the cost for the winners ended up being about $20,000 per household. Um, and Scott gave a great snarky remark that, that would pay for each uh, household get a Starlink terminal, which is $499. And now apparently on sale for $299 uh, for only a month. Um, and pay for 12 and a half years of monthly service. So, when we're talking about equity— how you know, how many billions of dollars have we been spending on these schemes?

I would say— these government schemes to that claim they're going to improve equity and pricing. And in the more than two years it has taken to even kind of set up one of these schemes, we have private companies based on private incentives, who've actually achieved— what you know I say achieved the goals that the government is claiming they're trying to achieve. And I agree with the idea that maybe a $455 upfront cost makes this prohibitive. And I'm not saying everyone should get LEO. But you know, in certain areas that might be your only option. But then it would make much more sense for the government —instead of using these billions of dollars. And all these convoluted rules— would be just to subsidize the, the household directly. And I think that would be a much more efficient resolvement of the problem.

Jay Schwarz:

So, so I know we're going to be talking about USF and I'm really looking forward to, to that portion, but I wanted to say a couple things. Um, both taking off of y'all's comments and semi-addressing um, that first question which is now maybe not even on there. Uh, first of all, that is just factually not true anymore that the vast majority only have one. Whoever, anonymous is?

Uh, if you want to ask me afterwards, I will walk you through all the data. Um with the new data and every— I agree with everything you said. I've found the same things uh, but there's been but, but kind of related to that. There's been this constant you know, the entire time I've been working in this area— effort to narrow the definition of broadband and it's like you narrow the definition, narrow the definition, and then you find there's no competition. And so sometimes that's what's also going on. And so, we see it in terms of speed. So, you know people want to just sort of assume, a way a lot of the competition that exists. We see it in terms of um, people want to say, there's only one valid technology, right? Uh, nothing else counts. Uh, you know we're also seeing this, this sort of related effort of a real push to— I call it like homogenizing all the offers. So, there's only one way you can sell broadband, and you can package broadband. And you um, you know— ISP shouldn't have the ability to. Maybe you know, contract with their customers in certain ways and so forth.

And so, we're seeing this, like push to have folks um in Washington and maybe in the States say, "hey this is what broadband is" and then sort of going back and saying, "this is, there's competition." And you know you sort of stole my thunder on the commercials. Consumers don't believe this, right— not only by their behavior but they watched the Super Bowl. If you watch the Super Bowl in 2023, what you saw is you saw uh, your company saying things about my company and my company saying things about your company. And then I think the next year, Verizon, AT&T got in on it and everybody's competing for, for the home market. And what's completely left out of a lot of these definitions about broadband—whether it's the speed definition and so forth is tradeoffs.

Right? And price, right so um, consumers very, are very comfortable with the idea of "hey um you know, maybe T-Mobile is going to charge me less", you know and "I'm going to get a different product" or "I'm going to pay more for this other product." And that is just completely out of the conversation, by and large. I will say, and then I'll finish. Um. Everything I said there is really related to competition and how we understand competition, which I think is really vibrant. Uh that's a slightly different thing than that practical question of what should the government subsidize? And so, I do think we need to distinguish those um a little bit.

Scott Wallsten:

Right and, and before we go on to, to that to that policy question. Um, there are a lot of questions sort of inherently coming up about market definition here, right? Like somebody asks if anybody here has ever used the non-LEO um satellite broadband, and uh you know, we all know those of us who have used it. Um sometimes it was good, sometimes it was awful. You could never game on it, right, because of the inherent latency. Um, and so that was, you know, that was sort of something in a different market. But then there are, you know, there's, there different geographic markets, too. Um. Now, the FCC is sort of, I think, required to come to a conclusion on whether there is sufficient broadband competition or whatever the rule is. But that doesn't kind of make

any sense. What —how should the FCC try to think about competition when there's not just one answer?

Jay Schwarz:

I think you don't assume— real quick. You don't assume uh that we're somehow at the end of history here. You look at the long— the trend over time. So just to throw out a stat. I looked in 2010 at—I used today's definition, 100/20 megabits per second, and I said, what did competition look like in 2010 —again using the, you know, much more crummy 477 data? But 98% of the country did not even have access to 100/20. Zero percent of the country had any choice, two or more, right? Not this is not including LEOs by the way. Uh, in 2013, that was just over 60%, okay? And many of those folks had three or four options. So, that's the trend. And if you go and look and, and try to take, you know, what uh cable said they're going to do in terms of upgrades and expansion—uh the Telos, the, the fixed wireless guys, you start to add all that in and, and, and project, and plus the bead programs, uh, you're going to have much more competition even going forward. There's no reason to believe that's going to stop this year.

Johannes Bauer:

I'll, I'll, I'll try a to stab with this one. And remember, I'm speaking for myself, okay, not for, not for the Federal Communications Commission. So, what the, the problem that you mentioned, right, that sort of the definition of what we consider “broadband” influences what comparative landscape we see, is, is um— is a is an issue, right? But I think there's a more generic problem at the heart of this, and that is that um technology —uh network industries evolve uh in, in, in multiple ways. I mean, you have uh fantastic advances, but those advances are not necessarily available throughout the whole network infrastructure immediately, right? So, there is sort of some, some uh differentiation between the types of services, types of technology that is available. And the, the basic fundamental problem that we have to ask as a society is what types of services, what level of quality do we consider is important, so important and so fundamental that everybody should have access to it, right? And then, what level of differentiation are we willing to allow? And I, I don't think, think we have a very rational way to approach those things, right? I mean, we have sort of ad hoc-ish uh, sort of steps uh and increments that we choose going forward—an from an economic perspective, right?

I mean, there's really no magic threshold that sort of identifies markets that yield 120 uh, download and upload speeds from, from others. I mean, they, they, they are in competition with each other, right? The competition is not an on or off. It's like the first question in the AI panel, right? I mean, the question of whether AI is good or bad is, is perfectly, useless. Uh, the question of whether competition exists or doesn't is perfectly, useless also. It's a question of intensity. Competition can be weak, or it can be intense. Uh, substitutability can be weak, or it can be intense. And so, I think a better approach would be to identify more clearly how intense is competition that we see, right? Is it sufficiently intense to achieve the outcomes that we want? And, and again, you know, we we haven't talked about, about prices. One reason, for example,

why a lot of people are excluded from currently subscribing to services uh, broadband services, is, is the price of broadband services, right? So, we have an affordability issue. And even in areas where, where higher quality services are available, they're sometimes priced at, at levels where a lot of the population think that they're sort of too expensive for the— for the needs. Not there's a whole other sort of set of issues related to affordability, but uh, these are indications that sort of a plain sort of focus on the number of providers, for example, whether competition exists or doesn't exist, right? Misses those nuances. And we have to dig deeper into what are the —what are the factors that influence these, you know, these outcomes, right?

Scott Wallsten:

So, let's, let's pull a few of those things together. So, um with at with more competition up to some point, you would expect to see lower prices. Somebody asked about that. Um, do we see any, any evidence of that? Um, and then the other question is, with the— the affordability, the affordable connectivity program, program um does it, you know, are we spending too much on infrastructure relative to helping low-income people? And sorry, Michelle, I think you're about to say something. I interrupted you.

Michelle Connolly:

Yeah, no, so I always react best to hearing other people's thoughts. Um, so one thing that I would mention is, what's very rarely discussed is actual usage needs. Okay, and I also stole this from Scott and Greg. Um, this was a year— well, Spring of 2023. I actually went through every application and found out what their min requirements were. So, this may be slightly off, but the highest um min requirement for download speed was 15 megabits per second. That was Netflix, if you were using it on a 4K Ultra high-high definition television. The minimum upload, the highest minimum upload speed I found was for twitch live video game streaming, and that was 6 megabits per second up. And gaming apps said that max latency that they could accept was 150 milliseconds. So, and that's of course one application by one person. So, I can certainly see if you have more people in your household, if you're trying to run more things at the same time, then you're going to want more. But affordability should also be a sense that, “well, if I am just one person and I don't need 100 megabits per second, is that really the only option I have?”

Secondly, almost all major internet service providers have always had a low-income plan. And those plans have been quite low, like some were $10 a month, some were $15, some were $17. Uh, a lot of these, I think, miraculously bumped up when the ACP started offering $30 a month to cover uh individuals. Um, but it is not the case that uh everyone is paying the face value price. Also, we have to realize pricing is usually national. Now, there could be specials for certain regions, but much of the pricing is national. So um, it's not like, well, I think— I think that's one thing to point out. And then the other thing is, is that there, there are low-offering low-price offerings available that people will often forego even if they're low-income because they prefer other things.

Scott Wallsten:

Right, it's not just price. Um, so what does this mean for the way we've focused, the way we've addressed universal service issues? Um, universal service came from the era when there was one company, and they cross-subsidized high-cost areas by charging urban areas more and businesses more. And that was sort of the rationale of how we ended up with universal service. Fundamentally, there's more competition um, and none of its really changed. Uh, assuming that we still believe in that societal goal of making sure that everybody everywhere has some access to some minimum level. What should we be doing differently?

Will Adams:

Well, good companies listen to their customers, and I think policymakers in this space should listen to their constituents. And here, whether it's the fixed wireless story or we're talking a lot about LEO SATs. You've seen a— a big change, not only in technology but what folks have been uh, been demanding. I think we're almost all in agreement on— on this one that the at a at a very high level, the approach of the government kind of stimulating the supply side by funding infrastructure directly raises a lot of thorny issues. Like, for example, the government then has to determine, well, what is the right level of broadband or quality of broadband that everyone should have? Should it be so-called future-proof fiber, or should we be more efficient and actually meet what people need today? Um, and my numbers are not that different than, than yours, Michelle. Um, so the radical idea would be, you know, maybe to the extent consumers need it, you provide resources so they can go purchase broadband, and that might stimulate providers to go build. So, it's a really good idea that the government has chosen not to do. They continue to fund —they continue to fund um infrastructure. Our position is, if you're going to stimulate the supply instead of the demand, then you ought to do it in a very efficient, targeted way. And the, the kind of core belief there is, I work for a major telecom company, and we are in the business of trying to figure out what our customers want to use our network for, but we don't know for sure— five years from now or 10 years from now what the new use case will be. In therefore, what kind of network we have to plan 10 years from now for today. And so, I guess the core insight is for the government, do you— do, do you all have a crystal ball that is better than ours? And, and my guess would be that they don't. And so, again, that kind of brings us back to I think we've all mentioned it, a kind of demand-side um stimulus, and that sounds kind of like ACP. One other interesting thing that people kind of overlook on ACP, there was a direct infrastructure piece to ACP. There was this provision— which I don't think any ISP in the in the country actually took advantage of which upped the subsidy from the standard $30 to $75 for extremely high-cost locations. To my knowledge.

Maybe someone in the crowd knows better than I do, but I haven't heard of an ISP taking advantage of that. The, the notion there is, well, there are places where the infrastructure necessary to provide service is more expensive, typically rural areas. And so, you kind of have to increase the amount of subsidy to stimulate and to incent… Say it again?

Audience member:

Tribes, tribes…

Will Adams:

Tribe, tribe, tribe. There was a yeah, there was a tribal broadband at $75 bucks. And then there was—

Audience member:

<inaudible> the as trip<inaudible>

Scott Wallsten:

Yeah, right. But they didn't have to do anything. It was declared that's $75.

Will Adams:

Right. And yeah, and then there I believe there was a separate provision that I was referring to for ISPs and, and non-tribal areas. And again, maybe you know, Harold, but to my knowledge, nobody took advantage of that anyway. Interesting infrastructure at, you know, it's an, an idea. Kern idea for demand-side that could actually stimulate private sector infrastructure.

Jay Schwarz:

I'll offer some conceptual ideas as we're thinking about um, you know, the traditional um traditional USF. What the government's doing is it's —it's buying a network. It's collaborating with the private sector to buy a network. If you think about the, the LEOs and the cost structure in in a sense, what you can start to imagine doing is you're, you're actually just you don't have to buy the constellation, if you're the government. You you're just buying some capacity there or you're buying some seats, right—for, for unserved folks. And so, I think that does open up some interesting ways we can start thinking about uh, the the high cost, the high-cost portion of USF. Um, both officially the USF and maybe more generally um—the most obvious is, Michelle already brought it up. You—there's going to be places where you can do this at lower cost. You can connect folks at lower cost. And um, yeah, that's, that's kind of the, the obvious one. And I think it helps on that distribution side. Um, there's this whole conversation about, you know, unsustainability with the USF fund. And, and one of the things we want to make sure is that we don't just blow it out uh, so I think that helps on the distribution side most obviously. But I think there's other things. So—

Scott Wallsten:

So that was an implicit answer to Rob's question. Basically, just show we blow up the—

Jay Schwarz:

I can't read in listen. So, I'm not even re—

Scott Wallsten:

Okay. Sorry, didn't mean to.

Jay Schwarz:

I mean, another one is, is time, right? Has anyone gone and asked rural people, who haven't had broadband um, hey, let me give you a choice here uh, next week we can get you set up with your LEO, and we'll get you going or four years from now, hopefully, you'll get your fiber connection."

Will Adams:

So, and option A, you get to keep 10,000 or 20.

Jay Schwarz:

Yeah, so. so I'm not even getting to that, right? Because, because you know, third party is paying for that, the government's paying, you know, but just go and ask someone, how much do they value that time? And I think you know I think we should at least incorporate that element much more. Um, getting a little bit more— I already mentioned it. SpaceX uh, is already there, you know, Kyper is planning on doing something. Maybe others will do something. I just heard something about Canada, maybe wanting to build a constellation. It is now conceivable that you could have—

Scott Wallsten:

Everybody laughs when you say Canada's gonna do something.

<Laughter>

Jay Schwarz:

But but fine, just leave the two.

Scott Wallsten:

Yeah.

Jay Schwarz:

You know, you can have rural competition, right? This this is like a big deal. It should be a big deal. And by the way, a lot of those areas may have some other type of terrestrial connection already. So that's exciting. Um, let's— two more. I think we can actually leverage this competition that exists from like the LEOs existing when we look at for instance, the legacy high cost. Okay, so um, there's always been kind of this holdout problem where look, you know, we're the, the legacy ready to return folks. They say, hey, if you cut us off, like then you'll just be

stranded. Well, guess what? There's now an outside option. And I think we should start getting more creative with how that outside option can help us competitively. Um as we try to make these more efficient. And then lastly, um as we think about things like BEAD going forward, there's kind of this looming Opex risk that you're going to have USF blow up. As all these funds or all you know, the, the, the BEAD for instance, builds these and then they say, “hey, we need Opex.” I think many people are fully expecting that's going to happen— that they're going to ask for USF. And we should at least stop for a second and say, “hey, even if we fund those fiber things, we shouldn't just completely accept that,” yeah, they need Opex. We should recognize we have some outside options. Maybe we should test that. Maybe we should say, “hey, um, let's really see knowing that we have the ability to, you know, if, if that network um struggles then you know, people can stay connected.” “They're not just going to be stranded.” So, I think there's lots of conceptual ways we can start to think about USF. I know I've like pissed off like several different interest groups, right there.

Scott Wallsten:

Possibly your own company.

Jay Schwarz:

No, no, I don't think so. Um, because I think it is important that we, you know, make sure we manage all everything I said there was really on that distribution side.

Scott Wallsten:

And I, I mean also generally from, from the questions and people who are skeptical about whether there's sufficient competition um, and from our history of USF, we've focused so heavily on subsidizing um the supply uh and not, not demand. Um that most of the questions seem to be about well, how can people —why don't so many— why don't more people have it? Not really anymore. Is it not there? Um, is it possible to change to a more I don't know whether you want to call it, a voucher-based system or a system that emphasizes more low-income support or is, is high cost just captured forever?

Johannes Bauer:

It's, it's a really um you raised a couple of really good points. I mean, for one, first of all, let me go back a couple of steps here. We —when we talk about competition, right? I mean, we really don't have a good counterfactual because we had over the past decades. We had multiple programs in place, right, that coexisted. It's so what we see is not the pure effects of competition, but there's other programs that have contributed too. Secondly, I didn't want to create the impression that, that up upgrading what we perceive, or we consider is a minimum level of connectivity is, is wrong. It's actually necessary as, as as, connectivity becomes increasingly um critical for our society. In fact, unless you have certain minimum level of connectivity, you are excluded increasingly. I mean, I— I you know, live in Michigan and I'm not in in Washington

DC. And, and in in our Upper Peninsula— very rural area. We see we see incredible forms of exclusion because many, many healthcare providers now are moving to online uh tele-health uh provision and for them, it's an efficiency improving innovation, right? But for people who don't have the right level of connectivity or the, or the level of um, uh sort of our stable connectivity that they would need.

It's a new form of exclusion. They cannot even make an appointment with the doctor anymore. And so, I think there are really serious issues that we need to consider. And um, but coming back to, to different funding models, right? I mean, I don't think we can understand universal service funding in this country without going to the political economy of those of those of those programs, right? And once you have a program in place, you create VTO players who are opposed to changing the program. So now we have, with the best of all intentions, we have an accumulation of programs that really don't work well with each other frequently, but send conflicting incentives to providers. Um, I deal a lot with small entrepreneurs who— who have a hard time navigating the, the complicated conditions, right? So, what we would need is a is a serious simplification. I don't think um that, the, the need for for uh supply-side programs will completely disappear. Right? There are good reasons for it. Uh, one of them, for example, is the resilience of network structure. So, one, one, one uh policy that would simply rely on satellite connectivity for rural areas probably has a, a resilience weakness that we haven't really explored and don't fully understand yet. Um, on the other hand, uh, demand-side programs just have lots of appealing things. I mean, as you said, I mean, if I have a voucher. I have an— you know, a sub that I can use uh to buy prop and I can easily switch from one to the other. We would overcome a time inconsistency issue. And I know plenty of people who actually subscribed to satellite connectivity because it was the only option, but once fiber was available, they would happily move to fiber uh because of, of the of the better latency of service and so forth that they, they had available on fiber. And I think a model that that empowers users to, to use their decisions to, to drive uh what we see in terms of investment would actually be desirable and has much to commend to it. The, the only problem that I see is this that markets in, in infrastructure sectors don't often not coordinate as well as we wish, right? You have an aggregation problem as a as a provider. You don't necessarily know ahead of time what's my take rate, right? And that that is one of the things that will influence investment decisions. So clearly, demand-driven uh, investment uh, course forward is probably where probably less workable than— we than we think right now.

Michelle Connolly:

So, I just from questions, I think there is clarification we want to make. Uh yes, we've been talking about satellite offering coverage for many, many years. But historically we've had, uh geostationary satellites. And that had that, and they're very far away from the Earth. And that creates this latency issue. The Le- what we're calling LEO is low earth orbit or non-stationary satellites. They're much, much closer and therefore are able to resolve the latency issue. So, that's why to me, I mean, it really was a game changer when I learned about this. Um, and that's why

this is not the same discussion that we were having about satellites, right? You 20 years ago um, I forgot what my other point was, but I mean—

Jay Schwarz:

When I when I saw your question, Scott about that, you posed here about infrastructure subsidies versus I think you said a low-income voucher. Um to, to form my opinion, I, I built a model. Um like —like I, I think we have to, to do that. Like I don't actually think it's one or the other necessarily. So, if we're talking about rural areas um, and so let's look at the, you know, the net present value of kind of those different approaches. And it's pretty clear to me that there are definitely areas where the NPV makes sense to, to build out that that fiber, okay? But then there's certainly— it's very also clear there's a place that it flips over. And you pro- it probably makes a lot more sense for the government to maybe be doing something like, you know, buying down the price if you want to put that there, not buying the network, buying down the price. You and so uh, I would say it's not in either or bit. I would hope that people are exploring it in a rational way like that. And look, the, the states with BEAD, you know, are supposed to be figuring out hey, how far do we build you know, a a wire line network? And then we go maybe fixed wireless or, or LEOs elsewhere. And so, I, I would hope that we can sort of rationally look at that because there's very clearly in my opinion and, and based on the model I was looking at, you know, a place where that makes sense. And then also, I would say though, you do, you do recognize that there's that time effect.

Scott Wallsten:

How long are we have to wait, right? And deciding where that line is depends a lot on what we think people's time preferences are, right?

Jay Schwarz:

Yeah.

Scott Wallsten:

Um, and so if and if people think broadband is a human right, then maybe don't want to make them wait 5 years for something. Um, and but if fiber is, you know, is by objective measures better, then that's going to push out the line a little more to where you want the time.

Jay Schwarz:

The time preference. But also, um, at least right now, there's obviously a speed difference, you know, a capability difference between a fiber connection and maybe fixed wireless or a LEO. And um, a very interesting idea would be for the FCC to go out there and actually ask real people um, here use this product for a month, here use this one for a month, and elicit their actual willingness to pay. Like, start to get I don't think that's actually a crazy thing when we're gonna be spending billions and billions of dollars allocating. I mean, a private, a private organization

just ran this like three-year study on UPI, right? Giving people a thousand —like this stuff's doable like that. What I described actually sounds easier than that.

Scott Wallsten:

Jeff and I did one for you know, lot less than the cost of a connection.

Jay Schwarz:

But, but, but like again, these models and what's rational really does depend on those things, like time preference. And I know you've written a paper in the past about, I think willingness to pay for different speeds. Like we need some updated information on some of those things.

Scott Wallsten:

Okay. I think we, I think we better wrap up um although I really love to keep going for a long-time um, so yeah, we're late. We're running late. So yeah, so thank you all very much. Um, I think it's a really interesting panel. There are a lot of good questions still up there. Again, we have them um archived, so we'll hopefully make them make them available. So, thank you very much. And let's see uh, now we will take another uh, 10-minute break and then come back. Uh, and you want to hear from we have actual telecom regulators, who'll be speaking next. We have enough I think to make an entirely new commission of international regulators. So be back in 10 minutes.