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JEAN RICE: Okay, we're ready to talk about funding. I'm Jean Rice, I'm a Senior Communications Policy Analyst with NTIA, and with BTOP, and we are so very happy to be here in California.

From the morning sessions, I was just very impressed of course, and having worked with California for a number of years, that you have really an interesting combination of champions, leadership, including leadership in the legislature and above, and also that you have kind of the wherewithal within the communities to take a look at what is needed next. And so my hat's off here to California.

I think it's kind of fun to be here on a funding panel just after a panel on business models because business models are basically something that's very key to what you need to fund a project, and to keep the project funded and going from then on.

So when you pick your business model, you want to think carefully about your funding models and develop your business plan, obviously, as you go forward. I like to think of Broadband as being all local because when you're looking at a community or an issue or a problem, you have to say what are my local resources, what are my local funding sources, and then also look up to state and to national.

So if you are looking at funding for many of your projects, you'll be looking at a combination usually of funding groups. So for example, if you're doing adoption, you may be looking at support from say the local library who has PCC center or a neighborhood group that does, but you'll be looking for additional funding, maybe from a community foundation, a corporation, your local government. There's different sources that you might look at for adoption.

If you're looking to provide sources to community anchor institutions, it'll look at

whether or not you can aggregate demand through community anchor institutions or whether you're going to take a look at can they also contribute, especially to areas that might be so far that a commercial provider might not go there.

If you're looking at last mile, you might look at not only your cost of construction, your operating expenses, but you might look at a revenue bond if you're a municipal model; you might look at a loan, or both; you might look at what your revenues are going to be going forward and how does that drive your plan.

Same way with a middle mile network. You're going to look at what revenues you might have. So for example, BTOP has had all of these business models, and I have to tell you, just a huge amount of funding sources that have come through the process, whether it is say an asset provided by a provider or a government, or whether it is something that might be from a university or an R&E [phonetic] network, but the whole idea is that with middle mile, you can look at who's helping fund it, but also what are the revenues. You're going to get cloud revenues, you're going to get revenue from back hall; you'll look at not only how do I get up and funded, but afterwards what do I do.

We do find that things grow over time, so we're seeing as you saw today, a lot of outgrowth with the 395 project and the CVIN project that was funded here for BTOP, but we're also seeing people who have done work that keep going all over the country, and part of it is, you grow your resources, you grow your partnerships, and you grow your capabilities. All of that leads to long-term sustainability.

Well, today, we have a panel that's going to be helping us talk about all of those different kinds of funding efforts, from the federal level, from grants and loans to reimbursement programs, to state-level plans, to what are people who have been looking at the industry as a

whole, what are they thinking about when it comes to planning?

Well, I've asked our illustrious panel here to take a look at a little TED Talk for you on financing, a short one, maybe three minutes each, on what it is that they think is essential to their programs, or what they think should be looked at.

I'm going to introduce each one of them before they do their little TED Talk, and I'm going to start right here with you, Keith.

Keith is the Assistant Administrator for Telecommunications for the Rural Utility Service at the Department of Agriculture. He has under him an annual program of $1 billion, and a loan portfolio of $4 billion, not to mention a billion under the Recovery Act, so that's a lot of money, Keith. I wonder if you could just tell us a little bit about your funding sources.

KEITH ADAMS: Good morning. Thank you, Jean, and I'd like to thank Doug and Amy and the organizers for inviting me.

I do want to make sure that I recognize my colleagues in the audience: Rocky Chenelle -- if you'd raise your hand, Rocky; he's a GFR, and Robert See [phonetic] from our State Rural Development office. So if I say anything that's not correct, they will correct me.

We have two grant programs: our Community Grant Program, you heard mention of that earlier in the previous session, it's about an $11 million program, and we have a Distance Learning and Telemedicine Program, which is about $19 million each year; those are our two grant programs.

And our two loan programs: our Traditional Infrastructure Loan Program, which is about $690 million per year, and our Farm Bill Broadband Program, and in all of those programs are specifically designed to connect rural America, and we work every day to see what we can do with the funding that we've been given to form public-private partnerships with many of you

who are in the room to make sure that we're providing access to as many rural Americans as we can.

JEAN RICE: Thank you, Keith. Now, I know you get to do workshops and things, but if somebody needed to get kind of a "how do I fit in your suite of offerings," you have people who can help on a regular basis in a state level, is that right?

KEITH ADAMS: Exactly. Well, I mentioned Rocky Chenelle; we have general field representatives, 25, who cover the 50 states. So they're going to be your point of contact for our loan and grant programs; they'll be able to walk you through once you decide what you want to do when either the loan application or grant application has been submitted to the national office in Washington. We have financial and business loan specialists who analyze the financials, and we have a staff of engineers who look at the technical feasibility.

JEAN RICE: Great. Thank you for that great overview.

Now I'm going to going to turn to another quite large funding agency for the federal government, to the FCC, and we've got Dana Shaffer here, who is the Deputy Administrator, and she looks at financial for all of universal services; she just has a long history, including heading up the Wireless Bureau at the FCC, but I have to say what I think is most important about her since she's dong E-rate analysis and worked really hard on the modernization is that she was an educator at heart.

So, Dana, would you like to tell us a little bit about the FCC programs?

DANA SHAFFER: Thank you. Yeah, my mama would kill me if I didn't also tell you I'm the daughter of an educator, the daughter-in-law of an educator, and I was an educator myself in Arkansas, in a very rural town where we might have graduated 12 kids a year.

I'm proud to say that they currently have a 50 meg connection that they get through E-

rate. I always love to meet with educators and just was yesterday with a superintendent from Glendale, Oregon. Anybody know where Glendale, Oregon is? It's pretty much in the middle, going from Portland all the way down south; it's south of Roseburg, south of Eugene.

I always like meeting with educators to see how E-rate is being used, and to see what the challenges still are.

So let me backtrack first just a little bit. I'll tell you the Glendale story in a second, but first, I want to thank David Adelman [phonetic], he's not here for me to thank him for his kind words. We are very committed to ConnectED, and so rather than giving you the basics of our programs, has anybody not heard of E-rate, or anybody not know what E-rate is? So I had you at hello? Great.

Because I'd like to jump right into the improvements or the modernization of the E-rate program. As David pointed out, the FCC has been very committed to ConnectED. We raised the funding cap in our modernization orders to $3.9 billion a year, as he said, representing roughly an $8 billion increase over five years from the original funding cap, maybe a little less than that if you count inflation -- we had bumped it up over the years.

We also found -- "found" is probably too loose a word -- but we also identified another $2 billion to focus on internal connections. So that funding cap raise is huge; that's huge news.

In addition with regard to infrastructure, we equalized for the first time the treatment of dark and lit fiber. As you know, in the past, you could get what were called "dark fiber services." Those of you from industry might go, "What the heck is that?" And having worked in the C-Link [phonetic] industry for over a decade with Doug Kinkoph actually -- I saw him today, I went, "Oh, my God, Doug, you're here." I don't know what to tell you what that is, because where I'm from, dark fibers is obtained two ways: through an IRU, an indefeasible right of use,

or you build it and own it yourself.

But we do also have this month-to-month thing called dark fiber services. But you couldn't get special construction funding to help you get access to dark fiber, and for the first time, we've equalized lit fiber and dark fiber, and so schools and libraries can go out to bid for -- they have to compare lit versus dark -- but they can go out to bid and see what their options are.

It's very important in a very rural area where there's never been a business case for infrastructure build-out to know that you can get access to special construction funding, either yourself to self-construct, or in the form of money for an IRU and special construction that's necessary to build the fiber that you're going to IRU, or for even lit services, for service providers for the first time. And it's not the first time they can get special construction funding, but the reason it's revolutionary is that we totally changed the way that we fund special construction.

In the past, you couldn't get special construction for dark fiber at all; you can now. But for lit services, if you were a service provider trying to make the case to go out to a very rural school, let's say the build's going to be $500,000, the special construction charge, you had to be amortized -- well, let's say 600,000; if it was 500,000 or more, a large upfront cost, it had to be amortized every three years for the E-rate portion.

As a service provider, that's probably not very attractive. I'm going to build this and deliver it, and then I'm going to go through the E-rate process and get a third, a third, a third every three years that the school's going to have to apply every year.

Oh, and schools, it wasn't very attractive for schools and libraries because guess when they had to pay their discounted share? Year one, when the service was delivered. So we flipped that, and now for special construction, if that's the most cost effective -- the rules haven't

changed for cost effectiveness -- if it's the most cost-effective solution for the school or library, they can get the E-rate funded portion of special construction in Year one when that service or that fiber is delivered, and the school or library can ask for in their 470, in their RFP, and if they pick a provider who agrees, they can get installment payments of their portion over a period of up to four years.

So the goal of equalizing dark and lit fiber and making special construction funding more accessible, both to service providers and applicants alike, the goal of that is to encourage and promote and to get infrastructure farther out into the communities. To get infrastructure where it's never been before, in some cases, people have asked, well, is it just limited to where there's no fiber infrastructure? No, as the speaker from Santa Monica was attesting to, sometimes there's infrastructure, but it's just as cost effective or more cost effective to build and provide service.

So we don't rule out what you might consider an over-build, but hopefully, if -- and I forget who it was that said we've all got to do this together -- if service providers are stepping up to the plate and providing lowest-cost pricing for schools and libraries, then we shouldn't see much over-build, but we don't rule that out.

But two last little bits to this: the reason it's not just encouraging infrastructure to schools and libraries, but to communities is for the special construction charges. Of course if you're the service provider and you're providing lit service, you bid a special construction charge and you build your network the way you're going to build it. Like if I'm building to your school, I'm probably going to put excess capacity in the ground. With an IRU, I'm going to put in whatever capacity, whether it's 144 or 48, and I'm going to IRU you the strands that you've asked for. But on a self-construct, and this is really probably -- don't limit it to really rural -- but I'd love to

talk to the man from the tribe, where it makes sense to do a self-construction project out to a school or a library, our cost allocation rules will allow the builder, meaning the winning bidder who is building for the school, to lay excess capacity at incremental cost, meaning the basic build is E-rate funded, but they can put in excess capacity at incremental cost, so now you're not just bringing capacity to the school or library, you're bringing capacity to a community that's never had it before. And I can tell you, that is huge.

Final thing, and I know I've gone over my three minutes, we also in the modernization order stated that if states will invest in infrastructure, so if it's a school or library and they're seeking special construction funding, whether it's to get a service provider services, dark fiber IRU or build their own fiber -- and anybody who's interested, I can point you to -- there are lots of rules and lots of comparisons; you have to make sure it's the most cost effective, do a total cost-of-ownership comparison.

I can see y'all already going to sleep when I started talking about that, so I won't talk about that now. But we will match dollar-for-dollar state funding up to an additional 10%. So if you are an 80% school or library and the state pays for 10% of your special construction, and we match that up to 10%, you now have special construction that didn't cost your school or library anything. That's huge.

I'll be here all day; I'll answer any questions I can; I can point you -- the best place to go is www.usac.org; they're our administrator -- but we're very excited to be here, and I'm very excited to have some conversations to see what projects may be bubbling up in your area. We've had several come in from this part of the country, but we're very excited to see schools and libraries really get the opportunity to bring infrastructure not just for their kids, but for their whole community, and we are very excited to be a part of that.

JEAN RICE: Thank you, Dana. I know it was over three minutes, but it's a lot of modernization to talk about. I have to say, I'm particularly excited about the infrastructure builds and the ability for communities to leverage the connectivity because the main street's awfully close to a lot of school systems.

DANA SHAFFER: Yeah, I do want to point out, schools cannot resale because there's a whole prohibition about taking E-rate funded services and getting something, but the builder can put in excess capacity and communities and counties can look at that as a way to bring in fiber to their communities.

JEAN RICE: Very good. Okay, our next panelist is Steve Blum; he's the President of Tellus Venture Associates -- it's a management planning and business development consultancy -- who has worked for a number of California cities like Santa Cruz, Salinas, Berkley and Oakland, close by here. He has a 30-year history in the industry and was one of the people who was involved in the launch of DirecTV. So, Steve?

STEVE BLUM: Thanks. I work with a lot of these programs, and I think at one point, all of these different programs on a regular basis, and I just had a few thoughts about how they all work together or don't as the case may be.

One point I'd like to make is that public subsidies provide the greatest benefit when you can use those public subsidies to leverage private investment. We heard this morning, one of the panelists said $160 billion in private investment and telecommunications infrastructure. That's two or three orders of magnitude more than the public spending in the same period for the same type of infrastructure. So if you can use public assets, money and other assets, to leverage private investment, you're going to get much further ahead.

The City of Ontario you just heard from is a good example of that, where you can take

the city's ability to direct growth and plan for growth and set standards for a city, and use it not just to improve the infrastructure in new development, which is a major issue, but also to provide an incentive to incumbents to upgrade. And what you see is, you see incumbent money where they're spending money on landline upgrades flowing towards competitive projects, often entrepeneured by cities.

A good example of leveraging private money is up in San Leandro, just across the Bay here. The city had a conduit that it owned, used it for its traffic signal network. A local entrepreneur put in $3 million, built an 11-mile fiber ring through the commercial and industrial areas of the city; the city came back with an economic development administration grant, about $2 million, put in another eight miles of conduit; the entrepreneur came back in, put more millions of dollars into putting more fiber into it, and now San Leandro is the poster child in the East Bay, and I think throughout California, for having municipal fiber network that was -- it is a private network, but it is also controlled to a certain degree by the city; it was built and it's being provisioned in a way that meets the city's public policy objectives.

So again, you can use those public funds to leverage private investment if you're doing it in a cooperative basis.

Second point, and this is something that it's already been talked about today, but I want to give my own personal outlook on it: public subsidies, public broadband subsidies are largely siloed. I mean, I see that on a working basis every day. Now, it's fine if you're the guy at the bottom of the silo and somebody's dropping money on you, or you're up at the top doing the dropping. You don't see the silos there, but if you're up at the top level at a city or a county, trying to coordinate things, trying to bring competition into your market, or just get upgrades done, the fact that there's very specific programs for very specific purposes that aren't being

coordinated is a huge barrier to getting things done.

I can give an example of down in Anza, in Riverside County, there are two grants pending now, well, if you call it connective here; I consider the Connect America Fund a grant, but however you want to characterize that, but subsidies. So the Connect America Fund is going to give several million dollars to Frontier, assuming the merger goes through, to upgrade service there to the 10 megabits down, one megabit up level. Anza Electric Cooperative has a draft resolution now that will be going before the California Public Utilities Commission, again for a few million dollars, to build a fiber to the home network there that meets the California Advanced Services Fund's benchmark of six down, 1.5 up -- it'll do a lot better than that -- but you've got two mutually exclusive programs there that are going to be overlapping, building out infrastructure in that area.

One project is going to be building modern infrastructure that'll be future-proofed for generations; the other is going to basically do a marginal upgrade on copper plant. We don't need both of those projects there; you should take the money from the copper plant and put it elsewhere in California where there's greater need.

Another example: City of Richmond, again, across the Bay and just up to the north. City's put in infrastructure for its own internal use; they've got the CalNet program to work with; they've got city budget to work with, and they've built out some infrastructure. The school district has used E-rate funding, and California Teleconnect Fund to build out infrastructure to the schools, but guess what? Those two networks don't touch other; they don't coordinate with each other. And then the Public Housing Agency, a separate agency, comes along and they want to light up public housing projects using California Advanced Services Fund's grant, and they can't do it because nobody at the school district asked whether or not this network should be

designed in an intelligent way; nobody at the city did; nobody at the Public Housing Agency even thought about it until they saw this grant program come up.

So you see, you have these uncoordinated programs driven by people with very specific needs and objectives that aren't being run in a way that meets the overall goals of the community.

Third point I'd like to make is that when you do this, middle mile should be the priority, and Michael Ort [phonetic] was just up here from Praxis Networks; that is an excellent example of how things work well when everybody works together.

So Digital 395 was built with money from the federal stimulus program and the California Advanced Services Fund; Suddenlink, the incumbent cable company on the eastern side of the Sierra, came in and literally hooked up to the network, threw a switch, and increased the capacity for all their customers by a factor of 10, no additional cost.

Frontier, you heard, is working with Digital 395 to upgrade. Part of that is driven, I mean, there's a good business case for it, and I'll give Frontier absolute credit for working well with the California Advanced Services Fund program, but that's also partly driven by their regulatory proceeding right now to take over Verizon's systems, and there's going to be a requirement -- assuming everything holds -- there will be a requirement in that permission that the CPUC grants that says that Frontier must work with California Advanced Services-funded middle mile projects and other projects similar; the Kirby project you just heard about; that's another example of projects that Frontier will be working with. But again, they're using, in this case, the CPUC is using the authority it has in a way that is trying to get people to work together, and where that happens, it's great.

You've got a lot of different programs on the eastern side of the Sierra: schools, libraries,

hospitals, public safety agencies, government agencies; those are all slowly but surely coming online, and you're starting to see the public money that's being spent on broadband; it is being used in a way now that can buy 10, 100, 1,000 times as much capacity as they had before, just by the fact that that middle mile infrastructure is there.

So I just say, just kind of my basic points here are is that private capital works, middle mile works, and intelligent management of public subsidies work.

JEAN RICE: Thank you very much, and that's a great summary. I have to say that we've seen with BTOP just huge benefits from partnerships like that, and through the planning that the state broadband initiative did through BTOP, as well as kind of the local follow-ons to that; we've also seen that kind of benefit of a community vision where you take advantage of what's available.

All right, our next speaker is Robert Wullenjohn, who is the Manager of the California Public Utilities Commission's Broadband Policy and Analysis Branch in the Communications Divisions. He's been involved in telecommunications policy for 25 years, and the issues are everything from market abuse to strategies to remove barriers to competition -- where have we heard that before -- and all kinds of reports on what the market share is, and he currently is looking also -- he's taken over the mapping component, and that is a critical element to his program.

ROBERT WULLENJOHN: Thank you. I have capable staff who actually work on the mapping program, and it is a very technical piece of work.

But I oversee the California Advanced Services Fund and the broadband mapping programs which identify where broadband is and is not available in California. But I'm going to first give a brief overview of the California Advanced Services Fund, also known as the CASF.

The goal of the CASF is to provide advanced services, that is broadband, to 98% of California households. The CASF has three sub-programs. First, the infrastructure program provides grants and loans for broadband facilities deployment. The grant is technology-neutral, and can fund wired or wireless facilities.

Second, the public housing program provides grants for on-premise broadband network facilities such as inside wire or Wi-Fi to publicly-funded housing agencies. For public housing already having facilities, the program may fund adoption programs.

And third, the consortia program provides grants to regional groups for needs assessment and adoption, and these groups that we fund represent most of the counties within the State of California.

We have already funded 51 infrastructure projects, nearly 100 public housing projects, and 17 consortia groups, and we are still accepting applications for these programs.

The infrastructure program has approximately $150 million available; however, the 18 pending projects under review vying for these funds already exceed that amount, though there is no guarantee they will be successful. Nevertheless, I encourage further project submissions, and applications can be filed at any time.

The public housing program has 22 million remaining in funds, and the next round of applications are due in January.

The consortia program has $5 million remaining in funds, and again, the next round of applications are due in January.

So there's further information about these programs in detail available at the CPUC communications division website. I encourage you to take a look at that to find out details about how to apply for these programs, but I'm here to help answer any questions that you have about

our programs and the mapping efforts that we do. Thank you.

JEAN RICE: Thank you. We had a little question for you actually from the first panel, which is: is the mapping program still being funded, and my question to you is: how do you use it to inform your decisions and how do potential recipients use it to inform theirs?

ROBERT WULLENJOHN: Good question. The program, which was originally funded by an SBI grant and really enabled the Commission to develop the expertise on mapping, and I think it's pretty mature now. Now this program is largely funded by the California Advanced Services Fund because we use that information to expose where availability of broadband exists and where it does not. Because the California Advanced Services Fund does consider the availability of not wire line, but wireless, be it fixed or mobile, as counting towards broadband. We must make an assessment also of the mobile services and fixed wireless.

So how we use it, you know, I could just kind of give you a little insight into some of our findings from our mapping analysis program.

So we've determined that there's a broadband divide between urban and rural areas in California. Only 75% of households in rural areas have broadband at available speeds of six megabytes down and one and a half megabytes upstream compared to 98% availability in urban areas. So there truly is a divide, we've determined.

We find that mobile broadband availability is very limited when we apply a reliability standard to our mobile testing protocol; thus, service quality and not just speed testing is important.

And three, we must be careful to avoid indicating that broadband is available in an area when it is not available to 100% of households. In those cases, an area should remain CASF-eligible to provide service to those without.

So we use our maps as a tool, and we hope that we accurately indicate eligibility for someone to submit a grant. A provider who is challenging that they actually service within a census block that was indicated by the applicant as a project area of interest; a service provider that's existing can challenge that application, and we will carve out those households which are served from those that are without.

But we like to rely not on false-positives of broadband existing in an area, but I would rather overstate a false-negative in order to allow projects to be brought forward so that we can analyze accurately where availability is.

JEAN RICE: I think you've taken reliability to the next level.

ROBERT WULLENJOHN: We are attempting to, and it's very interesting because if you look at a wireless availability map, it leaves you with the presumption that throughout California, wireless broadband or mobile broadband is available. When we apply a reliability standard to that, we find out that most of California has mobile broadband availability at less than serve speeds; in other words, it's less than six megabytes down, one and a half megabytes up.

STEVE BLUM: If I could just jump in real quick.

JEAN RICE: Sure, absolutely.

STEVE BLUM: The broadband map that the California Public Utilities Commission publishes on the web is the single most valuable tool for broadband development in the state, period. You can go on that map and find out who's serving what areas, what's available via fixed wireless, mobile wireless and wire line; you can find out a lot about the technology; you can find out a lot about the demographics. It's a hugely valuable tool.

The PUC, also via the California Advanced Services Fund, funds regional consortia that -

- and my home consortia is one of them -- some of the consortia have taken that data and even extended it further and drilled down deeper into the analysis. And it's all publicly available; you can download the raw data and do your own analysis, and it is incredibly valuable. It's a resource that I think we're lucky to have in California.

ROBERT WULLENJOHN: And thanks to Michael Morris who's in the audience, and he's available also to answer questions about that program.

JEAN RICE: Thanks for that great addition. Okay, I want to turn next to Chris, last but not least. Christopher Mitchell is the Director of Community Broadband Networks Initiative with the Institute for Local Self Reliance. In that he has written reports on many community broadband initiatives in great detail, and I think it has been very informative for those who are trying to learn what can be done to look at those.

He also keeps track of -- and you can catch it on the website with the muninetworks.org, the map of over 450 such community broadband networks.

In addition, he serves as the Policy Director of Next Century Cities, and the Senior Adviser for the Coalition for Local Internet Choice.

CHRISTOPHER MITCHELL: Thank you. For those who have attended the broadband communities series of events, you may have seen the panel that Doug and I do at every one of them, and in it, the running gag is that he has the longest title in the history of man for his job title, and so I was a little surprised to see I actually win that contest here today.

We spend a lot in the weeds really trying to figure out how communities are doing what they're doing, and so I was trying to think about what might be valuable to speak about today, and I think one of the observations that we've made is that the communities that have really moved forward, even in challenging funding environments, have done so because they have a

tremendous will to do so.

There's a number of communities that want to do something, and when they find that funding's not available in the first one or two mechanisms that they look at, they get disheartened and they turn to other priorities because there's no lack of priorities for local governments.

But some communities keep digging, and they dig and they dig and they dig, and it's fascinating to see some of these that go five or six years and they identify ways of moving forward. And I want to make the point that it's not to blame those who have not found a financial path for building the networks that they won because there's some communities for whom the challenges are too great, but the majority of the cases that I see where a community doesn't move forward, I would put it as a lack of political will, as opposed to a lack of opportunity.

And I'll just note one: EC Fiber in Vermont, which wanted to get a BTOP award in Vermont and was not selected as being among the top, and they decided to move forward with a different model where they actually sold shares. And so some of those who were looking to be connected by them bought shares, $2,500 per share -- it was actually an investment; it pays over 15 years' dividends that work out to five or 6%, should the project succeeded. A fair amount of risk for the early investors. They are now serving about 1,200 customers -- we did an interview with them today that's available on our website -- and they've raised over $8 million. At first, the state didn't really want to work with them, but they proved that there was demand, and that they had a method of doing it, and that they were competent, and now the state includes them and does dark fiber drops in some of the projects that the state was doing to ease their ability to connect people in this part of Vermont.

And so I raise that as an example of someone, a community that really had no options, and dug down to find enough capital -- not to build the project they wanted, but to prove that they could do something, and they unlocked other opportunities along the way.

We're starting to see local improvement districts where communities may build out to the early adopters that are enthusiastic, where a person may say, well, the entire neighborhood will have the option, and some people will say I'll pay $3,000 upfront or maybe attach five or $6,000 to my property taxes over the next 20 years in return for service. If you get enough people, the economics of the project can work out. We're seeing that being contemplated in Ammon, Idaho, and it's already worked to expand internet access in Brigham City in Utah. There's other places that have been working on it as well.

The last point I think I wanted to make, in hopes that we have some time for discussion still, is that when you're looking at partnerships and where you get your funding from, you have to be careful to some extent to make sure that it still fits with your vision. And it's really important, I think, to define a good vision of what you want your project to achieve.

If you're trying to bring broadband, high-quality access to local entrepreneurs and business districts, that requires a different strategy and a different approach, and potentially different funding than if you want to make sure a neighborhood or two have ubiquitous access for even those populations that cannot afford it or may not have the literacy skills to take full advantage of it. And it's important, I think, to look at that when you're looking at partnerships because your partner may have more power than you do to determine where the project goes.

I would point to San Leandro as a network that has been very successful in the vision of bringing connections to businesses, and does not appear to have a path forward when I last spoke with some of the people there involved with it for connecting residents, and I'm sure they're

working on it and that sort of thing, but if you're partnered with someone for whom that's not a priority, it can be a pretty big challenge to try and move forward with other aspects of your larger vision.

So I'm going to raise that as a caution. I think public-private partnerships can be terrific, but I also think their benefits are significantly overstated by people who recognize that in the current political environment, it's much more popular to just go with a public-private partnership than a municipal approach or other kinds of approaches because we tend to be more distrustful of government approaches, and public-private partnership has this ring to it that people just seem to think, well, that's not controversial; let's just do that. And I think there's some hidden risks that people don't always appreciate with that model.

JEAN RICE: I think that's great. I would mention that NTIA does have a public-private partnerships handout that you can get on our website which goes through kind of what do you think about and some models, but I think you're absolutely right; it's kind of like you have to make sure the vision stays intact.

I know though that you have looked at other funding mechanisms like potential tax, crowd sourcing, things like that, that people have used, do you want to just mention?

CHRISTOPHER MITCHELL: Sure. There is crowd sourcing that's being done. COS does well at these conferences; they're often represented. It's a company out of Sweden. There's Crowd Fiber out of Atlanta. And I think these are smart organizing tools. I worry about our ability to connect everyone. For me, universal access is tremendously important, and I think that the crowd funding model can move us in that direction, but it could also inadvertently move us against that direction because fundamentally, when you have a network that's just building out to areas of demand, you might not be building that network in a way that will be able to

connect everyone; that might be technically or that might be financially.

I think of this in terms of healthcare systems because people are so familiar with that from the years of debate over it. You don't build a healthcare system by saying we're going to cover healthy people, and then we'll figure out how to cover people that are a little bit ill, and then sooner or later, there'll be a business model for covering only people with terminal cancer. That's not flattering when you apply it to rural areas, but the truth is, is that if you're going to try to build a network to connect a rural area and you can marry that with more populated areas, you're going to have a more successful business plan that does not require ongoing subsidization.

The last item that I brought up that I wanted to mention was a project that I think has tremendous benefits for the rural models, and that's R.S. Fiber in Minnesota, where I'm from, St. Paul. And R.S. Fiber is rural farm country; it's small; it's very low density, and they're one of those people that they've been working on it for six years, and they just broke ground this year; they have a great model. But they actually created a fiber network, a fiber cooperative, a new cooperative, which is very challenging to do -- nobody wants to loan to a new cooperative, and they recognized that, and so they said, well, we're municipalities as well; we can do an economic development bond, and we can then loan that money to this new cooperative, which is us -- we're loaning money to ourselves; that's going to be seed capital, which will then be taken to private markets and local banks; local banks have an interest in making sure these areas are economically viable, and we're going to raise all the money that we need, knowing that if the project does not work out, we're going to take the hit first; we're going to be the last ones in line to be repaid.

And so in a situation in which the network may let's say not fail catastrophically, it might

just struggle a bit, they may have to raise their taxes a little bit in order to make sure that the network continues to cash flow because they're not getting those repayments from the network, but their reasoning was basically if our taxes go up a few bucks a month, we still have the network that we need, and so we're not as worried about that. Plus the network has introduced price competition in areas that did not have it before, and people that are moving from 80 or $90 a month satellite bills are thrilled to only be paying 40 or $50 a month for much higher-capacity services.

So that was a win-win, and the part of it that is really interesting, that's going to be more broadly applicable, is the Office of the Controller of the Currency, which was not written by a good writer, I'll tell you that. Regulates banks, and they're finding ways to help banks be investors in these kinds of projects or to take equity stakes. It's a really big deal, and it's going to be fleshed out more in coming months and over the next year.

JEAN RICE: Great. Thanks. Let me throw to the rest of you, how important do you think partnerships are to your grantees or people getting reversement funds?

DANA SHAFFER: Well, I think very important, keep in mind, ours is a reimbursement program, so schools have skin in the game, so when people come and say you're going to pay special construction to go way out into the hinterlands, well, don't forget, the school has to come up with their portion of it. And I think it's very important, no one funding source -- and this is what Steve was saying -- can be the end-all/be-all, and people tend to look at these funding sources in a silo, like when you talk about community broadband, you talk about what communities are doing. I want to talk to you afterwards and say yes, but are they bidding on the school projects, and are they utilizing our funding?

So not only are partnerships important, but understanding, I guess, the rules of the road; I

think a lot of reason people stay in the silos is they don't want the headache of having to comply with your rules and my rules, and they kind of vapor lock, as my husband likes to say, they vapor lock and they think, well -- but you can actually look at structuring your project in a way that you don't have to have all of those things converge at the same time; you don't have to marry my funding year with your funding year; you can look at partnerships where you're bidding out to be in my program, but you funded the base project somehow else, or maybe we're doing a joint build and so the portion that's going to -- you know, joint builds, structured projects, public-private partnerships where then they come back later and apply in my program, but they know they're going to try to compete for that money; I think those are all very important. It's important to be holistic, to work together. I think that's the only way that communities particularly very rural, very remote communities, are ever going to be able -- you can't just leverage one funding source. I mean, $3.9 billion is a lot of money, but we have a lot of demand from schools and libraries, so I think it's important that you look at it holistically, not only from funding sources public, but public-private, and have hybrid -- I guess I'd call it the hybrid models.

JEAN RICE: Anyone else on that?

KEITH ADAMS: Well, thank you, Jean. I feel like Ben Carson here. I think I stuck to my three minutes, and now all the time is gone.

JEAN RICE: Take a few.

DANA SHAFFER: Who does that make me? Oh, never mind. Don't answer that.

KEITH ADAMS: Well, I would just say in the program that came to mind when you mentioned the partnerships, it was our distance learning and telemedicine grant program. The secretary will be announcing this year's awardees in a couple weeks here, and that program is

severely oversubscribed. I think we've got about maybe $200 million worth of applications. But that program only provides the equipment, and I think the assemblyman talked about going to a hospital and seeing equipment with dust in the corner because they didn't have the infrastructure. Well, we look at those type of programs to see whether people have the capacity to use those equipments for telestroke, telehealth and telemedicine programs. So it's extremely important in our distance learning and telemedicine grant program.

JEAN RICE: That's great.

STEVE BLUM: I think in the work I do, partnerships are absolutely essential, and I take your point, Christopher, about you can't always count on a private partner doing things the way you want things to be done, but if the city -- or the county or whomever -- but the city is clear enough upfront and structures the deal so that it does meet the public policy objectives that they're trying to achieve, then you will get much further with that than you can by waiting -- and this is a California perspective -- but waiting for the political environment to change so that people are willing to go out and vote to tax themselves additional tax money on themselves in order to do things in the public domain. I mean, that just doesn't happen in California.

So what we have to work with is what we have to work with. San Leandro, the city achieved its objectives; I worked on that project, still am. City achieved the objectives it was trying to achieve.

If you look at the City of San Leandro, there's this big horseshoe of residential area where AT&T and Comcast are providing service that meets most people's needs most days, which means to say people aren't too pissed off usually, but it hasn't reached any type of pain point where they're willing to vote to raise their own taxes.

Then in the middle, you had this industrial area, old Brownfield industrial area, left over

from World War II, where you couldn't even get T1 lines from AT&T anymore, and Comcast would only go if you were willing to write 10 $20,000 checks. So the city as an economic development tool, worked with a local entrepreneur to build out fiber in that area, and is increasing the value of those properties there. So if the city has a focused objective and can write contracts with the private partners, and that's what we did in San Leandro, that provides the city enough leverage to make sure that public policy objectives, well-defined public policy objectives, are met, then you don't have that problem. I mean, it would be a great world if money could just descend on us and we could build out these municipal networks, and I've worked on municipal networks, I think they're great when the will to do it is there. Nine times out of 10, 99 times out of a hundred in this state, it's not there.

JEAN RICE: Okay, and then I've got a couple quick questions with quick answers, please.

CHRISTOPHER MITCHELL: I'll just say that I'm pigeonholed as sort of the municipal guy, and I see tremendous promise in it, but I'm not only recommending municipal approaches.

I will say that the vast majority of communities that have built networks have done it without raising taxes. I missed part of Joy's conversation, the panel, but Joy Wolfe is a tremendous example of what local governments can do in part by thinking holistically with all these different programs.

Most of the communities that have invested in municipal infrastructure have found that it actually lowers pressure on the tax base, which is to say that in the absence of that municipal network, public expenditures would be greater; they would require more money from the tax base; and so I think you'll often hear people saying, oh, the city can't do anything because it doesn't want to raise taxes, or doesn't want to use public funding, and I would say that that's

actually a misunderstanding of the issue of the options that are available to municipalities.

Now just very briefly because I would spend days on this. We are starting to see cities that are saying we're going to raise our taxes because we want to rapidly build open access infrastructure to catalyze private sector investment; we want to build fiber to enable the private sector to do more, and if we try to pay for that by financing it with loans that are going to have to be repaid, well, that business model doesn't work, but if we explicitly subsidize that, if we build fiber networks like we build our roads, and this is explicitly raising taxes, then we can actually have these other outputs that we think will benefit the community far more than the cost of raising the taxes or using that tax money for that purpose.

So it's not for every community, it's not for most communities today probably, but that's in the air.

DANA SHAFFER: Well, I wanted to address that real quickly. E-rate is focused on schools and libraries where statutorily, that's our limitation of funding, but like you said, it's not for every community. There are thousands of Glendale, Oregons out there -- I'm going to tell my Glendale story -- where there's no fiber. There is fiber in that community, there is a ton of fiber, it's all long-haul fiber, and trying to explain to the school superintendent who's also the football coach, who's also the tech director, who probably was also the day I went out there, you know, mowing the grass -- great guy, but to explain to him that you have terabits coming through your town, but you can't touch it.

They're currently spending $7,200 a month on 45 megs of transport-only to get back to their ESD to get internet. By the time you add up everything they're paying for their WAN connection between their schools and their voice, they're spending $135,000 a year, and this is just two little schools. Their portion of that is $13,500 a year, I mean, that's -- when I taught

school, that would have more than paid for my salary; that'll tell you why I went back to do something else. I love teaching, I love teaching, and I can spend a whole day talking about how we don't value our teachers enough, but I won't do that, but I'll do that in the hallway later.

But if we can bring a fiber project into their community, not only can we lower what the school is paying, from 135,000 to a fraction of that, but we can take them from 45 megs of transport out to a gig connection, but we also can hopefully -- it has to be competitively bid -- but get a provider who will come in with excess capacity, and now a community -- and we're not talking about places that are remote; Glendale is two miles off the interstate; it's beautiful, it's lovely; they're paying $7,200 a month for DS3. It just defies --

JEAN RICE: It's too much.

DANA SHAFFER: It's way too much. But for that community, if you've got a big pile of frogs, and I think some communities see this concept of ubiquitous connectivity as a huge pile of frogs and they don't know where to start, and my granddaddy always said if you've got a big pile of frogs to eat, eat the big one first.

And so if you don't know where to start, in a small community like Glendale, you might start by looking at the schools needs and what the funding availability is for the school because then you should be leveraging each funding source for the benefit of your community, and E-rate is just one tool, but hopefully, it will work for Glendale, and there are thousands of Glendale, Oregons all across this country, and you should not have -- having grown up in rural Arkansas -- you should not have to change your lifestyle or move out of your hometown to ensure that your children get the same quality education as every other child in America; you just shouldn't have to do that.

JEAN RICE: One last question from me, which is: one of the things we've seen is that,

with BTOP funding, people were successful; sometimes they'd had pre-planning grants, like NGN had one for economic development and worked with the university, then they started a co-op with two utilities, then they were able to fund it, but now that they have been successful, they're using a lot of other methods to continue and keep going.

So my question to you is: how important is the overall sustainability, and taking it kind of in step so that you build your expertise and your capabilities.

DANA SHAFFER: I can just speak for E-rate, that our cost comparison model requires that there be sustainability. If you're going to get construction funding, you have to compare the total cost of ownership over time, and we don't prescribe what time, but let's say you're looking at a 20-year IRU, and you're looking to buy your own electronics which are now eligible and run it yourself -- some schools do that -- or you're looking to get an IRU and pay someone to light the fiber. You compare that to available lit services cost over time, but it's important that we're not just building the infrastructure, but we're funding the most cost effective solution for the school that will be sustainable over time. So sustainability is very important in the E-rate context.

JEAN RICE: Rob, how about for you?

ROBERT WULLENJOHN: Our programs require that the applicant show that they can cover the variable cost of operating the network and by the fifth year, so hopefully, if they've covered all the capital costs and the skin in the game which they have to cover.

That's one thing about the CASF; it presumes that the applicant has invested either 30 or 40% into it, but there are cases where there has been partnership with RUS, like in Northern California with the Carook Tribe, or even Digital 395 where we leverage $41 million of CASF with 155 of federal monies. In those cases, it's certainly just the ongoing costs of the operations,

what makes it much easier, and that's why I think partnerships are very useful for those marginal projects.

JEAN RICE: Your last quick thoughts on this?

DANA SHAFFER: Robert's program, like ours, requires that the applicant certified that they've got the resources to carry their share, if you will, over time, and we have the same certification requirements. That's important to note though because if you're working with a school or working with an applicant, making sure that they can meet that certification because the provider can't waive it, they have to certify.

JEAN RICE: Chris?

CHRISTOPHER MITCHELL: Sustainability's incredibly important, and I think that's one of the reasons we see a lot of communities that would like to build out to everyone start by going to anchor institutions because they know that those anchor institutions have an incredible need; they know that they'll be there in the future -- five, 10, 50, 100 years; they're probably going to be there in some form -- and so that's one of the reasons we see so many municipal networks start off that way. They get up the learning curve, they get a little better at developing what they want to do, and they move on from there.

And so I think anchor institutions are incredibly important from the perspective of leading to future deployment, and one of the reasons I think it's really important to think holistically is to say, you know, when you look at Scenic [phonetic], Scenic provides an incredibly valuable service for California, but I'm glad that they engage in procurement that allows the communities to do the physical infrastructure, and I think that that's important because you want to keep some of that money and that revenue within the community where it can be reinvested in the ways that I would say Santa Monica has been a real leader.

JEAN RICE: Okay, well, thank you. We've gotten the two-minute warning a bit long ago, so I'm going to have to cut the discussion, but it's a great, great discussion.

I have to say that kind of the power partnerships, the kind of import on sustainability, looking at it holistically in terms of adoption and access and applications, is critical, and I just want to thank my panel, I think they've done a fantastic job. Thank you so much.

[END OF RECORDING]