

IJA Broadband Programs Pre-NOFO Technical Assistance Webinar #1
Moderator: Scott Woods
March 9, 2022

Scott Woods

00:01:48

Good morning and good afternoon everyone, it is my pleasure to be here with you today. My name is Scott Woods and I am the director of the office of minority broadband initiatives here at NTIA's Office of Internet Connectivity and Growth. It is my pleasure to welcome you to our sixth session of the IJA Broadband Programs public virtual listening series and our very first session to provide pre-NOFO technical assistance. Today's session is designed to help prospective applicants and the community understand NTIA IJA broadband grant programs and to assist you as you prepare high quality grant projects and applications. Before we get started, it is my pleasure to introduce Assistant Secretary for NTIA, the honorable Mr. Alan Davidson. Alan.

Alan Davidson

Thank you, Scott and good afternoon everyone from a rainy afternoon here in Washington DC. It is my pleasure to be with you, though, and I'll just start by saying you know, under the bipartisan infrastructure law, the NTIA has been given an extraordinary responsibility and opportunity to connect everyone in America with affordable, reliable and high-speed broadband. In May we plan to issue a notice of funding opportunity – what you'll affectionately hear us call the NOFO. This notice of funding opportunity will officially launch the law's broadband infrastructure program. That's less than 10 weeks away, not that anybody here is counting. So stay tuned for more and I'm glad you're joining us today for this webinar today. Also, this is kicking off a series of webinars that are designed to help state and local governments, community organizations, and broadband advocates everywhere, better understand and prepare for our coming programs.

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Over the next six weeks we will cover topics such as ensuring digital equity, building partnerships, and managing costs. Our discussion today is designed to help you all better understand broadband network engineering and economics. As we've said before, this is an all hands-on deck moment. We need a coordinated whole of government approach if we're going to finally close the digital divide. We have a once in a generation opportunity here to connect everyone in America to reliable high-speed broadband. Our investments will give Americans more power over their own lives. The ability to work where they choose, to study, how they want to live in the place that they love, and it will give everyone in America a better opportunity to thrive in the digital economy. Thank you for joining us on this mission, and I look forward to continuing our work together. And back to you Scott.

00:04:59

Scott Woods

Thank you, Assistant Secretary. Really do appreciate you and those welcoming remarks. Before we get started, ladies and gentlemen, let's quickly review some key housekeeping items. If you've been here with us before you know we always go through our housekeeping items. First, I know you all are asking the presentation, along with the transcript and recording of today's session will be available on our broadband USA website by March 16 and you can find that under the events slash past events tab. Second, if at any time, today you experienced technical issues with the zoom platform please use the chat function to send a message to our host and we will address your issues behind the scenes as quickly as possible. And then, finally, we know today we'll take questions at the end of the presentations but will not open up the microphones today so to submit a question, please use the Q & A box function on the zoom webinar module. As with past webinars you may also email questions to broadbandforall@NTIA.gov at any time. So with that said let's go over today's agenda. As Assistant Secretary Davidson mentioned, we are excited to have you join us as we present the basics of broadband engineering and economics.

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And it is my pleasure to introduce to you our speakers for today, Sarah Bleau and Mike Tibodeau. Just briefly on their background. Sarah has over 20 years experience in broadband infrastructure and networks, primarily in the private sector. She served in leadership roles, ranging from sales, engineering, organizational management, and network operations. She's worked with companies such as Arcadian, Viaset, and Level Three. Sarah joined us in early 2021 as a broadband program specialist where she leverages her vast experience as our industry and service provider liaison and she also has served as the team lead for the broadband infrastructure grant program which those awards were recently announced.

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Next, we have Mike Tibodeau. Mike also has extensive private sector experience and has helped organizations with a range of business and strategy development issues, including: data privacy, security network operations, enterprise architecture, and network sustainability. He is a certified information privacy professional manager and technologist and has worked with the International Association of Privacy Professionals, the International Committee for Information Technology Standards, and the Internet Engineering Task Force. Mike recently joined us here at NTIA as a telecommunications policy analyst with the Office of Internet Connectivity and Growth.

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After their respective presentations I will moderate the question and answer session per the instructions previously provided. And I will note, once again, we will not open the microphone for today's session but will accept your questions, via the Q & A function of our zoom platform. And with that let's get started. Please join me in welcoming Sarah Bleau followed by Mike Tibodeau. Sarah over to you.

Sarah Bleau

00:08:42

Thank you Scott. My name is Sarah Bleau and I'm here in the Office of Internet Connectivity and Growth over at NTIA. And today we're going to spend some time talking about the basics of network engineering. For those of you who have built networks before this will probably be very basic information, this is more geared towards an audience. As states or local municipalities or towns look at all of the billions of dollars that are available in the near term to build out new networks what we're trying to do here right now is explain a little bit about the basics like an engineering 101, that you should consider when building a network. Quickly let's go through the agenda for this portion we're going to talk about why engineering matters and we'll talk a little bit about architecture. Some of the elements that you might encounter when you look at infrastructure. A few business models that you will see when you talk to various providers and then finally we've got a screen to kind of share with you the different technologies that you might run into and some of the reliability and the speeds and all that.

00:09:53

All right, let's talk about why network is important in order to deliver ubiquitous broadband across this country to all Americans to the unserved and to the underserved. There are a few important concepts it's important to understand and that would be the network architecture that those items that you need in order to build the foundation of a comprehensive network. There are infrastructure elements that provision or enable the service of Internet. There are different business models available to owners, operators, and ISP and there are several different technologies available. When we think about architecture there's the core Internet backbone, there's middle mile, and last mile. I'm actually going to begin here on the right side of my screen and think about the last mile. When I think about my brother, for example, who lives right outside of Gary Indiana and he's at home on his couch watching Netflix and he wants to watch some comedian because that's what he does. The last mile is that connection from his service provider that goes into his house and also trying to apply this. That would be the \$42.5 billion dollars that we're looking at for BEAD, for example, oftentimes takes a look at the last mile getting to those unserved and underserved households. The middle mile, on the other hand is the piece that goes from Gary Indiana where my brother's ISP has their data

center to Chicago, for example, this is the middle mile. Think of it as kind of like the connector between the last mile getting to where all the Internet really is located, the middle mile. When we think about funding for it there's, for example, the billion dollars that is coming up with the middle mile program. There's also some consideration for middle mile that can be contemplated when looking at the BEAD Program. And the core Internet backbone is probably not something that we're talking about building today if you're if you're listening to this basics 101. You're not building Internet backbone. This would be its generally fiber based submarine cables. These are global networks that connect to what are called peering points around the world and that's where the Netflix comedian show that my brother was watching at his house goes to Gary Indiana then comes to Chicago and goes on the big court Internet backbone and that's where it says hey Netflix servers where are you? And Chicago will ping the Netflix servers and the Netflix servers will send that back to Chicago and then it goes across the middle mile and back to the last mile to my brother's house. This is another way to think of the network architecture. Very often, when you talk about building networks, people will talk about highways and city streets state highways and all that so back to the last mile, these are the local city streets, this is the connection that gets to the household smaller streets residential probably where you're only driving 30 miles an hour. The middle mile is a little bit bigger. It's kind of like the state highway of broadband. And then, finally, the core Internet backbone – these are the interstate highways of broadband. If you could drive across the ocean, for example, but these are the really big six lanes in one way, this is where all the traffic across the globe is really going. Now, after we've talked about the different architectures what you're going to see when you look at bids or proposals to build a network there are the passive infrastructure elements and the active infrastructure elements. And what that really means passive is kind of like more the physical layer of material that's needed in order to build or enable the conductivity. This might be when you're thinking about fixed broadband, this would be the fiber optic cable, the copper, this will be the poles, or the adapters are splitters when you're looking at wireless broadband the passive infrastructure or the towers, the antenna, the buildings. The ground station structures, on the other hand, the active its infrastructure, these are the elements that really make the Internet work, this would be pieces of equipment like routers, switches that actually route, the traffic are amplified from optical to electrical to optical again, these are things that change the medium of the signal strength and examples. Like I said routers switches, servers, and also fiber optic terminals these active infrastructure devices usually are built out inside of your ILA huts if you're building middle mile you're in line amplifier huts and if you're building the middle mile or also in the data center that would be located there, and sometimes even at the household if there's like a Wi-fi router that's required. These business models, I think what's really important especially these days you hear more and more that and you'll read quite a bit that people talk about open

access so that that's primarily what I want to talk about here. Open access means that somebody some infrastructure owner digs the trenches or places the conduit or pulls the fiber they're providing that passive infrastructure and yet the service on top of it is managed by many different service providers, so what you see here there's usually one or more owners. None of these owners of the passive infrastructure are providing the services, because these are on top ISPs that are providing Internet service to households. So, finally, what we have here are a few of the different types of technology as many at least that we could fit on one slide.

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These are different technology types or options that you might encounter read about beginning on the left here with fiber what you'll hear about glass or fiber optic cable. This is a terrestrial broadband, that means that it's usually down on the ground, or maybe aerial. Fiber optic cabling is it can be very, very fast it all depends on the active infrastructure elements that you have lighting the fiber it can be as much as a few megabits per second down speed download and upload and it can be all the way to terabits and terabytes per second download and upload the latency for fiber is typically very low and reliability. It's very reliable, for the most part, although fiber cuts happen there are train derailments that happen there are tractors that might dig into a trench by accident and cut the fiber so except for the case of damage to the buried lines or aerial lines, the reliability for fiber is oftentimes pretty high. We also have hybrid fiber coaxial, which is what that means is back in the day when everybody right a lot of us still do have cable TV there was coax pull to our house and so into the household we have coax. However there's all of our households in a neighborhood with this coax aggregate to a box somewhere, and from that box back out to the middle mile and the corner backbone that's fiber so when you see HFC or hybrid fiber coaxial that's what it means, it is also a terrestrial broadband solution. The speed varies, it can be very fast, it also depends on the distance to the fiber if you live in a very large neighborhood that was built out with lots of coax, it might take a few more blocks to get to the fiber so you probably want to just keep that in mind latency is pretty low and same thing with reliability unless somebody unless there's an accident, the reliability is pretty high and then finally there's also DSL which stands for digital subscriber line that is a little bit slower oftentimes. It depends on the length of the copper that's going into your House how long it's been there, the quality and all that. The latency is also pretty low, like the other terrestrial broadband options and same thing with the reliability it's a high reliability unless there's been some kind of damage to the aerial or buried lines. Moving over here to the right side, we have the wireless broadband technologies that you might run into. There's what's called FWA which stands for fixed wireless access that is oftentimes pretty fast, very fast. It does depend on the spectrum that's being used and how many people are using it, and the environment, where the tower

is located, the latency is pretty low and the reliability, it is it works very well, but sometimes in bad weather or if there's a line of sight obstructed and like above. A new house is being built in front of the tower, then you lose your line of sight and you might not have service. So usually the fixed wireless providers will find a way to work around that and make it work for you. So the next technology that you might encounter when you're looking at wireless broadband would be what's called TV white space TVWS. This is kind of this is newer it's in the earlier stages of deployment so at this point, it seems to be relatively slow and the latency appears to be relatively low, in theory, the reliability is a little bit different from fixed wireless in that it is able to overcome some of the line of sight issues and then we also have LEO's NGOs, the low earth orbit satellites, which are relatively fast they are closer to the earth's orbit than GOs. You can get up to you can get more than 100 megabits per second with the LEOs this would be like when you read about Space-x and some of these other projects just constellations of low earth orbit satellites that are launched and there's maybe like a you know 100 of them just traveling around the world and they're able to provide you with Internet service because it's closer to the earth orbit the latency is relatively low, as far as reliability, this is still a new and evolving technology. It is just getting out of It is out of beta in many cases, but it's difficult to really comment on how reliable, the services. And then, finally, we have GEO satellites, which are much more out there, whereas LEO's are close to the earth orbit and there's a constellation like I said in the travel around the globe together. GEOs are fixed there's one GEO satellite for this particular service, and it is, I think something like 20,000 miles out there. This one GEO satellite an example, might be, there are many people here in the US, who have used service or viasat that service, and those are examples of GEO satellite services and the speed varies it depends on how the GEO satellites that were launched back in the early 2000s are much slower than those that are being launched right now. But the speed, the speed does vary the latency is greater because when you think about latency being a factor of how long the distance to travel to get to the Internet, basically when you think about your at your household with an antenna and you're making the request to watch this comedian on Netflix it goes up 22,000 miles and then back down to the earth 22,000 miles and then it goes across fiber to get to the core Internet backbone, that means there's a great distance travel that the data request travels in order to get to the Internet, which in turn means that the latency is greater on the GEO satellites and the reliability, it might be lower in when there's adverse weather conditions oftentimes there's a really funny. You might if you Google, you can see that in some places wild animals like to keep warm in the winter in the dishes of these on the earth links up links of these satellites because they're built in now, with some heaters in there it's a nice place for kittens to cuddle and keep warm in the winter, when it's snowing if they happen to be outside. But I say all that, because the reliability could be worse in adverse weather and, of course, if a tree grows up and gets in the way of the uplink then there would

be some line of sight obstructions that that might inhibit the service that you're receiving. So I hope that that was helpful for our network engineering 101, and now I would like to hand off to my colleague Mike Thibodeau. Mike.

Mike Tibodeau

00:23:38

Thanks Sarah. My name is Mike Thibodeau. I'm also with the Office of Internet Connectivity and Growth at NTIA. I'm going to talk a little bit about network economics and as Sarah said, as she was covering some of the engineering, this is also going to be more of the 101 level. But we'll go through several of the factors that we want to make sure that you're aware of and us as we go through and plan and engineer design and build these networks. A few of the things that we'll talk about regarding the network economics, are going to be addressing the unserved and underserved areas. And then, some of the costs and revenues that are going to be associated with that we need to plug into our various equations. But also the provider implications and the actually the sustainability of these networks that we want and then a few things for your reference for starting points and considerations as we start this evolution. So we're going to focus more on underserved and underserved areas but don't be fooled by the economics. They are not limited to those areas it is going to apply to all areas. From the unserved areas we're going to be looking at the areas that are currently receiving either no service or services under 25 megabits per second download and three megabits per second upload with underserved areas having less than 100 megabits per second download and 20 megabits per second upload. Really, the underlying piece to all of the network economics and the engineering here is to know your customer. Or, if you prefer, know your constituents or know your subscribers. However, whatever mantra you want to use those are the, these are the types of things that we need to build into our model. So these are some of the challenges that we're going to see, and most of this is from the provider perspective, but again, knowing this and being able to build our models is going to be a lot of the battle.

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So let's start with low population density and perhaps more accurately lower population density, because there will not necessarily be one size fits all and over the past two years, as we've seen people migrate doing a lot more education from home as Sarah was talking about streaming your favorite comedian working from home, etc, the densities, and the demands in this area may have changed. So things that we want to look at it is going to be passings per mile or the number of subscribers that we can have per mile and from that we can derive the cost per homes past, so the overall cost that we're going to be out lane first is basically the population of that area, and this is all going to incorporate into the return on investment or the ROI and we'll talk more about the sustainability of that a little bit later. But as far as more so on the unserved and underserved communities, a lot of times we're going to be looking at rural

and remote locations and these can be much more difficult to provide service to. And a lot of this is basically going to be based upon distances. The more equipment that we're going to need the longer distances that we're going to have to span generally increased our costs, whether it be for construction equipment for some of the network components that Sarah was talking about, and the labor needed to reach that and, as far as the last mile goes. We may have a last mile but how long what's that distance again on the middle mile so that we can actually get to and provide that that transit for the last mile so that we can do all the various things education, work, streaming, and other entertainment as well. And, along with that, sometimes with rural, remote locations is also going to be difficult geographies. Now in this example we have mountainous terrain. But it can be different things, in that it could be just having perhaps to say tunnel or bore through solid granite doesn't necessarily have to be a mountain. It's going to be a lot harder take a lot more time and take a lot more effort to dig through solid rock, then it is going to be through say a sandy or soil or things of that nature and also Sarah had mentioned, you know cross the oceans, well, we may not be crossing an oceans but what if we have to cross a river, or you know some type of body of water or water for going to an island. And you know, have to go through lake or something like that how about actually transporting the equipment to that to that area. Do we airlift it in? Can it be driven in? Does it have to go by boat? All of these things we want to take into consideration, and we can also have difficult geographical constraints, in urban areas as well, because they have very dense areas that we have to disrupt current services or other types of day to day activities that people are doing in order to extend these networks and bring these networks into various communities. So these are some of the challenges and so now as you've heard me talk about some of the costs let's categorize some of those costs. We'll break this down into two simple cost categories capital expenditures and operational expenditures. Very simply let's take a look and say the capital expenditures are going to be the dollars that are going to take to build the network asset and or acquire the assets to build the networks and the operational expenditures are going to be more of the day to day, the ongoing the sustaining costs to run and repair the networks that the use. So generally the capital expenditures are going to be that large upfront costs including: material, land, labor, permitting, etc, and again the equipment to bring in the network assets themselves that construction equipment. If we utilize the transportation analogy that Sarah had before, with the different highways let's think of the capital expenditure in our own lives let's say a car truck or vehicles that you want that capital expenditure is going to be that vehicle, that truck, that sports car, the scooter, whatever it is that you want to own and operate. On the operational expenditures piece again to the network it's going to be the power. Power is going to be a big thing here, especially dependent upon the data centers and locations when it comes to cooling and environmental factors as well, but also ongoing maintenance, transit fees, Internet access, and the

sales and marketing, and all the customer support that goes behind that as we connect subscribers and make sure that their experiences are good. And again back to our transportation analogy with vehicle operational expenditures in this case would be something like the gasoline or oil or even today's and HD electricity that you're going to use to power that vehicle.

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Now, along with costs we're going to have the flip side of that right and it's going to be the revenues. And again from this since we're coming from the service provider perspective let's stay with service revenues and again let's stay with just the two categorization here so we'll have retail revenues and we'll have wholesale revenues. Generally speaking, the retail revenues are going to be to individuals and organizations. And this is going to be in the realm of fees and maybe monthly or maybe yearly or maybe say a multiple year contract, but the key thing that we want to remember here is recurring. We like the recurring the providers like to recurring because it makes our projections on our models, consistent and predictable. And that is very important, so that we can go through and choose among various models and see what the different variables, how the different variables change our models, as we go down that on that path and, generally speaking, the further retail service fees that's going to be in your last mile networks.

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Now, on the wholesale side that's going to be more from provider to provider. Where one provider pays for services from another provider, so that they can carry traffic or have some other type of backhaul but, generally speaking, leasing network capacity from another provide. There may be other fees in there as well, these are typically longer term contracts, but there is usually some type of data, charged with that, and these are more typical to the to the middle mile. Average revenue per user ARPU, which is the average revenue per household activated. Now don't be confused when you see a user versus houseful in theory, there could be more than one user per household there could be more than one household per physical structure, generally speaking, we're talking about the number of subscribers at a particular location. You'll also see a churn rate or maybe just churn, and this is going to be the percentage of subscribers who unsubscribe over time, generally speaking, we want that factor to be relatively low because it costs for us to activate subscribers and it costs for us to deactivate them. And then the take rate the presenters of customers with access to the network we choose to subscribe, we definitely want that to be high. But we don't want that to be too high. We want to make sure that the infrastructure that's behind that as Sarah was describing can support the number of users. So as take rate increases, we want to be sure that we can balance and scale the network to adopt and absorb the customers and the subscriptions. So if we put those costs together and combine that with the

revenues, what do we come up with it's basically it's a sustainability and again from the provider standpoint. We want to make sure that we have an economically sustainable network we're not dismissing sustainability in terms of environmental factors or anything else, but we do want to make sure that, with this network gets deployed and turned on it remains financially viable for decades to come. We're not going to be measuring this in months or years it's going to be multiple decades, so that we can have everybody have access to the greater Internet and the educational, and work, and entertainment, and other opportunities that it's going to provide. So a few things to remember here, especially, in the rural areas cost of middle mile access and maintenance will probably go up. They will definitely be factors in that viability and sustainability. Again make sure that we're taking a look at take rates, making sure that they are predictable and as accurate as they can be as long, with the corresponding average revenue per user. We do want to make sure that there's enough demand for an area and we'll talk about a little bit more on brownfields and greenfields in just a moment and also the time it takes to deploy right there is an opportunity cost here. We could have the absolute best network in the world, but if it's going to take too long for us to build, we cannot get the revenues from that immediately. And perhaps what's just as worse is that people are not going to be able to utilize that and derive the value from the broadband Internet services that can be provided, so we do want to make sure that we balance those needs. And the other things to note as well is regarding resiliency and you can maybe think of this redundancy some resiliency in the network is going to be good. But too much is really going to be can create complexities that make the network harder to operate and it's going to cost us more and potentially harder to fix and when there is a problem. We want the meantime to repair or MTR to be as low as possible. Again if I liken this to transportation analogy let's go back to our vehicle. How many spare tires do you have? It's probably one maybe none, but the odds are of you, having four spare tires are probably pretty low. Because the odds of having four flats at once, are going to be pretty low, but you also have to look at size, weight, power, other items like that the associated costs surrounding that. Do you have the trunk space? Or do you have the space on the on the back or underneath the vehicle to carry those tires? Are you willing to carry the cost of those tires when they're not being used so again we have to make sure that will be balanced, all these different variables, as we go forth and build and operate these networks. And regarding brownfields you may see the you may see this term and basically what we're talking about with brownfields our networks that currently exist. And what we're saying here again from a sustainability perspective is what I would call reuse being able to extend those existing networks, being able to upgrade, or update, those existing networks, we do want to make sure that when we are utilizing existing networks that we do have some consistencies and architectures. Or if we need to change architectures that those architectures can be integrated, because, as we change things that

will again affect that cost. And then, of course, there are the greenfields as well, basically, starting from scratch and deploying from new and sometimes that's easier, but again, the cost, because nothing or very little else existing will generally speaking, be higher. But we don't want to do is we don't want to confuse greenfields with fields and dreams build it and they will come. Again, we want to go back to knowing your customer, knowing your constituent, knowing the area, making sure that we have those variables and those models in place so that we can choose the best model: brownfield, greenfield, for the situation, and you know, maybe a little bit of a twist as well, when it comes to the brownfields don't just think of it as networks per se. Think about it as existing infrastructure, and this is where we can work with other third parties' private entities. They may have rights of way that we can already use. They may have towers, they may have poles. They may have other types of conduits and pathways that are currently existing that we can all work together to help build out these networks in a more economical and efficient manner. So just as a quick summary, these are some starting points and it's not a checklist, but I do think there's certain things that we would want to take a look at again, starting with that know your customer, know your constituent, know their area and answer, why is this area unserved are underserved and some of the variables behind that. What is existing today, as far as infrastructure is concerned, and is there competition in there? How accessible is anything that is existing today if it's very remote or if it's hard to access again that's going to drive our costs. And that, basically, will help us determine the complexity of the build, and so we can have a better idea of what is going to be involved from that economics, but we're going to be paying what we can recapture as the network is upgraded. Of course, in this day and age to, especially over the last few years supply chain don't forget the supply chain. And also, if there's the associated costs, Sarah had mentioned with the last mile do we need to extend or how much do we need to extend the middle mile to make sure that everybody has the access that they need and want. And then, again with leveraging existing infrastructures, the coordination with municipalities state governments third parties, other providers, so that we can have some form of that reuse and make these networks sustainable for the long term. And with that, I think, will go to some questions. And I will turn it back to Scott.

00:41:08

Scott Woods

Thank you Mike and Sarah for that really useful presentation and overview of both the engineering infrastructure side and 101 of broadband economics. The questions are flowing in we're really fast so it's really good I'm glad, everyone is engaging we're going to jump right into the questions and the first one jumps out to me for Sarah. Sarah referencing your initial presentation, you mentioned wild animals and cats warming up and satellite dishes. I was wondering if you could please explain or provide additional context for those remarks in your presentation.

Sarah Bleau

00:41:50

Yeah sure that's a great question. It's not super technical but they basically I was thinking about when for those of you who are familiar with LEO's and GOs and there's particularly Gos there's the rate the antenna on your house basically and in an adverse weather like snow here in Denver, for example, at one time, maybe your satellite service wouldn't work because of the bad weather. These days, there's just so much more technology that's built into making the provisioning lot smarter so they've got different ways that they can keep you in service. But they've also put these heaters into the antenna and it's kind of funny that cats particularly like to keep out of the snow and warm up in these little receivers so thank you for asking about that.

Scott Woods

00:42:42

I thought I'd start off with a real warming question and start. So the next question and we're seeing a lot of questions in both the chat and the Q & A. Where can one go to find out who their local some service providers are, particularly if they're thinking about inquiring about a status of a project or the providers future expansion plans.

Scott Woods

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I thought I'd start off with a real warming question and start. So the next question and we're seeing a lot of questions in both the chat and the Q & A. Where can one go to find out who their local some service providers are, particularly if they're thinking about inquiring about a status of a project or the providers' future expansion plans.

Sarah Bleau

00:43:07

Well, I think that one place where I would go would be on our Broadband USA website, where you can look up under state resources, what we call the state broadband leaders network and there we've got a map and you can select on the state and see who the contacts are for your state broadband office, so I would definitely start there. There's also if you go to broadband now you can type in your zip code or city or something like that, and then it'll identify various ISP us are in that area.

Scott Woods

00:43:41

Thank you. If I could just supplement that too, as well, for those of you to go to our broadband USA website, you can find out if your state is a partner with our National Broadband Availability Map again just to provide some additional information, we know that the IJA or the bipartisan infrastructure law programs will be dependent upon the maps that the FCC will develop but, again, if you want to get a quick hand up on, you know information that's available as Sarah said check out your SBLN, state broadband office and again, particularly if they

are participant with our national broadband availability map, we can help you get local information to help you get started.

00:44:32 Mike I want to come over to you, you had mentioned models several times in your presentation - very insightful presentation. Can you distinguish between the different types of models that you were talking about? I know somewhere project builds and implementation, and some were business models, and operational models. Can you put a little bit more context into the various types of models that you were talking about?

Mike Tibodeau

00:44:57 Scott yeah, thank you for that and most certainly if I wasn't clear so it's actually going to be all of the above right? So there is going to be a lot of modeling on the design phase, because getting back to the know your customer, know your constituent, you definitely want to know the areas that you're going to be serving. So that gets down to the demographics, the topology, population, things like that. Also when getting into the build side it's going to be making sure that the network is scalable assuming that there is going to be success and there's always going to be an increase in that desire for more bandwidth, more interesting applications, as we developed, especially say like in the areas of telehealth so that we can make sure that that is accounted for as well. Then even just when it comes down to say, like the construction, the planning and scheduling. None of this is going to roll out all at once it's going to be tiered, and so we want to make sure that you know we do this in a in a stepwise manner. You know that's logical and that we have the labor for that, we have the components for that, we have everything that we need to do that, to build. Then more so on the business modeling side other things to take a look at you know, is this, how are we going to be attracting investment and how are we showing the value proposition to the customers and to the subscribers. Do we have a sustainable network, you know where the revenues can sustain the ongoing operations? How are we going to market this? You know, especially say in an unserved community or where broadband is not you know day to day, availability and Internet or social marketing scheme may not be the best for that and that's you know, working with community groups working with third parties things of that nature. And then you know, also in that business model like what types of products and services are we going to have? Is it going to be simpler, are we going to have tiered speeds? What are the pricing structures things like that so there's all kinds of variables that we want to make sure that we plug in and so that we have those models and then we can see how the how the various factors influence them, including some of the things we talked about such as take rate, churn, etc, and how we need to adjust to the challenges and demands that surface in the near future.

Scott Woods

00:47:39 Thank you. Very comprehensive answer. Sarah, I'm going to come to you. And Mike I'm going to come to you with the follow up on this one, but we have the advocates for Alaska rural community submitted this question. Does the term wireless technology includes satellite technologies? If yes, then they

suggest that this is clearly outlined in the NOFO because most rural areas cellular and point to point technologies are very limited, at best, but most rural areas could see immediate broadband services by applying satellite middle mile technologies at a minimum, until robust more robust fiber can be laid and constructed. Just a suggestion and a question from the broadband advocates in rural Alaska. So Sarah I'm coming to you with that question, initially, does the term wireless technology include generally include satellite technology.

Sarah Bleau 00:48:37 Yes, that is a great question and the answer is yes, satellite technology is definitely covered in the wireless and a great point too. And we try to be tech agnostic while we work on the NOFOs. But that's a good point to make sure that the definitions fully cover all wireless technologies, thank you for that.

Scott Woods 00:48:56 And then Mike for the follow up we've also seen questions this fixed wireless access again we're staying on this subject also include 5G wireless technology and Michael that's for you.

Mike Tibodeau 00:49:10 Scott yeah thanks, so the very quick answer is yes, and I think we had it was toward the end of Sarah's section, we did have some delineation between terrestrial and wireless and I think for everybody to come up with the model that you feel comfortable with. You know whether it's fixed versus wireless or whether you want to split wireless into you know different types of terrestrial versus non i.e. satellite and of course 5G, 4G other types of wireless would be included in that, including the fixed white space that Sarah had mentioned as well, thank you.

Scott Woods 00:49:56 All right, Sarah I'm going to come back to you for this question again. Can you elaborate if setting up an Internet exchange points will be an allowable activity under either the Middle Mile or the BEAD programs? Specifically if the ISP is set up in a state where service providers have to go to another state for access.

Sarah Bleau 00:50:18 Yeah actually there's it and if it's helpful. I think, also on our broadband USA website we've got this deck that goes over because there was all the legislation, there was the act and it's a little bit hard to follow, so we tried to organize all that content in a way to explain the Middle Mile Grant Program, for example and one of the things that we talked about were all of the eligible uses that are in the statute and so that includes things like interrupts, transport backhaul, connections between data centers and interexchange facilities wired and wireless. As far as crossing state lines and I'm thinking again of the Middle Mile Program. You might have to cross the state line to build a middle mile network so but I would also say that we're refining the notice of funding

Scott Woods opportunity for the middle mile grant program and that will be available in mid May, May 16 I think is target date so we'll have better specifics, for you there but go check out the BroadbandUSA website and look for where we tried to deconstruct the legislation and explain these things a little bit more clearly.

00:51:32 Thank you Mike I'm coming to you for a network economics question, and this is a really good question. Is there a rule of thumb or number right or numbers plural for ppm and CPHP that above which a project is indeed not feasible?

Mike Tibodeau

00:51:52 So I don't know if there is an absolute rule of thumb. A lot of this is going to be location dependent, but from the from the legislation, the intent of this is to provide broadband for all, and so, and given the different geographies, given the different challenges and constraints that we're going to have those numbers will change. But the fact of the matter is this is intended to bring broadband to all of the United States. So there will be understand that there will be different models and there will be different costs to those models, depending upon the area and back to the transportation analogy your mileage may vary.

Scott Woods

00:52:40 Thank you. Sarah over to you. The question or states: I know the legislation, states that there is neutrality in technology, but will NTIA give any sort of preference when scoring for the competitive program.

Sarah Bleau

00:52:56 I think that you'll see that, when we get the NOFO out in the middle of May. I think I would reiterate, though the administration's goal of reliable and affordable Internet to all unserved and underserved Americans but you'll find out more when we release the NOFO. Sorry I can't help more.

Scott Woods

00:53:16 yeah and I would also add too that we have previous webinar material, we talked about sort of the preference priority, both in the BEAD and the middle mile again for 100/20 again serving unserved and underserved locations and what that what that means, by definition, as well as community anchors institutions that lack gigabit connectivity, so you will see that as Sarah said, you see that in our legislative overview. But you will also see the specific details in the notice of funding opportunity that we will be releasing here very soon.

Mike Tibodeau

00:53:54 Mike I want to come back to you, you point out the tension between cost per location and return on investment versus low density or rural build out. How will you or how should you balance these interests? Is it necessarily that it will cost more per location to reach the highest cost or hardest to reach consumers but, again, acknowledging that we don't want to leave them behind? Can you provide additional information or context regarding this question?

00:54:28 Scott, so, if I understand the question correctly, we're stating that there is going to be the different tiers, shall we say, and the cost will indeed vary? Is that correct.

Scott Woods

00:54:40 Yeah I mean the cost I think they said they pointed out to something you said in the presentation that there are some I wouldn't call it tension but, again, we all know that there is a direct correlation between cost per location and return on investments with respect to service provider build out,

particularly in rural and low density areas and I guess the question is: How do we balance that interest? I think, from a grant program perspective, you know we're subsidizing through the grant program the capital costs to build, but the question is, you know, is it necessarily true that it will cost more per location to reach the highest cost hardest to reach areas acknowledging that we don't want to leave again those areas behind in the focus of these programs.

Mike Tibodeau

00:55:29 Is it necessarily true that it's going to be the highest? No not necessarily true, although again taking a look at the overall cost models that may be the way to bet. But when we're looking at that, from the grant perspective, the grant is going to be much heavier on the capital side so it's going to be that initial construction that initial build out. And so what we want to make sure is that we can cover as much of that as possible so that the operational expense, although may still be higher, a little bit higher in the long run we're not constantly trying to add and keep the maintenance of that to where it is manageable so that worst case scenario would be is if something were to be constructed and the op-ex was not well, controlled and not well modeled from the Initially, then we don't have the assets to continue that service. So I would say that the focus there more is going to be make sure that the capital expenditures are taken care of but for the long term, that the operational expenses don't creep up too high in the long run.

Scott Woods

00:56:44 Thank you. Sarah we have a clarifying question for you, it says: Is the entire \$42 billion for the BEAD program dedicated to last mile projects or will there be middle mile architectures that will qualify.

Sarah Bleau

00:57:01 No the 42 and a half, almost 42 and a half billion that is going for BEAD is not 100% supposed to go to last mile it will go to the States and the territories to determine how to reach the unserved and the underserved and but it doesn't have to be necessarily strictly for the last mile.

Scott Woods

00:57:22 And I would also add to that there are also digital equity components, then in the BEAD program as well, and again stay tuned because all of those critical details right those fine points of governing these programs will be contained in the soon to be released notice of funding opportunity, so you will hear that theme a lot right we've done a lot to cover on a level high overviews of both the BEAD, as well as the middle mile, and the tribal, so we have information on our website that provides overview information on those projects but, again, the specifics will be contained in the notices of funding opportunity that will be released here soon. So you will hear that, as a consistent theme throughout the questions in our pre NOFO for technical assistance, if you will, that the, the devil is going to be in the details and the details are coming soon. Alright, so Sarah I want to ask another question to you we're talking about fixed wireless coverage earlier and Mike can chime in here as well. Do you know at what point whether 5G fixed wireless coverage in an area that reliably exceeds 100 by 20 will mean that an area will be considered

served as defined in the Act? And the questioner also as that national operators as we seen from marketing materials, primarily in urban areas are now quickly deploying the 5G and 5G to the home products on mid band spectrum that can cover large swath of areas in areas that would have otherwise been considered unserved are underserved. The follow up question is: Would that determination, be based on the FCC maps and the forthcoming challenge process, so I know that's a lot Sarah but if you can chime in on that, but I appreciate it.

00:59:19 Well, I think that it actually begins with that last statement right that the FCC is there, a fabric location data will come out and there will be challenges to that, but that will actually go, I think that everybody's very happy to hear that location by location, it will be determined where there's adequate Internet service available or where not. So once that comes out and there are other challenges to it, then we'll have a better sense for where the unserved and underserved are located. I think Scott, the other part of that is whether or not 5G is considered fixed wireless and, yes, it actually is considered fixed wireless so if there was a household in this fabric location data that was determined to be unserved 5G would be an option, did I answer that question or Mike do you have anything okay.

Sarah Bleau

Scott Woods

01:00:14 Mike do you want to add anything on that?

Mike Tibodeau

01:00:15 Yeah I think Sarah definitely hit it. We will have to you know rely upon the FCC data maps and I think based upon that question that just shows the rate at which there could be refreshed or whether via challenge process or just as the information comes in, because it will be changing. And as Sarah said by definitively fixed wireless and that, because a lot of legislation, it does name households and it also names businesses so if it is placed upon a structure definitively fixed.

Scott Woods

01:00:52 And Mike question to you, this is the follow up on the so the ROI inference that we had in the previous question, the question is: Are you suggesting that we do an ROI study on low density areas and not build Internet to unserved homes, if the ROI doesn't meet our goals?

Mike Tibodeau

01:01:14 No, I don't think I would be suggesting that. There again the intent of the legislation is to provide broadband Internet connectivity for everyone, and there will be various priorities going to the unserved, then priorities is going to the underserved, and then there will be the remainder so I would say don't ignore something, because of the ROI but definitely know the ROI a business case may be able to be made, but again, that factors of those priorities unserved, underserved, and then the remainder.

Scott Woods

01:01:55 And I'll reiterate, we were not suggesting that you do not build Internet to unserved homes if the ROI doesn't meet our goals, I think we've experienced and have gone through that we've not going through that again so

Sarah Bleau

that's not what we meant to infer and thank you for that that follow up question. I might come back to you yeah.

01:02:14 Scott. Can I ask you a quick question?

Scott Woods

01:02:18 Sure.

Sarah Bleau

01:02:2 Wasn't the part of the plan. Earlier we talked about the IJIA grants the middle mile program the note the webinars that we had done and I believe you referenced that deck is available on our website, the BroadbandUSA, can you confirm that, please. The webinars on middle mile, and the BEAD program, and digital equity?

Scott Woods

01:02:44 Yes, they are, they are available, I think, maybe put those in the chat a link to those they are available on our archive in our past events tab and you can see those previous presentations as part of the public listening sessions that we conducted so if you all recall, we went through five public listening sessions before this session, this is a pre-NOFO technical assistance, but we did an overview of all of the components of the Bipartisan Infrastructure Law and those are available on our website, including the presentations and the transcripts and so folks can access our website get that information and then be prepared for when the NOFO comes out. Alright I'm going to come back to you Mike and then I'll come to you, Sarah with a with a follow up question, but the question here Mike for you are: What are some signs to look for that would indicate low op ex and consequently a higher likelihood of sustainability in areas where revenues are low?

Mike Tibodeau

01:03:53 Scott. Can you repeat that, for me.

Scott Woods

01:03:55 What are some signs to look for that would indicate low op ex right low operational expenditures and consequently a higher likelihood, I think they mean a higher likelihood of a challenge of sustainability in areas where revenues could be or are low? So it's the interplay between low operational costs and a higher likelihood of sustainability in areas where there's low population density which correlate to potentially lower revenues.

Mike Tibodeau

01:04:29 Right yeah and I would say that they it may not be a high correlation as far as the low population and the operational expenditures, it will depend upon a number of factors. Things that that we've seen you know as far as especially in environmental you know what does the topography look like? How is the you know how are things handled. Say if you're using fiber or is it being buried, or is it being through aerial? How much how much operations and maintenance does that have to be through there? If there is, if there is a large need for customer service or for long drives just understand that the truck rolls for that are you know you don't want to have them consistently you want to take care of as much of the operation, as you can in one fell swoop or if you can do something remotely. We can run diagnostics remotely we can do a lot of things

now that may not necessarily require that physical touch. So there's a lot that can be done from the from the operations perspective it's just a matter of again how that was originally designed and then and then how that's rolled out and constructed.

Scott Woods

01:05:45 Thank you, Sarah coming back to you the general question will the IJA funding be available for all of the service options covered this morning in this presentation fiber fixed wireless access, etc?

Sarah Bleau

01:06:00 We are tech agnostic. The goal from the administration is to have all unserved and underserved Americans able to access, affordable and reliable Internet and that's going to take all types of technologies. It'll take all types of collaborations between industries and States and local subdivision so it's going to take out all of the above. Thank you.

Scott Woods

01:06:26 Right.

01:06:28 And the given the follow up question to this Mike. I know we answered this, but I want to ask this question for folks out here who are wondering, because we talked about this another of our presentations, but the question is a statement. It says it seemed like fiber is the fastest, most reliable and future proof technology given those knowns will NTIA encourage fiber builds?

Mike Tibodeau

01:06:54 So I would agree that at the moment fiber is the fastest technology that we know about. The future proofing I think will dependent upon how you how you define that, so I do think there's a greater variation there not considering for speeds if we're looking at say latency wireless would actually be a much lower latency due to the due to the bounce that we have to have within the within the fiber paths themselves, so I do think that's going to be an equation, yet another model as to what is necessarily going to be the best and as Sarah said, we are going to be technology neutral in some places fiber is going to make absolute complete sense if we get back to the one of the questions that was asked before I think it was you know regarding Alaska or, if you have to climb a mountain. Fiber may not may not be the best for you have to look at other alternatives and it's going to be, as I had mentioned the time to deploy. Fiber may be great, but if it's going to take 10 years, then maybe that's maybe that's not going to be our best option.

Scott Woods

01:08:09 And this is a question about, I gather, duplication, I want to ask this again for the edification of the audience. The question is, will funding be available for areas that are currently service or will be serviced by other programs, such as the USDA rural broadband grants which do not allow multiple ISPs to be awarded funds to service the same geographic area? And there will be either Sarah or Mike you want to chime in on that one.

Sarah Bleau

01:08:42 If the question, it sounds like is around duplication of funding. I don't think anybody wants to see funds duplicated to build out that if it was funded

with, for example, what we recently awarded with the Broadband Infrastructure program and RDOF. That is not allowed.

Scott Woods

01:09:18 And I'll take the opportunity here to highlight some of the work of our inter-agency task force. So we are actively, and have been, working with the FCC and USDA. Again, to identify these areas of we've been tasked with that responsibility has been undergoing that with our inner agency task force so again. You can rest assured that again if an area has been designated again there are nuances to this everyone so again the NOFO will have all the details. But please rest assured that part of our responsibility of transparency and implementing these programs is coordination or interagency coordination with other entities, like the FCC and the USDA regarding their funding, historically and recent funding of grant programs so that is a you can find more information about that in our recently released access broadband report talks about our Interagency efforts but also know that we're working with collaboratively with the FCC and USDA to identify those areas so rest assured that we've got that taken care of.

01:10:23 Here is a follow up question to the financial projections Mike that you were talking about and the question is: Will NTIA look for financial projections in the application? As a result of the I guess, they say state NOFOs, but I think they mean as a result of the State plans that move forward per the NOFOs issue by NTIA.

Mike Tibodeau

01:10:49 So I believe that the application formats, have not been completed yet that is a as a general purpose the financials would go more to the to the States to the eligible entities and there will be guidanc, that is provided as far as a pro forma things of that nature, but ultimately I believe in Sarah please keep me honest and correct me if I'm wrong here, the States are going to have the majority of the input with NTIA oversight and again, depending upon the different models and accounting methods based upon different regions, there could be some subtleties in there.

Sarah Bleau

01:11:35 And I think you're right the NOFOs will actually explain what's required and something like a pro forma or audited returns financials all that stuff is really helpful to NTIA to the States to the grants office to determine that the grant money will, that the plan being offered or proposed by an entity, who has experience so that's what we'll see the details in the NOFO, but I think it's safe to say that that's why that kind of information is historically requested.

Scott Woods

01:12:17 Thank you very much, and this seems like an off the wall question but it's not given the status of some of the fires out in the West, but the question is: and this is again for the edification of our general audience. How can we protect middle mile to last mile infrastructure from wildfires? And this came in through the check so Mike if you can take that and then Sarah asked you a follow up.

Mike Tibodeau

01:12:45 Certainly, so from the wildfire or other types of environmental perspective one easy way to is to bury the infrastructure. So if again if it was fiber and you have the choice between aerial and buried in that instance buried is probably better noticing, of course, that burying the fiber unless there's already conduit there will probably cost more, whereas it make ready for burial would probably be a little bit less and perhaps a bit more speedy. But yeah if you were definitely considering the environmental factors make sure wind is another factor that you would want to consider and any types of storms or flooding, especially along the coasts.

Scott Woods

01:13:32 Okay, thank you very much. And similar to similar question to you, Sarah and Mike get you to jump in and this one as well, it says what the RUS applications, the RUS USDA rural utility service program in their applications. A PE is required to sign off on the conceptual design for the application and then again for the detailed design after the award and the question is: Will the NTIA also include these important requirements and protection?

Sarah Bleau

01:14:06 Well, I again I hate to say wait for the NOFO, but I'm going to say wait for the NOFO, but just a reminder that what NTIA will be doing in mid May we'll be issuing the NOFO for the Middle Mile Program the BEAD money, which is the close to 42 and a half billion that program is actually going to be decided by the States and territories there'll be a planning NOFO that goes out from NTIA for the States, but the you know thinking about the PE stamp that would actually come back to the States, when I think it's safe to say.

Scott Woods

01:14:41 Now again folks I agree with Sarah some of these questions we're getting off into the weeds but again I'm asking them. So you can see the types of questions that we're getting and start thinking about some of these and again to make note of some of the questions and issues that will be addressed in the notices of funding opportunity so bear with us, we only have a few minutes left. I'm going to get to you Mike another question. This is a technical question it says: We have seen many fiber to the premise projects that the cost estimates overlook true make-ready calls with overhead deployment calls - pole attachments etc. make ready expenditures and rural areas can add 30 to 50% to the construction calls, will the NTIA require verification that the applicant has engaged the electric utility and I guess that engagement for the true make-ready cost and to be able to document those costs in the project?

Mike Tibodeau

01:15:44 So I'm going to reference Sarah's previous answer, I do think there's going to be much more instructions in the NOFO, but let me add to that as far as verification from say the utility and then something that I brought up with third parties. If we're looking at some of these brownfields or trying to make the best use and best value of the dollar, I would say, it would be encouraging to make sure that the utility companies or other third parties that may have existing infrastructure available be part of the process, the partnerships that can be done here, I think, are going to be have some really interesting combinations

that can really lower the price and it's going to be that combination of the States and the permitting authorities and the owners of these assets working together, maybe we can drive the permitting time and price down. And maybe there's some consistency or more consistency within the various utility corridors for that use. So to answer the original question, I do believe that there will be verifications in there, there will be checks in there but also again going to the to the state level where these partnerships can be can be had, and we can see some really interesting technology solutions come about. Scott, let me know if I answered them.

01:17:18 No, I think you do I think you did again I don't want to sound like a broken record to everyone, but again, you know the notice of funding opportunity will address a lot of this and again we're going to engage in pre NOFO for technical assistance will also engage in pulse NOFO outreach and technical assistance as well. So again, we may not have all of the answers now and that's Okay, but again, we will be here again to provide that technical assistance both to states and to communities, you know as we move further along in these in these processes.

Sarah Bleau

01:17:56 Scott, if I can add to it. Like you said, the technical assistance that we plan to provide is, I hope, if nothing else, facilitates conversations I mean this webinar today on network 101 and economics for building networks 101 is designed to be very basic because there are like thinking about the billions of dollars that are going to be available, that is a daunting task, and there is no such thing as a dumb question or a silly question. There's a lot that can easily be overlooked and it's really going to take all of us so that's why we're going to put a lot of effort into doing more of these webinars and reaching out and doing technical assistance and helping to make sure that the full comprehensive solution is in place and I'll get off my soapbox, but I feel very passionate about that. It's good to collaborate and talk and ask questions. Because we're all coming from different places and it's hard to get to that same language, so thank you.

Scott Woods

01:18:57 Absolutely, thank you. I'm asking another question that I already know the answer to, but I think it'll help the public here, the question is: Has NTIA considered one of the major challenges or barriers to providing broadband infrastructure to rural areas, particularly which are surrounded by federal and or public lands? Right securing permits and easements can be a daunting task and near impossible, especially traversing through national forest, tribal lands, etc. Can or has NTIA worked to identify public land owners and the Federal Government and start to provide fast track approach towards providing permits, easements right away, is etc. so that this does not impede broadband infrastructure deployment? Thank you. Yes, that's an excellent question, so I mentioned before, if you go to our website, as part of our previous sort of you know, intergovernmental Interagency activity we also work to address a lot of the federal permitting and land access issues, so if you go to our broadband USA

site, you will see a section on I believe it's federal permitting where we've worked with other federal government agencies that own federal lands to streamline again exactly those processes for providers and others to get access to public lands specifically you know for the deployment of broadband infrastructure, so if you go to our site, you can see all of those agencies that are Federal Land owners that have rights of way and provide easement and access, you can see what we've done to streamline those processes and again encourage you to review that information as you consider your projects moving forward, so I wanted to both ask and answer that because, again I knew the answer to that question. So we only have time for just a few more questions, and I know the questions are coming in really fast and I'm not going to be able to get to all of them. But again, you know we're seeing questions Mike and Sarah regarding you know how much revenue was enough for a company to decide, you know, to undertake a project, you know, is there a general percentage or formula that a company should utilize? Mike I want to give that when you this is a very general and I get I want to add to for the most of the grant programs, you know the grant money is providing a significant amount of capital costs to build right there is a matching requirement, but again Mike and Sarah you can chime in on this one regarding how much revenue was enough for a company to decide to undertake a project.

01:21:49 Scott thanks. I do think I'm going to get back to the one size does not even going to fit it's not going to fit all and it's definitely not going to fit many. It will vary it's going to vary based upon the population density, it's going to be based upon the state, there are different tax structures, there are going to be different pricing models. At the end of the day, I guess the stress that I'm going to have is that the operations expense needs to be reasonable and sustainable. Would a business want to you know undertake this. Some areas may say you know 3% profit, just to be a have an arbitrary amount would work, and if you don't have to have a lot of ongoing challenges or build outs that's probably fine in other areas that may need to be it may need to be higher, but the fact of the matter is if operational expenditures are above the revenue take, then that will be an issue and we need to take a look at other considerations.

Mike Tibodeau

Scott Woods

01:22:57 Sarah. I want to ask you this question given not just what you presented today, but just your background and the question is, we only have two more questions people and then we'll wrap it up, so thank you for joining us today. But the final two questions, Sarah I'm going to ask you this one can you cover and address the open access model, a little more. Can a local government or utility use IJJA funds to expand their fiber infrastructure and then possibly lease it out an RFP process, I guess, for you know community or local access and they wrap it up as I guess, I want to know how an entity would seek funding under this particular open access model?

Sarah Bleau

01:23:41 Yeah I think I'm going to have to be careful on that yes, I mean theoretically like it when you look at open access there, there are examples

here in the US, there are many examples, particularly in Europe. When you look at examples of them it is something like that, with like Sweden they are the network digger for lack of better terms. And then there's a whole bunch of ISP providing the service to the households and so that's what open access means to me, and you know it's going to vary state by state if the municipality is able to do something like that, but that's exactly it. It's the idea that somebody like a municipality or anybody else actually digs the holes trenches or pulls the conduit and the fiber through it and then Sarah Bleau ISP A sells service to 10 houses and Mikes ISP B sell services to another set of households and Scott was is the third ISP we're all providing service over sometimes it's just different service plans and all over the same common infrastructure so I'm not sure how well I answered your question, I think that part of it will do, but yeah that's what I think of when I think of open access.

Scott Woods

01:25:06 I encourage folks to continue to engage us, you know we're in their sort of the weeds now and some of the questions, but we do appreciate your time, the final question here today for the panelists I'm going to ask is, according to the bipartisan infrastructure law, the IIJA, the legislation states, that states are required you know by the letter of the law contained in the in the legislation to coordinate with regional organizations or regional councils on planning the aspects of the BEAD program, the question is: Has NTIA decided what this coordination will look like, or what NTIA will require from states, but in regard to this outreach and coordination for the NOFO or for the BEAD program? I'm going to ask that and I include local coordination, a part of that question as well, so I'm going to end on that one. Sarah and Michael to give you an opportunity to weigh in on this question, and then we will, close out.

Mike Tibodeau

01:26:11 So, as far as I don't think there's going to be dictation on the regional organization and councils, but there are organizations that are out there now, I think and Sarah had mentioned them before the state broadband piece, there have been listening sessions and summits with them. I think, several I don't even I don't even know what the number is many of the States have set up broadband offices and I think that's been encouraged as well and there's going for so that the various states can connect to other regional organizations within that domain. Sarah had mentioned before the, the question that we had had you know, on the various municipalities and again getting back to this third part it may be public partnerships, maybe it's public private partnerships. But there are a lot of organizations with a with a lot of infrastructure and assets that can play in here and it's Sarah mentioned before it's a lot of cooperation it's going to be a lot of digging in. Literally and figuratively, a lot of digging in so that we can make this happen.

Scott Woods

01:27:22 Thank you, Sarah, do you want to chime in on that one.

Sarah Bleau

Sarah Bleau

I think Mike just give the best answer of the whole show.

01:27:27 Absolutely.

Scott Woods

01:27:29 Absolutely, I want to thank you Mike and Sarah, thank you for your time today I received a lot of comments for thanking you for really informative session and a good job and I want to echo that on behalf of other participants, thank you for joining us today, thank you for the attendees for joining us. Again we plan to do this, several more times and we'll close out here and thank you for joining us so Carol if we can go to the next slide and again want to offer our sincere thank you to Mike and Sarah and Assistant Secretary Davidson for joining us today so as we close out here again, you can always ask additional questions about the bipartisan infrastructure law or the IJA broadband programs or, if you want to provide additional feedback, please feel free to email us at broadbandforall@NTIA.gov and then we have upcoming additional public virtual listening sessions or pre NOFO technical assistance, as we now have shifted into assisting you prepare for the NOFO so March 23 is our next one April 6, April 27, and May 11, and again for more information about these upcoming sessions and to register, please visit the site [here](#) the website, you can register at the events latest events tab and you can register for our zoom webinars so again on behalf of NTIA the office of Internet connectivity and growth. Assistant Secretary Davidson, Mike Tibodeau, and Sarah Bleau, I want to thank you all for joining us today, and we will see you again on March 23, 2022 Thank you very much, everyone and enjoy the rest of your day.