NWX-DOC-NTIA-OTIA

Moderator: Don Williams
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Coordinator: Good afternoon and thank you all for holding. At this time I would like to remind all parties that your lines will be placed on a listen-only mode throughout the presentation of today's conference. This call is also being recorded. If you have any objections, you may disconnect at this time. I will now turn the call over to Mr. Don Williams. Sir, you may begin.

Don Williams: Thank you. Good afternoon and thank you for joining us today for BroadbandUSA's monthly webinar on broadband topics and issues of interest to the public. I'm Don Williams, Senior Specialist for Broadband Development Infrastructure with NTIA's Broadband USA program.

Well we have a great webinar today, "Broadband's Role in Revitalizing Main Street". We're going to be focusing on how some communities are creating partnerships with local businesses, health organizations, schools and art groups to solve broadband connectivity's challenges.

These innovative partnerships will leverage intricate existing assets to build new opportunities. Today we're going to hear about case studies of models

that are working to successfully connect main street in underserved areas of our country.

We have a great group of presenters today. First, we have Michael Burns, Senior Advisor to the Regional Administrator, EPA Region 4 and he is also the CUPP Program Manager. In addition, we have two presenters that are going to be presenting jointly, Mona El Khafif, Associate Professor, UVA School of Architecture.

She's also the Co-Director of the MainStreet21 and Tho Nguyen, co-director of MainStreet21, Senior Research Program Officer, University of Virginia and we also have Fletcher Kittredge, Chief Executive Officer of GWI. Before we begin, I'd like to review the logistics of today's webinar.

First we'll open-up the webinar for questions after the completion of all presentations. As you hear from each presenter, please use the question box on the right-hand side of the screen to submit your questions for comments.

Second, the presentation along with the transcript and audio recording of today's session will be available on the BroadbandUSA website within seven days of this webinar under the events past and present tab.

Finally please visit our BroadbandUSA website for information about our technical assistance program including useful guides, toolkits, publications and other information that can assist you with planning, funding and implementing your broadband project.

Well, our first speaker is Michael Burns. Now Michael is an engineer by trade earning his BS degree from the United States Naval Academy in Annapolis, Maryland. He spent eight years as an engineer on three different

ships traveling through East Asia, the South Pacific and Europe during his time in the Navy.

After spending several years with small private companies, Mr. Burns returned to the federal government as a Supervisor of Safety Engineers and Gas-Free Engineer at the Philadelphia Navy Shipyard. He's also been the Director of Regional Public Works at Ft. Dix and Executive Director of the Navy Region in the Southeast.

Mr. Burns is currently the National Program Manager for the College Underserved Community Partnership Program which engages colleges and universities to provide free technical assistance to underserved communities, and I've also had the pleasure of working with Mr. Burns on just such a program. I would like to now turn it over to Michael. Michael, thanks for being here.

Michael Burns: Thank you, Don. I really appreciate the opportunity to speak to everyone and thank you everyone for participating in the call so next slide, please so briefly for background the College Underserved Community Partnership Program was created to provide technical assistance to poor communities based on the issues that those communities identified.

We don't tell communities what we're going to give them. We ask them what they need help with and we reach out to our partners to engage them to provide that assistance. We made a decision early that we believe colleges and universities were a huge untapped resource and we've partnered with colleges and universities to provide the technical assistance that these communities need in the various areas that we need it.

So the way the program works is that we identify communities that need help in a variety of ways. Sometimes they come through us, internal agencies, sometimes our colleges will tell us, nonprofit organizations or a lot of times we'll even be e-mailed. They will call or asked to have representation to work with these particular communities.

We identify the issues that the community says they need assistance with and then we go to a local university and ask them what they can assist the communities to do, what assists that they can provide to the community.

So one of the important factors is the CUPP program is a voluntary program. Colleges are participating in this and they're not charging the communities for the assistance nor are they being paid additional funding by the government to do this so when the colleges agree to provide that support, we know that it provides experiential learning opportunities to their students.

It gives them a chance to submit their education into their minds. It gives them something to put on their resume when they graduate so they can get the job they want, not the job that they need and also in most cases it's a capstone of practicum project so they're getting academic credit for the work.

So the university will select the particular things they would want to work on to assist the community. We bring the two of them together. We make sure that the project is identified, that their role is identified and we ask the college to begin to provide that assistance so the benefits are kind of obvious.

I mean, these poor communities are getting technical assistance at no cost to themselves. College students are getting that critical experience to put on their resume to help them get a job. More importantly we the federal government get the opportunity to partner with these colleges and expand the

assistance that's provided without expanding our staff because we then provide technical assistance to the colleges as it's requested. Slide, please.

So we talk about the slides - next slide, please - so our program began in 2016 with four colleges that we were partnering with to work with. Currently we've got 73 colleges and 55 communities helping 55 communities in 20 different states.

We've done over 150 projects, helped over three million people and we've been able for every dollar the government spends on administering this program, we're able to put roughly $10.1 in direct value back into the communities based on the work that's being done.

Along the way we've picked-up some additional partners. We've got nationwide agreements with Department of Interior, USDA and Department of Energy. Department of Education has agreed to collaborate with us on a nationwide basis with the federal work-study program.

They have allowed the use of 100% of federal work study program funds to provide stipends to students - poor college students - who participate in a program which allows them to contribute where otherwise they might not have the opportunity.

We've also got nonprofit partners who also have assisted with programs to be an engineering core or some people know it as Engineers Without Borders and also the American Geophysics Union's Thriving Earth Exchange. So slide, please. Don alluded to one particular opportunity we've had to work together and that was the broadband initiative.

At a conference in Warner Robins, Georgia as we were discussing with BroadbandUSA of the work that they do with communities, we'd begun to realize that while they have done incredible work trying to help people, they don't have nearly the staffing that they need to be able to reach the entire need that exists across the country, particularly when we know access to broadband is the biggest issue in rural America from coast to coast.

So, we decided that we would do a train-the-trainer concept and talk about having BroadbandUSA actually teach colleges how to develop these broadband plans for poor communities.

So instead of them having to worry to go to each community each time they teach a college, one college can do two, two can do four, four can do eight, eight can do 16 and eventually we have all these additional broadband plans that are being developed without NTIA having to actually go and develop each individual plan. Slide, please.

So under this collaboration we decided to do a pilot program in the University of West Alabama where they agreed to work on two cities, Livingston, Alabama and York, Alabama and they have actually BroadbandUSA actually was there, and completed the training at the university a couple of weeks ago and the university has worked in earnest to put together that plan but to make sure they include things like business development, education and health impact at the same time.

So those two to get a great multi-disciplined exercise to work on because there's four different academic areas involved and they'll become partners one-step plan is developed with those two cities to help execute funding that supports the development of broadband in those communities. So and they'll also help additional schools too. So it's a great collaboration.

We are grateful to NTIA to agree to develop this pilot and we've got several schools that have agreed to participate moving forward so very excited about the possibilities to this. Slide, please.

That's a picture of all of us in Livingston, Alabama at the University of West Alabama. That was at the beginning before we all spent 2-1/2 intense days going through the training but the school has been a tremendous player and partner in this and we're really grateful for their agreement to participate at the pilot school. Slide, please.

So the CUPP program does lots and lots of projects, again we don't tell communities what we need. We ask them where they need help and we provide that assistance. So we've done a number of things. On this slide on the left its students were putting together an alternate transportation plan, the Summit of Montgomery Trail appeared in the middle of that trail.

You're 47 miles from the supermarket, 53 miles from a hospital. This plan will provide transportation and will get there not only faster but relatively inexpensively. The right side was a food garden, the students on their own initiative built in Florida to address a food desert issue. Slide.

Here's a picture from students from Georgia State University. You know, this was right after the cybersecurity issue in the City of Atlanta. The City of East Point was concerned about their cybersecurity status.

The students not only came and took a look at some of their issues and developed recommendations but they actually developed a cybersecurity training program for all the city employees that was so well done it's being adopted by cities across the State of Georgia. Slide.

On the left side were students from Georgia Tech University that we had an issue in Selma, Alabama where the river was potentially eroding the structural supports of the Edmond Pettus Bridge. Those students came and did a 177-page feasibility study tackling the problem that the city was able to use as part of their contribution to an 80/20 program with the Corps of Engineers which allowed the Corps of Engineers to activate their 80% because they recognize that feasibility study is the 20% and now that project is actually being done.

And on the right side were students from Savannah State designing a city hall for a mayor that was not only designed by them but green and efficient to the point where they competed and won a CBDD grant to actually get that thing constructed. Slide.

On the right hand there was in a section of Alabama where there was high unemployment, Tuskegee University came in and said let's put this vacant land to use, did a pilot agricultural project and then subsequently worked with unemployed youth and seniors to make them small farmers and participate in a co-op that Tuskegee helped develop.

And on the right side, the University of North Carolina Wilmington is actually working with a city not only to help design natural resource projects but to teach them why those projects work were important. Slide.

Last picture is students from Clemson University. That was our four school collaboration. There were sewage issues in that part of Alabama where residents were dealing with things like ringworm and other things that people in this country haven't dealt with for decades but they were dealing with it today.

So there's a four school collaboration to come up with solutions and one of the solutions that the students designed was so good that the State of Alabama's putting together a pilot project in partnership with USDA that if that pilot is successful, they'll export that across the Black Belt so great project and with actually four schools that collaborate on it. Slide.

So, we're very proud of the collaboration with NTIA and BroadbandUSA, and I look forward to answering your questions at the end. Thank you.

Don Williams: Thank you, Michael. We appreciate that. As a reminder, we will have time for questions at the end of the session and remember please use the question box on the right-hand side of your screen to submit questions or comments at any time.

Well, we're very excited. We've got two great speakers coming up for a joint presentation and I want to tell you a little bit about them. They're doing some very interesting and creative work. I think the initial speaker's going to be Dr. Tho Nguyen who's a Computer Scientist at the University of Virginia.

He manages the ACCORD Advanced Cyber Instrument Program which provides access to secured research computing resources to researchers across the State of Virginia. Tho is currently a Senior Research Program Officer in the Department of Computer Science where he's primarily responsible for project and program development in cyber and physical systems and software/hardware systems research.

Tho's past work focused on sensing, modeling and application of controls for large scale environmental systems. His current research interest are extensive and they include secured cyberinfrastructure for data collaborations, extending cyber physical systems theory and technologies to mitigate the impact of

disruptions to interdependent systems and that being to make them more resilient.

We also have Dr. Mona El Khafif who is an Associate Professor at UVA School of Architecture where she serves as the Director of Urban Design Certificate and co-directs UVA's smart environments as well as the MainStreet21 program which engages underserved rural communities with digital technologies.

She received her Doctoral degree in urban design from TU in Vienna, Austria and she's a co-author of Urban Build: Local, Global and also the author of Staged Urbanism. Her design research operates at multiple scales examining interdisciplinary aspects of urban regeneration, temporary urbanism, urban prototyping and strategies for the smart city.

Listen, thank you both for being here so much. We look forward to your presentations. Take it away.

Tho Nguyen: Thank you so much Don and good afternoon, everyone. This is Tho Nguyen. I'm going to start the presentation and then I'll hand if off to my colleague Dr. Mona El Khafif and then I'll be back to wrap it up at the end.

So I'm here to talk about MainStreet21 which is the project that we have for policy and tech developments for division of 21st Century Main Street in Virginia. It is funded by the National Science Foundation. Next slide, please.

The goal of this project is to establish communities that Don mentioned our interest is to work with underserved communities. In fact, we are thrilled to be on this webinar because we define rural communities not by location but by connectedness. I'll use an example.

You'll notice in Virginia, you know, it's located in Charlottesville which technically is a mainly rural region of Virginia. However, in the Charlottesville within the city and the surrounding area is very well-connected. We have very wealthy people living in this area, myself excluded from that population, but they're well-connected. They have access to services and resources and so we don't consider this to be one of the priority areas that we work with.

We do, in fact, define connectedness as the communities that we work that we focus-on so underconnectedness, underconnected communities is our goal, and we do this through several approaches. One, we'd establish network of partners, folks that when someone wants to work on a project, they can go to our website and then look for partners and resources that will help them and Mona will go through some of those examples.

Two, we also seed small projects, again seed being key, the small funding to bring folks together and hash out an idea to the point of putting in a proposal; and three, we directly engage with communities, hold multiple workshops every year to get their input and identify areas where we could work on that would benefit both the community and our research community.

And four, we put out every year a playbook essentially as you all probably recognize at this point there is no single recipe to advance a community. The best we could do really is to identify successful projects and present them to folks to see if there are any lessons that could be transferred.

Next slide, please. So as we mentioned our approach is to be polycentric. What that means is that we wanted to work with communities to help them become a vibrant community in and of themselves. We are not looking, for

example, to help a small community building some structures so that the folks that live there could commute or telework to a larger urban area next to them.

We want that small community to be attractive, to bring in investments, to retain its workforce and so we focus on fundamental issue and what we consider fundamental are essentially the identity and the culture in that community.

We want to make that community attractive so that folks in addition to jobs want to relocate their families and live there and then Mona will give an example of that really quickly. I do want to point out our website which is mainstreet21.org. Here, we attempt to provide practical value to the folks that we serve.

If you are interested in this space, you can go there and you can look at products such as these wonderful cartographies that Mona's going to talk about that we put together and you can download and use them in your work to the extent that it's helpful to them, just go to the website and download our playbook and/or get in touch with us.

So please visit our website and see how it could work for you. With that I'm going to hand it over to Mona to talk about some of the work that we have going on.

Mona El Khafif: Yes, hello, everyone. Thank you Don for inviting us to join this webinar today. I am excited to present some of our work so I want to maybe continue, next slide, please, with the set or cartographies that Tho mentioned. When we started working, it was really critical to us if we understood the region that we are dealing with.

The project is Virginia bound and the first thing that we looked at, where do we have broadband Internet and is this actually solving the problem of the communities, I mean, our belief that this is a very important infrastructure but we have on also call out a couple of things that we discovered. For example, Albemarle is a small African or formally from an African-American community just 20 minutes out of Charlottesville.

They have broadband Internet. It was a school that they needed to shut down because of shrinking enrollments and what the community really understood at the end of the day is that the school was for a lot of families the only access to broadband Internet where parents were bringing their kids to the parking lot in the evening so that they could access the Wi-Fi Internet to do homework.

So by shutting-down the school and thank God the community stepped-in and now they continued as a community center. We also understand that secure access is not necessarily given depending on the income status, for example, of the families who are living in these areas. Next slide, please.

Virginia did a great effort to expand the broadband coverage specifically between 2005 and 2006. What you see here are the cartographies from year 2017. We are primarily working a lot with projects that are taking advantage of cellphone coverage because some of the projects are apps-based so this is more important to us and this coverage is much more completed already in the area.

Exceptions are obviously certainly countryside where you have a lot of topography where coverage is hard to access. But you can also see on the other smaller cartographies on the right-hand side, that coverage is one part. You have to look at where a community is shrinking. Why are they shrinking? What is the problem that these communities are facing? And a lot

of these communities are along the southwest area where a lot of the former industries of the 19th Century are shutting down. Next slide, please. And lastly we obviously looked at where are these shrinking economies.

You can see that Virginia primarily grows its economies in the urban centers but also around Roanoke and Charlottesville area but the more interesting thing is for us to look at what are the next industries that might tap into it and everyone who visited Virginia knows that it's an extremely scenic and very beautiful state and a lot of these natural resources and cultural resources are assets that we are to try to tap in on our projects. Next slide.

So this is the overall strategy that we developed in our first year of the grant. Based on our very best pilot project which is the UVA Telehealth program, we were looking at and we see the cartography on the left-hand side, the cover of the MainStreet21 booklet, this is the access to healthcare based on hospital and you see a lot of dark areas in Virginia because there are no hospitals nor health centers and the telehealth program is for us founded by Karen Reuben and is now 20 years in the making.

Very successful, expanded on the telecommunication and broadband Internet access to allow telemedical services to areas that don't have access to hospitals and this was basically our model. We then looked at some interdisciplinary collaboration by the Architecture School of Telehealth, Engineering and Weldon Cooper Center, we expanded this model, had to look at okay, what are the other areas we have to invest in? Health, education, culture, transportation and economy. Our approach was to really look at these cartographies and to see where are the target areas of our disconnected communities and how can we establish prototypes that are then up for replication because the idea is not that you are developing a solution for one community but it needs to be replicable. Next slide, please.

One example for replication is CCUS, a project that I'm working on with my colleague Andrew Mondschein, Zihao Zhang and Eric Field. It's an app-based community engagement tool that measures difference of environmental data.

The live data that is coming from our street live infrastructure on the one hand side with the scientific data and then the possibility for the community to participate to post because illumination of streets and neighborhoods in the night is not only a scientific it can be measured through subjective and objective data.

We established this originally for Charlottesville because Charlottesville was reworking its night vision standards, night vision standards but we now open it also up for other communities to use as the code can be very quickly replicated and the tools that we developed for this one and we are currently running it in Waynesboro which a community on the other side of the Blue Ridge that is also working on their light standard. Next slide, please.

The game that I want to talk about today primarily is We Are Martinsville. It's a game that was developed under the Telehealth program in Martinsville, a community that is shrinking but had its really important days during the '60s, '70s, etcetera, because of the furniture manufacturing industry, has amazing assets and nevertheless there is maybe a loss of identity.

We developed this game based on an app and players can on the one hand side be outside an exercise they can learn about their community and they can contribute very valuable datasets for their communities to rethink and re-strategize on the future of Martinsville. Next slide, please.

Next slide, please. These are our game fields. The pilot project is developed for the uptown area which is the historic city center that has an incredible historic fabric that is based on the legacy of the city and you can see on the left-hand side that the places that we are identity, they're basically a part of the site narrative that are a part of the game strategy. Next slide, please.

The game has multiple game layers that as I said like a kind of tourist guide so people who are signed-up are going to be out in the uptown area and every time and they get close to a point of interest, a game count is flying into the screen and this game count will allow the players to learn about the site and to go through a questionnaire and to answer questions and they can get points for being outside and also to answer the question correctly. Next slide, please.

We launched it and tested it and received wonderful feedback from the Girls and Boys Clubs in Martinsville which was really uplifting and super fun to do in the summer. We are now starting the general launch and are planning to do this in December.

What is fascinating about the project it is on the one-hand side a game but it is also a place-making strategy that's now brought a lot of stakeholders of the community together starting from the planning department, the YMCA, the Natural History Museum, the Piedmont Gallery, the schools, the planning director of the specifically the Department for Tourism and Economic Development.

The city just developed its new strategic plan to revitalize uptown so all of this comes together and we are also piggybacking the game on top of events that are taking place in the community so that the game can on the one-hand side strengthen local initiatives but also simultaneously can have the critical data that the city needs in order to move forward with a new vision plan.

Next slide, please. And I know that this slide takes a little bit longer as it's a heavy graphic so what you will see on the next slide is basically the data flow diagram and the data processing diagram that we developed.

There were a lot of community engagement projects that we initiated working together with the police department, the teachers, etcetera, everyone gave feedback and the beautiful thing is the game becomes a vehicle and everyone jumps on the vehicle. It strengthens the community.

It strengthens the identity and to really embed this in the incredible assets of the community and that Martinsville has to offer. What you see at the bottom is a little timeline as I said we are trying to piggyback the project on top of events that are taking place in Martinsville.

For example and I find it extremely beautiful, the city is initiating the 25 gift project where they are promoting local businesses who are selling Christmas gifts instead of ordering them maybe from Amazon and players are going to be asked to go to these sites to document these gifts to maybe call-out other gifts so it is really trying to strengthen what the city is already starting to contribute to its larger community.

And at the end of the day, you see that on the upper diagram it's really very important. We will select a lot of data. On the one-hand side, data that are related to points of interest which is a game count but people were players would also be asked to contribute in form of photos that they are uploading and these photos are going to be places they like and places that they don't like so much which will help to generate mental maps of Martinsville and which will be very crucial for the development of future vision plans.

And we developed this kind of processing aspect so the data that will be generated through the game will also be analyzed and handed to the community to move forward. Next slide, please.

Tho Nguyen: So this is so we're out of time so just really quickly as you can see we really do focus and we try to be creative for example using these games to communicate with communities and get their input to help communities, we revitalize by building their own identity and culture.

So, we are always looking for new partners. We're asking communities to scale this to so please don't hesitate to get in touch with us, either myself or Mona and we're happy to have conversations to follow up on this. That will be all. Thank you, everyone and we are looking forward to your questions later.

Don Williams: Thank you both very much. Those are fascinating projects and I know I've got some questions to ask and I'm sure the audience does as well. Our final speaker is Fletcher Kittredge. I've known Fletcher for quite a number of years and Fletcher's an entrepreneur. In 1994 after moving back to Maine from Cambridge, Massachusetts, he founded the Maine-based Internet service provider GWI, Great Works Internet.

In the last 25 years, GWI has transitioned from a dial-up to cable, DSL broadband, ultimately to Gigabyte fiber ISP. Currently, GWI provides service in all 16 Maine counties via its fiber optic network to both residential and business customers. GWI is a telephone company as well as an ISP and partners with a growing list of Maine communities to build and operate fiber networks.

In 2009 GWI was a recipient of the federal three-ringed binder program grant from BTOP and Fletcher was the grant's principal investigator. Three-ring binder was an 1100-mile high fiber strand count fiber optic network. It spans Maine in the form of three connector rings.

In 2004 Fletcher was named Maine's Biz Magazine which next list of Maine business leaders changing the state's economy for the better. In 2011 Maine Biz named Fletcher Maine's large business leader of the year. Fletcher, I look forward to your presentation as a provider to round-out our group here today. Take it away, Fletcher.

Fletcher Kittredge: Next slide, please. So, I think this is Don covered this slide in his presentation already. The only thing I'd point out is I've gotten a lot of experience from being on the board of Valley Net which is a really interesting nonprofit which built and operates a fiber network providing universal service to 24 rural Vermont towns. Next slide, please.

So we've worked with many communities in many different types of partnerships. Sometimes we own the network, sometimes the city owns the network. Sometimes we build it and operate it. Sometimes we just operate it but there are two in particular that I want to point out because I think there's a really important theme.

Broadband infrastructure is a tool and like most tools in and of itself it's not really useful for anything except for what you can do with the tool. It's not an end it in and of itself. The most important thing that a community or anyone setting-out to build infrastructure can do is figure out what is the goals, what are the problems that need to be solved?

And then match the network to the problems rather than come up with what happens too frequently is we've got this neat technology, let's put it out there and we build it and they will come and that's not always the case and there's something that I hope resonates with people.

An example of this, if you go to a poor community and you build a broadband network and you don't do two other things, you don't also at the same time worry about digital inclusion and digital literacy. Digital inclusion is making sure that people in communities can afford the network and can afford the equipment to attach the network via a computer or tablet or whatever.

And if they haven't been taught how to use the network, then the network has no use and we've seen places where that's happened and people just don't use it, even though it's there. So Town of Islesboro, it's an island community three miles off the coast of Maine. It's got about you know, between 500 and 600 year round residents, 270 total households, 161 families.

It's got a big summer community so there's far more premises but most of those are summer people and the problem that Islesboro has is the year round population has been shrinking, particularly as school-aged families and if you lose - this has happened again and again in Maine - is if an island loses its school-aged population, eventually the school closes.

The schools are the core of any rural community and once your school's gone, you lose your year round population eventually they all die out and new ones don't come in and you end up with just an island that's a summer community and the quality of life is a lot less. So both the summer people and the year round residents wanted to maintain that.

And a major problem the town knew it had is it didn't have broadband and they identified this as the number one thing they could do to attract the vital school-aged families, attract and retain them. Next slide, please.

So what the island decided to do is to build their own broadband network on this island off the coast of Maine and it was an interesting process. We got involved in it in the beginning. They put out an RFI and GWI was selected to do that.

We batted around several models. One GWI owning the network with the town and it was decided that for this town which they had problems, they had one advantage which is they had a quite significant tax base for property taxes because some of the island homes were summer homes were quite expensive.

And they decided the best way to do it is to float bonds and use property taxes to fund the bonds, not revenue bonds and they did that and we worked with them as they constructed the network and operate it today and it was turned up last year and the penetration rate has been phenomenal.

It's up probably over 90% at this point. Next slide, please. So 90% of the island has gigabit access and back to the digital inclusion point, one reason that so many people are using it and it really is universal service is the town made the decision to not charge much for the service and for those who could not afford even the low price, they subsidize.

So everybody in the town basically can afford it and so six new families in the last year have moved to the island as year round residents and that may not sound like a lot; but if you remember that there's 161 year round families as a whole, that makes a huge difference.

And it means that they will have a sense the school's going to stay viable and they're going to be able to continue to attract people who can move to the island and know that they will not be isolated and there are job opportunities for them through telecommuting.

The town is very satisfied with the island, the network, the residents are. One of the reasons is because there's a very direct link to their satisfaction and how the network operator gets paid. We just for this talk surveyed 50 residents. Next slide, please.

And this is what you see and I would like to point-out these might seem like they're not important but that if you've ever lived on a island, the two at the bottom that stand out social interaction and shopping are really big deals.

Shopping on an island is always a huge challenge and a lot of time is spent just figuring out how to get what you need; and social interaction, even though the communities tend to be very tight-knit, you can end up feeling isolated and this is an important outlet for people to know that they can interact with the outside world without having to go on a ferry ride. Next slide, please.

And this is what the perception of how it increases the quality of life and if you notice up there at the top, highly rated is attraction of new families so it's really made a big difference to that community and solved their fundamental goal which was literally existential if the community was going to survive.

Okay, next slide. Okay, for the City of South Portland, this is another community and their particular problem that they started with was the city the incumbent cable provider very significantly raised the price of the intermunicipal building network.

And they decided that they could go-out and lease dark fiber and operate their intermunicipal network themselves and save money. After a few years, it really would pay off so trading a large upfront cost for very low rates going forward and they put out an RFP for dark fiber and we won the RFP.

I think partly because we said look, we'll build this fiber network for you. We're basically going to do it at cost and the way we expect to make money is we're going to operate an open-access network that will also connect-up home and businesses along the way and we started doing that.

And we built it for the city, the first section in 2014 and at least once a year since then because both GWI and the city are very happy with the network, we've figured out how to extend it and at this point we have a pretty good path.

We have built about 10 miles which isn't very much but if you look at the way it's laid out, it spans the city and forms the backbone that the rest of the city can be served off of and we have good reason to believe that within the next few years, we'll be able to extend it to serve most or all of the city. Next slide, please.

So, the number 1 goal or the extensible first goal was to lower municipal costs. They also were able to come up with a smart traffic system which is traffic in their corridor was a real issue and a key anchor institution Southern Maine Community College was also connected and competition was introduced.

There really have been essentially one provider in the city and adding us as a second provider has sharpened everybody's pencil and resulted in lower prices

and better service all around and we have a path now for connecting the entire city. Next slide, please so thank you very much and back to you, Don.

Don Williams: Well, thank you, Fletcher. We appreciate that and I know NTIA has worked with a number of Maine islands and those are very difficult places to serve and perhaps so the right that sometimes it's an existential question to have enough population to continue infrastructure and school institutions.

Well, listen. I have some questions and I guess one of the first questions we have, remember type your questions into the question box. Well one answer to some of the questions is currently up on the screen which is the slides and transcript and an audio recording will be posted on BroadbandUSA website within seven days of the webinar and I will tell you, we our website continues to get better and better.

And I hope you can all visit that whenever you need advice and information on broadband. Well, Michael, one of the questions I got here is are there any schools in the State of Minnesota that are involved with the CUPP program?

Michael Burns: There are not. We have schools actually we're working with Michigan State University and we're having conversations with the University of Michigan but we have not had the good opportunity to work with the State of Minnesota. So if you're interested, I think my contact information is on the slides. Please let us know. We are endeavoring to continue to expand across the country.

Don Williams: Okay, great. Mona and Tho, we have a question as well for you which is, you know, the place-based projects such as CCUS and WAM, they're very specific to, you know, a particular location. How do you think about scaling those efforts to other communities? How do you go about, you know, putting-

in the important factors that need to be in place that support that kind of replication?

Mona El Khafif: Yes, thank you, that's a really great question so I think in the CCUS case it's quite easy and it's based on a Google Map platform and you can create a LAN for any community in Virginia or beyond and it's more about the data collection. As I said it consisted out of two data categories, one was the scientific data which was a live data and the environmental data that we collected like sound, etcetera.

This needs to be collected for this new specific place but the other data was crowdsourced data that comes from the community so obviously the data place bound and therefore quite specific but they're created by multiple outsource and this also now comes back to the WAM game. The WAM game for example the points of interest are very place-bound.

But we developed the app in a way that the back matter is very easy to handle and also open for every administrator so the community can create their own game cards and our goal is that the code is replicable for any other site and we need to build work on a kind of manual, what the different steps are to bring community together and to create this game as a community through multiple stakeholders.

I think this is the component of the place-making element that actually engages multiple stakeholders in the community, but while this sounds like work, the experience in Martinsville is a lot of fun and communities really like to engage in this kind of fun. So it's replicable through the code but for sure the specifics of the site has to be often generated by the community that is applying this kind of game.

Don Williams: Okay, thank you. Fletcher, I think this might be a good question for you. You mentioned broadband affordability and you mentioned digital inclusion, and one of the members of our audience wants you to speak a little bit more if you can about broadband affordability and particularly in rural communities that do not have affordable broadband.

And you know, one of the issues for me is when you think about networks that have to be sustainable and, of course, that means they have to make money and sometimes in rural areas it's difficult to put that together with affordability. So I'm wondering if you could talk about that?

Fletcher Kittredge: It is an absolute huge topic, very important. I would one of the things about that is if a network is not affordable, your take rate or penetration rate or whatever you want to call it goes down so you have fewer people using it and the costs are spread over fewer people which means more people.

And I, Don, I disagree with you. In rural areas and in other areas, I think that there networks aren't necessarily going to be profitable and there's going to be some level of subsidy. There has been for networks since the dawn of time in the U.S. We've always subsidized our various networks be it the highway network, the power network in rural areas, railroads and all that.

They've all been subsidized and today we heavily subsidize our communications networks to the tune of billions of dollars a year. It's just the subsidies are not efficient and I think there's a widespread recognition that the kind of thing you can say is not efficient and sometimes they're downright well, let's say they're not efficient.

The money does not go to the right places. So governments have always stepped in and I think they need to; and I also think I'm a frugal Yankee and

you've got to really keep an eye on your costs and only spend money on things that really have the value. So to comment on this, it's got to be and you can't you know, the government has always been involved in education.

Digital literacy is vital. If people have not been trained and educated in how to use the network to receive the public benefits, be it distance learning or telehealth or the job opportunities and all those sorts of things, the value isn't there and extreme value can be built by doing the education. So like I said, it's a huge topic, sorry to run-on, but there are entire organization's dedicated to this, and we can spend hours on it.

Don Williams: Well, Fletcher, indeed we could spend hours on it and we have talked about this and we'll spend more time talking about it as we go through to things. Mona too, a question here. It's the MainStreet map fiber deployment. Do you also map 4G coverage and they'd like to hear a little bit of your thoughts on 5G deployment.

Tho Nguyen: I mean, the map, yes. The second map that I showed is actually 4G as an e-coverage.

Don Williams: Okay.

Tho Nguyen: And go ahead.

Don Williams: and also they wanted a little bit of information on how you two are thinking about 5G deployment.

Tho Nguyen: Well, certainly, as we as technology advances, it will afford us with better connectivity and so we're very much looking forward to it, but you know, to

be honest when it comes to working in these communities, we actually don't rely on the technology that much.

We, in short, we're not prioritizing or waiting around for the 5G technology to get here. We are working with the community and we think that the coverage that is available now is adequate for what we're working with.

Mona El Khafif: Yes, and I would also agree I think it was Fletcher who said that, you know, all of these are just tools and at the end of the day it depends on what you are doing with them. These cartographies that I showed in the beginning were primarily status for us to understand where is high-speed Internet, where are the strength in communities, can we see relationships between these datasets?

Where is cellphone and 4G coverage because for our apps we need the 4G coverage and then this becomes basically our environment where we can utilize technology to actually look at what is more important out of our perspective which is about bringing community members together, helping them to get the right data and to find a new vision for their place.

Don Williams: Thank you. Mike a question for you is concerning the CUPP program and the question is can colleges or universities are they able to assist in closing the homework gap in the rural communities that surround those colleges and universities?

Michael Burns: Sure, you know, assistance is assistance. We focus on supplementing technical assistance to give poor communities the opportunity to go after the resources that would help make a difference but human resources are probably the most important resource of all.

So, if colleges were interested in doing tutorial programs or educational programs to supplement support for kids to get help with homework, that would be a great project and we would love to do that. We haven't had opportunities to do many of those but we do have a great collaboration with the Department of Education and I'm sure that would also be one that they would be interested in partnering with us also.

Don Williams: Okay. I think probably our final question and I believe this one is for Fletcher and others can certainly chime in, one of the issues raised is in what senses can a provider of a fiber based network add wireless to areas that are simply not dense enough to support a fiber run?

Fletcher Kittredge: That's a very interesting question so fiber and wireless are tightly bound, intrinsically linked. In modern wireless networks, the base station is always that by fiber so that the farther out you drive fiber, the better the wireless can be and 5G for example requires a massive amount of fiber because there are many, many, many more small-cell base stations.

So as from an engineering standpoint, what you want to do is one step is to come up with your potential tower locations or in the modern day I guess it would just be cell site locations which might be on something other than tower and then take that as kind of one layer.

And then start playing around with potential fiber routes which hit your community anchor institutions and then see if you can hit population centers at the same time and you want a network that solves multiple purposes but you're going to need fiber at least to your cell sites to build a wireless network.

Don Williams: Well Fletcher, I completely agree with you and I'm afraid our webinar time is up. I wanted to announce that I hope everybody can join us on November 20th at 2:00 pm Eastern Standard Time for next webinar. The topic is "Building Digital Workforce Skills at the Local Level".

But I want to thank again all of our speakers today and all the attendees for joining. As a reminder, presentations and transcripts and audio will be available within seven days. Finally, BroadbandUSA is available for technical assistance to help expand broadband connectivity and promote digital inclusion and broadband adoption.

I will tell you that our program there is quite excellent, of course I'm a part of that program; so, of course, I will say it but it's true. For more information, please e-mail us at broadbandusa@ntia.gov or visit our Website for more information. Thanks again to everybody and have a wonderful afternoon and go Nationals. Thanks.

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