

THE BROOKINGS INSTITUTION

BROADBAND OPPORTUNITY: BOOSTING UPTAKE IN AMERICA'S CITIES  
AND METROPOLITAN AREAS

Washington, D.C.  
Thursday, December 10, 2015

**PARTICIPANTS:**

**Welcome:**

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Chief Executive Officer and Executive Director  
National League of Cities

**Opening Remarks:**

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Fellow, Metropolitan Policy Program  
The Brookings Institution

**Moderated Conversation:**

ROBERT PUENTES, Moderator  
Senior Fellow and Director of Metropolitan Infrastructure Initiative  
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THE HONORABLE CORY BOOKER (D-NJ)  
United States Senate

**Panel Discussion:**

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## P R O C E E D I N G S

MR. ANTHONY: Good morning. President Nelson Mandela said that education is the most powerful tool you can use to change the world. And if I can paraphrase, broadband access is the most powerful tool you can use to make the world a better place and more accessible for all.

My name is Clarence Anthony and I am the CEO of the National League of Cities, and we're happy to be the co-host of this event today to talk about broadband opportunities, boosting uptake in America's cities and metropolitan regions. Brookings is a wonderful partner and this is an important discussion.

The National League of Cities represents 19,000 cities throughout America, towns, villages, and 218 million Americans which live in those cities. Fulfilling our mission of bringing information and access and best practices to leaders all over America that make cities better is our mission. Elevating this issue, broadband to every citizen, and making it accessible to every citizen is one of the major focuses of the National League of Cities. That's why we are pleased to lend our voice and our ears and our minds to this topic.

As you know, Internet is no longer a luxury. It is a necessity and it's a tool that helps citizens participate in every sector of the community, the economy, create opportunities for success. When Americans lack access to high-quality Internet, the impact is felt at home; it's felt in our cities; it's felt in the students' educational development which is halted; older Americans are left behind; and, more importantly, as well, the business growth and development and economic development of communities is also staggered.

We often ask the question who's responsible? All sectors are responsible, whether you're the federal government, the state/local government, private sector, the health community, the public safety, you name it, and, of course, the educational institutions throughout America. All of us in this room can recall in 1934 when the Communications Act was developed. And the reason it was created and adopted by the federal government was because they thought and knew that it was so important that every American had the ability, should have the ability, to have the tool of communications and telecommunications. They knew that it would make a difference in the prosperity of America.

Broadband is the same perspective because if we don't get access and provide access to

every American, we won't be the nation that we're capable of being. This is a big challenge. Big challenges deserve big solutions and require big solutions.

Now, things are happening in the public and private sector. I don't want to leave this opening here today because that's what our panel is going to talk about: What is happening in America? What are those challenges and what are those solutions? We're partnering with companies in the private sector: Comcast, Google, and other companies that are really reaching in communities. Microsoft, creating ideas and opportunities for people to get access again. So we're proud of the progress that is being made locally and nationally, but today is about solutions and we are committed to that discussion today as the National League of Cities.

Before I introduce our next speaker, I want to take a moment to acknowledge Karen. Thank you so much for getting me through the security there. I'm sure all of you -- it's for Senator Booker. That's the reason we have this security here. I just want you all to know that. It wasn't me, I'll just clarify. (Laughter)

And also, I want to make sure that -- Adie, who reached out to us, and I really appreciate this opportunity because Brookings is bringing relevant issues to the forefront. The National League of Cities bringing relevant issues to the forefront. And we're going to continue to do that with partners like Brookings, so thank you so much.

My team, Nicole, thank you so much for your help. I'd also be honored to ask my president of the National League of Cities to stand up, Councilmember Melodee Colbert Kean from Joplin, Missouri. (Applause) And finally, I want to thank all of you and our great panelists and speakers who've agreed to participate in this discussion today.

Now, the discussion won't be successful, in my mind, unless we challenge -- they don't want me to say this -- challenge these panelists and get some real outcomes. You remember I talked about big challenges deserve big solutions? We need that in this room today or we will not have been able to achieve the goal that we want to achieve.

So with that, Adie, do you want to come on up? He's a fellow here at Brookings' Metropolitan Policy Program and he's going to help us move through the remainder of the day.

Thank you all so much for this. Let's get to work and let's really bring access to all

Americans because we can't leave anyone behind. Thank you all. (Applause)

MR. TOMER: Good morning, everyone. First and foremost, thank you so much, the National League of Cities, for helping us put on this event in particular. I'm looking around for Nicole. Hi, Nicole. Everyone should meet Nicole Dupuis before they leave. She's an amazing infrastructure lead over at National League of Cities, so thank you so much for helping us.

And also welcome to everyone to The Brookings Institution, also to those streaming online. And thank you in particular to those of you in the room today. This is not a normal security day for us here at the Institution, so I really appreciate your patience. And we hope to reward it with an exciting and interesting conversation over these next 90-ish minutes or so.

And at least for me, it's really easy to be excited when talking about broadband because as much as this is a public setting, and now that I realize for posterity it's going to be saved on the Internets forever, I have a confession to make. I'm completely and utterly addicted to the Internet. (Laughter) I wake up every morning, I check weather and sports scores. I get to work, I read email, I look up other people's research online. I might mix in a New York Times story or some Twitter activity if no one's looking. We get home and my wife and I every single night face time with our family outside of town, so they can see our toddler grow up and make sure they see her face and not just hear her voice.

I imagine that your story might be a little bit different, but, at the end of the day, many of you in this room and, of course, streaming online, the Internet is a mandatory part of your day. But what's implicit in all of that effectively economic activity is that whether it's the smartphone in your pocket or the cable or fiber line running to your house is that you have a digital connection to the world everywhere you go and it moves at rapid speeds.

But there's another component that's implicit, too. You have the digital skills to be able to use those connected devices. And often, you probably have the financial means to afford multiple connections, again both your smartphone and a connection to your home. Unfortunately, though, today, and as Clarence kind of clarified in his opening remarks, that's not available to every American.

My colleague, Joe Kane, who's also sitting in the front, he and I released some new research this week looking at Census data to better understand how many Americans are subscribing to the Internet across the country. And the findings from that research are stark.

Only 75 percent of Americans currently subscribe to a private broadband subscription. That might sound high, but think about how many Americans have running water and telephone service and electricity going into their home. It's nearly ubiquitous. This is exactly the digital divide that so many researchers have been investigating and talking about for well over a decade. That digital divide continues to exist.

But second is that what we investigated that's a little bit different than that typical digital divide is that we also have a geographic digital divide. Metropolitan areas that are wealthy and invest in advanced industries, like Seattle and San Diego, they have broadband adoption rates that exceed 85 percent. Meanwhile, in lower-income and less-educated marketplaces, especially in the South, like New Orleans and Memphis, have broadband adoption rates below 70 percent. There's a huge gap in this country and when we need to think about how to get after it not just by people, but also by region.

And third and finally, that adoption gap, that digital divide, we're not making up ground on it fast enough. We need to think about how we can get more students online so they can do homework at home or look at an online course; how job seekers can find every single job that's available to them in the marketplace; how a family can no longer spend too much on their communications and actually afford to see their families on a day-to-day basis all across the country and world. This is the imperative we have moving forward and that's exactly what our conversation today is going to be all about. There is so much to unpack in here about how we address getting access, adoption rates, and even that skills gap addressed in every community across the country.

The panel to follow later this morning is going to talk a little bit more about the solutions going on in their communities and how there are innovative practices that we can follow all across the country. But first, and appropriate to being here in D.C., we're going to start with the federal conversation about what the federal government can do to think about expanding broadband access/adoption and, again, address those skills gaps in communities across the country.

We are so fortunate to have Senator Booker with us, a senator from the great state of New Jersey. I say that as my mom grew up in Trenton, New Jersey, so I really do mean it. And the senator both, of course, as the former mayor of Newark, New Jersey, and as well as one of the most active legislators on the Hill when it comes to broadband issues, is especially attuned to be able to talk

about that kind of federalist broadband policy framework that's going to be key for us moving forward.

Speaking with him in a very personal way will be Robert Puentes, the senior fellow here at The Brookings Institution and the director of our Metropolitan Infrastructure Initiative. Rob is both the most experienced infrastructure expert at the Institution and he is actually a native New Jerseyan, so I believe that we're going to have no problems having an interesting conversation between the two of them.

So, gentlemen, the floor is yours. (Applause)

SENATOR BOOKER: We were supposed to come up to a cue to Bon Jovi, but I don't understand. (Laughter) We were disappointed by that.

MR. PUENTES: Well, while they're mic'ing us up, thanks, Adie, for the great introduction. Thank you, Clarence. Thanks to the NLC team. Thank you all for being here.

Yes, I am delighted to be moderating this discussion with Senator Booker. I mean, I could throw in a New Jersey joke. I had about four of them all kind of queued up. My family all still lives there and really proud to be in that great state.

But for all of you who are not from New Jersey, you're also doubly lucky to be here because I think that there probably isn't somebody right now in the Senate for sure who is a bigger champion of the issues that we're talking about here with widespread broadband deployment than Senator Booker, not just because he fundamentally recognizes how important broadband is to the national economy, to places, and to just how we're all moving, but because he understands that even though we've had really massive broadband deployment in this country, in the infrastructure in recent years, the real challenge that we have right now, as was brought up at the beginning, is making sure that that adoption cuts across all segments of society.

As Adie mentioned, we've done a great job getting broadband into neighborhoods. The challenge that we have is in bridging that digital divide, providing affordable broadband service to more and more low-income families and households. The work that Adie and Joe Kane have shown is that that's really where the real challenge that we have at this part for our country. So the people part is really where we're going to focus most of this discussion.

We're going to talk a little bit about getting more physical access. That's certainly a big part of the discussion. But what we're not going to talk about are things about like what the content --

what's in the wires. So we're not going to talk about net neutrality here at this conversation. If you want to talk about that, there's probably three or four other events happening in Washington today that are going to get into that.

SENATOR BOOKER: And in various courtrooms around. (Laughter)

MR. PUENTES: That's right and boardrooms. But the purpose of this session then is going to be how to get more people online. That's really where we want to target this.

So how do we do that? What does a federalist approach look like? How do we get the federal, state, local, and metropolitan entities to work together and, as Clarence was saying, engage in true partnerships with the private sector? It's not all going to be completely government-driven, but the things that we're seeing at the Metro Program, as the senator can attest to, that the real innovation that we see this happening around the country is happening outside the Beltway. It's happening in these cities and the metropolitan areas.

We have a great panel that's going to talk about the state and local innovations next. As the former mayor of Newark, obviously the senator can talk about those issues firsthand. But as Adie mentioned, we're going to focus first here on the federal role.

We had the FCC chairman, Tom Wheeler, here on this very stage over the summer, who laid out kind of his vision. But I'd love to hear from you just in your own words about the importance of broadband, kind of what was said at the beginning. Why is it so important now and are we doing enough to connect people who need the access?

SENATOR BOOKER: Right. And first of all, it's great to be here. And Brookings has been working with me since I was a mayor and has been an extraordinary organization to partner with. When I was mayor I used to always say, in God we trust, but everybody else bring me data. (Laughter) And having sort of a data-based think tank really empowered me.

And, of course, the National League of Cities, I am a part of that organization in many ways having been a mayor. It's just wonderful to have this forum hosted by both.

I found that once you have a why, the how becomes a lot easier. And if you can get more people to share the why, then you're going to motivate more of a how. And for me, coming to Washington, wanting not to be this Democratic senator, I wanted to be a senator that gets things done, I

knew I wanted to be a bipartisan senator, and so finding ways to work across the aisle, finding Republicans to partner with on these issues. And I actually thought technology and innovation is a space that is made for bipartisanship, that his would be sort of a central thrust to my work.

And so when I sit down with even my Republican colleagues I talk about the why, that we are a nation, number one, everybody understands that we are now in a globally competitive economy, a knowledge-based economy, where our country is competing fiercely now with China, with India, with the EU. And if you start looking at these objective indices of competitiveness, you begin to understand that unless America makes some significant changes, we as a country are going to start declining as an economy relative to our competitive nations.

The World Economic Forum, OECD, puts out all of these indices of economic competitiveness. They look at infrastructure investment. We used to have the best on the globe. Now we're about number 12 to 18, depending on whose indices you look at. They look at overall education. We used to be the top country on the globe for graduating people from college and that included the STEM subjects. Now we've fallen out of the top 10. And so when I have those larger global conversations and I talk about what I think is a critical index for long-term competitiveness, which is related to education, which is broadband penetration, you start to understand that this country that did, with Al Gore and other heroes, invent the Internet, that we now literally have a nation that is 24th -- 24th -- in broadband penetration.

And the Internet now, and I always say this, as well, is one of the most incredible democratizing forces on the globe. And if you think about what's happening globally with the Internet in terms of the democratizing force of it, it's democratizing education. I can now go online and access education and information in ways I couldn't before. It's democratizing access to capital. We started in Newark an online platform -- we didn't start it, we brought them into Newark, called Kiva, which is helping minority, mostly women were our first Kiva entrepreneurs, getting access to \$5,000 and the like.

It's democratizing work. If you look at a group like Samasource, who takes micro work, but goes in developing nations and helps to create incredible economic opportunity, you can think of every element of our society that's being democratized. And even old institutions that were these massively strong institutions are being shaken, from banking to even media as we know it. Just a few



years ago, a Huffington Post or BuzzFeed, nobody would know what I was talking about just mentioning those. And so when you see the power of the Internet in transforming culture and expanding economic opportunity, and then you think the numbers that were just given before that 10, 20, 30 percent of Americans are not even engaged in the Internet at home, when you compare our schools to British schools with their access to the Internet and how much they're integrating that, that's the challenge.

And the workforce of 10 years from now will be radically different than the workforce today. And the skills that we need for this economy right now, not to mention 10 years from now, it's sort of stunning to me how we're not even -- we're having a training dislocation that we're not training people for the jobs. I sat at a hack-a-thon in Brooklyn for minorities. It was a coin I termed, the Black Hack, and one company stood up and said, look, we are hiring people at six-figure salaries. One guy, he said, I hired didn't have a ninth grade education, but was an extraordinary coder and we needed him so bad.

When I talk to friends of mine who lead some of the brand name companies that we know, Internet companies that we know, and they talk to me about the fierce competition they have for engineers in Silicon Valley because there's so much demand, when we know right now there's millions of jobs in America that are going unfilled because we haven't done the skills, this all comes down to the Internet divide. The whole pipeline in our country is, to me, a serious part of it, is about this problem of broadband access. And I'll end with this extraordinary data point.

So I've come to understand the power of diversity that we have in our country. It is an asset in this nation that many of us don't appreciate that other countries don't have this asset. And we have seen how it has enriched our culture in profound ways, from the arts to athletics, to incredible scientists, from a hero of mine, Neil deGrasse Tyson, to another hero of mine, Mae Jemison, you see the diversity of our country, what it offers every sector of our society.

And then you look in one little area where the venture-backed companies, venture-backed tech companies, what percentage are black and Latino? One percent. One percent are black and Latino. Now, think about that. If we'd said every other sector is going to have 1 percent -- 1 percent of our arts is going to be black and Latino, 1 percent of athletics is going to be black or Latino -- what we would deprive our nation of when it comes to that diversity, if we looked at it that way.

And so when you understand this, when I talk to companies like Google and Facebook

and their leadership about this problem, they understand that they need to do more when it comes to their hiring practices, which every company, and including the Senate, is not the greatest place for diversity either -- (Laughter) -- but they also go right to the problem with this pipeline, that children at their earliest ages are not getting exposed to the Internet and technology in the ways that are necessary to start cultivating the genius and really turn the attention back to that.

And so as mayor of Newark, when I would visit my city and knock on doors and go into homes and see how, while I would go to suburban homes in towns like I grew up, and the Internet would be -- broadband access would be front and center to go into hundreds and thousands homes in Newark, and see that they had no access. It was almost like we were saying -- and yesterday was the 150th anniversary of the 13th Amendment, but we know that imprisonment of the body is tragic and an offense to humanity, but imprisonment of the mind is equally offensive. And when you put people in a prison where they have no access to the technologies of today, that is a sin, as well, in a country and we've got to do something about this American sin. (Applause)

MR. PUENTES: So let's drill on that. So how do we get that access to everybody? So I think as the data that Adie and folks have shown is that the penetration's getting out there, people are adopting Internet in their homes, but we're not getting that last bit. So what do we do? What can you do as a senator? What can you do on the federal level to make sure that the last bit of folks are actually getting connected?

SENATOR BOOKER: Well, one big thing that I've worked on that is very important to me that I learned as a mayor is that mayors in America are the incubators of innovation in American government in extraordinary ways. And I always call Michael Bloomberg, like -- first of all, Mayor Bloomberg gave me the best political advice I ever had in my life, which if you're thinking about running for politics, write this down. He said, Cory, before you become a mayor, become a billionaire. (Laughter) And I did not.

MR. PUENTES: Write it down.

SENATOR BOOKER: I didn't write it down. Somebody take that advice. But I always called the mayor. Bloomberg was like the Nick Fury of American mayors. He would call together the Avengers and lots of the mayors would sort of go and we would talk about innovation, and he started

creating really great forums with which we could share ideas. And whenever I found I would meet mayors, from Michael Nutter, from Mayor O'Malley, I would ask them, hey, what's working? What innovation are you doing?

And for me, I told my staff at the very beginning that we were going to do everything we could to steal the best ideas from mayors across America and bring them to Newark, New Jersey. And so these innovators often hit bureaucratic obstacles to innovating in the ways they could. And these innovators actually have great assets. Like Newark, I was dealt some of the best hands of cards of any mayor you could have. So we had transportation superstructure, biggest college town with NJIT, Rutgers, Seton Hall right there in our city. And we had a metropolitan area that was connected to everything from New York City to Philadelphia. So all these assets that we had, but we started finding with some of the areas we wanted to innovate, that we would hit legal or bureaucratic boundaries.

And so one of the things that I started realizing was for me the Internet was a transformative platform for me in just governance and I started using even social media platforms in ways that, as I was talking in the green room before I came, that literally helped us to save lives. But I started realizing in many other cities or in states where they're passing legislation trying to stop the local innovations that are possible. And specifically, what I mean by that is this idea of municipal broadband as an option for municipalities that think of creative public-private partnerships or anything necessary to help bridge that last few feet into homes and into schools.

And so for me as a senator now, what I want to do is unleash the innovation of these mayors around our country by removing that. And that's why I passed -- I didn't pass it yet. God forbid that we pass something in Washington. (Laughter) I introduced the Broadband Innovation Act to try to stop this bar that states were saying that cities can't innovate. It's almost to me counter to what is one of the ideals I respect about Republicans, is that they let localities make their own decisions and choose their own destiny. So that's definitely one.

And then supporting some of those programs, that is not -- you know, many people want to try to criticize a social safety net and saying these are handouts. Well, if there's anything that's more of a hand up than a handout than access to education, something we all believe in, public education, funding programs that help rural areas especially, as well as cities, families bridge that gap so that they

don't have -- that poor families who are operating at the poverty line, which is a federal number, which makes no sense in regions like the New York City region where the cost of living is so much higher, helping families financially to bridge that gap so that they can get access to Internet, these are things the federal government should be committed to because they're investments that make a return on investment that's pretty extraordinary.

MR. PUENTES: I think you're right. I mean, restricting the ability of states to innovate doesn't make any sense, particularly the places where we see it happening. But is the idea then that cities will be able to bridge that last bit better, do you think, than the private sector? Or is it really just about creating more competition?

SENATOR BOOKER: Well, for me it's the former. I mean, right now, as a guy who believes deeply in the free market, if you just allow the free market it's actually not working. The financial incentives for a lot of companies to bridge that last inches often is just not there and it's not covering our country. And so where the free market is not working we've got to create, I think, a public pathway to access not homes, not access broadband, I say the public pathway to access the genius, the untapped genius, of particularly poor kids and rural poor kids. And so for me it's not about creating more competition. It's about getting the job done. I'm an ends-oriented person.

I will tell you right now I believe the private sector can do a significant amount of things much better than government has. In fact, government, as I found out as mayor, there's a lot of things we just did very badly and we needed to get out.

MR. PUENTES: The bureaucracy and the regulatory challenges.

SENATOR BOOKER: Bureaucracy, regulatory challenges. So for me it's just about what is the best to get what the private sector or what the free market is not doing to connect that? And what I'm finding, still using Newark as an incubator, is that when we started to collaborate with private sector people, we started to see tremendous opportunities. So recently, in Newark, we announced that we're trying to now replicate what are some of these incredible tech incubators around the country that are growing up and becoming incredible hubs for developing technology, especially amongst underrepresented minorities and women.

But we also realized that we had this incredible rich fiber going underneath the city that it

was very easy actually to tap into and to create this wonderful, in fact, arguably, some of this highest speed free Wi-Fi in the country. And that if we did that, especially around our downtown, it would actually help our universities and entrepreneurs and other innovators. But more than that, understanding why did Silicon Alley grow up? Why did Silicon Valley grow up? It's this incredible sort of mix of access to information technology, access to educated people, access to universities, and that the free high-speed Wi-Fi actually is just another variable in that equation that's going to help us to create a dynamic outcome that will not only help to connect people to the Internet, but help to reclaim an American city and create a vibrancy and a dynamism that really is a creative cauldron that we just don't know what can flourish from that.

MR. PUENTES: And I want to go to the audience. I know we have some folks with some questions. I think there's some folks tapping in on Twitter, too. But on that last piece, the free Wi-Fi is one thing, but how do you get folks to -- even if you have deployment in these cities, how do you make it more affordable for folks?

I know on the federal level you've been talking about the Lifeline programs, Chairman Wheeler was talking about that.

SENATOR BOOKER: Yes.

MR. PUENTES: How do you actually make it affordable for folks who simply don't have the means to access broadband?

SENATOR BOOKER: Right, and that goes down to that. That's one of the rubs here in Washington is, does the government have a role in finding ways to subsidize that? And I think fundamentally yes, because I equate it with the federal role and the state and local role in subsidizing education. We have come to a point in human existence where you cannot dissect education from Internet access. You just cannot do it. Now people talk about the homework divide, that when kids go home, just having the ability to access the Internet not only helps them complete assignments, but it actually stimulates curiosity. And when I talk to all my friends who are successful tech entrepreneurs that's what they'll talk about, that insatiable curiosity that came about from them taking apart an early stage computer and realizing how it works. Well, the vastness now of the information on the Internet can draw children in ways that is incredible. And parents who want to do more than their schools, the Khan

Academies and a lot of other tools that are out there now for parents who may not have the money even to go to tutors and some of the other chains that have opened up, it is so essential.

So if we are a society that says fundamentally, in accordance with our ideal of equal opportunity, that we think public education is something we're committed to, we can no longer say public education without having within that definition a robust access to broadband.

MR. PUENTES: And I think you're right about particularly where the deployment is lacking. I think we oftentimes think, well, it's a rural issue because it's spread out, it's (inaudible) scale, and all that stuff. But when you look at some of the cities, particularly in New Jersey, I was really surprised at some of the data we were looking at showed that the state actually is a high flier when it comes to broadband adoption. It's one of the top states that there is. But the cities are actually where the real struggles are, place like Camden, places like Passaic, well below 50 percent. So how do you actually -- in those particular places, in those cities where they have unique challenges, is there a specific response we need for those kinds of places versus a rural area or something else?

SENATOR BOOKER: First of all, within your question is a very important point to make. And we talk about the wealth divide now more and more in America. When I was mayor we used to always talk about a multiplier effect, so you build a business and then it has a multiplier effect. My port has a multiplier effect because it's not direct port jobs, but so many other ancillary benefits are going to come from that. And the challenge is it works in the reverse, that if this divide that is a wealth divide, this divide that is a housing divide, if you add into that now the Internet, what you're going to create is a multiplier effect of disadvantage that just grows and grows and grows over time.

And so we have a serious problem in this country, not the wealth divide in and of itself, but what it means for our inability now to access the genius, the untapped genius. You know, we found new ways to exploit difficult-to-find oil and other petroleum reserves, but we're not understanding that not tapping that genius of disadvantaged populations is really hurting our overall economy. And then when you inject into that a technological sort of overview, a lens of technology access, it is really going to just make this problem worse as you understand the jobs of the future are more and more technology based. And so this divide that we're all talking about bridging is just going to get wider and wider and wider.

And New Jersey is an interesting state, and I remember a New York Times article when I

was just starting out in politics that talked about Connecticut and New Jersey being the two highest wealth states in the nation, the highest per capita income. They were battling back and forth. This is in the '90s. But they had three or four of the poorest cities in the country, and it was a stark reality to me that this existed.

And so this is a real problem, as you said, from Patterson, Camden, Trenton, Newark, a real problem that if we don't focus on these dense populations of young people, all of the other issues we talk about, from crime and violence to environmental challenges, you name it, are just going to be exaggerated. And we could find ourselves tragically 5, 10 years from now not only from the wealth divide being greater, but the very idea spiritually of America now being undermined as this is a place where anybody born in any circumstance can make something of themselves.

I will tell you this right now, that this idea of the American dream, that we are a place where anybody can make it, relative to our other countries, our competitor countries now, they are now beginning to do better on us, an important indice of social mobility, the ability for someone born poor to go further. And so if you look at a country like England versus the United States, where everything from 52 percent of median income in the United States to go college, in England it's about 7 percent of median income to go to college. But if you look all the way down to their grade school, their equivalent of our grade school, you're going to start seeing that they are embracing for their poor communities technology, broadband access, much better than Germany, as well, or Japan, South Korea. Go through what they're doing in terms of access to the Internet for their kids, compare it to us, and I'm telling you they are threatening us to take away our American dream and be better exemplars of it. And I refuse to let that happen, that we should still be the place that cultivates that genius of our country and elevates in terms of opportunity everybody to have a fair shot at contributing.

And this is not about helping Puerto Ricans or Dominicans in Patterson. This is about the whole country benefiting because we are a nation that knows that this diversity is an asset. But unless we do something about it, the differences are going to fester and we're going to have problems.

MR. PUENTES: No, I'll be clear, it's definitely not just a city problem. My wife is doing this in Northern Virginia now. It's a fundamental. As Adie talks about a lot, you need an email just to apply for a job at McDonald's. So it's a fundamental tool in moving up (inaudible) for sure.

SENATOR BOOKER: Right.

MR. PUENTES: So I want to take a few questions, maybe just a few, a little bit of time. So Webster defines a question as an interrogative formed statement addressed to someone in order to get a reply. So I do my own speeches, but we'll stay away from speeches if you possibly can. If you can introduce yourself and keep it quick, thanks.

SENATOR BOOKER: And if you're from New Jersey, raise two hands because we will preface you in terms of picking on you.

MR. CHAVEZ: I've been there. Martin Chavez with the Hispanic Technology Telecommunications Partnership, 19 national Latino organizations, 12-year mayor of Albuquerque.

SENATOR BOOKER: Oh, right.

MR. CHAVEZ: I wanted your perspective on Internet access taxes. It's a cost and, of course, that's an issue having to do with -- that impacts adoption.

SENATOR BOOKER: Internet access taxes?

MR. CHAVEZ: Sure. You've got a measure up there I think today or tomorrow to make it permanent, demand taxes.

SENATOR BOOKER: So I'm still trying to understand, hold on. Internet access taxes, in other words sales tax on the Internet or are we talking about -- help me out here.

MR. CHAVEZ: It's the Internet Tax Access Act.

SENATOR BOOKER: yes.

MR. CHAVEZ: And there's a measure up there today, I believe, to make it permanent. Are there any taxes that local governments might impose for access to the Internet?

SENATOR BOOKER: Okay, understood.

MR. CHAVEZ: But basically it's an adoption issue.

SENATOR BOOKER: Right.

MR. PUENTES: Definitely the utility model on flipping that a little bit.

SENATOR BOOKER: Yes. So, look, I'm not going to endorse anything. What I'm saying is we've got to find a way to fund this. And this is one model and one way, in my opinion, to do so, but there's other creative models that localities have found. And remember, in Newark, we were granting



easements to telecom companies, giving them pretty extraordinary access to rip our roads and lay their fiber.

So, again, I have this problem even with just infrastructure as a whole as a country is how we're going to pay for it. While you'll see our European competitors with very high gas taxes, that seems to be often a dirty word in Washington. But I'm telling you right now, I know if I had to ask us as a nation, as a business, do we want to invest as taxpayers in our roads and bridges, New Jerseyans spent about \$2,000, almost \$2,000 a year of extra costs because of an inadequate infrastructure: damage to cars, challenges with idling in traffic and the cost of gas. And a moderate gas tax, which would fix a lot of that and diminish that \$2,000, is less, on a balance sheet analysis, is less than they're paying now. And they would get a tremendous return on investment.

I see the same thing with broadband and that's why I support creative measures to bring more revenue in to complete the last few inches.

MR. PUENTES: And there probably isn't anything that gets people more upset than digging up streets over and over again to do things. So I know they were trying to pack something into the transportation bill around dig one so that we can connect. When you're ripping up a road, that's a perfect time to lay some fiber.

Let's go back here.

MR. FELD: Yes, Harold Feld from Public Knowledge. I just wanted to ask you since you mentioned things like the free WiFi, one of the key assets that the federal government does control is access to spectrum. And I know that from working with you and your staff that you guys have recognized that potential, cared a great deal about that in the past. I wonder if you might say some things about what the federal government could do on spectrum policy to help unleash these local solutions.

SENATOR BOOKER: Yes, you're going to get me -- I mean, this is one of the areas I was surprised that the fight that I had sort of stepped into and this has not partisanship to it whatsoever. I introduced a WiFi Innovation Act with Marco Rubio. And he and I ticked off Democrats and Republicans when we did it, which is always the sign that you're probably doing something right. (Laughter) But we just knew this is one of the most valuable assets there are and, as you said, the government controls it. And we should be using that scarce, valuable resource in as equitable a way as possible.

And back in the 1990s, the government was giving large chunks of that spectrum away, or like the auto industry who just sat on it, parked on it. It's like somebody buying a bunch of real estate in a city and not building anything, which ticks off us mayors by saying that, well, one day we might need this for the safety of vehicles. And as soon as we put this bill in which said we should study this and if it doesn't impede upon the safety and security of people, we should share this access with other people, it was like we declared war, and the auto industry sort of motivating to stop us in really ways that shocked my staff and I what they were willing to do to stop us.

Meanwhile, off to Israel. And this is when I think the President is supposed to walk in, when I start making -- (Laughter) No? Off to Israel, where they're realizing that cars, in order for safety and security, don't need WiFi. What they more need is camera technology, laser technology, other technologies that can identify objects or other vehicles, whether they have WiFi or not. Remember, this is V to V technology which involves two cars communicating over WiFi spectrum. Well, what if the other car doesn't have WiFi spectrum? Or what if that moose doesn't have WiFi spectrum? (Laughter) You still want to be able to have you car react.

So we're pushing and I'm fighting to try to liberate as much WiFi spectrum for critical safety. Because remember, WiFi is important now for telehealth issues, I could go through all the ways WiFi's going to be used in the future to help keep us safer, stronger, and more enlightened. So this is something I'm going to continue to fight, to have a more equitable distribution of that precious resource in this country.

And by the way, this is now when my chief of staff is probably going to run up here to try to silence me, but even the military, which sits on a lot of this WiFi, we need to make sure that the public good is being served in the biggest possible -- we need to not necessarily have people be able to park on this territory and not give it up, even though they themselves are not using it now nor do they foresee them having it being necessary.

MR. PUENTES: I want to just leave that one just for -- let that percolate a little bit. I know the senator has to go, unfortunately. We could talk about these issues clearly all day. We're going to stay involved in this issue. I know that the senator's going to stay involved. I think we've just barely started to scratch the surface even just during the Q&A here. We've started to uncover lots and lots of

different issues from transport to accessibility and the financial piece of it.

So I want to thank you very much for the very engaging conversation. I want to thank you all for the great questions. We have a great panel coming up next. Please join me in thanking Senator Booker.

SENATOR BOOKER: Thank you very much. (Applause)

MR. HOWARD: Well, hello, everybody. It's fun to follow after the senator. He is definitely someone who has grappled with these issues at the local level. It's going to be interesting to see how and if he's able to get legislation through this Congress to do any of the things he's talking about, as always.

My name's Alex Howard. I'm a senior editor for technology and society at The Huffington Post. These issues definitely resonate with me as I'm one of the 21 percent of Americans who's constantly connected to the Internet and also sees the inequities that persist within the communities that I have grown up in, upstate New York, and Philadelphia and Boston, and certainly other places around the world, too, which are all really struggling with these issues. And the people up here studied these issues or worked on these issues, have lots of things to say, so let me give the stage to them as much as possible, offer them some questions. Let's see if I can do the introductions right.

Michael Mattmiller, he's chief technology officer for the city of Seattle. That would be Seattle CTO for those of you who are Tweeting.

Andy Huckaba right next to me, councilmember for the city of Lenexa and it's the National League of Cities Information Technology & Communications Steering Committee.

Dr. Nicole Turner-Lee, vice president and chief research and policy officer at the Minority Media and Telecommunications Council; @drturnerlee on Twitter.

DR. TURNER-LEE: That's not easy.

MR. HOWARD: And Ted Smith, chief of civic innovation at the Louisville Metro Government. Thank you, sir.

So first, let's just start with some reactions going down the pike here. You just heard a whole lot come out of the senator here. Do you agree or disagree with the positions he's taking in terms of the importance of this? Is there something we're missing here in terms of the relevance of online

access to the economy, to education across the board? Is there anything that we're missing in terms of context in these different communities?

Start with you down there and move on down.

MR. MATTMILLER: No, I absolutely agree. When we look at a city like Seattle, we are a high-tech hub. We're a city that's grown by 70,000 people over the last 5 years. We'll grow by 120,000 more in the next 10. And 75 percent of those people are moving to our city for high-tech jobs. So there's this expectation that people want their government to be high-tech, that services are online, and yet we know 85 percent of our households have Internet access at home, meaning 15 percent don't. That's about 90,000 households. So we're creating this gap where if those homes aren't getting access to services or aren't able to benefit from the homework divide, as the senator mentioned, we know we're creating permanent differences in our society.

So it's a critical gap that we in Seattle have been studying. We're looking at how we can bring -- I should say Mayor Murray has introduced a policy to make sure that everyone in the city gets access to equal, affordable, and competitive broadband that approaches a gigabit standard, and working on several strategies to get there.

MR. HOWARD: Okay.

MR. SMITH: Yes, so my boss, Mayor Greg Fischer, is passionate about really being a lean forward kind of city. And so if you think about Louisville, Kentucky, it's about 750,000 residents, so middle of the country, kind of a mid-sized city, where if you don't actually grab this issue by the horns, I mean, there's a chance that just history happens to you, you know. So if you're not one of the biggest cities that often get a lot of the attention, have the tech hubs and all those sorts of things, if you're not intentional about it, we're not really sure how the private marketplace sorts these things out.

We certainly learned a lot from the airline industry about if you're not paying attention, you might discover the economic dependencies you have. And these are broad dependencies. It's education, it's economic development, it's public safety. I mean, this cuts across everything.

So, yes, I mean, a lot of what the senator had to say are the things that we need to be talking about as a country.

DR. TURNER-LEE: You know, and for me, I don't come from a specific city. I represent

an advocacy organization here in Washington, D.C., that's focusing on bringing access and closing the digital divide for underserved communities. And the senator is right on when it comes to digital equity. First-class digital citizenship is imperative for people to participate in this economy, in the social and civic discourse. You know, everything that is important to each and every one of us in this room should be given and provided to every citizen regardless of what they earn, where they live, and what their literacy level is. And so I think what he said in terms of bridging equity and innovation is right on point.

I mean, I have some difference on how we get there, so we get to that point. As people have heard me talk before, you know, I think that there are ways that you could actually meet those goals where the priorities are more on the people versus just looking at is the solution around just bringing community broadband? I mean, there are some challenges there, as well, which we could talk about later.

MR. HOWARD: Get right to that after this. How about that?

DR. TURNER-LEE: Yes, I'll wait on that. But I think, you know, in terms of his encompassing message around digital equity, as he mentioned, if we don't get this right, we're forcing a further stratification of a community of people who are going to fall further and further behind, worse than where they are now. So I think he raised the eyebrows of many of us in this room to start paying attention to this.

MR. HUCKABA: I agree. Senator Booker's enthusiasm and passion for this is not overstated. I think that it's right on the mark, maybe not even stated strong enough. And I wish more of his colleagues in D.C., in Congress, would begin to take up this mantle.

We see broadband access, broadband interactivity, the use of broadband across all of our population as being a basic service. And the basic service we knew before was, what, telephone, right? It's changed and how it's Internet access.

Now, there's a lot of debate in terms of how big that is and how fast it is and so forth and so on. And that can go on through the discussion, but it's critical that we get people connected. It's a global competitive issue. It is a local competitive issue in terms of allowing people to be connected and to be productive wherever they are.

And it's even more important, I think, that it allows for a quality of life for people. It allows

people to have access to a quality of life that we hope that they have. And as an elected official, that's what I really care about is improving and increasing the quality of life of people. I think broadband is one of those paths that we need to make sure people have in their hands so that they can enjoy that.

MR. HOWARD: So we're in an interesting place in many ways in this country with our public discourse. People are Tweeting here, they're using Facebook, they're using private platforms for public speech, which gets us into some challenges. Right now our government's scrabbling with how to deal with that: threats from abroad, free speech at home.

If you look at the infrastructure around this country, a lot of what we're discussing here is private company infrastructure, and that's been true for a long time. We won't get too far into net neutrality, but there has been, you know, a very contentious rulemaking process which has decided that we're going to regulate Internet service providers, not the Internet, Internet service providers, like utilities.

Senator Booker brought up something interesting, though. He said that he believes in the free market, but there's been a market failure at the last mile. So do you agree with that? And if so, what should we do about it?

And I'll start this way and go another way.

MR. HUCKABA: Wonderful. Well, the last mile's always been a challenge in the telecommunications industry. Connecting that last -- when we talk about last mile, for those who don't know, it's really getting the major highways, if you may, there is not as big of a challenge as getting it to everybody's doorstep. And so that last mile is getting it to the doorstep.

It's very expensive. In some cases, in the private industry, it does not fit their business model. And that's a fair statement when you take a look at them and you try to partner with private industry, recognize where it doesn't fit their business model. Their motive is profit. Our motive is public service. Yet our goals are similar and that's to get everybody connected. And so we have to work together and figure out how that works.

That last mile is a challenge, but, to a certain extent, technology is starting to catch up with some of that, where it doesn't always have to be in the ground and some of it can be over the air. You have challenge with spectrum and how much spectrum's available and how fast you can do and so forth, but some of that is being eclipsed through the technology, Yet, it's still a challenge and it's

something we'll spend a lot of dollars on and a lot of brainpower on trying to figure out how to get that signal to everybody's doorstep.

MR. HOWARD: Your answer is wireless, if I had to (inaudible).

MR. HUCKABA: Well, that's one of the answers. It's not the whole answer.

MR. HOWARD: All right.

DR. TURNER-LEE: Yes, I mean, I would say with regard to the senator's conversation around making sure that every area is covered in some way by access, I mean, he's completely correct, right? We have to figure it out. You know, to Andy's point, wireless has become a stopgap in many communities where it's hard to put infrastructure.

But, I mean, having been a person historically in my early, early years -- I will not tell my age -- tried to implement community wireless networks in community areas in Chicago or other areas when I was working with a group called One Economy, it's hard. I mean, it's hard work for cities to figure out how to deploy strategies that compete with competitive marketplace. And honestly, in some cases, it's not really a good use of tax dollars, particularly when the questions that we talked about earlier are so much more relevant.

I mean, part of the problem that we have with these folks is that in the Pew study that just came out in July, 15 percent of Americans are just not using the Internet. And it's not because it's not available. It's just because they have not figured it out. And that 15 percent tends to be poor, they tend to be rural, they tend to be seniors, they tend to be those folks who are becoming the other America. So we have to start weighing the options and the feasibility.

Just like Andy said, how do we cover or how do cities begin to be a place that not only requires initial equity investment, but also requires cities to keep up with the investments? I mean, I don't know about you, but I can barely keep up with the investments of all of the things that are happening in technology. To place that stress on cities, you know, although, again, I'm a huge fan where there's not broadband available that we need to find ways to empower, much like the senator said, cities to do that, but it's tough.

You know, my Internet in the airport and the experience and expectations I have of free WiFi in the airport is different than what I expect to actually do telehealth and telemedicine in my

community. And so I think those weighing that feasibility and options is something that should be placed at the center as we make some of those decisions.

MR. HOWARD: It is something that many travelers definitely experience disparities, fair to say.

DR. TURNER-LEE: Right, right. So imagine that that's your kid trying to do homework, you know. I mean, you have to think about what that looks like when we try to actually build out that last mile.

MR. HOWARD: Okay. Did you have any specific examples of how to bridge that last bit?

DR. TURNER-LEE: You know, I think, and I think the senator alluded to that and Clarence alluded to it earlier, I think public-private sector partnerships are one of the areas that we can look at it where there's the opportunity to convince city leaders where there's more opportunities, I guess, to figure out how to pay for it, how to do it correctly.

I think WiFi has become another stopgap for people in communities and what we're seeing with regard to some of the public policies. It's becoming more interesting.

I think the conversation that the senator picked up on spectrum policy, we need more spectrum in the pipeline for any of this stuff to work. And if we don't get it off of those government agencies that are parking it, you know, we might as well wrap up our presents for Christmas and leave the room, right? You know, just saying, right?

So I think that there are ways that we can get at that infrastructure development in a way that is more productive and much more enhancing to cities. I mean, technology, again -- and I've said this for the last 15, 20 years I've been in this -- should be used for solving social problems. And that has to be the highlight of any decision that municipal agencies and governments make to ensure that it's done for the right purpose.

MR. HOWARD: All right. Bring it on down to the govie here.

MR. SMITH: The govie. (Laughter)

DR. TURNER-LEE: I know, right.

MR. SMITH: So I really think the access conversation has changed and I think we really



all have to update the narrative. So when we look in our city, access to the Internet in all of our communities is at 99 percent. I mean, it's just very high and it's mostly been a function of mobile phone technology. Right? So, you know, we've sort of shifted the conversation in access to be effective access, you know, the cost-effective access to effective speed.

And so we can start talking about broadband again, but when we look at it, it's really interesting there's now kind of an inversion, at least in our community. If you look at social media use, only the most affluent, older white people in our community are not participating. And we did this great map and it was a great challenge we went through, you know, because all the stereotypes and all the assumptions that people had were completely wrong. And so we're really trying to shift the dialogue to be really about that functional access, when somebody feels like they can do their homework with the Internet that they have in their hand, on their tablet, whatever it may be. And so if you're a city you just cannot avoid a conversation about fiber in the ground, about backhaul.

You know, the last mile, who operates it, who owns it, who you're making a phone call to and it doesn't work, I think it's premature to jump all the way over there when I look in our community and I look in cities all over the country, we just don't have infrastructure, important infrastructure across our communities. And so we're very much focused on being a fiber-friendly community.

And I know a lot of people sort of roll their eyes when you say fiber-friendly, but I got a good lesson when I started my job, which wasn't be a billionaire, thank goodness, because that's a hard advice to start work for anybody, but it was from Gig U. And they're just like, look, if you want this to be a city that can -- the telecommunications industry can work, that anybody can work with, with modern infrastructure, you better start figuring out how to get out of the way and reduce those barriers. Because we're never going to have any kind of infrastructure if we aren't a city that recognizes that we have to streamline the way this infrastructure's made available.

So we are about backhaul. We're about fiber-friendly. And we welcome conversations with everybody about how to solve it for the last mile.

MR. HOWARD: You would stand and say that maybe you wouldn't agree so much because mobile is filling that gap? It's there for 99 percent of residents?

MR. SMITH: Well, you see, the irony of mobile is mobile has a tremendous dependency

on backhaul and so you have to have a fiber conversation no matter what. Okay? And so a lot of people sort of said, well, if it's all going to come from the sky, then we don't have to worry about this conversation anymore. That's actually just not true at all, in any way. And so if it's all coming from the sky, that means more mini cell towers and nano cell towers and all of those things ultimately will need the speed of light somewhere behind them. You know, I believe that just because the power dynamics are so poor.

So, you know, we have to do this. We cannot avoid the conversation.

MR. HOWARD: So out in Seattle, is everyone on Amazon's Cloud yet? Are they providing access to everyone?

MR. MATTMILLER: Well, we can't leave Microsoft out of that mix either.

MR. HOWARD: No, they do the software, not the access, right?

MR. MATTMILLER: True, but, you know, the last mile has been a challenge in Seattle. When Mayor Murray took office he realized something that you articulated quite nicely, which is we didn't have a government that was friendly towards putting in the latest telecommunications infrastructure. We had just had a failed partnership with a municipal broadband provider that turned out not to have the capital necessary to build out infrastructure in our city. And so when we looked at how we improved that last mile challenge, we came up with a three-pronged strategy.

The first is reducing those regulatory barriers that we knew were preventing new fiber from coming into our city and also preventing competition. So we worked to harmonize some of our permitting practices. In the city, we also own the electric utility with the poles and wires that go with it. And within a short period of time we were able to attract a provider to the city who is now building out fiber to the premise citywide. And in the past 18 months, they've built out to about 160,000 homes is what they're telling us, and they're continuing to move forward.

But it's not just about what others can bring to the table through regulatory change. We also focused on public-private partnerships. Like many cities, we own about 550 miles of dark fiber that ring our city. It's not enough for us to go out and be a municipal provider as is, but we identified where we were underutilizing that fiber and where we could lease it to companies who wanted to become an ISP. And our council gave us that authority and we now have one company that is offering service to one of our neighborhoods, 100 megabit speed Internet service to that community.

We also were interested to see if we as a city that owns and operates utilities could be a municipal broadband provider. And we went through an effort this year to update a study we'd previously done and what we learned is that while there's demand in the community and costs have come down, the cost of fiber construction is still too great for our municipality to bear. The cost would be somewhere between 480 million and \$660 million. And due to Washington state laws and regulations, the way that we would finance that new utility would really put our general fund services at risk should it not be successful.

You know, Nicole, I think you said something really interesting, which is it's about the people. And one of the reasons we were studying municipal broadband is because we want to ensure that we as a city are in control of our destiny and we're not dependent on the telecos and cable companies of the world to make sure our Internet access is equitable. So when we know that we've got virtually ubiquitous broadband, whether it's wired or wireless, and 15 percent of our households don't take it, what we're very focused on right now is how do we close that gap? Is it an education issue, a cost issue? We're really working hard with our providers right now to get more low-income discount programs out into the community and spread that knowledge.

We also launched a program last year in partnership with our public library and Google to buy MiFi devices, the wireless hotspots, and make those available from checkout from our libraries. The program's been a huge success and we're going from about 150 hotspots to 700 next year, and we've got more grant applications in for more.

DR. TURNER-LEE: Yes. And can I just follow up on that, as well?

MR. HOWARD: Please. You can actually talk to each other, it's okay. (Laughter)

DR. TURNER-LEE: I'm not sure about that, right? Well, and I think that was the main point of my comment, right? When you talk about people and you put people in the middle, it becomes less of a conversation around we want to become the primary provider of that service, right, which has a lot of risks that are involved with that.

But I also caution cities, and this is not something Andy has not heard me say, or Clarence, you know, be careful, too, about how you relinquish assets in the private sector, particularly those as cities that will pass over households. It's very imperative that cities begin to think about when

you start taking over destiny that the destiny's for everybody and that you do not encourage digital redlining. We're seeing many cases where cities have come in because they've had this urgency to bring broadband to residents, but they've not serviced all the people that need it the most. And it's not because our city friends aren't trying to do the right thing. It's because I think we're all trying to reach this aspirational goal, which, like you said, is very difficult to get to. It requires multiple stakeholders at the table and it requires us to really look at what issue we're trying to solve and how does the availability of broadband do that.

And again, I just go back, I think taxpayer money is best spent on digital literacy and other programs that begin to build the demand for broadband services.

MR. HOWARD: You want to speak?

MR. HUCKABA: Yeah, so Nicole and I get a chance to hang together on these panels periodically.

DR. TURNER-LEE: All the time. So he's seen me act out.

MR. HUCKABA: Usually I'm moderating her and she's doing all the speaking. But, you know, one of the challenges here, and you brought it up when you talked about the redlining issue, is that the environment has changed a little bit. It's changed a lot, actually. The model has changed where the old model was very much a monopolistic model. Right? The cities treated it like a monopolistic model with franchises. The carriers or providers treated it as a monopolistic model; this is my area and I'm the only person serving here. And in that model there was that build-out requirement and all of the need to connect. And as different technologies have come into play and different regulations and so forth, it's become a competitive environment, not a monopolistic environment.

Carriers are trying to figure out what that means to them. I don't think they know yet in a lot of respects. But their world has changed because new entries are coming into the marketplace and we don't necessarily have the hook at a local level in a lot of states, and Kansas is one of them, to enforce franchise agreements upon these new participants in the market. In fact, they're not even characterizing themselves as a cable company or something of that nature. They are an Internet company, which goes by a whole different set of rules and so forth.

So this whole model is changing and it's mixing things up in terms of how do we keep

people from being passed over? How do we keep the redlining from happening? You've got all these participants. We want competition because it drives up service, it drives down cost, it gives people options. However, what do you do about the people that are left out?

And I think that this is where this public-private partnership comes into place because as a city councilman I care that my people are served. I don't care how they're served. I just care that they are served, and I want to find a solution to those gaps and ways to make that happen. And we do that through partnerships with our great providers that are out there in many cases who reach out to those people that are underserved and try to pass them.

And this big model change is something that we have to be cognizant of. We're not done with the change and people are starting to find their equilibrium with that change, and it matters.

MR. HOWARD: Yes, I just wrote about this challenge of companies calling themselves one thing, which means they can be regulated differently. Well, anyone familiar with Uber, right, (inaudible) come up here and there. They say they're a tech company, which means they're not subject to the Americans With Disabilities Act with their cars. And this is coming to a head around many cities right now in terms of whether there'll be enough wheelchair-accessible vehicles for those, well, 3.4, 3.6 million Americans who are in wheelchairs. It's becoming a real issue as the taxi companies become, well, disrupted by Uber.

This particular kind of challenge, I think, can come up in this space, too. And it, I think, drives home the question of what's public? What's the public interest?

There's a great question and it's classic Internet, it comes from Baron Bear, Lou 6 -- C69, who's a member of the ursine aristocracy on Twitter. He asks a good question, which happens a lot. What is the role of public places, public WiFi in public libraries and (inaudible) centers?

You talked about giving out MiFi devices. I know that the New York Public Library is doing that, as well. You spoke a little bit about the cost of that. Is that where this is -- direction it's going to go, cities are going to subsidize MiFi devices on wireless broadband networks? Is this how we're going to bridge the gap?

MR. MATTMILLER: Well, I think it's part of a kind of all-of-the-above strategy. We have a critical need now. We have technology available to overcome that need. Is it sustainable for us to buy

90,000 MiFi devices for our 15 percent of households that don't have access? No. While we work on that divide, though, it's something we can do now and we see huge demand for.

One of the things that we realized in our municipal broadband study is while we can't find the \$480 million we need to build out a citywide system we control, what we can do is better leverage assets, like WiFi. We do offer WiFi in the community centers, some of them, in all of our municipal buildings and other places. And, in fact, it always surprises me. I'll walk from my office about six blocks down to where I catch the boat in the morning and I'll pass by our -- yes, I take the boat to work.

DR. TURNER-LEE: Did you say boat? (Laughter)

MR. MATTMILLER: I highly recommend coming to try it. I'll pass by our fire station headquarters and whether it's 7 a.m. or 6 p.m. on the way out, you see this huge congregation of people just standing outside an old fire station. And granted it's Pioneer Square, it's a fun neighborhood in Seattle. But you ask the question why are those people there? And it's because there's a really strong WiFi signal and there's a great public park nearby.

So one of the things we'll be focused on doing in 2016, thanks to Mayor Murray and Councilmember Bruce Harrell, who chairs our Technology Committee, is they tasked us with developing a WiFi strategy for the city. So thinking about how do we create those places where if we can drive WiFi closer at a mass scale to communities who have traditionally lower adoption or access, we can create better outcomes without causing someone to stay at school or drive across town to get that access.

The other thing, you know, to that point around regulation and how do we think about what the public good is for these services, we know that the federal government has not given municipalities the right to regulate Internet providers in the same way they have cable television providers through franchise agreements. The nice thing is that while we see cord nevers and cord cutters increasing, the triple play is still very important in how people buy broadband services. You need cable television with your Internet for many households and potentially a phone line. So what we can influence is our cable code.

And so in the city of Seattle, we updated our cable code in March of this year to do away with franchise districts. So the notion that if you want to offer a new competitive broadband service, you don't have to commit to building out X-part of the city in seven years.

What we replaced that with, though, is a requirement that you must build out 30 percent of all new build to households that fall below the median income level in our city. So we try and address the redlining issue through some type of incentive that keeps pushing access farther and farther to those neighborhoods where we're concerned.

MR. HOWARD: You want to speak to that?

MR. SMITH: Yes. I mean, so we've definitely heard, well, you know, your public spaces, your community centers, your libraries, you know, that's what the city has, that's your home base, you should work from that base. And the truth of the matter is -- the MiFi stuff is genius, obviously -- is that I'm not going to send my 12-year-old to go do his homework to the park at 8:00 at night. I mean, just not going to do that. The community center's closed, the library's closed.

MR. HOWARD: How about McDonald's?

MR. SMITH: how about McDonald's? Exactly. I mean, it's a reality for a lot of people. And so, you know, the truth is the public spaces are a great place to start, but as soon as you move outside of the public spaces that we own and control you actually meet people where they are and you meet young people, you meet old people, you meet businesses. And it's a lot harder to leverage the public's platform in the neighborhood, in the commercial corridor, in the places where people are.

And, you know, we have pilot mesh network, wireless mesh network, in partnership with one of the largest telecommunications companies in the country that's just helping learn with us. And I think that's really what we have to do now is we need to have the Internet available where the people are and not in limited hours and not in limited geography, and we have to figure out how to pool this. Maybe you start with the community center, the library, and start building bridges into neighborhoods and places where people live. This is really what we're trying to do now because we do see the people hang out outside the community center because the signal's strong. And, you know, I think we're a better country than that. We can do much better than that and people deserve it.

MR. HUCKABA: I'd like to pile on to that, if I could.

MR. HOWARD: You can pile on after.

MR. HUCKABA: So this is just interesting because, you know, we have situations where schools are rolling out iPads to kindergarteners. You're not going to see a kindergartener take their iPad

to go do their homework at a library or city hall or whatever. So to support your theory, it's got to be where you are. And the question is, how do you get that signal there? And there are some great programs out there that some of our partners are putting in place. Comcast has the Internet Essentials program, does a great job of reaching out to a lot of low-income families and people to get that Internet access. I wish more of the other carriers would do more. Some of them have some lower price ones, but when somebody's making the decision between putting bread on the table today or having their Internet, what are they going to do? They're going to put bread on the table. We have to be cognizant of that fact and understand how to go past that.

I think the Lifeline discussion right now and strengthening that into the broadband world will help this. I think that it'll help take care of some of the cost issues that are involved in getting it out there.

But it occurs to me that a lot of this discussion has been dealing with access, which is primarily a technical issue, and not a lot of this discussion has been dealing with adoption, which is more about people and it's more an adaptive issue. And there's a lot to figure out and a lot to figure out why people don't adopt. And some of it is obvious that they don't feel like they can afford it, but some of it's not so obvious that they don't feel it's relevant. And that's our next big hurdle that we have to get over. We have to continue down the track of making sure access is there, but we have to hit that adoption side hard. Otherwise, we're still going to have 25 percent of the people in our country that don't have access to the Internet.

MR. HOWARD: Well, if we had another hour, we could talk about digital literacy, we could talk about the data divide, we could talk about data poverty, we could talk about education, we could talk about all of those things. My brief here was to drive in on the technical stuff a little bit and get into the larger social and regulatory issues, and you all have been game of that.

DR. TURNER-LEE: Can I just add on one quick thing?

MR. HOWARD: Oh, yes.

DR. TURNER-LEE: I mean, I want to just add on just in terms of this conversation about WiFi, I think we should also as we talk about WiFi be very cognizant that people still conduct private transactions within the comfort of their home. One of the things that I think has been really fantastic



about the FCC in recent years, Commissioner Rosenworcel has been particularly driving this, the homework gap, trying to move kids from the parking lot of McDonald's into a place that was much more safe and secure, like a library; e-rate extending the ability to do unlicensed WiFi within the purview of an educational institution. It's also critical that people have broadband at home.

I mean, how many of us sit in the library and look up our diagnosis or try to figure out, you know -- and imagine people who are navigating through the social service delivery system of trying to qualify for benefits or find a caretaker. With a 30-minute limit oftentimes in the library it becomes very hard. And our libraries are doing the best that they can to actually accommodate demand. But I think we need to also keep talking about how to improve residential broadband access.

You know, as Andy said, we are right now in the middle of looking at the Lifeline program, which would be one of those areas to capture populations where cost is restrictive. We do have companies that have invested and many more, Comcast and others, that are beginning to look at low-income broadband adoption programs that are targeted to residential broadband.

But I think, you know, I always find now WiFi is incredibly fascinating. I can do a lot of stuff, like many of you, where I am standing on that corner at that moment. But when I put myself in the shoes of a single parent or I put myself into the shoes of a kid that's trying to finish his science project, like my son is now, right, having the ability to do those things from the comfort of your home still matters. And so I think it's just, again, one of those things we have to keep talking about. It feels like oftentimes it's sort of pushed to the side.

And I don't know how far we can go into Lifeline, but, you know, just a plug, we need to have Lifeline have broadband included. It is the 21st century communications tool. So if that conversation is not happening. We're again disserving those populations with regards to that.

And better yet, when we talk about adoption and demand, we need to coordinate it with programs where people with needs lie, like the SNAP program or other public assistance programs, where we can match the 24 percent uptake of Lifeline with the 86 percent of those in poverty and figure out how to provide them a real gateway to self-sufficiency. So I don't know how much you're going to talk about that, but I wanted to put it out as a plug because we have to have a full conversation.

MR. HOWARD: We're bumping up against it. But I do want to give you all an opportunity

to ask questions. So someone right back there.

MS. HARGROVE: Hi, good morning. My name's September Hargrove and I'm the White House fellow at the National Economic Council. I'm actually working on Connect Home and looking at some of the reforms to Lifeline. And I'm really curious, we've been having some dialogues around the issue of credit and with these low-income programs from the private sector how if you have extending bills or credit issues, like from a local level as you're looking at your public-private partnerships have you all discussed kind of how to address that barrier as well?

MR. HOWARD: You want to hop on that.

DR. TURNER-LEE: Well, I mean, I could just say I think, to your point, I think we've come a long way where some of those hiccups that you're talking about in terms of credit, viability of low-income consumers, has been looked at by companies. I know at MMTC we've voiced concerned that those should be issues that companies take into consideration, and I would like to say that it's being responded to. It's tough with the private sector to take on somebody who has debt that's carried over for a few years, but I think they're beginning to see ways that they can actually integrate that.

I would say when it comes to Lifeline, because it is a universally available program, that should not exist. And any attempt to put credit restrictions on Lifeline is almost a way to sort of back-door people out versus bringing them in. So I would think that that would provide an option for those populations that may not necessarily get into these other programs. Lifeline should be the universal, ubiquitous tool for getting more people onto broadband.

MR. MATTMILLER: First off, thank you for all the work on the Connect Home program. Seattle was proud to be one of the first cohort cities and it's been great to have the resources from HUD around the public-private partnerships that exist to drive broadband further into communities.

Specific to your point around the barriers that exist to low-income discount programs, like the Comcast Internet Essentials Program and Internet Basics from Century Link. Obviously we're not big fans. We see that being a real struggle for people who want to take advantage of these programs, and we haven't solved that challenge yet.

One thing that we're realizing is, you know, we as a city can play a greater role in helping align people with discount programs that may be available. We have a community technology team of

four people on it who are driving digital equity strategies in our city. We have an Office of Cable Communications, where people call up to ask questions about broadband and cable. And so we today are able to answer questions about here's the types of programs for discounts you may be eligible for.

We could be doing more and are going to be looking at how it is we deal with the barriers like the 90-day (inaudible) for current customers before they get a discount, the debt rule, and see how we can work with our providers to overcome those.

MR. HOWARD: Right there.

MS. CLARK: Hi, thank you. Larra Clark at the American Library Association. I've been really glad to hear the library part of this story, but I know that there was a beginning of a conversation about adoption. And our 17,000 public libraries, access and adoption are married to each other and we as the training home for a lot of this stuff, I would love it if each of you would talk a little bit about the adoption piece and what kind of partnerships you're seeing there because I think there's a lot of room for improvement on the adoption, whether that's coding, the meaningful use of the technology, and how do we really ramp that up.

MR. SMITH: I'll go ahead and take it. So, you know, I think the situation in our libraries mirrors sort of the larger economy, which is when there aren't things to do with the Internet that are useful, then don't expect useful use of the Internet. Right? So when I look at, for example, government services, you know, Mayor Fischer's made a huge push on let's make sure that when you're at the library with our 30 minutes, or whatever it is, that you're actually able to do something meaningful that improves your situation. And so, you know, I think these things are absolutely tied.

I think adoption, I mean, not to sound arrogant about it, but it sort of takes care of itself if there's actual value in the equation. I'm not a big fan of teaching people how to use web browsers. That's not the game, right? So at the end of the day, it's a push for us to say, well, whether it's signing up for health insurance or whatever it may be, those are high-value things. We have an obligation, certainly in the public sector, to make sure that your government is more available to you, so that when you do have those snippets in places that you're able to do something that really takes some burden off of you. You don't need to go to a government office or whatever it might be.

So we're really working hard to try to tie the library to other things, right, the use of the

Internet. And, you know, it's also true in workforce stuff. So learning how to code, I mean, we have a big program called Code Louisville that is -- it's online courseware curated with mentors. We've got 760 people going through it right now. It's a high-scale good use of the Internet, good use of the services that we make available to the community as part of their tax dollars. So I think it's really a substance issue at some level.

MR. HOWARD: Question? Right there.

MR. GOLDSTEIN: Hi. Phil Goldstein from FedTech Magazine. You guys talked about wireless adoption sort of being a stopgap. The U.S. has led the way on LTE rollout. We're speeding towards 5G with promises of speeds of up to a gigabit per second potentially. But Mr. Smith mentioned backhaul and how backhaul really is what underpins wireless broadband. So as we move toward that future where speeds are going to be continually increasing, how should state and local governments think about how backhaul access is going to expand? Because when these networks get deployed, oftentimes the decision about where to put backhaul and how much backhaul is left up to the carriers who are deploying the commercial networks.

MR. HUCKABA: Yes, well, backhaul is a big challenge. We're seeing that literally every day as we look at innovation and as providers are densifying -- that's one of the words that's now becoming more and more popular and people will be talking about that more -- they're densifying their footprint. They're trying to provide higher speeds and better access and they're doing it through a lot of a combination of micro cells and mini cells and every other kind of cell that you can imagine to put a name to. And the reality is that to each one of those you have to have backhaul. You have to have the ability to hook into the Internet essentially. That's what we mean by backhaul.

MR. HOWARD: Does everybody in this room know what backhaul is? Raise your hand if you know what that is. That's pretty impressive, all right. Okay.

MR. HUCKABA: But, you know, so it's a huge challenge.

MR. HOWARD: You want to get this.

MR. SMITH: It's the connection between the telecommunications backbone and then whichever cell is distributing the signal at the end. So it's the in-between part.

MR. HUCKABA: So there are lots of ways to create backhaul is one of them to take fiber

to each pole that there's a device on. The problem is, is that there are also boxes on the ground when that happens. There's another way to -- now that they're playing around on the wireless side to at least get the mini cells taken care of, the problem is spectrum and it's typically unlicensed spectrum and it's part of the WiFi band. And so that's a challenge and it's expensive, as well, what they're dealing with, or to use some of the legacy infrastructure, like copper, and try to drive it that way. But, of course, we're retiring copper in this country by the year 2020 and that may or may not be available to us in the future.

And so there are lots of challenges in terms of how you get this backhaul to these places, how do you service this. It's going to create stresses somewhere else and we've got to deal with those, and there are smarter people than I to deal with this, I think.

MR. HOWARD: Okay. We'll take one more and then we're going to call it. Take the gentleman in the front here.

MR. JONES: Yes. I guess being by the mic has its advantages. (Laughter) Good morning. My name is Bobby Jones and I'm from the U.S. Department of Agriculture. And my question to you, as part of the 2016 Farm Bill there were funds allocated for broadband support for one of our agencies, Rural Development. And my question to you is, are you guys working with Rural Development? And if so, how is that relationship going when it comes to public-private relationships?

MR. MATTMILLER: We are not and it's not because we don't want to. It's because my understanding is that the city of Seattle, at our size, would not be eligible for the grants coming out of the Rural Development services. And while we just saw statistics that Adie presented that says Seattle is doing comparatively well in broadband adoption, I do think it's a little bit of a missed opportunity. Our urban areas are growing rapidly in this country and they drive -- if our economic development person can keep me accurate -- about 83 percent of our economic output in this country is from urban areas.

SPEAKER: That's good, I'll go with that. (Laughter)

MR. MATTMILLER: There we go. And yet we don't control our own destiny when it comes to broadband access. When we decided not to pursue a municipal broadband system in Seattle this year, it wasn't because we didn't want it. It's not because we didn't see the need or the goodness that would come from owning a connection to every home in our city. It was the fact that we don't have \$480 million and we didn't see a path to finance that without incurring significant risk to our general fund.

So I do hope in the future there will be federal opportunities that recognize that the Internet is the critical utility of the 21st century, the value that can come from having a tightly integrated society that's connected to a network for the greater good, and that, hopefully, we'll be able to reconsider our mini broadband decision in the future.

MR. SMITH: I'll just pile in on there's a great need right now for harmonization of these federal programs. And so, unfortunately, I didn't know anything about that. We'll go study it. You know, I certainly know about the work that HUD's doing. You know, there are any number of -- HHS is doing some things. And so it turns out as a community we really will benefit from the synergy of these programs. So we have the largest public-private broadband partnership in the country in the state of Kentucky, called the Kentucky Wire Project. It's running fiber across the entire length of our state. It's a middle mile project, it's not last mile. But we're embracing it as a city because we recognize that this is going to be another piece for solving the equation.

So the more infrastructure that's put in place, regardless of the program that funds it, we're all going to win. And so, you know, my hope is that we can have more of an abundance mentality about all the various efforts and how they really all are connected, one to the other. So I benefit when that middle mile project rolls across our state. It will definitely make my situation in Louisville better and I can only imagine it will be better for people in rural Kentucky to know that they're connected in a meaningful way to our urban center. So, you know, let's go call for harmony.

DR. TURNER-LEE: Right. I mean, I want to echo that. I think, you know, having been in this area for quite some time, what I have seen over the years and the Broadband Opportunity Council that came out of the White House is thinking around how do you create a comprehensive blueprint, was also an echoing of the National Broadband Plan that Blair Levin actually put out through the FCC. But what I keep seeing is sort of like let's figure out what parts of the puzzle might work and perhaps if we do this right, we'll get to the type of comprehensive broadband policy that moves the need.

I mean, RUS for our communities, you know, rural communities that are African-American and poor, could greatly benefit from infrastructure dollars into those communities. But I can tell you, not a lot of folks are qualified or eligible to participate and it's not known.

And the more that we have this conversation about comprehensive broadband policy that

looks at -- I think, again, BOC, the Broadband Opportunity Council, did a great job with the report, but I can tell you, it's sort of like when I sit down with my kids and I buy one of those 500-piece puzzles. The first thing that they do is they put all the pieces on the table and we sit there for a little bit of time trying to figure out what the picture looks like to put the pieces together. I think that's sort of what we did with broadband policy today. We put all the pieces on the table in hopes that we'll get to the illustration of what comprehensive policy looks like.

Perhaps we might want to look at, based on this conversation, based on what the senator said, where is our ultimate goal of where we want to go with national broadband policy, where the people fit into, where the communities fit into? How does it look in terms of taking the tensions that Andy talked about? And we actually might get someplace where those of us that have been in this business for 20 years might actually see a community where it is harmonized to create the economic benefits to other America that's not benefiting from broadband.

So I put it out there because I constantly tell people, it's like that pie, the pie that all the pieces have been taken out of the pie, but you can't put it back together.

MR. HUCKABA: Yes. So the rural money, the RUS money, probably not broad enough, didn't reach far enough.

DR. TURNER-LEE: Yes.

MR. HUCKABA: Still is going on. There is investment in infrastructure. It's primarily middle mile, as Nicole said. There are -- one of the hats that I wear is I serve on the Intergovernmental Advisory for the FCC and I represent cities, but we have people that represent tribal governments there, as well. And it's the epitome of the rural question that you're asking. And actually, getting that access and getting the carriers' attention in a lot of cases or the private sector's attention, or what else can they do to get more than just dial-up? The reality is that there are a lot of people that choose to live and work and thrive in their rural communities.

And part of the broadband promise, I think, is that we have the ability to live and work wherever we want to work, assuming we're connected, and thrive in those areas. And why does everybody have to move to a city to -- why can't they stay on their family farm that they've had for five generations and really make a go of it? Yet the Internet is real those people and it matters to those

people. And when they're doing cattle auctions and they're live cattle auctions and they can't keep up with the other people that are online because they don't have the kind of connection, that's an economic issue for them and it may drive them out of business.

DR. TURNER-LEE: Right.

MR. HUCKABA: We've got to also continue to look at the rural areas and figure out how to get the broadband out there and we have to do it in a lot of different ways. We've got to make sure that those RUS monies are extended and utilized correctly. We've got to engage the private sector that's out there already. Lots of them are more regional providers as opposed to national providers, and find way to engage them and get those pipes out there.

DR. TURNER-LEE: And keep the tribal nations, the first nations (inaudible).

MR. HUCKABA: Absolutely.

MR. HOWARD: Well, we could spend probably another hour on the RUS money issue.

MR. HUCKABA: You're right.

MR. HOWARD: And I would encourage anyone who hasn't seen it to read Tony Romm in Politico back from July. If you're not aware, the stimulus back in 2009 allocated \$3 billion -- \$3 billion -- to be spent on this area. His investigation in July found that less than half of the projects have drawn that down, 40 of them never even got started. And I'm not sure what happened in September, but there's a pretty good chance that close to \$300 million simply would never be allocated at all because they simply didn't follow through. You want any leads to go follow up, the journalists in the audience, go track that down. What happened to all the money that was supposed to be spent getting rural Americans online? Seven million people were supposed to get online. The agency declined to tell Politico, but the estimates are in the hundreds of thousands.

There is a gap between the rhetoric and between what actually happens on the ground. There is a gap between the money that's supposed to be spent and the outcomes for Americans.

I hope we got to some of the solutions that we need to be discussing here. One thing I would push a little harder on is whether mobile is enough when we know there are bandwidth caps that get stuck on there. Right? Is that sufficient to bridge the gap if you cannot get to full access? My new MiFi from my corporate overload at Verizon has a 2 gigabyte cap on it. That's a movie or two. I'm not



watching movies on it, we're watching other things. Right? But the reality is that for someone who's relying on it as their primary access point, that could be a big challenge, particularly if they're trying to, say, watch some of the video education that we're talking about with Flipping the Classroom. How are you supposed to use Kahn Academy if you've got a bandwidth cap on your mobile connection? I don't know the answer to that.

DR. TURNER-LEE: I know the solutions. I've got a paper coming out. (Laughter)

MR. HOWARD: Yes, well, bring it to us. What's great about opportunities like this and forums like this is we get to drive down towards solutions, but we also should be articulating how challenging some of the problems are, to begin getting into some of the places where incumbents are defending their ground using local regulations, using local does, using state legislatures, something I would have asked the senator about.

The extent to which we are allowing public interest advocacy to be pushed to the side by immense amounts of lobbying by those who have the most amount of money, that's something others of my colleagues have delved into. What's really the most valuable thing to me here is that we're talking with cities who really are working towards trying to connect people to solutions and comparing and contrasting how the approaches are working.

I'm really glad I got to come here again to talk about this with you all. I hope the people online have enjoyed it. Thank you for the questions on Twitter. This should be archived if you want to circle back. Definitely make sure to download that paper, take a look. Thank you for the research and please come back again. Thank you. (Applause)

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