Mackinac Center for Public Policy

Issues and Ideas Forum

"Smart Regs for Smart Tech: How Government Can Allow Next Gen Internet Networks to Flourish"

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Introduction and Moderator:
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Location: Radisson at the Capitol, Lansing, Michigan

Time: 12:00 p.m. EDT
Date: Wednesday, June 20, 2018

Transcript By
Superior Transcriptions LLC
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MICHAEL VAN BEEK: Good afternoon. It's 12:00. We're going to get our program started. We pride ourselves on our programs starting on time and ending on time, so you can all continue with your busy lives afterwards.

Welcome to another Issues & Ideas Forum put on by the Mackinac Center. We want to thank Auto-Owners Insurance for sponsoring these lunches that we provide on a regular basis here in Lansing.

Also just a few things before we get started – this event is being webcast or live cast on the Internet. That can be found at our website, Mackinac.org. It is also recorded, so you can go back later and view the recording of this event and share it with friends if you would like to.

Also, at the end of the presentation, we'll have a session for questions and answers from the audience. We have cards at your table and pens, so if you have a question, please write it down on the card that's available at your table, and one of my colleagues will come around and collect the questions from you, and then I will ask it from the podium here. The reason we do that is so that the audience viewing this online can hear the questions themselves, too; otherwise, they wouldn't be able to know what the question was.

And then finally, before we get started, I also just wanted to make you aware there is a publications table at the back of the room. Please feel free to look through any of that information that's there. The Mackinac Center does research on a wide variety of policy issues, so if any of those catch your eye, feel free to peruse and take whatever you like.

OK, let's get our program started. It's called, "Smart Regs for Smart Tech: How Government Can Allow Next Gen Internet Networks to Flourish."

The world is more dependent on internet connectivity than ever before. Our work, social lives and leisure time increasingly require reliable and speedy access to the internet, and tomorrow's technologies will only increase our use of these networks, such as autonomous vehicles, AI, machine learning, Internet of Things, commercial drones – you know all this stuff is coming. And all of this connectivity could significantly improve our well-being, but it also poses new challenges for government regulators.

What role should government play as these technologies come online? And with us to discuss this topic we have three excellent panelists. I will introduce them all in order here.

Our first panelist is Michael O'Rielly. He is a commissioner with the Federal Communications Commission, originally nominated by President Barack Obama and confirmed unanimously by the United States Senate in 2013. In 2015, he was sworn into office for a new term, following his re-nomination by the president and confirmation by the U.S. Senate.

Prior to joining the agency, he served as a policy advisor in the Office of the Senate Republican Whip and other elected officials. He received his B.A. from the University of Rochester.

After Mr. O'Rielly will be Brent Skorup. He is a senior research fellow in the Technology Policy Program at the Mercatus Center at George Mason University. His research areas include wireless policy, new media regulation, telecommunications, and driverless cars. He serves on the FCC's Broadband Deployment Advisory Committee and is the vice chair of the Competitive Access Subcommittee.

He has authored many pieces for law reviews, outlets like the National Affairs, New York Times, Chicago Tribune, Reuters, Wired – there's many others. Needless to say, he makes his younger brother, who is my colleague, very jealous. (Laughter.)

He has appeared on C-SPAN, NPR, CBS – lots of different national outlets. Brent got his B.A. in economics from Wheaton College and has a law degree from George Mason University Law School.

And then our last panelist, who will be Theodore Bolema – he is an adjunct scholar with the Mackinac Center and also a senior fellow with The Free State Foundation in Maryland. Previously he was a policy research editor at the Mercatus Center at George Mason, and a principal with the economics consulting firm, Anderson Economic Group. And he also was a professor of finance and business law at Central Michigan University.

Bolema received his Ph.D. in economics from Michigan State. He has a law degree from the University of Michigan, so he's got both of the flagship universities covered. (Laughter.) And then – the most important one – he got his undergraduate from a little college in Holland called Hope College, a fine, fine school. (Laughter.)

So with that, I'll invite up our first panelist, and we'll go from there. (Applause.)

MICHAEL O'RIELLY: Quite ominous here for a short fellow. (Laughter.)

Please do continue to eat. I do a number of speaking events and wouldn't want anyone to stop eating on my behalf.

But I want to thank you so much for having me here today to discuss such a timely and important topic. It is a distinct honor to visit the Mackinac Center. My hope is that these comments and the subsequent panel discussion will further the center's goal of equipping Michigan citizens and other decision makers with objective analysis to better evaluate policy options, a worthy function indeed.

Last week was a big week in communications policy. Two key principles that I have long believed were true were reaffirmed. First, removing the heavy-handed Title II regulations for the internet did not result in Armageddon we were all led to believe. (Laughter.) More specifically, the Federal Communication Commission's harmful 2015 net neutrality rules officially expired, and consumers were able to access and enjoy the same exact internet experience absent said rules. Second, a monumental and headline-grabbing judicial decision

solidified that the video marketplace is exponentially broader than many in government can conceive or would like to acknowledge.

Today I would like to spend my introductory remarks focused on this latter topic. As many of you know, last Tuesday, Judge Richard Leon of the U.S. District Court for the District of Columbia ruled against the U.S. government and in favor of AT&Ts application to merge with Time Warner without any conditions. Judge Leon began his 172-page analysis with an observation that I believe eloquently describes the current state of play between government bureaucrats and industry players. "If ever there were an anti-trust case where the parties had a dramatically different assessment of the current state of the relevant market and a fundamentally different vision of the future development, this is the one," said judge.

From the viewpoint of many, both the FCC and the Department of Justice have been stuck in administrative molasses, seeking to apply sectoral market analysis, preserve questionable bright-line tests, and continue the imposition of rigid restrictions as part of transactional reviews the same way now as they did in 2008, 1988, or 1958. As I would posit, the entire foundation of how the government currently views the communications marketplace – be it voice, video or data – is outdated and misguided.

Consider that the commission adopted, in previous quadrennial reports and transaction reviews, and continues to maintain an extremely narrow definition and scope of the media marketplace. Case in point is the consideration of the commission's media ownership rules. The prevailing perspective is that individual communication sectors do not compete with one another. Under such siloed thinking, AM radio only competes with AM radio, FM radio only competes with FM radio, and local television broadcasters only compete with other local broadcasters.

The problem with such approach, of course, is that when you narrowly define the marketplace and narrowly recognize competition, far devoid from market realities, the result typically leads to the greater application of additional regulations or limitations beyond what is necessary to protect consumers. Perhaps that is just the nature of the beast. But as Judge Leon recognized in his decision, there has been a veritable explosion in the media marketplace in the last just five years. In the video space, Netflix, Hulu, YouTube, and so many over-the-top providers now compete directly for consumer attention and the almighty advertising dollars. In the audio space, there is also satellite radio and a myriad of other internet offerings, including the ability to stream most radio stations from their own websites.

This has an impact on the ability of traditional media providers to cover their costs, make capital investments, expand operations to meet consumer needs, and so much more. Broadly this means, given the extensive competition from new technologies, the current generation of legacy media will only flourish, and perhaps, survive, if the government realizes this market reality. Accordingly, all relevant participants – newspapers, radio stations, broadcast television stations, cable companies, over-the-top providers, internet sites, social media platforms, streaming music services, and satellite radio must be included in any media market definition.

When I talk to existing providers in this space, they explain quite clearly to me how their future plans are centered around competing against all those operating in the market, especially

given the development and scale of two large internet companies, Facebook and Google. In not recognizing this in our rules, we shackle certain competitors, skewing the marketplace in favor of the unregulated industries.

Having a dynamic understanding of where the market stands at the current time, along with the agility to adapt as it changes, allows either the FCC or DOJ to conduct a fair but honest assessment, which should be a top priority. For example, one of the major reasons cited for the AT&T-Time Warner merger was the belief of the companies that the future rested in the delivering of content in the broadband space, particularly to mobile devices. Ironically, this very reasoning belies the similarly narrow mindset used when analyzing the current broadband marketplace. Regulators and some of the media have been fixated on fiber broadband above consideration of any other technology. This myopic view ignores many other consumer broadband access methods, and unfairly taints the overall market analysis for related administrative decisions.

Consider the Time Warner – or the Comcast-Time Warner cable merger application from 2014, 2015, when many of us were told that the FCC and DOJ had consternation over the possible combination of wireline broadband assets, subsequently leading to withdrawal of the application. But what about fixed wireless, mobile, or satellite broadband as a consumer substitute? More recently, we have seen comments, including those by my fellow commissioners, that the FCC's 2018 broadband deployment report indicated that 24 million Americans do not have broadband. However, this number represents those without wired broadband. The real unserved population is 14 million – still very important and need to be addressed, but keep in mind 10 million households have satellite broadband of sufficient speed and functionality to meet our measurements. So why doesn't satellite broadband count in the minds of some, including certain regulators?

Equally troubling, the commission – and perhaps DOJ – has been unable or unwilling to recognize mobile broadband as a sufficient substitute to fixed offerings. Look no further than the commission's deployment report, which extolls the virtue and growth of mobile broadband, but then dismisses it as a full substitute, arguing that there are salient differences between the two technologies. But if you spend one minute with actual consumers, you will see the importance, and in many cases, preeminence of mobile broadband.

Although it is not lost to me that cost can be a factor for some, many consumers use mobile broadband, especially with the existing unlimited pricing plans, as a replacement for wired broadband. A recent market report by Kleiner Perkins highlights this point very well, showing that U.S. mobile usage per adult has been growing every year since 2009, and now accounts for 56 percent of daily hours spent online. Not surprisingly, desktop, laptop usage has flatlined or shrunk every year since 2011.

Similarly, a summary of the National Telecommunications and Information Administration's recent survey on internet use states, "Data from 2017 show that more households had mobile data plans than wired broadband service, a reflection of changing patterns in internet use."

As I have stated previously, this trend will only increase as consumers have more experience with the benefits of mobile broadband that brings and accepts the potential drawbacks in terms of price, data caps, screen size, et cetera. And as we must also acknowledge, the next-generation – or 5G – networks, promising increasing speeds and capacity, are very much on the horizon.

Thankfully, Congress recognized the importance of keeping the commission and its regulations focused on market realities, and provided relevant statutory provisions to address these situations and others. Specifically, the 1996 Telecom Act mandates that the commission review every four years its media ownership rules to determine whether they are necessary in the public interest as the result of competition. At the same time, current law requires the commission to conduct a biennial review of regulations imposed on telecommunication providers and remove those that are no longer in the public interest because of competition. And the commission has another statutory, required broadband deployment report to assess our past approaches and considerations on broadband substitutes.

On that note, the commission will launch its 2018 quadrennial review of media ownership rules later this year. In this review, I will seek an updated market definition that incorporates many of the findings in Judge Leon's decision. For my part – and to quote Judge Leon yet again, "I simply cannot evaluate" our media ownership rules "without factoring in the dramatic changes that are transforming how consumers view video content."

I want to thank you for your attention. I'd be happy to answer any questions that you may have at the end of my colleagues' comments and our upcoming panel.

So thank you so very much. I appreciate your attention. (Applause.)

BRENT SKORUP: All right, good morning – or is it afternoon? Good afternoon.

It's a pleasure to be here, back in the Mackinac Center, and thank you, Michael, and the others for inviting me back. I'm excited to talk about broadband, broadband regulation, and 5G technology, and the opportunities that brings.

In part – so a few months ago, Pew released a poll. They surveyed people and asked people, what's the biggest area where American life has improved in the last 50 years? And by a huge margin, people said technology – technology is the biggest improvement in American life in the last 50 years. And a distant second was health care, and then some of the – environment, civil rights, transportation, and other issues.

But to me – I mean, and this is why I love doing the technology policy. There's a lot of optimism about it, and it really is a free-market success story. In 1996, when the internet was just getting started – I believe the commissioner had a hand in the '96 Telecom Act, and in that act, the Clinton administration and Republican Congress said that the internet and the internet services should be unfettered by federal and state regulation, and that has been a recipe for success. The U.S. is a global leader in technology, and technology startups, and new services.

And broadband is obviously a huge part of getting those new services to people. And 5G technology will push services deeper into the underserved and unserved areas. It will also open the door for brand new services that we don't even anticipate. And when you read – and historically states and localities have stayed out of technology picking and choosing winners and losers, fortunately, and that has been a recipe for success.

But when it comes to broadband, particularly 5G, there is a need for states and localities. They will be involved in accommodating these technologies and changing regulations to accommodate them and deploy them. So with 5G – when you are reporting on this, even from the carriers themselves, you kind of see two schools of thought of whether this is an evolution in wireless technology – just more capacity – or a revolution. And in some ways, I think it's both. I think it can be both. You are seeing new services delivered over wireless, and over internet, TV, gaming, health care, education, but there are some – we're getting some hints of the revolution that's coming about.

You know, I'll just raise – I think one company illustrates this, a company called Aira. And what Aira does, for people who are visually disabled or blind, they have these smart glasses that people wear. They have a camera and earphone, and using a wireless radio, they receive real-time narration of when they are walking around in public – in public squares, going to restaurants. Someone hundreds of miles away is receiving that video input and narrating what's in front of the person who might be blind.

It's really astonishing technology. It's on the market today. You can buy buckets – by the month, by the minute, and these are the kinds of things that this new technology is going to make possible because often, I think when people, you know – what's the faster cab videos, you know, that's all wireless. It's good for – and it's much more than that. It's companies like Aira, and driverless cars, and telemedicine, and a lot of new other things.

So, yeah, I'll just briefly go through a few things that I'm thinking about, and I hope you will think about. So I serve on the Broadband Deployment Advisory Committee that was formed last year at the FCC, and municipalities – you know, in a funny way, spectrum policy – spectrum policy has always been a federal issue, but in a funny way, with small cells and 5G, localities will be very instrumental in spectrum policy. And by that I mean if you have a wireless tower covering a town, and you permit a second wireless tower, you've just doubled the spectrum capacity in that locality, and so that's how I think regulators need to view it. They are increasing spectrum capacity, and if you allow a small cell in a downtown, urban area, you might be quadrupling – or more – the spectrum capacity in that very local area. And so – but these are going to raise new issues for localities and states to deal with – having these small cells everywhere and this new wireless technology – and I hope states and cities will view themselves as partners with the tech and telecom companies who are trying to deploy this.

You know, as part of that Broadband Deployment Advisory Committee, I mean, you've seen – there are some warning signs about municipal infrastructure in particular, and in one of the working groups, they collected – and I want to caveat this; this is not a scientific survey – but they've collected 1,200 agreements between pole owners – utility pole owners – and these poles are owned by investor-owned utilities, private companies and cities – it's a mix. And they found

that municipalities systematically charge much higher rates than private pole owners and investor-owned utilities. In fact, one number – for wireless pole attachments, which a lot of the 5G networks will be, the regulated private companies were charging about $9 per month for wireless pole attachment, and the cities – this seems incredible to me – the median charge was $900 a month. So, I mean, again, I don't know if this is typical. I mean, there could be market – I mean, cities might own poles in high-density areas. I don't know what's going on, but it certainly does raise the prospect that there are all these variances, and hopefully state and local officials will take a look at them and make sure that fees are reasonable and accommodating.

The other – second point I'd like to point out and raise is just – as the commissioner mentioned – this phenomenon that 5G will accelerate, but where people are going increasingly mobile only, and so in 2013, according to government data, about 10 percent of internet-using households were mobile only. And at that time – five years ago – people would say, oh, that's rural areas, people who don't use much broadband, or low-income folks who can't afford a fixed connection, but those numbers are only increasing. According to Pew, 24 percent – so last year 24 percent of internet-using households were wireless broadband only – so smartphone-only, hotspot, and don't have a fixed connection.

So this is a trend. It looks to be a long-term trend, and it's a good thing for consumers. I mean, these are new competitors, new options they have. But it will challenge traditional ways of thinking about broadband subsidies and in broadband infrastructure, but in the end, it's a good thing, it's a good problem to have, but people – even though the FCC has not said wireless is a complete substitute, I think it's a matter of time before they do that.

And on that note, I think the FCC's – it's called the Over-the-Air Reception Devices rules – the OTARD rules – I think those might see new life, particularly in rural areas. Those rules say that an HOA, or a landlord, or a city – you do not need permission to put a receiver on your personal property or on your balcony to receive a wireless signal. In the past, cities and HOAs would prevent satellite dishes from going up, so Congress and the FCC prevented that. And I think with fixed wireless, and new spectrum, and 5G, more people will see the benefit of these rules. You can – I believe the regulations are you can have a mast 12 feet above your roofline and have a receiver up there, and so in rural areas in particular, that might be a benefit.

The third thing – I think as these new technologies come about, and new wireless technologies, it's just consumer education. I think people instinctually might be discomfited by these wireless technologies and small cells, and there's a lot of people who are afraid of radio frequency and just what that does on health. I mean, you know, the government has studied this for a long time – the FCC and others – and, you know, there's no adverse health benefits, but it does – it does scare people reasonably, and I think just doing education, and putting reports out there, and bringing in experts to talk about the benefits of this new technology, and also comforting people about some of the safety – you are starting to see this, and I think it will become more frequent over time – as well as aesthetics, you know, having towers, or small cells, or antennas, you get – people are resistant to this, they care about aesthetics, and how a neighborhood looks, and there is certainly a role, certainly a good reason for that, but regulators in municipalities must be careful that they don't sacrifice new services for people and new competition for merely aesthetic issues.

And the final issue – and then I'll sit down – is hopefully we'll rethink universal service funds and federal government subsidies. The federal government spends a lot on rural broadband in particular. In the last 20 years the federal government spent over a hundred billion dollars on rural – rural alone – broadband and telecommunication services, and it doesn't always feel like that when you are out in rural areas.

And I recently testified in Montana about their rural broadband subsidy program, and what you are seeing in Montana, and I expect in other states, is subsidies are increasing and the number of beneficiaries are decreasing. And so something is amiss, and I hope states, and PUCs, and the FCC, and others will start to evaluate the existing programs because there have been large changes in the marketplace, and there hasn't been the large changes in broadband subsidy programs.

So I'll close with that, and happy – I look forward to questions in the Q&A. (Applause.)

THEODORE BOLEMA: My organization, The Free State Foundation, is based in Maryland, just outside of Washington, but I live here in Lansing, and have attended many of these Issues & Ideas forums for the Mackinac Center over the years, and I really appreciate the chance to speak at one today.

Anyway, being here in Michigan, I've been following the Michigan side of things, and I appreciate the lead-in from Brent just now to talk about what Michigan is doing about 5G deployment. Yes, the problems that Brent just talked about do exist here with the wide variations in fees and the permitting process for the new, small-cell units that will be required for the 5G deployment. So this 5G technology will be a real game changer, but if local governments are allowed to slow down the process through the permitting process, or there's just a lot of negotiations going on, that will really slow down the deployment and slow down the benefits that Michigan residents will receive from 5G deployment.

So there are some bills before the legislature right now. One of them has passed the Senate – Senate Bill 637 has already passed the Senate and is before the House right now – that will indeed standardize the process and standardize fees so that this deployment can be sped up going forward. And so that's very important.

There are some other bills floating around as well. I don't think the details are so important in them other than it will be a standardized process, the fees would be at a reasonable level, and that can really accelerate things.

T-Mobile and Sprint have announced a merger, and actually just filed before the FCC yesterday, so Commissioner O'Rielly will have to be considering that sometime in the next several months, but anyway, throughout their application, that's what their focus is, that T-Mobile and Sprint are the distant number three and number four carriers right now. Combined they won't be as big as either Verizon or AT&T, and so that's the whole theme of their application – is that combined they will be able to deploy 5G faster, and if Michigan makes it

easier for them to have a standardized process and follow a standardized process, that will accelerate the benefits there as well.

One other issue I wanted to mention is municipal broadband in Michigan, as Commissioner O'Rielly just talked about, you know, all these technologies are emerging right now. Satellite and mobile with 5G are going to be much more competitive with what we've had, and historically the argument for municipal broadband systems has been that the other providers aren't reaching them, so people need a government-provided service.

Well, one problem with them that we've talked about quite a bit at The Free State Foundation, and others have, too, is that these municipal systems do tend to fail financially so they are a real problem – can be a real problem for municipalities. But also, that's going to be even a bigger issue going forward as all these new technologies are emerging that are alternatives to the traditional fixed-line, wired broadband.

So the Mackinac Center has written about this quite a bit. Our moderator, Mike Van Beek, has written about the Traverse City plans, which I believe are still on hold at the moment. A couple of others are going forward, so Brent's brother, Jarrett, has written about the Holland system, which I believe is going forward. And Evan Carter has written about the Lyndon Township, near Ann Arbor, and their plans going forward. So some of these systems are going forward, and my concern is they're kind of the old technology, and looking at the market in a somewhat outdated way, and that there could be real problems for the municipalities if they launch new systems that aren't particularly competitive going forward.

And finally, we've heard about, you know, the net neutrality and their repeal of the open internet order from 2015, which I think was a very good development, and I appreciate Commissioner O'Rielly's leadership on that issue very much.

A lot of states – usually on the coasts – have been re-implementing net neutrality at the state level in various ways, either as a requirement for doing business in the state or maybe as a requirement for getting contracts from the state. So far we haven't really seen much of that in Michigan, so I'm really happy about that. I know one of the Democrats running for governor has mentioned it, but it hasn't really taken off as an issue. I'm very glad to see that in Michigan, so there really isn't much on that front, and I think that's good news.

As both my colleagues up here have said, you know, the best approaches tend to be the light-touch approaches toward the internet. That's really what we had until 2015. The internet thrived. I think the role of the government should be to continue a very – very much the light-touch sort of approach, and that doesn't mean no regulation at all. There are plenty of other types of regulation out there besides the direct regulatory approach that we saw in the Open Internet Order. You know, there's consumer protection laws, there's anti-trust laws. The FCC and others can implement minimum quality standards. So there's a lot of alternatives out there for dealing with specific issues that might come up, but in terms of just a general approach, a lesser approach that can use a light touch, I think that's the healthiest way to go, and the way that will unlock all the tremendous benefits that we should really be excited about that are now coming.

So thank you very much. (Applause.)

MR. VAN BEEK: All right, so we have plenty of time for Q&A, so if you have a question, jot it down on the card at your table, and then my colleague in the back there, the tall, good-looking guy with glasses, he'll collect them from you and bring them up here.

I have my own, so I'll start with that one.

This is for me and the rest of the audience members who sort of nodded along as you were talking about 5G, pretending like we knew what it meant and what it was – (laughter) – so can someone maybe just give a brief explanation of what 5G is, why it matters, and then maybe some of the tradeoffs, benefits, costs kind of thing?

MR. SKORUP: Yeah, is this on? Do I need to push? OK, it's on.

So most of us say – on our cell phones it will say 4G or LTE, and so every – about every ten years, standards bodies, and carriers, and others, globally, meet and design specifications for how fast these – the next generation should work, and what their capability should be. And so most of us have 4G LTE right now. And there's – currently the standardization process is going on around the world with all these carriers designing what will be the next cellular technology.

And 5G, you know, as I indicated, in some ways is just an evolution from 4G. It's more capacity. As regulators, like the FCC, are making more spectrum available, you can have more services, and there's more capabilities on these networks, and so they are updating the standards. And in time, these new 5G chips will be in our phones and be able to interact with these new networks.

Another aspect of 5G that frequently comes up is that until recently, cellular networks have largely been covering large areas called macro towers. These are the cell phone towers you see in the field, 200 feet in the air, and then they'll cover – I don't know – a mile or two sometimes. With 5G there's – and the downside of that is that you get great coverage, but you are covering a lot of people and so capacity might be limited often, and I'm sure we've all dealt with that.

With 5G there will be a bigger emphasis on small cells that might cover only a hundred meters, and that's why 5G is very infrastructure intensive. Instead of putting up one tower to cover a city, you might have 10,000 small cells in a city, and there's a lot of red tape that comes with that, and so that's why you are seeing a lot of attention on this. I mean, you know, municipalities and small towns might have one person who does this permitting, and that worked in a world of macro towers that cover – you know, one or two cover an area, but when you have thousands of these applications, you need to readjust, you know, how this works.

But in short, faster speeds, more capabilities, and more services like Aira, and telemedicine, and self-driving cars, and that sort of thing.

MR. O'RIELLY: Can I just augment that? For anyone who has not been focused on these issues, the G – the G in the whole equation is generation.

MR. SKORUP: Yeah.

MR. BOLEMA: Yeah.

MR. O'RIELLY: So fifth generation – that is the fifth. There was a 2.5 generation, but people don't really count that, so we're on the fifth generation and that's where the G is.

One thing to keep in mind is, in the past, the generations and the Gs have replaced the previous one, so the old one went away as a new one got more popular. In 5G, 4G is not going to go away. It's going to be a complement to, and 4G will continue to grow, and as it's materializing and expanding every day now, and it's handling more capacity and more speed, and improving. But 5G will layer on top of that. And it's likely – likely – that 5G will develop more commonly in big cities to start with because it is something – you're trying to get as many consumers, and you're trying to figure out how to make the propagation work.

Longer distance is harder, as Brent mentioned. You have to try and figure out where exactly – which spectrum band you are going to use for the purpose. But I want to give you a little bit of perspective. It is – they're going to complement each other rather than replace each other. And it adds to our work – excuse me – and the work that both my panelists mentioned in terms of dealing with locality siting.

Now people say, oh, I mean, I've got two macro towers about ten feet from my house, so I'm familiar with macro towers, and I do it for a living. But when you are talking about small cells, and people say, oh, what's a small cell. Well, a small cell right now – think of a bread box. That's what we're talking about, and they come in different forms and different machinations, but they're really – you know, give or take – 18 inches, depending on which company is manufacturing, and where they're going to be – what technology they're being attached to, but that's about the size and scope of what you are considering.

And the question is how many of those are necessary, how frequently within a city do you need to attach them. A lot of cities are looking at attaching them to light poles that already exist within the communities, so working through those issues have been – are definitely a full-time job for us.

MR. SKORUP: I'll say one more note about 5G because this has come up from some people I've talked to, and it's very confusing so you could be forgiven if you've thought along similar – I've had people say to me, oh, I have 5G. My wireless router at home, you know, says 5GHZ. And that's five gigahertz, and it's very confusing. That's a spectrum band; not the 5G technology that we're talking about.

MR. VAN BEEK: One question here is – maybe this is for Ted. We talked a little bit about what has been happening here in Michigan. There was a bill that passed the state senate.

What are other things that the Michigan legislature can do to help make deployment faster, cheaper, easier?

MR. BOLEMA: Well, that's the main one, right there. It just – largely it's get out of the way. Make it so that the process is expedited, so it's not, you know, really a lot more complicated than that. It's just right now, when a – in order to put up one of these bread-box-sized units, it requires a permit, it requires negotiating a fee with the local government. I mean, all this would be standardized, and so just – you know, we've had this with our cable systems for a while there where the contracts there have been standardized for, you know, I don't know, 10 years or so now, so maybe a similar sort of approach but now at the 5G deployment level.

MR. VAN BEEK: Commissioner or Brent, are there any other examples from other states, maybe, that have gotten this right, or?

MR. O'RIELLY: Well, these are – the two biggest issues – and they may not be occurring here, and it sounds like much more reasonable in Michigan – but we – but I've been to those communities where it has not been reasonable. And there's – the two biggest have been talked about by my colleagues. One is the permitting process, the application process, and the approval process.

The second is the cost issue. If you are talking about, you know, installing these every hundred meters, 200 meters – we've had some success at getting a thousand meters – that's an expensive proposition determining to cover a particular area, certainly a downtown area. You are talking about a number of small cells that you need to do.

Well, some localities said, well, this is a great opportunity for me to make money for other purposes, and they're charging $4,000 per small cell. Well, do the math on that, and guess what happens? The provider says, I'm not picking that community. I'm going somewhere else where their costs are more reasonable.

So it sounds like Michigan is approaching this much more thoughtfully, but there are not – there are bad actors out there. There are localities and states which are not approaching it in terms of the best interest of consumers who want service, but in terms of an opportunity. They see dollar signs, or they see an opportunity to slow down the process to make the company do what they would like it to do, and that's problematic.

We've had tribal governments in the past that have tried to, you know, force wireless providers into their particular structure that they would like to see. In some instances they actually wanted ownership of a portion of the company. They were like, we're going to set up a new subsidiary, and we're going to own a portion of that company. Well, the provider said, I've got an idea; how about I don't serve your area. That's problematic for those consumers that live in that community, and it's how to – we have the charge, at the commission, of trying to get service to all those people, and we're going to have to deal with the fact that some localities are not forward-looking, and we're going to have to address that probably through preemption.

MR. SKORUP: Yeah, and as the commissioner said, there are some actors out there who see small-cell rates as a chance to raise revenue and use their market power to raise public dollars. And it's particularly in the big cities. In big cities, you know, it's – companies will pay a lot to be in a big city, and the risk, I think, because this is new, a lot of towns and smaller cities might see these rates and say – and want a similar one, and – you know, not because they want revenue, but just because that's how others do it. And I think, hopefully, people will avoid that temptation.

As I said, a lot of towns – I mean, this is new – they might not be a full-time, you know, broadband person, and they're dealing with all this, and it's very easy to just cut and paste from another city, but hopefully, you know, education – we're all learning. This is a brand-new thing for everyone in telecom and regulation, but to be thoughtful about it – and standardization. I mean, I think there's 30,000 municipalities and counties, and just – as a carrier – to need to go to each one and go through a new process is very – is very time-consuming, particularly for the smaller carriers who are trying to get into underserved areas.

MR. VAN BEEK: Staying on the theme of 5G – generation, which I just learned, thank you very much – the way the infrastructure works, is it going to be feasible for rural areas to be served by 5G?

MR. O'RIELLY: So it is likely that this is going to be an uneven rollout in 5G services. You've seen the big providers, the big wireless providers indicate which test markets they are likely to hit in the near future. It may be a little bit of a delay before it gets to rural America. That's not a surprise.

It doesn't mean that the technology has passed them by; 4G will continue to advance, as I indicated before, having wonderful success in terms of its later years, after we reached the half-point. So that doesn't mean that they're left behind, but it does mean that it's probably not going to be the first market you go to when you are trying to figure out how do I deploy thousands of small cells, you know, and what can I cover. If a resident's house is, you know, every mile or two, that's probably not the first market you are going to go to. So it's probably going to be uneven, and then the question is, well, how do we deal with that going forward? And those are the policy challenges we have at the commission and deal with those on a daily basis.

MR. BOLEMA: You know, one of the test markets right now is Ann Arbor, Michigan, where it is available at the moment, on a test basis, in a small area near the downtown area.

MR. SKORUP: And, yeah, at the risk of making a confusing issue more confusing, you know 5G – it tends to be associated with these small cells and high-capacity new networks, but it should be said T-Mobile is using – how do I put this – so they're using that spectrum that goes a long ways, and they are – that will be part of the 5G system, all that to say there is going to be marketing materials with 5G, and it will be in rural areas, as well.

You know, at the end of the day, I don't think consumers care that much about what the marketing materials are; they care about what are the services offered, what are – the coverage,

and what are the prices. But all that to say 5G will be in rural areas, but it might be more marketing than some of the new, high-bandwidth services we're talking about.

MR. VAN BEEK: OK, we're going to stay in rural areas. I just have to read this question verbatim because it's great.

I've been hearing about state programs for rural broadband for 20 years. Is this an unsolvable problem, or just something that politicians like to talk about? (Pause, laughter.)

MR. BOLEMA: OK, over here.

MR. VAN BEEK: Really good question when it stumps all three. (Laughter.)

MR. O'RIELLY: No, it doesn't stump me. I work on the federal side, so if you want me to comment about state potential broadband programs, there's only so much I can do. These other – my colleagues here may have better knowledge about different states that are contemplating – we run – the federal government runs, at the FCC, a $4.5 billion program, per year, that invests in high-cost, hardest-to-reach areas. We also run other programs, and our total spending is about $11 billion. We get that money from consumers, who pay higher phone bills than they normally would need to, and we extract about 20 percent of your pay – your cost for these four programs that we operate. The $4.5 billion dollars go to providers today to build out and advance broadband throughout America.

We've had a number of changes to the program to strengthen it. I've been part of those efforts to make the program more – to reach farther, to cover more people, to add houses and locations that were not covered before, so we do do that at the FCC.

In addition, you should thank your congressman or the Congress in general as they have adopted and added more money for rural broadband at the agriculture department. Six hundred million was part of the last spending effort, on a bipartisan basis, and then additional money is being looked at as part of the farm bill this year to determine whether another $400 million would go for the same function. So additional money is being done at the federal level.

One of the tasks of federal-level agencies, as regulators, is how do we coordinate and make sure that we're not spending all our time doing the same thing and covering the same areas, and that's a task that I've been focused on: how do we make sure the different programs and pots of money don't – aren't wasted going forward.

But I don't have a good insight. Some states do have state broadband programs. Some are larger than others. Some get their money from different purposes and different functions. They're all a little different, and some have none, so it's a combination within the states from our perspective.

MR. SKORUP: I'll say a little bit about that. I mean, rural is a difficult issue. So there have been several studies that point out, of people who don't have the internet today, most of those don't want the internet at any price, which is – I mean, between 60 and 70 percent don't

want it at any price. These tend to be older people, and people who just don't see the need for the services, or they're worried about security online. But it's a very tough business case when – in these unserved areas, in rural areas if, at best, you can get 50 percent of the market, and if you have competitors, you are not even going to get that.

So it's a very difficult problem. The federal government is the source of most of these funds. As I noted in my comments, I looked at Montana, and I think these programs could be seriously improved. And I would like to see some sort of voucher-like system. There's, you know, billions of dollars that we spend, but there is some evidence that we're just building networks and people aren't subscribing, and so I would prefer vouchers so that these are directed at people who want the service, and they can go to all providers.

You know, another thing, I mean, a lot – I know cable companies don't receive – or don't participate in the rural broadband subsidy programs, for various reasons, and a voucher would kind of eliminate kind of this inertia that we've had for years about where this money goes.

MR. BOLEMA: Yeah, the silver lining for rural areas is all these new technologies that – Commission O'Rielly talked about in his initial remarks – have the greatest benefits for the rural areas, so the new satellites that are going up – this is going to be a much-improved satellite broadband that's available. It won't be like the old HughesNet of a decade ago which was kind of slow, or the cruise ship internet you might have used that's painfully slow to use, but now it's new, lower-orbit satellites that are being launched that will make this a very competitive service, once it's up and going. And that deployment is happening right now.

I know there's other alternatives that emerge, too. Another one is fixed wireless, which is basically running a wire to an area and then doing, you know, like a big wi-fi around it, so a lot of small towns that might not be reached otherwise by a traditional wire line are being reached by fixed wireless. So, you know, there's other alternatives out there for rural areas, too, and I think we need to keep that in mind.

MR. VAN BEEK: I think Brent mentioned this, in Montana that there were more broadband subsidies but fewer beneficiaries, fewer companies receiving the subsidy. This question is what can we do to reverse that or change that trend?

MR. SKORUP: Yeah, I mean, so in Montana – again, I think – I suspect this is true in a lot of states – you are seeing more money going into these states and fewer people benefitting from these subsidized lines. Again, a lot of it is just inertia. This is how it has been done. The same carriers, year after year, get the money, and I think moving – especially now where the market is fairly saturated, where most people who don't have it haven't expressed much interest. I mean, their minds can change, of course.

I think a voucher system is a better way, and actually the U.K. is starting to do this. They've done it for a couple of years – providing basically a coupon. You enter in a code when you subscribe, and if you are in a geographic area that's covered, you get a reduction on your broadband bill. They've been doing this for rural households and rural small businesses. And

economists, you know, have urged a voucher system for a long time just because the existing programs are not very well targeted.

MR. VAN BEEK: This question is a concern over potentially what to do in the case of an emergency. Are 5G networks more reliant on having constant power connectivity? Are there ways that – in the case of a big power outage or something like that, will these services still be able to be used?

MR. BOLEMA: Yes, I don't know the answer.

MR. O'RIELLY: I'll jump in. I think the answer is that any big disruption or incident is likely to overwhelm every network. They're not built to handle those, you know, really catastrophic circumstances that – and to handle that capacity at that rush at that moment.

It will have more – it will have greater capacity and, fully developed, will have a better experience. But I can't – I don't want to mislead you and say that it's going to be addressed – all of the capacity issues, depending on what – because we're also talking about, you know, in terms of when you have a catastrophic event, one of the things we are hoping that 5G will be able to offer is emergency personnel more information, and video, and picture, and multi-media information of what's happening on scene. Well, that's going to also travel – this structure, it's also going to travel on FirstNet, a separate network that is being built for public safety. So we're trying – you know, this information is going to travel, as it does today, and it's likely there will still be some congestion issues in the future. It's not completely going to eliminate all congestion.

MR. SKORUP: Yeah, and with traditional macro towers, often they will have a backup generator at those towers. Obviously you can't have generators lining our streets at every small-cell location, so power will be an issue. But, I mean, in absolute terms, though, we'll have more capacity and – but in catastrophic cases, it will be difficult to keep power on.

MR. VAN BEEK: There's a couple of questions here kind of asking about the proper role for the federal government here, and for local and state. Are there any sort of guiding principles that you can offer on that question? What is the proper role for the Feds, for the locals, and for the state?

MR. O'RIELLY: Well, look, it – I've given a number of speeches on this topic. I know this isn't easy to say, but, you know, I believe the internet is interstate in nature. I believe it is actually international in nature. It does not stop at any political boundary, whether, you know – and many of our boundaries are decided by geographic reasons – a river, a number of different things that got us to where we are in terms of state boundaries or city boundaries. And the internet transverses all of those, so I think that just by the very structure, that's why we have a commerce clause, that's why we address these issues. And they're going to be addressed mostly – in terms of the broadband and going forward – at the federal level.

That doesn't mean we're not going to have a role for – and we're not going to be listening to what's happening in individual states. Like I said, I am trying desperately to make

sure that we get everyone in the United States that's interested connected and have access. But I think that the regulation of the issue, whether it be the 5G issue or be a broadband issue – which can be one and the same – will be done at the federal level.

MR. BOLEMA: I think in general we do prefer to have government making decisions closer to the people whenever possible. What's going on here, though, and what the commissioner is just talking is that this is a national system, that there is integration of it. And that's what makes it different from a lot of other types of regulation that we have at the very local level.

But you know, this certainly isn't a new issue. You can go back to a century ago when there were a bunch of court cases involving railroads and different railroad standards. And courts always decided with saying that that is a national system; that you can't have one set of standards for Michigan and then a bunch of changes made when the train goes into Ohio. And so a national system made sense here. So I think it's the same principle here on the internet.

MR. VAN BEEK: Brent, you mentioned the company that does the eyeglasses thing that essentially could be enabled through 5G networks. Are there other exciting innovations that you can think of that would come with 5G? Particularly asking about what kind of changes or benefits K-12 education could potentially realize from 5G.

MR. SKORUP: Yeah, when you read reporting on this, yeah, there are some themes that come out. I mean, it's really hard to predict. I mean, certainly 15 years ago when we had 2G, no one could have predicted that 4G would make, you know, YouTube and Uber – I mean, you can't even think of Uber 15 years ago, but that's only because we have this high-capacity mobile network.

So Aira, you know, disability services is one thing. There is – I don't want to – I don't want to scare people, but at the risk of scaring people, there are companies – there are self-driving car companies out there, and there will always be corner cases where the autonomous system can't drive well, and so there are at least two companies right now that are using off-the-shelf 4G LTE modems and doing remote driving of a car. So, you know, you would be sitting in a car and someone who hunches miles away would be with the steering wheel driving it for you out of the situation.

Right now this off-the-shelf technology, I want that technology to be as quick and as reliable as possible, and 4G will make those things possible.

I mean, augmented reality where, you know, you might have glasses, and it's showing you information as you are walking down the street. It's a cool idea – if you've seen the Pokémon Go phenomenon, and virtual reality – you know, just things you can do, you know – visit Versailles from your living room, and that sort of thing. But, you know, we'll see. And it's a lot of exciting stuff, you know – we'll see. There has to be a business case, there has to be demand, and there has to be the network.

MR. O'RIELLY: Can I throw two out to you to think about? And one plays off of what Brent just said. One is remote construction where you can – and I've seen the ability to have a digger or a crane operated hundreds of miles away, and therefore reduce, you know, potential safety risks to workers. You don't have to have someone in the mine doing these things. You can do it just like you do drones today.

The second, and it's a little bit – I don't want to scare anyone on this, but it's actually talked about any time you talk about 5G in terms of the traffic patterns and how fast the information has to travel – is remote surgery. I mean, think about appendicitis – you know, removing your appendix from hundreds of miles away – being done because you have the instantaneous information from a doctor that's able to actually conduct the surgery from DC or wherever else. You are lying on a gurney with a nurse, and it's being done because of the network itself.

And so those are two things that are talked about often in terms of possibilities, but the beauty of this is the business cases will develop, and something that no one will talk about today will be the captivating moment. I know – I've live through 2G, 3G and 4G. When people were talking about – we were at 2-1/2G and thinking, you know, the questions – will we ever get to full-motion video? And here we are, right? And you can watch video all day long, and people do. They watch gigabit and gigabit of video, and the pricing point has worked out fairly well. So there is a lot of capacity and lot of people hungry for video.

MR. SKORUP: That made me think of two new – I mean, a lot of these are services we have today, but they will be better and more reliable in the future. One, I know a guy. His grandchild is being operated on, and they had this high-capacity network that allowed them to consult in real time with surgeon experts around the world. I mean, they could watch and advise at the same time, and that kind of thing is fascinating.

And also you see, when it comes to education, there are these wheeled robots that have a camera and a screen. If a child is sick or has a serious illness and can't be in school, this robot goes down the hallways and into class, and can watch the lessons remotely from bed or hospital.

But like I said, a lot of these things exist, but they'll become, hopefully, better, cheaper and more reliable.

MR. VAN BEEK: Well, thank you. We are out of time. I apologize that we didn't get to everyone's questions, but I think the panelists will be able to answer some after the event.

Thank you all for coming. I want to thank Auto-Owners Insurance, once again, for sponsoring these, and we hope to see you next time.

Thanks again. (Applause.)

(END)