Next Generation Digital Infrastructure: Promoting Investment, Competition and Consumer Protection

Carol Mattey
Rapporteur

THE ASPEN INSTITUTE

Communications and Society Program
Charles M. Firestone
Executive Director
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For all other inquiries, please contact:
The Aspen Institute
Communications and Society Program
2300 N Street, NW
Suite 700
Washington, DC 20037
Phone: (202) 736-5818

Charles M. Firestone
Executive Director

Patricia K. Kelly
Managing Director

The Aspen Institute
2300 N Street, NW
Suite 700
Washington, DC 20037

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This report is written from the perspective of an informed observer at the Aspen Institute Conference on Communications Policy. Unless attributed to a particular person, none of the comments or ideas contained in this report should be taken as embodying the views or carrying the endorsement of any specific participant at the Conference.

Foreword

With rapid developments in network and digital technologies—particularly with respect to digital platforms—concerns over consumer trust, use of data and the diffusion of broadband infrastructure and services have emerged as preeminent policy issues. These concerns highlight the importance of timely and comprehensive communications policy regulation. As digital infrastructures mature, how should decision-makers develop policies that promote investment, competition and consumer protection? And which agencies are best able to do so?

In short, federal, state and local governments face conflicts on which entities should regulate digital technologies and in what ways. The 33rd Annual Aspen Institute Conference on Communications Policy, which took place August 12-15, 2018, sought to provide guidance. It explored regulatory structures to create incentives for the deployment of communications infrastructure to unserved areas, and ways to promote competition and protect consumers on the internet. The Conference ultimately examined federalism in the field of communications—which government institutions should manage the evolving technologies and services.

The resulting report, written by rapporteur Carol Mattey, offers ten recommendations that provide guidance for regulation of communications technologies and services on the horizon. Mattey begins by addressing the fractured array of polices and standards for communications infrastructures, and then provides a brief case study on strategies to promote access to broadband in one particular state, Minnesota. This approach highlights the challenges and successes of public-private partnerships and of measuring the impact of government interventions in promoting broadband infrastructure. Mattey then details a number of recommendations from the group for improving the regulatory landscape.

Acknowledgments

I would like to acknowledge and thank the entities represented in this conference who have also contributed to the Communications and Society Program. They are Microsoft, AT&T, Comcast, Facebook, Charter, Google, National Association of Broadcasters, New Street Research, T-Mobile, Verizon, Walt Disney and Emmis.

I also want to thank Carol Mattey, our rapporteur, for her extensive and informative account of the conference discussions and our participants for their contributions to these complicated topics. Finally, I want to thank Dominique Harrison, Senior Project Manager, for producing the conference and editing this report.

Charles M. Firestone
Executive Director
Communications and Society Program
The Aspen Institute
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Next Generation Digital Infrastructure: Promoting Investment, Competition and Consumer Protection

Executive Summary

The needs of communities and consumers are increasing as new and burgeoning technologies provide new services and even greater connectivity to the world and the things in it. However, federal, state and local governments still face conflicts on what entity should regulate the deployment and management of these converged digital technologies, and in what ways. The 33rd Annual Aspen Institute Conference, "Next Generation Digital Infrastructure: Toward a New Regime for Promoting Investment, Competition and Consumer Protection," focused on three sets of questions:

- Which institutions, if any, should play a role in managing the emerging ecosystem of networks and services, and in what ways?
- How should the deployment of communications infrastructure be incentivized?
- How can competition be promoted and consumers be protected on the internet?

After a vigorous discussion regarding convergence, outmoded silos of regulation, and the impact of multiple overlapping governmental jurisdictions, conference participants proposed a series of recommendations, categorized by themes, to better align regulation of communications for the foreseeable future.

I. Rethinking Regulatory Structures

Recommendation 1: Develop a federal data strategy—in essence, a National Broadband Plan for data—principally dealing with data collection, access, accessibility and dissemination of public data and for public uses of private data (e.g., health outcomes, energy grid, public safety).

Recommendation 2: Improve ecosystem-wide coordination on broadband infrastructure to support policies and programs, and also on inclusion/digital divide issues.

II. Creating Incentives for Investment

Recommendation 3: Tailor government interventions to the unique needs of specific communities, depending on whether they are unserved/underserved/served, reassess baseline standards for broadband over time, based on data.

Recommendation 4: Localities should convene a consortium to negotiate a reasonable template agreement between local governments and broadband providers that could be used to reduce the time and cost of negotiation around deployment.

III. Protecting Consumers and Promoting Competition

Recommendation 5: Congress should enact federal privacy legislation.

Recommendation 6: Consumers should have improved access to information on appropriate channels of redress for issues or disputes relating to products or services in the communications marketplace.

Recommendation 7: Participants in the internet ecosystem should foster meaningful consumer choice through plain-language disclosures.

Recommendation 8: Participants in the internet ecosystem should promote improved security of digital information.

Recommendation 9: All members of the communications ecosystem should promote integrity to ensure that the ecosystem serves the interests of consumers and citizens.

Recommendation 10: Participants in the internet ecosystem should improve consumer choice by removing barriers to network deployment in a technology and business-model neutral way, including options for locally based networks.

Next Generation Digital Infrastructure: Promoting Investment, Competition and Consumer Protection

Carol Mattey

33rd Annual Aspen Institute
Conference on Communications Policy

Next Generation Digital Infrastructure: Promoting Investment, Competition and Consumer Protection

Carol Mattey

Introduction

Advances in communication technologies and the services offered over digital platforms are occurring today at a dizzying pace. Barely a day goes by without some announcement or new development impacting one or more players in the communications ecosystem. We stand on the cusp of a new world, with connectivity promising to transform everyday activities.

While the communications landscape is rapidly changing, the regulatory framework for many key issues remains bifurcated among different players at different levels of government. In a connected nation, traditional norms of federalism are increasingly challenged, and decisions by policymakers have global impact. Policymakers are wrestling with difficult questions of whether and how to manage the ongoing transformation of the communications sector.

While the communications landscape is rapidly changing, the regulatory framework for many key issues remains bifurcated.

Each year, the Aspen Institute Communications and Society Program convenes a conference on communications policy. It is an opportunity for a diverse group of individuals from major corporations, think tanks,

public interest groups, government and academia to discuss the issues of the day and develop recommendations for future action.

The topic for the 33rd Annual Aspen Institute Conference was "Next Generation Digital Infrastructure: Toward a New Regime for Promoting Investment, Competition and Consumer Protection." The conference focused on three sets of questions: Which institutions, if any, should play a role in managing the emerging ecosystem of networks and services, and in what ways? How should the deployment of communications infrastructure be incentivized? And how can competition be promoted and consumers be protected on the internet? A major focus was federalism in the digital age. Throughout the discussion, the recurring theme was, Who should set the rules of the road?

Fractured Responsibility in a Digital Age

In the communications regulatory arena, certain powers traditionally have been exercised at the national level by the Federal Communications Commission (FCC), while other powers have been exercised at the state or local levels. For instance, the FCC historically has regulated interstate telecommunications services, while state public utility commissions have regulated intrastate telecommunications services. The FCC regulates radio spectrum, while localities issue franchises for cable television providers. Meanwhile, some players in the internet ecosystem have faced little to no regulation.

In the internet world, many of these traditional divisions of responsibility have been upended. Many of the emerging areas of concern are falling into gray areas where there are few existing standards. Decisions abroad can and do have extraterritorial impact. At the federal level, more than one agency plays a significant role in funding investment in communications infrastructure. Other federal government agencies will play a critical role in setting the rules for services and applications that rely upon the existence of ubiquitous communications infrastructure. And there is keen interest among those closest to the people—state and local government officials—to ensure their constituents can take advantage of new innovations in the evolving communications landscape. But as A.J. Bhadelia, Manager of Public Policy and Government Affairs at Google, pointed out, there is a patchwork of state agencies and state legislatures, each pursuing their own goals.

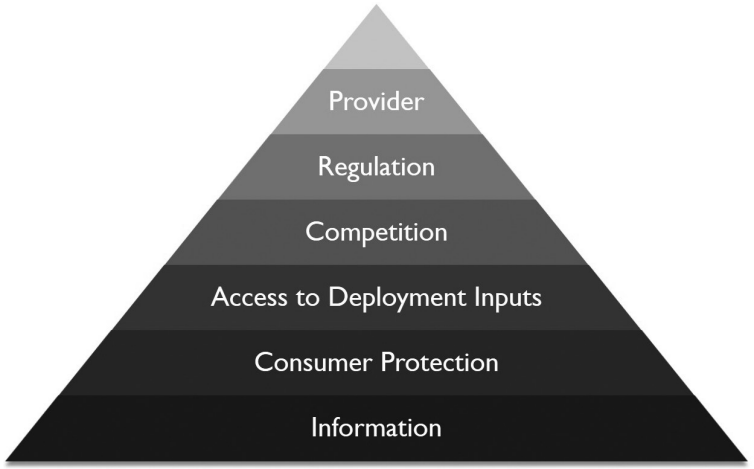
Blair Levin, a Fellow at the Brookings Institution, opened the conference with a presentation on different approaches to regulation in a converged communications environment. Historically, there were separate networks for voice communications, over-the-air broadcasting, multichannel video programming and data communications, each subject to differing regulatory regimes. Now, we have a converged network offering voice, video and data, and traditional regulatory constructs applying to different silos no longer make sense. Levin offered three potential approaches, not mutually exclusive, for reexamining the current regulatory framework in light of convergence:

1. Create targeted, uniform governmental oversight over common elements of a converged network, such as device regulation, spectrum policies, competition policies and deployment policies.
2. Define the problems that need to be solved and develop a tactical list focused on those problems.
3. Start with a clean sheet and focus on the important roles that government plays (see Figure 1):
    - *Information:* What kind of information should be collected, analyzed and disseminated to help government policymakers, educate consumers and inform markets? Accurate information is foundational to many of the other roles that government may play.
    - *Consumer protection:* What kind of activities should consumers be protected against, regardless of the level of competition? Examples include fraud, spam and use of private information.
    - *Access to deployment inputs:* How does society facilitate access to key inputs for network deployments and use, such as spectrum rights (including prevention of interference), poles, rights of way, buildings and intellectual property?
    - *Competition:* How does government policy encourage or assure a competitive environment and protect against anticompetitive behavior?
    - *Regulation*: How does government regulate to assure that public goods are created, such as 911 and emergency alerts? And how does government ensure that innovation is

enabled, for instance with respect to the Internet of Things and autonomous vehicles?

- *Provider*: How does the government act, either by itself, in partnership, or by funding, to assure the provision of certain goods and services? Examples include the FCC's Universal Service Fund (USF), municipal broadband, smart cities, smart grid, smart transit and other public service applications.

Figure 1. Government Roles in Broadband Policy



Source: Blair Levin, Presentation at the 2018 Aspen Institute Conference on Communciations Policy in Aspen, Colorado.

Other conference participants offered their own perspectives. Former FCC Chairman Reed Hundt, now CEO of Making Every Vote Count, believes it is time for a deep rethinking of the role of government in a digital world. In his view, the focus should be on government creation of public goods, a commitment to entrepreneurship and innovation, social justice and an international agenda. Mark Lloyd, Professor at the USC Annenberg School for Communications and Journalism, agreed that these are extremely important, but we should be asking not only what is important but also for whom. He suggested looking to the needs of citizens, families and communities, and not just consumers and the marketplace.

Marc Rotenberg, President of the Electronic Privacy Information Center, recalled sentiments expressed by the Computer Professionals for Social Responsibility 25 years ago, at the birth of the commercial internet:

> The National Information Infrastructure (NII) holds great promise for the future. The convergence of communications technologies and the expansion of network services will transform our society and create unparalleled opportunities . . . the benefits of the NII should not be framed solely in economic or functional terms. The nation's communications infrastructure should reflect the values of democracy. Ultimately, the success of the NII will be measured by whether it empowers citizens, protects individual rights, and strengthens the democratic institutions on which this country was founded.[1]

. . .it is time for a deep rethinking of the role of government in a digital world. – *Reed Hundt*

Rotenberg noted that back then there were a number of concerns for the future of the Net:

- Would there be universal access?
- Would a small number of companies dominate the network?
- Would carriers control content?
- Would services emphasize commerce at the expense of communications?
- Would public access to government information be restricted?

He proposed that it is time to check to see if we have made progress or have fallen back.

David Redl, Assistant Secretary for Communications and Information, and Administrator of the National Telecommunications & Information Administration (NTIA), while acknowledging the focus on convergence, suggested that pipes and data are fundamentally different things. The central question of the decade, he proposed, will be to determine what rules should apply to pipes, what rules should apply to data, and what should apply to both.

State Strategies to Promote Broadband: The Minnesota Experience

In the second plenary session for the conference, Danna MacKenzie, Executive Director of the Minnesota Office of Broadband Development, offered a state perspective on strategies to promote access to broadband. Key steps include setting a state goal for broadband access—higher than the federal standard—and creating an Office of Broadband Deployment, functionally located within the state's economic development agency.

Among other functions, the Minnesota Broadband Office is charged with mapping the availability of broadband in the state and administering Minnesota's Border-to-Border Broadband Development Grant Program. This activity provides financial assistance to service providers in order to expand into areas of the state that do not have wireline broadband meeting the state's minimum standards. The state is thus supplementing the actions of the federal government to achieve its universal access policy objectives.

"Townships see themselves as the elected officials closest to the problem, who know the people impacted by the gaps better than anyone else."
- Danna McKenzie

In 2010, at a time when the FCC viewed 4 Mbps downstream/1 Mbps upstream (4/1) as "broadband," the Minnesota state legislature codified a goal of everyone in the state having access to 10 Mbps downstream/5 Mbps upstream service by 2015. Subsequently, in 2016, the Minnesota legislature updated the state-level goal to be universal access to 25 Mbps downstream/3 Mbps upstream (25/3) broadband service by 2022, and added a "future-oriented" goal of access to 100 Mbps symmetrical broadband service by 2026.

Minnesota's Border-to-Border grant program helps reach for that goal and is funded out of annual appropriations. The state will match up to 50 percent of the capital costs to build infrastructure into unserved areas. Over four years, the program has invested $85 million, which has leveraged $110 million in private and local match. The program is technology-

agnostic in the sense that any technology that can meet the state's scalability requirements is eligible for funding. To date, the bulk of the state's investment has been in wireline infrastructure, but the program also has invested in innovative models involving fixed wireless and wireless hybrid solutions. MacKenzie observed that Minnesota cannot afford to wait to see if 5G will come to rural areas; the opportunity cost for waiting to see if that becomes a viable solution is simply too great.

The Minnesota Office of Broadband Deployment actively works with the 117 broadband service providers in the state to learn where they are investing, where their challenges are, and how the state can help remove barriers. In some sense, the Office serves as a troubleshooter, working with other state agencies and listening to the needs of local townships and citizens for service. As MacKenzie put it, "Townships see themselves as the elected officials closest to the problem, who know the people impacted by the gaps better than anyone else."

Measuring Results and Their Consequences

One important question is how to evaluate the impact of government intervention. Not everything is a problem that must be solved, argued Robert Pepper, Head of Global Connectivity and Technology at Facebook. Christopher Yoo, Professor of Law, Communication and Computer & Information Science at the University of Pennsylvania, agreed, cautioning not to assume that an intervention to fix a problem lacks flaws; the better approach is to compare the two.

Alden Abbott, General Counsel at the Federal Trade Commission, agreed. It is critical to ask, "What are the costs and benefits of any government intervention," and "Is this the most efficient way we can try to promote this public good?"

The question remains, however, whether regulators have the institutional capability to undertake such an analysis. One recurring theme was the need for better economic research to measure outcomes from governmental action to advance broadband. Unfortunately, too often all that is available is anecdotal evidence. The group noted the FCC will be in a better position to address such questions through its new Office of Economics and Analytics.

One of the consequences of the current system with fragmented governmental responsibility for funding broadband is that no one agency

is undertaking a comprehensive cost-benefit analysis of the value of broadband infrastructure investment in the context of broader public policy objectives. For instance, two federal agencies have a direct funding role with respect to broadband infrastructure—the FCC, through its Universal Service Fund, and the Department of Agriculture's (USDA) Rural Utility Service (RUS), through its broadband loan and grant programs. Each agency is constrained by its authorizing statute, and neither is in a position to fully fund ubiquitous next generation infrastructure in areas of market failure. This is unfortunate as such action could have important externality effects impacting other parts of the federal government, such as lowering the cost of healthcare. When looked at across the entire government, the case for more investment is clear. Yet, given institutional and political constraints, neither agency is willing or able to shoulder the full cost.

…if we do not have connectivity in certain areas, it has consequences not just for rural areas, but rather for all of us. – *Paula Boyd*

Wayne Leighton, Chief of the FCC's Office of Strategic Planning and Policy Analysis, pointed out the danger of conflating outputs and outcomes. For instance, focusing solely on the number of homes with newly available broadband does not answer the question of what benefits come from that connectivity. The more difficult task, he added, is establishing causation: does the availability of broadband actually cause improvements in specific areas, such as job growth or productivity?

While there was general support for the notion that government intervention should be subjected to a cost-benefit analysis, not all agreed. Jonathan Chaplin, Managing Partner of New Street Research, pointed out that we are not going to know what will drive the economic return at the time when a decision to build communications infrastructure is made. If we demand a demonstration of economic return, nothing would ever be built. Simply put, we cannot today foresee the applications that will justify the investment.

Moreover, not all governmental interventions are susceptible to rigorous quantitative analysis. Several participants suggested that the goal of promoting greater access to broadband should not be viewed just through the lens of economic benefit; there is a broader dimension that implicates social equity and citizen participation in a connected world. Paula Boyd, Senior Director at Microsoft, observed that if we do not have connectivity in certain areas, it has consequences not just for rural areas, but rather for all of us. Safiya Umoja Noble, Assistant Professor in the Department of Information Studies at the USC Annenberg School for Communications and Journalism, urged policymakers to think about what connectivity means in the broader context of income inequality; does the minimum wage or basic universal income need to be on the table to make connectivity affordable for all?

Recommendations

From the premises of convergence, outmoded silos of regulation, and multiple overlapping jurisdictions at the federal, state and local levels, conference participants developed a series of recommendations to better align regulation of communications for the foreseeable future.

I. Rethinking Regulatory Structures

The first set of recommendations from the conference center around what areas of the digital ecosystem warrant government involvement, and which institutions should play a role in managing various aspects. The "Regulatory Structures" working group grappled with the complexity of multiple government players impacting the communications sector in today's world.

There was general agreement that in a converged market, a much broader reexamination of regulatory structures is essential. Several participants observed that institutions do not change quickly, and frequently last longer than the problems they were originally created to solve. The question posed by Christopher Lewis, Vice President of Public Knowledge, is whether we want institutions that can adjust as markets change. Reed Hundt declared that it is necessary either to renew agencies' missions in terms of the problems of the decade or kill them. In his view, the FCC is ill equipped to serve any of the key functions of government, given its authorizing statute and how the courts have construed those statutes.

In response, others cautioned against blowing up the FCC without anything to replace it. Sunsetting an agency may leave Congress chasing from crisis to crisis, said Alex Hoehn-Saric, Chief Counsel for the Subcommittee on Communications and Technology in the U.S. House Committee on Energy and Commerce. He sees a value in having institutions with a longer-term perspective that can weather issues and events as they arise.

There are many players in today's digital ecosystem: local, regional and state governmental entities; the federal government, foreign governments and other international bodies; as well as trade associations, nongovernmental organizations, standards bodies and private sector companies. In many areas, no single institution occupies the field.

There were very different opinions among conference attendees on what role the federal government should play relative to the states and localities on specific issues. The group did agree, however, that the only workable long-term solution for net neutrality was federal legislation. Efforts to develop a unified vision of which institutions should play a primary role and which should play a secondary role on many other communications issues often devolved into a debate about what the underlying policy should be.

There was a consensus that in many areas, shared policy making and shared duties for both implementation and enforcement are the norm and will remain so in the future. Consequently, there is a pervasive need for better coordination and clearer lines of authority, both within the federal government and across the different levels of government at the federal, state and local levels.

One area where this is particularly relevant is the use of data for public purposes.

Recommendation 1: Develop a federal data strategy—in essence, a National Broadband Plan for data—principally dealing with data collection, access, accessibility and dissemination of public data and for public uses of private data (e.g., health outcomes, energy grid, public safety). The United States needs a national plan for publicly oriented data collection and access in key areas like energy and health. Institutions need the resources to produce good public interest information—that is, information that is managed, collected and disseminated by govern-

ment agencies—and ensure that information is not used in a way to promote social and economic inequality. A coordinated data strategy is critical to the effective investment of resources in emerging artificial intelligence to address pressing public policy objectives. We need to build data trusts and ecosystems to enable public data to be shared more broadly to advance initiatives such as smart cities, smart grid and coordinated healthcare.

A coordinated data strategy is critical to the effective investment of resources in emerging artificial intelligence to address pressing public policy objectives.

Notably, other countries are developing such a plan. For instance, the French government recently released a report outlining a comprehensive strategy for data.[2]

The logical place to develop such a national data strategy would be NTIA, the executive branch agency that has principal responsibility for advising the president on telecommunications and information policy issues.

Recommendation 2: Improve ecosystem-wide coordination on broadband infrastructure support policies and programs, and also on inclusion/digital divide issues. There are multiple players that provide funding for broadband infrastructure in the United States. The FCC's USF high-cost program historically has provided financial support for both network investment and operating expenses in rural, high-cost areas. RUS for many decades has played a major role in financing loans to telecommunications carriers in rural areas, and at the time of the Aspen conference was developing a framework to implement a new $600 million broadband pilot program. Subsequent to Aspen, Congress enacted the 2018 Farm Bill, which authorizes additional funding for grants and loans for rural broadband.[3]

Meanwhile, there is growing engagement at the state and local level regarding the need for broadband. Notably, many state and local

officials view access to broadband as critical to remaining economically competitive in a national and global marketplace. In a number of states, the office to promote broadband deployment organizationally falls under a state economic development agency, rather than within the state public utility commission. State grant programs are typically funded out of general appropriations, rather than through sector-specific assessments on telecommunications carriers.

At both the federal and state levels, broadband funding is increasingly offered on a voluntary basis to willing market participants. This is favored over regulatory mandates for specific providers, such as incumbent telephone companies. In essence, the preferred approach is to provide a financial carrot rather than a regulatory stick.

In light of these multifaceted efforts to close the digital divide, there is a need for regular communication between different governmental agencies and, in particular, a need for better data to enable each to work constructively and not at cross purposes with each other. This is true within the federal government and across different levels of government.

There have been efforts in recent years under both the current and prior administrations to develop institutional frameworks for interagency coordination at the federal level on broadband issues. In 2015, President Obama created the Broadband Opportunity Council, co-chaired by the Department of Commerce and the Department of Agriculture, tasking it to produce specific recommendations to increase broadband deployment, competition and adoption through executive actions within the scope of existing agency programs, missions and budgets.[4] The council's Broadband Interagency Working Group, comprised of more than 25 federal agencies and co-chaired by NTIA and RUS, met weekly over a period of several months first to develop a report, and then to monitor progress in implementing various actions.[5] The Broadband Interagency Working Group continues to serve as a forum for cross-agency communication within the federal government under the Trump Administration, as noted by David Redl.

In addition, in April 2017, the Trump Administration created an Interagency Rural Prosperity Task Force, chaired by the Secretary of Agriculture. Among other things, the task force recommended that there be an interagency strategy, led by the Office of the President, to improve rural e-connectivity. It also called for an assessment of the effi-

cacy of current programs, specifically existing federal grants or subsidy programs, to identify duplicative or overlapping federal programs and to make recommendations to enhance coordination of various funding streams.[6] But because the Rural Prosperity Task Force, by definition, is focused solely on rural areas, any further efforts to implement these recommendations will not address the gaps in internet connectivity that remain in urban areas.

Unfortunately, there are inherent limitations in what any federal working group can accomplish. Federal working groups lack authority to override the priorities and decisions of individual member agencies. And each agency is working within the framework of its own authorizing legislation.

Furthermore, Congress itself is balkanized on digital infrastructure issues. For instance, the Commerce Committee and the Agriculture Committee both play a key role due to their respective responsibilities in overseeing NTIA, the FCC and USDA's RUS, while other cross-cutting issues in the digital ecosystem, such as autonomous vehicles and the Internet of Things, implicate the jurisdictions of other congressional committees. The net result is that no one truly is in charge.

The interplay between FCC and RUS funding programs illustrates some of the difficulties of coordinating the actions of two federal agencies. Christopher McLean, RUS Assistant Administrator, explained that the legislation establishing the new RUS broadband pilot program requires that at least 90 percent of the households served by a project receiving a loan or grant must be in a rural area without access to broadband, defined as 10/1 Mbps. Moreover, the law prevents funding from overbuilding any RUS borrower.

RUS sought public comment on how to implement this new program, asking among other questions how data speeds should be verified and what sources of data should be used when determining whether an area already is served.[7] One problem is that census blocks classified as served by the FCC using FCC Form 477 data may be only partially served. Moreover, an area that is unserved today may be slated to get 10/1 Mbps (or better) service through the FCC's Connect America Fund at a future date. How will RUS take that into account?

Subsequent to the Conference, USDA announced the program rules for its new pilot program, now branded as the ReConnect Program.[8]

It concluded that the only entities eligible to apply for loans in areas subject to winning bids in the FCC's Connect America Fund Phase II auction would be the Phase II winning bidders. It is not immediately apparent, however, how RUS will evaluate applications to overbuild incumbent telecommunications carriers that have not yet completed their required 10/1 Mbps deployment in geographic areas outside of the Phase II auction.

Most participants agreed that it does not make sense to have two government agencies each funding a different service provider in areas that economically cannot support, without governmental assistance, even one service provider. But what this means is that much more coordination is needed, so that the left hand knows what the right hand is doing.

Leaders recognize the need for better coordination. Section 6212 of the 2018 Farm Bill directs RUS and the FCC to consult with each other when making funding decisions. The legislation also directs USDA, NTIA and the FCC to jointly submit a report to Congress on how best to coordinate federal broadband programs and activities. Among other things, the legislation directs the three agencies to identify ways to harmonize broadband reporting requirements, consolidate existing broadband data and share data on projects supported by federal programs.

There also are ongoing efforts to share information among federal, state and local government officials, but more can be done. "I'm asking the federal government to partner with us and communicate more directly with us," said Danna MacKenzie of the Minnesota Broadband Office. "How do we share information so that we aren't duplicating efforts and can actually amplify and support each other's investments?"

MacKenzie praised NTIA's BroadbandUSA initiative as providing a forum for states to talk to their counterparts.[9] But with 50 states plus territories, more than 3,000 counties, and many more townships and municipalities across the nation, in-depth, ongoing coordination between levels of government remains challenging.

II. Creating Incentives for Investment

With respect to incentives for investment in next generation infrastructure and applications, the group's discussion revealed the challenges that come from the multilevel governmental environment in the United States:

- In the case of market failure, should it be the job of the federal government to step in to finance additional deployment?
- Will federal investment inhibit or incent additional investment by state or local governments?
- What are the respective roles of states and their constituent governmental units?
- In what areas should the federal government preempt local regulations and policies?
- Should states limit the ability of municipalities to build their own networks or provide broadband service?
- Who plays a role in ensuring a favorable business case for the deployment of 5G networks?

Universal service for telephony has been a cornerstone of U.S. communications policy for many decades. While some at the Conference debated whether the statutory directive was clear, the foundation of universal service stems from language in the Communications Act of 1934 creating the FCC and empowering it "to make available so far as possible to the people of the United States, without discrimination … rapid, efficient, nationwide and worldwide wire and radio communications services with adequate facilities at reasonable charges."[10]

Historically, universal telephony was accomplished through a patchwork of implicit subsidies among regulated monopolies, aided by the availability of low-cost loans from RUS to finance infrastructure deployment. Section 254 of the Telecommunications Act of 1996 further expanded the national commitment to universal service, providing that consumers in all regions of the country should have access to telecommunications and information services that are "reasonably comparable" to those services provided in urban areas at reasonably comparable rates.[11]

Charlie Firestone, Executive Director of the Aspen Institute Communications and Society Program, asked whether the goals of the Communications Act for universal service need to be updated. Blair Levin, who previously was the architect of the National Broadband Plan, suggested that the first sentence of a new act should be: "The availability and pricing of bandwidth should never constrain economic growth and social progress."

Over the last decade, policymakers have recognized that the nation should have universal access not just to telephony but also to broadband. In 2009, as part of the American Recovery and Reinvestment Act, Congress appropriated $7.2 billion to advance broadband deployment and adoption, and it tasked the FCC with the job of developing a National Broadband Plan "to ensure that all people of the United States have access to broadband capability."[12] In 2011, the FCC transformed its existing high-cost universal service program into the Connect America Fund with the express goal of ensuring universal access to both fixed and mobile broadband in high-cost, rural areas.[13]

While participants at a high level agreed with the goal of universal service, there was some disagreement as to how that goal should be achieved in practice. Broadband, unlike water or electricity, is not a homogenous product. There are many different types of broadband—fixed and mobile, terrestrial and satellite, with varying attributes of speed, latency and usage for a given price, offered by companies using different technologies. Inevitably, the question becomes, What are we actually trying to accomplish?

There are challenges when different governmental bodies do not share a common understanding of what the problem is, or how it should be addressed. In recent years, the FCC used one standard—25/3 Mbps—to define broadband when reporting on availability to Congress, but required most recipients of subsidies from the Connect America Fund to meet a lower minimum standard—10/1 Mbps—when deploying broadband in unserved areas. However, in December 2018, after the Conference, the FCC took steps to align its standards, voting to require smaller incumbents to deploy 25/3 Mbps broadband service in exchange for USF subsidies.[14]

Meanwhile, Congress has dictated that funding for RUS's new pilot program be targeted predominately to areas lacking 10/1 Mbps, but the Secretary of Agriculture has the discretion to adjust that benchmark in future years. It remains to be seen how the two agencies will align their funding priorities or processes subsequent to the first year of the ReConnect Program.

In order for strategies to increase infrastructure investment to be truly effective, the federal government needs an ongoing assessment of what the entire government is trying to accomplish and common

milestones against which progress can be measured. In 2009, Congress directed the FCC to establish metrics for meeting the goal of universal broadband. However, as several participants observed, the FCC's National Broadband Plan has not been updated in eight years. The group recommended that the National Broadband Plan be updated based on current data.

Moreover, any effort to update the National Broadband Plan should be done within the executive branch, potentially at NTIA. "Implementation is important," Blair Levin noted, and implementation begins with a planning process designed to build support across the administration.

Broadband is not static; it changes over time in response to consumer demand, new applications and new usage (see Figure 2). More than two decades ago, the FCC viewed infrastructure providing at least 200 kilobytes as "advanced telecommunications capability." Today, the FCC uses 25/3 Mbps as its benchmark for purposes of its annual report to Congress.

Figure 2. What is Broadband? Standard Speeds, by Year

Year	*FCC Annual Report to Congress*	*FCC Connect America Fund (USF)*
1999	200 Kbps symmetrical	
2010	4/1 Mbps	
2011		4/1 Mbps
2014		10/1 Mbps
2015	25/3 Mbps	
2018		25/3 Mbps

Source: Compiled from https://www.fcc.gov/reports-research/reports/annual-reports-congress and https://www.fcc.gov/general/universal-service

Similarly, the FCC's view of what is required for universal service has changed over time. Initially, in 2011, the FCC set a standard of 4/1 Mbps for recipients of the Connect America Fund. Subsequently, in 2014, it raised the minimum standard to 10/1 Mbps. In summer 2018, the FCC conducted the Connect America Phase II auction, allowing

bidders to bid for support to offer one of four tiers of service: 10/1 Mbps, 25/3 Mbps, 100/20 Mbps and 1 Gigabit/500 Mbps. Virtually all of the winning bidders plan to offer 25/3 Mbps or better broadband service. The auction results helped inform the FCC's recent decision to set 25/3 Mbps as the minimum standard for future deployment by smaller incumbents receiving Connect America Fund subsidies.

Conference participants agreed that the baseline for broadband should be periodically reassessed, based on data. This year, the group unanimously viewed 25/3 Mbps as the baseline—the minimum level of fixed broadband service that all Americans should have.

According to the FCC, there is a gap in broadband availability between rural and urban residents. Based on December 2017 FCC Form 477 data, fixed terrestrial broadband with speeds of at least 25/3 Mbps has been deployed to approximately 94 percent of all Americans: 98.5 percent of Americans in urban areas and 75.7 percent of Americans in rural areas. The FCC estimates that 19 million people lack fixed terrestrial 25/3 Mbps broadband.[15]

As several participants pointed out, the number of unserved could be higher. The methodology used by the FCC to calculate its numbers for fixed broadband—treating all residents in a given census block as served even if only one resident has access to service—masks the true extent of the broadband availability gap.

… the rollout of 5G may actually increase, not lessen, the mobile wireless digital divide.

Similarly, while much attention these days is focused on the highly anticipated arrival of 5G, there still are areas of the country that lack 4G or even 3G, or only have such service due to ongoing Universal Service Fund subsidies. And there was concern among attendees that the rollout of 5G will actually increase, not lessen, the mobile wireless digital divide.

Multiple participants at the conference predicted that 5G will not be available to a significant portion of the country. Blair Levin, for example, noted, "5G will not go to more than 60 percent, maybe 70

percent of the country, which means the wireless digital divide will be about three times larger and possibly much larger than that." The hype around 5G is "creating expectations for all consumers that far outstrip the planned deployments," said Christopher Yoo.

While removing regulatory barriers may help advance 5G deployment in some areas, it will not change the underlying economics: 5G requires the existence of a fiber-rich network, and the cell densification needed for 5G is not commercially feasible in lower density areas, which typically are rural. That is why some conferees speculated that 5G likely will exacerbate a wireless digital divide.

The hype around 5G is "creating expectations for all consumers that far outstrip the planned deployments." – *Christopher Yoo*

Recognizing that markets and technology will change, participants asserted that it is critical to set aspirational goals—a direction of where the nation should be heading. This is particularly important so that government interventions to meet baseline standards can support progress toward these goals. Household needs will grow over time. As Christopher McLean observed, "The trick is not to make mistakes that essentially throw money away. We should try to look to the future. We should make sure the investment to meet our minimal goal can be leveraged to meet our aspirational goals."

Conference attendees could not agree, however, on what those aspirational goals should be. Moreover, some expressed concern that setting higher long-term goals could unnecessarily foreclose useful experimentation that may lead to new innovative solutions. Insisting on futureproof networks will make other alternatives not viable, several warned. No one vision is the right model. At the same time, there was general agreement that when grant programs are considering alternative proposals for funding, there is a value in financing a technology that is scalable to higher speeds in the future.

In many respects, the debate regarding aspirational goals mirrored the conversation that the FCC has had for years over what it is trying

to accomplish with the Connect America Fund. Is the goal to provide some minimally acceptable level of broadband to everyone? Or is the goal to prioritize funding to ensure that all have access comparable to what is available in urban areas?

"We should make sure the investment to meet our minimal goal can be leveraged to meet our aspirational goals." – *Christopher McLean*

While the Telecommunications Act of 1996 mandates that all consumers should have "reasonably comparable" service at "reasonably comparable" rates, it does not specify what "reasonably comparable" means in practical terms. And reasonable people can differ on how to read those terms.[16]

RUS Assistant Administrator Christopher McLean argued that rural America is entitled to the same service as urban America. In his view, we have to stop acting like we are doing the unserved a favor, whether they live in rural America or urban America or suburban America or ex-urban America. "We have one economy," he said. "There is a cost to having a network, period." In contrast, Rob Atkinson, Founder and President of Information Technology and Innovation Foundation (ITIF), questioned the notion that rural residents should have subsidized access to infrastructure equivalent in cost and quality to what is available in urban areas.

Wayne Leighton observed that just because Congress mandated universal service does not mean there is no role for a cost-benefit analysis in deciding how to implement that mandate. Rather, one can employ economic tools to compare different approaches in achieving the congressional goal and identify the costs of one approach versus another.

According to a white paper prepared by Paul de Sa, former chief of the FCC's Office of Strategic Planning and Policy Analysis, it would cost $80 billion in capital investment alone, plus an additional $2 billion in annual ongoing operations expense, to bring fiber-based broadband to all Americans.[17] The paper concluded that extending fiber to 98 percent of the country would require $40 billion in capital investment, with

those areas able to generate sufficient end-user revenue to cover ongoing operating costs going forward.

Deloitte estimates that the United States needs to invest $35–40 billion in fiber infrastructure over the next five to seven years to provide coverage for rural and underserved areas and another $15–20 billion to support wireless densification for 5G.[18] Notably, Deloitte's estimates assume the use of alternative technologies such as fixed wireless and fiber-to-the-node in rural areas, not fiber-to-the-home. A third study, prepared by Costquest Associates, estimates the investment required for ubiquitous 5G, including the fiber network needed for backhaul, to be between $61 and $250 billion, depending on varying demand assumptions.[19]

"…rural America is entitled to the same service as urban America…we have to stop acting like we are doing the unserved a favor…. We have one economy. There is a cost to having a network, period." *– Christopher McLean*

Most participants assumed that some percentage of the U.S. population will not have the same service as what is widely available in urban areas. So where do you draw the line?

Paula Boyd and Robert Pepper assumed that the last two percent of the country should be served by alternative technologies. As Paula Boyd put it, to get to the unserved, we need to be looking at fixed wireless, and for the last numbers, satellite. Danna MacKenzie, Minnesota Broadband Office, pointed out that hybrid solutions that meet short-term needs are comforting to both citizens and rural legislators. It is difficult for legislators to say, "You are the haves, and you are the have nots."

With that as the backdrop, the group offered several recommendations.

Recommendation 3: Tailor government interventions to the unique needs of specific communities, depending on whether they are unserved/underserved/served, and reassess baseline standards for broadband over time, based on data. As Christopher Yoo put it, "Rightsizing the

intervention is important." One size does not fit all. The first step in developing appropriate strategies to create incentives for investment in broadband is to segment the country into three markets: those areas that are unserved with 25/3 Mbps, those that are underserved and those that are served (see Figures 3 through 5). Different strategies are appropriate for each segment of the market. It would be an error, however, to equate "unserved" with rural, and "served" with urban. There are rural areas in each of the three categories, and also urban areas. Nicol Turner-Lee, Fellow at the Brookings Institution, disputed that access exists within low-income communities in areas that are classified as underserved or served; she highlighted the need for access to loans and other funding for those communities.

"Rightsizing the intervention is important." One size does not fit all. - *Christopher Yoo*

There was less clarity in the discussion regarding the "underserved" segment of the market. Robert Atkinson questioned whether the group was using the term "underserved" in terms of quantity (is there more than one provider?) or quality (does service meet baseline standards?) and argued that the latter issue (quality) is the appropriate one. Madura Wijewardena, Vice President of Global Public Policy at Comcast, rejected the concept of "underserved." In his view, it is easier to set a threshold—whether it is 10/1 Mbps or 23/3 Mbps, or something higher—as the dividing line between "served" and "unserved."

In response, Will Johnson, Senior Vice President of Federal Regulatory and Legal Affairs at Verizon, suggested one benefit of having a third category of "underserved" may be that it is a way to tailor appropriate policies for different problems. Geographies completely lacking a business case for broadband deployment likely require a distinct set of policies from those where market forces have led to at least some level of baseline deployment. In some areas, connectivity may only be possible with subsidies, whereas in others, a more appropriate focus would be on improving the business climate for private investment.

Underserved regions offer an opportunity for entrepreneurs, said Frank Washington, Chief Executive Officer of Crossing TV. Drawing on his experience with the FCC Minority Tax Certificates for broadcasting licenses, Washington proposed providing a benefit to companies operating in served areas in exchange for service to underserved or unserved markets.

For served areas, the question is what, if anything, should be done to benefit consumers. There was some discussion of whether additional competition in the places that are served through market forces is needed to bring faster speeds or lower prices, and whether there is any role for government to foster such competition.

Several participants pointed out that most of the nation has access to adequate broadband financed by the private sector, using private capital; they pushed back on the notion that government is the solution to improving incentives for investment. "The biggest incentive for investment is the private market and clear customer demand," said Richard Clarke, Assistant Vice President Economic and Regulatory Policy at AT&T, cautioning that we should be careful not to inhibit the ability of consumers to express their willingness to pay for something.

Conference participants developed a list of specific strategies—financial and regulatory—that can be tailored to meet the needs of specific communities. They emphasized that no one single strategy is the solution. Approaches that may work in one community may not work in others. Rather, we should promote experimentation and not be afraid to try new tactics.

Fundamentally, as one participant noted, it is a choice of poisons: do you want a top-down (federal) approach or a self-help (local) approach to address the gaps in broadband deployment? On balance, do we trust a multiplicity of local decisionmakers over the federal government? Localities may make mistakes, but institutionally they often are able to move more quickly.

With respect to infrastructure investment, multiple participants recognized that state and local governments are closer to the ground and often in a better position to make decisions tailored to the needs of their communities. There is a value in knowing what the local customers want and letting local communities define their needs, rather than forcing it down from the federal level. As Paula Boyd explained,

Microsoft's approach is not to define a problem that it is going to solve, but rather to let localities tell the company what problems they need to address—whether it is to provide connectivity for economic development for a small business district or for precision agriculture or to address the homework gap.

Figure 3. Strategies for Unserved Areas

Financial Tools	*Regulatory Tools*
Grants • New appropriations • USF CAF & Lifeline • BTOP middle mile & backhaul funding	Model defining unserved/served areas, with rebuttable presumption & appeals
Loans	Good data & broadband mapping
Taxation (revenue)	Fast track/eliminate regulatory barriers
Tax cuts/incentives for unserved or hybrid areas (90% unserved limit?)	More low-band/mid-band unlicensed spectrum, and more mid-band/high-band licensed spectrum
Public-private partnerships (PPPs) with key stakeholders (health care/ energy/university systems)	Improved federal/state/local communication/coordination

Source: Working Group Presentation at the 2018 Aspen Institute Conference on Communciations Policy in Aspen, Colorado.

Rec. 3.1: For unserved areas, one key strategy is governmental funding.

There was a wide recognition at the Conference that in unserved areas, there is a definitive role for government to play because there simply is insufficient density to justify private network investment. To get the job done, the government is going to have to invest money; the private sector is not going to do it on its own.

Some called for a radical restructuring of funding approaches. The preferred model for Eli Noam, Professor of Economics and Finance, and Director of the Columbia Institute for Tele-Information at Columbia University, would be for the federal government to provide funding to the states on some matching basis, and let them decide how to spend the money.

Jonathan Chaplin and others challenged the notion that companies need to continue to receive universal service subsidies forever: "We should make an investment in end-state infrastructure, and let the market support it going forward. Not all the infrastructure supported by public investment today should continue to be supported. If you push the fiber deeper into communities, the cost may be manageable within the system." Chaplin believes that if companies materially lower their operating costs by deploying fiber, they can become self-sustaining businesses without ongoing support from the Universal Service Fund. Blair Levin agreed: "We should want to get people off the system."

Some state and local governments are not satisfied with the extent of private sector broadband investment in their communities and are actively taking steps to provide funding above and beyond what is available from the federal government. Direct funding programs are an example of a situation where it is workable to have different federal and state standards: funding provided by the federal government to achieve some defined baseline for the country, with states and localities free to do more, using their own money.

All of the state grant programs discussed—in Minnesota, Tennessee, Massachusetts and Virginia—are aiming to bring a higher level of service to their residents than the federal minimums. The case for local autonomy and experimentation is strengthened when states and localities are willing to bring money to the table: if they are willing to pay for something better than the federal minimum, why not?

The state programs underway in Tennessee,[20] Massachusetts[21] and Virginia[22] share some common attributes. In each case, funding is targeted to unserved areas, with a process to challenge the eligibility of areas for funding. Awards are provided on a technology-neutral basis and awarded to those willing to serve at the lowest cost per home.

Several participants highlighted the value of state and federal programs working in harmony, in a sense "co-funding" broadband expansion. Christopher McLean observed that it is the availability of federal universal service support or state grant programs that provides the financial stability necessary for RUS to be able to make a long-term loan. But others took a dim view of one arm of government loaning money to companies premised on the assumption that another part of government will provide funding to repay the loan.

The discussion pointed out the need for federal programs to re-evaluate the baseline expectation for government funding. Subsequent to the conference, the FCC concluded in the context of providing more Connect America Fund support to smaller incumbents, that it would treat areas as unserved by an unsubsidized competitor only if that competitor is providing at least 25/3 Mbps broadband service, raising the screen for competitors from 10/1 Mbps. It is likely that the FCC will require 25/3 Mbps or better broadband service in future auctions and will broaden the eligibility of areas for USF funding to reflect its new baseline.

In contrast, by law, funding for the new RUS broadband pilot program must be targeted to areas where 90% or more of the households lack 10/1 Mbps, at least in the initial program year, 2019. The 2018 Farm Bill also prioritizes funding to areas lacking 10/1 Mbps.

Participants recognized that it is critical to analyze what happened with past funding efforts to learn from past experience. As Charlie Firestone noted, we can learn a lot from failures. There were both successes and failures in the prior administration's stimulus funding programs, with significant learning curves for various players at the federal, state and local levels.

There was general agreement that government funding should be provided on a technology-neutral basis, but less clarity on what technology neutrality means in practice. For instance, Robert Pepper expressed concern that setting a definition that requires technology to be scalable to 100 Mbps symmetrical prevents new business models based on hybrid wireless technologies. On the other hand, Christopher McLean worried that technology neutrality has been used in the past as a way to lower standards.

Rec. 3.2: For both unserved and underserved areas, develop public-private partnerships with key stakeholders in areas such as healthcare, energy and higher education.

Often, local efforts to promote broadband are galvanized by dissatisfaction from key local businesses and anchor institutions regarding the level of service provided by the current incumbent, whether telecom carrier or cable operator, as well as dissatisfaction from residential customers. Public-private partnerships provide the opportunity to marry local knowledge with private sector expertise in service provision. Moreover,

Figure 4. Strategies for Underserved Areas	
Financial Tools	***Regulatory Tools***
Lifeline for broadband	Model defining unserved/served areas, with rebuttable presumption & appeals
Loans	Good data & broadband mapping
Taxation	Fast track/eliminate regulatory barriers
PPPs with key stakeholders (health care/energy/university systems)	Access to infrastructure/rights of ways
	Improved federal/state/local communication/coordination
	Government as anchor tenants & demand stimulator
	Targeted build-out requirements
	Demand aggregation of consumers

Source: Working Group Presentation at the 2018 Aspen Institute Conference on Communciations Policy in Aspen, Colorado.

both public and private sector stakeholders in areas such as healthcare, energy and education may have incentives to co-invest in solutions that will enable them to improve their own operations.

Some participants, however, questioned whether local governments themselves should take on the role of service provider. Localities may lack the knowledge and expertise to be a broadband provider. While acknowledging there have been some successful municipal broadband deployments, Christopher Yoo pointed out that many are cash-flow negative. Eli Noam warned that public-private partnerships "can totally muddle the different roles, particularly the public role."

Rec. 3.3: We need good maps and better data in all areas.

There was general agreement that to effectively devise a strategy to promote investment in next generation digital infrastructure, it is critical to know where broadband is, and more importantly, where it is not. Accurate maps are necessary to target funding to unserved areas.

One important question is, Whose data and whose maps? Multiple funding sources at different levels of government, each relying on different information sources, raise the potential for inefficiencies and a fail-

ure to target funding effectively absent a sharing of data and commonly accepted definitions for how information should be reported.

RUS intends to rely on multiple sources of data to determine which areas qualify for funding for its new broadband pilot program. NTIA's National Broadband Map has not been updated since 2014, although—as noted by David Redl—Congress recently directed NTIA to update its map.[23]

The FCC's Form 477 data may yield a false picture of the availability of broadband service, for several reasons. First, under current FCC rules, if a service provider offers fixed broadband service to any portion of a census block, that block is counted as "served." While that presumption works in geographically small, typically urban, census blocks, it is more problematic in rural areas where census blocks can be considerably larger because a small portion of the census block may be served while the remainder is not.

In some instances, states are able to more precisely map actual broadband availability. For instance, Minnesota has been able to determine at a more granular level where broadband is lacking by overlaying information regarding the service territory boundaries of its service providers. Christopher McLean noted that the work of Minnesota and other states that have continued to map broadband within their states will be invaluable to the RUS in helping to identify areas that will be eligible for the new RUS pilot project.

Second, under the current FCC Form 477 rules, broadband providers report they serve a block if they are "able" to provision broadband service within a reasonable time frame—even if they are not actually providing service. One solution, advocated by Paula Boyd of Microsoft, would be for the FCC to change its rules so that carriers do not report service in blocks unless they actually serve someone in the census block.

Third, broadband providers can and do make mistakes in reporting their data. That is why many have urged for a process to independently validate the data that is submitted by service providers (although no one in Congress seems willing to appropriate funding to pay for such efforts).

And finally, as several Aspen participants noted, the delay in the release of Form 477 data makes the data less useful for targeting funding to unserved areas. Typically, the FCC's publicly available data is a year old. The risk is that recent deployment is not captured when funding

decisions are made based on stale data. States like Minnesota are able, however, to obtain data from the providers in their own state more rapidly, enabling them to target funding more effectively.

Rec. 3.4: Establish a process to challenge data/maps to refine which areas are unserved and underserved in order to target government interventions more effectively.

For purposes of targeting the Connect America Fund to areas that are not served by unsubsidized providers, the FCC has undertaken challenge proceedings on several occasions. This provides an opportunity for interested parties to present evidence to persuade the FCC to flip the designation of an area from "served" to "unserved" and from "unserved" to "served."

Thus far, the FCC has effectively put the burden on parties challenging its maps to prove the maps are wrong. That was the approach taken when the FCC offered Connect America Fund Phase II support to incumbent wireline carriers to extend broadband service and for the Mobility Fund Phase II challenge process. In essence, it represents a willingness to tolerate false negatives in some areas to ensure that finite resources are going to the areas of most need, even if that leaves the potential for some areas to remain unserved.

Madura Wijewardena agreed that it is appropriate to put the onus on the party seeking funding to identify specific areas that are unserved, with an opportunity for public comment. He noted that Comcast is seeking public funding for broadband expansion for the first time through the programs in Tennessee, Massachusetts and Virginia, which use the FCC maps as the starting point and allow for public comments to augment those maps by using various proof points. On the other hand, numerous stakeholders, both in the private sector and elected officials, have vocally criticized the FCC's current challenge process to determine eligibility of areas for the upcoming Mobility Fund Phase II as being overly burdensome.

It is a problem when there are no providers interested in challenging the presumption that an area is served. This is particularly troubling in low-income communities that may be classified as served, where the private sector is less likely to step forward to challenge the presumption. It is also a problem when the costs of mounting an effective challenge

are high for interested stakeholders. Local communities typically are not well equipped to participate in regulatory proceedings. The end result will be digital deserts that remain unserved with no prospects for relief on the horizon.

Rec. 3.5: For both unserved and underserved areas, government can aggregate demand, as an anchor tenant and as a driving force for adoption, by providing services online.

Public safety, smart grid, smart cities, smart road, education and healthcare are all public services that are going to be disrupted by next generation technology, according to Larry Downes of Georgetown University. Therefore, government itself could drive broadband investment by aggregating demand and by implementing government programs through online apps. Government can serve as an anchor tenant that commits to being a customer of a newly deployed network, and it can stimulate demand by creating e-government programs.

Jeff Smulyan, CEO of Emmis Communications, suggested that healthcare is "a perfect example, where Medicare—with a fully deployed network—could save billions of dollars in terms of services." Robert Pepper pointed out that if Medicare and Medicaid applications were easily available online, that would drive an increase in online demand from the older population.

Governmental institutions should have economic incentives to contribute to the cost of the communications network in order to realize cost savings in other programs, such as healthcare. The challenge is to figure out the mechanisms to make that sort of cross-government financing work.

Rec. 3.6: For all areas, reducing regulatory barriers is a strategy that may increase the incentives for investment.

One approach to stimulate investment in broadband, favored particularly by the companies themselves, is to remove regulatory barriers. Recent FCC efforts to reduce regulatory barriers to broadband deployment are a case study in conflict between different levels of government. The deployment of broadband infrastructure in many instances raises issues of access to rights-of-way, local zoning and permitting. Key stakeholders have fundamentally different views about state and local requirements. Service providers support some restrictions on

local authority so as to provide greater consistency and certainty and to protect against unreasonable costs. In contrast, many states and localities view restrictions as undermining their ability to negotiate fees that are a potential source of revenue or to protect the health, safety and welfare of their constituents. Some localities argue these revenues help to finance important policy objectives, including local efforts to close the digital divide. Ultimately these questions need to be asked: Can and should the federal government impose federal limits on local and state authorities, and how should policymakers weigh the tradeoffs between encouragement of investment in communications and local concerns?

Figure 5. Strategies for Served Areas

Financial Tools	*Regulatory Tools*
Lifeline for broadband	Model defining unserved/served areas, with rebuttable presumption & appeals
	Good data & broadband mapping
	Fast track/eliminate regulatory barriers
	Targeted buildout requirements
	Demand aggregation of consumers

Source: Working Group Presentation at the 2018 Aspen Institute Conference on Communciations Policy in Aspen, Colorado.

Rec. 3.7: Provide funding to reduce the cost of broadband for low-income households by funding Lifeline for broadband.

Several participants reminded the group not to ignore the demand side of the equation, particularly for vulnerable populations. The group highlighted the importance of Lifeline funding to make broadband more affordable for low-income households.

In 2016, the FCC modernized the Lifeline program, which formerly provided a $9.25 per month subsidy for telephone service. The FCC concluded, among other things, that it would phase-out support for voice over a period of years and instead would provide the $9.25 discount on qualifying broadband service. It also sought to increase competitive entry into the program by creating a new Lifeline Broadband Provider designation process that would be administered by the FCC rather than the states. The changes were intended to broaden access to broadband for low-income households.

In 2017, the FCC reversed course, proposing to eliminate the FCC designation of Lifeline Broadband Providers, returning authority to the states to designate the entities that would offer Lifeline service. It proposed to limit participation in the Lifeline program to facilities-based carriers, noting that the vast majority of instances of waste, fraud and abuse in the previous five years had involved resellers. It also proposed to impose an annual cap on Lifeline disbursements, asking what the cap should be and whether it should be adjusted for inflation over time or in response to specific events.[25]

Carmen Scurato, Vice President of Policy and General Counsel at the National Hispanic Media Coalition, argued that these various FCC proposals to change the Lifeline program would be a large step backward, pointing out there is currently a racial digital divide, and adoption gaps exist between whites and people of color. According to Free Press, 58 percent of white households with income under $20,000 have internet access at home compared to 51 percent of Hispanic households and 50 percent of black households in that same income bracket.[26] Moreover, because more than 70 percent of Lifeline households purchase service from wireless resellers, elimination of such providers from the program would have an enormous impact. Only 49 percent of households with income under $20,000 have home internet service, with internet-adopting households in the bottom income quintile twice as likely as upper-income households to live in a household with only mobile internet access.[27]

Recommendation 4: Localities should jointly convene a consortium to negotiate a reasonable template agreement between local governments and broadband providers that could be broadly used to reduce the time and cost of negotiation around deployment. A forum for local governments to work directly with service providers could help reduce transactional costs surrounding broadband investment. The objective of the consortium would be to negotiate a reasonable framework for deployment that could be broadly used across communities. By limiting the number of issues left for negotiation, service providers and localities could more quickly come to terms on the necessary steps to proceed. The group assumed there is a high degree of overlap—75 percent to 80 percent—in what cities want in terms of infrastructure investment, and in the right environment, they would have incentives to work cooperatively. The consortium could create:

1. Template(s) for agreements on reducing barriers to local deployment
2. Cost studies around local deployment
3. Case studies of unique scenarios in speeding up local deployment

The benefits would stem from empowering local officials to come to the table, providing a forum to normalize facts and identify options for future action. This would lower transactional costs, providing a meaningful opportunity to reach agreement and move forward.

There would be a political value in convening such an effort outside of the FCC because there is inherent suspicion at the local level of FCC involvement. The ideal approach would be a bottoms-up solution, with cities motivated to find areas of consensus amongst themselves and with service providers in order to accelerate broadband deployment in their respective localities. The alternative to such a forum is the threat of rules imposed by the federal government in a top down approach, which everyone hates, argued Jonathan Chaplin.

There are advantages to taking action outside the ambit of the federal government, such as the ongoing Broadband Deployment Advisory Committee, which seeks expertise and input from across the industry, including consumer perspectives. For instance, such discussions would not need to comply with the requirements of the Federal Advisory Committee Act, nor would participants be limited in their collection of data by the federal requirements of the Paperwork Reduction Act.

The focus of this recommendation would be to improve the investment climate in areas that are "served" with broadband meeting current baseline standards, but not on a trajectory to have next generation infrastructure in the future. This is critical to maintaining the United States' economic competitiveness, urged Jonathan Chaplin. His concern is that 60 percent to 70 percent of the country that is deemed "served" has infrastructure that is woefully lacking.

III. Protecting Consumers and Promoting Competition

The final set of recommendations center on emerging issues relating to competition and consumer protection in a digital era. They focus on strategies to accelerate the public use and safe enjoyment of communications technologies and services, and who gets to set the rules of

the road. This is particularly relevant in situations where the FCC has expressly disavowed jurisdiction to regulate key players in areas such as privacy or net neutrality. Can states step in to fill the void?

What do consumers want with respect to communications infrastructure and services?

- **Value**
- **Choice**
- **Transparency**
- **Privacy**
- **Quality**
- **Reliability**
- **Redress**
- **Data security**
- **Innovation**
- **Integrity**

Here, the discussion went beyond consumer protection to include core values for citizenship, civil rights, human rights, social policy and democracy in an internet era. It is critical to recognize that existing civil rights laws that outlaw discrimination already apply to the digital online universe, Nicol Turner-Lee and others noted. But if there are gaps in the law that prevent enforcement of those laws, they need to be addressed.

Ultimately, many of the emerging issues center around online platforms. As Bill Bailey, Vice President of Government Relations at Disney, stated, "All of the facilities-based issues are important, but looking at major events of last year, there are issues with data and online platforms. That's part of the soup-to-nuts online experience of consumers."

Our definition of what is fraud, and what practices are harmful to consumers, has changed over time, observed the FCC's Wayne Leighton. Technological advances have provided new tools to commit fraud through online interactions. At the same time, technology may empower consumers, companies and the government as they seek to protect themselves against such abuse. The critical question in this case is who is the cop on the beat, and is that entity well equipped to play that role? The difficulty becomes apparent when there is a mismatch between the concerns of governments, their constituents and the legal authority of governmental agencies, according to Reed Hundt. "We haven't been changing the genetic code of our agencies."

Having separate state-by-state regimes for online activities can burden companies operating in multiple states, as national operators effectively are forced to comply with the rules of the most restrictive state. Richard Clarke explained, "Large companies do not operate

well on a balkanized basis. Do we want the state that drafts the most stringent rules to lord over all of the other states?" It is critical to ask whether state and local policies are imposing negative externalities on the national system, suggested Robert Atkinson.

Recommendation 5: Congress should enact federal privacy legislation. Virtually everyone agreed that privacy is an important issue, and the European Union's recent implementation of the General Data Protection Regulation (GDPR) is already having an impact on the American landscape, with the California privacy law looming on the horizon.[28] As Marc Rotenberg observed, "There has been a significant change because of GDPR. Whether you're in favor of it or against it, it is in a sense a new reality. You might describe it as a forcing function, or you might describe it as something that needs to be dismantled. But it is no longer the case that we're writing on a blank sheet. There is a new privacy framework that we have to confront one way or another." Robert Pepper agreed, "GDPR has refocused the discussion everywhere. It is the starting point for the conversation. That's useful."

Subsequent to the Conference, NTIA solicited public comment on a potential national privacy framework.[29] It noted that some foreign countries and American states had articulated different visions for how to address privacy concerns, leading to a nationally and globally fragmented regulatory landscape. NTIA's stated objective is to develop a national approach to consumer data privacy designed to provide high levels of protection for individuals while giving organizations legal clarity and the flexibility to innovate.

Notably, the request for comment was the product of an interagency process led by the National Economic Council. NTIA worked with the International Trade Administration to ensure consistency with international privacy objectives.

There was no agreement by participants, however, on whether federal law should preempt state law, or if states should be free to adopt additional requirements. Nor was there agreement on whether federal legislation should be comprehensive or sector-specific. Participants did, however, agree on a series of steps to improve the everyday American users' experience of the digital ecosystem.

Recommendation 6: Consumers should have improved access to information on appropriate channels of redress for issues or disputes relating to products or services in the communications marketplace. Information is available today on the FCC's website on common types of complaints involving phone service and how to file an informal complaint. The FCC's website also indicates that consumers may file informal complaints regarding internet-related issues, and the FCC will forward such complaints to the Federal Trade Commission (FTC). But people may not even know to look on the FCC website for such information. Many consumers have no idea which governmental agency has authority to address issues of concern in the communications marketplace or how to lodge a complaint.

One solution would be to establish an online tool, possibly leveraging machine learning, to make it easier for consumers to identify and interact with the appropriate channel, whether that be the FTC, FCC, NTIA, a state attorney general or some other body, in situations where they believe they have been harmed. Such an online tool potentially could be developed and managed by a nongovernmental entity such as a nonprofit.

Recommendation 7: Participants in the internet ecosystem should foster meaningful consumer choice through plain language disclosures. Consumers purchase services from internet service providers and interact with others in the internet ecosystem that provide something of perceived value under different business models. Transparency regarding pricing, key service characteristics and business practices would enable consumers to make informed decisions. And, as Kathleen Ham, Senior Vice President of Government Affairs at T-Mobile, put it, "Information needs to be understood by the average consumer."

Recommendation 8: Participants in the internet ecosystem should promote improved security of digital information. In particular, there is a need for standards on emerging technologies, such as the Internet of Things, and an increase in consumer education. The security of information generated by devices connected to the internet will have enormous implications for both residential consumers and businesses.

Recommendation 9: All members of the communications ecosystem should promote integrity to ensure that the ecosystem serves the interests of consumers and citizens. American citizens do not want to feel that foreign governments are interfering in elections, nor do they want to feel subject to continual surveillance in the online world. Consumers are looking for a level of accountability not just for their service providers but also for online platforms.

Recommendation 10: Improve consumer choice by removing barriers to network deployment in a technology and business-model neutral way, including options for locally based networks. The sense of the group was that people should have a competitive choice of broadband providers, although there were differing views of the appropriate role of government in implementing this recommendation. Consumers should have options in their choice of companies and businesses should be able to participate in a competitive market.

Unfinished Business for Future Conversations

In a number of areas, there was general agreement among the participants on broad principles for action but less consensus on the specific details. Thus, the group offered several high-level recommendations that would benefit from further analysis and more in-depth discussion.

For instance, several recent and emerging issues arising from the digital ecosystem may warrant some form of governance, such as algorithmic discrimination, data profiling, harmful speech and the rise of disinformation on digital platforms. Participants recognized these issues are complex and important, but they could not agree on whether or what specifically warranted further study or by whom, nor could they agree on the best way to study such issues. Safiya Umoja Noble suggested that any one of these issues could benefit from a more in-depth examination.

Similarly, while there was an effort to develop a recommendation regarding the potential for antitrust laws to be used internationally as a trade barrier and as a form of national protectionism, FCC General Counsel Alden Abbott urged caution given the complexity of ongoing international efforts in this area.

There also was some discussion, but not agreement, on whether and how to make the FTC's consumer welfare standard more agile. Conference participants discussed a recommendation to consider whether competition review should take into account additional factors such as evolving business practices, new technologies, international developments and issues including but not limited to privacy, increased communications consolidation and research and development spending. This provoked a spirited conversation and disagreement among conference participants. While some argued that the language in the recommendation—"to consider whether" competition review should take into account other factors—was carefully crafted not to prejudge the answer, others were not convinced. With the FTC holding a series of public hearings on privacy, big data and competition, these issues are ripe for further discussion.[30]

Endnotes

1. Computer Professionals for Social Responsibility, "National Information Infrastructure," http://cpsr.org/prevsite/program/nii/nii.html/.

2. Cédric Villani, *For a Meaningful Artificial Intelligence: Towards a French and European Strategy,* 2018, https://www.aiforhumanity.fr/pdfs/MissionVillani_Report_ENG-VF.pdf. The first prong of the French approach would be to promote data access, making data publicly available. Second, the French government would focus on four key sectors – health, transport/mobility, environment and defense/security – uniting the various ecosystems around sector-specific pooling platforms and making space for experimentation. These sector-specific platforms would provide secured and shared access to useful data for all participants in the ecosystem (researchers, companies, public authorities). Third, the report envisioned that the use of data could lead to a profound transformation in the delivery of government services. For example, public health services could use data generated by Internet of Things devices for the early detection of diseases, reducing healthcare costs by earlier interventions. *See also* Nick Wallace, *Countries Can Learn from France's Plan for Public Interest Data and AI,* Center for Data Innovation, August 14, 2018, https://www.datainnovation.org/2018/08/countries-can-learn-from-frances-plan-for-public-interest-data-and-ai/.

3. Title VI, Subtitle B, of the 2018 Farm Bill focuses on connecting rural Americans to high speed broadband. The Conference Report is available at https://docs.house.gov/billsthisweek/20181210/CRPT-115hrpt1072.pdf.

4. U.S. Department of Agriculture and U.S. Department of Commerce, *Broadband Opportunity Council Report and Recommendations*, 2015, https://www.ntia.doc.gov/files/ntia/publications/broadband_opportunity_council_report_final.pdf.

5. U.S. Department of Agriculture and U.S. Department of Commerce, *Broadband Opportunity Council Progress Report*, 2017, https://www.ntia.doc.gov/files/ntia/publications/broadband_opportunity_council_agencies_progress_report_jan2017.pdf. The stated mission of the Broadband Interagency Working Group is to improve coordination across programs, reduce regulatory barriers to broadband deployment, promote awareness of the importance of federal support for broadband investment and digital inclusion programs, and collect and share information with communities about available federal resources for broadband deployment and digital inclusion efforts.

6. U.S. Department of Agriculture, *Report to the President of the United States of the Task Force on Agriculture and Rural Prosperity*, 2017, https://www.usda.gov/sites/default/files/documents/rural-prosperity-report.pdf.

7. Request for Comments: Broadband e-Connectivity Pilot Program, July 17, 2018, https://www.regulations.gov/document?D=RUS-18-TELECOM-0004-0001.

8. Additional information about USDA's Re-Connect Program is available at https://reconnect.usda.gov/s/.

9. NTIA's BroadbandUSA serves as a resource for local and state governments, industry and nonprofits that are seeking to expand broadband connectivity and promote digital inclusion. It supports local planning efforts, helps to identify funding, advises on local broadband programs and convenes regional workshops that bring local stakeholders together. *See* https://broadbandusa.ntia.doc.gov/.

10. 47 U.S.C. § 151.

11. 47 U.S.C. § 254(b)(3).

12. American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 6001(k)(2)(D), 123 Sta. 115, 516.

13. *Connect America Fund et al.*, WC Docket No. 10-90 et al., Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663 (2011), *aff'd sub nom., In re*: FCC 11-161, 753 F.3d 1015 (10 Cir. 2014).

14. *Connect America Fund et al.*, WC Docket No. 10-90 et al., Report and Order, Further Notice of Proposed Rulemaking, and Order on Reconsideration, FCC 18-176 (rel. Dec. 13, 2018).

15. Federal Communications Commission, *FCC Releases Draft Appendices to the Communications Marketplace Report*, GN Docket No. 18-231, Public Notice, DA 18-1230, Appendix D-1, December 4, 2018, https://www.fcc.gov/document/fcc-releases-draft-appendices-communications-marketplace-report.

16. The FCC annually sets "reasonable comparability" benchmarks for pricing of broadband service for Connect America Fund recipients, based on an annual survey of urban rates. The pricing benchmark is set at two standard deviations above the mean rate for broadband with specific service characteristics, based on the annual survey. The benchmark varies for broadband service with differing download and upload speeds and usage allowances. *See generally* https://www.fcc.gov/general/urban-rate-survey-data-resources.

17. Paul de Sa, *Improving the Nation's Digital Infrastructure*, https://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0119/DOC-343135A1.pdf.

18. Deloitte, *Communications Infrastructure Upgrade: The Need for Deep Fiber*, 2017, https://www2.deloitte.com/content/dam/Deloitte/us/Documents/technology-media-telecommunications/us-tmt-5GReady-the-need-for-deep-fiber-pov.pdf.

19. CostQuest Associates, *The 5G Mobile Ubiquity Price Tag*, 2017, https://www.costquest.com/uploads/pdf/5g-mobile-ubiquity-costs-summary.pdf.

20. Tennessee has established a "Broadband Accessibility Grant Program," which is providing $30 million over a three-year period ($10 million per year) to broadband providers for capital investments necessary to deploy broadband to unserved homes and businesses. Funding is targeted to areas lacking 10/1 Mbps broadband service, with the opportunity to challenge the FCC's data regarding service availability. The program is administered by the Tennessee Department of Economic and Community Development. See Tennessee Department of Economic and Community Development, "Tennessee Broadband Accessibility Grant," https://www.tn.gov/ecd/rural-development/tennessee-broadband-grant-initiative/tnecd-broadband-accessibility-grant.html.

21. Massachusetts's Last Mile grant program is focused on 44 unserved areas in Western Massachusetts. Since May 2016, the Massachusetts Broadband Institute and the Executive Office of Housing and Economic Development have awarded over $31 million to extend broadband to 42 towns in Western Massachusetts, including projects to construct municipally owned fiber-to-the-home networks and grants for private providers to expand networks in unserved and partially served communities. See Massachusetts Broadband Institute, "Last Mile Program for Unserved Towns," https://broadband.masstech.org/last-mile-programs/program-unserved-towns.

22. Virginia is providing grants to the private sector to extend service to areas unserved with 10/1 Mbps service in a program administered by the Department of Housing and Community

Development. Grant applicants are required to provide public notice of where they are seeking funding, and the program plans to implement a challenge process in the next funding cycle to allow other parties to present evidence that they in fact do serve the area in question. See Virginia Department of Housing and Community Development, "Virginia Telecommunications Initiative (VATI)," http://www.dhcd.virginia.gov/index.php/business-va-assistance/telecommunications/254-virginia-telecommunication-planning-initiative-vatpi.html and Virginia Department of Housing and Community Development, *2019 Virginia Telecommunications Initiative Program Guidelines and Criteria* (draft document), http://www.dhcd.virginia.gov/images/VATI/Draft%202019%20Virginia%20Telecommunication%20Initiative%20Program%20Guidelines%20and%20Criteria.pdf (funding guidelines for 2019).

23. NTIA sought recommendations and feedback on potential sources of broadband availability data, as well as mechanisms to validate that data and any other ideas that can help to better inform broadband infrastructure planning. Improving the Quality and Accuracy of Broadband Availability Data, 83 Fed. Reg. 24747 (May 20, 2018), https://www.ntia.doc.gov/files/ntia/publications/fr-05302018-rfc-improving-broadband-data.pdf.

24. In August 2018, the Commission concluded that state and local moratoria on telecommunications services and facilities deployment are barred by section 253(a). *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment et al.*, Third Report and Order and Declaratory Ruling, WC Docket No. 17-84 et al., 33 FCC Rcd 7705(2018). In September 2018, after the Aspen conference, the FCC took action with respect to local fees and permitting processes for authorizations for small cell deployment. *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment et al.*, Declaratory Ruling and Third Report and Order, WT Docket No. 17-79 et al., FCC 18-133 (rel. Sep. 27, 2018).

25. *Bridging the Digital Divide for Low-Income Consumers et al.,* Fourth Report and Order, Order on Reconsideration, Memorandum Opinion and Order, Notice of Proposed Rulemaking, and Notice of Inquiry, WC Docket No. 17-287 et al., 32 FCC Rcd 10475 (2017).

26. S. Derek Turner, *Digital Divide: The Impact of Systematic Racial Discrimination on Home Internet Adoption,* December 2016, https://www.freepress.net/sites/default/files/legacy-policy/digital_denied_free_press_report_december_2016.pdf.

27. S. Derek Turner, *Digital Divide,* 2016.

28. The California law gives consumers – defined as California residents for tax purposes – the right: to know what personal information is collected about them and how it is used, to opt-out of allowing businesses to sell their personal information to third parties, to have a business delete their personal information, and to receive equal service from a business even if they exercise their privacy rights under the law. Any company in the United States with an online presence that collects personal information from California residents is subject to the California requirements, which will be implemented in 2020.

29. Developing the Administration's Approach to Consumer Privacy, 83 Fed. Reg. 48600 (Sep. 26, 2018), https://www.ntia.doc.gov/files/ntia/publications/fr-rfc-consumer-privacy-09262018.pdf. The request for comment does not call for enactment of a statutory standard. Rather, it seeks to identify a set of user-centric privacy outcomes that underpin the protections that should be produced by any federal actions on consumer-privacy policy and a set of high-level goals that describe the outlines of the ecosystem that should be created to provide those protections.

30. Federal Trade Commission, Hearings on Competition and Consumer Protection in the 21st Century, https://www.ftc.gov/policy/hearings-competition-consumer-protection.

APPENDIX

The 33rd Annual Aspen Institute
Conference on Communications Policy

Next Generation Digital Infrastructure: Toward a New Regime for Promoting Investment, Competition and Consumer Protection

Aspen, Colorado
August 12-15, 2018

Conference Participants

Alden F. Abbott
General Counsel
Federal Trade Commission

Robert Atkinson
Founder and President
The Information Technology and Innovation Foundation

Bill Bailey
Vice President,
Government Relations
The Walt Disney Company

A.J. Bhadelia
Manager, Public Policy and Government Affairs
Google

Paula Boyd
Senior Director, Government and Regulatory Affairs
Microsoft

Matthew Bui *(guest scholar)*
Ph.D. Student and Graduate Fellow
USC Annenberg School for Communication and Journalism

Jonathan Chaplin
Managing Partner
New Street Research

Richard Clarke
Assistant Vice President,
Economic and Regulatory Policy
AT&T Services, Inc.

Larry Downes
Project Director
Georgetown Center for Business and Public Policy
Georgetown University

Charlie Firestone
Executive Director
Communications and Society Program
The Aspen Institute

Note: Titles and affiliations are as of the date of the conference.

Kathleen Ham
Senior Vice President,
Government Affairs
T-Mobile USA, Inc.

Alexander Hoehn-Saric
Chief Counsel, Subcommittee
on Communications and
Technology
U.S. House Committee on
Energy and Commerce

Reed Hundt
Chief Executive Officer
Making Every Vote Count

Will Johnson
Senior Vice President,
Federal Regulatory and
Legal Affairs
Verizon

Wayne Leighton
Chief, Office of Strategic
Planning and Policy Analysis
Federal Communications
Commission

Blair Levin
Fellow
Brookings Institution

Christopher Lewis
Vice President,
Government Affairs
Public Knowledge

Mark Lloyd
Professor
USC Annenberg School for
Communication and Journalism

Danna MacKenzie
Executive Director, Broadband
Development
Minnesota Department of
Employment and Economic
Development

Carol Mattey *(rapporteaur)*
Principal
Mattey Consulting

Christopher McLean
Assistant Administrator, Rural
Utilities Service Electric
Programs
United States Department of
Agriculture Rural Development

Eli Noam
Director, Columbia Institute for
Tele-Information, and Professor
of Economics and Finance
Columbia University

Safiya Umoja Noble
Assistant Professor, Department
of Information Studies
USC Annenberg School for
Communication and Journalism

Robert Pepper
Head of Global Connectivity
and Technology Policy
Facebook

Note: Titles and affiliations are as of the date of the conference.

David J. Redl
Assistant Secretary for Communications and Information and Administrator,
National Telecommunications and Information Administration,
U.S. Department of Commerce

Marc Rotenberg
President and Executive Director
Electronic Privacy Information Center

Carmen Scurato
Vice President, Policy & General Counsel
National Hispanic Media Coalition

Vanessa Sinders
Senior Vice President, Congressional and Administration Affairs
Charter Communications

Jeff Smulyan
Chief Executive Officer and Chairman of the Board
EMMIS Communications

Nicol Turner-Lee
Fellow, Center for Technology Innovation
Brookings Institution

Frank Washington
Chief Executive Officer and Founder
Crossings TV

Madura Wijewardena
Vice President, Global Public Policy
Comcast Corporation

Christopher S. Yoo
John H. Chestnut Professor of Law, Communication, and Computer & Information Science
University of Pennsylvania

Staff:

Dominique Harrison
Senior Project Manager
Communications and Society Program
The Aspen Institute

Note: Titles and affiliations are as of the date of the conference.

About the Author

Carol Mattey is the Principal of Mattey Consulting LLC, based in the Washington, D.C., metro area. Mattey Consulting provides regulatory, strategic and public policy advisory services to broadband providers, governmental entities, nonprofit organizations and others active in the telecommunications industry.

Ms. Mattey has more than 30 years of experience formulating, enforcing and advising on federal communications regulation. Prior to launching her own firm, Ms. Mattey was Deputy Chief of the Wireline Competition Bureau at the Federal Communication Commission (FCC) from March 2010 to February 2017, where she focused on modernizing the FCC's universal service programs. Before that, she served as Senior Attorney Advisor on the FCC's National Broadband Plan from September 2009 to March 2010. From 2005 to 2009, she was a director in Deloitte's Technology, Media and Telecommunications practice advising private sector clients on business strategy and regulatory compliance matters. Between 1994 and 2004, she held several management positions at the FCC, including Deputy Bureau Chief, focusing on wireline policy issues, including local competition, privacy and universal service. Previously, she worked on telecommunications, media and spectrum issues at the National Telecommunications & Information Administration. She started her professional career as an attorney at Wilmer Cutler & Pickering (now WilmerHale) in Washington, D.C.

Ms. Mattey received a J.D. *cum laude* and M.A. in Public Policy Analysis from the University of Pennsylvania, and a B.A. from the University of Virginia.

About the Communications and Society Program

www.aspeninstitute.org/c&s

The Communications and Society Program is an active venue for framing policies and developing recommendations in the information and communications fields. We provide a multidisciplinary space where veteran and emerging decisionmakers can develop new approaches and suggestions for communications policy. The Program enables global leaders and experts to explore new concepts, exchange insights, develop meaningful networks and find personal growth, all for the betterment of society.

The Program's projects range across many areas of information, communications and media policy. Our activities focus on a broad spectrum of ICT issues such as open and innovative governance; public diplomacy; institutional innovation; broadband and spectrum management; consumer cybersecurity; artificial intelligence; connected learning; issues of race and diversity; and the free flow of digital goods, services and ideas across borders.

Most conferences employ the signature Aspen Institute seminar format: approximately 25 leaders from diverse disciplines and perspectives engaged in roundtable dialogue, moderated with the goal of driving the agenda to specific conclusions and recommendations. The program distributes our conference reports and other materials to key policymakers, opinion leaders and the public in the United States and around the world. We also use the internet and social media to inform and ignite broader conversations that foster greater participation in the democratic process.

The Program's Executive Director is Charles M. Firestone. He has served in this capacity since 1989 and is also a Vice President of the Aspen Institute. Prior to joining the Institute, Mr. Firestone was a communications attorney and law professor who has argued two cases before the United States Supreme Court and many in the courts of appeals. He is a former director of the UCLA Communications Law Program, first president of the Los Angeles Board of Telecommunications Commissioners, and an appellate attorney for the U.S. Federal Communications Commission.

Previous Publications from the Aspen Institute Communications Policy Project

Rethinking Institutions of Spectrum Management by Ruth Milkman

There is rapid growth in spectrum demand. With the emergence of 5G, Internet of Things, and unmanned vehicles, spectrum policy issues have become more complex. The report, *Rethinking Institutions of Spectrum Management*, written by roundtable rapporteur Ruth Milkman, examines the urgency for a different structure for spectrum management that could better serve spectrum-related needs and includes recommendations for incremental change within the current institutional framework. 2018, 57 pages, $12.00

Streams of Connectedness & New Media: Fragmentation, Innovation and Democracy by John Horrigan

While greater consumer choice in media has spurred connectedness and diversity of creative voices, it can breed fragmentation, which in turn can degrade public debate. Participants of the 32nd Aspen Institute Conference on Communications Policy explored policies for the new media landscape and identified two issues stakeholders should confront going forward: inclusion and content quality. Conferees grounded their recommendations in current Federal Communications Commission Chairman Ajit Pai's statement of principles—digital empowerment, the need for ubiquitous Internet access, the power of competitive free markets, and light-touch regulation. The report, written by John Horrigan, includes three proposals to address challenges in the new media landscape, such as investment in access and inclusion, changes in regulation to promote network deployment, and leadership and education. 2018, 56 pages, $12.00

Revisiting Spectrum Policy: Seven Years After the National Broadband Plan by David Bollier

Revisiting Spectrum Policy: Seven Years after the National Broadband Plan revisits the spectrum recommendations contained in a landmark 2009 report of the Federal Communications Commission setting forth a

National Broadband Plan (NBP). That Plan is most remembered for its innovative recommendation that spectrum be repurposed from broadcasting to newer uses through the mechanism of an incentive auction, a process that took place in 2016-17. The intervening time has seen even more demand and new uses arise such as the need for spectrum for controlling drones and for billions of devices to communicate as part of the Internet of Things. In this context, the report provides recommendations for incorporating emerging technologies, considers various licensing approaches, and frames U.S. spectrum policy from a global perspective. 2017, 56 pages, ISBN Paper: 0-89843-660-5, $12.00

Setting the Communications Policy Agenda for the Next Administration, by Richard Adler

The 31st Aspen Institute Conference on Communications Policy took place in Aspen, CO, August 14–17, 2016. Given this timing, it seemed appropriate for the conference to identify the key communications issues that would face the incoming administration and to propose promising approaches for dealing with those issues. This report is a series of chapters, written by rapporteur Richard Adler, that synthesizes the ideas that emerged from participants during the two-day dialogue. It explores areas where the new administration should focus its efforts concerning communication policy. The report also includes recommendations to promote inclusion and expand opportunities for all citizens, how to encourage continued investment and innovation, and strategies to create a trust environment online to protect citizen's digital lives. 2017, 59 pages, ISBN Paper: 0-89843-655-9, $12.00

Preparing for a 5G World, by Richard Adler

The 2015 Roundtable on Spectrum Policy took place in Queenstown, MD, October 26–28, 2015. This report is a series of chapters, written by rapporteur Richard Adler, that synthesizes the ideas that emerged from participants during the two-day dialogue. It examines the range of needs that the next generation of wireless innovation, 5G, is intended to address and seeks to understand the technological options for meeting those needs. 2016, 67 pages, ISBN Paper: 0-89843-646-X, $12.00

Skirting Bottlenecks: Policies to Support Network Evolution, Digital Inclusion and Data Security, by John B. Horrigan

The Thirtieth Annual Aspen Institute Conference on Communications Policy, titled "The Future of Broadband Competition," took place August 12–15, 2015 in Aspen, Colorado. Robust competition among communications providers has always been a crucial goal for policymakers, leading to robust, innovative and efficient delivery of services. But what does the competitive communications marketplace of the future look like? Thirty-two leading communications policy leaders and experts gathered in Aspen to investigate policy goals that can ensure this robust, competitive marketplace, and consider how broadband markets can promise delivery of economic and social benefits that improve the quality of life in America for all. The report, written by rapporteur John B. Horrigan, offers five recommendations for the future of broadband competition. 2016, 44 pages, ISBN Paper: 0-89843-643-5, $12.00

Making Waves: Alternative Paths to Flexible Use Spectrum, by Dorothy Robyn

The 2014 Aspen Institute Roundtable on Spectrum Policy (AIRS) gathered 26 of the top telecommunications policy experts at the Aspen Wye River Conference center in Queenstown, MD, to investigate whether the U.S., in light of recent progress in alternative approaches to spectrum allocation, should make the more drastic move to a regime that has all spectrum, other than some carved out for specific public benefit, to be considered general use spectrum eligible for the highest and best use available. The report, written by Roundtable rapporteur, Dorothy Robyn, tackles the task of describing what general purpose spectrum actually is; discusses the practical, political and institutional limits and ways to overcome them; and details the necessary technical advances and regulatory actions to make general purpose spectrum a reality. 2015, 68 pages, ISBN Paper: 0-89843-625-7, $12.00

The Atomic Age of Data: Policies for the Internet of Things, by Ellen P. Goodman

The Twenty-Ninth Annual Aspen Institute Conference on Communications Policy, titled "Developing Policies for the Internet of Things," took place August 13–16, 2014, in Aspen, Colorado. As the world becomes increasingly connected and more objects become

embedded with sensors, the Internet of Things is poised to explode, with estimates of 25 billion connected devices by 2020. 35 knowledgeable participants gathered to examine how communications policies should specifically accommodate the new Internet of Everything. This report explores the nascent promises and challenges of the IoT. In examining the interplay between the vast increase in data created on the Internet of Things (IoT), and the resultant strain on the networks that carry this information, and the group came to a realization. Data needs to be thought of as "infrastructure." 2015, 72 pages, ISBN Paper: 0-89843-623-0, $12.00

Making Waves Alternative Paths to Flexible Use Spectrum, by Dorothy Robyn

The 2014 Aspen Institute Roundtable on Spectrum Policy (AIRS) gathered 26 of the top telecommunications policy experts at the Aspen Wye River Conference center in Queenstown, MD to investigate whether the U.S., in light of recent progress in alternative approaches to spectrum allocation, should make the more drastic move to a regime that has all spectrum, other than some carved out for specific public benefit, to be considered general use spectrum eligible for the highest and best use available. The report, written by Roundtable rapporteur, Dorothy Robyn, tackles the task of describing what general purpose spectrum actually is; discusses the practical, political and institutional limits and ways to overcome them; and details the necessary technical advances and regulatory actions to make general purpose spectrum a reality. 2015, 77 pages, ISBN: 0-89843-625-7, $12.00

Video Veritas: Building a 21st Century Video Platform for a High-Performance Society, by John B. Horrigan

The Twenty-Eighth Annual Aspen Institute Conference on Communications Policy focused on the future of video regulation. The resulting report, written by John B. Horrigan, looks at the changing landscape of video regulation and the fundamental shift in how video is being viewed. While cable and broadcast television continue to be the dominant modes of transmission, over-the-top delivery of content via the Internet provides new ways to distribute personalized and targeted programming directly to the viewer. This, and the proliferation of mobile devices and tablets can deliver video to the viewer anywhere, anytime. As a result,

the advertising-based broadcast business model is undergoing significant challenge and change. This report examines the evolving video ecosystem and offers recommendations for policy that can accommodate the new video market. 2014, 54 pages, ISBN Paper: 0-89843-603-6, $12.00

Spectrum as a Resource for Enabling Innovation Policy, by William Webb

The 2012 Aspen Institute Roundtable on Spectrum Policy (AIRS) convened shortly after the presidential election to consider ways that spectrum policy could improve the economy through innovation. The 32 leading communications policy experts in attendance focused on how spectrum policies could help create an environment that makes it easier to use spectrum as a resource for innovative new goods and services. The participants first identified problems facing new entry and innovation today, and then recommended solutions, looking specifically at the interstices among licensed and unlicensed approaches, spectrum sharing and flexibility, and new institutional arrangements to manage these solutions. The report, written by British spectrum expert William Webb, sets forth 11 recommendations that he gleaned from the conference dialogue to guide future spectrum policy development with regard to facilitating innovation. 2013, 45 pages, ISBN Paper: 0-89843-584-6, $12.00

Rethinking Communications Regulation, by Richard Adler

As the Internet and other information and communications technologies grow exponentially, and as a new ecosystem is emerging that could conflate previously distinct methods of communication into a single digital medium, questions arise as to whether the traditional silos of regulation are still appropriate. The report resulting from the 2012 Aspen Institute Communications Policy Conference addresses the overarching concern as to whether the Communications Act needs a radical revision. Written by rapporteur Richard Adler, the report considers the key goals of a new communications regime and offers regulatory and non-regulatory approaches for achieving these goals in a digitally connected world. 2013, 65 pages, ISBN Paper: 0-89843-583-8, $12.00

The Reallocation Imperative: A New Vision for Spectrum Policy, by Preston Marshall

The report resulting from the 2011 Aspen Institute Roundtable on Spectrum Policy addresses new ways of allocating, clearing, using and/

or sharing spectrum controlled by private parties and government agencies. Written by rapporteur Preston Marshall, the report attempts to step back and establish a broad vision for reallocating spectrum in the United States in the public interest, discussing new approaches that will facilitate more effective and efficient spectrum use. A number of recommendations are laid forth to guide future spectrum policy development, congressional actions and technology explorations. 2012, 54 pages, ISBN Paper: 0-89843-570-6, $12.00

Updating Rules of the Digital Road: Privacy, Security, Intellectual Property, by Richard Adler

Given the current growth and importance of the Internet, the report of the 2011 Aspen Institute Conference on Communications Policy, titled *Updating Rules of the Digital Road: Privacy, Security, Intellectual Property,* highlights the elements that will allow for greater use of broadband as the common medium: security, privacy, and intellectual property regulation. Written by rapporteur Richard Adler, the report explores a range of threats that plague the use of today's communications media and provides a series of recommendations that aim to ensure that users' communications are secure, private, and protected. 2012, 70 pages, ISBN Paper: 0-89843-563-3, $12.00

Spectrum for the Next Generation of Wireless, by Mark MacCarthy

The report resulting from the 2010 Aspen Institute Roundtable on Spectrum Policy explores possible sources of spectrum, looking specifically at incentives or other measures to assure that spectrum finds its highest and best use. It includes a number of recommendations, both private and federal, of where and how spectrum can be repurposed for wireless use, including a discussion of incentive auctions, overlay auctions, flexible use, a spectrum innovation fund, and spectrum fees, among other strategies. 2011, 68 pages, ISBN Paper: 0-89843-551-X, $12.00

Rewriting Broadband Regulation, by David Bollier

The report of the 25th Annual Aspen Institute Conference on Communications Policy in Aspen, Colorado, considers how the United States should reform its broadband regulatory system. Participants looked at international models and examples, and examined how data and communications should be protected in the international arena. The

resulting report explores a range of policies for U.S. broadband regulation, many of them derivative of the National Broadband Plan adopted by the Federal Communications Commission only a few months before the conference. For the most part, conference participants refined policies and nuances of a rather familiar regulatory terrain.

Participants also ventured into new and interesting territory with the novel concept of "digital embassies." They saw this as a way of dealing with jurisdictional issues associated with the treatment and protection of data in the cloud (i.e., data that is provided in one country but stored or manipulated in another). The concept is that the data would be treated throughout as if it were in a kind of virtual embassy, where the citizenship of the data (i.e., legal treatment) goes along with the data. This policy seed has since been cultivated in various other regulatory environments. 2011, 52 pages, ISBN Paper: 0-89843-548-X, $12.00

Scenarios for a National Broadband Policy, by David Bollier

The report of the 24th Annual Aspen Institute Conference on Communications Policy in Aspen, Colorado, captures the scenario-building process that participants used to map four imaginary scenarios of how the economy and society might evolve in the future and the implications for broadband policy. It identifies how certain trends—economic, political, cultural, and technological—might require specific types of government policy intervention or action. The report also highlights a number of crosscutting themes and questions that participants believe the Omnibus Broadband Initiative should address. 2010, 52 pages, ISBN Paper: 0-89843-517-X, $12.00

Rethinking Spectrum Policy: A Fiber Intensive Wireless Architecture, by Mark MacCarthy

The report resulting from the 2009 Aspen Institute Roundtable on Spectrum Policy explores innovative ways to respond to the projections of exponential growth in the demand for wireless services and additional spectrum. In addition to discussing spectrum reallocations, improved receivers, shared use, and secondary markets as important components for meeting demand, the report also examines opportunities for changes in network architecture, such as shifting the mix between fiber and wireless. 2010, 58 pages, ISBN Paper: 0-89843-520-X, $12.00

ICT: The 21st Century Transitional Initiative, by Simon Wilkie

The report of the 23rd Annual Aspen Institute Conference on Communications Policy in Aspen, Colorado, addresses how the United States can leverage information and communications technologies (ICT) to help stimulate the economy and establish long-term economic growth. The report, written by Roundtable rapporteur Simon Wilkie, details the Aspen Plan, as developed in the summer of 2008, prior to the economic meltdown beginning in September 2008 and prior to the election of Barack Obama as president. The Plan recommends how the federal government—through executive leadership, government services, and investment—can leverage ICTs to serve the double bottom line of stimulating the economy and serving crucial social needs, such as energy efficiency and environmental stewardship. 2009, 80 pages, ISBN Paper: 0-89843-500-5, $12.00

A Framework for a National Broadband Policy, by Philip J. Weiser

While the importance of broadband access to functioning modern society is now clear, millions of Americans remain unconnected, and Washington has not yet presented any clear plan for fixing the problem.

Condensing discussions from the 2008 Conference on Communications Policy and Aspen Institute Roundtable on Spectrum Policy (AIRS) into a single report, Professor Philip Weiser of the University of Colorado at Boulder offers a series of specific and concrete policy recommendations for expanding access, affordability, and adoption of broadband in the United States. 2008, 94 pages, ISBN Paper: 0-89843-484-X, $12.00

The Future of Video: New Approaches to Communications Regulation, by Philip J. Weiser

As the converged worlds of telecommunications and information are changing the way most Americans receive and relate to video entertainment and information, the regulatory regimes governing their delivery have not changed in tune with the times. These changes raise several crucial questions: Is there a comprehensive way to consider the next generation of video delivery? What needs to change to bring about a regulatory regime appropriate to the new world of video? The report of the 21st Annual Conference on Communications Policy in Aspen, Colorado, outlines a series of important issues related to the emergence of a new video marketplace based on the promise of Internet technology

and offers recommendations for guiding it into the years ahead. 2006, 70 pages, ISBN Paper: 0-89843-458-0, $12.00

Clearing the Air: Convergence and the Safety Enterprise, by Philip J. Weiser

The report describes the communications problems facing the safety enterprise community and their potential solutions. The report offers several steps toward a solution, focusing on integrating communications across the safety sector on an Internet-Protocol-based backbone network, which could include existing radio systems and thus make systems more dependable during emergencies and reduce costs by taking advantage of economies of scale. The conference participants stressed that the greatest barriers to these advances were not due to lagging technology but to cultural reluctance in adopting recent advances. Writes Weiser, "The public safety community should migrate away from its traditional reliance on specialized equipment and embrace an integrated broadband infrastructure that will leverage technological innovations routinely being used in commercial sectors and the military." 2006, 55 pages, ISBN Paper: 0-89843-4, $12.00

Reforming Telecommunications Regulation, by Robert M. Entman

The report of the 19th Annual Aspen Institute Conference on Telecommunications Policy describes how the telecommunications regulatory regime in the United States will need to change as a result of technological advances and competition among broadband digital subscriber lines (DSL), cable modems, and other players, such as wireless broadband providers. The report proposes major revisions of the Communications Act and FCC regulations and suggests an interim transitional scheme toward ultimate deregulation of basic telecommunications, revising the current method for universal service subsidies, and changing the way regulators look at rural communications. 2005, 47 pages, ISBN Paper: 0-89843-428-9, $12.00

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