Broadband Opportunity Council Report and Recommendations

Pursuant to the Presidential Memorandum on Expanding Broadband Deployment and Adoption by Addressing Regulatory Barriers and Encouraging Investment and Training

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Executive Summary

"Access to high-speed broadband is no longer a luxury; it is a necessity for American families, businesses, and consumers. Affordable, reliable access to high-speed broadband is critical to U.S. economic growth and competitiveness. High-speed broadband enables Americans to use the Internet in new ways, expands access to health services and education, increases the productivity of businesses, and drives innovation throughout the digital ecosystem." – President Barack Obama

The United States continues to experience unprecedented growth and innovation in broadband and in the advanced applications and services it enables. While the benefits of increased broadband access and adoption are widespread, barriers like income and geography keep many Americans from taking advantage of the economic, educational and social benefits of broadband access. To make sure that the Federal government does everything within its power to support broadband deployment and adoption, on March 23, 2015, President Obama signed a Presidential Memorandum (Memorandum) "Expanding Broadband Deployment and Adoption by Addressing Regulatory Barriers and Encouraging Investment and Training."[1] The Memorandum created the Broadband Opportunity Council (Council) and tasked 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. This Report responds to that directive.

The Council presents four overarching recommendations:
1. Modernize Federal programs to expand program support for broadband investments.
2. Empower communities with tools and resources to attract broadband investment and promote meaningful use.
3. Promote increased broadband deployment and competition through expanded access to Federal assets.
4. Improve data collection, analysis and research on broadband.

To pursue these objectives, Federal Agencies will take dozens of actions over the next 18 months. These include commitments to:
- Modernize Federal programs valued at approximately $10 billion to include broadband as an eligible program expenditure, such as the Department of Agriculture's (USDA) Community Facilities (CF) program, which will help communities around the country bring broadband to health clinics and recreation centers;
- Create an online inventory of data on Federal assets, such as Department of the Interior (DOI) telecommunications towers, that can help support faster and more economical broadband deployments to remote areas of the country;
- Streamline the applications for programs and broadband permitting processes to support broadband deployment and foster competition; and
- Create a portal for information on Federal broadband funding and loan programs to help communities easily identify resources as they seek to expand access to broadband.

The Council proposes continuing actions in support of its mission, including monitoring agencies' progress in implementing the action items in the Report and exploring additional steps to further the goals set forth in the Presidential Memorandum.

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1. Introduction

Progress to Date

Day by day, access to broadband, and the advanced applications it facilitates, becomes more integral to the daily lives of Americans and to the mission and work of the Federal government and its Agencies. Broadband drives the provision of services across nearly all government functions and across many of the activities that are key to advancement and opportunity for all Americans.

- Broadband enables greater civic participation, provides tools for open government and streamlines government processes.
- Broadband enables changes in how we access educational resources, collaborate in the educational process, conduct research and continue to learn anytime, anyplace and at any pace.
- Broadband enables improved healthcare access, treatments and information.
- Broadband enables new business models, creates business efficiencies, drives job creation, and connects manufacturers and store-fronts to clients and partners worldwide.
- Broadband can also help bring communities together and improve public safety, create a greener planet, and make our transportation systems more resilient and efficient.

Additionally, broadband provides a foundation for many of the advancements we will see across industry sectors in the coming years.[2]

That's why the Obama Administration has focused over the past six years on expanding broadband access for all Americans. Under the Obama Administration's leadership, the United States has experienced unprecedented growth and innovation in broadband networks and services. Since 2009, nearly 45 million more Americans have adopted broadband.[3] Today, 84 percent of Americans are "Internet users," up from 76 percent 5 years ago.[4] Tens of millions of households have seen their home broadband speeds more than double without paying significantly more for monthly service. Communities around the country are beginning to reap the benefits of gigabit speed fiber networks. And while other countries are just beginning to deploy fourth-generation wireless networks to scale, over 98 percent of Americans now have access to 4G mobile broadband.[5]

A combination of robust private investment and targeted Federal policy has driven these remarkable strides in broadband access and adoption. Through the American Recovery and Reinvestment Act (Recovery Act), USDA and the Department of Commerce (DOC) invested nearly $7.5 billion in broadband networks to help connect under-served areas around the country:

- The Commerce Department's National Telecommunications and Information Administration (NTIA) awarded approximately $4 billion in grants under the Broadband Technology Opportunities Program (BTOP) and approximately $293 million in grants under the State Broadband Initiative (SBI) program. Grantees deployed more than 114,500 miles of new or upgraded network miles; connected more than 25,500 community anchor institutions; installed or upgraded more than 47,100 personal computers in public access centers; and prompted more than 670,000 people to subscribe to broadband services. SBI grantees mapped broadband availability in all 50 states and 6 territories and supported well over 200 local broadband planning teams across the country.
- USDA's Rural Utilities Service (RUS) expanded its existing telecommunications programs with an additional $3.5 billion in loans and grants as part of the Broadband Infrastructure Program (BIP). The awards went to 285 last mile providers, 12 middle mile providers, and 4

satellite companies for the deployment of broadband facilities. Additionally, 19 technical assistance grants funded planning efforts to get broadband service to hard-to-reach areas of the country. To date, 64,794 miles of fiber cable and 1,845 wireless access points have been installed in rural communities, bringing new or improved broadband service to over 230,000 residences, businesses and anchor institutions.

The Recovery Act also supported significant investment in systems for electronic health record payments for hospitals and clinicians through HITECH - the Health Information Technology for Economic and Clinical Health Act. In addition, the Obama Administration adopted policies to make more spectrum available for commercial wireless broadband, increasing capacity to meet the growing demand posed by wireless-enabled devices.

Building on the successes of the Recovery Act, the Obama Administration has explored ways to capitalize on other Federal funding sources and work with the public and private sectors to continue expanding broadband access. For example, in June 2013, the President and the Department of Education (ED) Secretary Arne Duncan launched ConnectED, a public-private partnership that "empowers teachers with the best technology and the training to make the most of it, and empowers students through individualized learning and rich, digital content."[6] ConnectED's objective is to connect 99 percent of American students to next-generation broadband by 2018. While broadband connectivity and adoption in schools and libraries is a foundation of ConnectED, the program goes far beyond connectivity with initiatives designed to expand the availability of digital materials and support teachers as they integrate technology into curriculums, further engaging students and improving educational outcomes with personalized learning.

ConnectED is already having an impact. This spring, the Federal Communications Commission's (FCC) e-Rate program awarded $470 million in Federal funds to bring Wi-Fi and high-speed connectivity to classrooms in over 10,000 schools and over 500 libraries across America.[7] These investments are part of over $8 billion in funding that the FCC has made available to meet the President's school connectivity goals. Over 3 million students from 10,000 schools in all 50 states are already using the software, hardware, wireless connectivity and training resources deployed as part of the over $2 billion in private-sector commitments.[8]

More recently, in July 2015, the President and the Department of Housing and Urban Development (HUD) Secretary Julián Castro announced ConnectHome. As a demonstration project, ConnectHome will help bridge the "homework gap" for nearly 200,000 children in 275,000 low-income households in 27 cities and one Tribal Nation.[9] The public-private partnership with Internet Service Providers, non-profits and the private sector will offer broadband access, technical training, digital literacy programs and devices for low-income residents in assisted housing units.

Challenges Remain

Amidst this progress, clear challenges remain. According to 2012 Census data, published as part of NTIA's Digital Nation series, more than 25 percent of American households do not subscribe to broadband at home.[10] This "digital divide" is better understood as a series of digital divides based on geography, income and other demographics factors. Seniors, people with disabilities,[11] those with less than a high school degree, and people with low income levels[12] are among the groups with

lower than average adoption rates – and therefore lower rates of access to the benefits associated with digital information and services.[13]

In an NTIA report based on 2012 Census Bureau data, 29 percent of households without a home broadband connection pointed to expense as a major barrier.[14] And, as a recent report from the Council of Economic Advisers (CEA) highlighted, a gap of almost 20 percentage points in adoption rates exists between wealthy and low-income neighborhoods in cities like Washington, D.C., Philadelphia, Pennsylvania and San Antonio, Texas.[15] Americans in the lowest quartile for household income are 24 percentage points less likely to subscribe to broadband at home than those in the topmost income quartile.[16]

Geography also plays an important role in broadband availability. Some parts of the country, mostly rural and Tribal lands, are connectivity deserts – regions with little or no access to broadband – or "parched" with broadband coverage inadequate to meet community needs. For example, broadband speeds of at least 25 Mbps (download) and at least 3 Mbps (upload) are available to only 47 percent of rural households and 37 percent of people living on Tribal Lands, compared with 92 percent of urban households.[17] Low-income neighborhoods are also significantly less likely to have high-speed connections available to them. For example, the CEA report found that there is a gap of roughly 20 percentage points between the wealthiest and least wealthy communities for download speeds of 25 Mbps to 100 Mbps.[18]

Much of the easy work has been done – building out broadband infrastructure in more profitable areas of the country where the community capacity is strong and the business case is compelling; and encouraging broadband adoption and use among people who are already "digitally ready."[19] The hard work that remains is reaching those communities where geography and economics work against deployment and reaching individuals who do not yet have the same opportunities to use broadband to meet personal and professional goals.

At the same time, limited competition is also a challenge even in communities with high rates of adoption.[20] Today, nearly 40 percent of American households either do not have the option of purchasing a wired 10 Mbps connection or they must buy it from a single provider.[21] Three out of four Americans do not have a choice of providers for broadband at 25 Mbps, the speed increasingly recognized as a baseline for broadband access.[22] Lowering barriers to deployment and fostering market competition can drive down price, increase speeds, and improve service and adoption rates across all markets.

The Federal government has played a crucial role in advancing policies to promote broadband deployment and adoption, including disseminating best practices, breaking down regulatory barriers and encouraging further investment. Yet, more action is needed.

2. Broadband Opportunity Council Process

To help address these challenges, the President launched the Broadband Opportunity Council on March 23, 2015 to make recommendations on actions that the Federal government can take under existing authority to improve the nation's broadband networks and bring the benefits of broadband to more Americans. The Presidential Memorandum issued that day, "Expanding Broadband Deployment and Adoption by Addressing Regulatory Barriers and Encouraging Investment and Training," framed the scope and working process for the Council.

The Council is co-chaired by the Secretaries of Commerce and Agriculture or their designees, with designees from 25 Federal Agencies, departments and White House offices, support from the Director of the National Economic Council and the Director of the Office of Science and Technology Policy, and consultation with the Federal Communications Commission and relevant Federal Working Groups. DOC Secretary Pritzker designated Lawrence E. Strickling, Assistant Secretary of Commerce for Communications and Information and Administrator, National Telecommunications and Information Administration, and USDA Secretary Vilsack designated Lisa Mensah, Under Secretary for Rural Development, USDA, to lead the Council. Appendix A provides a list of Council member Agencies.

Council Working Group members met weekly by phone and in person. Agency designees developed and contributed action plans, reviewed those commitments within their Agency, and reviewed and approved the substance of this full Report.

In addition to engaging agencies across the Federal government, the President charged the Council with gathering stakeholder input about how the Federal government can better support broadband deployment, competition and adoption. The Council published a Request for Comment (RFC) in the Federal Register on April 29, 2015[23] and hosted a webinar on May 19, attracting more than 200 viewers. Comments submitted by 248 individuals, businesses, organizations and Agencies are available at http://www.ntia.doc.gov/Federal-register-notice/2015/broadband-opportunity-council-comments.[24] A brief summary of the approximately 1,000 pages of comments received is included below. Appendix B provides the list of commenters.

The Agency commitments and recommendations contained herein, submitted to the President on behalf of the Council, represent the result of internal Agency exploration, consultation with stakeholders through the public comment process and extensive deliberations among members of the interagency Council Working Group.

Public Input to the Broadband Opportunity Council

In response to the Council's RFC, 248 diverse stakeholders provided input and recommendations. Commenters included major telecommunication carriers and associations; IT innovators and technology companies; nonprofits and community anchor institutions; State, Local and Tribal governments; and individuals. The Council requested input on regulations and barriers that hamper broadband deployment, recommendations on ways to promote public and private investment in broadband and ideas for ways that the Federal government can encourage and support broadband adoption and digital literacy.

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A number of themes emerged from the comments including the need for: increased clarity and guidance on Federal funding options for broadband;[25] streamlined processes that enable the use of Federal assets for broadband;[26] insight on attracting local investment;[27] requests for best practices and technical assistance;[28] and a desire for more data[29] and research on broadband.[30]

In terms of infrastructure policy, commenters urged the Federal government to further facilitate the use of government lands and infrastructure for broadband deployment. They asked that Federal programs: allow broadband providers or other entities to install infrastructure during Federal construction projects;[31] develop an online permitting and tracking system;[32] make Federal highway and sewer projects contingent on the allowance of conduit or fiber deployment during excavation;[33] and that the Federal government encourage State and Local "Dig Once" policies that allow deployment of conduit and fiber in transportation rights of way during other projects.[34]

Commenters asked the Council to simplify and modernize funding processes[35] and to ensure that definitions for broadband speeds were clear and consistent across programs.[36] Other comment areas included requests for consolidated information about broadband funding opportunities across the Federal government[37] and suggestions for decreasing timelines for application reviews.[38]

One area that was the subject of a number of recommendations was permitting on Federal lands. Commenters requested that Agencies streamline processes and standardize timelines for the review and processing of permitting applications and make such documentation easily accessible.[39] Several commenters particularly asked that Agencies streamline wireless siting.[40] A number of commenters noted the progress of the Executive Order (EO) 13616 Working Group[41] and asked for expedited progress on finalizing master contracts, applications and fees.[42] A recurring theme was the recommendation to develop a comprehensive inventory of broadband assets[43] and Agency points-of-contact[44] and to streamline environmental and cultural review processes, particularly in already disturbed land or where review has already been performed.[45]

Commenters stressed the importance of promoting adoption[46] and availability[47] among vulnerable populations such as low-income individuals, persons with disabilities, seniors, veterans and those with limited English. They also emphasized the need for digital literacy and offered suggestions for addressing it.[48] Some recommended that the Federal government donate surplus equipment and encourage refurbishment.[49] Commenters supported the idea of expanding free public Wi-Fi hot spots, especially in Federal buildings and on Federal Lands.[50]

Commenters recognized NTIA's BroadbandUSA initiative as providing valuable support for communities working to expand broadband programs. They requested additional support from NTIA including technical assistance, webinars and publications on best practices on broadband adoption, infrastructure and planning.[51] Commenters acknowledged the effectiveness of Agencies' moving services online, and also cautioned that digital literacy and outreach are necessary to include all citizens.[52]

A number of comments came in from individuals expressing concern about the lack of adequate, affordable broadband service where they live.[53]

Some areas identified by commenters are out of the Council's scope and better directed toward the FCC, Congress, and State governments. For example, some commenters made specific recommendations for reforming Lifeline to support broadband;[54] expanding e-Rate to support more than schools and libraries;[55] reforming retransmission consent and program access rules.[56]

Others requested tax incentives[57] or Congressional extension of bonus depreciation.[58] The comments directed to the FCC have been shared with the FCC for their consideration. Other comments requested additional funding, requiring statutory changes from Congress.

While the Council was not able to translate every comment received into an immediate Agency action, the stakeholder feedback provided important insight into current challenges and opportunities for broadband deployment and adoption – input that shaped the Guiding Principles outlined in Section 3, informed the recommendations summarized in Section 4 and provided the basis for the next steps described in Section 5.

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3. Guiding Principles

The President provided the following guidance that set the policy context for the Broadband Opportunity Council:

It shall be the policy of the Federal government for executive departments and Agencies having statutory authorities applicable to broadband deployment (Agencies) to use all available and appropriate authorities to:

- *Identify and address regulatory barriers that may unduly impede either wired broadband deployment or the infrastructure to augment wireless broadband deployment;*
- *Encourage further public and private investment in broadband networks and services;*
- *Promote the adoption and meaningful use of broadband technology; and otherwise*
- *Encourage or support broadband deployment, competition, and adoption in ways that promote the public interest.*

Through the Council's extensive research into Agency programs, analysis of the public comments, engagement with the private sector and discussions with trade associations, research institutions, advocacy groups and other stakeholders, the Council has elaborated on the President's guidance to further inform Agencies as they translate these prescriptions into actionable policies. The Council began this task with the overarching goal to encourage or support broadband deployment, adoption and competition in ways that promote the public interest. The Council was guided by several principles for doing so:

Identify and address deployment barriers and promote interagency coordination

- **Leverage Federal assets**. Federal lands, buildings and assets are important conduits for broadband deployment and should be accessible for the promotion of broadband competition and deployment.

- **Streamline processes.** The Federal government should strive for common permitting and application processes to reduce the burden on Local government, State government, non-profit, and private applicants applying for Federal aid and resources.

- **Collaborate and strengthen coordination.** Agencies should expand interagency coordination to minimize redundancy and remove regulatory barriers and should continue to collaborate to meet the goals established for the Council. Additionally, where appropriate, Council members should increase collaboration and coordination with State, Local and Tribal governments to support their initiatives to expand broadband access and adoption.

- **Lower barriers to competition.** While regulatory power generally rests with State, Local and Tribal governments and independent regulatory Agencies, the Federal government should provide fair and open access to government assets and processes. Such open access is designed to stimulate increased deployment and competition by lowering barriers for new market entrants and for incumbent expansions.

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Encourage further public and private investment

- **Specify broadband as eligible expenditure in Federal programs.** Broadband is a critical element of community and regional infrastructure and should be an eligible expenditure and, where possible, a priority for infrastructure funding and loan programs.

- **Encourage public-private partnerships.** The deployment of broadband almost always requires collaboration between the public and private sector and often cooperation across multiple levels of government. As Federal Agencies shape their broadband policies, they should work closely with the private sector and State, Local and Tribal governments to ensure those policies maximize overall investment in and adoption of broadband services.

Promote adoption and meaningful use

- **Expand outreach.** Access to affordable broadband is unevenly distributed and is impacted by both geography and income. Federal Agencies should target resources towards high-need communities, *e.g.*, communities with low connectivity or with few options for procuring high-speed broadband. For example, broadband adoption lags among seniors, low-income households, people with lower educational levels, people with disabilities and those living in Indian Country and in rural areas.

- **Increase digital literacy.** Digital literacy and fluency is increasingly integral to economic advancement and participation in American society. Agencies should incorporate increased digital literacy training and broadband adoption support into online platforms, training programs and services.

- **Encourage meaningful use.** Access to broadband should increase access to government services, especially in rural communities or populations that may lack easy access to government resources. The Federal government should be a leader in encouraging meaningful use of broadband by making services, data and information readily accessible and regularly evaluating online accessibility and use.

The recommendations in Section 4 arise from these Guiding Principles. As noted in our conclusion, the Broadband Opportunity Council will continue to explore opportunities to advance these core principles through additional reforms and actions.

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4. Recommendations and Agency Actions

The Council was charged with making recommendations for actions that can be implemented within the scope of existing Agency programs, missions and budgets. The Council makes recommendations in four areas where Federal actions can strengthen broadband deployment, foster competition and promote broadband adoption:

1. Modernize Federal programs to expand program support for broadband investments.
2. Empower communities with tools and resources to attract broadband investment and promote meaningful use.
3. Promote increased broadband deployment and competition through expanded access to Federal assets.
4. Improve data collection, analysis and research on broadband.

Milestones reflect the Federal fiscal year calendar which begins October 1. Please see Appendix A for a list of Agencies and acronyms. Recommended next steps for the Broadband Opportunity Council are summarized in Section 5.

4.1 Modernize Federal programs to expand program support for broadband investments

Broadband has steadily shifted from an optional amenity to a core utility for households, businesses and community institutions. Today, broadband is taking its place alongside water, sewer and electricity as essential infrastructure for communities.

However, not all Federal programs fully reflect the changing social, economic and technological conditions that redefined the need for and benefits of broadband. In some cases, programs that can support broadband deployment and adoption lack specific guidelines to promote its use. Other programs have not integrated funding for broadband commensurate with its importance and role in program execution and mission.

> **RECOMMENDATION: All relevant Federal programs, especially those supporting economic development, infrastructure and housing programs, will use rulemakings or guidance to open financing resources for broadband investments.**

To implement this recommendation, Council members will take the following initial 13 actions. Cumulatively, these actions will open up or clarify the potential uses for $10 billion in Federal grants and loans for broadband-related activities.

- USDA: Update guidance for the Rural Development Community Facility Program: Rural Housing Service - Community Facilities (CF), which represents an estimated $2.3 billion in FY16 funding, will develop and promote new funding guidance making broadband projects eligible.
  - o Key Milestones:

- Develop new program guidelines   3QFY16
- Promote new policy to stakeholders   4QFY16

- <u>USDA: Expand broadband eligibility for RUS Telecommunications Program</u>: RUS will revise regulations that currently limit broadband investment in specific areas with inadequate service. This change would open funding opportunities to a different provider even though an incumbent exists and would allow new entrants to access an estimated FY16 funding of $690 million.
  - o <u>Key Milestones</u>:
  - Develop and publish new regulation   4QFY16

- <u>DOC: Highlight broadband eligibility for Economic Development Assistance</u>: DOC's Economic Development Administration (EDA) will issue an FY16 Federal Funding Opportunity (FFO) for its Economic Development Assistance Programs (EDAP) that highlights broadband planning and deployment as one of EDA's national strategic priorities for funding. The President's FY16 request for EDAP is $227.5 million.
  - o <u>Key Milestones</u>:
  - Publish Federal Funding Opportunity   1QFY16

- <u>Department of Treasury (UST): Clarify broadband eligibility for New Market Tax Credits</u>: Treasury will update Frequently Asked Questions (FAQs) to specify that broadband projects in qualified census tracts are eligible for the New Markets Tax Credit Program (NMTC Program), provided the investment meets the IRS Regulations related to a business qualifying under the NMTC program. The NMTC Program provides a 39 percent tax credit to offset Federal tax liability for investors that make equity investments in specialized financial institutions called Community Development Entities (CDEs) that provide loans and other credit assistance in low-income communities. Over the past 5 years, CDEs have raised $20.644 billion in qualified private equity investment under the NMTC.
  - o <u>Key Milestone</u>: Issue updated FAQs   1QFY16

- <u>HUD: Establish broadband connectivity standards for housing construction</u>: HUD will begin a rulemaking process to require that HUD-funded new residential construction and substantial rehabilitation projects include plans for infrastructure that supports unit-based access to broadband internet connectivity. Exceptions will be made where the local infrastructure, location of the building or building structure makes broadband infeasible as determined by HUD. In addition, the rule will not apply to properties that only participate in HUD-insured or guaranteed mortgage or loan programs. Other Agencies will explore adoption of similar standards for housing construction programs under their purview.
  - o <u>Key Milestones</u>:
  - Publish the proposed rule in the Federal Register   1QFY16

- <u>USDA: Expand broadband eligibility for Rural Business Loan Guarantee Program</u>: USDA Rural Business will issue guidance to rural communities stating that broadband projects represent an eligible infrastructure expense for the Rural Business Cooperative Services

Business and Industry Loan Guarantee Program. Subject to specific requirements, loan funds may be used for real estate, equipment, working capital and debt refinancing. This program represents an estimated $1.2 billion in FY16 funding.
- o Key Milestones:
- ▪ Issue guidance to stakeholders and prospective applicants   3QFY16

- USDA: Expand broadband eligibility for RUS Electric Program: RUS will issue guidance to its legacy electric borrowers and other stakeholders that broadband projects supporting smart grid and communications facilities for energy management are an eligible infrastructure expense. This program represents an estimated $5 billion in electric infrastructure investment. SmartGrid funding will be available based on demand. The Department of Energy (DOE) will highlight this guidance on Smartgrid.gov and will send out an alert to their list serve.
  - o Key Milestones:
  - ▪ RUS announcement and promotion to stakeholders   2QFY16
  - ▪ DOE announcement to SmartGrid stakeholders   2QFY16

- HUD: Amend Consolidated Plan regulations to include broadband: HUD's Office of Community Planning and Development will begin rulemaking to integrate broadband feasibility and needs assessment into planning efforts. The Consolidated Plan serves as a framework for a community-wide dialogue to identify housing and community development priorities.
  - o Key Milestones:
  - ▪ Publish the proposed rule in the Federal Register   1QFY16

- Department of Labor (DOL): Expand broadband eligibility for One-stops and Job Centers: DOL will issue clarification that broadband service within one stops / American Job Centers is an allowable expense within administrative allowances. ETA will address the allowability of funds to improve digital literacy skills for job hunters, promote Wi-Fi in public facilities, and improve capacity of computer centers to deliver services to customers. This clarification can impact up to 2,500 one-stop career centers across the country.
  - o Key Milestones:
  - ▪ Issue guidance to the public workforce system   2QFY16

- Department of Health and Human Services (HHS): $25 million in new grants to advance Health Centers' use of health IT: HHS will support Health Centers' efforts to use health information technology to improve healthcare. HHS will award $25 million in grants to help health centers implement electronic health records and other health information technology to improve quality of care and patient access to personal health information. Since patient and health center use of electronic health information relies on having access to those records, training and technical assistance to facilitate access to broadband will be listed as an eligible expense in this grant program.

- Key Milestones:
  - Release of the Funding Opportunity Announcement   1QFY16
  - Awarding of up to 50 grants   4QFY16

- <u>HUD: Expand broadband eligibility for community development and housing</u>: HUD Office of Community Planning and Development will issue guidance to over 1,300 communities that are recipients of Community Development Block Grant Program, Housing Trust Fund, HOME Investment Partnerships Program, Housing Opportunities for Persons With AIDS, Emergency Solutions Grant, and Continuum of Care stating that broadband is an eligible infrastructure expense. These programs represented nearly $6.4 billion in FY15 funding.
  - Key Milestones:
    - Issue guidance to grantees   1QFY16

- <u>HUD: Clarify broadband eligibility in the Indian Community Development Block Grant Program</u>: HUD's Office of Native American Programs (ONAP) will issue guidance to Indian Community Development Block Grant (ICDBG) recipients that broadband is an eligible infrastructure expense. Tribes and certain Tribal organizations are eligible to apply for funds. HUD is making available approximately $58.9 million for this competitive program in FY15.
  - Key Milestones:
    - Issue guidance to grantees   1QFY16

- <u>Department of Justice (DOJ): Highlight broadband eligibility for Justice Assistance Grant Program</u>: DOJ will issue guidance clarifying that the Justice Assistance Grant (JAG) program allows funding for broadband deployment and adoption related to criminal justice activities. Approximately 1,100 State, Local and Tribal jurisdictions receive annual JAG formula funding. This program represents an estimated $370 million in FY16 funding.
  - Key Milestone:
  - Issue guidance to State Administrative Agencies   3QFY16

4.2 Empower communities with tools and resources to attract broadband investment and promote meaningful use

While sound national policies and programs are important, most decisions on broadband investment are made by Local governments in partnership with the private sector, guided by State law. Anchor institutions, like libraries and hospitals, can also play an important role in shaping broadband policy and expanding access to underserved communities.

To address the remaining gaps in broadband coverage, the Federal government will need to partner with these stakeholders – not only by providing funding and financing but by providing targeted, easily accessible resources that empower communities and help them learn best practices from their peers around the country.[59]

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> **RECOMMENDATION: Agencies will develop best practices, provide technical assistance and create a one-stop portal for broadband resources to support local governments and anchor institutions.**

Beyond targeting best practices, the Council sees opportunities to engage private, public, philanthropic and nonprofit groups to develop a benchmark or index system of community connectivity indicators to promote innovative practices, investment, and digital inclusion. The index would help community leaders understand where their strengths lie and where they need to improve, and would promote innovative community policies and programs. It would be supported by tools and processes for community assessment, improvement and recognition.

> **RECOMMENDATION: The Executive Branch will convene stakeholders to design and launch a community connectivity index.**

There is also significant room for improvement in Local and State government policies. While the Federal government cannot address Local and State regulations through executive action, it can encourage best practices. Among other practices, "Dig Once" policies have emerged as an important source for cost savings. "Dig Once" policies help Local and State governments lower their own costs and costs for telecommunication companies by coordinating infrastructure projects and allowing conduit to be laid alongside transportation, water and other projects. Under Executive Order 13616, the Department of Transportation (DOT) provided guidance for using "Dig Once" practices in Federally-funded projects. The Council recommends expanding this guidance to projects supported by other Federal Agencies that fund infrastructure projects, such as the Environmental Protection Agency (EPA), GSA, USDA, HUD, and DOI.

> **RECOMMENDATION: Federal Agencies that fund significant infrastructure investments will work together to further promote "Dig Once" policies.**

While many communities around the country would benefit from Federal support in addressing connectivity issues, Tribal areas face particular challenges.[60] Broadband deployment and adoption in Tribal Lands remains well below national averages, creating yet another barrier for education, healthcare and economic development. The Council recommends that DOI bring together Federal agencies to focus time and resources on identifying creative ways to address the unique challenges facing Tribal areas.

> **RECOMMENDATION: Federal Agencies, working in conjunction with Native American leaders and led by DOI, will work to address broadband challenges on Tribal Lands.**

Access is not enough. Broadband adoption and Internet use is often lowest among those populations that can most benefit from digital information services. Agencies must look for opportunities to further promote and support broadband deployment, adoption and education in areas that are aligned with their programs and missions.

> **RECOMMENDATION: Federal Agencies, working with partners, will support broadband adoption and promote meaningful technology use.**

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The Agency actions listed below will build community capacity, bring appropriate resources to bear on broadband issues, speed community projects, and support individuals and communities as they strengthen the technology infrastructure needed for education, health and community services.

Develop Best Practices and Provide Technical Assistance

- DOC: Provide a one-stop portal to access information about Federal broadband programs: NTIA's BroadbandUSA initiative will create a portal to serve as the main client access point for Federal broadband resources. Functionality will include a list of Council committed Agency actions with status on implementation; links to Agency policies and grant guidance related to broadband; best practice guides; technical assistance briefs; Agency and program points-of-contact; and a list of Frequently Asked Questions. Program and content responsibility will remain with the originating Agencies. This effort will help to institutionalize the work of the Council, by making available a summary of Federal programs that support broadband investment and providing visibility to Agency commitments.
    - Key Milestones:
        - Identify contributing content owners and points of contact   1QFY16
        - Develop functional outline/map for updated site   3QFY16
        - Initial site available   4QFY16

- HHS: Launch series of national connectivity workshops for community health organizations: HHS will promote the use of broadband for healthcare organizations and consumers and work with other Federal Agencies to develop plans to upgrade broadband at health facilities. HHS will provide assistance to health organizations seeking funds for broadband expansion through a series of national and state workshops offered in partnership with the Appalachian Regional Commission (ARC), FCC, DOC, and USDA. The goal of this work is to encourage participants to develop plans and complete applications to secure upgraded broadband connectivity.
    - Key Milestones:
        - Convene Federal partners to develop workshop agenda   1QFY16
        - Announce 2016 broadband healthcare workshop schedule   1QFY16
        - Convene state-specific and national workshops   FY16

- Institute of Museum and Library Services (IMLS): Provide libraries with tools to assess and manage broadband networks: IMLS will fund a new initiative to develop a network assessment toolkit and technical assistance program for rural and Tribal libraries. These libraries provide critical public access to computers and the Internet with support and training from professionals, but many have inadequate connectivity and Wi-Fi. The toolkit will help libraries configure, modify and manage their networks. After piloting in 30 rural and Tribal communities, an expanded rollout will be considered.
    - Key Milestones:

- Conduct needs assessment and design toolkit modules   2QFY16
- Develop toolkit   3QFY16
- Pilot and refine toolkit and training program   4QFY16-2QFY17

- <u>DOC: Offer best practices and technical assistance for communities seeking to expand broadband</u>: BroadbandUSA will develop and release best practice publications to support community broadband infrastructure, adoption, digital literacy programs and economic development. In conjunction, BroadbandUSA will provide technical assistance to local and regional communities developing broadband infrastructure and adoption projects, offering services designed to accelerate and advance these projects. BroadbandUSA will also collaborate with other Federal Agencies to support broadband-related initiatives and programs.
  - <u>Key Milestones</u>:
  - Broadband infrastructure technical assistance initiative launch   4QFY15
  - Broadband adoption technical assistance initiative launch   1QFY16
  - Consolidate stakeholder feedback; map out additional guides   2QFY16

- <u>ARC: Focus technical assistance on broadband deployment in Appalachia</u>: In order to improve application quality and support grantees in completing ambitious broadband projects, the ARC will expand outreach and technical support associated with the $20 million special allocation to help improve rural broadband access in distressed coal-impacted communities in Kentucky, Tennessee and West Virginia and the 13-state Appalachian Region.
  - <u>Key Milestones</u>:
  - Community Toolkit and best practices available   4QFY16

- <u>IMLS: Offer technical assistance for library broadband connectivity expansions</u>: IMLS will fund a new initiative to develop best practices and expand technical support for e-Rate-funded public library Wi-Fi and connectivity expansions. The technical assistance program will support libraries in assessing connectivity needs, procuring efficient and competitive broadband services and completing e-Rate applications. This initiative will be implemented in partnership with state library agencies to ensure that library information services and free public access points are available to all.
  - <u>Key Milestones</u>:
  - Conduct cross-state review of e-Rate practices   1QFY16
  - Develop clearinghouse tool and contributed resources   2QFY16
  - Provide education forums and assistance   2QFY16

Broadband Opportunity Council

Convene Stakeholders to Develop a Community Connectivity Index

- NTIA/OSTP: Convene stakeholders to design and launch a community connectivity index: NTIA, with support from the White House Office of Science and Technology Policy (OSTP) and National Economic Council (NEC), will convene a series of stakeholder forums to develop an index program that encourages advancements and investments in community connectivity. Stakeholders will include private, public, philanthropic and nonprofit groups with interests in leveraging broadband to support innovation, economic growth and digital inclusion. The index program will identify indicators of community connectivity in a range of categories related to broadband deployment, competition, and adoption, such as average broadband speed and adoption rates, local/regional policies that support broadband, digital inclusion policies, public access points and online applications such as telehealth, digital learning or e-government.

  The index would help community leaders understand where their strengths lie and where they need to improve, and would promote innovative community policies and programs. The goals of the index program are to:

  1) provide a framework and tools for communities to learn about the factors that influence a community's connectivity;
  2) mobilize community action and coordination to improve connectivity;
  3) encourage and recognize innovative policies and programs; and
  4) attract economic development and investment.

  The stakeholder community will determine the criteria and measures. The Executive Branch will provide convening support and explore partnerships to create, support and sustain the program.
    - Key Milestones:
      - Identify potential partners   1QFY16
      - Convene stakeholder forums to discuss criteria   2QFY16
      - Identify program owner(s) and sustainability plan   3QFY16
      - Announce program   1QFY17

Further promote "Dig Once" policies

- Joint Agency action to promote "Dig Once" policies: "Dig Once" policies promote broadband competition, reduce costs for broadband providers and decrease road-related costs from repeated excavation. Based on EO 13616, DOT has already taken actions to promote "Dig Once" policies, including developing best practices and model policies and disseminating them to State DOTs and other stakeholders. To build on the work of DOT and further promote "Dig Once" policies, DOI, EPA, GSA, USDA, DOC and HUD will, in partnership with DOT:
  - Review Agency regulations to assess if there are changes that would facilitate and/or promote "Dig Once" policies for State and Local governments.

- Develop, publish and disseminate best practices documents and models to stakeholders; and explore opportunities to provide technical assistance and expertise to interested State, Local and Tribal governments and recipients of Federal construction support.
- Review existing notification systems for Federally supported construction projects and identify opportunities to promote increased levels of information and visibility to Local and Tribal governments, utilities and broadband and communications service providers to facilitate practical project-level coordination between project sponsors and broadband providers.
- Agencies with Federal land stewardship responsibilities ensure that they lead by example in implementing "Dig Once" policies which encourage broadband competition and deployment, including planning, joint use, construction and notification.
  - Key Milestones:
  - DOT and DOI designate an office to provide information on "Dig Once" policies Q4FY15
  - Agencies will complete review of policies to encourage "Dig Once"   Q2FY16
  - Agencies will publish best practice documents   Q3FY16
  - Agencies will begin providing technical assistance, as appropriate   Q4FY16

Address Broadband Challenges on Tribal Lands

- DOI: Conduct a Native American summit on broadband in Indian Country: DOI, in conjunction with other Federal Agencies, will conduct outreach to Tribes to plan and convene a Native American Broadband Summit to provide opportunities for the White House Council on Native American Affairs, Broadband Opportunity Council members and representatives from Federally-recognized tribes to review the current status of connectivity in Indian Country and discuss approaches to improve broadband access and adoption. The forum will provide an opportunity to develop inter-agency and inter-governmental actions to improve connectivity on Tribal lands and among Native American people. A Summit Report will be developed highlighting results, actions and intended next steps. Agencies supporting this effort include: FCC, Department of Homeland Security (DHS), ED, DOC, HUD, IMLS, and USDA.
  - Key Milestones:
  - Host listening session at White House Tribal Nations conference   1QFY16
  - Develop agenda, logistics and outreach plan   3QFY16
  - Conduct the summit   4QFY16

- DOI: Launch an interagency Tribal schools technology initiative: The DOI Bureau of Indian Education (BIE) will work with the White House Council on Native American Affairs, other Federal Agencies and the Educational Native American Network (ENAN) to increase broadband connectivity and educational support at schools throughout Indian Country. This action will leverage resources and programs such as ConnectED, BroadbandUSA, RUS Telecommunications and Distance Learning Grants and new e-Rate regulations to develop

and implement a plan to increase connectivity at Tribal Schools. All actions will be implemented through ENAN, which provides standards-based connectivity, security, content delivery, web services, distance learning, email access, education application access and other information services to BIE schools. In addition to supporting educational outcomes, high-speed connections at schools can support broader plans to increase broadband access in Tribal Lands. The following Agencies will support this effort: DOC, ED, HUD (ICDBG), IMLS and USDA.

- o <u>Key Milestones</u>:
- ▪ Identify schools that need increased capacity broadband   Q2FY16
- ▪ Develop a 3-year plan to provide higher speeds to designated schools Q4FY16

- <u>DOL: Expand technology-based job training in tribal communities</u>: DOL Employment Training Administration will provide information on the Rural Utilities Service (RUS) Distance Learning and Telemedicine (DLT) and Community Connect grant programs to its Indian and Native American Program grantees. This information will reach over 125 grantees across the country, helping them to deliver online services to their customers. IMLS will also promote RUS grant information to their Native American Library and Museum Services grantees.
  - o <u>Key Milestones</u>:
  - ▪ Outreach to IMLS Native American grantees   2QFY16
  - ▪ Outreach to DOL Native American "community of practice"   2QFY16

Support Broadband Adoption and Meaningful Technology Use

- <u>HUD: Fund educational navigators in HUD-assisted housing to facilitate broadband adoption</u>: HUD will issue a new grant opportunity to fund "educational navigators" in HUD-assisted housing to expand access to high quality education resources and assist residents with broadband access and adoption questions. An estimated $2 million in funding will be available for these competitive grants, which will be awarded to approximately 3 Public Housing Authorities (PHAs) over a 3-year period. The PHAs will designate which HUD-assisted housing developments they will serve.
  - o <u>Key Milestones</u>:
  - ▪ Release Notice of Funding Availability   2QFY16

- <u>ED: Expand technology-enabled learning practices to new partner Agencies</u>: ED will build on its Future Ready Schools work by providing additional technical assistance and support to schools that have taken the Future Ready pledge. Technical assistance will include topics such as infrastructure, professional development and open educational resources. ED will collaborate with other Federal Agencies to expand the reach of the program to DOI's Tribal and rural community stakeholders, participants in HUD's ConnectHome demonstration program and DOL's adult learning programs. Future Ready Schools provides districts, schools and communities with a clear path to building the necessary vision and capacity to

use technology to improve learning. The following Agencies will support this effort: DOI, HUD, and DOL.

- o <u>Key Milestones</u>:
- ▪ Finalize 2015/16 Future Ready support plans for schools   4QFY15
- ▪ Define DOI, HUD and DOL Future Ready collaborations   1QFY16
- ▪ Align partner activities/resources to Future Ready Framework   1QFY16

- <u>General Services Administration (GSA): Modernize government donation, excess and surplus program</u>: GSA will lead an interagency effort to recommend updates to EO 12999[61] and the Computers for Learning program with the objective of updating equipment definitions and enabling additional user groups to receive surplus equipment. The donation program promotes recycling of surplus equipment while making devices available to support schools, libraries and educational non-profits. The following Agencies will support this effort: IMLS, NTIA.
  - o <u>Key Milestones</u>:
  - ▪ Convene stakeholders to explore program revisions   1QFY16
  - ▪ Propose updates to Executive Order   2QFY16
  - ▪ Issue updated guidance on Computers for Learning   3QFY16

- <u>Small Business Administration (SBA): Develop and deploy new digital empowerment training for small businesses:</u> SBA will develop new training modules to support small businesses in using broadband-based applications and services to conduct better market research, improve operations and efficiency, and strengthen marketing and sales. SBA's Office of Entrepreneurial Development will distribute materials to SBA field offices including more than 900 Small Business Development Centers (SBDCs), 100 Women's Business Centers (WBCs) and 16 Veterans Centers. Materials will also be made available at 14 RUS Regional Centers through a partnership with USDA and through the BusinessUSA portal.
  - o <u>Key Milestones</u>:
  - ▪ Provide updated digital literacy toolkit   2QFY16
  - ▪ Launch awareness campaign   3QFY16

- <u>GSA: Publish consumer guides on the benefits of broadband targeted at key communities</u>: Through targeted consumer campaigns using printed publications and websites, GSA will educate citizens, especially low-connectivity populations, on the benefits of broadband adoption. NTIA's BroadbandUSA will take the lead in creating content for these publications. Material on the benefits of broadband adoption will be provided through GSA's English and Spanish print publications, which reach over 300,000 people.
  - o <u>Key Milestones</u>:
  - ▪ Develop communication/outreach plan   2QFY16
  - ▪ Develop digital inclusion content   2QFY16
  - ▪ Develop and issue initial digital products   3QFY16
  - ▪ Provide insert for print publications   4QFY16

Broadband Opportunity Council

4.3 Promote increased broadband deployment and competition through expanded access to Federal assets

One important way to increase competition in broadband markets – and thereby reduce costs and improve services for consumers – is to reduce the barriers to entry, especially the costs of infrastructure deployment. While patterns of land ownership and local and state regulations shape most deployment options, Federal lands, buildings and assets are also important conduits for broadband deployment. Recognizing this opportunity, the President released EO 13616, "Accelerating Broadband Infrastructure Deployment" on June 14, 2012, directing Federal Agencies to streamline application processes and otherwise promote access to Federal lands.[62] While Federal Agencies made significant progress, stakeholders suggest that more remains to be done – especially to provide more information on the wide range of Federal assets that are or can be made available for broadband purposes.

Continuing to build on EO 13616, the Federal government can also continue to do more to help service providers obtain the necessary permits and permissions to build out broadband networks on Federal lands, use Federal assets or cross Federal rights-of-way. Comments received through the Council RFC process highlighted the EO Working Group's work in these areas and urged continued and expedited efforts to streamline Federal permitting.[63]

> **RECOMMENDATION: Agencies will streamline processes and promote interagency coordination to lower barriers to investment.**

When we think of Federal assets, it is common to think of public lands, buildings or towers, but Federal programs, publications and digital content can also serve as important resources to support broadband. These resources should be identified and made more accessible and available.

> **RECOMMENDATION: Agencies will create an accessible open inventory of Federal assets that can support broadband and expanding access to those assets.**

Streamline Processes and Lower Barriers to Investment

- DOT: Issue policy guidance to leverage highway rights of way for broadband; DOT will develop and disseminate policy guidance defining broadband flexibilities within highway rights of way. Guidance will include, but not be limited to: the use and valuation of excess fiber capacity within Intelligent Transportation Systems (ITS); shared use of fiber, conduit and other assets; and policies for overlashing and pole attachments.
    - Key Milestones:
        - Develop draft guidance document   3QFY16
        - Issue final guidance   1QFY17
        - Outreach initiative includes national webinar   2QFY17

- DOI/USDA: Explore strategies to create efficiency and consistency in Section 106 review for broadband projects: DOI and USDA will work with the Advisory Council on Historic Preservation and other relevant Agencies, like the General Services Administration, to

explore ways to align and create efficiency in Section 106 historical review permitting processes for broadband projects on Federal lands.

- o <u>Key Milestones</u>:
- ▪ Inventory existing processes, agreements and policy   1QFY16
- ▪ Identify priority improvements and establish timelines for implementation   2QFY16

Create Inventory and Expand Access to Federal Assets

- <u>Create accessible open data inventory of infrastructure assets that can support broadband</u>: NEC, OSTP and the Office of Management and Budget (OMB) will bring together and organize key Agencies across the Federal government to create and make available, as appropriate, a centralized inventory of broadband-related infrastructure assets. The inventory will include Federal data sets that contain telecommunications assets, buildings and other assets that can be used to support increased broadband deployment. All data will be publicly available through a common interface such as data.gov with tagging, or metadata to simplify discovery, access and use. While Agencies will not create a combined map of Federal assets, the data sets will include Geographic Information System (GIS) and other mapping data; the availability of these data sets will enable other providers to leverage this information to create regional or national asset maps. This centralized data inventory will enable private and public concerns to better evaluate and access the Federal assets that can be used to lower costs for broadband deployment, thereby promoting investment and increasing competition. Agencies supporting this effort include: DOC, DOE, DOI, DOT, GSA, and USDA.
  - o <u>Key Milestones</u>:
  - ▪ Define required data elements and scope of inventory   1QFY16
  - ▪ Provide appropriately formatted data for database   1QFY16
  - ▪ Make data sets accessible to public   2QFY16

- <u>DOI: Expand utilization of towers on Tribal and rural lands</u>: DOI will develop an initiative to leverage over 4,000 towers and other assets on DOI-managed property to support broadband deployments. The initiative will seek public-private partnerships to "make ready" or upgrade towers in exchange for discounted tower leases, consistent with statutory requirements. This effort could reduce barriers to entry, increase competition and improve service over 500 million square acres of land in unserved and underserved communities. NTIA will assist DOI in this effort.
  - o <u>Key Milestones</u>:
  - ▪ Develop "credit in kind" tower lease model   1QFY16
  - ▪ Develop agreements with partners   4QFY16
  - ▪ Establish semi-annual meetings (roundtables)   2QFY17

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4.4 Improve Data Collection, Analysis and Research on Broadband

Research on broadband deployment, competition and adoption has not kept pace with the massive digital changes that permeate our economy and society. More research and development is needed: research into broadband economics; studies on deployment barriers; deeper study on how competitive telecommunication markets work in rural and remote regions; and updated studies on broadband adoption and digital literacy.

Council Agencies recognized the need for more granular data about broadband connectivity as it impacts their stakeholders and missions. This can include data on: broadband speeds and quality points; wireless loads at community anchor institutions; digital literacy and confidence; metrics on effective use; or e-commerce-driven business growth. Opportunities exist to leverage interagency collaboration to improve data collection strategies and to improve our overall understanding of current conditions and needs.

More than any one study; the Council recommends developing a comprehensive research and data collection agenda to prioritize future research plans and continuing to invest in pioneering research programs that support American competitiveness.

There are ample opportunities to engage stakeholders in developing this agenda, executing a broad research program and promoting more sharing across entities.

> **RECOMMENDATION: Agencies will develop a national research agenda, prototype advanced applications and improve data collection, analysis and research on broadband**.

- National Science Foundation (NSF) and NTIA: Develop a national broadband research agenda: NSF and NTIA, with participation from other Federal Agencies and bureaus including the Commerce Department's Census Bureau and Economics and Statistics Administration, will develop a national broadband research agenda. This activity will comprise a review of existing broadband research and resources (including, *e.g.*, a review of Federal research programs, data sets and data collection efforts relating to broadband) and will engage the broader research community to understand challenges, needs, and opportunities and map out and prioritize the most significant opportunities for broadband research. Possible research questions include topics related to broadband innovation, deployment, competition, adoption and impacts (including social/economic impacts). The national broadband research agenda will also consider how to make broadband research (and data) publicly available via open data initiatives. The following Agencies will participate in this effort: DOC, DHS, GSA, HHS, IMLS, and others.
  - Key Milestones:
    - Inventory broadband data needs/assets of Federal Agencies   2QFY16
    - Engage the research community and stakeholders/practitioners   3QFY16
    - Publish broadband research agenda   4QFY16

- ED: Compile and create national data on broadband in schools: ED will use existing data collection tools and vehicles to assess and compile better national data about student access to technology in school and at home. This initiative will leverage Local and State Education Authority data tools and surveys to create a stronger national and regional understanding

of district needs for connectivity, devices and digital content. Results will inform future local, regional and national program and policy actions and support the goals and objectives outlined in ConnectED and implemented through e-Rate reforms.

- o <u>Key Milestones:</u>
- Identify appropriate state and regional survey capabilities   1QFY16
- Develop additional queries to add to surveys   3QFY16
- OMB approval for new data collection   2QFY17
- Begin expanded data collection   3QFY17

- <u>NSF: Pilot new applications that leverage advanced broadband networks</u>: The US Ignite initiative, launched by the Administration in June 2012 with NSF serving as the lead agency, supports next-generation Internet applications that leverage ultra-high-speed connectivity and other advanced networking infrastructure to provide transformational capabilities and services, such as state-of-the-art weather monitoring to improve disaster preparedness and response and real-time individual and patient monitoring to improve health outcomes. NSF will work with other Federal departments and Agencies to develop a new round of application ideas and prototypes to advance agency missions. These efforts will demonstrate to agencies and to the public the technological benefits that can be gained by expanding gigabit broadband networks, encouraging a virtuous cycle of broadband investments and innovations. To develop these applications, NSF will work with partner Federal Agencies to convene workshops with academic researchers, entrepreneurs, developers, community organizers and users to spur collaborations and advance subsequent investments. Agencies supporting this effort include: NSF, HHS, DOT, DOJ, and HUD.
  - o <u>Key Milestones</u>:
  - Convene workshops in various verticals   1QFY16
  - Prototypes new applications in at least two verticals   4QFY16

5. Implementation and Next Steps

The March 23, 2015 Presidential Memorandum established the Council to coordinate actions among all the member Agencies in support of the Administration policy to encourage investment in broadband infrastructure and promote the adoption and meaningful use of broadband technology. It further directed the Council to issue a report within 150 days providing a list of recommendations "on actions that Agencies can take to support broadband deployment and adoption."

Over the past five months, the Council sought public comment, conducted dozens of stakeholder meetings and held extensive interagency deliberations to explore opportunities to take action. Council members have deepened their understanding of the importance of broadband to their respective missions and of further actions their Agencies may take to advance broadband deployment, competition and adoption in America.

This Report describes 36 immediate actions, with associated milestones, that Federal Agencies have committed to undertake. In order to ensure that these recommendations are implemented in a timely and transparent fashion, Agencies will provide regular updates to the Council Steering Committee which will monitor progress and report periodically to the NEC.

In addition to the recommendations herein, the Council will explore additional actions that can unlock even more value across our agency initiatives. For example, greater reach, speeds, and cost-savings can be achieved in our broadband investments by adding technical expertise and reference designs to support each initiative. As one of its first steps, the Council will explore ways to bring this expertise into key agencies, which in turn will increase the impact of the recommended actions.

The work of the Council was shaped by input and conversation with a diverse group of stakeholders including State, Local and Tribal government leaders; major telecommunication carriers and associations; IT innovators and technology companies; nonprofits and community anchor institutions; community advocates and individuals. Their insights were critical to shaping these recommendations and will be critical to both the implementation of actions and considerations for future actions. Member Agencies will continue to engage with stakeholders to shape implementation plans, to gather feedback on the impacts of these changes and to develop future actions for consideration.

Appendices

A. Broadband Opportunity Council Member Agencies
B. List of respondents to Council Request for Comment
C. Endnotes

Broadband Opportunity Council

Appendix A: Broadband Opportunity Council Member Agencies

Appalachian Regional Commission	ARC
Council of Economic Advisers	CEA
Council on Environmental Quality	CEQ
Department of Agriculture	USDA
Department of Commerce	DOC
Department of Defense	DOD
Department of Education	ED
Department of Energy	DOE
Department of Health and Human Services	DHHS
Department of Homeland Security	DHS
Department of Housing and Urban Development	HUD
Department of the Interior	DOI
Department of Justice	DOJ
Department of Labor	DOL
Department of Transportation	DOT
Department of the Treasury	UST
Department of Veterans Affairs	VA
Domestic Policy Council	DPC
Environmental Protection Agency	EPA
General Services Administration	GSA
Institute of Museum and Library Services	IMLS
National Economic Council	NEC

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National Science Foundation   NSF

Office of Management and Budget   OMB

Office of Science and Technology Policy   OSTP

Small Business Administration   SBA

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Appendix B: List of respondents to Council Request for Comment

Abilene Public Library

Acton Plan Cooperative

Advanced Communications Law & Policy Institute

Advanced Superabrasives Inc.

Affiliated Tribes of Northwest Indians Telecommunications Committee

Alaska Native Tribal Health Consortium

Alaska Rural Coalition

Albemarle-Kenmore Neighbors Association

Alford, Dulce

Allen, Terry W.

American Cable Association

American Library Association

American Telemedicine Association

AT&T Services, Inc.

Atkins, Brian

Bay Area Council

Benton Foundation

Blegen, Edward

Bluebird Network

Boggs, Harriett

Booker, Joyetta

Bostnick, Janet

Bowers, Jarid

Brenner, David and Marilyn

Britton, Jill

Broadband Collaborative

broadbandnow

Buhrkuhl, Tom and Mary

California Department of Technology

California Emerging Technology Fund

Camdenton Area Chamber of Commerce

Canida, Monna

Cascone, Anthony

Casey, Mary Ruth

CenturyLink, Inc.

Charlton, Melissa

Chatham County NC

chebeague.net, LLC

Choice Broadband

City and County of San Francisco

City of Osage Beach

City of Winters

CK Blandin Foundation

Clarkson, Rob

Clegg, Roger

Coalition for Local Internet Choice

CoBank

Cochise County Board of Supervisors

Coeur d'Alene Tribe

Cole, Rollie

Colorado Association of Regional Organizations

Comcast Business

Communications Workers of America

Broadband Opportunity Council

Community Foundation Santa Cruz County

CompassPoint Technologies, LLC

Connect Your Community 2.0

Connected Nation, Inc.

Conxxus, LLC

Cooksey, Libby

Covelli, Donna

CTIA – The Wireless Association

Daley, Elizabeth

Datagrammatics Inc.

Deere & Company

Deluhery, Rod

Dempsey, George and Veronica

Detroit Community Technology Project and the Resilient Communities Program, New America

Dross, Polly C

Ericsson

EveryoneOn

Ferree, Nancy

Ferree, Robert

Fiber to the Home Council Americas

Fiberutilities Group, LLC

Fielding, Ed

FireServe Broadband Internet

Fishback, Sharon

Fizer, Paula

Fleming, Gerald

Fleming, Joel

Foundation Telecommunications, Inc.

Free Press

Friend, Diane

Gaeke, Dwayne

Gaeke, Robert

General Communications, Inc.

GENI Project Office Raytheon BBN Technologies

Georgia Technology Authority

Gideon, Beth

Gilchrist, Sharon

Gilkerson, Paul and Joan

Google Inc.

Grate, Matt

Green, Andy and Stacy

Green, Darlene

Hagen, Elaine and Dave

Hatley, Debbie

Heffern, Rebozo

Hensell, Kathy

Hetherington, George M.

Heuring, Kyna

Hicks II, Edward

High, Alta

Hogue, Charley

Huntington Ophthalmology, PC

ICF International

Illinois 21st Century Digital Futures Alliance NFP

Independent Telephone & Telecommunications Alliance

Indiana Department of Transportation

Information Technology Industry Council

Information Technology & Innovation Foundation

Institute for Local Self-Reliance

Broadband Opportunity Council

Iowa Communications Alliance

Island Institute

Jackson, Karen

Joanne's Radiology Transcription

JALA International

Jenkins County Development Authority

Johnson, Gary

Johnson, Ron

Jones, Gail

Kaelber, Dr. David

Kehus, Cynthia A.

Kindle, Dwayne

Klatt, Mark and Kathy

Klise, Kate

Kopecky, Randy

Leadership Conference on Civil and Human Rights, et al.

Levin, Blair

Lexington Broadband Initiative

Lifeline Connects Coalition

Lone Eagle Consulting

Long, Samantha

Louisiana State University

MacIntyre, Norman

Manfredi, Frank

Marcus Spectrum Solutions LLC

Martin County Board of County Commissioners

Mathis, Virgil

McComb, William and Ardith

McGuire, Vince and Lynnette

Metts, William

Meyer, Randolph and Dorothy

Midkiff, Brenda

Minnesota Office of Broadband Development

Mississippi State University Extension Service Intelligent Community Institute

Mobile Future

Monroe Health Center

Monte R. Lee and Company

Moore, David

Morgan, Charlotte

Morrison, Melissa

Mozilla

Musgrave, Edward

National Association of Regulatory Utility Commissioners

National Cable & Telecommunications Association

National Congress of American Indians

National Digital Inclusion Alliance

National Hispanic Media Coalition

National Housing Conference

National League of Cities, National Association of Counties, and National Association of Telecommunications Officers and Advisors

National Rural Electric Cooperative Association

National Rural Health Association

National Tribal Telecommunications Association

National Urban League

New America's Open Technology Institute

Nelson County, VA

NoaNet

Broadband Opportunity Council

Noel Communications

North Carolina Office of Digital Infrastructure

Norton, Marian

Novak, Lawana

NTCA–The Rural Broadband Association

O3b Networks

Oregon Broadband Advisory Council

Owen Holdings, LLC

Ostrand, Keith

P.S.S. Inc. (d/b/a "Home and Business Electronics")

PCIA – The Wireless Infrastructure Association

Pennsylvania Technical Assistance Program

Pintar, Bette

Pioneer Broadband

Port of Whitman County

Poyser, Jonathan

Public, Jean

Redzone Wireless, LLC.

Reecht, Paula

Reed, Jane and George

Reese, Mike

Regional Fiber Consortium

Representatives Huffman, Eshoo, Welch, Loebsack, Thompson, Lujan, Kilmer, and Tonko

Rhinesmith, Colin

Robertson, Gary and Jennifer

Roy, Barbara

Rural Broadband Policy Group

Rural County Representatives of California

Rural Telecommunications Congress

Russell, Kevin P.

Sapp, Gina

Satellite Industry Association

Saylor, Don, Yolo County Supervisor

Schools, Health & Libraries Broadband Coalition

Schultz, Ralph

SDN Communications, South Dakota Telecommunications Association

Seeds of Literacy

Senator Amy Klobuchar

Seth, La Vana

Shea, Carol

SMT Rail Corporation

Slaton, Jon

Srinivasan, Professor S., Texas Southern University

State of Illinois

Steen, Daryl

Stevens County Washington and Washington State University Stevens County Extension

Stoffa, Paul

Stowell, Jim

Strategic Networks Group

Taylor, Everet B.

TechAmerica

Technology and Information Policy Institute

Telecommunications Industry Association

The Quilt

Tom and Betty

Town of Benton

Town of Hawley

Broadband Opportunity Council

University Corporation for Advanced Internet Development (d/b/a "Internet2")

US Ignite

USTelecom

Utah Department of Transportation

Utah Governor's Office of Economic Development

Utilities Telecom Council

Valley Vision and the Connected Capital Area Broadband Consortium

Valu-Net LLC

Walker, Angela

Walker, Fred

Walser, Jesse

Walsh, Jeremiah

Washington State University Extension, Division of Governmental Studies & Services

Watauga County Planning & Inspections and Economic Development

Webb, Louise

Mark Wells

Western Rural Development Center

Whittle Electronics

Wilson, Shelley

Windstream Services, LLC

Wireless Internet Service Providers Association

Yolo Local Agency Formation Commission

Zelenok, David S.

Appendix C: Endnotes

1 Obama, Barack, "Presidential Memorandum - Expanding Broadband Deployment and Adoption by Addressing Regulatory Barriers and Encouraging Investment and Training," March 23, 2015, https://www.whitehouse.gov/the-press-office/2015/03/23/presidential-memorandum-expanding-broadband-deployment-and-adoption-addr (Presidential Memorandum).

2 Over time, our definition of what constitutes high-speed internet or broadband has evolved as consumers engage in more activities online. Most recently, the Federal Communications Commission (FCC) has defined household "broadband" as 25 Mbps for download speeds and 3 Mbps for upload speeds. The FCC acknowledges that the ultimate goal is for consumers to have sufficient broadband capacity to take full advantage of the services and applications they want to use online. Accordingly, businesses and community anchor institutions supporting simultaneous users or mission critical applications may need 100 Mbps or multi-gigabit connections to address their needs. For this Report, we consider broadband as a connection that supports an acceptable quality of service for the applications that people expect to use in the course or their work and daily life.

3 Council of Economic Advisors, "Mapping the Digital Divide," July, 2015, p. 1, https://www.whitehouse.gov/sites/default/files/wh_digital_divide_issue_brief.pdf (CEA report).

4 Perrin, Andrew and Maeve Duggan, *Americans' Internet Access: 2000-2015*, June 26, 2015, http://www.pewinternet.org/2015/06/26/americans-internet-access-2000-2015/

5 White House, "FACT SHEET: Next Steps in Delivering Fast, Affordable Broadband," March 23, 2015, https://www.whitehouse.gov/the-press-office/2015/03/23/fact-sheet-next-steps-delivering-fast-affordable-broadband.

6 White House, ConnectED Initiative, https://www.whitehouse.gov/issues/education/k-12/connected.

7 White House, "FACT SHEET: ConnectED: Two Years of Delivering Opportunity to K-12 Schools & Libraries," June 25, 2015, https://www.whitehouse.gov/the-press-office/2015/06/25/fact-sheet-connected-two-years-delivering-opportunity-k-12-schools.

8 *Id.*

9 White House, "FACT SHEET: ConnectHome: Coming Together to Ensure Digital Opportunity for All Americans," July 15, 2015, https://www.whitehouse.gov/the-press-office/2015/07/15/fact-sheet-connecthome-coming-together-ensure-digital-opportunity-all.

10 NTIA, "Exploring the Digital Nation: Embracing the Mobile Internet," October 16, 2014, p. 15, http://www.ntia.doc.gov/report/2014/exploring-digital-nation-embracing-mobile-internet (Digital Nation 2014). The underlying data assumes that households have broadband service if they use anything other than dial-up.

11 Fox, Susannah, Pew Research Center, "Americans living with disability and their technology profile," January 21, 2011, http://www.pewinternet.org/2011/01/21/americans-living-with-disability-and-their-technology-profile/.

12 Id. Pew includes differences in education level and income together as "class."

13 File, Thom and Camille Ryan, "Computer and Internet Use in the United States: 2013," November 2014, p. 6, http://www.census.gov/content/dam/Census/library/publications/2014/acs/acs-28.pdf.

14 Digital Nation 2014, p. vii

15 CEA report pp. 4-5, Figure 4.

[16] *Id.* p. 6.

[17] FCC Broadband Progress Report, p. 6.

[18] CEA report p. 7.

[19] Horrigan, John P., "Digital Readiness: Nearly one-third of Americans lack the skills to use next-generation 'Internet of things' applications," June 2014, http://jbhorrigan.weebly.com/uploads/3/0/8/0/30809311/digital_readiness.horrigan.june2014.pdf.

[20] CEA report p. 8.

[21] Prepared remarks of FCC Chairman Tom Wheeler, "The Facts and Future of Broadband Competition," September 4, 2014, p.2, https://www.fcc.gov/document/chairman-remarks-facts-and-future-broadband-competition.

[22] *Id.*

[23] Broadband Opportunity Council Notice and Request for Comment, Docket Number 1540414365-5365-01, 80 Fed. Reg. 23,785 (Apr. 29, 2015), http://www.ntia.doc.gov/Federal-register-notice/2015/broadband-opportunity-Council-notice-and-request-comment.

[24] Broadband Opportunity Council Comments, Docket Number 1540414365-5365-01, June 12, 2015, http://www.ntia.doc.gov/Federal-register-notice/2015/broadband-opportunity-Council-comments.

[25] City and County of San Francisco p. 3 (June 10, 2015); National Housing Conference p. 2 (June 3, 2015). *See also* endnote 37 below.

[26] *See* endnotes 39 and 40 below.

[27] AT&T Services, Inc. pp. 9-11 (June 10, 2015); Fiber to the Home Council Americas pp. 3-4 (June 10, 2015); SDN Communications and South Dakota Telecommunications Association p. 2 (June 10, 2015).

[28] Fiber to the Home Council Americas pp. 3-4 (June 10, 2015); National League of Cities, National Association of Counties, and National Association of Telecommunications Officers and Advisors p. 2 (June 5, 2015); Schools, Health & Libraries Coalition p. 6 (June 10, 2015); Town of Hawley p. 2 (June 9, 2015). *See also* endnote 51 below.

[29] American Library Association pp. 10-11 (June 10, 2015); Benton Foundation p. 3 (June 10, 2015); California Emerging Technology Fund pp. 30-31 (June 10, 2015); Connected Nation pp. 7-8 (June 10, 2015); EveryoneOn p. 3 (June 10, 2015); Leadership Conference on Civil and Human Rights et al. pp. 1, 3 (June 11, 2015); New America's Open Technology Institute p. 5 (June 10, 2015); State of Illinois p. 11 (June 10, 2015); Utah Governor's Office of Economic Development p. 7 (June 10, 2015); Washington State University Extension, Division of Governmental Studies & Services pp. 5-6 (June 10, 2015)

[30] Advanced Communications Law & Policy Institute, New York Law School p. 16 (June 10, 2015); CK Blandin Foundation pp. 7-8 (June 9, 2015); California Emerging Technology Fund p. 31 (June 10, 2015); EveryoneOn p. 3 (June 10, 2015); National Rural Electric Cooperative Association p. 18 (June 10, 2015); State of Illinois p. 12 (June 10, 2015),

[31] Coalition for Local Internet Choice p. 9-12 (June 10, 2015); Ed Fielding p. 1 (June 10, 2015); North Carolina Office of Digital Infrastructure p. 3 (June 10, 2015); State of Illinois p. 7 (June 10, 2015); Utah Governor's Office of Economic Development p.4 (June 10, 2015); Wireless Internet Service Providers Association p. 5 (June 10, 2015).

[32] Information Technology and Innovation Foundation p. 7 (June 10, 2015); Minnesota Office of Broadband Development p. 3 (June 10, 2015)

[33] California Emerging Technology Fund p. 9 (June 10, 2015); Information Technology and Innovation Foundation p. 6 (June 10, 2015); Blair Levin p. 5 (June 10, 2015); Valley Vision and the Connected Capital Area Broadband Consortium p. 2 (June 10, 2015).

[34] CK Blandin Foundation p. 3 (June 9, 2015); Senator Amy Klobuchar p. 2 (June 10, 2015); Minnesota Office of Broadband Development p. 9 (June 10, 2015); New America's Open Technology Institute p. 7 (June 10, 2015); The Quilt p. 4 (June 10, 2015); Rural Telecommunications Congress p. 5 (June 10, 2015).

[35] CTIA – The Wireless Association pp. 27-28 (June 10, 2015); Foundation Telecommunications Inc. p. 8 (May 28, 2015); Oregon Broadband Advisory Council p. 2 (June 10, 2015); Utah Governor's Office of Economic Development p. 2 (June 10, 2015).

[36] Colorado Association of Regional Organizations p. 2 (June 1, 2015); National League of Cities, National Association of Counties, and National Association of Telecommunications Officers and Advisors p. 4 (June 5, 2015); New America's Open Technology Institute p. 6 (June 10, 2015); National Rural Electric Cooperative Association p. 10 (June 10, 2015); Rural Telecommunications Congress p. 3 (June 10, 2015); Utah Governor's Office of Economic Development pp. 3-4 (June 10, 2015); Washington State University Extension, Division of Governmental Studies & Services p. 3 (June 10, 2015); Wireless Internet Service Providers Association p. 5 (June 10, 2015);

[37] Fiber to the Home Council Americas p. 3 (June 10, 2015); Minnesota Office of Broadband Development p. 6 (June 10, 2015); North Carolina Office of Digital Infrastructure p. 2 (June 10, 2015); Town of Hawley p. 6 (June 9, 2015); Washington State University Extension, Division of Governmental Studies & Services p. 2 (June 10, 2015).

[38] Utah Governor's Office of Economic Development p. 2 (June 10, 2015).

[39] Advanced Communications Law & Policy Institute, New York Law School pp. 4, 14 (June 10, 2015); American Cable Association pp. 2, 7-9 (June 10, 2015); Benton Foundation p. 5 (June 10, 2015); CenturyLink pp. 4-6 (June 10, 2015); Fiber to the Home Council Americas p. 3 (June 10, 2015); General Communications, Inc. p. 7 (June 10, 2015); Information Technology and Innovation Foundation p. 7 (June 10, 2015); Minnesota Office of Broadband Development p. 3 (June 10, 2015); National Cable & Telecommunications Association pp. 2-3 (June 10, 2015); National League of Cities, National Association of Counties, and National Association of Telecommunications Officers and Advisors (NATOA) pp. 6-7 (June 5, 2015); NTCA – The Rural Broadband Association pp. 10-11 (June 10, 2015); USTelecom p. 4 (June 10, 2015); Utah Governor's Office of Economic Development p. 2 (June 10, 2015); Wireless Internet Service Providers Association p. 3 (June 10, 2015).

[40] Advanced Communications Law & Policy Institute, New York Law School p. 14 (June 10, 2015); AT&T Services pp. 4, 6-9 (June 10, 2015); CTIA – The Wireless Association pp. 11-21 (June 10, 2015); Information Technology & Innovation Foundation p. 8 (June 10, 2015); PCIA – The Wireless Infrastructure Association pp. 7-8 (June 10, 2015).

[41] Advanced Communications Law & Policy Institute, New York Law School p. 5 (June 10, 2015); American Cable Association p. 3 (June 10, 2015); Benton Foundation pp. 1-2 (June 10, 2015); Blair Levin p. 5 (June 10, 2015); Connected Nation p. 3 (June 10, 2015); CTIA – The Wireless Association p. 3 (June 10, 2015); Fiber to the Home Council Americas p. 2 (June 10, 2015); General Communications Inc. p. 6 (June 10, 2015); Google Inc. p. 15 (June 10, 2015).

[42] AT&T Services pp. 4, 6 (June 10, 2015); Information Technology & Innovation Foundation p. 8 (June 10, 2015); Blair Levin p. 7 (June 10, 2015); Mobile Future pp. 6-7 (June 10, 2015).

[43] California Emerging Technology Fund, p. 27 (June 10, 2015); Minnesota Office of Broadband Development p. 4 (June 10, 2015); New America's Open Technology Institute p. 6 (June 10, 2015); NCTA –The Rural Broadband Association (June 10, 2015); North Carolina Office of Digital Infrastructure p. 1 (June 10, 2015); Rural Telecommunications Congress pp. 2-3 (June 10, 2015).

[44] American Cable Association pp. 2, 7, 9 (June 10, 2015).

[45] Advanced Communications Law & Policy Institute, New York Law School, p. 14 (June 10, 2015); CenturyLink pp. 5-6 (June 10, 2015); General Communications, Inc. pp. 2, 5, 7-8 (June 10, 2015); Independent Telephone & Telecommunications Alliance p. 5 (June 10, 2015); Minnesota Office of Broadband Development pp. 4, 6, 9 (June 10, 2015); Mobile Future p. 5 (June 10, 2015); State of Illinois p. 8 (June 10, 2015); Utah Governor's Office of Economic Development pp. 2, 3 (June 10, 2015).

[46] Benton Foundation pp. 4-6 (June 10, 2015); California Emerging Technology Fund pp. 11, 23 (June 10, 2015); CK Blandin Foundation p. 11 (June 9, 2015); Google Inc. p. 16 (June 10, 2015); ICF International p. 10 (June 10, 2015); Illinois 21st Century Digital Futures Alliance NFP p. 10 (June 10, 2015); Lifeline Connects Coalition pp. 2-9 (June 10, 2015); Senator Amy Klobuchar p. 1 (June 10, 2015); Leadership Conference on Civil and Human Rights pp. 1-4 (June 11, 2015); Minnesota Office of Broadband Development p. 10 (June 10, 2015); National Hispanic Media Coalition pp. 2-7 (June 10, 2015); National Housing Conference pp. 1-2 (June 3, 2015); Colin Rhinesmith pp. 1-2 (June 9, 2015); Stevens County Washington and Washington State University Stevens County Extension p. 3 (June 10, 2015); Town of Hawley p. 7 (June 9, 2015); USTelecom pp. 8, 10 (June 10, 2015); Washington State University Extension, Division of Governmental Studies & Services p. 4 (June 10, 2015); NCTA –The Rural Broadband Association (June 10, 2015).

[47] American Library Association p. 3 (June 10, 2015); California Emerging Technology Fund pp. 23, 25 (June 10, 2015); Foundation Telecommunications Inc. p. 9 (May 28, 2015); National Housing Conference pp. 2-3 (June 3, 2015); National Rural Electric Cooperative Association p. 15 (June 10, 2015); S. Srinivasan, Texas State University p. 1 (May 31, 2015); USTelecom p. 8 (June 10, 2015).

[48] *See* Advanced Communications Law & Policy Institute at New York Law School p. 16 (June 10, 2015); American Library Association p. 4 (June 10, 2015); California Emerging Technology Fund pp. 6, 9-10, 16-17, 21, 25 (June 10, 2015); Connect Your Community 2.0 pp. 1-3 (June 10, 2015); Google, Inc. pp. 17-18 (June 10, 2015); Information Technology and Innovation Foundation p. 9 (June 10, 2015); Island Institute p. 2 (June 4, 2015); Lifeline Connects Coalition pp. 3-5 (June 10, 2015); National Digital Inclusion Alliance pp. 4-7 (June 10, 2015); National Hispanic Media Coalition pp. 3 (June 10, 2015); National Urban League p. 2 (June 10, 2015); New America's Open Technology Institute pp. 4, 8-10 (June 10, 2015); Owen Holdings LLC pp. 13-14 (June 9, 2015); Colin Rhinesmith pp. 1-2 (June 9, 2015); Schools, Health & Libraries Broadband Coalition pp. 6, 12 (June 10, 2015); Strategic Networks Group p. 2 (June 10, 2015); Windstream p. 7 (June 10, 2015).

[49] See California Emerging Technology Fund p. 14 (June 10, 2015); Google Inc. p. 18 (June 10, 2015); National Digital Inclusion Alliance p. 5 (June 10, 2015).

[50] California Emerging Technology Fund pp. 7-8, 16 (June 10, 2015); Google, Inc. p. 10 (June 10, 2015); Information Technology Industry Council p. 4 (June 10, 2015).

[51] CK Blandin Foundation pp. 5, 7 (June 9, 2015); Minnesota Office of Broadband Development pp. 8-9 (June 10, 2015); National Digital Inclusion Alliance p. 6 (June 10, 2015); State of Illinois pp. 5, 9, 10 (June 10, 2015).

[52] American Library Association p. 4 (June 10, 2015); Benton Foundation p. 3 (June 10, 2015); CK Blandin Foundation p. 11 (June 9, 2015); Google Inc. pp. 18-19 (June 10, 2015); Leadership Conference on Civil and Human Rights pp. 1, 3 (June 11, 2015); Minnesota Office of Broadband Development pp. 5, 8 (June 10, 2015); National Digital Inclusion Alliance p. 3 (June 10, 2015); National Hispanic Media Coalition pp. 5-6 (June 10, 2015); National League of Cities, National Association of Counties, and National Association of Telecommunications Officers and Advisors p. 3 (June 5, 2015); Town of Hawley p. 3 (June 9, 2015).

[53] *See, e.g.*, Terry Allen p. 1 (June 5, 2015); Brian Atkins p. 1 (June 8, 2015); Mary Ruth Casey (June 9, 2015); Charley Hogue p. 1 (May 28, 2015); Ed Musgrave p. 1 (May 27, 2015); Barbara Roy (May 24, 2015); Jesse Walser p. 1 (June 10, 2015); Shelley Wilson p. 1 (May 24, 2015).

[54] California Department of Technology p. 3 (June 12, 2015); CK Blandin Foundation p. 11 (June 9, 2015); Dr. David Kaelber p. 2 (June 10, 2015); Leadership Conference on Civil and Human Rights et al. pp. 1, 2 (June 11, 2015); Minnesota Office of Broadband Development p. 7 (June 10, 2015); USTelecom pp. 32-33 (June 10, 2015).

[55] Alaska Native Tribal Health Consortium p. 1 (May 28, 2015); EveryoneOn pp. 2-3 (June 10, 2015); Yolo Local Agency Formation Commission p. 2 (June 10, 2015).

[56] Google Inc. p. 8 (June 10, 2015); Independent Telephone & Telecommunications Alliance pp. 7-8 (June 10, 2015); USTelecom pp. 21, 25-26 (June 10, 2015).

[57] Foundation Telecommunications Inc. p. 3, 5, 11 (May 28, 2015); Schools, Health & Libraries Broadband Coalition p. 10 (June 10, 2015); Wireless Internet Service Providers Association p. 7 (June 10, 2015).

[58] CTIA – The Wireless Association pp. 28-29 (June 10, 2015); TechAmerica p. 7 (June 10, 2015); USTelecom pp. 15-17 (June 10, 2015).

[59] AT&T Services Inc. pp. 4, 9-11 (June 10, 2015); C.K. Blandin Foundation pp. 5, 7 (June 9, 2015); Fiber to the Home Council Americas pp. 3-4 (June 10, 2015); Minnesota Office of Broadband Development p. 8 (June 10, 2015); National League of Cities, National Association of Counties, and National Association of Telecommunications Officers and Advisors p. 2 (June 5, 2015); Schools, Health & Libraries Coalition p. 6 (June 10, 2015); Town of Hawley p. 2 (June 9, 2015). See Minnesota Office of Broadband Development p. 9 (June 10, 2015); National Digital Inclusion Alliance p. 6 (June 10, 2015); State of Illinois pp. 5, 9, 10 (June 10, 2015).

[60] Affiliated Tribes of Northwest Indians Telecommunications Committee p. 6 (June 10, 2015); ICF International p. 4 (June 10, 2015); National Conference of American Indians pp. 1, 3 (June 10, 2015);National Tribal Telecommunications Association pp. 3-4 (June 10, 2015); Rural Broadband Policy Group p. 1 (June 11, 2015)

[61] White House, "Executive Order 12999 - Educational Technology: Ensuring Opportunity for All Children in the Next Century", April 17, 1996, http://www.gsa.gov/portal/content/100841.

[62]White House, "Executive Order -- Accelerating Broadband Infrastructure Deployment', June 14, 2012, https://www.whitehouse.gov/the-press-office/2012/06/14/executive-order-accelerating-broadband-infrastructure-deployment.

[63] See California Emerging Technology Fund, p. 27 (June 10, 2015); Minnesota Office of Broadband Development p. 4 (June 10, 2015); New America's Open Technology Institute p. 6 (June 10, 2015); North Carolina Office of Digital Infrastructure p. 1 (June 10, 2015); Rural Telecommunications Congress pp. 2-3 (June 10, 2015).