June 10, 2015

National Telecommunications and Information Administration,
U.S. Department of Commerce,
1401 Constitution Avenue NW., Room 4626,
Washington, DC 20230.
Attn: Broadband Opportunity Council,

Re: Comments of the Telecommunications Industry Association to Telecommunications and Information Administration regarding the Broadband Opportunity Council Notice and Request for Comment, Docket No. 1540414365–5365–01

I.   Introduction

The Telecommunications Industry Association appreciates the opportunity to comment on ways to promote public and private investment in broadband and get a better understanding of the challenges facing areas that lack access to broadband.

TIA represents the global information and communications technology ("ICT") industry through standards development, advocacy, tradeshows, business opportunities, market intelligence, and world- wide environmental regulatory analysis. Its hundreds of member companies manufacture or supply the products and services used in the provision of broadband and broadband-enabled applications. Since 1924, TIA has enhanced the business environment for broadband, mobile wireless, information technology, networks, cable, satellite, and unified communications. TIA's standards committees create consensus-based voluntary standards for numerous facets of the ICT industry.

At the outset, TIA suggests that the policy challenges associated with broadband in 2015 are different from those posed in 2010 at the time of the National Broadband Plan. First, significant investment has taken place since 2010. As a result, the average connection speed for the U.S. as a whole in the second quarter of 2010 was 4.6 Mbps. Fast forward to 2014 – the U.S. has an average connection speed at 11.4 Mbps.[1] As the notice observes, the definition of what actually constitutes broadband is becoming more complex. The Federal Communications Commission effectively "raised the bar" earlier this year.[2] However, the practical broadband standard remains much lower for many applications.

Secondly, not only is broadband more available than was previously the case, but users also have more competitive broadband alternatives to choose from:

---

[1]   See, Akamai , The State of the Internet; Q4 2014 Report http://www.akamai.com/dl/content/q4-2014-soti-a4.pdf (last accessed June 9, 2015)

[2]   See, Federal Communications Commission, 2015 BROADBAND PROGRESS REPORT AND NOTICE OF INQUIRY (Rel. February 4, 2015)

- 95% of housing units have one wired BB provider available;
- 99% have at least one wireless BB provider;
- 88% have at least two wired BB options to choose from.[3]

Perhaps the most significant change regarding broadband in the past half-decade has been the dramatic increase in America's use of mobile broadband connectivity. This is most visible with the rapid growth of smartphone adoption. These devices are essentially handheld computers integrated with a mobile telephone, allowing consumers to use them in much the same manner as their home computers. With smartphones replacing feature phones, the growth in the smartphone universe is straining available wireless spectrum.

In 2012, for the first time, wireless subscribers spent more on data than they did on voice. Spending on data rose by a third in 2012, and during the next four years, it will increase by 94 percent. TIA projects that the overall wireless market, including voice and data services, wireless handsets, wireless infrastructure equipment, and services in support of the wireless infrastructure, will expand at a 7.6 percent compound annual rate, reaching an estimated $364.5 billion in 2016 from $272.3 billion in 2012. Innovation and growth have also gone well beyond the smartphones. Demand for bandwidth consuming devices such as netbooks and tablets are skyrocketing.[4]

TIA regards broadband deployment as but one component of an overall "ecosystem" – combining connectivity with applications. Through economic and regulatory incentives for network deployments and upgrades, the U.S. Government can create investment in next-generation broadband infrastructure.

Continued investment in next-generation broadband networks promises major advances in education, healthcare, teleworking, e-commerce, public safety, and security. These capabilities are equipping users with the tools that are necessary to compete in the 21st century, making them far more productive, increasing their standards of living, and enhancing economic and physical security.

II.   Addressing Adoption: One Speed Does Not Fit All

The Request for Comment appropriately raises an essential challenge: how to should adoption rates be increased? Based on a number of metrics, broadband subscription rates lag availability as many potential users do not understand the value broadband' s value proposition as sufficient to justify its cost. Unquestionably, broadband subscription remains only one multiple expenditure of time and income that is competing for consumer attention.

TIA anticipates that potential users are likely to be prepared to contract for a variety of broadband speeds and capacity, tied specifically to the particular applications they value. For example, mobile broadband users clearly opt to trade the convenience of not being tethered to a

---

[3]   *See,* NTIA, National Broadband Map, Year-End 2013.

[4]   This data, as well as all other projections and statistics provided in this document which are not cited to otherwise, are derived from the TIA 2015 ICT Market Review & Forecast, a proprietary annual publication from TIA containing distilled data and analysis on information and communications technology industry trends and market forecasts through the end of 2018. This document is available for purchase at http://www.tiaonline.org/resources/market-forecast.

fixed connection over speed. Email, and even video streaming, may not be sufficient to encourage consumers to adopt the FCC's new preferred broadband standard.

Yet, in the near-term future, TIA anticipates that the distinction between "Mobile" and "Fixed" will become less clear as more traffic moves to "Heterogeneous Networks." [5] These HetNets will blur the distinction between Mobile and Fixed, further obscuring broadband performance metrics. Quite unlike the experience of universal phone service in which users either had voice service or they did not, universal broadband and universal broadband speeds involve less clear-cut metrics.

III.   TIA Recommendations:

1.   <u>"User subscription" Should Not be the Only Business Model to Pay for Broadband Connectivity</u>

As discussed above, TIA anticipates that applications will drive user demand for higher broadband speeds. As a corollary to this, then the value users attach to specific broadband "rates" will be linked to specific application and services. To address this, it should be possible to link necessary connectivity requirements to the user's service.

"Just in time broadband capacity" could offer many consumers more value by giving reluctant adopters more flexibility and encouraging more adoption. As a result, users would be assured of not having to pay for more connectivity than necessary.

Examples of such potentially bundled connectivity services include:

- healthcare remote monitoring;
- advanced video streaming;
- video conferencing, such as for educational applications, and
- application associated with the Internet of Things (IoT), such a remote sensors.

TIA, however, cautions that the Federal Communications Commission's Open Internet[6] order presents challenges for this approach. So-called "Zero" & "Low" rating marketing strategies in which the cost of connectivity is bundled with another service has the potential to make broadband more affordable, at the same time also serving as a gateway to more robust broadband offerings. TIA encourages policymakers, including the FCC, to be flexible in allowing new competitive alternatives to be introduced in the market.

---

[5] "Heterogeneous Networks" refers to wireless networks using different access technologies. For example, a wireless network which provides a service through a wireless LAN and is able to maintain the service when switching to a cellular network. see Archi Delphinanto; Ben Hillen; Igor Passchier; Bas van Schoonhoven; Frank den Hartog (January 2009). "Remote Discovery and Management of End-User Devices in Heterogeneous Private Networks". 6th IEEE Consumer Communications and Networking Conference (CCNC 2009).

[6]   *See,* Federal Communications Commission, REPORT AND ORDER ON REMAND, DECLARATORY RULING, AND ORDER, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (Adopted February 26, 2015, Rel. March 12, 2015)

2. Support Broadband Ecosystem Applications

As discussed above, given the widespread availability of broadband, further adoption depends upon compelling applications. Examples exist in:

- **Education**

The U.S. must continue to connect students and library users to the benefits of more robust broadband by increasing technological flexibility for E-Rate program participants, coupled with greater incentives for efficient and economical investment decisions. However, local jurisdictions also have a responsibility to transition student materials, such as textbooks, to electronic devices.

- **Healthcare**

The U.S. health care system is harnessing advances in ICT products and services to extend the delivery of care beyond the walls of the hospital and the doctor's office. Government policies must promote the role of ICTs in advancing healthcare, particularly the harnessing of patient-generated health data from remote monitoring devices and services which improve the quality of care for Americans while reducing costs for patients.
    - Remove arduous restrictions on telehealth and remote monitoring services under Section 1834(m) of the Social Security Act for Medicare through efforts with stakeholders and potential Congressional involvement.
    - Incorporation of telehealth and remote patient monitoring as covered services in key government healthcare programs, such as Medicare Incentive Payment Program (Meaningful Use) and the Medicare Shared Savings Program (MSSP), through Congressional legislation and federal rulemaking processes.
    - Medical device approval process be streamlined at the Food and Drug Administration.
    - Provide increased regulatory clarity for mobile medical applications and other ICT products and services.

- **Public Safety Communications**

ICT products and services are critical enablers in saving lives. A nationwide public safety broadband network is the critical enabler by ensuring that first responders and other public safety professionals have reliable access anywhere to cutting-edge technologies for mission-critical applications.
    - TIA strongly supports the establishment of, and investment in, a sustainable nationwide interoperable public safety broadband network (NPSBN) and the deployment of NG9-1-1.
    - Public investment should enable public safety/first responders to access the most appropriate technologies in the most efficient manner to meet their specific needs and resources.
    - TIA supports the rapid adoption of "next-generation technology" into public safety communications networks, including the adoption of a sustainable FirstNet business model that provides for the necessary investment, beyond the initial funding under the Spectrum Act, needed to build, maintain and upgrade the nationwide interoperable public safety broadband network.

- **Transportation systems**

Pro-innovation and pro-competition policies will promote the societal and economic benefits of an advanced intelligent transportation system (ITS) ecosystem.

- Innovation and market competition must drive our nation's policy framework in order to enable the U.S. to lead the world in ITS technology.
- Voluntary, industry-led standardization can accelerate adoption and enable cost-effective introduction of new ITS technologies, while providing a clearer technology evolution path that stimulates investment.
- Viable public-private partnerships between government and industry will make deployment of ITS technologies an appealing investment, as well as ensure sustainability of infrastructure and technological innovation over the long-term.
- Government allocation of funding and resources to encourage research and development (R&D) and deployment of autonomous vehicles and connected vehicle communication technologies like advanced 4G/LTE, 5G, Wi-Fi, DSRC, and satellite will enhance vehicle safety and help ensure that the U.S. will be globally competitive in the ITS marketplace.

3. Enhancing Global Cybersecurity

Efforts to improve cybersecurity in critical infrastructure protection are critical to addressing current and emerging threats in a context of risk management. A global supply chain can best be secured through a risk management approach promoting industry-driven adoption of international best practices and global standards.

Working together, government and industry must leverage a partnership framework to increase the effectiveness of dialogue between industry and government (domestic and foreign) experts to discuss international standards and best practices. Internationally accepted best practices relevant to the products at issue should be utilized as important considerations when developing cybersecurity risk management and protection policies.

4. Avoiding a Spectrum Crunch through more Availability

As discussed above, mobile broadband traffic has been increasing at a dramatic pace. Global mobile data traffic increased 81 percent in 2013, and is expected to rise 11-fold over the next five years.[7] More spectrum is needed to keep pace with this exploding demand. The U.S. needs to make an additional 500 MHz of spectrum available for broadband use by 2020. The FCC has made a strong start by opening 5 GHz, AWS-3, and H block spectrum and is making progress on 600 MHz, 3.5 GHz, and additional 5 GHz spectrum, but more must be done.

---

[7] See, Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update 2014–2019 White Paper, (rel. February 3. 2015, available at http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html (last accessed June 9, 2015)

Innovative, next-generation broadband wireless devices, applications, and services require spectrum availability for both fixed and mobile broadband use; this can be achieved through further reallocations of federal spectrum, flexible regulations, improved spectrum management among users and rapid implementation of voluntary incentive auctions. In view of mobile broadband dynamic growth and long-term needs, further efforts must continue to identify additional spectrum for availability in the next decade and beyond. Budgetary incentives and a long-term plan that supports predictability for both commercial and government uses will encourage more efficient use of this valuable resource.

5. Support for Research & Development

U.S. ICT research remains significantly underfunded. While the ICT industry accounts for $1 trillion of U.S. GDP -- seven percent of the economy – federal research spending on ICT accounts for less than two percent of all federal R&D spending. Strategic and robust U.S. investment in telecommunications research including a permanent R&D tax credit, multi-year federal research plans, immigration reform and education in science, technology, engineering, and mathematics (STEM) will enable the U.S. to remain a technology industry leader.

The U.S. government must make long-term communications research a priority, and funds need to be directed to key areas: spectrum sharing; universal broadband; interoperable mobility; and homeland security related fields including interoperability, security, survivability, and encryption.

6. Flexibility to Address Accessibility

ICT products continue to positively transform the lives of those with disabilities. The ICT industry continues to work closely with the disability community to improve access to the technologies of today, while looking ahead to the products of the future. Increasing accessibility to technology for those with disabilities can be achieved through collaboration among stakeholders, policies that reflect technological neutrality and feasibility principles, and the usage of voluntary consensus-based standards.

Government should support pro-competitive policies that encourage marketplace solutions and rapid deployment of accessible technologies. There should be an emphasis on solutions which are technically feasible, with a focus on people-centric or scenario-based designs that are outcome-focused (as opposed to feature/function focused). Supported policies should include the allowance of voluntary, consensus-based standards as safe harbors for compliance with regulations when appropriate, and the use of blanket waivers for classes of nascent products.

When developing any accessibility policies, the government must ensure that the required technologies are technically feasible and provide sufficient time for industry to come into compliance.

## V.	Conclusion

The Telecommunications Industry Association commends the Broadband Opportunity Council for soliciting appropriate public inputs in identifying the ways to promote public and private investment in broadband and urges it to take into consideration our views in this proceeding.

Respectfully submitted,

TELECOMMUNICATIONS INDUSTRY ASSOCIATION

/s/ Mark Uncapher

Mark Uncapher
Director, Regulatory and Government Affairs

TELECOMMUNICATIONS INDUSTRY ASSOCIATION
1320 North Courthouse Road
Suite 200
Arlington, VA 22201
703.907.7700

June 10, 2015