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September 17, 2020

Rafi Goldberg,
National Telecommunications and Information Administration (NTIA)
U.S. Department of Commerce
1401 Constitution Avenue, NW., Room 4725
Washington, DC 20230
Via data@ntia.gov

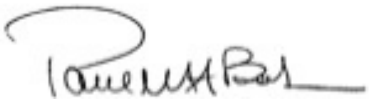
Re: Notice, request for public comments.
National Telecommunications and Information Administration (NTIA)
[Docket No. 200813-0218]
NTIA Internet Use Survey Questionnaire Development

Dear Mr. Goldberg:

Enclosed for filing in the above referenced Public Notice are the comments of the Georgia Institute of Technology (Georgia Tech), Center for the Development and Application of Internet of Things Technologies (CDAIT), Center for Advanced Communications Policy (CACP) and the Rehabilitation Engineering Research Center for Wireless Inclusive Technologies (Wireless RERC).

Should you have any questions concerning this filing, please do not hesitate to contact me via email at paul.baker@gatech.edu.

Respectfully submitted,



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Enclosure

National Telecommunications and Information Administration (NTIA)
Washington, D.C. 20230

The National Telecommunications and Information Administration (NTIA) is seeking comments and recommendations for possible revisions to questions asked on the NTIA internet Use Survey. This long-running survey of individuals and households covers a range of topics related to digital inclusion and other internet policy issues, including the adoption of different types of devices and internet access technologies, locations of internet use, online activities, and challenges preventing some Americans from taking full advantage of the internet. This Notice and Request for Public Comments is an opportunity for members of the public to provide input as to what question additions, revisions, or deletions NTIA should consider in updating the survey instrument.

COMMENTS OF
GEORGIA INSTITUTE OF TECHNOLOGY (GEORGIA TECH),
CENTER FOR THE DEVELOPMENT AND APPLICATION OF INTERNET OF THINGS TECHNOLOGIES (CDAIT)
CENTER FOR ADVANCED COMMUNICATIONS POLICY (CACP)
AND THE REHABILITATION ENGINEEERING RESEARCH CENTER
FOR WIRELESS TECHNOLOGIES (WIRELESS RERC)

Georgia Tech's Center for the Development and Application of Internet of Things Technologies (CDAIT) and Center for Advanced Communications Policy (CACP) in collaboration with the Rehabilitation Engineering Research Center for Wireless Inclusive Technologies[1] (Wireless RERC) hereby submits comments in the above-referenced Public Notice released on August 18, 2020. CACP is the organizational home for CDAIT and the Wireless RERC. CACP is recognized at the state and national level as a neutral authority that monitors and assesses digital and information-based technological developments, identifies future policy approaches, and provides insights into related legislative and regulatory issues. CACP and CDAIT evaluate technological trends that can impact issues as diverse as development of Internet of Things (IoT) and connected services, usability of health and well-being related technologies, efficacy and accessibility of emergency communications for first responders,

[1] The **Rehabilitation Engineering Research Center for Wireless Technologies** is sponsored by the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) of the U.S. Department of Health and Human Services under **grant number 90RE5025-01-00**. The opinions contained in this website are those of the Wireless RERC and do not necessarily reflect those of the U.S. Department of Health and Human Services or NIDILRR.

workforce development for critical populations, and the operation of social media. The Wireless RERC's mission is to research, evaluate and develop innovative wireless technologies and products that meet the needs, enhance independence, and improve the quality of life and community participation of people with disabilities. All of the centers engaged in evidence-based research activities using quantitative and qualitative methodologies including surveys, focus groups, and in-person user testing of technology.

We believe it is essential that information and communications technologies (ICT) and services increase their levels of accessibility *and usability,* for people with disabilities; as access to technology can enhance inclusive and independent living. We find the main goal of the NTIA internet Use Survey, "to inform evidence-based analysis and development of internet policy generally, and particularly to support solutions that increase digital inclusion and bridge the digital divide" (P. 50804, FR Doc. 2020–18041) to be a significantly useful objective to researchers working with individuals with historically inadequate access to the Internet, or other wirelessly connected devices.

Since 2000, both CACP and the Wireless RERC, and their predecessor organizations, have been actively involved with research and regulatory issues concerning accessible ICT and wireless communications and devices. The comments respectfully submitted below are based on subject matter expertise developed over the past 20 years. Findings from our research inform the observations on the NTIA internet Use Survey made herein.

1. Should NTIA be aware of any past or future planned uses of data from the NTIA internet Use Survey? If so, which survey questions or topics were or would be most important to accomplishing this work?

The NTIA internet Use Survey is of vital importance not just to researchers working in the area of information and communications technologies (ICT) directly, but more broadly, to a number of fields of inquiry related to the social sciences that rely heavily on the development and use of these technologies. Several of our research outputs[2] make use of NTIA work products, that are, in turn, dependent on the Survey, and associated analysis. More broadly, a search of Google Scholar suggests that the terms NTIA "Internet Use Survey" have occurred in some 75 articles. Further, a Google search

[2] For example: Moon, N. W., Baker, P. M., & Goughnour, K. (2019). Designing wearable technologies for users with disabilities: Accessibility, usability, and connectivity factors. *Journal of Rehabilitation and Assistive Technologies Engineering.* https://doi.org/10.1177/2055668319862137; Bricout, J. C., & Baker, P. M. (2010). Leveraging online social networks for people with disabilities in emergency communications and recovery. *International journal of emergency management*, 7(1), 59-74, Baker, P. M., Hanson, J., & Bell, A. (2008, May). Municipal WiFi and policy implications for people with disabilities. In Proceedings of the 2008 international conference on Digital government research (pp. 216-224).

of the term "NTIA internet Use Survey" appears in more than 1800 search results. Because work related to access to ICT for populations such as people with disabilities, frequently relies upon baseline survey research and consistent statistics[3] and in regulatory filings[4], the Survey represents an important role in generate estimates about use patterns and technology. Questions such as CMPINT capturing use of various types of devices and locations are especially valuable. TABLET and WEARAB are quite useful in our work in terms of ability of people to access the internet, and to get a sense of the degree of uptake for IoT devices and services. We believe that questions related to use of technologies (e.g INSCHL) coupled with the access to broadband (TCHINT) are important in quantifying elements of the digital divide. Addition questions related to USEINT, TELEWK, and MEDINT are important in our work related to advancing participation and well-being for people with disabilities and the aging. We do have some concern that the nature of some of the questions 1) might cause respondents to provide less than accurate answers due to concern about social standing (NOHM, NOOU), or are 2) worded in a way that might not be clear to people with mild cognitive impairments, learning disabilities, or for whom English is a second language (USESVC).

2. What questions, if any, should NTIA propose adding to the NTIA internet Use Survey? New questions could either expand on an existing topic, *e.g.,* an additional type of computing device or online activity not currently tracked, or address an entirely new topic in computer or internet use. Commenters may wish to discuss the desired response format (yes or no, multiple choice, etc.), unit of measurement (individuals, households, or a subset of either), and other details of the data to be collected. Further, parties proposing new questions may consider commenting on how NTIA should address any resulting increase in respondent burden, including time needed to administer the survey.

At the risk of increasing the length of the survey, it would useful to have additional questions related to Internet of things (IoT) devices, services and use cases. Given the increasingly important use of wearables not just for fitness but also for telehealth, additional probes (beyond WEARAB) on the specific ways in which users employ the technologies, and barriers and opportunities for use. These

[3] See for instance: Baker, P. M., & Moon, N. W. (2008). Wireless technologies and accessibility for people with disabilities: Findings from a policy research instrument. *Assistive Technology*, *20*(3), 149-156;
Jones, M. L., Morris, J. T., Mueller, J. L., Lippincott, B., & Sweatman, W. M. (2020). Regulating hearing aid compatibility of cell phones: results from a national survey. Assistive Technology, 32(4), 173-181.

[4] For example: Mitchell, H., LaForce, S., Moon, N., Baker, P.M.A., Garcia, A., & Jacobs, B. (2018, May 3). Comments submitted in response to the Public Notice in the Matter of The Accessibility of Communications Technologies for the 2018 Biennial Report Required by the Twenty-First Century Communications and Video Accessibility Act [CG Docket No. 10-213, Consumer and Governmental Affairs Bureau]. Federal Communications Commission: Washington, D.C.].

technologies can be of important in enhancing independence for people with disabilities.[5] With addition information about such elements of complexity of use or cost of devices or services would be useful in designing technological and policy interventions. An additional area to inquire would be the ways in which the connected devices are used to access government and public services.[6]

Of particular note, one set of IoT related devices has not been included – voice input devices (such as Amazon Echo, Google Home or Apple Siri powered devices). These devices are increasing in deployment and use as part of the "smart home" trend, and while one question (HOMIOT) generally touches on it, we suggest that an addition section be added probing on use, accessibility, perceptions and barriers to adoption. For people with disabilities, these devices can offer a degree of security and independence which make these questions of value to researchers and other stakeholders.

More broadly as we noted in previous submission to the NTIA[7], while not specifically mentioned in the survey, we see several areas that could be augmented in the questions the are 1) characteristics of users (i.e. whether they have functional limitations, either due to disability or aging, following six disability questions used by the American Community Survey (ACS), Survey of Income and Program Participation (SIPP), and Current Population Survey (CPS)), 2) questions related to accessibility and usability of technologies and services (which are not included in the questions), and 3) one important use currently not included: emergency and governmental services (e.g. receipt of Integrated Public Alert & Warning System (IPAWS) alerts or internet-based first-responder services).

The importance of internet accessibility along many dimensions – technology, service, design, information access, and economics – was summed up in an article: "While the Internet of Things offers great benefits to all, people with disabilities stand to benefit considerably from connected technologies. The technology used to build smarter cities and smarter homes can help create a more

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[5] Moon, N. W., Baker, P. M., & Goughnour, K. (2019). Designing wearable technologies for users with disabilities: Accessibility, usability, and connectivity factors. *Journal of Rehabilitation and Assistive Technologies Engineering.* https://doi.org/10.1177/2055668319862137;

[6] *Driving New Modes of IoT-Facilitated Citizen/User Engagement,"*(July, 2018). Center for the Development and Application of Internet of Things Technologies (CDAIT), Thought Leadership Working Group. Atlanta, Georgia. (co-editor). https://cdait.gatech.edu/sites/default/files/georgia_tech_cdait_thought_leadership_working_group_white_paper_july_9_2018_final.pdf

[7] Mitchell, H., Baker, P.M.A., Moon N.C., Fain, B., LaForce, S. (2017, March 13). Comments filed in response to National Telecommunications and Information Administration (NTIA) Notice, request for comments *Request for Comments on the Benefits, Challenges, and Potential Roles for the Government in Fostering the Advancement of the Internet of Things* [Docket No. 170105023-7023-01] RIN 0660–XC03. Washington D.C: NTIA.

Mitchell, H., Baker, P.M.A., LaForce, S. (2016, October 1). Comments filed in response to National Telecommunications and Information Administration (NTIA) Notice, request for comments *National Broadband Research Agenda*. [Docket No. 160831803–6803–01] RIN 0660–XC031. Washington D.C: National Telecommunications and Information Administration.

accessible environment for people with disabilities and offer them the opportunity to live more independently."[8]

As new Federal U.S. and global regulations and industry standards are negotiated, internet access via mobile devices, cost effective delivery of broadband services to people with disabilities, especially all people living in rural areas, have become the primary platform for information and communications IoT among people with and without disabilities.[9] It is extremely important that 1) proactive Federal policy be developed and 2) regulatory bodies provide broad-based accessibility provisions that can deliver a flexible applicable architecture as the internet evolves, with the ability to guide industry and engage appropriate stakeholders in developing accessible produces and services that also promote usability of the same. This requires solid evidence, which addition questions on NTIA Internet Use Survey could support.

Finally, the internet and connected devices are important components in emergency communications and disaster management. Modern emergency communications systems are built on a number of internet related technologies. One component, the IoT platform represents, depending on implementation, a variety of approaches to integrate and enhance the ability to communicate with vulnerable populations during emergencies and disasters.

Individuals with disabilities may be a vulnerable population during the best of times, but even more so during emergency situations for several reasons, and for these individuals, access to internet and wireless technologies is quite critical. This diverse demographic represents those with sensory, cognitive, physical, perceptual, and those who are elderly or aging into disabilities. For those with a disability, it can be very important to clarify the message, acquire more information, and ask questions to those that can help them best. An overlay IoT can serve both to coordinate information flow across hybrid and legacy systems (helping to cross legacy system and geographic boundaries). In a connectivity and information distribution mode, IoT serves as a framework to communicate, alert and warn populations by providing information at the point that is readily accessible (for instance via wearable devices), and facilitate connection with bottom-up social networks.[10, 11, 12]

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[8] J. New, "The Internet of Things Means a More Accessible World", http://www.datainnovation.org/2015/05/the-internet-of-things-means-a-more-accessible-world/ [retrieved: May 2015]

[9] Gould, M. & Studer, E. (2010). *Convention on the Rights of Persons with Disabilities (CRPD) 2010 ICT Accessibility Progress Report*. G3ict – the Global Initiative for Inclusive Information and Communication Technologies, 2010 http://g3ict.org/resource_center/CRPD_Progress_Report_On_ICT_Accessibility_2010

[10] Mitchell, H and Louchez, L. (2016).

[11] Bricout, J.C., & Baker, P.M.A. (2010). Leveraging online social networks for people with disabilities in emergency communications and recovery. *International Journal of Emergency Management,* 7(1), pp. 59-74.

[12] H. Mitchell, D. Bennett, and S. LaForce, (2011) "Planning for Accessible Emergency Communications: Mobile Technology and Social Media," 2nd International AEGIS Conference Proceedings, Brussels.

This is especially pertinent as research has shown that people, including people with disabilities often carry and use wireless devices regularly. The use of mobile devices has become an integral part of the emergency communications ecosystem, and according to a survey of user needs, 82% of 1600 respondents with disabilities stated that wireless devices were increasingly important to them while 72% stated that wireless devices were especially important during emergencies[13] and depended on them to receive lifesaving information and to seek help.[14] The IoT, then allows for use of digital technologies and to expand the capabilities, and as important, accessibility of emergency communications. The timely request for comments by the NTIA, provides the opportunity to address the inconsistencies in how emergency warnings and alerts are issued and their level of accessibility.

Additionally, information generated by an augmented Survey would assist in the development of policy interventions that could enhance newer technology integrations for emergency communications could provide an important link to engagement, inclusion and usability of emergency alerts and warning.

5. In addition to questions discussed above, are there any questions or general issues related to the NTIA internet Use Survey that should be of particular focus during the cognitive testing process? The Census Bureau will test the entire draft survey instrument, creating an opportunity to assess the performance of all questions individually and collectively.

Principles for reducing or managing cognitive load in survey development are useful for all respondents while ensuring accurate responses and for reducing attrition and abandonment; however, attention to cognitive load is even more important for individuals with sensory, cognitive, or learning disabilities. The testing process would benefit from attention to 1) ensuring that questions are not overly complex, 2) questions are presented clearly (e.g. avoiding double-barreled, absolutes, or leading questions), and 3) options for questions are sufficiently organized or minimized to the extent possible. When possible, it would be useful to test survey questions with commonly used screen reader software (e.g. JAWS, COBRA, VoiceOver), for both input and output, to ensure accessibility to, and comprehension by, users of screen readers, including, but not limited to individuals who are blind or who have vision disabilities and individuals with learning or processing disabilities such as dyslexia. Inclusion of individuals with a range of disabilities or capabilities in the testing process is always highly

[13] Muller, J et al "Accessibility of Emergency Communications to Deaf Citizens" International Journal of Emergency Management 7.1 (2010): 41-46

[14] R. Wei and L. Ven-Hwei (2006). "Staying Connected While on the Move: Cell phone use and social connectedness." New Media and Society 8(1): 53-72.

recommended. In addition to testing the instrument and questions, it is recommended to ensure that the actual survey platform is both accessible and usable.

In closing, we commend the NTIA's work in encouraging growth of the digital economy and ensuring that the Internet remains an open platform for innovation. The NTIA's internet Use Survey is indeed "an important source of data for informing solutions to digital inclusion and other internet-related public policy challenges." In addition, we strongly agree with and offer our support of the value of the NTIA internet Use Survey in informing "evidence-based analysis and development of internet policy generally, and particularly to support solutions that increase digital inclusion and bridge the digital divide."[15] We hope that our comments on the Survey will be useful to achieving this objective.

To this end, the CACP and the Wireless RERC, wish to emphasize the importance of including accessibility for people with disabilities to the greatest extent possible in data collection that informs the development of policy approaches that influence design and development of the internet, and associated devices and services and policy.[16] To achieve these objectives, we urge that people with disabilities be consulted through survey questions, and more broadly, that the findings of these survey questions on the accessibility implications of internet technologies become a high-level consideration when planning Federal level technology development strategies and policy. Minor modifications and additions to the Survey (as noted above) will significantly aid researchers and other stakeholders in making progress toward this end.

Respectfully submitted,

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[15] Docket No. 200813-0218

[16] Baker, P.M.A.; Gandy, M. & Zeagler, C. (2015). Innovation and Wearable Computing: A Proposed Framework for Collaborative Policy Design. *IEEE Internet Computing, 19*(5) (September-October).