Federal Communications Commission
Office of Strategic Planning and Policy Analysis
445 12th Street, SW
Washington, DC 20554

OBI Working Paper Series

2

A Giant Leap & A Big Deal: Delivering on the Promise of Equal Access to Broadband for People with Disabilities

April 2010

Elizabeth Lyle

A Giant Leap and A Big Deal: Delivering on the Promise of Equal Access to Broadband for People with Disabilities[1]

I. Overview

> "It seems that all the hard work that we did 20 years ago has virtually disappeared when it comes to updating access standards for broadband and the Internet. Imagine Neil Armstrong watching a re-broadcast 20 years later, in 1989, of his first steps on the moon, only to find his words which echoed across the globe, "one small step for man, one giant leap for mankind," were no longer there – erased, as if he had never been to the moon. That's how taking closed captions out of broadcast content now being shown on the Internet feels to millions of people like myself."
>
> Marlee Matlin
> Federal Communications Commission Field Hearing,
> Gallaudet University, Washington, D.C., November 6, 2009

There are 54.4 million Americans who have disabilities, and 35 million Americans who have a severe disability.[2] For those aged 15 and over, this includes 7.8 million who have difficulty seeing the words in ordinary newsprint; 7.8 million who have difficulty hearing a typical conversation; 2.5 million who have difficulty having their speech understood; 27.4 million who have lower body limitations; 19 million with upper body

---

[1] The author wishes to acknowledge the contributions of those who filed and otherwise participated in the broadband proceeding, from which this paper draws heavily, as well as the contributions of Jamal Mazrui, Erik Garr, Brian David, Elise Kohn, John Horrigan, Greg Elin, Gray Brooks, Kris Monteith, Ellen Satterwhite, Jessica Almond, Krista Witanowski, Joel Gurin, Karen Peltz Strauss, Mark Stone, Yul Kwon, Cheryl King, Thomas Chandler, Amelia Brown, Susan Kimmel, Greg Hlibok, Diane Mason, Scott Marshall, Rachel Kazan, Pam Gregory, Kelly Jones, Helen Chang, Paul de Sa, Zachary Katz, Austin Schlick, Joel Kaufman, Christopher Killion, David Horowitz, Suzanne Tetreault, Colleen Heitkamp, Ruth Milkman, Monica Desai, Jane Jackson, Renee Crittendon, Jeffrey Steinberg, Stagg Newman, Walter Johnston, Salomon Satche, Jennifer Manner, David Furth, Sharon Gillett, Nicholas Alexander, and Richard Hovey of the FCC; and David Capozzi of the Access Board; Daniel Weitzner of the National Telecommunications and Information Administration; Terry Weaver of Government Services Administration; Jennifer Sheehy of the Department of Education; and Samuel Bagenstos and Mazen Basrawi of Department of Justice.

[2] Matthew W. Brault, *Americans with Disabilities: 2005,* CURRENT POPULATION REPORTS 3 (2008) ("2005 Census Report"), http://www.census.gov/prod/2008pubs/p70-117.pdf. The percentage of people who identified themselves as having a disability in this survey is 18.7%, somewhat lower than the 24% who identified themselves as having a disability in the FCC consumer survey discussed *infra*. This variation is due to differences in survey methodology and context as well as the age range of the respondents. Other sources cite even higher numbers of people with disabilities and functional limitations. The Center for Disease Control and Prevention, for example, states that there are 34.8 million adults who have "hearing trouble" and 25.2 million who have "vision trouble." *See* Centers for Disease Control and Prevention, FastStats: Disability and Functioning (Adults), http://www.cdc.gov/nchs/FASTATS/disable.htm (last visited March 26, 2010).

limitations; and 16.1 million with cognitive, mental, and emotional functioning disabilities.[3]

Historically, it has taken years – even decades – for these Americans to have anything close to equal access to communications.[4] It took over 100 years for telephone systems to become accessible for people with speech and hearing disabilities; over 50 years for television to become accessible for deaf people; and 10 years for people who used hearing aids to use digital wireless phones.[5] People with vision disabilities still do not have access to all emergency information on video programming or audio access to text messages on the vast majority of cell phones.[6]

Designers of equipment, services and networks have often failed to consider accessibility issues in the design and development stage -- and retrofit solutions are expensive. This has been true for solutions implemented for digital wireless technologies to make them compatible with teletypewriters ("TTYs")[7] and hearing aids. Some would even characterize the FCC's telecommunications relay service ("TRS")[8] as a retrofit solution that was put in place to allow people with hearing and speech disabilities to have access to the public switched telephone network ("PSTN").[9]

Even where consumers with disabilities have made gains in the past, they have often lost these gains with the introduction of new technologies. TTYs and hearing aids that worked with analog cell phones did not work with digital cell phones.[10] Captioning that worked on analog televisions ("TVs") did not work effectively on digital TVs and have largely been omitted from the Internet.[11]

---

[3] 2005 Census Report at 6-7.

[4] Rosaline Crawford, Esq. Director, Law and Advocacy Center, ational Association of the Deaf Statement at Broadband Accessibility II Workshop (Oct. 20, 2009).

[5] Karen Peltz Strauss, Co-Chair, Coalition of Organizations for Accessible Technologies Statement at Broadband Accessibility II Workshop (Oct. 20, 2009).

[6] Rehabilitation Engineering Research Center on Telecommunications Access and Communications Service for the Deaf Comments in re NBP PN#25 (*Comment Sought on Transition from Circuit-Switched Network to All-IP Network – NBP Public Notice # 25,* GN Docket No. 09-51, et al., Public Notice, 24 FCC Rcd 14272 (WCB 2009), (*NBP PN# 25*)), filed Dec. 21, 2009, at 2 (RERCTA and CSD Comments).

[7] A teletypewriter or TTY is a type of machine that allows people with hearing or speech disabilities to communicate over the phone using a keyboard and viewing screen. *See* FEDERAL COMMUNICATIONS COMMISSION, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN 354 (2010) ("*National Broadband Plan"),* http://www.broadband.gov/plan/.

[8] *See* p. 16*, infra.*

[9] *See* KAREN PELTZ STRAUSS, A NEW CIVIL RIGHT, TELECOMMUNICATIONS EQUALITY FOR DEAF AND HARD OF HEARING AMERICANS 347(GALLAUDET PRESS) (2006) ("KAREN PELTZ STRAUSS, A NEW CIVIL RIGHT, TELECOMMUNICATIONS EQUALITY FOR DEAF AND HARD OF HEARING AMERICANS").

[10] *Id.* at 387 and 322.

[11] RERCTA and CSD Comments in re NBP PN#25 at 2; Marlee Matlin, National Association of the Deaf Statement at the Broadband Access for People with Disabilities Field Hearing (Nov. 6, 2009).

Despite these obstacles, some people with disabilities have been early adopters of technology because it was critical to their economic and educational success.[12] They have been pioneers who have embraced technology and, in the process, have brought gains to all of society. Many technologies that were developed to help people with disabilities gain access have led to technologies that have been later deployed in mainstream products. Voice command technology used to help people with vision, mobility, and cognitive disabilities to type is now being used in cars and e-readers.[13] Predictive-text software, which finishes words that people type in e-mail and search engines, was originally developed as a tool for people with disabilities as well.[14] Closed captioning on video programming, originally designed for people with hearing loss, has become a mainstay in noisy restaurants, airports, and exercise facilities.

With broadband technologies, we have the opportunity to consider accessibility issues relatively early in the deployment process and ensure that people with disabilities share fully in the benefits of broadband. Even more, broadband "bridge[s] gaps and provide[s] opportunities that were inconceivable in the past."[15]

Broadband allows people with disabilities to "live independent lives . . . in their communities of choice."[16] For example, broadband allows people with disabilities to telecommute or run a business out of their home.[17] The National Telecommuting Institute believes that over the next two years it will be able to double the number of people with disabilities it places in in-home jobs (from 400 to 800 annually), and that broadband will be key to its success.[18]

Broadband also makes telerehabilitation services possible, providing long-term health and vocational support to clients in their home communities.[19] These services include teletherapy, telemonitoring, teleconsultation, and the secure exchange of health information among consumers, providers, government, and insurers.[20]

---

[12] California Emerging Technology Fund, Accessibility Plan, http://cetfund.org/investments/accessibility (last visited Feb. 23, 2010).

[13] Reena Jana, *How Tech for the Disabled Is Going Mainstream,* Business Week, Sept. 24, 2009, http://www.businessweek.com/magazine/content/09_40/b4149058306662.htm.

[14] *Id.*

[15] William E. Kennard and Elizabeth Evans Lyle, *With Freedom Comes Responsibility: Ensuring that the Next Generation of Technologies is Accessible, Usable, and Affordable,* 10 COMLCON 5, 7 (2001).

[16] World Institute on Disability Comments in re *A National Broadband Plan for Our Future*, GN Docket No. 09-51, Notice of Inquiry, 24 FCC Rcd 4342 (2009) (*National Broadband Plan NOI*) at 1-2.

[17] *Id.*; *see also* Margaret V. Hathaway, Esq., Vice-President for Public Policy, Spinal Cord Advocates Statement at Broadband Accessibility Workshop II (Oct. 20, 2009) and Alan Hubbard, COO, National Telecommuting Institute, Inc. Statement at the Broadband Access for People with Disabilities Field Hearing (Nov. 6, 2009).

[18] Alan Hubbard, COO, National Telecommuting Institute, Inc. Statement at the Broadband Access for People with Disabilities Field Hearing (Nov. 6, 2009).

[19] Katherine D. Seelman, Ph.D., Professor, Rehabilitation Science and Technology, University of Pittsburgh Statement at Broadband Accessibility II Workshop (Oct. 20, 2009).

[20] *Id.*

Access to on-line education classes and digital books[21] is also possible with broadband. Readers with print disabilities, for example, can access Bookshare, a searchable online library that offers more than 60,000 digital books, periodicals, and other tools.[22] Volunteers (mostly people who use Bookshare themselves) scan books to make digital books that can be read aloud, enlarged, turned into braille, or spotlighted and read aloud simultaneously.[23]

Broadband also enables people who are deaf or hard of hearing to use video relay service ("VRS"), allowing them to use video phones to communicate with another person through a communications assistant (*i.e.,* relay operator) who is in a remote location via sign language. VRS has been a "life-changing technology" that allows "communicat[ion] with a rapidity and nuance that is not possible with other forms of relay."[24]

For people with autism, on-line technologies have allowed the development of an independent autistic community and culture.[25] One reason is that the challenges associated with interpreting non-verbal and social cues are less significant online.[26] Having the opportunity to connect online with peers also allows people who have autism "to have an understanding that you are not alone in this world."[27]

The promise of broadband for people with disabilities is even greater in the future. For example, E-911 will have real time interoperable voice, video, and text capabilities, allowing equal access to emergency services for people with hearing and speech disabilities,[28] and accessible smart grids will allow people with disabilities to receive information about their electricity, water, and natural gas consumption.[29]

We cannot realize the full potential of broadband, however, unless we fully consider the needs of people with disabilities. As a threshold matter, for example, broadband needs to be defined in a way that recognizes the importance of two-way video

---

[21] World Institute on Disability Comments in re National Broadband Plan NOI at 1 and Fruchterman (Benetech) Statement at Broadband Accessibility Workshop II (Oct. 20, 2009).

[22] Bookshare, Books without Barriers, http://www.bookshare.org/ (last visited Feb. 12, 2010). A print disability is one that "makes it difficult or impossible to read a printed book," and includes vision, physical, and learning disabilities. *See id.* Bookshare receives funding from the Department of Education and other donors.

[23] Jim Fruchterman, President, Benetech Statement at Broadband Accessibility Workshop II (Oct. 20, 2009).

[24] Letter from I. King Jordan, President Emeritus Gallaudet University, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123 (May 19, 2009) at 1.

[25] Ari Ne'eman, Founding President, Autistic Self Advocacy Network Statement at the Broadband Access for People with Disabilities Field Hearing (Nov. 6, 2009) (Ne'eman Statement).

[26] *Id.*

[27] *Id.*

[28] Patrick Halley, Director, Government Affairs, National Emergency Number Association Statement at the Broadband Access for People with Disabilities Field Hearing (Nov. 6, 2009).

[29] Ishak Kang, CEO/Founder, dot UI Statement at Broadband Accessibility Workshop II (Oct. 20, 2009).

capabilities.[30] We also must understand and address the barriers faced by people with disabilities.

This paper will first consider numerous barriers to broadband usage faced by people with disabilities, including inaccessible hardware, software, and services, and inaccessible web content. It will also identify barriers related to specialized assistive technologies that people with disabilities use to gain access to broadband services as well as barriers faced by specific populations within the disability community. Next, the paper will discuss existing private sector efforts to address these barriers, including the advances made by industry innovation and collaborative efforts. It examines how government grant programs and legal and regulatory measures address these barriers as well.

After identifying existing barriers and efforts, this paper next considers the gaps in current efforts to address accessibility for people with disabilities and the needs that must be met if we are to accelerate the adoption path for people with disabilities. Specifically, the government must

- Improve implementation and enforcement of existing accessibility laws;
- Gather and analyze more information about disability-specific broadband adoption issues;
- Coordinate accessibility policy and spending priorities;
- Update accessibility regulations;
- Update subsidy programs and ensure the availability of training and support; and
- Update its approach to accessibility problem solving.

Finally, this paper reviews the three broad recommendations from the National Broadband Plan which seek to address the range of disability access concerns and discusses how the recommendations address the needs identified above. The recommendations include: (1) the creation of a Broadband Accessibility Working Group ("BAWG") within the Executive Branch; (2) the establishment of an Accessibility and Innovation Forum at the FCC; and (3) the modernization of accessibility laws, rules, and related subsidy programs by the FCC, the Department of Justice ("DOJ"), and Congress.

II. Today's Barriers

Based on data from its October-November 2009 survey, the FCC estimates that 42% of Americans with disabilities have broadband at home, considerably below the national

[30] For an effective video quality necessary for a two-way conversation, upload and download speeds will need to be equally robust to support the application's demands in both directions. *See* THOR KENDALL, THE BROADBAND AVAILABILITY GAP (OBI Working Paper, forthcoming 2010).

average of 65%.[31] Some 39% of non-adopters have a disability, much higher than the 24% of the overall survey respondents who have a disability.[32]

People with disabilities face the same major barriers to adoption as other Americans, such as cost of equipment and service, lack of training, and belief that on-line material is not relevant to them.[33] Among non-adopters who have a disability, 37% cited cost as a barrier (compared to 35% of non-adopters without a disability); 25% cited a digital-literacy related topic as their main concern (compared to 19% of non-adopters without a disability); and 17% stated that digital content was not relevant to them (compared to 19% of non-adopters without a disability).[34]

While people with disabilities face many of the same barriers related to costs, digital literacy, and relevance as other Americans, these barriers can sometimes pose additional concerns for people with disabilities. With respect to cost, as detailed below, some people with disabilities must pay for expensive assistive technologies ("AT")[35] in order to access broadband services. Regarding digital literacy, people with disabilities also often do not receive the specialized training and support that they need.[36]

As to relevance, in many cases, people with disabilities are not aware of how broadband could change their lives[37] or that technical solutions exist that would allow them to be broadband adopters.[38] For some, content is not relevant because it is not captioned or described.[39] For others, even when there are technical solutions, they have not always been made available. While VRS is a very relevant broadband application for

---

[31] JOHN B. HORRIGAN, BROADBAND ADOPTION AND USE IN AMERICA 3 (FEDERAL COMMUNICATIONS COMMISSION) (2010) ("Horrigan Adoption Paper").

[32] *Id.*

[33] *Id.* at 30.

[34] Horrigan Adoption Paper at 38.

[35] Assistive technologies encompass a wide range of products used to "maintain, increase, or improve the functional capabilities of people with disabilities." Assistive Technology Act of 1998, as amended, Pub. L. No. 108-364, 118 Stat. 1707 (2004). With respect to devices and software needed for Internet access, assistive technologies include such things as "screen reading software, screen enlarging, alternative key boards, alternative mice, pointing devices, and braille [displays]." C. Marty Exline, Director, Missouri Assistive Technology Program Statement at the Broadband Accessibility Workshop II (Oct. 20, 2009).

[36] *See, e.g.,* American Council of the Blind Comments in re: NBP PN #4, (*Comment Sought on Broadband Accessibility for People with Disabilities Workshop II: Barriers, Opportunities, and Policy Recommendations—NBP Public Notice* #4, GN Docket Nos. 09-47, 09-51, 09-137, Public Notice, 24 FCC Rcd 11968 (CGB 2009)) (NBP PN #4)), filed Oct. 7, 2009, at 2; Elizabeth Weintraub, Member, Council on Quality and Leadership Statement at Broadband Accessibility II Workshop (Oct. 20, 2009); and Ne'eman Statement.

[37] *See* Connected Nation Comments in re NBP PN # 4 filed Oct. 6, 2009, at 1 (finding that 40 percent of people with disabilities who had not adopted broadband said that they had no need for broadband).

[38] Rehabilitation Engineering Research Center on Universal Interface and Information Technology Access Comments in re NBP PN # 4, filed Oct. 6, 2009, at 13.

[39] *See* Larry Goldberg, Director, Media Access Group at Statement at the Broadband Accessibility II Workshop (Oct. 20, 2009) ("Accessible online media is the killer app for . . . [the disability] community, and far too little is available today.")

people who are deaf or hard of hearing, for example, there is no similar speech-to-speech video relay service that would be a compelling broadband application for many people who have speech disabilities.[40]

People with disabilities also face additional barriers not faced by others,[41] including inaccessible hardware, software, services, and content. As mentioned above, AT can be very expensive and presents other challenges as well. In addition, people with disabilities also can have difficulties gaining physical access to libraries and other community-based organizations that provide Internet access.

Inaccessible Hardware, Software, and Services

Mainstream equipment and device manufacturers often do not consider accessibility issues when they design and develop their broadband products, resulting in products that do not have built-in accessibility features and are not compatible with assistive technologies needed by people with disabilities. People with cognitive disabilities or manual dexterity limitations have difficulty with complex and miniaturized menus and user guides;[42] people who are blind cannot use many on-screen menus and touch screens;[43] and people who are hard of hearing cannot use many smart phones and other phone-like devices with their hearing aids.[44]

Mainstream services can also be inaccessible. For example, as people with hearing and speech disabilities have transitioned from using unwieldy, specialized TTYs toward mainstream forms of text and video communications (many of which are IP-based), they no longer have a way to contact E-911 directly.[45] This is because public safety answering

---

[40] Rebecca Ladew, East Coast Representative, Speech Communications Assistance by Telephone, Inc. Statement at Broadband Accessibility II Workshop (Oct. 20, 2009) (stating the need to expand the Commission's Telecommunications Relay Service to include a program which would allow people with speech disabilities to use video-assisted speech over broadband to communicate through a communications assistant trained in understanding people with speech disabilities, who would then relay the call to anyone on the PSTN).

[41] This is not to say that only people with disabilities would benefit if these barriers were addressed. Research sponsored by Microsoft, for example, shows that "nearly six out of 10 adult computer users [are] in a position to benefit from some sort of accessibility feature." Letter from Paula Boyd, Regulatory Counsel, Microsoft Corporation, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 09-47, 09-51, 09-137 (Dec. 2, 2009) ("Microsoft December 2, 2009 *Ex Parte*") at 5.

[42] Karen Peltz Strauss, *Past and Present: Making the Case for a Regulatory Approach to Addressing Disability Discrimination in the Provision of Emerging Broadband and Cable Technologies,* BROADBAND AND CABLE TELEVISION LAW 2010, DEVELOPMENTS IN CABLE TECHNOLOGY, PRACTISING LAW INSTITUTE at 5*,* Jan. 26, 2010 (*"Strauss PLI Paper")* http://trace.wisc.edu/docs/2010-broadband-cable-regs/.

[43] *See, e.g.,* Eric Bridges, American Council of the Blind Statement at Broadband Accessibility Workshop II (Oct. 20, 2009) (noting that the first smart phone that had built-in features allowing it to be used by a person who was blind was introduced in July 2009) and National Federation of the Blind Comments in re NBP PN #4 filed Oct. 6, 2009, at 4.

[44] *See, e.g., Strauss PLI Paper* at 16.

[45] *See* Comments of Telecommunications for the Deaf and Hard of Hearing, Inc. in re NBP #14 (*Comment Sought on Public Safety Issues Related to Broadband Deployment in Rural and Tribal Areas and Communications to and from Persons with Disabilities,* GN Docket No. 09-51, et al., Public Notice, 24 FCC Rcd 13512 (WCB 2009)), filed Dec. 1, 2009, at 2.

points ("PSAPs") very rarely have the capabilities to accept text or video.[46] More generally, most services do not support real time text that is data or IP-based.[47]

Inaccessible Web Pages, New Media Applications, and Video Programming on the Web

Another barrier is that content on the web is often not accessible to people with disabilities. An October 2009 survey of 665 screen reader users suggests that web content is getting more accessible, but the data is mixed: 46.3% think that web content has become more accessible; 33.3% think that web accessibility has not changed; and 20.4% think that web content has become less accessible.[48] The same survey found that only about 8 percent thought that social media sites were "very accessible;" 52 percent found the sites "somewhat accessible;" and about 20 percent found the sites "somewhat inaccessible."[49]

In addition, while there has been recent progress, the vast majority of video programming on the Internet is inaccessible. Most programming, even programming that was originally captioned on traditional television, is not captioned when it is re-shown on the Internet,[50] and video description is virtually non-existent.[51] Furthermore, captioning is proving difficult in the new 3D TV environment as well.[52]

Assistive Technologies that are Expensive, not Interoperable with the Latest Technologies, and Difficult to Find

The AT that many people with disabilities need to access broadband can be prohibitively expensive. For example, screen access technology that reads the text that is on the screen for people who are blind or have low vision ranges from between $800-$1,000 for computers and costs approximately $400 for cell phones.[53] Displays that produce the on-screen content in braille cost in the range of $3,500 to $15,000,[54] with an

---

[46] *Id.*

[47] Real-time text differs from traditional forms of text communications such as text messaging, in that it provides an instantaneous exchange, character by character, whereas traditional forms of text-communications such as text messaging require users to finish their typed message before sending it. *See Strauss PLI Paper* at 17.

[48] WEBAIM SCREEN READER USER SURVEY RESULTS (2009), *available at* http://www.webaim.org/projects/screenreadersurvey2/

[49] *Id.*

[50] Rehabilitation Engineering Research Center on Telecommunications Access Comments in re NBP PN#4, filed Oct. 6, 2009, at 3.

[51] *Id.* Video description is "the insertion of verbal descriptions of on-screen visual elements during natural pauses in a program's audio content." *Strauss PLI Paper* at 6, n. 17 (2010).

[52] Vioditv, 3DTV Not Quite Ready for Primetime, http://www.viodi.tv/2010/01/10/3dtv-not-quite-ready-for-prime-time/ (last visited Feb. 25, 2010).

[53] National Federation of the Blind Comments in re NBP PN # 4, filed Oct. 6, 2009, at 3.

[54] American Foundation for the Blind, Technology - Assistive Technology - Braille Technology, http://www.afb.org/Section.asp?SectionID=4&TopicID=31&DocumentID=1282 (last visited Jan. 9, 2010).

average cost of approximately $5,000.[55] Augmentative and Alternative Communication ("AAC") devices for people with severe motor or other communication disabilities can cost $8,000 or more.[56] While government programs pay for AT under certain circumstances,[57] the European Commission ("EC") recently estimated that people with disabilities in the United States pay for AT out of pocket about 56 percent of the time, which "results in an unmet need among those who cannot afford it."[58]

AT is also often not interoperable with the latest technologies and can be difficult to find, learn how to use, and repair.[59] People with disabilities also have a low awareness of AT products and the benefits that they can provide.[60]

The lack of affordability of AT is probably of the greatest concern to people who are deaf-blind, given the combination of their low incomes and the high cost of the AT that they use.[61] While the price of many kinds of AT has come down dramatically because of innovations in software applications,[62] no such software-based solution exists for the braille display that some in the deaf-blind community require to access broadband services.[63]

Physical Barriers in Libraries and Other Community-Based Organizations

While the focus of the adoption recommendations in the National Broadband Plan is to accelerate the at-home adoption of broadband, the plan also recognizes that libraries and other community-based organizations ("CBOs") are "important venues for free

---

[55] Elizabeth Spiers, in re *A Few More Questions,* BLOGBAND, http://blog.broadband.gov/?entryId=10743#comments.

[56] Ashlee Vance, *Insurers Fight Speech-Impaired Remedy*, THE NEW YORK TIMES, Sept. 15, 2009, http://www.nytimes.com/2009/09/15/technology/15speech.html?_r=1&scp=1&sq=impairment&st=cse.

[57] *See* discussion at pp. 17-18, *infra.*

[58] *See* EUROPEAN COMMISSION, ANALYSING AND FEDERATING THE EUROPEAN ASSISTIVE TECHNOLOGY ICT INDUSTRY 38-41 (2009) ("2009 EC Report"), http://ec.europa.eu/information_society/newsroom/cf/itemlongdetail.cfm?item_id=4897

[59] *See, e.g.,* Karen Peltz Strauss, Co-Chair, Coalition of Organizations for Accessible Technology Statement at the Broadband Access for People with Disabilities Field Hearing (Nov. 6, 2009) and Elizabeth Spiers, Director, Information Services, American Association of the Deaf-Blind Statement at the Broadband Access for People with Disabilities Field Hearing (Nov. 6, 2009). *See also* National Council on Disability, Federal Policy Barriers to Assistive Technology, Stakeholder Validation Section (unpaginated) (2000), http://www.ncd.gov/newsroom/publications/2000/assisttechnology.htm#1 (finding in survey of 2000 AT users that biggest AT-related barriers were lack of information about the appropriate AT and lack of funds for AT).

[60] Microsoft Dec. 2, 2009 *Ex Parte* at 4.

[61] Rehabilitation Engineering Research Center on Telecommunications Access Comments in re NBP PN # 4, filed Oct. 6, 2009, at 2-3.

[62] *See, e.g.,* Letter from K. Dane Snowden, Vice President, External and State Affairs, CTIA - the Wireless Association, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 09-47, 09-51, 09-147 (November 16, 2009) (CTIA Nov. 16 *Ex Parte)* at 5. *See also infra* at p. 11-12.

[63] For some in the deaf-blind community, having a braille display is also the most efficient way to access basic telephone service (through IP-based TRS services). *See* Elizabeth Spiers, in re *A Few More Questions,* BLOGBAND, http://blog.broadband.gov/?entryId=10743#comments.

Internet access" and "supportive environments for reluctant and new users to begin to explore the Internet."[64] CBOs that offer computer access, however, may be physically inaccessible to people with disabilities.[65] Nor do they always provide the needed accessible technologies or support.[66]

The table below references some of the most significant barriers to broadband faced by people with disabilities:

Table 1

Disability	**Examples of Significant Broadband Barriers**
Vision	• Most devices, menus, and touchscreens do not have text-to-speech/speech-to-text • Expense of screen readers • Lack of website accessibility, including virtually no video description on video programming
Deaf/Hard of Hearing	• Lack of captioning on Internet, including captioning stripped from programming • Lack of direct data or video access to E-911 and general lack of interoperable real time text via data and IP-based technologies • IP-enabled devices are not hearing aid compatible
Deaf-Blind	• Same barriers as above, depending on degree of vision and hearing disabilities • Expense of braille displays and difficulty of getting repairs
Speech	• Expense of AAC devices • Lack of IP-enabled or video assisted speech-to-speech services
Mobility	• Devices and menus that are difficult to manipulate and navigate • Libraries and community centers with computers that are inaccessible

[64] *National Broadband Plan* at 176.

[65] U.S. BROADBAND COALITION, BROADBAND ADOPTION AND USE: BRIDGING THE DIVIDE AND INCREASING THE INTENSITY OF BROADBAND USE ACROSS ALL SECTORS OF THE ECONOMY 22 (2009), http://www.baller.com/pdfs/US_Broadband_Coalition_AandU_Report_11-13-09.pdf .

[66] *Id.*

Intellectual	• Devices and menus that are difficult to manipulate and navigate • Lack of training and support
Autism	• Difficult to fully access Internet content without captions or transcriptions • Lack of specialized digital literacy programs

III. Ongoing Private Sector and Government Efforts to Address the Barriers

In order to address the barriers set forth above, our efforts must accomplish the following:

- Promote the availability of innovative hardware, software, and services that have built-in accessibility features and standardized interfaces that allow for interoperability between IT and AT;
- Promote the accessibility of web pages, new media content, and video programming on the Internet;
- Promote affordable and innovative AT options and ensure that people with disabilities are aware of these options; and
- Promote training and other support.

This section will discuss ongoing efforts to achieve these objectives. The next sections will discuss the gaps that prevent us from fully achieving these goals and how the National Broadband Plan addresses these gaps.

Ongoing Industry Innovation

Hardware, Software, and Services

Industry innovation and collaborative efforts have tremendous potential to help close the adoption gap among people with disabilities. In the last year, companies have introduced various accessible devices, software, and services. One company introduced a smart phone which contains a built-in screen reader and captioning capabilities.[67] Another introduced a software operating system that supports speech recognition features; a magnifying window; an onscreen keyboard; and a free open-source screen reader.[68] One industry partnership established a real time instant messaging ("IM") relay service, which allows a specially trained relay operator to read IMs to the hearing caller and type IMs dictated by the hearing caller, which are displayed in real time to the end user with a hearing disability.[69]

---

[67] Apple, Apple's Commitment to Accessibility, http://www.apple.com/accessibility/ (last visited Feb. 11, 2010).

[68] Microsoft, Window's 7 features, http://windows.microsoft.com/en-us/windows7/products/features/accessibility (last visited Feb. 11, 2010).

[69] AT&T Comments in re NBP PN # 4, filed Oct. 6, 2009, at 1.

Companies are also developing Application Programming Interfaces ("APIs") which allow mainstream products to have AT plug-ins from third party developers, often yielding more efficient and affordable accessibility solutions than dedicated AT devices. One application that a consumer can use with a smart phone, for example, allows people with speech and communication disabilities to communicate using natural sounding text-to-speech voices, symbols, and a default vocabulary.[70] The price of the software is about $200, whereas, as mentioned above, a dedicated AAC device can cost $8,000 or more.[71] Some wireless carriers offer accessibility software, such as screen readers, at a significantly discounted rate,[72] and one company offers free downloadable accessibility features for some of its devices, including an application which allows the user to receive short message service ("SMS") messages in braille on a vibrating touchscreen.[73]

Companies, consortia, and individuals are also developing open-source software applications that consumers can download for free.[74] One allows a user to write up to 30 words per minute ("wpm") by pointing or gazing at zooming letters on a screen;[75] another is a screen reader using speech, braille, and magnification;[76] and a third is a program that has both text-to-speech and automatic speech recognition capabilities.[77]

Although recent advances have allowed consumers with disabilities to use software applications to meet their needs, in some cases, dedicated devices or add-on peripherals provide the best accessibility solution. A consumer who is blind, for example, can connect a braille display to a wireless device with an installed global position system ("GPS") application.[78] This technology allows the consumer to navigate in unfamiliar settings and retrieve information about nearby points of interest, such as restaurants, from a database.[79] Other sensoring and monitoring technologies allow seniors and people with disabilities to live more independently in their own communities, for example, by

---

[70] CTIA Nov. 16 *Ex Parte* at 5 (citing Proloquo2Go application that can be used with the Apple i-phone).

[71] *See* n. 47, *supra.*

[72] CTIA Comments in re NBP PN #4, filed Oct. 6, 2009, at 6-7.

[73] CTIA Nov. 16 *Ex Parte* at 4 (citing Nokia's "Braille Reader").

[74] Letter from Christopher Hankin, Senior Director, Global Communities, Sun Microsystems, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51(Nov. 23, 2009) at 1.

[75] *See* Dasher Project: Special Needs, http://www.inference.phy.cam.ac.uk/dasher/SpecialNeeds.html (last visited Feb. 11, 2010).

[76] *See* Live.gnome.org, About Orca, http://live.gnome.org/Orca (last visited Feb. 11, 2010). Orca runs on the GNOME desktop and its development has been led by the Accessibility Program Office of Sun Microsystems.

[77] *See* Dimio, *D-Software by Dimio,* http://dimio.altervista.org/eng/ (last visited Feb. 11, 2010).

[78] Robert D. Atkinson and Daniel D. Castro, Digital Quality of Life: Understanding the Personal and Social Benefits of the Information Technology Revolution 51 (Information Technology & Innovation Foundation) (2008), http://www.itif.org/index.php?id=179.

[79] *Id.*

allowing them to push a "help button" which will allow emergency medical personnel and family members to track their location over the Internet.[80]

Public-private partnerships have yielded innovative new hardware solutions as well. The Washington State Office of Deaf and Hard of Hearing ("ODHH") and Humanware, an AT company based in Canada, developed the DeafBlind Communicator ("DBC"), a braille keyboard that connects wirelessly to a cell phone with a screen and keyboard. The DBC allows a person who is deaf-blind to communicate face to face (the other person uses the cell phone key board) or using TTY, SMS, or web browser/e-mail capabilities.[81]

Content

In November 2009, one company announced that it had developed voice recognition technologies which allow viewers of videos on its new media site to request captions.[82] Originally the capabilities applied to videos of a small group of partners, but in March 2010, the company expanded the capability to all videos posted on its site in which there is a clearly spoken audio track in English.[83] Another company has announced plans to launch a free web-based tool that allows individuals to caption any videos from an open video-sharing site.[84] In February 2010, a major television network announced that it will provide closed captions on all of the long form programs that it puts on its online player.[85]

The table below shows some recent innovations that promote accessibility:

Table 2

Product	**Innovation**
Smart Phone	Has built-in screen reader and captioning capabilities

[80] *See* Silvers Summit Technology for Life, Mobile Help: Cellular and GPS-Enabled Mobile Personal Emergency Response System (M-Pers), http://silverssummit.com/index.php?option=com_myblog&show=iPhone-Health-Applications.html&Itemid=5 (last visited Apr. 23, 2010).

[81] Humanware, DeafBlind Communicator: Opening Doors to the World, http://www.humanware.com/en-usa/products/blindness/deafblind_communicator/_details/id_118/deafblind_communicator.html (last visited Apr. 23, 2010).

[82] Broadcasting Ourselves ;), The Official YouTube Blog, *The Future Will Be Captioned: Improving Accessibility on YouTube*, March 4, 2010, http://youtube-global.blogspot.com/2010/03/future-will-be-captioned-improving.html.

[83] *Id.*

[84] Matthew Knopf, Vice President, Business Development, PLYmedia Statement at the Broadband Accessibility II Workshop (Oct. 20, 2009).

[85] *See* Blair Levin (FCC), *Marlee and Mickey*, BLOGBAND, February 22 , 2010, http://blog.broadband.gov/?category=Disabilities%20Access.

Real Time IM Relay Service	Allows relay operator to read instant messages from a caller with a hearing loss to hearing caller in real time and send instant messages to end user with hearing loss in real time
Software Application	Allows user to write up to 30 wpm by pointing or gazing at zooming letters on a screen
Communication Device For People Who Are Deaf-Blind	Braille keyboard that connects wirelessly to a cell phone with a screen and keyboard that allows face to face, TTY, SMS, and web browser/e-mail communications
Voice Recognition Software	Facilitates the captioning of videos on new media site

Ongoing Collaborative Efforts

Hardware, Software, and Services

Industry is also participating in numerous collaborative efforts that promote accessibility. Some are broad efforts, such as the G3ict, a public-private global forum sponsored by the United Nations that is dedicated to facilitating the implementation of the digital accessibility rights defined in the Convention on the Rights of Persons with Disabilities.[86] Several collaborative projects focus on applying universal design principles to mainstream devices, software, and services. One company developed and made public a Universal Design methodology so that wireless equipment and application developers can better create accessible products for their customers.[87] The European Union's ("EU") AEGIS Project, which is funded by the EC and consists of IT industry representatives, disability organizations, research organizations, and universities, identifies user needs and develops open source accessibility solutions for mainstream information and communications technology ("ICT") desktops, web applications, and mobile devices.[88] In addition, REACH112 in the EU is implementing a 12-month pilot project in Sweden, the U.K., the Netherlands, France, and Spain to allow people with disabilities to communicate directly with emergency services with IP devices using voice, video, and text.[89]

Content

Other ongoing efforts focus on making content more accessible. The World Wide Web Consortium's ("W3C") Web Accessibility Initiative, which includes representatives

---

[86] G3ict, About G3ict, http://g3ict.com/about (last visited Feb. 11, 2010). The United Nations ratified the Convention in December 2006. President Obama signed the convention in July 2009, but it has not been ratified by the Senate.

[87] AT&T Comments in re NBP PN # 4, filed Oct. 6, at 1.

[88] AEGIS Project, "About AEGIS," http://www.aegis-project.eu/ (last visited Feb. 11, 2010).

[89] REACH112, What is REACH112? http://www.reach112.eu/view/en/index.html (last visited Feb. 11, 2010).

from industry, disability organizations, government, and research labs, has developed and continues to develop strategies, guidelines, and resources to make the web accessible to people with disabilities.[90] The Society of Motion Picture and Television Engineers is working to develop technical standards for the construction of captioning information that accompanies video content distributed over broadband networks and hopes to publish a standard by late 2010.[91]

Assistive Technologies

Other collaborative efforts are also focused on promoting interoperability between information technology ("IT") and AT. The Accessibility Interoperability Alliance ("AIA") is a coalition of IT and AT companies working to enable developers to more easily create accessible software, hardware, and web products.[92] A working group of the International Organization of Standards, ISO/IEC JTC1/SC35/WG6, is seeking to promote broader awareness of open accessibility APIs provided by computer operating systems that allow AT vendors to build hardware and software products that interoperate with mainstream products.[93]

Training

Still other collaborative efforts have focused on training. One company, for example, has "partnered with two non-profit organizations . . . to open 41 centers throughout the United States that provide technology training and assistance for people with a variety of disabilities that affect computer use, such as low vision, hearing loss, and hand and wrist pain."[94] The Cerebral Palsy Research Foundation, with support from private sector partners and the Departments of Education and Labor, provides computer and workforce training to people with disabilities and low income individuals in Wichita, Houston, New Orleans, and Atlanta.[95]

Ongoing Government Efforts

Numerous government programs promote the adoption of broadband by people with disabilities, either directly or indirectly. The $7.2 billion that Congress appropriated to the Department of Commerce's Broadband Technology Opportunities Program ("BTOP") and the Department of Agriculture's Broadband Infrastructure Program ("BIP") will fund both infrastructure and adoption programs that seek to bring the benefits of broadband to all Americans who are unserved and underserved.[96] The

---

[90] W3C, Accessibility, http://www.w3.org/standards/webdesign/accessibility (last visited Feb. 11, 2010).

[91] Society of Motion Picture and Television Engineers Comments in re NBP PN #4, filed Oct. 6, 2009, at 2.

[92] Peter Abrams, *Accessibility Interoperability Alliance News,* IT Analysis Communications Ltd., September 1, 2008, http://www.it-director.com/business/compliance/content.php?cid=10692.

[93] ISO/IEC, JTC1/SC35/WG6 - User Interface Accessibility, http://www.open-std.org/Jtc1/SC35/wg6/ (last visited Feb. 11, 2010).

[94] Microsoft Dec. 2, 2009 *Ex Parte* at 9.

[95] Janis Krohe, Ph.D., VP, Employment Services Division, Cerebral Palsy Research Foundation Statement at the Broadband Access for People with Disabilities Field Hearing (Nov. 6, 2009).

[96] *See* Daniel Weitzner, Associate Administrator for the Office of Policy Analysis and Development, Department of Commerce, NTIA Statement at the Broadband Accessibility II Workshop (Oct. 20,

National Council on Disability ("NCD"), an independent federal agency, prepares reports and recommendations for the President, the Congress, and federal agencies on a broad range of disability issues, including technology.[97] In 2006, NCD issued regulatory policy proposals designed to ensure access to communications services by all people with disabilities.[98] Other programs, as discussed below, focus more on specific barriers related to broadband adoption faced by people with disabilities.

Services, Equipment, and Electronic and Information Technology

Many laws, rules, and grant programs serve to promote the accessibility of services and equipment. The TRS program, which was mandated as part of the Americans with Disabilities Act ("ADA"),[99] allows people who are deaf, hard of hearing, and have speech disabilities to have telephone access through a communications assistant ("CA"). Originally, this population communicated through the CAs using a TTY, but now consumers have the option of communicating through the CA via a broadband-based service, such as video relay service or text-based IP relay.

Rules implementing Section 255 of the Communications Act require telecommunications and interconnected Voice over Internet Protocol ("VoIP") manufacturers and service providers to make their products accessible to people with disabilities when it is readily achievable to do so; when it is not, their products must be compatible with AT, if it is readily achievable to do so.[100] FCC rules also require that manufacturers and service providers make a certain percentage of their wireless phone models hearing aid compatible.[101] And Section 508 of the Rehabilitation Act[102] provides an incentive for electronic and information technology ("EIT") manufacturers and service providers to make their products accessible, because this Section requires the federal government to procure and maintain accessible EIT.[103] In the aftermath of the passage of Sections 255 and 508, the United States Access Board, an independent federal agency

---

2009) and Gary Bojes, Ph.D., Senior Level Program and Policy Advisor, Rural Utility Service, U. S. Department of Agriculture Statement at the Broadband Accessibility II Workshop (Oct. 20, 2009).

[97] National Council on Disability, NCD Publications by Subject, http://www.ncd.gov/newsroom/publications/index_subject.htm (last visited March 14, 2010).

[98] National Council on Disability, *The Need for Federal Legislation and Regulation Prohibiting Telecommunications and Information Services Discrimination*, Dec. 19, 2006, http://www.ncd.gov/newsroom/publications/2006/discrimination.htm#conclusion

[99] The Americans with Disabilities Act of 1990, Pub. L. No. 101-336, 104 Stat. 327 (1990) (codified at 47 U.S.C. §225) ("ADA Title IV").

[100] *See* 47 C.F.R. § 6.1 *et seq.*

[101] *See* 47 C.F.R. § 20.19.

[102] Workforce Investment Act of 1998, Pub. L. No. 105-220, 112 Stat 936 (1998) (codified at 29 U.S.C. § 794d) ("WIA Section 508").

[103] Under Section 508 of the Rehabilitation Act, federal agencies must "develop, procure, maintain, and use" electronic and information technologies that are accessible to people with disabilities – unless doing so would cause an "undue burden." WIA Section 508 (a)(1)(A).

that develops accessibility criteria, convened consumer-industry fora to establish accessibility guidelines that would serve as the basis of rules.[104]

The government also provides funding to support universally designed technologies. The Department of Education's National Institute for Disability and Rehabilitation Research, for example, funds a Rehabilitation Engineering Research Center ("RERC") on Universal Interface and Information Technology, which focuses on the accessibility and usability of current and emerging IT.[105] It also funds a Wireless RERC, which works with consumers with disabilities, wireless companies, and researchers to promote access to wireless technologies and the adoption of universal design.[106]

Content

Other rules, laws, and grant programs promote the accessibility of content. Under Section 508, the federal government is required to make its web content accessible to people with disabilities, unless doing so would cause an undue burden.[107] State and local governments also are required under the ADA to provide equal access to their "programs, services, and activities,"[108] and the DOJ's website provides technical assistance to help state and local governments make their web pages accessible.[109]

With respect to video programming, it is not clear whether laws and regulations related to captioning or access to emergency programming apply to programming distributed over the Internet or many IP-enabled devices that play video programming. The Television Decoder Circuitry Act of 1990 requires built-in decoder circuitry to display closed captions and applies to televisions with screens 13" or greater.[110] The captioning regulations promulgated pursuant to provisions passed in the 1996 Telecommunications Act require the captioning of virtually all "video programming."[111]

The government has many ongoing grant programs to promote accessible media. The Department of Education, for example, funds the Described and Captioned Media Program, a program administered by the National Association of the Deaf, which free-

---

[104] United States Access Board, Guidelines and Standards, http://www.access-board.gov/gs.htm (last visited Feb. 12, 2010).

[105] Trace Center, "RERC on Universal Interface and IT Access," http://trace.wisc.edu/itrerc/ (last visited Feb. 12, 2010).

[106] Wireless RERC, About Us, http://www.wirelessrerc.org/about-us (last visited Feb. 12, 2010).

[107] WIA Section 508 (a)(1)(A).

[108] ADA Title IV, (codified at 42 U.S.C. § 12101).

109 U.S. Department of Justice, Accessibility of State and Local Government Websites to People with Disabilities, http://www.ada.gov/websites2_prnt.pdf (last visited Feb. 12, 2010).

[110] The Television Decoder Act Circuitry Act of 1990, Pub. L. No. 101-431, 104 Stat. 960 (1990) (codified at 47 U.S.C. § 303 (u) and § 330(b)). Subsequently, the Commission amended its rules to require captioning capability in computer monitors that are 13" or greater in diameter; digital television (DTV) screens measuring 7.8" or greater vertically; and all standalone DTV tuners and set top boxes, regardless of size. *See Strauss PLI Paper* at 11.

[111] The Commission defines "video programming" as "[p]rogramming provided by, or generally considered comparable to programming provided by, a television broadcast station that is distributed and exhibited for residential use." 47 C.F.R. § 79.1(a)(1).

loans over 4,000 described and captioned media titles to its members.[112] The National Science Foundation funded work by WGBH's National Center for Accessible Media to produce guidelines for describing science, technology, engineering, and math images in digital talking books and on web sites.[113]

Assistive Technology

Laws requiring equal access for people with disabilities often ensure that people with disabilities have access to AT under certain circumstances. School districts are required to provide AT for students with disabilities where necessary to provide an "appropriate" education under the Individuals with Disabilities Education Act.[114] Public and private employers are generally required to provide AT if necessary as a "reasonable accommodation" to provide equal access to employment opportunities for people with disabilities under the Rehabilitation Act[115] and ADA.[116]

Other programs serve to make AT more affordable for people with disabilities. Medicare, Medicaid, and programs funded by the Veterans' Administration pay for AT under certain circumstances. Although many states have equipment distribution programs that provide AT used to access telecommunications (such as amplified phones or voice activated phones), only Missouri has a program that includes AT used to access the Internet.[117]

Some video relay service providers, who are reimbursed for their "reasonable costs" as part of the FCC's TRS program,[118] provide consumers AT called video phones. Video phones allow relay users to communicate with another person through a communications assistant (*i.e.,* relay operator) who is in a remote location via sign language. Video providers give away phones to entice consumers to use their service,[119] although under our orders, consumer equipment and related expenses are not compensable from the

---

[112] Described and Captioned Media Program, About Us, http://www.dcmp.org/About/Default.aspx (last visited Feb. 12, 2010).

[113] National Center for Accessible Media, WGBH's National Center for Accessible Media Publishes Free Guidelines for Describing STEM Images for Use within Digital Talking Books and on Web Sites (press release), Sept. 24, 2009, available at http://ncam.wgbh.org/about/news/ncam-publishes-guidelines-for- .

[114] Individuals with Disabilities Education Act, as amended in 2004, Pub. L. No. 108-446, 118 Stat. 2647 (2004).

[115] Rehabilitation Act of 1973, Pub. L. No. 93-112, 87 stat. 355, §504 (1973). Section 504 of the Rehabilitation Act requires that programs and activities conducted or funded by the federal government be accessible to people with disabilities where doing so would not create an undue burden.

[116] *See* ADA, *supra* n. 99**.**

[117] C. Marty Exline, Director, Missouri Assistive Technology Program Statement at the Broadband Accessibility Workshop II (Oct. 20, 2009).

[118] *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CC Docket No. 90-571, Report and Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking, 19 FCC Rcd 12475, 12551, para. 199 (2004).

[119] Letter from Claude Stout, Executive Director, Telecommunications for the Deaf and Hard of Hearing, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket 09-51 (Nov. 17, 2009) at 4.

Fund.[120] As part of its recently launched reform efforts,[121] however, the Commission is considering how to make the compensation methodology more fair and efficient and may consider setting up a separate subsidy fund for video phone technologies.

Training

There are also some ongoing training programs at all levels of government. The Department of Defense's Computer/Electronic Accommodations Program is the world's largest AT program and provides AT and training to employees with disabilities at the Department of Defense and throughout the federal government.[122] The Department of Education funds an AT program in the states, which provides a $500,000 grant for training, resources, and rental of a wide range of AT equipment for each state.[123] Assist! to Independence, a non-profit organization in Tuba City, Arizona, which receives some of its funding from the Department of Education, has a Regional Resource Center for Assistive Technology that provides training and education in a range of low-tech and high-tech assistive technologies to the Navajo, Hopi, and Southern Paiute Reservations.[124] The D.C. Public Library has an adaptive technology program[125] that includes online and volunteer in-person assistive technology training for people with disabilities.[126]

The table below provides examples of government programs that address accessibility barriers:

---

[120] *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CG Docket 03-123, Report and Order and Declaratory Ruling, 22 FCC Rcd 20140, 20170-20171, para. 82 (2007).

[121] These efforts are focusing on: (i) fraud and abuse; (ii) the most efficient way to deliver VRS while maintaining functional equivalency; and (iii) a fair and transparent compensation methodology. *See FCC Announces Agenda and Panelists for Workshop on VRS Reform To Be Held on December 17, 2009*, Press Release, (CGB Dec. 15, 2009), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-295208A1.doc.

[122] Computer/Electronic Accommodations Program, CAP Timeline and History, http://www.tricare.mil/CAP/About_us/CAP_Timeline.cfm, (last visited Feb. 28, 2010).

[123] Department of Education, Assistive Technology, http://www2.ed.gov/programs/atsg/index.html (last visited Feb. 12, 2010).

[124] ASSIST! to Independence, Helping American Indians with differing abilities live in harmony, http://www.assisttoindependence.org/index.html (last visited Feb. 12, 2010).

[125] Adaptive technologies are "a type of assistive technology that includes customized systems that help individuals move, communicate, and control their environments." Family Center on Technology and Disability, FCTD AT Fact Sheet Services: Assistive Technology Glossary, http://www.fctd.info/show/glossary, (last visited Feb. 12, 2010).

[126] Patrick Timony, Adaptive Technology Coordinator, DC Public Library Statement at the Broadband Access for People with Disabilities Field Hearing (Nov. 6, 2009).

Table 3

Barrier	**Government Program**
Service Inaccessibility	Video Relay Service
Content Inaccessibility	Bookshare (funded by Department of Education)
AT Cost	Missouri Telecommunications Access Program for Internet
Lack of Training	D.C. Public Library Adaptive Technology Program

IV. Gaps in Current Efforts

Current public and private efforts have undoubtedly helped to increase broadband penetration among people with disabilities. But there are gaps in our current efforts that we must address, if we are to accelerate the adoption path for people with disabilities. Specifically, the government must

- Improve implementation and enforcement of existing accessibility laws;
- Gather and analyze more information about disability-specific broadband adoption issues;
- Coordinate accessibility policy and spending priorities;
- Update accessibility regulations;
- Update subsidy programs and ensure the availability of training and support; and
- Update its approach to accessibility problem solving.

Improve Implementation and Enforcement of Existing Accessibility Laws

Each agency is responsible for its own implementation of Section 508,[127] and implementation has been inconsistent. Agencies often do not focus enough resources on procuring accessible electronic and information technology.[128] In addition, government websites and new media applications continue to pose challenges to people with disabilities.[129]

---

[127] *See* n. 116, *supra.*

[128] *See, e.g.,* Eric Bridges, American Council of the Blind Statement at the Broadband Accessibility Workshop II (Oct. 20, 2009) (stating that the Veterans' Administration Section 508 compliance office evaluates about 300 IT projects on a budget of less than $1 million per year).

[129] *See, e.g.*, Karen Peltz Strauss, Co-Chair, Coalition of Organizations for Accessible Technologies Statement at the Broadband Accessibility Workshop II (Oct. 20, 2009) and Alice Lipowicz, "Federal sites rapped over accessibility problems," FEDERAL COMPUTER WEEK, Oct. 23, 2009, http://www.fcw.com/Articles/2009/10/26/Week-Section-508-recovery.aspx

Section 508 requires the U.S. Office of the Attorney General to submit a biennial report to the President and Congress that provides information on agency compliance and makes recommendations for federal agency accessibility.[130] While the Attorney General prepared an interim report in 2000 also required by the statute,[131] since that time, DOJ has never submitted a biennial report.[132]

Some agencies are also facing challenges applying the requirements of Section 508 of the Rehabilitation Act to new technologies. For example, some federal employers are not providing employees with disabilities access to video relay services or point-to-point communications as reasonable workplace accommodations due to security concerns.[133]

The FCC also needs to improve the enforcement and implementation of its existing accessibility rules, including devoting more resources to outreach. The Commission, for example, has not initiated any enforcement actions with respect to Section 255.[134] This is due in large part to the complexities associated with making a determination as to whether it is readily achievable for a manufacturer or service provider to make a product or service accessible or usable.[135] In the past few years, the Commission has resolved numerous informal Section 255 complaints, and in 2009, it started reporting publicly the number of complaints that it received. But it has undertaken little outreach and has not made public more information about these complaints, such as trends that are reflected in the complaints. The FCC also has not addressed many of the concerns relating to the

---

[130] WIA § 508(d)(2).

[131] WIA § 508(d)(1)

[132] *See* Department of Justice, Civil Rights Division, Section 508 Homepage, http://www.justice.gov/crt/508/508home.php (last visited Jan. 16, 2010).

[133] *See* KAREN PELTZ STRAUSS, VIDEOTELEPHONY AND VIDEO RELAY SERVICE POLICIES AFFECTING U.S. FEDERAL EMPLOYEES WITH COMMUNICATION DISABILITIES: AN ANALYSIS 6-9 (ITU-T Workshop) (2009), http://www.itu.int/dms_pub/itu-t/oth/06/28/T062800000600222PDFE.pdf. Section 501of the Rehabilitation Act also requires non-discrimination in employment by Federal agencies. *See* Rehabilitation Act of 1973, *supra* n. 128, at § 501.

[134] This contrasts to its enforcement of the wireless hearing aid compatibility requirements, where it has been active. *See* Enforcement Bureau Takes Action to Enhance Access to Digital Wireless Service for Individuals with Hearing Disabilities, Public Notice, 25 FCC Rcd 370 (EB 2010).

[135] The three formal complaints that consumers have filed have all settled without a determination being made as to how to enforce the "readily achievable" standard. *See* Dr. Bonnie O'Day v. Cellco Partnership d/b/a Verizon Wireless, Motion To Dismiss With Prejudice, EB-03-TC-F-001, Order, 19 FCC Rcd 17477 (2004); Frank Winsor Burbank and Barbara Gail Burbank v. OnStar Corporation, EB-03-TC-F-001, Order, 19 FCC Rcd 16652 (2004); and Dr. Bonnie O'Day v. Audiovox Communications Corporation, EB-03-TC-F-004, Order, 19 FCC Rcd 14 (2004).

implementation of captioning rules,[136] which is the area in which the FCC currently receives the greatest number of complaints.[137]

Gather and Analyze More Information about Disability-Specific Broadband Adoption Issues

While the FCC collects some information under the Broadband Data Improvement Act ("BDIA")[138] regarding adoption by people with disabilities, no government entity provides an in-depth analysis of broadband barriers and usage issues relating to different disability subcommunities. Furthermore, while the Department of Commerce released a study on the *entire* AT industry in 2003,[139] the government has never analyzed all the different sources of ICT AT funding, how much each source pays for ICT AT, and how many people with disabilities are not adopters because they have no source of funding for AT that they cannot afford.

This contrasts with the European Commission ("EC"), which did a study analyzing the European ICT AT industry that it released in March 2009.[140] The report also compared the EC's AT delivery system to the one in the U.S.[141] The EC noted that:

> The biggest element to highlight after looking at the U.S. service delivery system for AT is that coverage of assistive technologies is fragmented among a range of programs. Only a few cover a broad range of AT, and many cover only selected technologies as part of broader program objectives . . . This high level of segmentation . . . complicate[s] the ability to determine and provide in a

---

[136] These concerns include addressing a 2004 petition that the Commission adopt specific quality requirements for captioning and addressing hundreds of "undue burden" petitions from religious non-profits and others, who do not have to caption their programming while their petitions are pending before the Commission. *See* Letter from Nguyen T. Vu, Counsel to Telecommunications for the Deaf and Hard of Hearing, Inc., to Marlene H. Dortch, CG Docket No. 03-123, (March 2, 2009), Attachment at 3.

[137] For example, in the first quarter of 2009, 142 of the total 226 informal complaints concerned captioning. *See* FCC News, Report on Informal Consumer Complaints Regarding Access to Telecommunications for People with Disabilities," Press Release,(CGB Sept. 8, 2009) available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-293274A1.doc.

[138] Broadband Data Improvement Act of 2008, Pub. L. No. 110-385, 122 Stat. 4097 (2008) (codified at 47 U.S.C. §§ 1301-04) ("BDIA"). Section 103(c) of the BDIA provides that the Commission conduct a periodic consumer survey of broadband service capability.

[139] According to the Department of Commerce survey, only 9% of the U.S. assistive technology companies focused on products related to computers (as compared to, for example, 20.7% for mobility; 12.2% for orthotics/prosthetics; 12.0% for aids to daily living; and 10.4% for communication devices). *See* U.S. DEPARTMENT OF COMMERCE, BUREAU OF INDUSTRY AND SECURITY, TECHNOLOGY ASSESSMENT OF THE U.S. ASSISTIVE TECHNOLOGY INDUSTRY 7-8 (2003), http://www.icdr.us/atreportweb/index.htm

[140] *2007 EC Report*.

[141] The report noted that the U.S. differed from the EC in that its assistive technology programs were for the most part rooted in universal design and anti-discrimination laws, rather than direct subsidies for the end user. *See id.* at 7. The report recommends that the ICT AT industry in the European Union ("EU") would be strengthened if industry formed a federation or other type of ICT AT industry association, similar to the Assistive Technology Industry Association in the United States. *Id.* at 139.

> coordinated fashion the specific combination of services and technologies that most efficiently and cost-effectively assists individuals in functioning. . .[142]

Coordinate Accessibility Policy and Spending Priorities

The federal government has many programs that contribute directly or indirectly to promoting broadband adoption by people with disabilities, but policies and spending priorities affecting broadband accessibility are not necessarily coordinated across agencies. For example, the DOJ and the FCC need to coordinate on ADA policies that implicate communications policies.

Some program restrictions also may be inconsistent with broader policy objectives. Under Medicare's regulations, for example, coverage of AT is limited to "durable medical equipment" that is "primarily and customarily used to serve a medical purpose" and "generally is not useful to a person in the absence of an illness or injury."[143] This means that Medicare will pay for a dedicated AAC device that costs $8,000 or more but not for a $300 smart phone that can run $150 text-to-speech software and that works more effectively than the AAC device.[144] Policies should promote the development of mainstream technologies with built-in accessibility features and ensure that such technologies can be used to address accessibility needs when it is more efficient and effective to do so.

The government also needs to consider more broadly policies which will promote the development of innovative assistive technologies, lower the cost of AT, and ensure that AT can keep pace and be interoperable with the latest technologies. It should give further consideration to a proposal that the government provide funding for a unified, network-based delivery system for AT, which would lower the cost of AT and provide easy-to-use accessibility features for people with disabilities, seniors, and others who would benefit from simplified access.[145] Under this proposal, software enhancements to the broadband infrastructure would allow people to "call up interface features or adaptations that they need anytime, anywhere, and on any device that they encounter."[146]

---

[142] *Id.* at 41.

[143] *See* 42 C.F.R. § 414.202.

[144] *See* Ashlee Vance, *Insurers Fight Speech-Impaired Remedy*, THE NEW YORK TIMES, September 15, 2009, http://www.nytimes.com/2009/09/15/technology/15speech.html?_r=1&scp=1&sq=impairment&st=cse. Medicare will pay for a separate software application that performs the function, but not for hardware, even if the hardware has built-in software that provides the function. *See* Centers for Medicare and Medicaid Services, Medicare Coverage Determinations Manual, Chapter 1, Part 1, Section 50.1, http://www.cms.hhs.gov/manuals/downloads/ncd103c1_Part1.pdf.

[145] *See* Letter from Gregg Vanderheiden, Director, RERC on Universal Interface and Information Technology Access, Trace R&D Center, Univ. of Wisconsin; Jim Fruchterman, President, Benetech; Larry Goldberg, Director, Carl and Ruth Shapiro National Center for Accessible Media at WGBH (NCAM); Dale Hatfield, ICT Consultant, former Chief Engineer, FCC; Eve Hill, Burton Blatt Institute; Karen Peltz Strauss, Principal, KPS Consulting; and Jim Tobias, President, Inclusive Technologies, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 09-47, 09-51, 09-137 (Jan. 6, 2010) at 1.

[146] Karen Peltz Strauss, Co-Chair, Coalition of Organizations for Accessible Technology Statement at the FCC Field Hearing on Broadband Access for People with Disabilities, Nov. 6, 2009. Under the proposal, "the basic structure, tools, resources, and security for the development and support of a

The government also needs to consider how to lower the costs of AT by taking full advantage of the relative strengths of different and emerging software development, distribution and licensing models. Government policy and procurement procedures should consider specific aspects and advantages of cloud computing, open source,[147] shared-source and proprietary software. Among the factors that should be considered are costs, innovation, interoperability, distribution, training, and maintenance. The government should also consider how to incentivize states to distribute IT AT to people with disabilities[148] and whether subsidies are needed for AT vendors.[149]

Update Accessibility Regulations

While some in industry who are not regulated are producing accessible products and content because they think it makes good business sense to do so,[150] widespread change and universal access will be more likely if all companies are required to focus on how to make their products accessible. In the past, broadly-based change in the marketplace has not occurred until Congress passed laws or the FCC passed rules mandating accessibility. Access to the PSTN for people with speech and hearing disabilities, captioning, and wireline and wireless hearing aid compatibility only occurred after legislative and regulatory action was taken.

Current accessibility laws and rules often do not cover today's services, equipment, and content. Section 255, for example, applies to telecommunications and interconnected Voice over Internet Protocol ("VoIP") services and equipment but has not been applied to non-interconnected VoIP, electronic messaging, and video conferencing services and equipment. Hearing aid compatibility rules apply to equipment and services that are commercial mobile radio services ("CMRS") but have not been applied to non-CMRS VoIP or other IP-enabled phone-like devices. Rules that mandate captioning capability apply to televisions that are 13" or above (as well as some computer monitors and DTV screens and all DTV tuners and set top boxes) but have not been applied to most other devices that play video programming, including devices that are portable such as smart phones and MP3 players. Captioning rules apply to video programming shown via broadcast, cable, or satellite but have not been applied to programming shown over the Internet.

---

variety of access products and features" would be publicly funded and the "ecosystem for accessibility products and features consisting of commercial assistive technology (AT) companies, mainstream ICT companies, free and open source developers, and [others]" would mostly be privately funded. *Id.*

[147] *See* Letter from Christopher Hankin, Senior Director, Global Communities, Sun Microsystems, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51 (Nov. 23, 2009) at 1.

[148] Currently, Missouri is the only state that distributes assistive technologies that are used to access the Internet. *See* C. Marty Exline, Director, Missouri Assistive Technology Program Statement at the Broadband Accessibility Workshop II (Oct. 20, 2009).

[149] *See* Letter from Paula Boyd, Regulatory Council, Microsoft Corporation, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 09-47, 09-51, 09-137 (Dec. 2, 2009) at 10.

[150] *See, e.g.,* Microsoft December 2, 2009 *Ex Parte* at 5; Ken Salaets, Information Technology Industry Council in re A Few More Questions, http://blog.broadband.gov/?entryId=10743#comments; and Tom Krazit, *Web Accessibility No Longer an Afterthought,* CNET NEWS, Dec. 14, 2009, http://news.cnet.com/8301-30684_3-10414041-265.html.

In addition, the FCC has not engaged in the issue of the need to implement a standard for reliable and interoperable real-time text anytime VoIP is available and supported. In March 2010, however, the Access Board released draft ICT standards and guidelines for Section 255 and Section 508 that include real time text requirements for hardware and software that provides real-time voice conversation functionality.[151]

Furthermore, with respect to commercial websites, DOJ has never clarified the extent to which commercial establishments covered under Title III of the ADA, which protects people with disabilities from discrimination in places of public accommodation, must make their websites accessible. DOJ has indicated in an *amicus* brief and an opinion letter that Title III is applicable to commercial websites,[152] but courts are split on this issue.[153]

Update Subsidy Programs and Ensure the Availability of Needed Training and Support

Current subsidy programs do not provide incentives for the development of AT or mainstream ICT that can promote accessibility. Subsidy programs should ensure that those who cannot afford AT and who do not have access to AT through existing programs have federal support. As mentioned, one population that is particularly in need of specialized devices is the deaf-blind. The American Association of the Deaf-Blind estimates that 4,000 people who do not use broadband now could be online if subsidies were available for braille displays, which have an average cost of about $5,000.[154] The limited size of the relevant population will keep funding requirements small, and federal support is essential to provide the deaf-blind community access to communications as few states are willing to incur the high expenses associated with braille displays.[155]

In addition, government needs to have a comprehensive approach to broadband training and support for people with disabilities. The training should cover the mainstream and assistive technologies used by people with disabilities and use teaching modules that are accessible to people with disabilities, including those with learning and intellectual disabilities.

Update the Approach to Accessibility Problem Solving

---

[151] *See* United States Access Board, *Draft Information and Communication Technology (ICT) Standards and Guidelines*, (March 2010) at 80, ("Access Board Draft Guidelines"), http://www.access-board.gov/sec508/refresh/draft-rule.pdf.

[152] *See Hooks v. Okbridge,* No.99-50891 (5th Cir. 1999), *Brief of the United States as Amicus Curiae in Support of Appellant* and Letter to Senator Tom Harkin from Deval L. Patrick, Assistant Attorney General, Civil Rights Division, United States Department of Justice (Sept. 9, 1996).

[153] *Cf, e.g., National Federation of the Blind v. Target Corp.,* 452 F. Supp. 2d 946, 956 (N.D. Cal. 2006) (holding that Article III of the ADA is applicable "if the inaccessibility of the website impedes the full and equal enjoyment of goods and services in the [store itself]") to *Access Now, Inc. v. Southwest Airlines, Co.*, 227 F. Supp. 2d 1312 (S.D. Fla. 2002) (holding that an airline Internet website is not a "place of public accommodation" within the meaning of Title III of the ADA).

[154] Elizabeth Spiers, in re *A Few More Questions*, BLOGBAND, http://blog.broadband.gov/?entryId=10743#comments

[155] *Strauss PLI Paper* at 19.

The Commission needs to update its approach to accessibility problem solving. This approach needs to recognize the complexity and diversity of the broadband ecosystem[156] and the rapid pace of technological change.[157] The FCC needs to reach out to and engage with all stakeholders on a regular basis, using open and collaborative problem-solving mechanisms. These mechanisms should include an online web presence that uses new media tools to tap into new sources of information and innovation.

V. The National Broadband Plan's Blueprint for Accessibility

The National Broadband Plan sets forth specific recommendations to address the gaps identified above and to accelerate the adoption rate for people with disabilities. These recommendations address the barriers faced by all non-adopters as well as the specific accessibility and affordability barriers faced by people with disabilities. This paper also considers additional issues that should be considered in the implementation phase.

There are several broadly-based recommendations that will spur the adoption of broadband by people with disabilities, including the plan's recommendations to make broadband affordable for low-income Americans. For example, the plan recommends that the Universal Service Fund Lifeline and Link-Up telephone support programs be expanded to include broadband.[158]

The plan also recommends the establishment of a digital literacy corps to teach digital literacy skills.[159] The program will be designed to ensure that people with disabilities are fully included – both in terms of content and in terms of accessibility of teaching materials.[160]

In addition, the plan recommends the creation of private partnerships that collaborate with federal agencies that serve low-adopting populations.[161] Under the recommendation, private and non-profit partners would provide discounted hardware and broadband service, as well as relevant software, training and applications, to encourage and enable adoption.[162] Among the agencies cited as ideal potential collaborators is the Social Security Administration, which reaches 7 million children and adults with disabilities who have little or no income and are served by the Supplemental Security Income program.[163]

---

[156] *See, e.g.,* AT&T Comments in re NBP PN # 4, filed Oct. 6, 2010, at 2.

[157] *See, e.g.,* Rob Atkinson, President, Information Technology and Innovation Foundation Statement at the Broadband Accessibility for People with Disabilities II Workshop (Oct. 20, 2009).

[158] *National Broadband Plan* at 171-173.

[159] *Id.* at 174-178.

[160] *Id.*at 175.

[161] *Id.* at 178-181.

[162] *Id.* at 178.

[163] *Id* .at 178-179.

In addition to addressing barriers that all Americans face, the plan considers the additional affordability and accessibility barriers unique to people with disabilities and provides recommendations to address these barriers.

The plan contains three broad recommendations to address these concerns: (1) the creation of a Broadband Accessibility Working Group ("BAWG") within the Executive Branch;[164] (2) the establishment of an Accessibility and Innovation Forum at the FCC;[165] and (3) the modernization of accessibility laws, rules, and related subsidy programs by the FCC, the Department of Justice ("DOJ"), and Congress.[166]

Broadband Accessibility Working Group

The first major recommendation made in the National Broadband Plan is for the Executive Branch to convene a BAWG.[167] Under the plan, the BAWG would consist of approximately 15 different agencies[168] and "would take on several important tasks."[169] The first of these tasks is to "ensure the federal government complies with Section 508 of the Rehabilitation Act."[170] The plan recommends that the Attorney General prospectively submit the biennial reports required under Section 508, and that the BAWG "work with the Executive Branch to conduct an ongoing and public assessment of the degree to which agencies are complying with Section 508."[171] It also recommends that the BAWG "survey federal agencies to determine how they could apply Section 508 requirements to grant recipients and licensees."[172]

The BAWG would also "coordinate policies and develop funding priorities across agencies."[173] Examples of actions it would take include "identify[ing] and modify[ing] program restrictions preventing new and efficient technologies from being funded" and "exploring whether any public funding should be used for the development and operation of new software enhancements that could support a network-based delivery system for assistive technologies." [174]

---

[164] *Id.* at 181.

[165] *Id.*

[166] *Id.* at 182.

[167] *Id*. at 181.

[168] Members of the BAWG would include representatives from the Departments of Agriculture, Commerce, Defense, Education, Health and Human Services, Justice, Labor, and Veterans' Administration; and the Access Board, the FCC, the Federal Trade Commission, the General Services Administration, the National Council on Disability, and the National Science Foundation. *See id.*.

[169] *National Broadband Plan* at 181.

[170] *Id.*

[171] *Id.*

[172] *Id.*

[173] *Id*

[174] *Id.*

In addition, it would "prepare a report on the state of broadband accessibility in the United States within a year after the BAWG is created and biennially thereafter."[175] The report would consider "broadband adoption, barriers, and usage among people with disabilities" and "analyze the root causes of the relatively low broadband adoption rate by people with disabilities and make specific recommendations to address these problems."[176]

The BAWG should also take additional actions consistent with these recommendations. For example, the BAWG should consider how to ensure that as technologies evolve, implementation of Section 508 stays up to date and security and other concerns are addressed.

Accessibility and Innovation Forum

The second major recommendation is that the FCC should establish an Accessibility and Innovation Forum.[177] The forum would "allow manufacturers, service providers, assistive technology companies, third-party application developers, government representatives and others to learn from consumers about their needs, to share best practices, and to demonstrate new products, applications, and assistive technologies."[178] The forum would hold workshops "to share and discuss breakthroughs. . . that promote accessibility" and have an "ongoing Web presence to allow participants to share information about public and private accessibility efforts and discuss accessibility barriers and inaccessible products."[179] The Chairman of the FCC, in conjunction with the forum, "could also present an Accessibility and Innovation Award recognizing innovations" in the public and private sectors "that have made the greatest contribution to advancing broadband accessibility."[180]

The Accessibility and Innovation Forum should be a model of engaged and open government. The web presence should incorporate regular blog coverage, XML feeds for syndication, online video, and crowd-sourcing platforms for harnessing public knowledge and insight. It should also include a clearinghouse of information on the availability of accessible products and services and a list of products and services with access features.[181] In addition, the FCC should undertake outreach through the forum and share specific information about the trends it sees in the complaints it receives. It should also designate a specific contact within the agency through which consumers could request further investigations into potential violations without having to file a formal complaint.

---

[175] *Id.*

[176] *Id.*

[177] *Id.*

[178] *Id.*

[179] *Id.*

[180] *Id.*

[181] *See, e.g.,* Twenty-first Century Communications and Video Accessibility Act of 2009, H.R. 3101, 111th Cong. § 2 (2009) ("H.R. 3101"), introduced by Representative Markey. This recommendation is similar to a provision in H.R. 3101, § 717(d).

Modernizing Accessibility Laws, Rules, and Subsidy Programs

The third major recommendation is that Congress, the FCC, and DOJ should update accessibility laws, regulations, and related subsidy programs "to cover Internet Protocol-based communications and video programming technologies."[182] The plan notes that H.R. 3101, the Twenty-First Century Communications and Video Accessibility Act of 2009, introduced by Representative Edward Markey, is a starting point for discussion for many of these updates.[183] Specifically, the plan recommends that (1) "the FCC should ensure that services and equipment are accessible to people with disabilities;" (2) "the federal government should take steps to ensure the accessibility of digital content;" and (3) "the FCC should materially support assistive technologies to make broadband more usable for people with disabilities."[184]

Services, Equipment, and Software

With respect to services and equipment, the plan finds that the Commission should "extend its Section 255 rules to require providers of advanced services and manufacturers of end user equipment, network equipment, and software used for advanced services to make their products accessible to people with disabilities."[185] The plan notes that advanced services, as defined in H.R. 3101, include non-interconnected VoIP, electronic messaging, and video conferencing (as well as interconnected VoIP, which is covered by Section 255).[186] The plan also notes that the FCC should "assure itself of its jurisdiction to extend Section 255 to all advanced services or, if it cannot do so, seek authorization from Congress."[187] In addition, the plan notes that H.R. 3101, which requires advanced service providers and equipment manufacturers to make their products accessible unless doing so would cause an undue burden, should be a starting point for discussion of both the scope of coverage and the legal standard of the accessibility obligation applied to service providers and manufacturers.[188]

The plan also recommends that the Commission extend its wireless hearing aid compatibility rules to all types of devices that provide voice communications via a built-in speaker and are typically held to the ear, to the extent that it is technologically feasible.[189] Existing hearing aid compatibility rules require manufacturers and service providers to make a certain percentage of their wireless phone models hearing aid-compatible, but the rules apply only to CMRS phones that connect into the PSTN and utilize an in-network switching facility.[190] Phones using VoIP applications over

---

[182] *National Broadband Plan* at 182.

[183] *Id.*

[184] *Id.*

[185] *Id.*

[186] *Id.*

[187] *Id.*

[188] *Id.*

[189] *Id.* This recommendation is similar to a provision in H.R. 3101, § 102.

[190] 47 C.F.R. § 20.19(a).

unlicensed WiFi networks, for example, are typically not covered.[191] In November 2007, the Commission issued a Notice of Proposed Rulemaking in which it sought comment on whether its hearing aid compatibility rules should be modified to address new technologies, including "new devices that more closely resemble mobile computers but have voice communication capability."[192] In this proceeding, the FCC should extend its hearing aid compatibility rules to uncovered service providers and manufacturers of new wireless technologies that provide phone-like capabilities.

In addition, the plan recommends that the Commission open a proceeding on the need to implement a standard for reliable and interoperable real-time text anytime VoIP is available and supported.[193] The Commission should consider the Access Board's draft guidelines on real-time text[194] as part of that proceeding. It should also coordinate its work with Next Generation E-911 efforts to implement a real-time, interoperable voice, video, and text E-911 system.[195] In this endeavor, the Commission should be working to efficiently transition all current users of TTYs to next generation technologies.

Content

With respect to content, the plan recommends that the Commission open a proceeding on "the accessibility of video programming distributed over the Internet; the devices used to display such programming; and related user interfaces, video programming guides, and menus."[196] The inquiry would cover closed captioning decoder and video description capability and the transmission of emergency information over the Internet. The plan also recommends that Congress consider clarifying that the Commission has authority to adopt video description rules and notes that H.R. 3101 should be a starting point for discussion with respect to the scope of the Commission's authority to adopt such rules.[197] The plan also notes that "[a]s part of the proceeding, the Commission should assess its jurisdiction to adopt rules with respect to (i) captioning and emergency information of video programming on the Internet and devices which display such programming and (ii) related user interfaces, video programming guides, and menus."[198]

The inquiry should be a "fact-gathering, analytical initiative to [better] understand the needs of the disabilities community and the contributions that would be required from . . .

---

[191] *Amendment of the Commission's Rules Governing Hearing Aid-Compatible Mobile Handsets*, WT Docket No. 07-250, Second Report and Order and Notice of Proposed Rulemaking, 22 FCC Rcd. 19670, 19702, para. 89 (2007) ("*Wireless Hearing Aid Compatibility Notice").*

[192] *Wireless Hearing Aid Compatibility Notice*, 22 FCC Rcd at 19704, para. 92.

[193] *National Broadband Plan* at 182.

[194] *See Access Board Draft Guidelines* at 80-82.

[195] This proceeding should be coordinated with the FCC proceeding addressing the future roles of 9-1-1 and NG9-1-1 as communications technologies, networks and architectures expand beyond traditional voice-centric devices.

[196] *National Broadband Plan* at 182. This recommendation is similar to a provision in H.R. 3101, § 201.

[197] *National Broadband Plan* at 182. In *Motion Picture Ass'n of America, Inc. v. FCC*, 309 F.3d 796 (D.C. Cir. 2002), the D.C. Circuit vacated the Commission's video description rules, finding that the Commission lacked the authority to adopt such rules.

[198] *National Broadband Plan* at 182.

video service providers, video programmers, manufacturers of end user equipment, software developers, and network providers."[199] It should be coordinated with the ongoing work of the Society of Motion Picture and Television Engineers to "develop technical standards for the construction of captioning information that accompanies video content distributed over broadband networks."[200] It should also be informed by the Consumer Advisory Committee's Working Group on DTV Captioning, and the Commission should assign discrete questions to this group as appropriate.

The plan also recommends that DOJ should amend its regulations to clarify the obligations of commercial establishments under Title III of the ADA[201] with respect to commercial websites.[202] DOJ also should prepare technical assistance on website accessibility for commercial establishments that is similar to the technical assistance it has prepared for state and local governments. In a related matter, DOJ should help localities ensure that libraries and community centers are accessible to people with disabilities by clarifying how localities can meet their obligations under Title II of the ADA[203] and Section 504 of the Rehabilitation Act.[204]

Subsidy Funds

With respect to subsidy funds, the plan recommends that Congress authorize the Commission to use Universal Service Funds ("USF") to provide competitively-based funding to "developers of innovative devices, components, software applications or other AT that promote accessibility."[205] This funding should be capped at $10 million per year.[206] Developers receiving this funding would be eligible to receive the Chairman's Award for Accessibility and Innovation.

The government also should ensure that those who cannot afford AT and who do not have access to AT through existing programs have federal support. Accordingly, the plan recommends that Congress "authorize the FCC to use universal service funds to provide assistive technologies that would enable individuals who are deaf-blind to access broadband services."[207] The plan recommends capping the funding at $10 million per year.[208]

---

[199] AT&T Comments in re NBP PN #4, filed Oct. 6, 2009, at 3 & 6.

[200] SMPTE Comments in re NBP PN #4, filed Oct. 6, 2009, at 2.

[201] ADA, § 302.

[202] *National Broadband Plan* at 182.

[203] Title II of the ADA requires that state and local governments make programs "readily accessible and usable" unless doing so would cause "fundamental alteration" to the structure or an "undue financial and administrative burden." ADA, § 506.

[204] *See* n. 115, *supra.*

[205] *National Broadband Plan* at 182.

[206] *Id.*

[207] *Id.*

[208] *Id.* This recommendation is similar to a provision in H.R. 3101, § 105(b)(2)(i)(1).

Furthermore, as part of its broader reform efforts,[209] the plan recommends that "the FCC issue an NPRM on whether to establish separate subsidy programs to fund broadband services and AT under the . . . TRS program."[210] Funding is needed because, as mentioned above, while most states fund AT used to access the telephone system, only one state – Missouri – funds assistive technologies used for Internet access.[211] The AT used with TRS include video phones that people with speech and hearing disabilities use to communicate via sign language; braille displays, which connect to a computer and produce a braille output of the text on screen and allow people who are deaf-blind to access IP relay; and captioned phones, which have a screen to display captions of what the other party to the conversation is saying.

The Commission should also consider whether TRS funds should be used to subsidize mainstream technologies that can be used to address accessibility barriers efficiently and effectively. More generally, the Commission should consider how to migrate to a model in which consumers could use a greater number of mainstream technologies to access broadband-based TRS services.[212]

In addition, the plan recommends that the Commission consider providing support for broadband services for low-income people with hearing and speech disabilities,[213] since these services are needed to use IP-based services. The program administrator could use the same criteria as those used under the Lifeline/Link Up program and would only provide funding when no other source of funding was available.[214]

The plan also recommends that the FCC determine "whether additional IP-enabled TRS services, such as Video Assisted Speech-to-Speech Service,[215] could benefit people with disabilities."[216] The Commission should also consider this issue as part of its ongoing reform efforts.

The table below summarizes the recommended actions in the NBP to accelerate adoption by people with disabilities:

---

[209] *See FCC Announces Agenda and Panelists for Workshop on VRS Reform To Be Held on December 17, 2009* Press Release (CBG Dec. 15, 2009), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-295208A1.doc

[210] *National Broadband Plan* at 182.

[211] *See* C. Marty Exline, Director, Missouri Assistive Technology Program Statement at Broadband Accessibility for People with Disabilities II Workshop (Oct. 20, 2009).

[212] Jim Tobias, Inclusive Technologies Statement at Workshop on Video Relay Service Reform (Dec. 17, 2009).

[213] *National Broadband Plan* at 182.

[214] *See* C. Marty Exline, Director, Missouri Assistive Technology Program Statement at Broadband Accessibility for People with Disabilities II Workshop (Oct. 20, 2009).

[215] *See* Rebecca Ladew, East Coast Representative, Speech Communications Assistance by Telephone, Inc. Statement at Broadband Accessibility for People with Disabilities II Workshop (Oct. 20, 2009) and Letter from Monica Martinez, Commissioner, Michigan Public Service Commission, to Julius Genachowski, Chairman, FCC,GN Docket Nos. 09-47, 09-51, 09-137; CS Docket No. 97-80 (Dec. 23, 2009) at 1.

[216] *National Broadband Plan* at 182.

Table 4

ENTITY	RECOMMENDATION
BAWG	• Ensure government complies with Section 508 • Coordinate funding objectives and policy goals • Issue Biennial State of Accessibility Report
FCC	• Establish Accessibility and Innovation Forum, including clearinghouse • Update Section 255 rules • Update Hearing Aid Compatibility rules • Open proceeding on need for real time text standard for VoIP • Open proceeding on accessibility of Internet programming and related devices • Consider TRS funds for subsidies for broadband services and mainstream and assistive technologies • Open rulemaking proceeding on funding Video Assisted Speech-to - Speech as new TRS service
DOJ	• Clarify the applicability of the ADA to commercial websites
CONGRESS	• Clarify FCC's authority to adopt video description rules • Authorize limited use of USF for AT equipment for people who are deaf-blind and for competitively-based funding for AT developers • Provide FCC authority to update accessibility rules where authority does not exist.

VI. Conclusion

> [I am] a disabled citizen on a very tight budget . . . I have this computer as a gift from my sister, and I currently have wireless Internet access as part of my rent at the RV park where I live. . . I have difficulty getting out and doing many things physically, and to shop, bank, and the like. . . Before going on line, I rarely socialized because the physical effort to get there, to do so, was just too great. With the Internet, I can do so with little energy output, and enjoy doing so. Believe it or not, that is a big deal.
>
> --sandraleesmith46,
>
> Posted on Ideascale
>
> Broadband.gov, December 19, 2009

Congress has tasked us to "seek to ensure that all people of the United States have access to broadband capability."[217] The International Treaty on the Rights of People with Disabilities, which the United States signed in July 2009,[218] "recognizes the importance of accessibility . . . to information and communication in enabling persons with disabilities to fully enjoy all human rights and fundamental freedoms."[219]

How do we realize this vision and implement a "principle of inclusion"[220] for people with disabilities as we deploy our broadband infrastructure?

We as a society must believe sandraleesmith46 when she tells us that having access to broadband is a big deal. We must embrace the cause and understand that if 39% of non-adopters have a disability, we will not close the adoption gap until we address the barriers faced by people with disabilities. Those barriers may be challenges that are shared with other Americans or they may be barriers that are more disability-specific. Both must be addressed, and, in doing so, we must highlight that accessibility concerns have implications for us all. We must make clear that building-in accessibility at the design and development stage is cost-effective, and that all of society benefits from the widespread use of accessibility features such as captioning, speech recognition, and

---

[217] American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115, §6001 (k)(2) (2009).

[218] Department of Justice, International Treaty on the Rights of People with Disabilities, http://www.ada.gov/un_statement.htm (last visited Feb. 12, 2010). The Senate has not yet ratified the treaty.

[219] United Nations Enable, Convention on the Rights of Persons with Disabilities, Preamble (v), http://www.un.org/disabilities/default.asp?navid=13&pid=150. (last visited Feb. 12, 2010).

[220] American Association of People with Disabilities Comments in re NBP PN # 4, filed Oct. 6, 2010, at 2.

speech output. An accessible world will even be more important to us as we get older, given the fact that 71% of those 80 or over have a disability.[221]

We also must ensure that government itself is a model of accessibility and that these efforts are part of a larger movement toward open government. We must update our regulations to take into account the new broadband ecosystem. We also must update our *approach* to regulation and foster collaborative and problem-solving processes among stakeholders. Advances in technology must work to close the gap for people with disabilities and not create new barriers that erase the progress of the past. We must build from ongoing public and private efforts but also use new tools and new media to tap into sources of ideas and innovation that were previously unimaginable and unreachable.

Implementing this vision will require ongoing commitment and resources from both the public and private sectors. Indeed, delivering on the promise of equal access to the broadband infrastructure will be one of the "giant leaps" of our generation. Now is the time to engage in this endeavor in earnest and show that we do indeed believe that this is a big deal, for people with disabilities and for all Americans.

---

[221] *2005 Census Report* at 4.