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U.S. Wireless Policy Landscape in the Disabilities Context

Helena Mitchell, Ph.D., Wireless RERC/GCATT
Georgia Institute of Technology, Atlanta, Georgia, USA

Paul M.A. Baker, Ph.D., Wireless RERC/GCATT
Georgia Institute of Technology, Atlanta, Georgia, USA

Alan Bakowski, Wireless RERC/GCATT
Georgia Institute of Technology, Atlanta, Georgia, USA

Email: helena.mitchell@gcatt.gatech.edu

Email: paul.baker@gcatt.gatech.edu

Email: alan.bakowski@gcatt.gatech.edu

Abstract

This paper provides a background and overview of the U.S. wireless policy environment and identifies critical issues, opportunities and barriers that can be addressed within a policy framework in order to facilitate increased access to wireless and other information and governmental services, as well as an enhanced quality of life for people with disabilities.

Keywords: Wireless Technology, disabilities, U.S. policy, access

1.0 Introduction

Mobile wireless information and communication technologies (ICTs) have emerged as an important tool for communicating, conducting transactions, and to obtain information to assist in navigating daily activities. Deployment and adoption of new wireless technologies including cell phones and mobile computers could greatly increase the independence of people with disabilities, a key policy objective to achieve increased access to government and daily living opportunities. Barriers (such as lack of awareness, economic, technological and regulatory) to the use of these technologies by people with disabilities can be mitigated through the development of appropriate policy. In the United States, the community of people with disabilities and those with a connection to people with disabilities represents a sizeable, yet inadequately studied population. According to the U.S. Census, an estimated 49.7 million men, women and children have a disability that impacts their everyday activities (Census 2003).

A significant barrier to improved access to wireless and other ICTs by people with disabilities can be addressed by increased awareness and outreach activities. On such approach is targeting educators and business decision makers to help them become more knowledgeable about accessibility issues in general, as well as products that have accessibility features. Further, in the United States, policy analysts maintain that legislators and regulators must also be a part of this process. Stakeholders periodically share findings and provide information on the issues related to technology and disabilities to law makers and regulators. Synergistic communication between legislators, regulators and policy makers helps to increase independence, increase employment, and improve the quality of life for many people with disabilities, thus reducing dependence on revenue generated by taxpayers.

This paper provides a background and overview of the U.S. wireless policy environment and identifies critical issues, opportunities and barriers that can be addressed within a policy framework in order to facilitate increased access to wireless and other information and governmental services, as well as an enhanced quality of life for people with disabilities.

3.0 U.S. Wireless Policy Landscape in the Disabilities Context

As noted above, in the United States, the community of people with disabilities and those with a connection to people with disabilities represents a sizeable yet inadequately studied population (Access Board 2000). While 63 percent of people with disabilities say that life has improved in the past decade, many individuals are still in need of support and assistance (NOD 2002). Wireless technologies and mobile information devices could be a key to helping persons with disabilities overcome the unique and diverse challenges they face. Information and e-accessibility is already limited for people with disabilities, even assuming fixed (wired) environments. Only 25 percent of persons with disabilities own a computer, compared to 66 percent for non-disabled adults. In addition, only 20 percent of people with disabilities have access to the Internet, compared to over 40 percent of U.S. adults who are classified as non-disabled (Kaye 2000). While no comparable statistics catalog the use of wireless and other mobile information-related technologies by people with disabilities, we can assume that the use is proportionate.

A user survey of the Consumer Advisory Network of the Wireless RERC¹ indicated that 86 percent of those surveyed would be interested in trying out a prototype of a new wireless device, indicating that interest in wireless technology is just as strong in the disability community as it is in the general population. Additionally, the development of wireless technologies is influenced by a variety of factors including economic variables, key stakeholders such as policymakers, regulators, manufacturers, other industry interests, and end-users.

4.0 U.S. Federal Policy and Regulatory Arena

4.1 Policy Arena

4.1.1 National Telecommunications and Information Administration (NTIA)

The NTIA, part of the U.S. Department of Commerce, is the Executive Branch agency principally responsible for domestic and international telecommunications and information *policy* issues. It manages Federal use of the spectrum; administers infrastructure grants to support the development of an accessible national information infrastructure; manages public telecommunications facilities grants designed to maintain and extend the public broadcasting infrastructure; and performs cutting-edge telecommunications research and engineering.

4.1.2 National Council on Disability (NCD)

The National Council on Disability (NCD) is an independent Federal agency responsible for making recommendations to the Congress and the President on issues affecting Americans with disabilities. As a policy council, it coordinates no services or programs, but its recommendations can have tremendous impacts on Federal disability policy. Most notably, NCD was responsible for the landmark Americans with Disabilities Act.

4.1.3 Access Board

The Access Board is an independent Federal agency devoted to accessibility for people with disabilities, and was originally created as the Architectural and Transportation Barriers Compliance Board in order to implement the Architectural Barriers Act, which required government-funded facilities to be accessible. The Access Board develops and maintains accessibility guidelines for the built environment, transit vehicles, telecommunications equipment, and information technology. These guidelines serve as the baseline for the accessibility standards that are enforced.

¹ [www.wirelessrerc.org]: see Research Project "R1: Assessment of User Needs".

4.2 Regulatory Arena

4.2.1 Federal Communications Commission (FCC)

The FCC is an independent government agency established by Congress to regulate interstate and international communications by radio, television, wire, satellite, and cable. The Commission derives its authority primarily from one authorizing statute: the Communications Act of 1934 (as amended by The Telecommunications Act of 1996). It is responsible for ensuring competitive telecommunications markets are available to all consumers in the United States. Historically, this has meant regulation of the monopolistically-controlled telecommunications infrastructure and interstate interconnection agreements among local and long-distance telephone service providers, tasks with which the FCC has shared its jurisdiction with state-level regulatory commissions. Since the telecommunications industry deregulated, the FCC has focused on removing regulatory burdens and barriers to competition and facilitating the deployment of advanced telecommunications services, including broadband and wireless services. It also focuses on improving the efficiency of spectrum use in order to encourage innovative communications technologies. The FCC's current strategic goals include promoting broadband, increasing competition, increasing spectrum efficiency, promoting competition and diversity in media, and protecting national communications and information infrastructure.

4.2.2 Food and Drug Administration (FDA)

The Food and Drug Administration (FDA) is an independent government agency responsible for ensuring the safety of drugs, biological products, medical devices, the U.S. food supply, and other substances which humans rely on for their health and well-being. As a result, the FDA is responsible for regulatory safeguards on some technologies for people with disabilities. The FDA also ensures that all products emitting radiation are safe for human use, and its standards can affect the deployment of wireless technologies, especially assistive wireless technologies. The FDA facilitates development of new devices by publishing standards for design that meet safety requirements.

4.3 Other Key Disability Policy and Regulatory Agencies

4.3.1 Office of Special Education and Rehabilitative Services (OSERS)

OSERS part of the U.S. Department of Education, supports programs that help educate children and youth with disabilities, provides for rehabilitation of youth and adults with disabilities and supports research to improve the lives of people with disabilities.² Through its three program offices, OSERS coordinates a large part of the Federal government's disability policy. It supervises the Office of Special Education Programs, the Rehabilitative Services Administration, and the National Institute on Disability and Rehabilitation Research. It is responsible for implementing the Individuals with Disabilities Education Act, the Rehabilitation Act, the Assistive Technology Act, and other major pieces of legislation.

4.3.2 National Institute on Disability and Rehabilitation Research (NIDRR)

NIDRR provides leadership for a comprehensive research program for the rehabilitation of individuals with disabilities and focuses on research in areas such as employment, health and function, technology access, independent living and community integration, and other disability issues. NIDRR conducts its work through a network of projects and centers of excellence. Over two dozen Rehabilitation Research and Training Centers (RRTC) and Rehabilitation Engineering Research Centers (RERCs) evaluate and disseminate innovative technology solutions for people with disabilities and provide training and education assistance. In addition to the body of research generated by the RERCs, NIDRR sponsors grants for assistive technology development. NIDRR's emphasis on technology is part of its mission to set the course for the future of disability research.

² OSERS Mission statement. Online at [<http://www.ed.gov/about/offices/list/osers/mission.html>].

4.3.3 General Services Administration (GSA)

The General Services Administration (GSA) provides assistive technology solutions through its Center for Information Technology Accommodation (CITA). It coordinates Federal government accessibility efforts, especially with respect to information technology. A Usability Solutions Group works towards making electronic services more usable and accessible for all. This Group works with Federal agencies to develop guidelines and standards for e-government efforts. While the GSA's efforts are administrative in nature, and have little direct impact on national policymaking, the agency's actions impact the accessibility of Federal government services and information.

4.4 Other Key Stakeholders

A number of other stakeholders are involved in the policy development and regulatory process. A representative catalogue of not-for-profit and industry organizations with some degree of interest in telecommunications or other communications and assistive type technologies is beyond the scope of this paper but range from membership nonprofit organizations, to industry related organizations to an array of federally funded groups.

5.0 FCC, Wireless Technologies and Disability Issues

The FCC has developed a number of initiatives to increase access and reduce barriers to the use of wireless technologies for people with disabilities. Specific disability issues are coordinated by the Disability Rights Office (DRO)³ in the FCC's Consumer and Governmental Affairs Bureau (CGAB). General telecommunications policies that affect people with disabilities may also be handled by other parts of the agency, such as the Wireless Telecommunications Bureau. While the FCC has some responsibility for ensuring people with disabilities have access to telecommunications services, most of its disability-related initiatives are regulatory or administrative actions required by legislation such as the Americans with Disabilities Act (ADA) and Section 255 of the Communications Act.

Although disability issues fall within the Commission's mandate to act "in the public interest," the Commission has not used that authority to create bold initiatives for people with disabilities. This is due to a combination of legal constraints on the Commission's authority and the large scope of the Commission's jurisdiction. The FCC is first and foremost a regulatory authority over the communications sector. The Commission's CGAB in an effort to decrease barriers for people with disabilities, has initiated forums on several disability related issues including emergency communications and homeland security, Voice over Internet Protocol technology (VoIP), and the role of wireless technologies in bridging the communications gap for people with physical and developmental disabilities. There is however, no coordinated framework for wireless technologies and people with disabilities.

5.1 Key Issues

The FCC has in recent years identified a series of key issues that impact wireless technologies and people with disabilities. These include (in no particular order): *Telecommunications Relay Services (TRS)*, *Emergency Alert System (EAS)*, *Product Accessibility*, *IP-Enabled Services*, *Wireless Broadband/Universal Service*.

5.1.1 Telecommunications Relay Services (TRS)

The FCC is responsible for overseeing Telecommunications Relay Services (TRS) that allow people with hearing and/or speech disabilities to interact with standard voice users on the public telephone network. While many aspects of TRS have been codified by law, the FCC has been investigating how new technologies can expand relay services to meet changing needs and demands. Specifically, the shift towards Internet Protocol (IP)-Enabled services presents both challenges and opportunities for people with disabilities relying on the public telephone network for communication. The convergence of voice, video, and data services raises questions about the future of relay services and how citizens

³ [<http://www.fcc.gov/cgb/dro/>].

can communicate intermodally. Of note, the FCC initiated rulemaking proceedings (FCC 04-137) in June addressing the future of IP relay and video relay services, potentially drivers for broadband services.⁴

5.1.2 Product Accessibility

Section 255 of the Telecommunications Act requires that manufacturers and service providers make their equipment and services accessible to people with disabilities when readily achievable. The FCC is responsible for enforcing this law and it works with people with disabilities to resolve their complaints with companies. As broadband and wireless data expand telecommunications services, conflicts in the U.S. regulatory regime (between “information” vs. “telecommunications” services) create uneven accessibility standards. This can result in severe problems for people with disabilities trying to adapt to the information age. The FCC receives both formal and informal complaints from consumers about the inaccessibility of telecommunications products and services. In February 2000, the Commission’s rules to implement Section 255 went into effect, and it carries out enforcement actions for violation of those regulations.⁵

5.1.3 Emergency Alert System (EAS)

The EAS is composed of broadcast networks; cable networks and program suppliers; AM, FM, Low Power FM (LPFM) and TV broadcast stations; Class A television (CA) stations; Low Power TV (LPTV) stations; cable systems; wireless cable systems which may consist of Multipoint Distribution Service (MDS), Multichannel Multipoint Distribution Service (MMDS), or Instructional Television Fixed Service (ITFS); and other entities and industries operating on an organized basis during emergencies at the National, State and local levels.

The FCC recently issued a Notice of Proposed Rulemaking (NPRM) (FCC 04-189) on the Emergency Alert System (EAS), seeking comment on how EAS can be improved to be a more effective mechanism for warning the American public of an emergency. The NPRM also addresses the need for comments on the topic of providing emergency information and alerts for individuals with disabilities. The NPRM stems in part from recommendations of the Media Security and Reliability Council (an FCC Advisory Committee), and the Partnership for Public Warning. The Commission seeks participation of state and local emergency planning organizations, the disability community, as well as the communications industries involved in alerts and warnings.

The FCC’s commitment to making sure that equal access to public warning for persons with disabilities is evident not only through the proposed EAS changes but also through other requirements. The commission requires, for instance, that all distributors of video programming that provide emergency information must make it available in a format accessible to persons with hearing and vision limitation.⁶

5.1.4 IP-Enabled Services

The Internet is revolutionizing the telecommunications sector, and the convergence of voice, video, and data services offers great opportunities for people with disabilities. Because Internet Protocol is a uniform standard, establishing accessible standards for IP-based services can have a tremendous impact on the provision of services worldwide. At the same time, the interaction between IP-based networks and traditional networks poses challenges for accessibility and public safety. The FCC is examining services such as Voice over Internet Protocol (VoIP) carefully to ensure that all individuals can take advantage of advanced capabilities, although the FCC does not currently have regulatory authority over VoIP. The FCC proposed rules (FCC 04-28) concerning IP-enabled services in

⁴ [FNPRM: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-137A1.pdf]. More information about the Commission’s TRS efforts is available at [<http://www.fcc.gov/cgb/dro/trs.html>].

⁵ [http://www.fcc.gov/Bureaus/Common_Carrier/Orders/1999/fcc99181.pdf] More information about the FCC’s accessibility rules can be found at [<http://www.fcc.gov/cgb/dro/section255.html>].

⁶ See for instance 47 C.F.R. 73.1250, 79.1, 79.2, 79.3, as well as DA 03-2361.

February 2004, seeking comment on appropriate regulatory regimes for the new services.⁷ In May, the Commission held a summit to discuss how VoIP would affect people with disabilities.⁸

5.1.5 Wireless Broadband/Universal Service

Mobile wireless technologies can offer specialized information services in multiple formats for people with disabilities, enabling them to be integrated into the new economy. However, coverage is not yet comprehensive and inexpensive enough to guarantee accessibility for all. The FCC is focusing on making broadband services available to every American, and it is increasingly turning to wireless networks to achieve that goal. By reallocating spectrum and setting standards for cognitive “smart” radio systems, the FCC is focused on expanding wireless broadband in rural and underserved communities where many people with disabilities live. The FCC has initiated a number of proceedings related to wireless broadband. In May 2004 the Commission formed a Wireless Broadband Access Task Force charged with identifying ways to facilitate further deployment. In addition, the FCC hosted a forum on wireless broadband and proposed new spectrum allocation rules (FCC 04-135; FCC 04-113; FCC 04-100) that will foster growth in wireless services. The Task Force is currently investigating the issue and is seeking public comment.⁹

6.0 Research and Development Policy and the WirelessRERC

While several RERCs have some research mission associated with telecommunications, communication, or information technology¹⁰, the Rehabilitation Engineering Research Center on Mobile Wireless Technologies for Persons with Disabilities (Wireless RERC) has the mission of “promoting universal access to mobile wireless technologies and exploring their innovative applications in addressing the needs of people with disabilities.” The RERC has two primary aims: 1) ensure equitable access to mobile wireless products and services by people with disabilities of all ages and abilities; and 2) investigate promising applications of mobile wireless technologies in support of employment, independent living and community integration of people with disabilities. The Wireless RERC fulfills its mission through interrelated research, development, training, and dissemination activities which convey results and strategies to assist stakeholders. The activities are guided and evaluated by constituent advisory groups made up of consumers, rehabilitation professionals, wireless industry representatives and an Advisory Board that is representative of all the stakeholders including government.

In particular, the results of the policy research conducted by the Wireless RERC have helped to establish a body of credible, objective evidence that can be, and has been noted in influencing policy directions at the state and Federal levels (GCATT 2003). The following section summarizes the results of one of the policy related research initiatives of the Wireless RERC, a baseline policy assessment to examine the role that advances in wireless communications and related technologies play in providing the disabled community increased opportunities for daily interactions (GCATT 2003).

7.0 Baseline U.S. Wireless Policy Assessment

The examination of the key issues at the intersection of disabilities and wireless technologies has previously not been undertaken in a comprehensive manner by industry, government or the disability community, and such a baseline review provides pertinent information on the disability community and legislative and regulatory policies that meet at the crossroads of mobile wireless technology and e-accessibility. The policy study identified key issues facing disabled users of wireless technologies, including barriers to access and use, as well as opportunities for reducing those barriers.

⁷ [http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-28A1.pdf].

⁸ Information is available at [<http://www.fcc.gov/voip/>].

⁹ Information is available at [<http://www.fcc.gov/wbatf/>].

¹⁰ See (GCATT 2003), appendix C for list.

7.1 Key issues

An initial set of disability, wireless and communication technologies related policy issues was identified through research of not-for-profit agencies, government resources, and policy journals, and consultation with key stakeholders. These policy issues included:

- Affordability of assistive technology (AT) products
- Definition of telecommunication/information services (in a regulatory context)
- Disability divide/access/awareness
- E-911 (wireless emergency) call accuracy
- Inter-agency coordination
- New Freedom Initiative¹¹
- Re-prioritizing the nation's disability and rehabilitation research agenda
- Spectrum allocation/availability
- Universal design and product development
- Wireless device (in)compatibility (e.g. interference/audio feedback resulting from hearing aid and digital mobile phone use)

7.2 Barriers to Increase Use of Wireless Technologies

In analyzing the intersection of disability policy and wireless technologies three underlying barriers to access/use appear to be relevant to this nascent environment of disability and technology collaboration: 1) *awareness and proficiency factors*, 2) *economic barriers*, and 3) *incompatible technologies*.

A primary concern associated with the deployment and use of wireless and other telecommunications technologies in general is a *lack of awareness* that a given technology exists, or that it could be of benefit (GCATT 2000). New wireless technologies regularly appear, and are rarely developed with consideration to specialized needs and requirements of persons with disabilities. Potential users of telecommunications technologies may be significantly uninformed as to their availability or utility. Stakeholders that could inform the public on assistive technologies, government, industry and not-for-profit organizations, frequently lack the appropriate resources, incentive, organization, or in some cases, simply the awareness that such efforts are necessary (GCATT 2003).

Economic issues come to play for instance as wireless devices tend to be prohibitively expensive to a population already more likely to be unemployed or receive government assistance. The potential value of such technologies has not been fully realized, and these devices are often not covered in the U.S. under private or employer-based health benefits, or the two primary public health insurance programs for persons with disabilities, Medicare and Medicaid.

Incompatibilities across products of different design, manufacturer, or purpose can create barriers to the efficient and effective operation of wireless devices. Some telecommunications and medical devices operate in overlapping or adjacent frequency spectrum ranges, raising the risk for interference and malfunction (FCC 2002). Designers and manufacturers of incompatible devices are not effectively collaborating (often due to different goals) to ensure that such vital devices are reliable and efficient in all circumstances and situations.

7.3 Opportunities to Improve Access/Use of Wireless Technologies

While a variety of policy options exist to reduce barriers to wireless technology access, the Wireless RERC focused on three principle areas of opportunity to increase access/use of technologies: (1) *Policy/regulatory approaches*; (2) *Market mechanisms*, and (3) *outreach/awareness* prospects.

¹¹ The New Freedom Initiative announced on February 1, 2001, by President George W. Bush is a comprehensive strategy for the full integration of people with disabilities into all aspects of American life. [<http://www.whitehouse.gov/infocus/newfreedom/>]

Policy emphasizing public sector interventions on behalf of wireless telecommunications technologies can affect the success or failure of a product. Ideally policy initiatives, regulations, executive orders and other directives can encourage the development of new devices and services as well as reinforce the importance of technologies being accessible and useable by all people. Assistive wireless telecommunications technologies have long been thought of as very specific products designed for a relatively small fraction of the population – specifically, those persons who are disabled. However, as noted above, millions of U.S. residents may have some degree of disability under definitions supported by the Census Bureau. Further, the aging of the American population with the concurrent increase in age related infirmities will increase the total number of people in the United States with disabilities, or other functional limitations to daily living activities. Examples of recent public sector activities with the potential to increase the opportunity for increased wireless technology use among people with disabilities include *New Freedom Initiative*, announced in 2001 by President Bush; and the Hearing Aid Compatibility Act of 1988 (HAC Act) was modified in July 2003, by the FCC to require that wireless phone manufacturers and wireless phone service providers make models of accessible digital wireless phones available to people who use hearing aids.

Markets come into play in terms of new possibilities for users as manufactures becomes aware of new markets. A deficiency in quality research that documents the market potential of assistive wireless technologies and mobile devices has made it difficult to convince designers and manufacturers on the economic viability of such products. Not only are there potentially more disabled consumers than previously thought, but manufacturers must also realize that assistive technologies can also benefit the non-disabled public at large. Some recent activities that can help the market for assistive wireless technologies include: Voluntary standards – the InterNational Committee for Information Technology Standards (Incits)/V2 Technical Committee, a voluntary group with representation from the IT industry, device manufacturers, academia and consumer groups. V2 is currently developing standards for a Universal Remote Console (URC) framework of components that combine to enable remote user Interfaces and remote control of network accessible electronic devices and services.”¹² Also, the National Organization on Disability (NOD), in cooperation with the Harris poll, conducted the 2004 *NOD/Harris Survey of Americans with Disabilities*, which provided information on the participation of Americans with and without disabilities in ten key areas of life (NOD 2004). For example, survey respondents were questioned regarding their use of assistive technologies. Findings of the survey indicated that Americans with disabilities rely heavily on assistive technology, with one third reporting that they would lose their independence without it.

Again, the inefficient dissemination of information regarding available assistive and wireless telecommunications technologies, products and methodologies continues to be a barrier to the effective delivery, usage and understanding of such aides. These *outreach and awareness* efforts are vital to successful utilization. The Wireless RERC has identified four key venues through which information can be effectively disseminated to unknowledgeable, potential beneficiaries of assistive telecommunications technologies, products and methodologies including: industry or not-for-profit organizations, conferences, government entities and user forums.

8.0 Conclusions

Wireless information and communications technologies offer individuals the means to lead a more independent, knowledgeable and convenient lifestyle, unfettered by physical locale, making information readily available regardless of location or time. Increased exchange of information and findings can help leverage the resources and capabilities of research and other organizations to facilitate synergistic research, business and academic collaborations. Marketing the capabilities and benefits of assistive wireless technologies has always presented problems for both producers and users alike. With a larger potential market base, assistive telecommunications technologies would enjoy the benefits associated with a competitive marketplace – thereby offering improved technologies at affordable prices. Increased investment in product research and development may help address problems of technology incompatibility. Larger markets for these technologies provide incentives to development of new products.

The challenges faced in the European Union and the United States similarly impact the ability of *all* countries to stimulate innovations, develop meaningful universal design approaches, take advantage

¹² [http://www.incits.org/tc_home/v2.htm]

of assistive technologies, develop opportunities in unlicensed spectrum¹³, create policy planning across borders and countries, and train a new generation of design engineers, policy makers and end users. Future opportunities to work together will serve as a bridge for users and policymakers to discuss with manufacturers the achievement of common goals of accessibility to enhance participation of persons with disabilities.

Discussions exploring international policy issues provide the opportunity to develop fresh lenses of analysis combining the different disciplinary perspectives of the participants. Identification of the key policy issues such as those presented above may vary by locale and can be expected to be culturally and socially dependent. Still, examining broad policy approaches designed in different settings can yield innovative synergistic initiatives to help achieve fully accessible living for all. Working groups can investigate specific policy and regulatory interventions that can for instance explore use of market mechanisms, voluntary standards groups to deliver new products, and increase outreach/awareness efforts using Internet and other ICT-centric technologies. Collaboration can then harvest the best ideas, solutions and innovations from the respective international partners (WirelessRERC 2004).

Countries working in independent silos can not solve far reaching issues of inclusion of all our citizens. Conversely, international collaborations will reduce redundancy, increase efficiency, identify mutual challenges, and lead to enriched relationships among the engineering, research, development and disability communities on both sides of the Atlantic. Finally, as technology and engineering innovations do not occur in a vacuum, increased emphasis needs to be placed on research efforts exploring the opportunities as well as barriers that domestic and international policy offers to the development and deployment of new wireless technologies and services.

A policy agenda placing an emphasis on collaborations, domestically and internationally, and supporting initiatives to develop new applications of telecommunications technologies can offer new opportunities for people with disabilities, and reduce barriers existing in day-to-day living. The critical contribution of wireless technologies toward improving the quality of life not only for persons with disabilities, but also for all members of society underscores the importance of transatlantic wireless communications policy and research initiatives. In conclusion, sharing, collaborating and creative policymaking will further international relations and benefit not only citizens of developed nations but also improve the social welfare of citizens worldwide.

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¹³ International bodies such as the International Telecommunications Union often use the term short range devices because the term "unlicensed" is often confusing in an international context.

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Presenter Bio

Paul M.A. Baker, Ph.D., AICP, is the Associate Director of Policy Research with GCATT/Georgia Institute of Technology, and a Project Director for both the Wireless and Workplace Accommodations Rehabilitation Engineering Research Centers (RERC). Baker is currently researching the role of policy in advancing technology and universal accessibility goals for persons with disabilities; and institutional issues involved in public sector information policy development and state and local government use of information and communication technologies.

