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June 15, 2000

MEMORANDUM FOR MARY BETH CAHILL

FROM: Jonathan Young, OPL Associate Director for Disability Outreach

CC: Maria Echaveste, Assistant to the President and
Deputy Chief of Staff

Gene Sperling, Assistant to the President and
Director, National Economic Council

Tom Kalil, Special Assistant to the President for Economic Policy

RE: President Clinton's Digital Divide Disability Trip

INTRODUCTION

On April 18, in Chicago, President Clinton made a public announcement: "in a couple of months we will have a part of this digital divide tour devoted solely to the potential that web accessibility offers to disabled Americans to participate more fully in the educational and economic life of the United States." Information Technology offers unprecedented potential to level the playing field for people with disabilities and offer greater participation in the education, economic, and social fabric of our nation. It also improves the likelihood of financial independence and economic self-sufficiency for people with disabilities.

The purpose of this memo is to: 1) provide background information about the digital divide for people with disabilities; 2) suggest themes for framing the President's trip; 3) discuss possible destinations and deliverables for the trip; and, 4) suggest a strategy meeting to discuss next steps.

I. BACKGROUND

A. EMPLOYMENT OF ADULTS WITH DISABILITIES

Administration Disability Policy currently centers on the need to increase employment opportunities for people with disabilities. Despite low overall unemployment rates, there is a staggering rate of unemployment for working-age people with "severe" disabilities -- in the range of 73.9% (according to data reported by the Census Bureau, based on the 1994-95 Survey of Income and Program Participation). The Administration has focused on how a *coordinated* and *holistic* approach is necessary to successfully increase employment rates. The availability of a

job, for example, may be practically meaningless if an individual does not have a place to live, or transportation to get to a job, or health care, or adequate education and training, or assistive technology, etc.

The framework for the President's New Markets Initiative dovetails with the employment challenges for people with disabilities. In fact, the language the President used to explain the need for the work incentives legislation closely paralleled the way he discussed New Markets. "Even as we celebrate more than 18 million new jobs and a nationwide unemployment rate of 4.2 percent, the lowest in a generation..., 75 percent of Americans with disabilities remain unemployed," the President said on June 4, 1999. "This is not just a missed opportunity for Americans with disabilities. It's a missed opportunity for America. This is an era now of labor shortages, where companies go begging for employees they need to stay competitive in the global economy. And we simply cannot afford to ignore the potential of millions of potential workers simply because they have a disability."

The difficulty with making a direct link between the New Markets Initiative and people with disabilities was that they (fortunately) do not constitute geographically-concentrated markets. People with disabilities instead are a sort of "cyber-community" spread throughout the nation, who cut across every race, ethnicity, gender, sexual orientation, and religion. The New Markets concept -- of being an untapped resource that could not only empower individuals but also help the economy -- was directly applicable to people with disabilities, but not concretely demonstrable. The President's Digital Divide initiative, however, makes a direct integration of people with disabilities possible.

B. OPL ACTIVITIES REGARDING DIGITAL DIVIDE FOR PEOPLE WITH DISABILITIES

In January, following the President's State of the Union Address, OPL began facilitating conversations with disability advocates about the Digital Divide for people with disabilities, and solicited examples of efforts already taking place to bridge the divide. Community representatives joined an OPL-wide Digital Divide briefing on February 22, and noted the specific needs of people with disabilities. OPL subsequently began hosting weekly conference calls with individuals interested in digital opportunities for people with disabilities, to identify the nature of the challenges and generate suggestions for how they could be addressed.

On March 10, as part of its outreach efforts to multiple constituencies regarding the Digital Divide, OPL hosted a briefing for the disability community. The discussion underscored the real gaps in access to computers and the internet for people with disabilities, and highlighted the possibilities of accessible information technology. In particular, technology experts noted the importance of "usability." They explained that when we speak of "universal accessibility" we tend to mean universal *availability* -- carrying an assumption that the products made available could also be used by all purchasers. But the availability of a given type of technology does not mean it is necessarily *usable* (more discussion of this concept below).

In addition to weekly conference calls since the March 10 meeting, OPL has met individually with a variety of groups -- corporate as well as non-profit -- to discuss possibilities for the

President's Digital Divide Tour. Although there was some disappointment that disability issues did not get more fully integrated into the original tour, the disability community is excited about the President's announcement of an additional disability-related trip.

On Thursday, June 1, OPL convened a meeting of representatives from federal agencies to review possible federal initiatives to bridge the Digital Divide for people with disabilities.

C. OVERVIEW OF DIGITAL DIVIDE FOR PEOPLE WITH DISABILITIES

Although the disability community has recognized the benefits and importance of technology for many years, the Department of Commerce's high-profile consideration of the Digital Divide, has devoted little attention to the importance of information technology for people with disabilities.

A recent DoED-funded report, "Computer and Internet Use Among People with Disabilities," helps fill the disability void in *Falling Through the Net*. The study "demonstrates that gaps in computer and Internet use based on disability status are *just as large as those based on race and ethnicity* [emphasis added]." Its principle findings, based on Current Population Survey data include:

- 32.6% of people aged 15-64 with a work disability have a computer in their home (compared with 55.6% in same age range of the general population);
- 15.8% of people aged 15-64 with a work disability have Internet access at home (compared with 33.9% in same age range of the general population);
- 15.1% of people aged 15-64 with a work disability use the Internet either at home or elsewhere (compared with 42.3% in same age range of the general population);
- Disparities in computer ownership and Internet access among seniors with work disabilities parallel the 15-64 population.

The report also explains that, beyond the general gaps between people with disabilities and the general population, the disability community is similarly affected by general socio-economic factors:

- Disparities regarding computers and the Internet according to level of **education** among people with disabilities parallel the general population;
- Disparities regarding computers and the Internet according to level of **income** among people with disabilities parallel the general population.

The study also indicates similar usage patterns of the Internet for people with disabilities and the general population:

- Reasons for Internet use among people with disabilities are similar to the general population (e-mail and searching for information the two most common reasons);
- 17.0% of people with disabilities use the Internet to shop, pay bills, or for other commercial activity.

D. CURRENT PROJECTS AND INITIATIVES FOR BRIDGING THE DISABILITY DIGITAL DIVIDE

Examples of projects and programs across the country currently attempting to bridge the Digital Divide for people with disabilities include the following:

- **ABLE-NET Internet Service** specializes in offering affordable, accessible Internet Access for People with Disabilities in 31 States and Canada;
- The **CPB/WGBH National Center for Accessible Media (NCAM)** is collaborating with the Massachusetts Institute of Technology's Center for Advanced Educational Services to make an on-line interactive physics course accessible to students with disabilities;
- The **Web Accessibility Initiative** of the World Wide Web Consortium is developing standards for accessible web design;
- **Bancroft e-Solutions** seeks to identify job openings conducive to telecommuting and match with individuals working out of their home over the Internet.
- **CAST** is a leader in the development of the Universal Design for Learning educational paradigm, working to make the general educational curriculum accessible and educationally relevant for everyone;
- **DPI** (Disabled Programmers, Inc.) is a nonprofit agency working in partnership with Silicon Valley businesses and the community to prepare people with disabilities for competitive employment. Through adaptive computer access technology and career transition services, DPI creates opportunities for significant advances in universal access, social integration, and employment for people with disabilities;
- **Edapta**, a for-profit company, is developing third-party Internet solutions that would enable customization of Internet information according to one's visual and input preferences.
- **e-Transcribe**, started by Goodwill Industries of Hawaii, trains individuals with disabilities to become medical transcriptionists and provide them contract work to perform from their homes using an array of technology, including computers with voice activated software, the Internet, and Dictaphone equipment.
- **High School High Tech**, a program of the President's Committee on Employment of People with Disabilities, seeks to provide high school students with internships with high-tech companies and agencies, including Goddard Space Flight Center in the Washington, DC area. The program currently has projects in 10 states.
- The **Merze Tate Center for Technology and Educational Reform** at Western Michigan University is leading a public-private initiative to develop a national on-line support center to help facilitate the training of people with disabilities for employment in the fast growing computer industry.
- The **Motion Picture Access Project**, with initial funding from NIDRR, has developed digital technology that allows people who are deaf or blind to access closed-captioning or video descriptions in movie theaters.
- **Virtual Buddies** takes donated computers, and donated Internet accounts, and places them in the homes of low-income people with different disabilities. The program gives individuals largely isolated in their homes a way to communicate with others and enhance their education through distance learning.

II. THEMATIC FRAMEWORK

A. SUGGESTED THEMES FOR POTUS DISABILITY TRIP

The President's Disability Digital Divide trip will meet with the greatest success if it is situated in the broader context of employment of *people* with disabilities, not merely on the specific *technologies* that enable many people with disabilities to participate in the digital economy. Moreover, even the issues of technology access can be presented in the broader context of *usability* for all Americans. This framework will help ensure greater collaboration from the business community, which is in many respects fearful of a regulatory approach, and has even mobilized efforts against internet accessibility (for example, a February 9, 2000 congressional hearing on the subject). Two main themes are suggested for the framework for the trip:

Maintaining Economic Growth. The United States has reached its lowest unemployment in decades by dipping under 3.9%. While this is a great achievement, it also presents challenges for meeting labor shortages. Congress has issued visas for high technology workers because so many positions have gone unfulfilled. With unemployment among people with "severe" disabilities exceeding 70%, not to mention underemployment of people with disabilities generally, people with disabilities represent an under-utilized reserve of American labor. Finding ways to encourage companies to hire and to mentor people with disabilities, and to work with the non-profit disability community to build awareness of job opportunities, is essential. One of the best ways of reducing the digital divide for people with disabilities is to increase employment, since income-level, as with the general population, is a strong determinant of access.

Availability & Usability. "Access" is generally discussed in terms of the availability of computers and the internet. Equally important is "usability," which applies to everyone. Individuals of all ages, backgrounds, and abilities have a variety of ways of accessing electronic information. Language, visual, motion, and hearing impairments have all been barriers that have presented substantial challenges. Some of the technologies originally designed to make electronic information usable to people with disabilities have wide applicability in the general population. The tools that have helped people with disabilities will make it easier for all Americans; developing more of them is the challenge and opportunity. Examples of "usability" include:

- Language translation software for documents;
- Speech Recognition software that eliminates the need to use a keyboard;
- "Audiotext" where the content of a document is verbally articulated for user to listen to;
- "Sticky keys" that make it easier for users who have difficulty using regular keyboards input information.

B. CONCEPTUAL POSSIBILITIES FOR DELIVERABLES

Ideally, a powerful package of announcements could focus on private-sector hiring commitments in collaborative partnerships with government and non-profit entities. Such an announcement would include:

- commitments to provide all necessary reasonable accommodations, including assistive technologies;
- commitments to accessible web design;
- mentoring/internship programs;
- design stage R&D for accessible products and software;
- new efforts at data collection and reporting regarding people with disabilities and information technology;
- education and training; and,
- efforts to provide hardware and software to people with disabilities.

This announcement could also be linked with implementation of the Ticket to Work and Work Incentives Improvement Act. Business and government entities could emphasize they want to make the legislation a reality by providing employment opportunities, and disability organizations could help by identifying people with disabilities who are able and ready to work.

III. DESTINATIONS AND DELIVERABLES

A. POSSIBLE DESTINATIONS FOR A TRIP

Willow CyberCenter Networks (Miami, FL). Willow is a web-based Network for telecommuting customer service operations, which is reaching out to people with disabilities to become an integrated component of its pool of CyberAgents representing people of all ages and backgrounds.

Web Accessibility Initiative, MIT, and WGBH (Boston, MA). WAI is working to help make websites more accessible; MIT is developing innovative internet-based, cross-disability instruction; and WGBH is creating captioning technologies in partnership with MIT and others.

Georgia Tools for Life and Georgia High School High Tech (Atlanta, GA). Georgia Tools for Life sponsors ReBoot, a computer recycling program for people with disabilities. Georgia's High School High Tech program is one of the most extensive in the country, providing high tech internship opportunities for disabled high school students.

Western Michigan University in (Kalamazoo, MI). Western Michigan University in cooperation with IBM, Smartforce.com and Monster.com along with the Association of Rehabilitation Programs in Computer Technology (ARPCT) are about to launch a national on-line support center for preparing people with disabilities for IT careers.

* More detailed information on each of these possibilities is available as requested.

B. POSSIBLE DELIVERABLES

OPL has been discussing a variety of deliverables with for-profit and not-for-profit entities. Most of the potential deliverables are still in planning stage, in part because people do not have a solid grasp of when the President's trip will take place; some lack certainty that the trip will in fact take place. Likely deliverables, however, include the following entities.

- **Procurement Central, Inc.** wants to announce a major commitment to hire thousands of people with disabilities for its web-based procurement data management centers (the CEO is a person with a disability);
- **Willow CyberCenter Networks** is exploring possible ways to build on their commitment to hiring people with disabilities as CyberAgents;
- Members of the **Able to Work Consortium**, a network of corporate business leaders, are exploring the possibility of hiring commitments;
- **NCR Corporation** submitted a proposal for the initial trip and is now putting together a new proposal (OPL met with NCR representatives on Friday, May 26);
- **The National Rehabilitation Hospital** is developing an initiative to provide low-end computers or web devices to patients with disabilities leaving the hospital and provide training in information technology;
- The President's Committee on Employment of People with Disabilities is seeking to expand its **High School High Tech** program, perhaps announcing new projects in additional states;
- **HalfthePlanet.com**, an internet portal for people with disabilities, is exploring an initiative to provide scholarships supporting design-stage engineering projects;
- **Edapta** has proposed using SSA's Access Seniors website as a test site for its Internet transformations;

* More detailed information on each of these possibilities is available as requested.

IV. Recommended Strategy Session

The following individuals would be ideal for a strategic planning meeting, tentatively scheduled for Thursday, June 22, at 11:00 AM.

✓ ***Judy Brewer:** Director of the World Wide Web Consortium's Web Accessibility Initiative, she is a leading expert in the mechanics of designing and developing standards for accessible websites.

✓ **Steve Jacobs:** President of IDEAL, a non-profit at NCR Corp. dedicated to promoting the hiring of people with disabilities, he is an expert in a variety of accessible technologies, including information kiosks.

David Bolnick: Accessibility Program Manager at Microsoft, he is the engine behind the Microsoft-inspired Able To Work consortium and the Enable educational video about computers and people with disabilities.

✓ ***Greg Vanderheiden:** Director of the Trace Research and Department Center in Madison, WI, he is a leading expert who has worked closely with corporations such as Microsoft to encourage integration of accessible technologies.

X **Cynthia Waddell:** ADA Coordinator, City of San Jose, she is a well known author and speaker on the subject of the Internet and the fair and accessible presentation of information for everyone, including presentations before the Department of Commerce.

✓ **Andrew Imparato:** President of the American Association of People with Disabilities, he is working with AOL and others about IT for people with disabilities, focusing not so much on specialized technologies but the basic income- and education-based divide.

✓ *Mike Rosen*
Ed Eckenhoff: President of the National Rehabilitation Hospital, he is developing a web-based initiative, HealthTown, which will enable patients to communicate with the hospital more efficiently, and provide discharged patients with computer or web devices.

✓ ***Alan Dinsmore:** Executive Director of the American Council of the Blind, he is an expert on the accessibility issues for individuals who are blind and visually-impaired.

✓ **Jane West:** Disability consultant working with the Association of Tech Act Projects and corporations, including Edapta.

✓ *Larry Goldberg*
*** Attended the March 10 Digital Divide meeting.**

CONCLUSION

President Clinton's Disability Digital Divide trip provides an outstanding opportunity to demonstrate the potential of technology in improving the educational, social, and economic lives of people disabilities, which can result in increased economic independence and self-sufficiency. Equally important, the New Markets framework offers a way to redefine the relationship between the disability and business communities. At a time when Clint Eastwood has publicized an adversarial relationship between people with disabilities (as represented by "parasitic attorneys") and the business community, the Digital Divide trip can help move both the disability and the business communities toward **a collaborative relationship based on win-win results.**

Atlanta Site

Three programs assisting people with disabilities of interest

- * Georgia Tools for Life A computer recycling program operated mostly by people with disabilities for distribution to people with disabilities. The machines are evaluated, repaired (if necessary), and loaded with software. The program, called, Reboot, also trains individuals in ten centers located around the state.
- * The GATE (Global Assistive Technology Explorer) Web Site Provides information on accessibility technology devices, services and other related information.
- * Shepherd Center The focus is on improving the level of health and independence of individuals who have sustained catastrophic spinal cord and brain injuries and assist their family, friends and caregivers. The concept, called telerehabilitation, will use high bandwidth video conferencing, remote monitoring, environmental control, and high speed delivery of interactive, multimedia instruction. The goals are to improve community reintegration (including return to work), reduce secondary complications and incur lower overall health care and support costs. The project has both private and public center partners.

Boston Site

Four programs to be highlighted at one site each demonstrating a facet of web accessibility.

Venue is MIT's Interactive Classroom "LiNC" that connects with remote classrooms globally.

- * World Wide Web Consortium Web Accessibility Initiative Effort focuses on ensuring support for people with disabilities in core Web technologies and develops guidelines for Web site, browsers, and authoring tools
- * WGBH National Center for Accessible Media/ MIT PIVOT Project (Physics Interactive Video On-Line Tutor) Project makes introductory physics class accessible on-line, using captions for audio and descriptions for video
- * Bell Atlantic.com Accessible e-commerce Web site demonstrating commitment to Universal Design Principles and implementation of W3C Content Accessibility Guidelines.
- * Allaire Corporation's HomeSite authoring tool Demonstrate how easy it is to convert inaccessible Web pages and how easily accessible Web pages can be built.

Kalamazoo, Michigan Site

Three programs of interest

- * Western Michigan University In cooperation with IBM, Smartforce.com, ARPCT (Association of Rehabilitation Programs in Computer Technology) and Monster.com Western Michigan University are about to launch a national on-line support center for preparing people with disabilities for IT careers. Over half a million dollars has been raised by corporate partners to bring training to homebound and other individuals with disabilities.
- * Michigan Career and Technical Institute Trains 800 individuals per year in 10 different

technology related areas through ITV at what is essentially a residential college for people with disabilities.

- * Disability Resource Center of Southwest Michigan As a center for independent living, it has been active with Senator Carl Levin for improved access to the Internet for people with disabilities.

June 7, 2000

MEMORANDUM FOR MARY BETH CAHILL

FROM: Jonathan Young, OPL Associate Director for Disability Outreach

RE: President Clinton's Digital Divide Disability Trip

INTRODUCTION

Information Technology offers unprecedented potential to level the playing field for people with disabilities and offer greater participation in the education, economic, and social fabric of our nation. And it improves the likelihood of financial independence and economic self-sufficiency for people with disabilities.

On Friday, April 14, Gene Sperling announced internally and to a couple of outside advocates that the President would add a disability trip to his Digital Divide tour. On April 18, in Chicago, President Clinton made a public announcement: "in a couple of months we will have a part of this digital divide tour devoted solely to the potential that web accessibility offers to disabled Americans to participate more fully in the educational and economic life of the United States."

The purpose of this memo is to: 1) provide background information about the digital divide for people with disabilities; 2) suggest themes for framing the President's trip; and, 3) discuss possible destinations and deliverables for the trip.

I. BACKGROUND

A1. EMPLOYMENT OF ADULTS WITH DISABILITIES

Administration Disability Policy currently centers on the need to increase employment opportunities for people with disabilities, and has recently focused on the recommendations of the Presidential Task Force on Employment of Adults with Disabilities (hereafter, Task Force), which the President created by Executive Order on March 13, 1998. The main problem the Executive Order addressed was a staggering rate of unemployment for working-age people with "severe" disabilities. It is difficult to assess a precise employment rate because there are a multitude of different federal definitions of disability, and because statistics depend upon self-reporting. Data reported by the Census Bureau, however, based on the 1994-95 Survey of Income and Program Participation (SIPP), indicate the following employment rates among people 21 to 64 years of age:

- **82.1% of people without disabilities**
- **76.9% of people with disabilities not labeled severe**
- **Only 26.1% of people with severe disabilities.**¹

The purpose of the Task Force, according to the Executive Order, "is to create a coordinated and aggressive national policy to bring adults with disabilities into gainful employment at a rate that is as close as possible to that of the general adult population." The conceptual foundation of the Task Force is that a *coordinated* and *holistic* approach is necessary to successfully increase employment rates. The availability of a job, for example, may be practically meaningless if an individual does not have a place to live, or transportation to get to a job, or health care, or adequate education and training, or assistive technology, etc.

Administration efforts to break down employment barriers for people with disabilities² include:

- Passage of the Ticket to Work and Work Incentives Improvement Act;
- Issuing an OPM *Plan* for hiring and promoting people with disabilities throughout the Federal government;
- Raising the Social Security Substantial Gainful Activity (SGA) level to \$700;
- Ending the disparities between federal hiring of people with psychiatric and physical disabilities.

The framework for the President's New Markets Initiative dovetails with the employment challenges for people with disabilities. In fact, the language the President used to explain the need for the work incentives legislation closely paralleled the way he discussed New Markets. "Even as we celebrate more than 18 million new jobs and a nationwide unemployment rate of 4.2 percent, the lowest in a generation..., 75 percent of Americans with disabilities remain unemployed," the President said on June 4. "This is not just a missed opportunity for Americans with disabilities. It's a missed opportunity for America. This is an era now of labor shortages, where companies go begging for employees they need to stay competitive in the global economy. And we simply cannot afford to ignore the potential of millions of potential workers simply because they have a disability."

The President noted that people with disabilities are central to resolving a top domestic policy challenge: "how can we continue to grow this economy and lift the standards of living of our people until we embrace everybody who has not participated in the recovery; keep the recovery going..., and not have an explosion of inflation?" The President suggested three possible answers: 1) get more unemployed people into the work force; 2) target large areas that have been left out of economic growth; and, 3) find more markets abroad. "The last big chunk of people in this country who could keep the economy going for all of us, with low inflation," President Clinton said, are "Americans with disabilities -- who want to work, who can work, and who are not in the work force. Every American citizen should have a selfish interest in the pursuit of this goal in the most aggressive possible way."

¹ "Re-Charting the Course: First Report of the Presidential Task Force on Employment of Adults with Disabilities," November 15, 1998, p. Appendix-69

² The White House Disability Accomplishments document provides a comprehensive list of achievements and current proposals with descriptions.

A2. PEOPLE WITH DISABILITIES AS A "NEW MARKET"

The difficulty with making a direct link between the New Markets Initiative and people with disabilities was that they (fortunately) do not constitute geographically-concentrated markets. People with disabilities instead are a sort of "cyber-community" spread throughout the nation, who cut across every race, ethnicity, gender, sexual orientation, and religion. The New Markets concept -- of being an untapped resource that could not only empower individuals but also help the economy -- was directly applicable to people with disabilities, but not concretely demonstrable. The President's Digital Divide initiative, however, makes a direct integration of people with disabilities possible.

B. OPL ACTIVITIES REGARDING DIGITAL DIVIDE FOR PEOPLE WITH DISABILITIES

In January, following the President's State of the Union Address, OPL began facilitating conversations with disability advocates about the Digital Divide for people with disabilities, and solicited examples of efforts already taking place to bridge the divide. Community representatives joined an OPL-wide Digital Divide briefing on February 22, and noted the specific needs of people with disabilities. OPL subsequently began hosting weekly conference calls with individuals interested in digital opportunities for people with disabilities, to identify the nature of the challenges and generate suggestions for how they could be addressed.

On March 10, as part of its outreach efforts to multiple constituencies regarding the Digital Divide, OPL hosted a briefing for the disability community. The discussion underscored the real gaps in access to computers and the internet for people with disabilities, and highlighted the possibilities of accessible information technology. In particular, technology experts noted the importance of "usability." They explained that when we speak of "universal accessibility" we tend to mean universal *availability* -- carrying an assumption that the products made available could also be used by all purchasers. But the availability of a given type of technology does not mean it is necessarily *usable* (more discussion of this concept below).

In addition to weekly conference calls since the March 10 meeting, OPL has met individually with a variety of groups -- corporate as well as non-profit -- to discuss possibilities for the President's Digital Divide Tour. Although there was some disappointment that disability issues did not get more fully integrated into the original tour, the disability community is excited about the President's announcement of an additional disability-related trip.

On Thursday, June 1, OPL is convening a meeting of representatives from federal agencies to review possible federal initiatives to bridge the Digital Divide for people with disabilities.

C. OVERVIEW OF DIGITAL DIVIDE FOR PEOPLE WITH DISABILITIES

The disability community has recognized the benefits and importance of technology for many years. Screen readers, refreshable Braille, closed-captioning, telephone relay services, manual and motorized wheelchair devices, prosthetics, and many other technologies have enhanced the abilities and opportunities of people with disabilities. The National Institute for Disability and Rehabilitation Research in the Department of Education has helped support a research agenda for assistive technology. Other federal departments and agencies have deliberated, at least internally, about technology and disability. And a number of individuals and agencies have documented the specific interests of people with disabilities in the information age -- both in terms of the opportunities and challenges.³

The Department of Commerce's high-profile consideration of the Digital Divide, however, has not generally recognized the importance of information technology for people with disabilities, resulting in criticism from the disability community. Advocates have noted:

- The Department's series of reports, *Falling Through the Net*,⁴ makes scant reference to people with disabilities;
- Government-funded Community Access Centers, replete with the most advanced technologies, have reportedly (in some instances) been created in spaces inaccessible to people using wheelchairs;
- Neglect of disability in defining the Digital Divide also characterized early development of White House action on the issue (public statements referenced race, income, education, and geography).

The President's next Digital Divide trip provides an opportunity to show renewed leadership in this area, building on the incorporation of disability into the December 1999 E-Government and E-Society directives.

A recent DoED-funded report, "Computer and Internet Use Among People with Disabilities," helps fill the disability void in *Falling Through the Net*. The study "demonstrates that gaps in computer and Internet use based on disability status are *just as large as those based on race and ethnicity* [emphasis added]." ⁵ Its principle findings, based on Current Population Survey data include:

³ See, for example: Cynthia D. Waddell, J.D., "The Growing Digital Divide In Access For People With Disabilities: Overcoming Barriers To Participation," Paper presented at "Understanding The Digital Economy: Data, Tools and Research," May 25 and 26, 1999, US Department of Commerce, Washington DC, <http://www.aasa.dshs.wa.gov/access/waddell.htm>; Susan Brummel, "People with Disabilities and the NII: Breaking Down Barriers, Building Choice," September 1994 National Information Infrastructure White Paper, <http://www.itpolicy.gsa.gov/coca/nii.htm>; *Access To Multimedia Technology By People With Sensory Disabilities*, National Council on Disability, Washington, DC, March 13, 1998, <http://www.ncd.gov/newsroom/publications/sensory.html>.

⁴ "Falling Through the Net: Defining the Digital Divide," July 8, 1999 (revised November 1999), <http://www.ntia.doc.gov/ntiahome/fttn99/contents.html>; "Falling Through the Net II: New Data on the Digital Divide," July 1998, <http://www.ntia.doc.gov/ntiahome/fttn99/contents.html>; "Falling Through the Net: A Survey of 'Have Nots' in Rural and Urban America," July 1995, <http://www.ntia.doc.gov/ntiahome/fallingthru.html>.

⁵ H. Stephen Kaye, "Computer and Internet Use Among People with Disabilities," *Disability Statistics Report (13)*, Washington, DC: U.S. Department of Education, 2000, p. 1.

- 32.6% of people aged 15-64 with a work disability have a computer in their home (compared with 55.6% in same age range of the general population);
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- 17.0% of people with disabilities use the Internet to shop, pay bills, or for other commercial activity.

D. CURRENT PROJECTS AND INITIATIVES FOR BRIDGING THE DISABILITY DIGITAL DIVIDE

Examples of projects and programs across the country currently attempting to bridge the Digital Divide for people with disabilities include the following:

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- **Bancroft e-Solutions** seeks to identify job openings conducive to telecommuting and match with individuals working out of their home over the Internet.
- **CAST** is a leader in the development of the Universal Design for Learning educational paradigm, working to make the general educational curriculum accessible and educationally relevant for everyone;
- **DPI (Disabled Programmers, Inc.)** is a nonprofit agency working in partnership with Silicon Valley businesses and the community to prepare people with disabilities for competitive employment. Through adaptive computer access technology and career

transition services, DPI creates opportunities for significant advances in universal access, social integration, and employment for people with disabilities;

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- **High School High Tech**, a program of the President's Committee on Employment of People with Disabilities, seeks to provide high school students with internships with high-tech companies and agencies, including Goddard Space Flight Center in the Washington, DC area. The program currently has projects in 10 states.
- The **Merze Tate Center for Technology and Educational Reform** at Western Michigan University is leading a public-private initiative to develop a national on-line support center to help facilitate the training of people with disabilities for employment in the fast growing computer industry.
- The **Motion Picture Access Project**, with initial funding from NIDRR, has developed digital technology that allows people who are deaf or blind to access closed-captioning or video descriptions in movie theaters.
- **Virtual Buddies** takes donated computers, and donated Internet accounts, and places them in the homes of low-income people with different disabilities. The program gives individuals largely isolated in their homes a way to communicate with others and enhance their education through distance learning.

II. THEMATIC FRAMEWORK

A. SUGGESTED THEMES FOR POTUS DISABILITY TRIP

The President's Disability Digital Divide trip will meet with the greatest success if it is situated in the broader context of employment of *people* with disabilities, not merely on the specific *technologies* that enable many people with disabilities to participate in the digital economy. Moreover, even the issues of technology access can be presented in the broader context of *usability* for all Americans. This framework will help ensure greater collaboration from the business community, which is in many respects fearful of a regulatory approach, and has even mobilized efforts against internet accessibility (for example, a February 9, 2000 congressional hearing on the subject). The following themes are suggested as a framework for the trip:

Maintaining Economic Growth. The United States has reached its lowest unemployment in decades by dipping under 3.9%. While this is a great achievement, it also presents challenges for meeting labor shortages. Congress has issued visas for high technology workers because so many positions have gone unfulfilled. With unemployment among people with "severe" disabilities exceeding 70%, not to mention underemployment of people with disabilities generally, people with disabilities represent an under-utilized reserve of American labor. Finding ways to encourage companies to hire and to mentor people with disabilities, and to work

with the non-profit disability community to build awareness of job opportunities, is essential. One of the best ways of reducing the digital divide for people with disabilities is to increase employment, since income-level, as with the general population, is a strong determinant of access.

Availability & Usability. "Access" is generally discussed in terms of the availability of computers and the internet. Equally important is "usability," which applies to everyone. Individuals of all ages, backgrounds, and abilities have a variety of ways of accessing electronic information. Language, visual, motion, and hearing impairments have all been barriers that have presented substantial challenges. Some of the technologies originally designed to make electronic information usable to people with disabilities have wide applicability in the general population. The tools that have helped people with disabilities will make it easier for all Americans; developing more of them is the challenge and opportunity. Examples of "usability" include:

- Language translation software for documents;
- Speech Recognition software that eliminates the need to use a keyboard;
- "Audiotext" where the content of a document is verbally articulated for user to listen to;
- "Sticky keys" that make it easier for users who have difficulty using regular keyboards input information.

Double-Edged Sword for People with Disabilities and America. Information technology can provide social, educational, and economic opportunities for people disabilities like never before. A blind man taking customer product orders over the telephone for GSA, for example, who utilized speech-to-text and refreshable Braille technologies to do his job, recently explained an encounter he had with one of his customers. The GSA employee, "John," was such an effective and reliable customer service representative that this one customer, "Dave," always asked to place his orders with John. Dave surprised John one day by saying he was in Washington and wanted a chance to meet. John obliged him, but this time Dave was the one who got surprised. Over the telephone, Dave had no idea that John was blind, and could not have imagined a blind person could work so deftly with computers. John showed him how he listened to his customers in one ear as the computer translated speech to text in his other ear, while the refreshable Braille display indicated what was on the screen and enabled him to double-check his work. These and similar technologies enable many people with disabilities to compete in the workplace. But information technology is a double-edged sword, for if the technologies are not fully accessible and affordable, information technology will further shut people with disabilities out of the mainstream rather than promote improved integration. The ability of people with disabilities to help address America's labor shortages and promote economic growth in the New Economy thus depend upon accessible technologies -- both in terms of availability and usability.

Customization, Innovation and Accessible Technology. Each individual may, at certain times, have variable preferences in how they want the content of an electronic document communicated to them or how they would like to input information into the computer. He or she would want these preferences to be portable and not machine dependent. For people with sensory and motion impairments, the preferences are absolutely critical, but for others it will probably be a welcome convenience. If car manufacturers are focusing intently on developing electronic dashboards that can be customized by drivers, customizing how information is presented on

computers and how information input functions can be viewed as just another stage in the development of consumer choice in products.

Meeting the Needs of the Boomer Generation. With the leading edge of the post-war baby boomers turning 55, there is a large demographic of individuals who will want to stay involved and active but whose sensory capabilities may not be as sharp as they once were. This generation also happens to be among the wealthiest in American history and have historically been able to use their buying power to enormous effect. Baby boomers who now own computers will certainly be looking for solutions (software, hardware, and services) that will enable them to remain productive and connected. The knowledge gained by developing tools to assist people with disabilities can be refined and applied to another market.

Affordability. The essence of mass marketing is developing products in demand at a price range that consumers are willing to pay. Home computers over the past five years have become, due to both changes in perception and improvements in capability, truly mass market products with increasingly high rates of household penetration in the population. Devices are being introduced in the market that now cost below a thousand dollars and some with limited capabilities can be obtained for around \$500. Irrespective of specialized technologies, people with disabilities benefit from affordability of general information technology. To offer comprehensive service to the market segment of individuals with disabilities, features that offer physical and sensory accessibility must also be affordable. Through further research and analysis they must be priced to service this demographic group while generating income and profits for the provider.

Government by Example. The Federal Government is in a position to use its influence as a purchaser of electronic software and information technology equipment to require changes in design that will increase accessibility for people with disabilities. Given the President's commitment to make the unemployment rate for people with disabilities approach the general population, federal agencies and departments can set trends for private industry by integrating people with disabilities into the federal workforce, and providing the technology tools they need. There are opportunities for exchange of information that may of be benefit to all.

Design-Stage Innovation. The realities of structural accessibility for buildings is instructive in the context of information technology. The ADA focused on new construction and renovations (requiring only that "readily achievable" modifications had to be made to existing structures) because the costs of accessibility features are minimal if incorporated at the design stage. Similarly, the costs of promoting accessibility in wireless telecommunications are minimal if pursued at the design stage. Working to develop a level of awareness of usability by corporate and government leaders in Research & Development can help avoid costly retroactive changes.

B. CONCEPTUAL POSSIBILITIES FOR DELIVERABLES

Because recognition of disability as a central component of the digital divide lags behind recognition of other factors, public and private entities may be less prepared to offer initiatives to help bridge this digital divide. Following are thematic areas where actions might be pursued:

B1. GOVERNMENT

Hiring in Information Technology. Perhaps the most effective way to help address the IT needs of people with disabilities is to integrate them throughout federal IT jobs. They could help other IT experts understand the potential of people with disabilities while bringing their own expertise to tackling high-tech challenges.

Telecommuting Customer Service. Some government customer service operations could be directed toward people with disabilities trained to telecommute from their homes over the internet. This is a rapidly developing industry, and the government could help by demonstrating leadership in hiring people with disabilities.

High-Tech Internships and Mentoring. Less than one-half of one percent of individuals with disabilities who join the SSDI/SSI roles ever get off. By providing high school and college students with internships and other IT mentoring experiences, the federal government can help interest more people in IT and provide experience important for competing in the job market.

Data Collection and New Markets. Long-term solutions for bridging the disability divide for people with disabilities will necessitate effective information gathering and analysis, and communication with the business community, which are not currently being pursued adequately. Perhaps the President could issue an Executive Order creating a Task Force within the Department of Commerce, which could help establish the appropriate structures to make disability an integrated, priority issue within the Department.

Government Reporting. Commerce's *Falling through the Net* reports have been remarkably effective in building momentum for bridging the digital divide, but have not addressed disability issues. Disability could be identified as a priority area to be integrated in future reports. By accurately identifying and framing the problems as other aspects of the divide, government reports could have a profound impact on increasing employment for people with disabilities.

Accessibility of Government-Funded Digital Divide Initiatives. Many of the general community and classroom-oriented initiatives to bridge the digital divide could help people with disabilities, provided they are accessible to people with disabilities. In other words, separate programs need not be created, but agencies could be more aggressive in ensuring that they include usability in designing their information technology programs.

Section 508. Effective implementation of Section 508 could help create incentives in the private sector to be more aggressive in designing accessible technologies. The Department of Commerce could work with industry to set up a certification organization to develop testing procedures to determine compliance with testing standards.

Continued Funding of Assistive Technology Research. The National Institute on Disability and Rehabilitation Research (NIDRR) is a leader in promoting the development of accessible technologies. One current "Young Scholar" funded by NIDRR is developing "auditory

displays," that use stereophonic (side-to-side) and tonal (up-and-down) sounds to present graphs and other visuals to blind persons.

Technology Loan Programs. Although many assistive technologies are minimal in cost, others, such as speech devices for people with cerebral palsy, are costly. Government-subsidized loans could help individuals with high-cost needs.

B2. PRIVATE SECTOR

Hiring Commitments. Welfare-to-Work was successful because the corporate sector made strong and public commitments to providing the education and training and other supports necessary to achieve lasting employment opportunities for people on welfare. Similar commitments to hire people with disabilities, especially in IT jobs, could heighten the overall economic well-being of disabled Americans, which correlates to computer ownership and internet access.

Internships and Mentoring. The private sector could partner with the federal government to provide internship and other mentoring opportunities for people with disabilities.

Donation of Internet Accounts. Internet service providers could parallel their initiatives for minority populations by donating internet free accounts to youth with disabilities. A questionnaire could be designed and administered on-line (someone could donate their services to do this) to determine the use of these accounts, and its impact on school, work, socialization, and other factors.

Telecommuting. Consulting firms could analyze which industries would benefit from a part-time, home-based telecommuting workforce and identify a business framework in which this could be a manageable enterprise.

Design-Stage R&D. IT firms could commit resources to R&D in developing accessible products and services at the design stage.

Supplying Computer and Internet Devices. Non-profits working with children and adults with disabilities could develop partnerships to provide low-end computer and web devices to help people with disabilities "get connected" to IT.

Sponsoring Accessible Computer Facilities. Corporations could play an important role in ensuring that library and community computer resource centers attend to the needs of people with disabilities.

Distance Learning. Internet Training companies could develop and execute a program on how to teach visually impaired and blind individuals through distance learning.

Media Attention. Electronic business magazines could make commitments to covering the opportunities (and challenges) presented by the disability labor market and the need for customizable interface products.

III. DESTINATIONS AND DELIVERABLES

A. RECOMMENDED DESTINATION FOR TRIP

One current practice is clearly best-equipped to illustrate the themes outlined above: the **Willow CyberCenter Networks** of Miami, FL. Willow is a web-based Network for telecommuting customer service operations, which is reaching out to people with disabilities to become an integrated component of its pool of CyberAgents representing people of all ages and backgrounds.

Willow is a for-profit corporation that bills itself as the "ultimate CSR (Customer Service Representative) staffing solution." Its website (www.willowcsn.com) boasts that "Leading corporations across America like Ticketmaster and the Home Shopping Network are expanding their labor pool, increasing profits and improving customer service **without** building new call centers." Willow fills a business need: companies with large customer service call-in operations face significant overhead costs in maintaining call centers, and struggle to meet peak periods that can be irregular and unanticipated. Willow meets these challenges by training a network of CyberAgents, who work out of their homes and handle customer service calls over the phone and through the Internet.

Willow is an innovative example of public-private partnering. Companies participating in the Network (the Clients) save money by reducing overhead costs, including training of personnel and high turnover rates. Each individual CyberAgent is responsible for financing his or her own home office, estimated at around \$2,500. But government subsidies help individuals get their businesses started, and the State of Florida offers public school classrooms for training the CyberAgents.

Willow's primary role is to develop a network of corporate clients and recruit a pool of qualified CyberAgents, and to provide a web-based software application whereby clients register the hours they need staffed, and CyberAgents sign up for the posted hours they wish to work (and for which clients). CyberAgents go through a basic training that includes instruction about creating and maintaining one's own independent business, and then pursue applied training for the specific call content of individual clients. Distance training is facilitated through the non-profit National Telecommuting Institute (NTI). CyberAgents work no more than two consecutive hours a day for any one Client, so they must become trained for several Clients.

While the Willow Network offers dramatic benefits to corporate clients, it offers equally attractive benefits to the CyberAgents. (Willow estimates there will be 800,000 CyberAgents across the U.S. within 5 years.) Although OPL first encountered Willow through Gary Barron, a Willow consultant, who is working with NTI to seek the participation of government agencies in the Willow Network to hire people with disabilities, the Network's social benefits are much

broader. OPL had the opportunity to attend one of Willow's monthly conferences in September 1999. There were testimonials from a mother who wanted the flexibility to work at home while caring for small children, from a top real estate agent who didn't want to miss his youngest son's childhood, and a retired Vice President of a bank who saw many friends languish in retirement and wanted to remain active. It offers individuals flexibility, variety, the ability to avoid transportation cost and stress, and savings in work-related expenses such as clothing.

It also offers comparatively excellent income. Whereas customer service agents working out of call centers may make little more than minimum wage and devote an entire work-day to the same types of calls, CyberAgents average between \$13 and \$18 an hour (well above the so-called "living wage"), and sometimes make as much \$25 per hour. Agents can earn so much more at the same time clients increase their profits because the Clients typically face dramatic overhead costs in maintaining call centers.

For people with disabilities, being a CyberAgent offers additional benefits. For many people, the time and costs associated with transportation to work can be prohibitive. Working out of the home actually enables individuals to *increase* their social lives because they spend so much less time and energy in preparing for and traveling to and from work. Moreover, becoming an independent entrepreneur offers a level of individual reward that far exceeds working for minimum wage. Sahadeo Bickram, a married Hispanic wheelchair-user and father of two children, describes how he can do his therapy in the morning, work from 12-5, have dinner with his family and help his kids with their homework, and then work again in the evening. Working for Willow has enabled Sahadeo to move out of public housing and purchase his own home. He contrasts his material well being: before Willow, he says, he got to the point where he couldn't afford to go to K-Mart to buy his children Christmas gifts; now, he's in a position to buy gifts for all the kids on his block!

Because the Willow Network is web-based, many of the Internet accessibility initiatives taking place around the country could be demonstrated at Willow in Miami. President Clinton, for example, could visit the home of Sahadeo and even take a call from one of Willow's Clients as a CyberAgent. By emphasizing this end result of people with disabilities helping to fill a business need, the President would have a meaningful context for emphasizing why it is important to make information technology not only available to but also usable by all Americans.

In Miami the President could highlight, among other things:

- The W3C Web Accessibility Initiative's efforts to make internet sites accessible;
- Edapta's efforts to provide Internet "Transformations" according to user preferences (e.g. increasing size of print, varying color contrasts, offering decision trees);
- Distance learning initiatives, including those at MIT;
- Projects designed to provide computers and Internet accounts to people with disabilities.

B. POSSIBLE DELIVERABLES

OPL has been discussing a variety of deliverables with for-profit and not-for-profit entities. Most of the potential deliverables are still in planning stage, in part because people do not have a solid grasp of when the President's trip will take place; some lack certainty that the trip will in fact take place. Likely deliverables, however, include the following entities.

- **NCR Corporation** submitted a proposal for the initial trip and is now putting together a new proposal (OPL met with NCR representatives on Friday, May 26);
- **The National Rehabilitation Hospital** is developing an initiative to provide low-end computers or web devices to patients with disabilities leaving the hospital and provide training in information technology;
- The President's Committee on Employment of People with Disabilities is seeking to expand its **High School High Tech** program, perhaps announcing new projects in additional states;
- **HalfthePlanet.com**, an internet portal for people with disabilities, is exploring an initiative to provide scholarships supporting design-stage engineering projects;
- **Edapta** has proposed using SSA's Access Seniors website as a test site for its Internet transformations;
- The **National Science Foundation** has expressed an interest in developing a deliverable (yet to be defined).

CONCLUSION

President Clinton's Disability Digital Divide trip provides an outstanding opportunity to demonstrate the potential of technology in improving the educational, social, and economic lives of people disabilities, which can result in increased economic independence and self-sufficiency. Equally important, the New Markets framework offers a way to redefine the relationship between the disability and business communities. At a time when Clint Eastwood has publicized an adversarial relationship between people with disabilities (as represented by "parasitic attorneys") and the business community, the Digital Divide trip can help move both the disability and the business communities toward **a collaborative relationship based on win-win results.**

Underlying message of this document

The President will need to take great care not to alienate the Information Technology Industry Council ("ITI") when stressing the importance of supporting efforts to "Bridge the Digital Divide for Persons with Disabilities." ITI represents the leading U.S. providers of information technology products and services. ITI member companies employ more than 1.2 million people in the United States and exceeded \$460 billion in worldwide revenues in 1999. These companies are responsible for more than 15% of all U.S. industrially funded research and development and more than half of all information technology research and engineering. The IT industry is credited with contributing on average 35% of this country's annual economic growth over the past five years.

Purpose of this document

To recommend a way to navigate the situation, described above, successfully.

Please note: I offer the ideas and opinions, expressed in this document, as an industry expert on IT-access.

Current Environment

The current environment, with regard to the IT industry "Bridging the Digital Divide (BDD)" for persons with disabilities," can best be described as having the following attributes:

- IT access is a supply-push effort;
- A majority of the investments being made, in support of BDD, come from government agencies, universities and special interest groups and not from industry;
- The BDD effort is not, currently, a self-sustaining initiative;
- IT industry is in a reactive mode with regard to BDD;
- IT industry is investing tremendous resources to make legal arguments against BDD;
- IT industry legal compliance with 508 is virtually non-existent;
- The driving force behind existing IT industry BDD compliance efforts is the fear of being sued; and,
- The motivation behind many positive BDD efforts is that, "it is the right thing to do."

All of the characteristics above, when measured against business success factors, describe an effort that is not self-sustainable and doomed to fail.

Proposed Themes for the upcoming DD Tour

Establish themes surrounding why BDD makes good common business sense... having nothing to do with disabilities. This will be easy to do. To cite but a few examples:

When introducing the following projects do not showcase their primary benefits as supporting persons with disabilities, but rather ->	Supporting main stream business requirements of participating in our 21st Century digital economy... and oh, by the way, it also supports access by persons with disabilities.
Comply with the W3C's Web Accessibility Design Guidelines	Develop web pages that can easily be converted to web pages that are accessible by wireless Internet appliances ²

When introducing the following projects do not showcase their primary benefits as supporting persons with disabilities, but rather ->	Supporting main stream business requirements of participating in our 21 st Century digital economy... and oh, by the way, it also supports access by persons with disabilities.
	Develop web pages that comply with consumer preference and current 1:1 marketing philosophies.³ Develop web pages that are accessible by standard telephones.⁴ Develop web pages that can be much more easily, and less expensively, translated into other languages.⁵ Develop web pages that can be accessed by consumers living in low-bandwidth information infrastructure emerging markets.⁶
Caption videos for the deaf.	Produce video programming that can be digitally stored, word-searched, retrieved, reformatted and redelivered. This is the current trend in the news and entertainment industries. The above described capabilities require that the videos be captioned... having nothing to do with persons who are deaf. ⁷
Develop Digital Talking Books (DTB) for the Blind	DTB have the ability to enhance the effectiveness of our educational system, K-12 and university level. DTB enable readers who are auditory learners to listen to books being read to them! At the same time student's who are visual learners can read the book. ⁸
Develop kiosks accessible by persons with disabilities	Develop kiosks that are accessible, usable and useful to the following global constituencies: 1.4 billion consumers who are illiterate; and 400 million consumers who are 65+ years of age
Develop non-visual methods for acquiring information from the Internet.	Develop non-visual methods for acquiring information while driving a car, piloting a plane, etc.

Recommended Strategy for the Trip

Educate the general public on the business benefits IT-access initiatives bring to the table for everyone.

Proposed Itinerary

Visit **WGBH** in Boston. Showcase their Accessible Media Lab. While there conduct an interview with Judy Brewer from **WAI**. Have Judy travel to WGBH. Maybe have someone interviewed from **MIT**. Have WGBH do a satellite link to Rochester Institute of Technology **RIT** to showcase an online web development course being taught. Much more here than I can put into print. If there is interest... let's discuss.

Notes

Note 1:

I express the ideas and opinions, set forth in this document, as an industry expert as evidenced by the following:

- Managed the implementation of an accessible Internet-based resource center for the 53rd Presidential Inauguration. <http://www.prodworks.com/ncr/>
- Managed the implementation of an accessible Internet-based resource center for the International Leadership Forum (ILF) for Women with Disabilities' Chaired by First Lady Hillary Rodham Clinton. <http://www.prodworks.com/ilf/>
- Served as a member of the Access Board's Telecommunications Access Advisory Committee (TAAC). http://tracecenter.org/docs/taacmtg_jun96/march28.htm
- One of the authors the Telecommunications Access Advisory Committee report. <http://www.access-board.gov/pubs/taacrpt.htm#1.1>
- Served as a member of the Access Board's Electronic and Information Technology Access Advisory Committee (EITAAC). <http://www.access-board.gov/notices/intent.htm>
- One of the authors of the Electronic and Information Technology Access Advisory Committee report. http://www.trace.wisc.edu/docs/eitaac_final_rpt/EITAAC_final_report.htm
- Called to testify as an expert industry witness before the Committee on Science, Subcommittee on Technology, regarding, "Meeting the Needs of People with Disabilities through Federal Technology Transfer." http://www.mdtaf.org/tt/1997.08/1e-jacobs_test.html
- One of the initiators the Web Accessibility Initiative (WAI). <http://www.w3.org/WAI/References/access-brief>
- Serve as an expert resource on Internet access, FCC rules and Information Technology access for the The Center for An Accessible Society. <http://www.accessiblesociety.org/index.shtml>
<http://www.accessiblesociety.org/exp.shtml>
- One of the authors of the W3C's Web Accessibility Guidelines. These guidelines explain how to make Web content accessible to people with disabilities. http://trace.wisc.edu/docs/html_guidelines/version7.htm
<http://www.w3.org/TR/WAI-WEBCONTENT/>
- Officer and Founding Member of the Association of Access Engineering Specialists (AAES). <http://www.narte.org/aaes/>
- President, IDEAL at NCR, Inc. IDEAL is a not-for-profit business resource group whose mission is to support the development of information products and services that are accessible to, and usable by, persons with disabilities.

Note 2:

Wireless Internet Appliances

- Consumer demand driving form factors smaller and smaller
- By 2003, there will be 25 million people receiving data over wireless Net devices. Currently, there are about 1.7 million such users
- Designed to be about the size of a human hand
- Data output is limited
- Data input is limited
- Interfaces must be easy to use

- No or small data storage
- IGI Consulting Group expects wireless internet access devices to reach 830 million by 2005. By 2003, furthermore, more people will be accessing the internet by mobile phones than by PCs.
- By 2005, the analysis firm predicts that 91 percent of U.S. homes will be online. About 90 percent of them will use a PC, but 73 percent will also have interactive TV or other Net device.
- Deep pages and number of clicks

Wireless devices communicate at slow speeds. They lend themselves to accessible interfaces for all to use. This, in turn, makes it easier for persons who are blind and low-vision to access the device. This can also enable the device to use text to speech synthesis.

References:

Home Net Devices To Surge, Study Says

<http://devices.internet.com/news/9912/991216home.htm>

Sales of Digital Devices Pass \$7 Billion

http://cyberatlas.internet.com/big_picture/hardware/article/0,1323,5921_292841,00.html

Consulting Group expects wireless internet access devices to reach 830 million by 2005. By 2003, furthermore, more people will be accessing the internet by mobile phones than by PCs.

http://www.emarketer.com/estats/012400_wire.html

WAP (wireless application protocol) mobile phones and other devices. Requirements/Guidelines for Mobile Access

<http://www.w3.org/TR/1999/NOTE-html40-mobile-19990315/NOTE-html40-mobile.html#Requirements>

Mobile Millions and the Wireless Web

http://www.emarketer.com/estats/012400_wire.html

Study: Wireless Data About To Boom

<http://www.allnetdevices.com/news/9910/991026study/991026study.html>

Gelon.net's Online WAP Browser

Provides the opportunity to view WAP pages via your WEB browser.

<http://www.gelon.net/>

Year Sales	(Billions)
1999	\$1.1
2000	\$2.4
2001	\$3.9
2002	\$4.9
2003	\$5.3

Wireless Networks

- Slow communication speeds
- Latency is an issue due to complicated routing

Speaking on global Internet penetration, Gerstner recounted the results of another study which found that while there will be 600 million PC's globally in 2003, there will be over 2 billion handheld devices connected to the Internet. The proliferation of the latter will drive online commercial growth in less well-off economies where the PC is not a domestic appliance.

Wireless networks communicate at slow speeds. They lend themselves to accessible interfaces for all to use. This, in turn, makes it easier for persons who are blind and low-vision to access the device. This can also enable the device to use text to speech synthesis.

References:

How do I convert it for wireless access?

[http://www.squeezenet.com/Sqnet/FAQ/faq5.htm#convert it](http://www.squeezenet.com/Sqnet/FAQ/faq5.htm#convert%20it)

<http://www.w3.org/Mobile/1998/Workshop/Brief/>

Accessibility Requirements

<http://www.w3.org/TR/NOTE-html40-mobile/#Accessibility>

BolsaPlus

<http://bolsaplus.com>

Scalaworld

<http://wap.scala.se>

Freedom Phones

<http://wap.wirefree.com>

Mothership

www.mothership-design.index.wml

Note 3:

Why Consumers Use E-Commerce

- Choices dramatically increased
- Access to much more, and better, information when making purchasing decisions
- Save time
- Find shopping more convenient
- Reduced prices or improved quality
- Have their individual needs catered to
- Browse “the store” conveniently

Loyalty Index

Repeat Visitors 12/8/1999	
Repeat Visitors	Percent Allocation
First visit	72.56%
2 to 4 visits	16.04%
5 to 9 visits	4.57%
10 to 24 visits	3.45%
25 to 49 visits	1.62%
50 to 99 visits	0.95%
100+ visits	0.81%

The loyalty of consumers is not much. You better grab their attention quickly or you will lose them. On the first visit to your Internet/Intranet web site the consumer needs to be given the feeling that you are catering to their individual wants, needs and preferences... in an easy-to-understand, easy-to-use and fast way.

http://www.statmarket.com/SM?c=Loyalty_Index

Page Load Times

% Still Waiting	Load Time
84%	10 sec
51%	15 sec
26%	20 sec
5%	30 sec

Do you make your pages load fast? TurboSanta reports (Dec. 1999) that the average home page load time among the Web's *top* 120 retailers was about five seconds: can your site compete with this? People will leave a site if pages take too long to load. eMarketer reports (Nov. 1998) how long people are willing to wait before they give up on a site:

Remember how demanding consumers are:

- Easy-to-use
- Easy-to-Navigate
- Minimum download times
- Error-free
- Anytime, anywhere, convenience
- Personalized-services
- One-stop-shopping

http://www.upsdell.com/BrowserNews/stat_des.htm

Do you know the connection speeds of your visitors? Many people still use lower-speed modems. eMarketer reports (Jan. 2000) how many people are connected at what speeds at home:

% of People	Connection Speed
8.3%	14.4 K baud or less
45.2%	28.8-33.6 K baud
40.7%	56.6 K baud
5.9%	128 K baud or more

http://www.upsdell.com/BrowserNews/stat_des.htm

By combining the results of the previous two tables, it is possible to calculate how many people will wait to see a page load for various sizes of pages. E.g., if a page is 70K in size - including text, graphics, audio, etc. - only about 43% of typical home users will wait for the page to load: the other 57% will give up and go elsewhere. Caution: the graph is valid only for typical users with good Internet connections in Jan. 2000: your mileage will vary.

Page Load Times	
Percent of Users Still Waiting	Page Size
95%	20K
77%	40K
53%	60K
35%	80K
23%	100K
15%	120K

http://www.upsdell.com/BrowserNews/stat_des.htm

Note that website developers typically have faster connections. This report by WebTrends (Jan. 2000) indicates how many people involved in website design are connected at what speeds:

% of Developers	Connection Speed
3%	28.8 Kbaud or less
6%	33.6 Kbaud
32%	56.6 Kbaud
7%	128 Kbaud
48%	1,000 Kbaud or more

http://www.upsdell.com/BrowserNews/stat_des.htm

Do you consider people who have different connections, e.g., slower modems? People will leave a site if pages take too long to load. Multiply the load times you observe by these factors. For example, if you test with a 56K modem, and want to know how long pages would load with a 28.8K modem, use the factor 1.49: 10 seconds for you would therefore be 10x1.49 seconds for someone with a 28.8K modem.

User \ You	14.4K	28.8K	33.6K	56K	ISDN	T1
14.4K	1.00	0.55	0.47	0.36	0.12	0.03
28.8K	1.83	1.00	0.86	0.67	0.23	0.06
33.6K	2.14	1.17	1.00	0.78	0.27	0.07
56K	2.74	1.49	1.28	1.00	0.34	0.09
ISDN	8.06	4.39	3.76	2.94	1.00	0.27
T1	29.4	16.0	13.7	10.7	3.64	1.00

http://www.upsdell.com/BrowserNews/stat_des.htm

How to Get (and Lose) Visitors

Do you frustrate your visitors? Pew Research Center found (fall 1998) that users are more frustrated about finding things on the Net (60%) than over receiving spam (45%). Do you know what encourages people to revisit your sites? Forrester Research reports these factors driving visitors to return to websites (Feb. 1999):

Users	Factors
75%	High-quality content
66%	Ease of use
58%	Quick to download
54%	Updated frequently
14%	Coupons and incentives
13%	Favorite brands
12%	Cutting-edge technology
12%	Games
11%	Purchasing capabilities
10%	Customizable content
13%	Chat and BBS
6%	Other

http://www.upsdell.com/BrowserNews/stat_des.htm

Do you know what people want to do online? MarketFacts reports (Mar. 1999) why people are online:

Users	Reasons
87.8%	Gathering news/information
83.2%	E-mail
80.5%	Research
75.3%	Surfing
33.7%	Play Games
30.8%	Chat
30.0%	Post to Bulletins
17.8%	Shop

http://www.upsdell.com/BrowserNews/stat_des.htm

Do you have an eCommerce site? IntelliQuest reports (Nov. 1998) factors motivating online shopping, and factors inhibiting online shopping:

Users	Motivating Factors
59%	Convenience
41%	Saves time
35%	More selection
27%	Prices

Users	Motivating Factors
Users	Inhibiting Factors
75%	Credit card worries
67%	Return hassle
59%	Want to see it in person
58%	Junk e-mail

Guideline: Alternate Text for Graphics

Business facts and benefits:

- *Much faster downloads (up to six times faster)*
- Twenty to thirty percent of users surf with graphics off;
- One third of online shoppers waiting for web pages to download will "bailout" after only eight seconds;
- Wireless Internet Appliance access requires all text interfaces;
- Web pages using Alt-text tags can be more easily reformatted to comply with wireless standards;
- Using H/W tags decrease the time needed for a browser to render the content of a web page.
- One third of online shoppers waiting for web pages to down-load will "bailout" after only eight seconds.
- The average Web page, now 90,000 bytes up from 50,000 bytes in 1995 and 120 times more complex since 1995
- Roundtrip delays have grown from 240 milliseconds to 370 milliseconds since 1995, largely as a result of the number of extra routers now needed for information to reach it's destination.
- An estimated 2.5 billion hours were wasted online last year as people waited for pages to download
- Unacceptable download times could result in as much as \$4.35 billion in United States e-commerce sales being at risk each year
- Efficient Telephone Access to the Web (trend in e-commerce) can only be achieved through the use of Alt Text Tags
- Fifty-three percent of Internet users in the US [72.9 million] connect at a speed of 33.6 Kbps or less. This represents 39 million users. Extrapolating this figure to Internet users worldwide in 1999 [171 million] this number increases to 91.5 million users

Text pages download more quickly and are less likely to be abandoned. Following WAIs Alt text guideline enables consumers to shop with pictures off.

Across all groups of users, taking too long to download pages (i.e. "speed") is the most commonly experienced problem with the web (64.8% of respondents). The percentage reporting this problem has been consistent over the last two surveys (63% in the Eighth and 66% in the Seventh). Even though modem speeds continue to rise and respondents upgrade their modems fairly frequently (48% have upgraded in the past year), web pages become even more heavily laden with images, animations, scripts, program s, etc. all of which take extra time to download. Online retailers especially should take note: 53% of respondents reported that they had left a web site while searching for product information simply because the site was too slow.

More than HALF of all respondents reported that they had left a web site while searching for product information just because the site was too slow.

<http://www.webpagesthatsuck.com/badnavigation.html>

References:

2.5 Billion Hours Spent Waiting in 1998 According to John Roth, chief executive of Nortel Networks, an estimated 2.5 billion hours were wasted online last year as people waited for pages to download.

http://www.nua.ie/surveys/?f=VS&art_id=905355331&rel=true

Zona Research estimates users' frustrations could result in as much as \$4.35 billion in United States ecommerce sales being at risk each year due solely to unacceptable download times.

http://www.internetnews.com/wd-news/article/0,1087,10_148261,00.html

Mistakes Could Cost E-tailers \$6 Billion This Holiday Season:

<http://www.ecommercetimes.com/news/articles/991008-2.shtml>

Faster Downloads:

Bandwidth in the US November 1999				
Speed	Unique Audience	Pages/ Person	Visits/ Person	Percent of Net Users
14.4	6,050,900	282	11	8.3%
28.8/33.6	32,991,289	451	15	45.2%
56	29,671,057	587	18	40.7%
High speed	4,266,023	1,036	28	5.9%
Source: Nielsen//NetRatings				

A majority of users use slow modems. Are your web pages graphics rich. Are your accessors bailing?

The report showed that 39 percent of test shoppers failed in their buying attempts because sites were too difficult to navigate.

Internet Performance Slowing Down:

http://www.nua.ie/surveys/index.cgi?f=VS&art_id=905355353&rel=true

The Eight-Second Rule:

http://www.emarketer.com/estats/070599_8sec.html

e-Tailers beware: one third of online shoppers waiting for web pages to down-load will "bailout" after only eight seconds. Bandwidth in the US November 1999:

http://cyberatlas.internet.com/big_picture/hardware/article/0,1323,5921_277191,00.html

Traditional Marketing Philosophy

One product to as many as possible

Four Ps

- Product
- Place
- Price
- Promotion

60's right products for mass-marketing

70's segmentation and product line extension

80's niche marketing

Early 90's selling value add

Point for Discussion: *Past marketing philosophies could get away with ignoring consumer differences.* The four Ps of traditional marketing by Don Peppers and Martha Rogers, Ph.D.

http://www.1to1.com/articles/ns-fivei.html?VT=J6i_mUHax0IijIi_aQ2wiua4cutCLuKgQCBpdCFdM8Pe

One-to-One Marketing Philosophy

Five I's

- Identification
- Individualization
- Interaction

- Integration
- Integrity

Customize to individual consumers

- Wants
- Needs
- Preferences

The marketing philosophy of the day, 1:1, is DESIGNED to address individual consumer differences. Your products and services need to support this if you want to succeed. The Evolution of One-to-One Marketing by Don Peppers and Martha Rogers, Ph.D.

http://www.1to1.com/articles/ns-evolution.html?VT=J6i_mUHax0IijIi_aQ2wiua4cutCLuKgQCBpdCFdM8Pe

The Five "I"s of One-to-One Marketing by Don Peppers and Martha Rogers, Ph.D.

http://www.1to1.com/articles/nsfivei-1.html?VT=eLi_mUHaxVPijIi_aQ2wiua4cutCLuKgQCBpdCFdM8Pe

Note 4:

Technology Trends

Telephone Access to the Web:

- SpeechWeb
- Tel-Web
- pwTelephone
- SpeechHTML
- Web On Call
- Portico
- VoXML
- AudioWeb: *The telephone access technologies, originally developed to provide persons who are blind access to the Internet has evolved into a competitive, mainstream, business advantage!*

Note 5:

Emerging Market Characteristics

- English Will Dominate Web for Only Three More Years
- Low-bandwidth infrastructures

Does your information infrastructure cater only to English-speaking individuals? How hard will it be to translate into other languages? How do you go about doing this. Are there things you can do today to make translation faster, easier, an less expensive to do in the future?

<http://websnapshot.mycomputer.com/languages.html>

References:

English Will Dominate Web for Only Three More Years
<http://www.computereconomics.com/new4/pr/pr990610.html>

Internet Usage According to Language				
	1999	2001	2003	2005
English Speaking	91,969,151	108,282,662	124,265,453	147,545,824
(percentage)	54%	51%	46%	43%
Non-English Speaking	79,094,449	104,480,528	143,733,527	198,008,511
(percentage)	46%	49%	54%	57%
Total Worldwide	171,063,600	212,763,190	267,998,980	345,554,335

Evolution & Projections of Online Linguistic Populations

Language \ Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Spanish	0.2	0.8	1.8	6.2	12.0	19.8	33.0	40.0	50.0	60.0
Japanese	2.0	7.0	9.0	12.3	19.8	32.0	45.0	60.0	62.0	65.0
German	0.5	3.5	6.3	13.7	14.0	22.0	26.0	30.0	35.0	38.0
French	0.2	2.0	3.4	6.0	9.9	18.0	20.0	22.0	24.0	26.0
Chinese	0.1	1.2	2.0	4.1	10.0	15.0	23.0	40.0	80.0	160.0
Scandinavian	2.0	2.2	3.2	4.7	8.2	9.0	11.0	12.0	13.0	14.0
Italian	0.1	0.5	1.8	3.2	9.7	15.0	20.0	25.0	29.0	35.0
Dutch	0.1	1.0	2.0	4.1	5.8	7.0	8.0	9.0	11.0	14.0
Korean	0.0	0.1	0.8	1.7	4.4	20.0	25.0	30.0	35.0	40.0
Portuguese	0.0	0.2	1.2	1.4	4.0	6.0	7.0	10.0	15.0	20.0
Other Non-English:			13.8	13.9	6.9	11.0	18.0	23.0	31.0	43.0
English	40.0	45.0	72.0	91.0	113.5	160.0	185.0	205.0	230.0	250.0
TOTAL:	50.0	70.0	117.0	151.0	205.8	322.0	490.0	489.0	598.0	747.0
Total Non-English:	10.0	16.0	45.3	71.3	104.7	175.0	235.0	300.0	385.0	515.0

By 2005 English-based documents will comprise only 30% of the information available over the Internet.
<http://www.gltreach.com/globstats/evol.html>

Web pages that have been developed in compliance with WAI guidelines are easier and less expensive to translate into foreign languages.

Note 6:

Web pages that have been developed in compliance with WAI guidelines are easier and less expensive to translate into foreign languages.

Note 7:

See <http://www.virage.com>

Note 8:

Currently, talking books for the visually impaired are distributed on audio cassettes. The next-generation technology for this application will be digitally based, bringing many improvements in sound quality, document navigation, and searching. The NISO Digital Talking Book (DTB) Standard will ensure compatibility among the many systems expected to be developed.

See: <http://www.niso.org/commitaq.html>

See: <http://www.niso.org/talkbookdraft.html>

Driving Universal Access for the 3 Million Persons with Disabilities of New York State

The TRAIID Project

For New York's estimated 3 million people with disabilities, assistive technology (AT) represents a collection of tools that are vital to achieving independence and maximizing individual potential. The Assistive Technology Act provides State grants to remove barriers to AT through public awareness, interagency coordination, technical assistance, outreach, and training.

AT cannot be viewed as a single issue, but must be considered as part of the whole. The merit of assistive technology is often diminished without access to education, housing, employment, etc. Each is reliant upon the other. OAPwD TRAIID is the collaborator, facilitator, and provider of technical assistance. By enabling other agencies or organizations to identify and implement the necessary changes themselves, the likelihood of permanently changing policies, practices and effecting an overall paradigm shift is increased.

Despite significant advances, daunting barriers remain. Following are highlights of activities which the TRAIID Project has initiated, and the barriers which continue to present obstacles:

- LACK OF INFORMATION AND AWARENESS
 - Provided Information and Referral:
 - Responded to more than 33,431 AT-related information and referrals calls during the past decade
 - Publications, Brochures, and Web Presence
 - Distributed over a quarter of a million brochures conveying essential AT information to consumers, legislators, service providers, and citizens
 - In 1999, the agency website was accessed approximately 1,000 times a month
 - Building Local Capacity for Direct Access
 - Funded in collaboration with the NYS Department of Health, Early Intervention Program, 13 Regional TRAIID Centers so that consumers can have local and hands on access to AT
 - In 1999 alone, nearly 19,107 people were helped in identifying and acquiring devices and services, at an average cost of \$28.26 per contact
 - Allocated over 54% of Tech Act dollars to support nonprofit and community organizations

- LACK OF TRAINING ON AT
 - Organized first Governor's statewide Conference on AT, which was attended by approximately 500 people
 - Collaborated with the NYS Education Department to develop and offer 27 sessions to over 500 parents, educators, administrators, service providers, therapists, and school board members regarding Special Education and access to AT
 - Provided training to 200 stakeholders on implementing AT and the ADA
 - Provided training to 180 stakeholders to implement a policy to assure web accessibility of agency websites
 - Contracted with Hunter College to develop and provide training for vocational rehabilitation graduate students
- LACK OF ACCESS TO SERVICES AND PROGRAMS
 - Provide Technical Assistance to Other Agencies
 - Worked with the State Department of Health to assure Medicaid Managed Care contracts include the needs of persons with disabilities
 - Provide Cross-Agency Coordination
 - Worked with the State Education Department to develop a policy that permits the transfer or sale of assistive technology devices between school districts or transition to higher education or employment
 - Collated evidence of dilemmas that occur for individuals who are duly eligible for Medicaid and Medicare sparking interagency discussions to remedy those issues
 - Working with mandated partners who are implementing the WIA
 - Providing support and information to make AT available to local WIB's
 - Ensuring cross-disability and cross-age issues
 - Coordinate Policy Development and Implement Criteria to Ensure Access
 - Developed Criteria for Funding Seating, Positioning, & Wheeled Mobility Devices; Augmentative & Alternative Communication; Computer & Information Technology
 - In partnership with the NYS Office for Technology and multiple State agencies and public partners, issued a statewide policy on website accessibility

*Systems are not static, and the disability population continually evolves. We must ensure that people have access to the supports which they require. The **TRAID Project** has leveraged over \$2 million in public and private support for AT-related initiatives, in direct response to the goal of universal access for persons with disabilities in New York State.*

Clinton Presidential Records Digital Records Marker

This is not a presidential record. This is used as an administrative marker by the William J. Clinton Presidential Library Staff.

This marker identifies the place of a publication.

Publications have not been scanned in their entirety for the purpose of digitization. To see the full publication please search online or visit the Clinton Presidential Library's Research Room.



State Information Technology Access Coalition

National Association of State Information Resource Executives
National Association of State Procurement Officers
Association of Tech Act Projects

Information Technology Accessibility: A Status Report

Information technology accessibility for people with disabilities is at a critical turning point. According to the 1999 National Telecommunications and Information Administration report, *Falling Through the Net: Defining the Digital Divide*, although more Americans than ever have access to information tools, such as the personal computer and the Internet, there is still a significant "digital divide" separating American information "haves" and "have nots." For people with disabilities a basic reason for exclusion from the digital environment is inaccessibility of the information technology product. Inaccessible web sites, software that is incompatible with adaptive devices, voice automated systems that cannot be accessed by adaptive telephones, and other access barriers continue to exclude people with disabilities from digital government.

This report provides an overview of current federal and state activities underway to address information technology accessibility. It concludes with a discussion of a coalition formed to address information technology access in state government with membership including state chief information officers, state procurement officials, and state assistive technology programs.

Further information about the member organizations of the State Information Technology Access Coalition (SITAC) can be found on each association web site. Contact information is as follows:

National Association of State Information Resource Executives
www.nasire.org

National Association of State Procurement Officials
www.naspo.org

Association of Tech Act Projects
www.ataporg.org

This information in this report is current as of March 10, 2000.



RESNA Technical Assistance Project

Suite 1540, 1700 N. Moore Street, Arlington, VA 22209-1903
703/524-6686, Fax: 703/524-6630, TTY: 703/524-6639

Digital Divide Initiatives of the Assistive Technology Act Grantees

Digital Divide Initiatives of the Assistive Technology Act Grantees

(Funded by the National Institute on Disability and Rehabilitation Research [NIDRR], U.S. Department of Education)

Georgia Tools for Life

<http://www.gatfl.org>

Contact: Joy Kniskern, 404/657-3084

Nearly 27 percent (1,270,584) Georgians have one or more disabilities. Of these, nearly 14 percent (656,097) have severe disabilities requiring one or more kinds of assistive technology (LaPlante, et al, *Technology and Disabilities*, 6, pp. 17-28, 1997 and the 1990 U.S. Census Report). The Tools for Life project offers a computer-recycling center, called Re-Boot, that refurbished almost 1,000 computers in 1999. The ReBoot program is located at FODAC (Friends of Disabled Adults and Children) at Stone Mountain, Georgia.

ReBoot is a nonprofit, statewide, collaborative effort of many groups and organizations committed to recycling computers. All participants in ReBoot's Computer Re-Utilization Project receive the equipment as a donation; they do not buy the equipment. ReBoot acquires the equipment, evaluates it, repairs it (if needed), loads licensed software, distributes the equipment to people with disabilities; and trains the people on the equipment. The program is operated 85 percent by volunteers—by people with disabilities for people with disabilities. ReBoot has 10 training centers across the state.

Other Georgia Projects Working to Bridge the Digital Divide:

Center for Rehabilitation Technology (CRT) (Atlanta, GA)

Georgia Institute of Technology

Contact: Robert Todd, Project Director, 404/894-4621

The Center for Rehabilitation Technology will operate a *National AT Internet Site*. The AT Act authorized a National AT Internet Site that would provide information to individuals with disabilities and the general public to increase access to AT devices, services, and other related information.

CRT will develop and sustain the Global Assistive Technology Explorer (GATE), a comprehensive, up-to-date, easy-to-use national public Internet site on disability-related resources. GATE will increase the availability of and access to information about AT, services, and resources for individuals with disabilities. The site will provide 24-hour access to all those with Internet capability.

**A Telerehabilitation Network to Support Community Re-entry Following
Catastrophic Injury**

Technology Opportunities Project (Atlanta, Georgia)

Shepherd Center

Contact: Mike Jones, PhD, Research Director, 404/350-7595

*(Note: This project is funded by the National Telecommunications & Information
Administration [NTIA], U.S. Department of Commerce.)*

The overall goal of this project is to develop effective telerehabilitation applications using advanced network technologies. A test-bed network will be developed in the metro-Atlanta area to link rehabilitation professionals with patients who have sustained catastrophic spinal cord and brain injuries, their family members, and caregivers. The test-bed will emulate capabilities of the Next Generation Internet, including high-bandwidth videoconferencing, remote monitoring, environmental control, and high-speed delivery of interactive, multimedia instruction.

The network will be used to develop, deliver, and evaluate telerehabilitation applications which (a) support community re-entry after catastrophic injury, (b) prevent or reduce the severity of secondary complications often associated with catastrophic injury, and (c) deliver health and wellness support and advocacy assistance to people with disabilities living in the community.

The project expects to find that individuals who receive telerehabilitation: (1) achieve greater success in community reintegration (e.g., return to work), (2) experience fewer secondary complications; (3) demonstrate greater independence and self-efficacy; (4) incur lower overall health care and support costs; and (5) report higher satisfaction with their health-related quality of life.

Project Significance. The project is in an ideal position to explore emerging technologies that may have telemedicine and telerehabilitation applications. Because Georgia Tech is a development site for the Next Generation Internet and Internet 2, and with the support of corporate partners, the project has immediate access to the latest network technologies. The proposed work is also significant because of the persons served. Each year, there are an estimated 60,000 new SCIs and TBIs in the US. Problems with access to specialized services and resources affect people with catastrophic injuries in all communities, so the project has national relevance. The involvement of major "players" in the telecommunications industry, and development of resource materials and applications that utilize the Internet, should enhance the project's ability to serve as a resource for people with SCI and TBI, their families, and health providers nationwide.

A collaborative effort will be undertaken by researchers and practitioners from Shepherd Center, the Biomedical Interactive Technology Center at the Georgia Institute of Technology, the School of Public Health at Emory University, MindSpring Enterprises, Inc., CyberCare, Inc., and Siemens Corporation.

Florida Alliance for Assistive Service and Technology (FAAST)

<http://faast.org>

Contact: Terry Ward, PhD, Project Director, 850/487-3278

The FAAST project is working with the Florida Department of Education's demonstration site to provide overlapping services for access to assistive technology outside the traditional school framework for adults beyond school age as well as those of school age. Minorities and the elderly are served.

Iowa Program for Assistive Technology

<http://www.uiowa.edu/infotech>

Contacts: Mary Quigley, 319/356-4402; Jane Gay, 319/356-4463, Co-Directors

The Iowa Program for Assistive Technology (IPAT) worked with the Iowa Department for the Blind to develop a project to increase accessibility to the Internet for persons with disabilities. Businesses use their web sites to advertise employment opportunities as well as to sell products and services. Colleges, universities, and community colleges use the Internet to provide information; accept applications and financial aid forms from potential students; and to conduct distance-learning programs. Many public programs also use the Internet for these purposes. The web sites created to accomplish these things are often inaccessible to individuals with disabilities, creating an increasingly widening "digital divide."

The first part of the project was the creation of a booklet, *Designing Accessible Web Sites: Creating sites that are accessible to people with disabilities*. The booklet discusses how persons with disabilities access and use the web, and contains instructions on how to create an accessible web site, including examples of accessible sites and other resources. The booklet was mailed to 258 web masters in the public and private sector in Iowa. Included were offices of city, county, and state agencies, universities and colleges, and major employers. The booklet was also sent to 65 computer training programs in the state, including the *Master Navigator Program* sponsored by Iowa State University Cooperative Extension. Staff from the Iowa Department for the Blind then provided technical assistance to 40 entities identified as providing critical services or employment. *All of these sites became accessible.*

IPAT then developed an article and public service announcement about the booklet and the importance of web access to persons with disabilities. The article was published in the *IPAT/InfoTech Newsletter* and reprinted in other newsletters that reached approximately 7,000 Iowans. The booklet is available on the IPAT web site and the web site for the Iowa Department of the Blind (IDB). This information was shared with all of the state Assistive Technology Act Projects, Centers for Independent Living, parent groups, and education and vocational rehabilitation services staff. The information was also provided to the Computer Services Departments at the University of Iowa and Iowa State University. These departments distributed the information to the 300 web masters throughout their system.

At Iowa State University, the IDB provided advanced training to all the web masters, including those for the Iowa Cooperative Extension Service. Each state has a land grant college that houses their Extension Services Offices. These programs provide information to farmers, ranchers, and others living in rural areas across the United States on nutrition, maternal and child health services, agricultural issues, and financial issues. In Iowa, there are Extension Offices in all 99 counties, with the state office housed at Iowa State University. As a result of this technical assistance, the booklet was then taken to the National Conference on Extension Services that focused on providing extension services via the web. *Information about accessible web sites was thus shared with the agricultural extension services from all states.*

Another component of the project is to work with the state library system. Many individuals with disabilities do not own computers, but could access the Internet through their public library. The newsletter of the State Library is distributed to all of the state's 340 public and private libraries and will have an article about web access and the booklet. IPAT is coordinating with other entities and the State Librarian to work over the next few years on improving library access.

In order to ensure that future web sites become accessible, IPAT is collaborating with the Information Technology Services (ITS) office at the University of Iowa to develop training materials on web access as part of the ITS web master classes. Training materials will also be included in the ITS classes and courses on instructional design for faculty and students in the Department of Education.

A potential future component of this project could be to encourage and develop "corporate or business mentors." Iowa is a state with many small businesses and entrepreneurs. In addition, because of the rural nature of the state, many individuals with disabilities are more interested in starting small businesses than in finding employment outside of their community. Small businesses often need to use the Internet to effectively compete in the market place. However, they often do not have the resources to devote to specialized computer staff. Larger businesses often have this kind of expertise. The first phase of our project was aimed at businesses with current web sites. These could be the first "mentors" to provide technical assistance to future and current smaller businesses on accessible web site creation.

Another potential future component could be to seek "corporate sponsors or donators" of more computer hardware and software for the public libraries in Iowa. The library system is extensive in the state and the only source of computer access for many Iowans, particularly those with disabilities. Many libraries, however, do not have the resources for the newer computer adaptations necessary to serve many people with disabilities.

Massachusetts Assistive Technology Partnership (MATP)

<http://www.matp.org>

Contact: Marilyn Howe, 617-355-7820

MATP has been very active in initiating and coordinating compliance with Section 508 of the Rehabilitation Act. The project was instrumental in orchestrating Executive Order 348 signing (1/1/93) which establishes state policy for access to electronic equipment and information technologies for citizens with disabilities. The project trained 80 ADA coordinators on Section 508; developed Section 508-compliant PC Standards through the Governor's Advisory Council on IT; made GSA/COCA's *Managing Information Resources* manual available electronically and in print to state agencies upon request; provides technical assistance to state agencies in purchasing 508-compliant equipment; provided technical assistance in the development of an amendment to Section 508 on the federal level; advocated that the U.S. Department of Education develop a policy guidance to the state Department of Education regarding accessibility of educational technology and widely distributed Secretary Riley's letter to Massachusetts special education departments; and provide technical assistance on Section 508 implementation on the state level to other AT Act grantees.

New Hampshire Technology Partnership Project

<http://www.iod.unh.edu/projects/spd.htm>

Contact: Therese Willkomm, PhD, Project Director, 603/528-3060

The New Hampshire project donated more than 300 computers through the Governor's Prison Project where the computers were refurbished and then redistributed to the schools.

New Mexico Technology Assistance Program

<http://www.nmtap.com>

Contact: Bill N. Newroe, Project Director, 505/954-8539

The project provides technical assistance and training to set up a package of electronic and information technology accessible hardware /software features with existing computers for public access with public agencies and ed tech computer labs in schools.

New York State TRAIL Project

<http://www.state.ny.us/disabledAdvocate/technlog.htm>

Contact: Deborah Buck, 518/474-2825

The New York AT project assisted with the New York state policy from the Director of state agencies on making all state agencies' web sites accessible by July 2000 by following the World Wide Web Consortium's Web Accessibility Initiative. The New

York TRAIID Project is referenced in the State Technology Policy office for agencies wishing to receive technical assistance on making their web sites accessible.

North Carolina Assistive Technology Project

<http://www.mindspring.com/~ncatp>

Contact: Ricki Cook, Project Director, 919/850-2787

The North Carolina project assists with the "Virtual Buddies Program." This program is funded through a private foundation that provides recycled computers and Internet access to people with disabilities around the State. The program also works at the local level to identify people knowledgeable about computers to assist new users. To date, the program has provided 76 adults with disabilities services including the following: training, a computer system, Internet access, computer upgrades, or modem.

The North Carolina project also coordinates a financial loan program through Nations Bank for people with disabilities seeking low-interest loans for assistive technology.

Carol Boyer

From: Carol Boyer [cboyer@resna.org]
Sent: Tuesday, March 07, 2000 10:37 AM
To: Jonathan M. Young
Subject: Update to Atlanta, GA Area/New Markets Trip

Jonathan,

Hopefully, Kristen shared the file we sent on 2/28/00 with summaries of what the Assistive Technology Act grantees are doing regarding digital divide issues and individuals with disabilities.

Below is some additional information about the **Georgia Tools for Life** project's private-public partnerships, some of which are becoming models throughout the United States. The last paragraph highlights the **ADA Regional Center** (the Southeast Disability and Business Technical Assistance Center [DBTAC])--also in Atlanta.

Georgia Tools for Life, Project Director: Joy Kniskern, 404/657-3084, 2 Peachtree Street NW, Atlanta, GA 30303-3142; <http://www.gatfl.org>

Microsoft awarded a mini-grant of \$15,000 to the "Touch the Future" program for part-time instructors for jobs training with computers. In addition, Microsoft donated \$43,000 worth of Microsoft products to assist with this program. In addition, the company provides fundraising assistance by donating Microsoft promotional products for the project to sell at Microsoft conferences.

Hewlett-Packard provided space for the project's computer recycling activities at H-P's Atlanta offices. H-P also offers employee-release time for a corporate volunteer to help once a week with the project. This model is being replicated at other H-P offices throughout the country.

Lockheed-Marietta donates 486 or better computers as well as computer parts to the ReBoot project.

Tools for Life has an ongoing relationship with the **IBM-PC Users Group** in the Atlanta area. The Users Group donates software that can be refurbished.

Georgia Perimeter College students provide A+ computer certification classes at the ReBoot project (at FODAC) so that volunteers can audit these classes at no cost to obtain the appropriate skills training.

The Touch the Future project has already donated almost 1,000 computers in the first quarter of 2000. At this rate, they will exceed by about four times the numbers donated in 1999.

ADA Regional Center

Project Director: Shelley Kaplan, 404/385-0636, Georgia Tech, Center for Rehabilitation Technology, 490 Tenth Street, Atlanta, GA 30318, <http://www.sedbtac.org>

This center is responsible for providing technical assistance, information, training, and public awareness to businesses and agencies with duties and responsibilities under the Americans with Disabilities Act and to individuals with disabilities who have rights under the ADA throughout the southeast region of the country (AL, FL, GA, KY, NC, SC, MS, TN).

NOTE: The ADA Regional Center is housed at the same location as the new National Public Internet site on Assistive Technology highlighted in our first summary.

Thank you for your review of this information.

Carol Boyer

Project Associate

RESNA Technical Assistance Project

Computer and Internet Use Among People with Disabilities

by

H. Stephen Kaye, Ph.D.

Disability Statistics Center
Institute for Health and Aging
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San Francisco, California

March, 2000

National Institute on Disability and Rehabilitation Research
U.S. Department of Education

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The author is grateful to the following individuals for their contributions to this report: Mitch LaPlante, for guidance on the analysis methods; Jack McNeil and Alexandra Enders, for helpful feedback; David Keer, project officer, and the staff of NIDRR; and Will Leber, graphic designer.

Disclaimer

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INTRODUCTION

Computer technology and the Internet have a tremendous potential to broaden the lives and increase the independence of people with disabilities. Those who have difficulty leaving their homes can now log in and order groceries, shop for appliances, research health questions, participate in online discussions, catch up with friends, or make new ones. Blind people, who used to wait months or years for the information they needed to be made available in Braille or on audiotape, can now access the very same news stories, magazine articles, government reports, and information on consumer products at the very same time it becomes available to the sighted population. People who have difficulty holding a pen or using a keyboard can use the latest speech recognition software to write letters, pay their bills, or perform work-related tasks.

These new technologies hold great promise, but as this report makes abundantly clear, the

computer revolution has left the vast majority of people with disabilities behind. Only one-quarter of people with disabilities own computers, and only one-tenth ever make use of the Internet. Elderly people with disabilities, and those with low incomes or low educational attainment, are even less likely to take advantage of these new technologies. African Americans with disabilities also have an especially low rate of computer and Internet use.

Extensive media coverage was devoted to a recent analysis (National Telecommunications and Information Administration, 1999) documenting huge racial and ethnic gaps in access to electronic technologies in the United States. The present report, using data from the same survey, demonstrates that gaps in computer and Internet use based on disability status are just as large as those based on race and ethnicity.

DATA SOURCE AND METHODS

The Current Population Survey (CPS) is a nationally representative survey of approximately 50,000 U.S. households each month. Conducted by the Census Bureau for the Bureau of Labor Statistics, the basic CPS questionnaire focuses on employment status and household income. The sample consists of eight panels, with a new panel brought into rotation every month. Households in each panel are interviewed eight times—for four months in a row, and then, after an eight-month break, during the same four calendar months of the following year.

Supplementary questionnaires are often included along with the basic monthly survey. The present analysis is based on data from two such supplements: the 1998 Computer and Internet Use Supplement, conducted in December of that year, and the 1999 Annual Demographic Survey, conducted three months later, in March.

The Computer and Internet Use Supplement contained questions on household computer ownership and Internet access, as well as questions on specific uses of the Internet by each household member. It was conducted for the National Telecommunications and Information Administration (NTIA) as a means of surveying the degree of penetration of computer technology in the general population. NTIA's analysis found significant gaps in access to computers and the Internet, based on factors such as family income, race and ethnicity, and educational attainment.

Disability is not mentioned in NTIA's report, because the supplement was not designed to measure computer and Internet use among people with disabilities. No questions on disability status were asked in the supplement, nor does the basic monthly survey provide any useful way of identifying a general sample of the population with disabilities.¹

Unlike the monthly survey, however, the March demographic supplement does include a single,

broad question on work disability. Respondents are asked whether anyone in the household has "a health problem or disability which prevents them from working or which limits the kind or amount of work they can do." The question provides a reasonable way of identifying a sample of persons at least 15 years of age who are limited in their ability to work. Work disability is a narrower and more problematic definition of disability than activity limitation or functional limitation; it is also of somewhat dubious validity for people without work histories, and for those elderly people who retired from work long ago.

Because of the longitudinal nature of the CPS, it is possible to link data from the two above-mentioned supplemental surveys. Of the eight panels interviewed in December 1998, two were re-interviewed the following March.² Thus, for one-quarter of the sample, minus missing responses, it is possible to obtain the work disability status of those persons whose computer and Internet usage was separately measured.

The two panels for which both surveys were administered number 30,128 records, out of a total of 122,935 records for the entire Computer/Internet supplement. In 91.6 percent of these cases it is possible to merge data from the two supplements; the remaining 8.4 percent (2522 records) have been dropped for lack of work disability data. Simple non-response is one reason for missing data. Another is that the CPS is a survey of households rather than of families, and no attempt is made to recontact families who moved between interviews. The new residents of the household are interviewed instead, which leaves us with no information on the disability status of the persons of interest.

The merged sample used in this analysis numbers 27,606 records, or 22.5 percent of the full Computer/Internet Supplement sample. Some 2,196 records represent persons identified as having work disabilities. The reduced sample lacks the statistical power for a highly detailed analysis of the computer and Internet use habits of people with disabilities, but it is adequate to provide comparisons of computer ownership and Internet use among broad sub-populations with and without work disabilities.

For the purposes of evaluating computer and

¹ It would be possible, however, to use the monthly survey to analyze the population unable to work because of health, but this is an overly restrictive definition of disability.

² It is fortuitous that the survey was conducted in December, so that there was a partial overlap with the March demographic supplement. The previous supplement on computer and Internet use, conducted in October 1997, had no panels that overlapped with March 1997 or 1998.

Internet use among various racial and ethnic groups, this report imitates the NTIA study in using the household as the unit of analysis. The household's racial and ethnic classification is that of the first respondent listed in the survey roster—generally the person in whose name the home is owned or rented. Unlike the NTIA analysis, however, this report preserves the survey's distinction between the racial classification and the identification of Hispanic origin. In other words, a household identifying herself as black (in response to the question about race) and of Hispanic origin (in response to a separate question on ethnicity) would have her household listed under the racial category African American as well as the ethnic category Hispanic.

For some 21.8 percent of *households*, or 10,480 of the 48,070 households interviewed in the Computer and Internet Supplement, the Demographic Supplement contains records for all household members. Only these households, for which complete work disability information is available, have been retained in this analysis.

Survey non-response has been observed to vary with age, sex, and racial background. The

probability of a family changing residence during the three-month lag between interviews is also likely to vary with these characteristics. In order to reduce biases due to missing data (as well as to account for the missing panels), individual records in the merged sample have been re-weighted so as to obtain the same population estimate as the full sample in 60 age-sex-race cells (15 age bins, 2 sexes, and 2 races—black vs. other).

In the analysis of households, the re-weighting (based on the original household weight) uses the age, sex, and race of the first respondent listed in the survey roster. For this analysis, 40 age-sex-race cells are used for post-stratification, with the number of age bins reduced to 10 so that the few households headed by persons under 20 years of age are all relegated to a single age bin.

Because the estimates in this report are based on a sample of the population, they are subject to sampling error. Estimates of sampling errors have been calculated using formulas provided by the Bureau of the Census (Bureau of the Census, 1999).³ In the data tables, estimates with low statistical reliability (standard error greater than 30 percent of the estimate) are flagged with an asterisk. All comparisons mentioned in the text have been tested for statistical significance, and, unless otherwise stated, are significant at the 95 percent confidence level or greater ($p < .05$).

³ The stratum and primary sampling unit data necessary for direct estimation of standard errors are not provided in the CPS public use data files.

ANALYSIS RESULTS

Of the 20.9 million Americans aged 15 and over with work disabilities (see above for definition), 5.0 million have computers at home (Table A). Less than half of this group, 2.4 million people, have access to the Internet via their home computer, whether or not they choose to take advantage of it. Some 1.5 million actually use the Internet at home; 2.1 million people with disabilities make use of the Internet either at home or on some other computer.

As shown in Figure 1, people with disabilities are less than half as likely as their non-disabled counterparts to have access to a computer at home (23.9 vs. 51.7 percent). The gap in Internet access is even more striking: Almost three times as many people without disabilities have the ability to connect to the Internet at home as those with disabilities—31.1 versus 11.4 percent.

Whether through a home computer or one at work, at school, or in a library, people with disabilities

are far less likely than those without disabilities to make use of the Internet. Only one-tenth (9.9 percent) of people with disabilities connect to the Internet, compared to almost four-tenths (38.1 percent) of those without disabilities. When they do use the Internet, it is likely to be done at home (7.2 percent use the Internet at home, compared to 25.9 percent of those without disabilities). Internet use away from home is much less common for those with disabilities, in part because most people with work disabilities are not employed: Only 3.9 percent of those with disabilities use the Internet outside of the home, compared to 20.6 percent of their non-disabled counterparts.

Age and Gender

Although the disability population is heavily skewed toward the older ages, and older people

Table A. Computer ownership and Internet use, by disability status and age group, ages 15 and over.

	Work disability		No disability	
	Number (1000s)	%	Number (1000s)	%
Persons aged 15 and above	20,877	100.0	189,954	100.0
Has computer in household	4,983	23.9 †	98,267	51.7
Has Internet access at home	2,379	11.4 †	59,132	31.1
Uses Internet	2,076	9.9 †	72,300	38.1
at home	1,512	7.2 †	49,126	25.9
elsewhere	821	3.9 †	39,050	20.6
Persons aged 15-64	12,579	100.0	164,928	100.0
Has computer	4,106	32.6 †	91,618	55.6
Has Internet access at home	1,991	15.8 †	55,903	33.9
Uses Internet	1,896	15.1 †	69,702	42.3
Persons aged 65 and above	8,289	100.0	23,973	100.0
Has computer	877	10.6 †	6,056	25.3
Has Internet access at home	388	4.7 †	2,944	12.3
Uses Internet	180 *	2.2 *†	2,134	8.9

Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement

†Difference in rates between populations with and without work disability is statistically significant at the 95% confidence level or better.

*Estimate has low statistical reliability (standard error exceeds 30 percent of estimate).

are less likely to use new technologies, the above-mentioned gaps are not accounted for by differences in age. As Figure 2 shows, significant differences remain in rates of computer ownership, Internet access, and Internet use for both the non-elderly (ages 15-64) and elderly (65 and above) populations.

Only one-third (32.6 percent) of non-elderly persons with work disabilities have computers in their homes, compared to more than half (55.6 percent) of those without disabilities. Once again, only about half of those computer-owners with disabilities can access the Internet—15.8 percent of the disability population, compared to 33.9 percent of the non-disabled. And the ratio of Internet use is nearly 3 to 1: 42.3 percent of people without disabilities use the Internet, compared to only 15.1 percent of those with disabilities.

Among the elderly, only one-quarter (25.3 percent) of those without disabilities have computers, but a still smaller fraction—only one-tenth, or 10.6 percent—of those with disabilities have them. Internet access is available for about half of computer owners in each group (12.3 percent of non-

disabled and 4.7 percent of those with disabilities). Although actual use of the Internet is rare among the elderly, it is far higher for those without disabilities (8.9 percent) than for those with (2.2 percent).

For the population as a whole, the gender gap in computer ownership and Internet use is statistically significant but surprisingly small. Just over half (51.6 percent) of men and just under half (48.7 percent) of women have access to a computer at home; one-third (33.3 percent) of men and just under a third (30.5 percent) of women use the Internet. Among the population with work disabilities, there are no statistically significant gender gaps (Table B). The gaps between those with

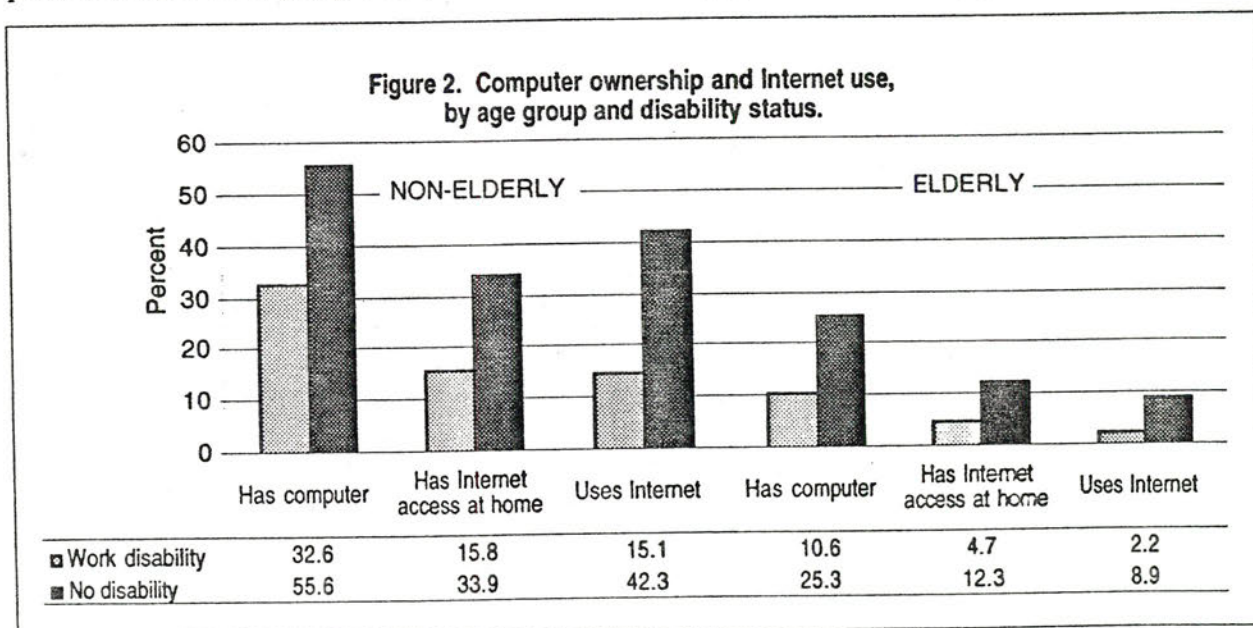
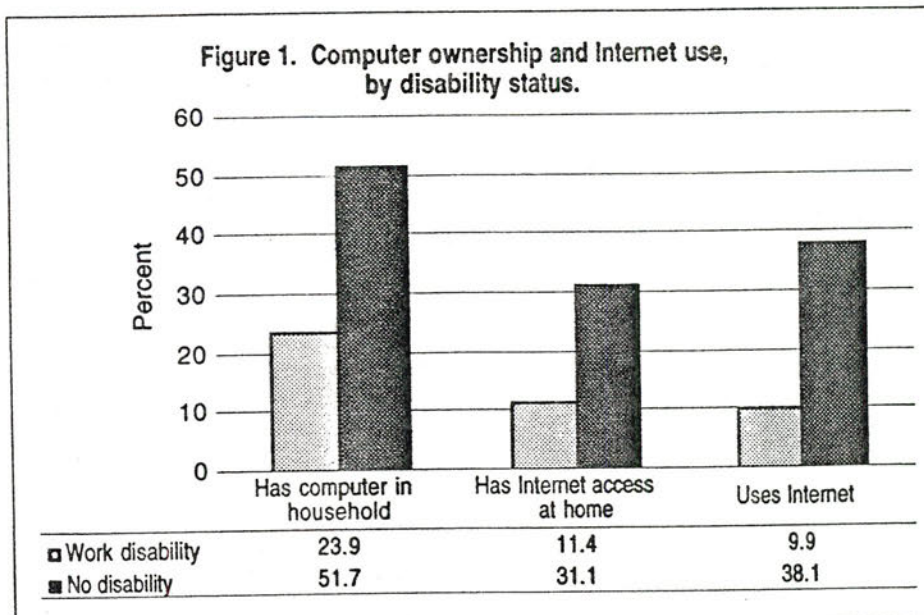


Figure 3. Computer and Internet use, by disability and employment status, ages 18-64.

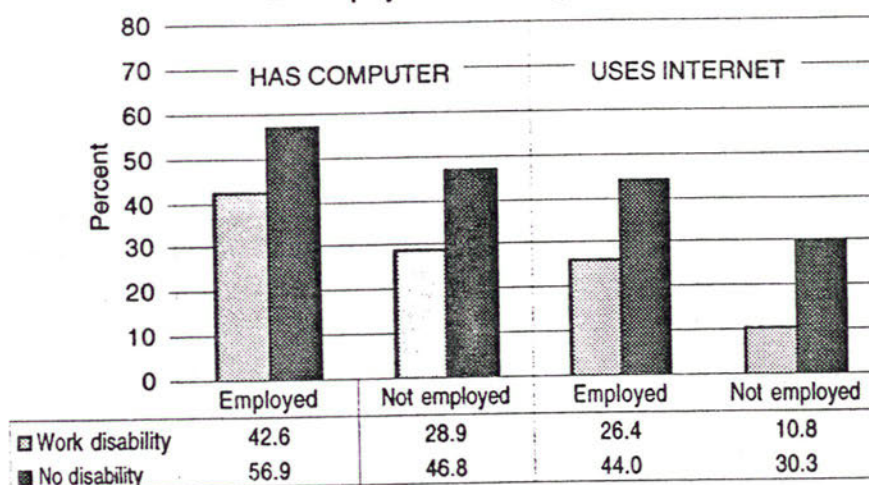


Table B. Computer ownership and Internet use, by disability status, gender, employment status, educational attainment, and family income, ages 15 and over.

	With work disability					No work disability				
	Total population	Computer in household		Uses Internet		Total population	Computer in household		Uses Internet	
	Number (1000s)	Number (1000s)	%	Number (1000s)	%	Number (1000s)	Number (1000s)	%	Number (1000s)	%
Gender										
Male	9,587	2,383	24.9 †	1,056	11.0 †	92,105	49,040	53.2	36,942	40.1
Female	11,289	2,600	23.0 †	1,020	9.0 †	97,849	49,227	50.3	35,358	36.1
Employment status (ages 18-64 only)										
Employed	3,351	1,427	42.6 †	885	26.4 †	124,001	70,547	56.9	54,621	44.0
Not employed	9,024	2,608	28.9 †	970	10.8 †	29,445	13,786	46.8	8,914	30.3
Educational attainment										
Not high school grad	7,461	949	12.7 †	179 *	2.4 *†	37,520	12,949	34.5	8,457	22.5
High school grad	11,418	3,105	27.2 †	1,294	11.3 †	108,779	53,267	49.0	35,957	33.1
College grad	1,998	929	46.5 †	604	30.2 †	43,655	32,051	73.4	27,885	63.9
Family income										
Less than \$20,000	8,614	950	11.0 †	424	4.9 †	28,557	6,326	22.2	5,419	19.0
\$20,000 or more	8,512	3,403	40.0 †	1,417	16.6 †	132,451	81,042	61.2	59,916	45.2

Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement.

†Difference in rates between households with and without work disability is statistically significant at the 95% confidence level or better.

*Estimate has low statistical reliability (standard error exceeds 30 percent of estimate).

and without disabilities remain large and significant for both sexes, however. For example, 24.9 percent of men with disabilities own computers, compared to 53.2 percent without; 23.0 percent of women with disabilities own computers, versus 50.3 percent without.

Employment Status

For working-age adults, having a job can make it financially feasible to buy a computer; often, on-the-job access to computers and the Internet is also provided, along with training in how to use them. It is not surprising, therefore, that people with and without work disabilities are more likely to have computers and use the Internet if they are employed than if they are not (Figure 3 and Table B).

But even when they do have jobs, people with disabilities are significantly less likely to gain access to these new technologies: Among employed people with work disabilities, 42.6 percent have computers and 26.4 percent use the Internet, compared to 56.9 and 44.0 percent of their non-disabled counterparts. All around, rates are significantly lower among those without jobs: Only three-tenths (28.9 percent) of those with disabilities have computers, and only about one-tenth (10.8 percent) use the Internet.

Educational Attainment

People who are well educated are far more like-

ly to have the skills, not to mention the financial resources, necessary to buy and use computer technology. But regardless of the level of educational attainment, people with disabilities have much lower rates of computer ownership and Internet use than their non-disabled peers (Figure 4).

Only one-eighth (12.7 percent) of people with disabilities who have not graduated from high school own computers. This figure compares with one-third (34.5 percent) of non-high-school-graduates without disabilities, almost half (46.5 percent) of college graduates *with* disabilities, and three-quarters (73.4 percent) of college graduates without disabilities.

Even more striking is the fact that only 2.4 percent of people with disabilities who lack high school diplomas use the Internet. Those without disabilities are almost 10 times as likely to connect (22.5 percent), and those with disabilities who have college degrees are still more likely (30.2 percent). But even this last group has less than half the likelihood of Internet use as college graduates without disabilities, almost two-thirds (63.9 percent) of whom are Internet users.

Family Income

Half (50.3 percent) of people with work disabilities have family incomes of under \$20,000 per year. For this group, buying a computer and paying the monthly fees of an Internet service provider may seem like a frivolous expense in relation to the basic necessities of life. Low-income

Figure 4. Computer and Internet use, by disability status and educational attainment, ages 15 and over.

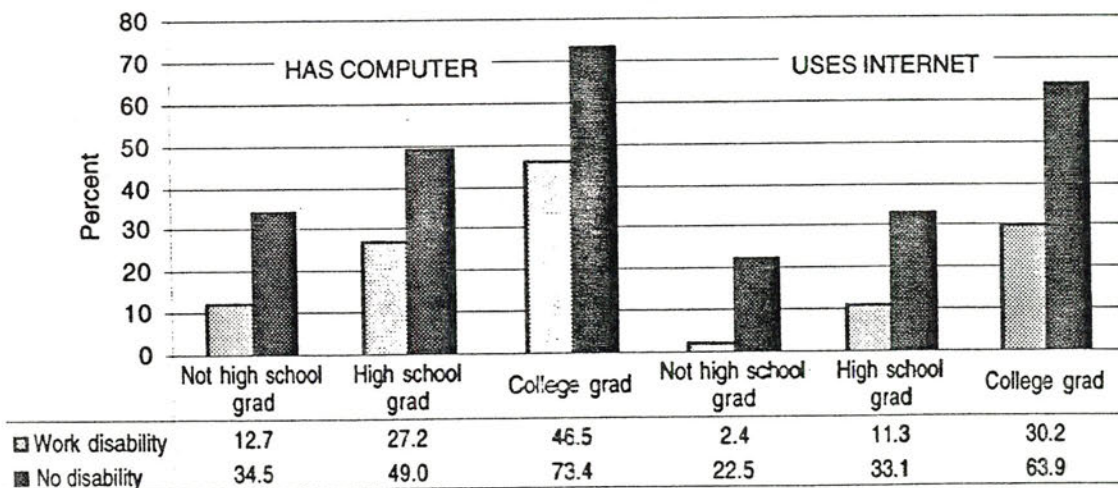


Figure 5. Computer and Internet use, by disability status and family income, ages 15 and over.

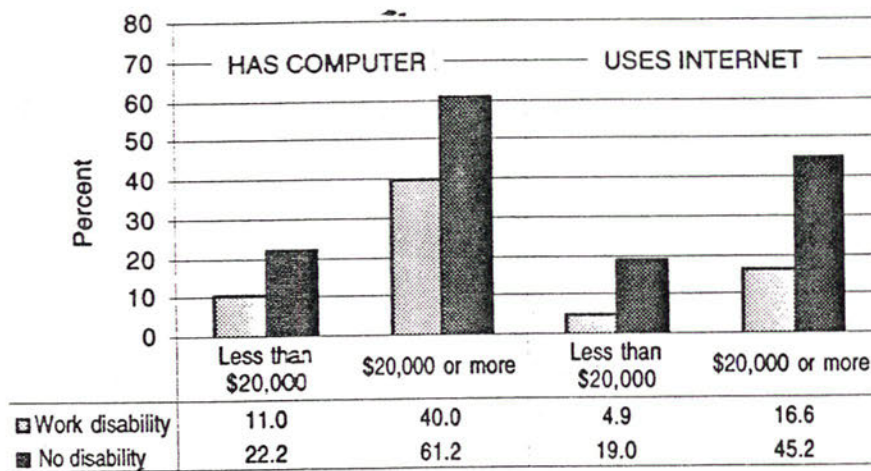


Table C. Household computer and Internet access, by race, ethnicity, and disability status of household members.

	With work disability					No work disability				
	Total households	Computer in household		Household has Internet access		Total households	Computer in household		Household has Internet access	
	Number (1000s)	Number (1000s)	%	Number (1000s)	%	Number (1000s)	Number (1000s)	%	Number (1000s)	%
All households	17,709	4,298	24.3	2,144	12.1	86,503	41,179	47.6	24,772	28.6
Race										
White	14,297	3,833	26.8	1,905	13.3	73,133	36,693	50.2	22,454	30.7
African American	2,910	311	10.7	141	4.8	9,879	2,602	26.3	1,130	11.4
Native American	208	43	20.7	41	19.5	583	228	39.1	143	24.6
Asian/Pacific Isl.	294	111	37.8	58	19.7	2,909	1,656	56.9	1,045	35.9
Ethnicity										
Hispanic	1,257	239	19.0	106	8.5	6,986	2,282	32.7	1,018	14.6
Non-Hispanic	16,452	4,059	24.7	2,038	12.4	79,517	38,897	48.9	23,755	29.9

Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement

Note: A household is classified as having a work disability if any member has a work disability. Race and ethnicity are those of the first person listed in the survey roster, generally the person in whose name the home is owned or rented. Households of Hispanic ethnicity are also included in the appropriate racial categories.

† Difference in rates between households with and without work disability is statistically significant at the 95% confidence level or better.

¥ Rate is significantly different from that of whites (for racial groups) or non-Hispanics (for Hispanics) at the 95% confidence level or better.

* Estimate has low statistical reliability (standard error exceeds 30 percent of estimate).

Table D. Reasons for using the Internet, by disability status, ages 15 and over.

	Work disability		No disability	
	Number (1000s)	%	Number (1000s)	%
All Internet users	2,076	100.0	72,300	100.0
Electronic mail	1,393	67.1	54,335	75.2
Search for info.	1,304	62.8	46,466	64.3
News, weather, sports	810	39.0	32,529	45.0
Courses, schoolwork	608	29.3	25,456	35.2
Job-related tasks	543	26.2	31,182	43.1
Shop, pay bills, etc.	353	17.0	16,255	22.5
Search for jobs	330	15.9	12,066	16.7
Other	498	24.0	13,075	18.1
Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement				

American households are much less likely than white households to have a computer (10.7 vs. 26.8 percent) or have access to the Internet (4.8 vs. 13.3 percent).

It is also worth noting that the rates for white households *with* disabilities (26.8 percent of which have computers and 13.3 percent of which have access to the Internet) are roughly equal to those of African American households *without* disabilities (26.3 and 11.4 percent, respectively). Thus, in comparing these populations, disability and race can be seen to be equally significant factors in determining the household's likelihood of exposure to computer technology.

Reasons for Internet Use

By far the most common reasons that people with disabilities cite for using the Internet are send-

ing and receiving electronic mail (1.4 million people, or 67.1 percent of the 2.1 million Internet users) and searching for information (1.3 million, or 62.8 percent; see Table D). These are also the two top-ranked reasons for Internet use among people without disabilities.

Four-tenths (39.0 percent) of Internet users with disabilities read the news online, check the weather forecast, or obtain sports scores. Three-tenths (29.3 percent) take courses over the Internet or use online resources to help with schoolwork. One-quarter (26.2 percent) of Internet users with disabilities use the Internet for job-related tasks, a significantly lower figure than the 43.1 percent of Internet users without disabilities, who are more likely to have jobs. One-sixth (17.0 percent) use the Internet for shopping, paying bills, or other commercial activities, and 15.9 percent use it to look for employment opportunities.

CONCLUSIONS

People with disabilities are perhaps the single segment of society with the most to gain from the new technologies of the electronic age. Yet they have among the lowest rates of use of these technologies. As a result, the potential benefits of computers and the Internet to the disability community are a long way from being realized.

The problem is largely one of access. Many people with disabilities are poor and can little afford a computer capable of navigating the Internet, the specialized software they might need in order to adapt it to their needs, and the monthly charges imposed for access to the Internet. Many people with disabilities, whether elderly or not, lack an awareness of the potential benefits of this technology, an understanding that, for themselves especially, a computer and an Internet connection could become not a toy, but an important tool with

which to gain greater independence and social integration.

The advent of lower-cost computing—including the free computers that come with an extended subscription to an Internet service provider—may help to make this technology more available. Simpler user interfaces, which would encourage use by people who are less comfortable with the technology, might also help people with disabilities to overcome any resistance they might have to exploring the Internet. But it seems clear that, in order to clarify the benefits that this technology can offer to the population with disabilities, a concerted program of education will be needed, along with training and support in the use of the hardware and software, before significant progress is made in closing the enormous gaps in technology access that have been identified in this report.

REFERENCES

- Bureau of the Census (1999). Source and Accuracy Statement for the December 1998 CPS Microdata File for Internet and Computer Use in the U.S. Available online at: <http://www.bls.census.gov/cps/computer/1998/ssrcacc.htm>.
- National Telecommunications and Information Administration (1999). Falling Through the Net: Defining the Digital Divide. Washington, DC: U.S. Department of Commerce, National Telecommunications and Information Administration. Available online at: <http://www.ntia.doc.gov/ntiahome/digitaldivide/index.html>.



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Subject: Re Digital Divide trip: ADA Coverage of the Internet

Jonathan and Becky --

If anyone asks tomorrow about ADA coverage of the Internet, you can say:

Per the Justice Dept., "the ADA does not cover the Internet per se. If an entity would otherwise be covered by the ADA and it delivers its services over the Internet, then the delivery of those services would be covered (e.g. a bookstore such as Barnes & Noble)."

liz

Computer and Internet Use Among People with Disabilities

by

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University of California
San Francisco, California

March, 2000

National Institute on Disability and Rehabilitation Research
U.S. Department of Education

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INTRODUCTION

Computer technology and the Internet have a tremendous potential to broaden the lives and increase the independence of people with disabilities. Those who have difficulty leaving their homes can now log in and order groceries, shop for appliances, research health questions, participate in online discussions, catch up with friends, or make new ones. Blind people, who used to wait months or years for the information they needed to be made available in Braille or on audiotape, can now access the very same news stories, magazine articles, government reports, and information on consumer products at the very same time it becomes available to the sighted population. People who have difficulty holding a pen or using a keyboard can use the latest speech recognition software to write letters, pay their bills, or perform work-related tasks.

These new technologies hold great promise, but as this report makes abundantly clear, the

computer revolution has left the vast majority of people with disabilities behind. Only one-quarter of people with disabilities own computers, and only one-tenth ever make use of the Internet. Elderly people with disabilities, and those with low incomes or low educational attainment, are even less likely to take advantage of these new technologies. African Americans with disabilities also have an especially low rate of computer and Internet use.

Extensive media coverage was devoted to a recent analysis (National Telecommunications and Information Administration, 1999) documenting huge racial and ethnic gaps in access to electronic technologies in the United States. The present report, using data from the same survey, demonstrates that gaps in computer and Internet use based on disability status are just as large as those based on race and ethnicity.

DATA SOURCE AND METHODS

The Current Population Survey (CPS) is a nationally representative survey of approximately 50,000 U.S. households each month. Conducted by the Census Bureau for the Bureau of Labor Statistics, the basic CPS questionnaire focuses on employment status and household income. The sample consists of eight panels, with a new panel brought into rotation every month. Households in each panel are interviewed eight times—for four months in a row, and then, after an eight-month break, during the same four calendar months of the following year.

Supplementary questionnaires are often included along with the basic monthly survey. The present analysis is based on data from two such supplements: the 1998 Computer and Internet Use Supplement, conducted in December of that year, and the 1999 Annual Demographic Survey, conducted three months later, in March.

The Computer and Internet Use Supplement contained questions on household computer ownership and Internet access, as well as questions on specific uses of the Internet by each household member. It was conducted for the National Telecommunications and Information Administration (NTIA) as a means of surveying the degree of penetration of computer technology in the general population. NTIA's analysis found significant gaps in access to computers and the Internet, based on factors such as family income, race and ethnicity, and educational attainment.

Disability is not mentioned in NTIA's report, because the supplement was not designed to measure computer and Internet use among people with disabilities. No questions on disability status were asked in the supplement, nor does the basic monthly survey provide any useful way of identifying a general sample of the population with disabilities.¹

Unlike the monthly survey, however, the March demographic supplement does include a single,

broad question on work disability. Respondents are asked whether anyone in the household has "a health problem or disability which prevents them from working or which limits the kind or amount of work they can do." The question provides a reasonable way of identifying a sample of persons at least 15 years of age who are limited in their ability to work. Work disability is a narrower and more problematic definition of disability than activity limitation or functional limitation; it is also of somewhat dubious validity for people without work histories, and for those elderly people who retired from work long ago.

Because of the longitudinal nature of the CPS, it is possible to link data from the two above-mentioned supplemental surveys. Of the eight panels interviewed in December 1998, two were re-interviewed the following March.² Thus, for one-quarter of the sample, minus missing responses, it is possible to obtain the work disability status of those persons whose computer and Internet usage was separately measured.

The two panels for which both surveys were administered number 30,128 records, out of a total of 122,935 records for the entire Computer/Internet supplement. In 91.6 percent of these cases it is possible to merge data from the two supplements; the remaining 8.4 percent (2522 records) have been dropped for lack of work disability data. Simple non-response is one reason for missing data. Another is that the CPS is a survey of households rather than of families, and no attempt is made to recontact families who moved between interviews. The new residents of the household are interviewed instead, which leaves us with no information on the disability status of the persons of interest.

The merged sample used in this analysis numbers 27,606 records, or 22.5 percent of the full Computer/Internet Supplement sample. Some 2,196 records represent persons identified as having work disabilities. The reduced sample lacks the statistical power for a highly detailed analysis of the computer and Internet use habits of people with disabilities, but it is adequate to provide comparisons of computer ownership and Internet use among broad sub-populations with and without work disabilities.

For the purposes of evaluating computer and

¹ It would be possible, however, to use the monthly survey to analyze the population unable to work because of health, but this is an overly restrictive definition of disability.

² It is fortuitous that the survey was conducted in December, so that there was a partial overlap with the March demographic supplement. The previous supplement on computer and Internet use, conducted in October 1997, had no panels that overlapped with March 1997 or 1998.

Internet use among various racial and ethnic groups, this report imitates the NTIA study in using the household as the unit of analysis. The household's racial and ethnic classification is that of the first respondent listed in the survey roster—generally the person in whose name the home is owned or rented. Unlike the NTIA analysis, however, this report preserves the survey's distinction between the racial classification and the identification of Hispanic origin. In other words, a household identifying herself as black (in response to the question about race) and of Hispanic origin (in response to a separate question on ethnicity) would have her household listed under the racial category African American as well as the ethnic category Hispanic.

For some 21.8 percent of *households*, or 10,480 of the 48,070 households interviewed in the Computer and Internet Supplement, the Demographic Supplement contains records for all household members. Only these households, for which complete work disability information is available, have been retained in this analysis.

Survey non-response has been observed to vary with age, sex, and racial background. The

probability of a family changing residence during the three-month lag between interviews is also likely to vary with these characteristics. In order to reduce biases due to missing data (as well as to account for the missing panels), individual records in the merged sample have been re-weighted so as to obtain the same population estimate as the full sample in 60 age-sex-race cells (15 age bins, 2 sexes, and 2 races—black vs. other).

In the analysis of households, the re-weighting (based on the original household weight) uses the age, sex, and race of the first respondent listed in the survey roster. For this analysis, 40 age-sex-race cells are used for post-stratification, with the number of age bins reduced to 10 so that the few households headed by persons under 20 years of age are all relegated to a single age bin.

Because the estimates in this report are based on a sample of the population, they are subject to sampling error. Estimates of sampling errors have been calculated using formulas provided by the Bureau of the Census (Bureau of the Census, 1999).³ In the data tables, estimates with low statistical reliability (standard error greater than 30 percent of the estimate) are flagged with an asterisk. All comparisons mentioned in the text have been tested for statistical significance, and, unless otherwise stated, are significant at the 95 percent confidence level or greater ($p < .05$).

³ The stratum and primary sampling unit data necessary for direct estimation of standard errors are not provided in the CPS public use data files.

ANALYSIS RESULTS

Of the 20.9 million Americans aged 15 and over with work disabilities (see above for definition), 5.0 million have computers at home (Table A). Less than half of this group, 2.4 million people, have access to the Internet via their home computer, whether or not they choose to take advantage of it. Some 1.5 million actually use the Internet at home; 2.1 million people with disabilities make use of the Internet either at home or on some other computer.

As shown in Figure 1, people with disabilities are less than half as likely as their non-disabled counterparts to have access to a computer at home (23.9 vs. 51.7 percent). The gap in Internet access is even more striking: Almost three times as many people without disabilities have the ability to connect to the Internet at home as those with disabilities—31.1 versus 11.4 percent.

Whether through a home computer or one at work, at school, or in a library, people with disabili-

ties are far less likely than those without disabilities to make use of the Internet. Only one-tenth (9.9 percent) of people with disabilities connect to the Internet, compared to almost four-tenths (38.1 percent) of those without disabilities. When they do use the Internet, it is likely to be done at home (7.2 percent use the Internet at home, compared to 25.9 percent of those without disabilities). Internet use away from home is much less common for those with disabilities, in part because most people with work disabilities are not employed: Only 3.9 percent of those with disabilities use the Internet outside of the home, compared to 20.6 percent of their non-disabled counterparts.

Age and Gender

Although the disability population is heavily skewed toward the older ages, and older people

Table A. Computer ownership and Internet use, by disability status and age group, ages 15 and over.

	Work disability		No disability	
	Number (1000s)	%	Number (1000s)	%
Persons aged 15 and above	20,877	100.0	189,954	100.0
Has computer in household	4,983	23.9	† 98,267	51.7
Has Internet access at home	2,379	11.4	† 59,132	31.1
Uses Internet	2,076	9.9	† 72,300	38.1
at home	1,512	7.2	† 49,126	25.9
elsewhere	821	3.9	† 39,050	20.6
Persons aged 15-64	12,579	100.0	164,928	100.0
Has computer	4,106	32.6	† 91,618	55.6
Has Internet access at home	1,991	15.8	† 55,903	33.9
Uses Internet	1,896	15.1	† 69,702	42.3
Persons aged 65 and above	8,289	100.0	23,973	100.0
Has computer	877	10.6	† 6,056	25.3
Has Internet access at home	388	4.7	† 2,944	12.3
Uses Internet	180 *	2.2 *	† 2,134	8.9

Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement

†Difference in rates between populations with and without work disability is statistically significant at the 95% confidence level or better.

*Estimate has low statistical reliability (standard error exceeds 30 percent of estimate).

are less likely to use new technologies, the above-mentioned gaps are not accounted for by differences in age. As Figure 2 shows, significant differences remain in rates of computer ownership, Internet access, and Internet use for both the non-elderly (ages 15-64) and elderly (65 and above) populations.

Only one-third (32.6 percent) of non-elderly persons with work disabilities have computers in their homes, compared to more than half (55.6 percent) of those without disabilities. Once again, only about half of those computer-owners with disabilities can access the Internet—15.8 percent of the disability population, compared to 33.9 percent of the non-disabled. And the ratio of Internet use is nearly 3 to 1: 42.3 percent of people without disabilities use the Internet, compared to only 15.1 percent of those with disabilities.

Among the elderly, only one-quarter (25.3 percent) of those without disabilities have computers, but a still smaller fraction—only one-tenth, or 10.6 percent—of those with disabilities have them. Internet access is available for about half of computer owners in each group (12.3 percent of non-

disabled and 4.7 percent of those with disabilities). Although actual use of the Internet is rare among the elderly, it is far higher for those without disabilities (8.9 percent) than for those with (2.2 percent).

For the population as a whole, the gender gap in computer ownership and Internet use is statistically significant but surprisingly small. Just over half (51.6 percent) of men and just under half (48.7 percent) of women have access to a computer at home; one-third (33.3 percent) of men and just under a third (30.5 percent) of women use the Internet. Among the population with work disabilities, there are no statistically significant gender gaps (Table B). The gaps between those with

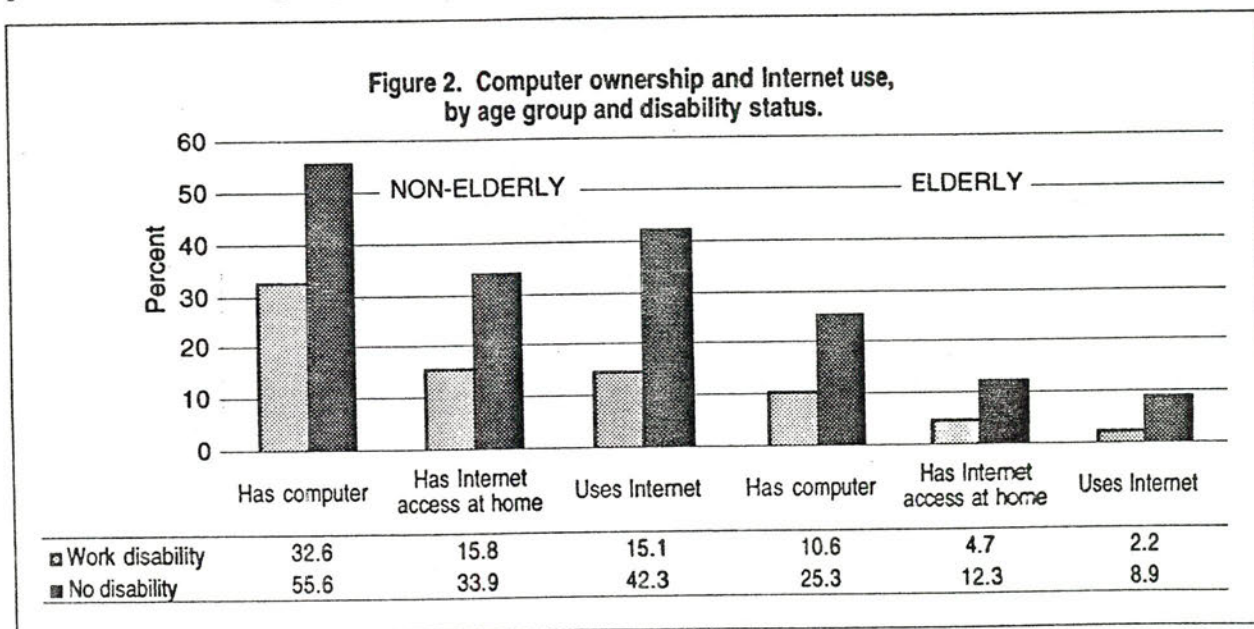
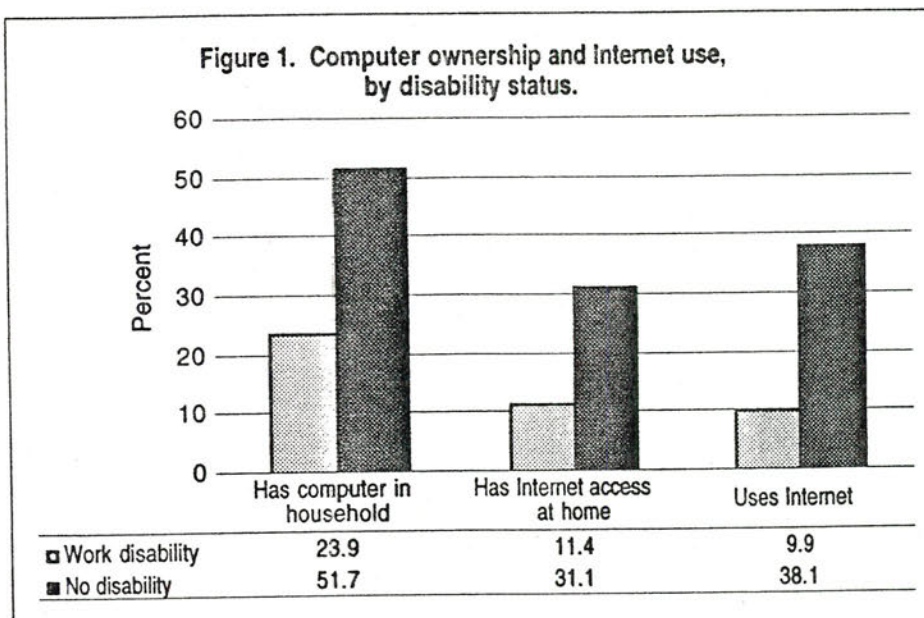


Figure 3. Computer and Internet use, by disability and employment status, ages 18–64.

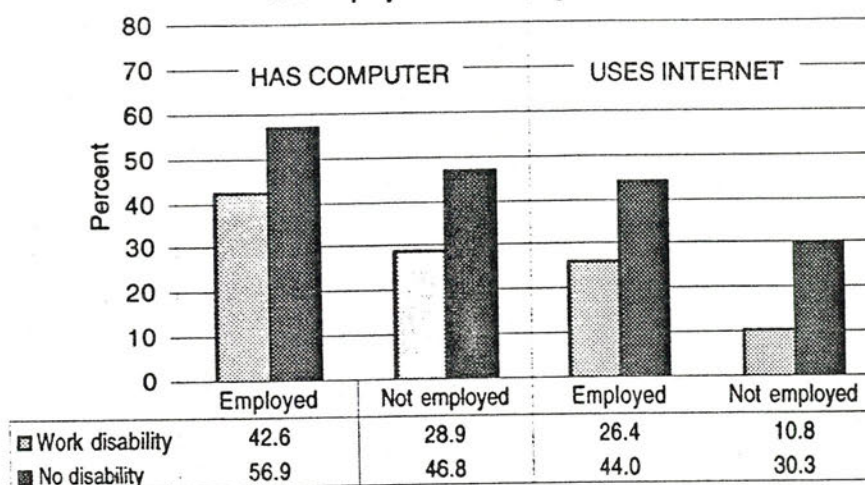


Table B. Computer ownership and Internet use, by disability status, gender, employment status, educational attainment, and family income, ages 15 and over.

	With work disability					No work disability				
	Total population	Computer in household		Uses Internet		Total population	Computer in household		Uses Internet	
	Number (1000s)	Number (1000s)	%	Number (1000s)	%	Number (1000s)	Number (1000s)	%	Number (1000s)	%
Gender										
Male	9,587	2,383	24.9 †	1,056	11.0 †	92,105	49,040	53.2	36,942	40.1
Female	11,289	2,600	23.0 †	1,020	9.0 †	97,849	49,227	50.3	35,358	36.1
Employment status (ages 18–64 only)										
Employed	3,351	1,427	42.6 †	885	26.4 †	124,001	70,547	56.9	54,621	44.0
Not employed	9,024	2,608	28.9 †	970	10.8 †	29,445	13,786	46.8	8,914	30.3
Educational attainment										
Not high school grad	7,461	949	12.7 †	179 *	2.4 * †	37,520	12,949	34.5	8,457	22.5
High school grad	11,418	3,105	27.2 †	1,294	11.3 †	108,779	53,267	49.0	35,957	33.1
College grad	1,998	929	46.5 †	604	30.2 †	43,655	32,051	73.4	27,885	63.9
Family income										
Less than \$20,000	8,614	950	11.0 †	424	4.9 †	28,557	6,326	22.2	5,419	19.0
\$20,000 or more	8,512	3,403	40.0 †	1,417	16.6 †	132,451	81,042	61.2	59,916	45.2

Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement.

†Difference in rates between households with and without work disability is statistically significant at the 95% confidence level or better.

*Estimate has low statistical reliability (standard error exceeds 30 percent of estimate).

and without disabilities remain large and significant for both sexes, however. For example, 24.9 percent of men with disabilities own computers, compared to 53.2 percent without; 23.0 percent of women with disabilities own computers, versus 50.3 percent without.

Employment Status

For working-age adults, having a job can make it financially feasible to buy a computer; often, on-the-job access to computers and the Internet is also provided, along with training in how to use them. It is not surprising, therefore, that people with and without work disabilities are more likely to have computers and use the Internet if they are employed than if they are not (Figure 3 and Table B).

But even when they do have jobs, people with disabilities are significantly less likely to gain access to these new technologies: Among employed people with work disabilities, 42.6 percent have computers and 26.4 percent use the Internet, compared to 56.9 and 44.0 percent of their non-disabled counterparts. All around, rates are significantly lower among those without jobs: Only three-tenths (28.9 percent) of those with disabilities have computers, and only about one-tenth (10.8 percent) use the Internet.

Educational Attainment

People who are well educated are far more like-

ly to have the skills, not to mention the financial resources, necessary to buy and use computer technology. But regardless of the level of educational attainment, people with disabilities have much lower rates of computer ownership and Internet use than their non-disabled peers (Figure 4).

Only one-eighth (12.7 percent) of people with disabilities who have not graduated from high school own computers. This figure compares with one-third (34.5 percent) of non-high-school-graduates without disabilities, almost half (46.5 percent) of college graduates *with* disabilities, and three-quarters (73.4 percent) of college graduates without disabilities.

Even more striking is the fact that only 2.4 percent of people with disabilities who lack high school diplomas use the Internet. Those without disabilities are almost 10 times as likely to connect (22.5 percent), and those with disabilities who have college degrees are still more likely (30.2 percent). But even this last group has less than half the likelihood of Internet use as college graduates without disabilities, almost two-thirds (63.9 percent) of whom are Internet users.

Family Income

Half (50.3 percent) of people with work disabilities have family incomes of under \$20,000 per year. For this group, buying a computer and paying the monthly fees of an Internet service provider may seem like a frivolous expense in relation to the basic necessities of life. Low-income

Figure 4. Computer and Internet use, by disability status and educational attainment, ages 15 and over.

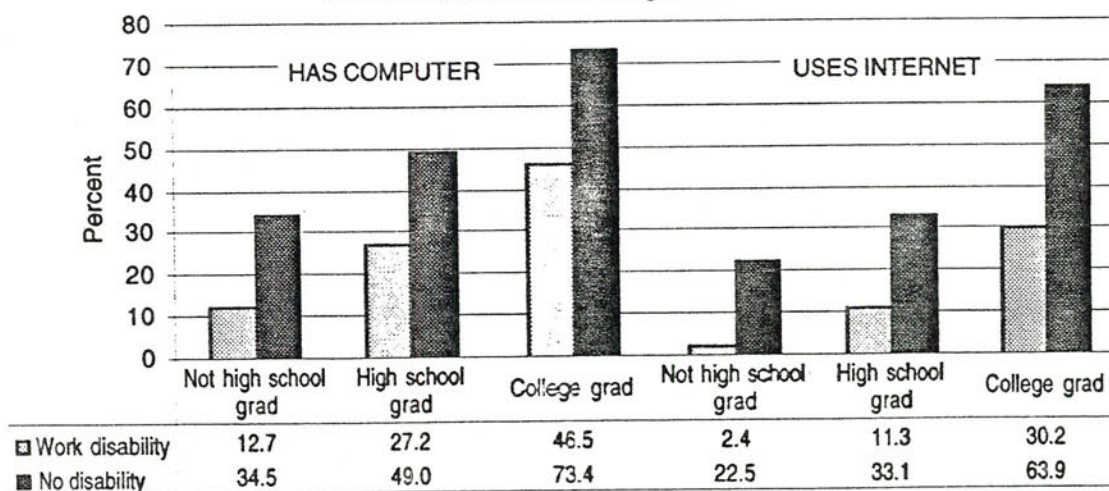


Figure 5. Computer and Internet use, by disability status and family income, ages 15 and over.

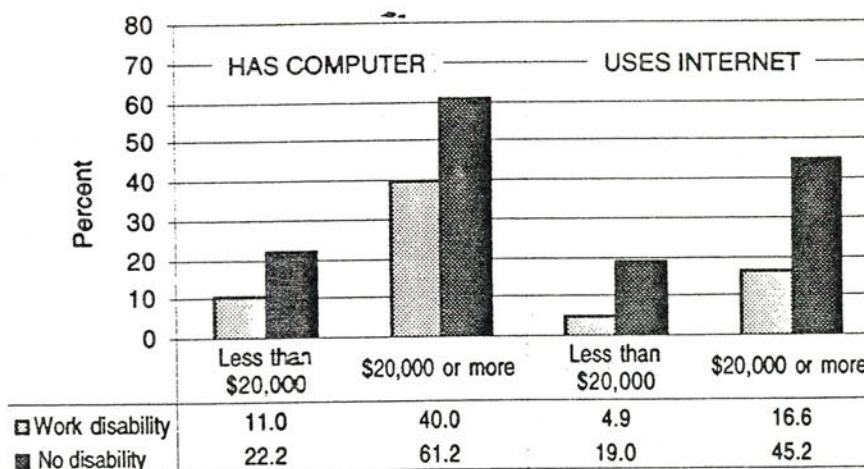


Table C. Household computer and Internet access, by race, ethnicity, and disability status of household members.

	With work disability					No work disability				
	Total households		Computer in household		Household has Internet access	Total households		Computer in household		Household has Internet access
	Number (1000s)	Number (1000s)	%	Number (1000s)		Number (1000s)	Number (1000s)	%	Number (1000s)	
All households	17,709	4,298	24.3	2,144	12.1	86,503	41,179	47.6	24,772	28.6
Race										
White	14,297	3,833	26.8	1,905	13.3	73,133	36,693	50.2	22,454	30.7
African American	2,910	311	10.7	141	4.8	9,879	2,602	26.3	1,130	11.4
Native American	208	43	20.7	41	19.5	583	228	39.1	143	24.6
Asian/Pacific Isl.	294	111	37.8	58	19.7	2,909	1,656	56.9	1,045	35.9
Ethnicity										
Hispanic	1,257	239	19.0	106	8.5	6,986	2,282	32.7	1,018	14.6
Non-Hispanic	16,452	4,059	24.7	2,038	12.4	79,517	38,897	48.9	23,755	29.9

Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement

Note: A household is classified as having a work disability if any member has a work disability. Race and ethnicity are those of the first person listed in the survey roster, generally the person in whose name the home is owned or rented. Households of Hispanic ethnicity are also included in the appropriate racial categories.

† Difference in rates between households with and without work disability is statistically significant at the 95% confidence level or better.

¥ Rate is significantly different from that of whites (for racial groups) or non-Hispanics (for Hispanics) at the 95% confidence level or better.

* Estimate has low statistical reliability (standard error exceeds 30 percent of estimate).

Table D. Reasons for using the Internet, by disability status, ages 15 and over.

	Work disability		No disability	
	Number (1000s)	%	Number (1000s)	%
All Internet users	2,076	100.0	72,300	100.0
Electronic mail	1,393	67.1	54,335	75.2
Search for info.	1,304	62.8	46,466	64.3
News, weather, sports	810	39.0	32,529	45.0
Courses, schoolwork	608	29.3	25,456	35.2
Job-related tasks	543	26.2	31,182	43.1
Shop, pay bills, etc.	353	17.0	16,255	22.5
Search for jobs	330	15.9	12,066	16.7
Other	498	24.0	13,075	18.1
Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement				

American households are much less likely than white households to have a computer (10.7 vs. 26.8 percent) or have access to the Internet (4.8 vs. 13.3 percent).

It is also worth noting that the rates for white households *with* disabilities (26.8 percent of which have computers and 13.3 percent of which have access to the Internet) are roughly equal to those of African American households *without* disabilities (26.3 and 11.4 percent, respectively). Thus, in comparing these populations, disability and race can be seen to be equally significant factors in determining the household's likelihood of exposure to computer technology.

Reasons for Internet Use

By far the most common reasons that people with disabilities cite for using the Internet are send-

ing and receiving electronic mail (1.4 million people, or 67.1 percent of the 2.1 million Internet users) and searching for information (1.3 million, or 62.8 percent; see Table D). These are also the two top-ranked reasons for Internet use among people without disabilities.

Four-tenths (39.0 percent) of Internet users with disabilities read the news online, check the weather forecast, or obtain sports scores. Three-tenths (29.3 percent) take courses over the Internet or use online resources to help with schoolwork. One-quarter (26.2 percent) of Internet users with disabilities use the Internet for job-related tasks, a significantly lower figure than the 43.1 percent of Internet users without disabilities, who are more likely to have jobs. One-sixth (17.0 percent) use the Internet for shopping, paying bills, or other commercial activities, and 15.9 percent use it to look for employment opportunities.

CONCLUSIONS

People with disabilities are perhaps the single segment of society with the most to gain from the new technologies of the electronic age. Yet they have among the lowest rates of use of these technologies. As a result, the potential benefits of computers and the Internet to the disability community are a long way from being realized.

The problem is largely one of access. Many people with disabilities are poor and can little afford a computer capable of navigating the Internet, the specialized software they might need in order to adapt it to their needs, and the monthly charges imposed for access to the Internet. Many people with disabilities, whether elderly or not, lack an awareness of the potential benefits of this technology, an understanding that, for themselves especially, a computer and an Internet connection could become not a toy, but an important tool with

which to gain greater independence and social integration.

The advent of lower-cost computing—including the free computers that come with an extended subscription to an Internet service provider—may help to make this technology more available. Simpler user interfaces, which would encourage use by people who are less comfortable with the technology, might also help people with disabilities to overcome any resistance they might have to exploring the Internet. But it seems clear that, in order to clarify the benefits that this technology can offer to the population with disabilities, a concerted program of education will be needed, along with training and support in the use of the hardware and software, before significant progress is made in closing the enormous gaps in technology access that have been identified in this report.

REFERENCES

- Bureau of the Census (1999). Source and Accuracy Statement for the December 1998 CPS Microdata File for Internet and Computer Use in the U.S. Available online at: <http://www.bls.census.gov/cps/computer/1998/ssrcacc.htm>.
- National Telecommunications and Information Administration (1999). Falling Through the Net: Defining the Digital Divide. Washington, DC: U.S. Department of Commerce, National Telecommunications and Information Administration. Available online at: <http://www.ntia.doc.gov/ntiahome/digitaldivide/index.html>.

The IT Workforce Shortage and the Skills Gap: A White Paper on Developing Resource Support and New Pools of Talent to Build the 21st Century Information Technology Workforce

Authors: Computing Technology Industry Association (CompTIA), Technology Workforce Coalition (TWC) and the National Cristina Foundation (NCF)

Executive Summary:

As we enter the new millennium, the workforce skills that made America great in the Industrial Age are not adequate to reach our potential in the Technology Age. This is the "Skills Gap". This white paper looks at solutions for filling the more than 600,000 IT openings among new pools of talent. This can be addressed through building resource support for Information Technology training through the creation of a *national computer re-utilization network*. The computer resources collected through this process would be directed toward training organizations that educate teens and young adults, veterans, unemployed or underemployed individuals and people with disabilities. Often these organizations and their students face the barrier of insufficient access to technology for skills training. Computing industry members and their customers will be asked to assist with this effort by contributing appropriate previously used technology to the computer re-utilization network.

To address the challenge that more than 50% of working-age adults with disabilities are not in the workforce, CompTIA will create on its website a centralized web resource, *the IT Employment Resource Center for People with Disabilities*. This will serve as a portal on all issues, information, programs and resources concerning career awareness, career ladder development, and recruiting, training, certifying and placing of individuals with disabilities in jobs within the IT industry.

In support of this web based resource center, a national coalition of organizations will be established. The coalition member are organizations that provide technology access and training to people with disabilities or represent constituencies who do so. They will be called upon to provide information about successful programs and practices and resources that can be shared and replicated across our nation and internationally by training organizations that prepare youth and adults with disabilities to become productive members of the IT workforce.

The IT Workforce Shortage and the Skills Gap

**A White Paper on Developing Resource Support and New
Pools of Talent to Build the 21st Century IT Workforce**

**Computing Technology Industry Association (CompTIA)
Technology Workforce Coalition (TWC)
National Cristina Foundation (NCF)**

September 21, 2000

"I have often said that we do not have a worker shortage in this country but a skills shortage. We must equip all Americans with the tools they need to succeed in the new economy, while at the same time provide businesses with the skilled workers they need to succeed in the global economy. "

- Alexis M. Herman, Secretary of Labor

THE INFORMATION TECHNOLOGY (IT) WORKFORCE SHORTAGE

*According to **Workforce Study: The Crisis in IT Service and Support**, a recent study conducted by the Computing Technology Industry Association, (CompTIA), there are currently more than 640,000 unfilled, available jobs in information technology (IT). At least 300,000 of these job openings are in computer service and support.*

Major survey findings concluded that:

- Staffing and training issues are among the most challenging issues facing chief information officers.
- One in ten IT service and support positions remains unfilled.
- Companies have had only marginal success in filling these open positions.
- IT managers expect only marginal improvements in the availability of qualified IT service and support staff.

Impact of Shortage of IT Service & Support Workers

- Shortages of IT service and support staff affects every aspect of a company.
- As a result of this shortage, final demand in the entire economy is reduced by \$105.5 billion annually.
- The estimated productivity loss resulting from computer labor shortage is \$4.5 billion annually.
- Household income for all consumers is also reduced by \$37.2 billion annually because of this shortage of qualified IT service and support professionals.
- This reduced personal (household) income also reduces income tax revenue for the Federal and state governments--*creating an even larger impact.*
- This shortage has a ripple effect in the entire U.S. economy

Because of lower spending on the output of business services, 1.6 million jobs throughout the entire economy cannot be created as a result of resulting IT service and support vacancies. Most companies have to outsource in order to meet their IT service and support requirements.

THE “SKILLS GAP”

“Worker skills will be the most serious competitiveness hurdle for the United States in the next decade “. Council on Competitiveness

The American Economy is at a crossroads. As we enter the new millennium, the shift from a manufacturing to a knowledge economy is accelerating. But the workforce skills that made America great in the Industrial Age are not adequate to reach our potential in the Technology Age. This is the “Skills Gap.”

All users of technology are affected by the Skills Gap. It goes beyond the high tech stereotype, to every organization that uses computers to get its business done - public and private, large and small, commercial and not-for-profit.

The size of the Gap is significant. A recent Microsoft study estimates the Skills Gap at 600,000 unfilled IT jobs. CompTIA and others believe this is due to:

The shortage of new “recruits” entering the IT industry.

A lack of training to keep pace with the new skills demanded by rapidly evolving technologies.

The societal costs of the Skills Gap are significant

For businesses, the greatest cost may be lost opportunities. Without enough people with the right skills, sales are not made. Prospects are not called. Customers are not serviced. Projects are postponed. And opportunities are unmet. On the socio-economic level, not filling the Skills Gap will hurt increased economic productivity, growth in wages, corporate earnings and the tax base. Just focusing on the 300,000 positions that do not require computer science higher education (according to Microsoft), American society stands to benefit substantially if it can create effective programs to fill those positions.

Confronting the “Skills Gap”

CompTIA

CompTIA, the Computing Technology Industry Association, is a not-for-profit trade association, founded in 1982. Today it represents more than 10,000 companies and professional IT members in the rapidly converging computing and communications market. These include computer hardware and software manufacturers, distributors, retailers, e-tailers, resellers, VARs, system integrators and training, service, telecommunications and Internet companies in more than 50 countries. CompTIA provides a unified voice for the industry in the areas of e-commerce standards, vendor-neutral certification, service metrics, public policy and workforce development. More than a quarter of a million individuals worldwide have earned CompTIA certifications in PC service, networking, document imaging, and Internet related skills.

JOBS+ Workforce Development Initiative

JOBS+, CompTIA’s IT Career Management Program, is a solution to a supply-and-demand equation where the need for employees currently far exceeds the pool of talent. CompTIA and the JOBS+ workforce development program has a goal to recruit, train, certify and place 200,000 new employees in entry-level, information technology positions nationwide by 2004. New pools of talent must be developed in order to make an impact on the workforce shortage and achieve this aggressive goal.

While we will always need “tool and die” industrial workers, the real employer demand is for titles like “Network Engineer” and “Service Field Technician.” These are the jobs that can provide a meaningful career path in the Information Age, feeding families, educating the young, and meeting the needs of society. However, the way for acquiring the skills necessary for entry into computer related jobs is often blocked for individuals who might otherwise choose Information Technology as a career goal such as people with disabilities, inner city students, and targeted groups of individuals who are unemployed or under-employed.

Technology Workforce Coalition

TWC was created by CompTIA and the Information Technology Training Association in 1999 and now includes a dozen IT associations and over 500 companies. TWC advocates federal and state level solutions including IT training tax credits, H-1B temporary visas, K-12 curriculum changes, and teacher training incentives to address the shortage. While TWC supports a multi-faceted approach, it believes that IT training tax credits will have the greatest impact. TWC has helped introduce IT training tax credit legislation in Congress to provide employers or individuals with a tax credit that pays for 100% of the first \$1,500 of IT training expenses that lead to certification. State level tax credit bills were enacted in Arizona in April 2000, and passed in Maryland in 1999. State level coalitions are forming in CA, FL, LA, MA, NC, PA, TX, VA, and WA.

Closing the “Skills Gap” with New Pools of Talent

The challenge of locating sufficient technology resources so that traditionally underrepresented workforce populations can be effectively trained could be met through the tapping of an important source of equipment—the virtual inventory of computer technology that is retired each year as companies upgrade their installed base. These numbers are significant.

Installed Base of Personal Computers - United States

(Thousands)

	1995	1996	1997	1998	1999	2000	2001
Installed Base	71,930	85,524	101,922	116,388	126,823	137,466	152,030
Retirements	10,838	12,056	14,402	21,084	30,285	35,556	40,836

Dataquest, Spring 1998

Rather than sold at a fraction of their original acquisition price, retired computer equipment could provide considerable bottom-line benefits to the corporate sector if they were donated to not-for-profits and public agencies as tools for skill development and job training. Through the contribution of their used technology, business would be making an important investment in workforce development. Additionally, they would be gaining efficient, cost-effective disposal models for their used equipment as well as tax benefits.

Incentives for the Training of People with Disabilities, Minorities, and Economically Disadvantaged Persons

A universal challenge to increasing the technology workforce is the cost of IT training and retraining. If these costs can be effectively reduced for businesses or individuals who pay for that training, more training will result. The greatest opportunities for these individuals is in the technology workforce, i.e. computer technicians, networking and Internet professionals etc. Training for certifications in those areas can be completed by a high school graduate in 3-12 months, and many courses are available online. The time and costs are far less than a four-year degree in an IT related curricula.

Both democrats and republicans have embraced this concept. The recently revised bipartisan house bill and one bipartisan senate bill provide tax credits for qualified IT training. Both feature additional incentives for targeted audiences (i.e. disadvantaged and minorities) and democratic and republican lead sponsors agree that it would be entirely appropriate to expand this group to include the disabled. Vice President Gore has endorsed the concept and discussions are underway with house leadership to include the new house version in the tax package that is being negotiated with the Administration.

A National Computer Re-utilization Network

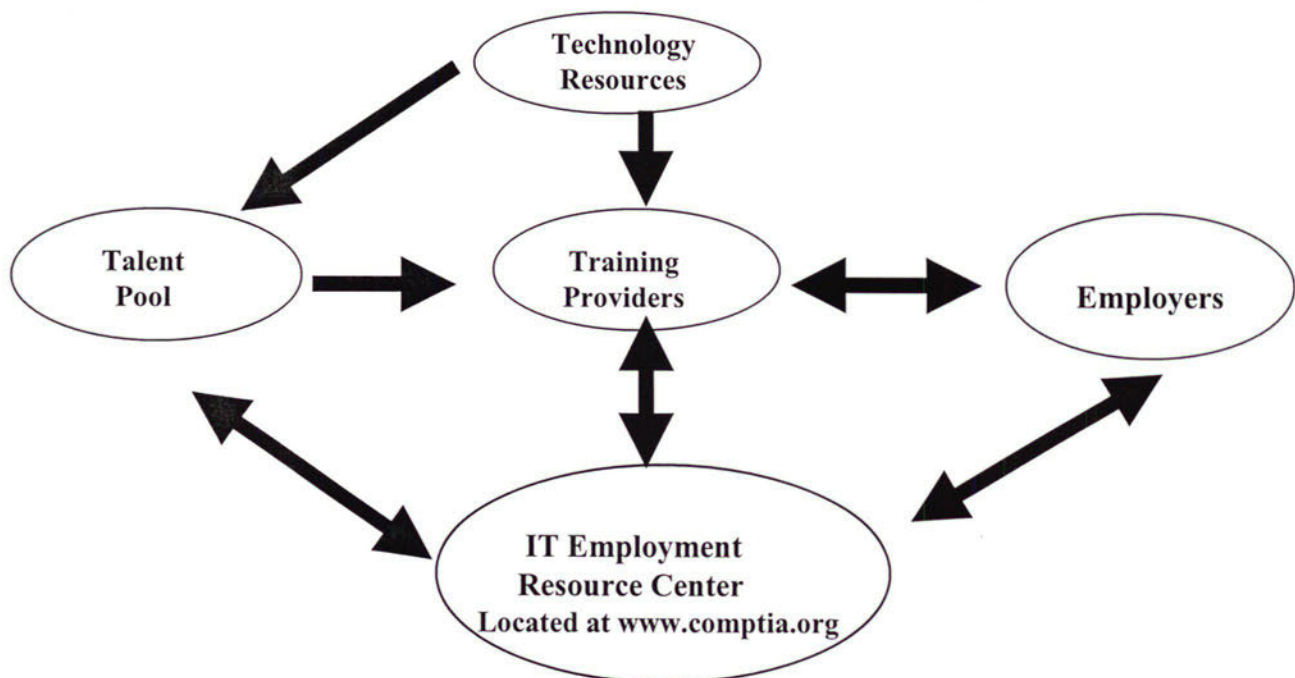
A national computer re-utilization network would provide an important weapon to address the Digital Divide that has kept potentially eligible youth and adults from moving into the IT workforce. Schools, homes and community settings that are frequently the last to get sufficient access to technology would be able to acquire tools necessary to support IT training. *The New Millennium Classrooms Act*, if passed by Congress, could speed the transfer of fairly current technology through increasing tax incentives for corporations that donate technology to classrooms in schools and adult training settings, particularly to locations where they are greatly needed.

Despite a 1999 U.S. unemployment rate of 4.1%, a 29 year low, more than 50% of working-age adults with disabilities are not in the workforce (Presidents' Committee on Employment of People with Disabilities, 1999). *The Work Incentives Improvement Act of 1999* can expand access to additional employment resources and allows individuals to keep their health care benefits while they attempt to enter the workforce. For achieving successful careers in the IT industry access to computers and training must be provided. Many need these options to be made available to them.

As America moves into the age of information and global competition, it becomes increasingly important that we make critical investments in the knowledge, education and skills of our workers. Today, tomorrow and far into the future, a highly skilled workforce is and will be our competitive advantage.

Developing Resource Support and New Pools of Talent to Build the 21st Century IT Workforce

JOBS+ is creating important support to increase the employment of underrepresented populations within the IT industry:



- JOBS+ is **building training and career awareness partnerships and programs** with CompTIA member IT firms, education and various training organizations and with government. These alliances are creating curriculum models, defining industry approved instructional skill sets and providing IT job information.
- JOBS+ and the National Cristina Foundation, are working together to **build a national computer re-utilization network** to ensure that people with disabilities, teens and young adults, and unemployed and under-employed persons will have sufficient access to computer technology for the training tools and hands-on experience essential for acquiring the skills needed for employment within the IT industry. Model training programs will be selected as pilots at specifically determined locations in cooperation with CompTIA members and organizations who engage in training. Successful pilots will lead to broad replication by training providers both within the computing industry and in the educational and training community. CompTIA member companies and their customers will be asked to donate their used and excess computer technology to assure that these training locations will have sufficient technology available to help build IT career skills among new pools of talent that can help solve the Skills Gap within the IT industry.
- Specifically aimed at increasing the employability of people with disabilities within the Information Technology (IT) industry, CompTIA has developed a proposal to create on its web site an **IT Employment Resource Center for People with Disabilities**. This centralized web resource will be a portal for all issues, information, programs and resources for recruiting, training, certifying and placing individuals with disabilities in jobs within the IT industry. Such information as industry skill standards, job profiles, and model curricula for certification training will be provided. JOBS+ is currently seeking funding from corporate and private foundations to build the site and bring it live.
- In their joint commitment to bring IT career opportunities to new pools of talent, CompTIA's JOB's+ Workforce Development Initiative and the National Cristina Foundation will launch a **national coalition of organizations** who provide technology access and training to people with disabilities or represent constituencies who do so. These organizations will contribute to the data collected by the **IT Employment Resource Center for People with Disabilities** information about successful programs and practices and resources that can be shared and replicated across our nation and internationally by training organizations that prepare youth and adults with disabilities to become productive members of the IT workforce.

Inaugural organizations participating in the creation of the National Coalition for building IT skills for people with disabilities include the following:

THE NATIONAL CRISTINA FOUNDATION

The National Cristina Foundation (NCF), a not-for-profit public charity, created a national distribution channel in 1984 for the donation of used computers to people with disabilities and economically disadvantaged persons. The Foundation is highly experienced in fostering computer re-utilization partnerships at the local, state, national and international level, to date providing support to millions of people. Since its inception, NCF has placed particular priority on providing access to computer technology tools to organizations that train people with disabilities to help them lead more independent and productive lives.

The Foundation has worked closely with CompTIA for many years to educate its members and their customers about effective ways their used or obsolete technology could provide assistance to people of all ages who need access to technology tools for independent living and skills training.

NCF has had long practice in coordinating the distribution of donated technology throughout the United States and abroad. There are never any fees neither to donors or to recipient organizations. The NCF Re-utilization Model™ provides an effective systems approach to helping communities help themselves. In kind support and volunteer assistance are basic in NCF's approach to building community based solutions that effectively put used computers back to work again.

ALLIANCE FOR TECHNOLOGY ACCESS

The Alliance for Technology Access (ATA) is a nationwide network of 40 community-based, consumer-driven technology resource centers that serve consumers with disabilities and their families as well as schools, health professionals, and other community groups. ATA technology centers work in collaboration with approximately 80 vendors of conventional and assistive technology; and a growing number of allied organizations and individuals to increase access to technology for children and adults with disabilities.

ASSOCIATION OF WORKFORCE BOARDS

COMMUNITY OPTIONS

Community Options, Inc. was incorporated in 1989 as a non-profit in New Jersey dedicated to advance the social and economic independence of persons with the most significant cognitive and physical disabilities. Since 1998, their center on innovation in Washington DC is building a progressive research, training, and demonstration agenda to address leadership development, employment and technology issues. The Center's research and information dissemination activities are reaching policymakers and persons with disabilities in all fifty states. Key priority areas that Community Options focus on include projects that address the independence and productivity of individuals with significant disabilities in housing and employment and the placement of these individuals in jobs earning better than minimum wage in small and large diverse business settings.

EASTER SEALS

Easter Seals was founded in 1919. One of the first organizations established to help people with disabilities, its mission is to help create solutions that change lives for children and adults with disabilities or other special needs and their families. Easter Seals primary services - - medical rehabilitation, job training and employment, inclusive child care, adult day services and camping and recreation - - benefit more than one million individuals and their families each year at one of over 400 centers nationwide.

GOODWILL INDUSTRIES INTERNATIONAL

HIGH SCHOOL/HIGH TECH PROGRAM

The High School/High Tech Program has been established by the President's Committee for the Employment of People with Disabilities. The Program is building sites across the United States that provide opportunities for students with disabilities to explore careers in science, mathematics and technology and intends to coordinate with this national coalition for building IT skills for people with disabilities.

NATIONAL COUNCIL ON INDEPENDENT LIVING

NATIONAL ASSOCIATION FOR STATE DIRECTORS OF SPECIAL EDUCATION (NASDSE)

NASDSE, a not-for-profit corporation established in 1938, promotes and supports education programs in the United States and outlying areas. Specifically, NASDSE operates for the purpose of providing services to State agencies to facilitate their efforts to maximize educational outcomes for individuals with disabilities. NASDSE serves as the contact through all of the nation's State Directors of Special Education for dissemination and feedback of information. Since its inception, NASDSE has been at the forefront of debate and policy development concerning the education of individuals with disabilities.

NASDSE has been a provider of distance education in assistive technology, and has worked with the National Cristina Foundation to support the donation and re-use of technology throughout the United States.

NATIONAL FEDERATION FOR THE BLIND

RESNA

Founded in 1979 as a not-for-profit professional organization, RESNA is an interdisciplinary association of people with a common interest in technology and disability. Currently its membership includes 150 organizational members and over 1400 individuals. RESNA's purpose is to improve the potential of people with disabilities to achieve their goals through the use of technology. That purpose is served by promoting research, development, education, advocacy, and the provision of technology and by supporting the people engaged in these activities.

Sponsored projects currently include technical assistance to the *Assistive Technology Act* State Projects. Previous projects have included quality assurance in Assistive Technology Service Delivery project which produced the Assistive Technology Knowledge and Skills Guidelines and training for AT professionals in outreach to underserved populations.

UNITED CEREBRAL PALSY

United Cerebral Palsy (UCP) is a national organization established more than 50 years ago. Its nationwide network of 135 affiliates strives to ensure the inclusion of persons with disabilities in every facet of society- from the Web to the workplace, from the classroom to the community. UCP's mission is to advance the independence, productivity and full citizenship of people with cerebral palsy and other disabilities, through their commitment to the principles of independence, inclusion and self-determination.

Impact of Human Capital Development on the IT Workforce

- Enables at risk students, people with disabilities, and economically disadvantaged persons to embark on career path training to become productive workers who can participate in the 21st Century economy.
- 300,000 new service jobs would directly create \$15 billion in new wages annually, which will generate approximately \$4 billion in new federal, state and local taxes.
- By filling IT jobs with qualified individuals, industry can create \$187 billion in new annual revenue while reducing the high cost of recruiting and retaining employees.
- Finally, our country can maintain its pre-eminent position as the world's leader in the information-based economy.