SPEED MATTERS

AFFORDABLE HIGH SPEED INTERNET FOR ALL

A COMMUNICATIONS WORKERS OF AMERICA POLICY PAPER

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Speed Matters:
Affordable High Speed Internet for All

The telecommunications industry is at a critical juncture. The emergence of a new telecommunications system—one based on high-speed interactive networks designed for voice, data, and video communications—opens up tremendous opportunities for improving the quality of our economic, civic, and personal lives. While most attention has been focused on entertainment and gaming the real story is that advanced high capacity communications networks have become essential to economic growth and can increase democratic and civic participation, improve the delivery of health care, education, job training, public safety and other vital services.

However, the United States has failed to bring the benefits of this telecommunications revolution to most of our population. While more households are adopting broadband, our relative position in the world is worsening. We have fallen to 16th among the major industrialized nations in terms of broadband adoption even though we were the home of the computer and the Internet. This is not surprising since we spend relatively less as a nation on telecommunications investment and we spend relatively more as consumers for slower speeds. For example, the Japanese can obtain broadband connections with 8.5 times the speed but at one-twelfth the cost. To make matters even worse, there is a substantial digital divide that separates access to high speed Internet based on income and geography.

We are falling behind because the United States is the only industrialized country without a national policy to promote high speed broadband.[1] Instead, we have relied on a hodgepodge of fragmented government programs and uneven private sector responses to changing markets.

It is now time for the United States to adopt a comprehensive national high speed broadband policy to ensure that we all benefit from the telecommunications and information revolution. Throughout our history we have been able to benefit from major technological advances because we adopted national policies to ensure their widespread and equitable deployment. In the 19th century we adopted policies to develop canals and a national railroad system. In the 20th century we instituted policies to develop national telephone and highway systems. It is now the 21st century but we still do not have a national high speed broadband policy.

There are a number of bold but specific steps that the United States should take to recover our lost leadership and competitive position and to ensure that all residents have the ability to benefit from high speed Internet access.

1 As used in this paper, high speed broadband or high speed Internet access refers to connection speeds of at least 2 megabits per second (mbps) downstream and one mbps upstream. This differs significantly from the Federal Communications Commission (FCC) which defines "high speed services for Internet access" as transmission speeds of at least 200 kilobits per second (kbps) in one direction and "advanced services" as transmission speeds of at least 200 kbps in both directions. As will be discussed, the FCC's definitions are inadequate because many Internet applications require speeds greater than 200 kbps.

There are five key goals that should guide policy makers in this effort to obtain universal, affordable access to high speed internet services.

- **SPEED AND UNIVERSALITY MATTER FOR INTERNET ACCESS.** It is important to realize that Internet access alone is not enough. Truly high speed, universal networks are needed to obtain the full benefits of the information and technology revolution including further technological innovation, job growth, telemedicine, distance learning, rural economic development, public safety and e-government.

- **A NATIONAL HIGH SPEED INTERNET FOR ALL POLICY IS CRITICAL.** The U.S. should not only adopt policies for affordable universal access but should also set specific timetables to ensure that an infrastructure with adequate capacity is actually deployed. A reasonable initial national goal would be an infrastructure with enough capacity for 10 megabits per second (mbps) download and 1 mbps upload speeds by 2010. This national goal would be increased periodically to reflect changes in technological progress and the public's need for greater capacity.

- **THE U.S. DEFINITION OF "HIGH SPEED" IS TOO SLOW.** The Federal Communications Commission (FCC) defines "high speed" as just 200 kilobits per second (kbps) in one direction. This inadequate measure undermines any realistic assessment concerning the actual deployment and adoption of "high speed" Internet. Instead, government should immediately set "high speed" at 2 mbps downstream and 1 mbps upstream.

- **THE U.S. MUST PRESERVE AN OPEN INTERNET.** High speed, high capacity networks will eliminate bandwidth scarcity and will promote an open Internet. Consumers are entitled to an open Internet allowing them to go where they want, when they want. Nothing should be done to degrade or block access to any websites. Reserving proprietary video bandwidth is essential to finance the build-out of high speed networks.

- **CONSUMER AND WORKER PROTECTIONS MUST BE SAFEGUARDED.** All residential and business customers should be protected by basic consumer and service quality protections no matter where they live, which carrier they choose or what technology is used to provide their services. Quality service depends primarily on sufficient investment in telecommunications infrastructure and adequate staffing provided by trained, well-compensated career employees. Public policies should support the growth of good, career jobs as a key to quality service.

The CWA makes the following specific policy recommendations (see Appendix One for a more detailed list).

- **DEVELOP A BROADBAND MAP OF AMERICA — A RELIABLE DATABASE TO IDENTIFY GAPS IN AVAILABILITY, PRICE AND SPEED.** A broadband map would provide an infrastructure assessment of broadband availability throughout the U.S.

- **REQUIRE PUBLIC REPORTING OF ACTUAL BROADBAND SPEEDS & RELIABILITY.** Currently, consumers do not know exactly what broadband speed they are getting. In many cases, delivered speeds are quite different from advertised speeds. The government should develop a standard and a reporting mechanism that consumers can use to evaluate the speed and reliability of the broadband services provided in the market. The Environmental Protection Agency (EPA) estimated mileage standards represent a similar effort to inform customers.

- **CREATE A CONNECTAMERICA PROGRAM — A PRIVATE-PUBLIC PARTNERSHIP TO PROMOTE DEPLOYMENT AND DEMAND AT THE LOCAL COMMUNITY LEVEL.** This joint federal, state and local government, community, labor and private sector initiative would identify areas with and without high speed broadband and work together to stimulate investment and demand.

- **STIMULATE INVESTMENT** through tax incentives, universal service fund reform, grants to emergency responders for high speed broadband and leveraging public monies.

- **ENSURE AFFORDABLE ACCESS**. The Universal Service Fund low income program should be expanded so that consumers can obtain assistance in purchasing broadband in addition to the current program's sole focus on voice services.

- **STIMULATE DEMAND** by providing education programs, making government agencies more efficient by utilizing high speed broadband, and subsidizing computer and high speed broadband for schools, libraries, community centers and low income families.

- **ESTABLISH OVERSIGHT, ACCOUNTABILITY AND REPORTING.** Government agencies and regulatory bodies should not only monitor the development and progress of such policies but also their enforcement in relation to deadlines, penalties and the protection of consumer rights.

- **ENSURE HIGH QUALITY JOBS AND SERVICES.** Policies should support stable employment for communications workers and ensure a level regulatory playing field by requiring all providers to meet the same high standards for service quality and consumer protections.

- **ESTABLISH AN OFFICE OF TELECOMMUNICATIONS.** An Office of Telecommunications in the White House would be responsible for implementing and administering a coherent and consistent national telecommunications policy — as opposed to the current system that is characterized by bureaucratic fragmentation.

- **ENCOURAGE STATES TO ADOPT HIGH SPEED BROADBAND POLICES** in order to promote economic development, civic participation and an improved quality of life.

This position paper consists of five separate parts. The first provides a working definition of high speed broadband and provides examples that illustrate why it is necessary. The second part identifies some of the consequences resulting from our failure to enact a national policy for universal high speed broadband. The third part focuses on the importance of such a policy for jobs and quality services. The fourth part provides examples of other countries that have successfully implemented national policies. The final part provides a list of specific policy recommendations. By adopting these recommendations the United States would utilize the power of both the public and private sectors to promote the common welfare.

Why High Speed Broadband Is Necessary

High speed broadband is interactive, always on, two-way communications provided by a host of different technologies including telephone lines, cable modems, fixed and terrestrial wireless, and fiber optics to the home. It is a connection platform, a gateway to information and services.

The issue of broadband capacity and speed is critical because it defines what is possible. Dial-up connections of 56 kilobits per second (kbps) or DSL connections of 200 kbps (the FCC definition of high speed) are too slow for many important applications. Some countries have already established goals of 100 megabits per second (mbps) both in terms of download and upload speeds. In the U.S., speeds most often range from 1 to 3 mbps download and 50-384 kbps upload. Yet, even these speeds are too slow; for example, 6 mbps are needed for such important interactive features as videoconferencing.

Broadband Applications & Speeds [2]

Download Speed	Application	Technology
56 kbps	Low Quality, Streamlining Audio	Dial Up
200 kbps	FCC Definition of High Speed	DSL Lite: (256 kbps)
1 mbps	Streaming Video	Satellite, DSL, Cable
2.5 mbps	High Resolution Neurological Testing	DSL, Cable
4 mbps	Standard TV	DSL, Cable
6 mbps	Videoconferencing	DSL, Cable
20 mbps	High Definition TV	ADSL
100 mbps	All	Fiber

Source: S. Derek Turner, Broadband Reality Check, Free Press, August 2005

The following examples illustrate the benefits that can be obtained from truly high speed Internet networks.

ECONOMIC GROWTH & QUALITY JOBS. Investment in building high speed networks creates jobs that have historically been union-represented and, thus, provide relatively high wages and good benefits.[3] In addition, the revolution in the development of applications not only creates jobs but also many opportunities for innovation, growth, and e-commerce. A recent

2 Consumers may not obtain the speeds listed in this chart for a number of reasons. For example, congestion can slow speeds because broadband providers may not have built up the infrastructure between the central office and the Internet backbone or more users are sharing the "pipe" at the same time.

3 The largest employers in the telecommunications sector are the union-represented network carriers such as AT&T, Verizon, Qwest, and BellSouth and Cingular Wireless. For more detail see the section entitled "The Need to Protect High Quality Jobs and Services."

paper utilizing data from 1998-2002, found that the availability of broadband in communities added over 1% to the employment growth rate, an 0.5% increase in the growth of business establishments, and an 0.5% increase in the share of establishments represented by Information Technology firms.[4] A number of reports using forward-looking economic models have calculated that broadband would add $500 billion to GDP and 1.2 million additional jobs from the construction and use of a nationwide broadband network.[5] Another paper warned that the failure to improve broadband performance could reduce U.S. productivity by one percentage point or more per year.[6]

TELEMEDICINE. High speed interactive broadband with instantaneous contact between health professionals and patients enables remote monitoring, efficient chronic disease management, and more effective responses to emergencies. Traditional health care allows face-to-face interaction between provider and patient. However, in some settings this system encounters obstacles including distance and time restraints. High speed broadband augments current medical services by using technology to make health care more accessible, cost effective and flexible.

For example, broadband has allowed doctors in Georgia to save lives and minimize the potentially devastating impact of strokes on rural Georgians. The REACH system connects the Medical College of Georgia's neurology department with 10 rural Georgia hospitals.[7] When a patient has a stroke, there is a 3-hour window for doctors to determine whether the stroke is caused by clotting or bleeding, and administer life saving/enhancing medicine. However, the medicine that saves individuals suffering from a stroke caused by a clot will be devastating to individuals suffering from a stroke caused by bleeding. Thus, an examination by an experienced professional is required. Most often, there is little possibility of getting a stroke victim from rural Georgia to the few urban hospitals that have access to stroke specialists within the three-hour window. Once a stroke patient is taken to a rural community hospital, the Reach program — using high speed broadband — allows a doctor anywhere in the world with access to a computer to conduct a quick examination of the patient, determine the type of stroke, and prescribe the correct medicine. Specifically, the physician at the community hospital calls the "tertiary" medical center which contacts an on-call neurologist. The neurologist assesses the patient through the REACH system via the Internet, examines the patient's responses to certain physical directions via video, assesses the patient according to the NIH stroke scale and prescribes the correct medicine. Rural Georgians have benefited from this program. Broadband does not improve the REACH program; it makes the REACH program possible.

4 Lehr, William, Carlos Osorio, Sharon Gillet, Marvin Sirbu, Measuring Broadband's Economic Impact, Presented at the 33rd Research Conference on Communication, Information and Internet Policy, Revised January 17, 2006.

5 Crandall, R. and C. Jackson: Broadband: The $500 Billion Opportunity: The Potential Economic Benefit of Widespread Diffusion of Broadband Internet Access," Criterion Economics, 2001. Pociask, S. Building a Nationwide Broadband Network: Speeding Job Growth, prepared for the New Millennium Research Council by TeleNomic Research, available at http://www.newmillenniumresearch.org/event-02-25-2002/jobspaper.pdf.

6 Ferguson, C. The United States Broadband Problem: Analysis and Recommendations. Brookings Institution Working Paper, 2002.

7 REACH stands for Remote Evaluation of Acute Ischemic Stroke.

EDUCATION & INTEGRATED LEARNING. The dynamic of two-way communication, discourse and conferencing allows students and teachers to minimize the obstacles of distance and maximize the potential of simultaneous voice, data, and video sharing. For example, the Milwaukee public school system used the federal E-rate program to construct an advanced broadband network for its schools — fifty-five of which have access to two-way video. The schools are utilizing the interactivity to augment learning by partnering with outside groups. A program called Classes and Courtrooms brings judges and middle school social studies students together to discuss how the court system works. Discovery World, a local community-based organization, offers math and science programs. Former students who are now in college connect with current high school students to discuss life after high school. Rather than directing students to websites, the interactivity presents real-time information that brings classroom lessons to life. Milwaukee also is using the technology for administrative and training purposes.[8]

WORKER TRAINING. The National Coalition for Telecommunications Education and Learning is a partnership between leading telecommunications employers and the CWA and IBEW. It allows workers to take online courses leading to a two-year associate college degree in Telecommunications. The CWA/Nett Academy provides online training and certification including the only online Cisco certification and training program in combination with hands-on activities directed by trained CWA proctors in CWA union halls. Broadband would allow streaming audio-visual material and real-time two-way conversations among students and faculty.[9]

E-GOVERNMENT & CIVIC PARTICIPATION. Governments increasingly rely on the Internet as the means to provide information and forms for taxes, government programs, eligibility criteria, and other uses. People without access to such information are, in effect, penalized. Enrollment in the Medicare Part D drug plan relied on web-based communications. In addition, high speed interactive broadband should allow citizens to increase and improve their ability to participate in civic life; for example, not only could government meetings be opened to public view by many more citizens but the ability to interact with public officials should be significantly enhanced through two-way video broadband technology.

PUBLIC SAFETY & FIRST RESPONDERS. Access to high speed broadband is increasingly important for police, fire and emergency medical personnel as a means to respond to crises in this post 9-11 world. More than 90% of the nation's public safety infrastructure is financed, owned, operated, and maintained by more than 60,000 separate, independent local jurisdictions and police, fire and emergency services. Public safety personnel operate on 10 different frequency bands, and their equipment, sometimes more than 30 years old, is frequently incompatible.[10] When Hurricane Katrina hit, emergency responders from different jurisdictions used different frequencies and could not communicate. High speed broadband would enable first responders to share text, image and video across jurisdictional barriers. Fire incident commanders could monitor and direct their units via voice, video and data-enhanced communications either at the scene or remotely. Knowing the exact location of firefighters in a building could mean the difference between going home to a family — or not.

8 Alliance for Public Technology and the Benton Foundation, A Broadband World: The Promise of Advanced Services, 2003.

9 Alliance for Public Technology and the Benton Foundation, A Broadband World: The Promise of Advanced Services, 2003.

10 Tom Ridge, Helping First Responders, The Washington Times, June 5, 2006.

INDEPENDENT LIVING. High speed Internet can help senior citizens and people with disabilities live independently, improve their quality of life, increase participation in economic and civic life and reduce costs of care. However, these benefits can only be realized if high speed broadband is available in all environments. For example, the advances made through audio technology can improve opportunities for individuals who are blind. Text can be converted to audio and made completely navigable for a blind person. This information can either be downloaded or examined in real time over a broadband connection, rather than waiting for the information to be presented on CD-ROM or other conventional devices. This allows access to many types of printed materials, including textbooks, newspapers, and government reports. Broadband is not only important for transmission of video. Audio requires large amounts of bandwidth making the high capacity of broadband necessary in order to ensure that people who are blind can utilize information as they choose. Accessibility is one of the most inspiring developments in broadband. This technology can overcome many of the barriers that have been faced by people with physical limitations.

Another example is provided by real-time sign language interpreting. Sign language interpreters have become commonplace. Deaf people need interpreters for routine tasks such as going to the doctor or just to have a conversation with a friend. This process requires scheduling an appointment with the interpreting agency, coordinating with the doctor's schedule, waiting for the interpreter and then sometimes being unable to finish a conversation if the interpreter must leave. However, high speed broadband enables video conferencing which means that the interpreter does not have to travel to different locations. Clients can utilize this system when and how they need, without being tied to the schedule of the interpreter while interpreters can serve more clients by not losing travel time between sites.[11]

RURAL DEVELOPMENT. Technology can break down the barriers of distance allowing residents of more remote communities to participate fully in economic and civic life. For example, farmers and ranchers increasingly need broadband for monitoring weather, market quotes, crop reports, and quicker access to parts and feed/seed suppliers. One report found that broadband saved a parts supplier 1-3 hours per day and improved service quality.[12] Rural businesses also can use broadband to expand markets and increase access to such critical services as banking, accounting, order fulfillment, and freight forwarding.

Broadband also allows rural communities to attract businesses and individuals that would not be able otherwise to live and work in rural communities. Broadband also opens up educational and health care opportunities to rural communities that otherwise would function as barriers to economic development. For example, broadband has allowed Indian nations to develop tourism, advertise native products, and create culturally relevant curricula for students.

But even as this modern, high-technology network is being rapidly constructed, government and regulators face tough choices to ensure that the benefits of these technological developments flow not only to those who can afford the most advanced network services, but to all residents, regardless of income or geography.

11 Alliance for Public Technology and the Benton Foundation, A Broadband World: The Promise of Advanced Services, 2003.

12 Alliance for Public Technology, Grange Technology Project, February 11, 2005.

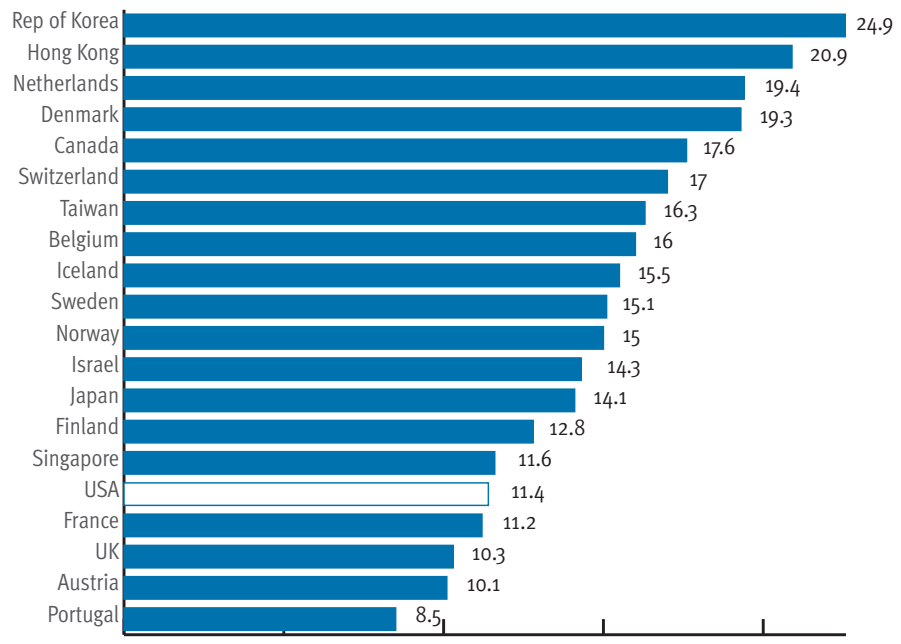
13 Karen Buller, National Indian Telecommunications Institute.

Current Polices Are Failing as the U.S. Falls Behind Other Countries

The United States — the country that invented the Internet — has fallen behind many countries in terms of broadband adoption. Our reliance on market forces, deregulation, and inadequate governmental programs has not served us well. We invest relatively less on telecommunications; we are charged more for slower speeds; millions encounter a significant digital divide based on income and geography; and unionized jobs with relatively good wages and benefits are being replaced by low-wage jobs with less training and higher turnover.

THE U.S. IS FALLING FURTHER BEHIND OTHER COUNTRIES. From 2002 to 2005 the U.S. fell from 11th to 16th in the world in terms of the percentage of residents with broadband subscriptions, ranking behind such countries as Japan, Korea, Sweden, Canada, and Switzerland just to name a few.[14]

Broadband Subscribers Per 100 Inhabitants



Source: International Telecommunications Union, January, 2005

14 International Telecommunications Union, World Telecommunications Indicators Database 2006.

U.S. CONSUMERS PAY MORE FOR SLOWER SPEEDS. In the U.S., DSL generally reaches speeds of up to 1.5 — 3.0 mbps at a price averaging $30-$50 per month (not including fees) while cable modems generally reach speeds of 3-5 mbps for $40-$50 per month. In Japan, the cost of an average connection with the speed of 26 mbps costs about $22.[15] The contrast is even more striking when expressed in terms of cost per 100 kbps. The top speed generally available in Japan is 51 mbps at a cost of $0.06 per 100 kbps. The top speed generally available in the U.S. is 6 mbps available at a cost of $0.72 per 100 kbps. In other words, the Japanese have 8.5 times the speed at 1/12 of the cost.

Broadband Speed and Data Prices in Selected Countries

Country	Provider	Type	Price $/month	Speed Down mbps	Speed Up mbps
Canada	Bell Canada	ADSL	$48.81	5	0.8
	Cogeco	Cable	$68.29	10	1
France	France Telecom	ADSL	$72.12	8	1
	Noos	Cable	$42.73	10	
	Free	ADSL	$36.72	20	1
Japan	NTT West	Fiber	$36.58	100	100
	J-Com	Cable	$98.20	30	2
	Yahoo BB	Fiber	$39.22	100	100
United States	AT&T	ADSL	$39.30	3	0.384
	Comcast	Cable	$72.20	6	0.768

Note: Consumers do not always obtain the speeds advertised by any of these providers.

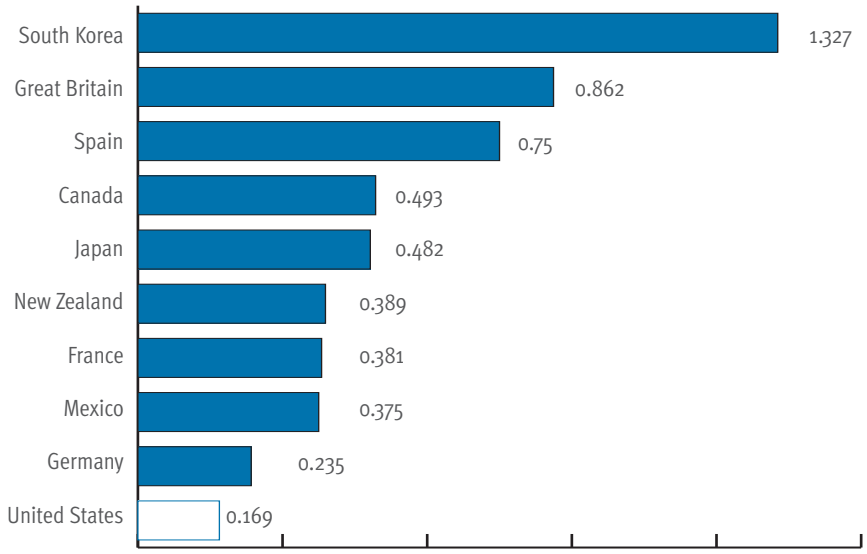
OECD Working Party on Telecommunications and Information Services Policies, *Multiple Play: Pricing and Policy Trends*, April 7, 2006

THE U.S. INVESTS RELATIVELY LESS IN TELECOMMUNICATIONS. The U.S. invests relatively less in telecommunications as a percentage of Gross Domestic Product. Indeed, we rank behind South Korea, Great Britain, Spain, Canada, Japan, France and even Mexico.[16]

15 S. Derek Turner, Broadband Reality Check, August 2005.

16 International Telecommunications Union, World Telecommunications Indicators Database 2006

Telecommunications Investment as a Percentage of GDP



Source: ITU, Connect the World Database, 2006.

THE DIGITAL DIVIDE ESPECIALLY HURTS LOWER INCOME AND RURAL AMERICANS. Millions of Americans — especially in rural and low-income urban areas — do not have access to high-speed broadband because it does not yet pay for providers to invest in these areas. The uneven distribution of broadband is divided along the following fault lines.

- Income. More than 62% of households with incomes over $100,000 subscribe to broadband at home while just 11% of households with incomes below $30,000 subscribe.[17]
- Rural/Urban. Only 17% of adults in rural areas subscribe to broadband compared to 31% in urban and 30% in suburban areas.[18]
- Farm/Non-Farm. Only 15.8% of farm households have adopted broadband.[19]
- Race. Only 31% of African Americans have adopted broadband at home compared to 42% of whites and 41% of English speaking Hispanics.[20]

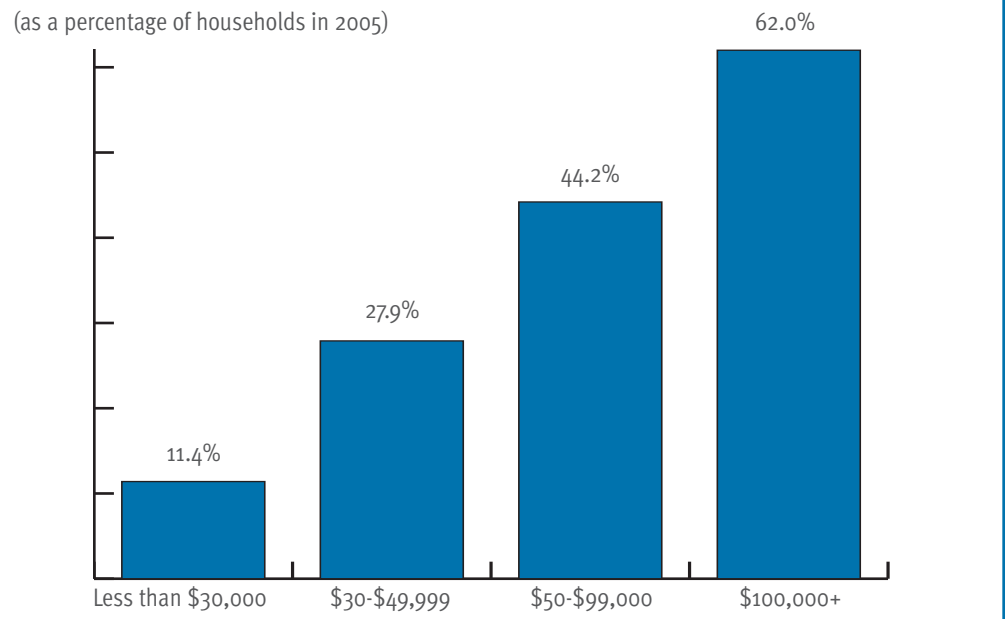
17 Government Accounting Office, Telecommunications: Broadband Deployment is Extensive throughout the United States, but It Is Difficult to Assess the Extent of the Deployment Gaps in Rural Areas, May 2006, GAO-06-426 (GAO Broadband Report).

18 Ibid.

19 National Agriculture Statistic Service, Agricultural Statistics Board, U.S. Department of Agriculture, Farm Computer Usage and Ownership, July 29, 2005.

20 Pew Internet & American Life Project, Home Broadband Adoption, 2006, p.3.

Broadband Subscriptions by Income Group



Source: Government Accountability Office, Broadband Report, April 2006, p. 30.

The key barriers to broadband adoption by low-income and rural consumers are price and the lack of availability.[21]

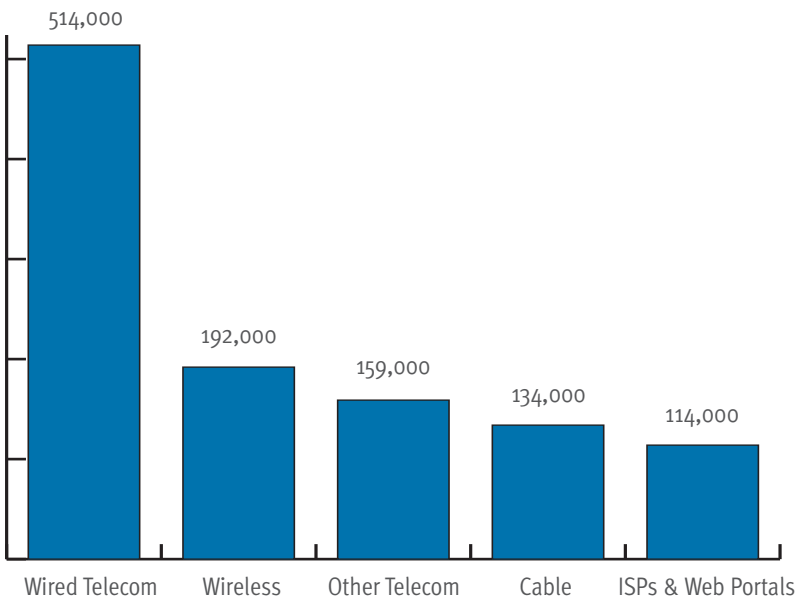
The Need to Protect High Quality Jobs and Services

Building new networks, upgrading existing infrastructure, selling new services, and connecting customers to high speed Internet creates employment in the telecommunications sector. Equally important, access to advanced data networks is essential for business success in the 21st century global economy in order to rapidly connect firms with suppliers, customers, and employees.

Contrary to conventional wisdom, the "new" telecommunications firms, including the Internet firms that create content and applications, generate few jobs, and those jobs pay less than those in the "old" telecommunications industry. The largest employers in the broadly defined telecommunications sector are the network carriers, with wired telecommunications far ahead of all others both in quantity and quality of jobs. In 2005, AT&T and Verizon employed more than 400,000 people, four times the number of workers at Amazon, Yahoo, eBay, Google, and Microsoft combined.

21 For an analysis of recent surveys about barriers to broadband adoption see S. Derek Turner, Broadband Reality Check II: The Truth Behind America's Digital Divide, Free Press, August 2006, pp. 27-30.

Employment in the Telecommunications Industry — 2005

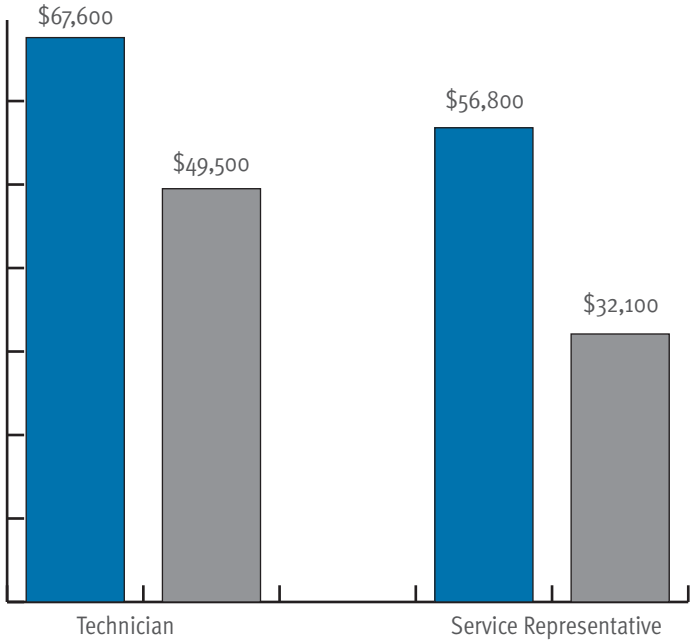


Note: Other Telecom includes Telecommunications Resellers, Satellite Telecommunications and Other Telecommunications.

Source: Institute for Women's Policy Research, *Making the Right Call: Jobs and Diversity in the Communications and Media Sector*, July 2006

Most employers in the "new" telecommunications/Internet sectors strive to compete based on low wages and benefits, taking the low-road in human resource policies. The union difference is significant for workers and their families. For example, technicians obtained $18,100 or 37% more in total compensation (wages, benefits and overtime) in the Bell companies, which are 90% unionized, than technicians employed by cable companies, which are just 4% unionized. Service representatives in the heavily unionized Bell companies obtained $24,700 or 77% more.

Total Compensation per Employee for Cable and Bell Companies (2003)



Source: Jeffrey Keefe, *Racing to the Bottom: How antiquated public policy is destroying the best jobs in telecommunications*, 2005.

Low-wage corporate policies also hurt consumers. For example, workers in the heavily unionized traditional wireline operations of the Bell companies have more job stability, earn higher wages and benefits, obtain more job training and have lower turnover rates than workers in the non-union cable sector. The result is that customer satisfaction is much higher for the Bell companies than the cable companies.[22] Indeed, cable companies actually rank lower than the IRS in terms of customer satisfaction.[23]

Other Countries Have National High Speed Broadband Policies — We Do Not

Almost every economically developed nation has a national telecommunications policy to promote broadband development — except for the United States.[24] Some of the most common features of these policies include the centralization of policy in a special government ministry or cabinet level position; a mix of deregulation and regulation of markets; financial incentives for stimulating investment in broadband infrastructure; universal service programs to stimulate broadband in lower income and rural areas; and specific policies to stimulate demand and educate consumers.

22 Jeffrey Keefe, Racing to the Bottom: How Antiquated Public Policy is Destroying the Best Jobs in Telecommunications, Economic Policy Institute, 2005.

23 American Society for Quality.

24 For example, all 15 members of the European Union adopted national broadband strategies by 2003. Since their accession to the EU, Poland, Hungary, Slovenia, Czech Republic and Lithuania have adopted similar policies.

KOREA. There was no market for broadband in Korea before 1998. Yet, by 2002, a quarter of the country's population subscribed to broadband. Between 1999 and 2001, broadband subscriptions increased from 114,000 to 4.2 million. The Ministry of Information and Communications (MIC) was given sole responsibility for implementing Korea's information technology policies.

The Korean government built a national Internet backbone for broadband, supported R&D, and created technology demonstration and pilot projects. This effort also included the provision of broadband services to government agencies and public institutions including all public schools.[25] To facilitate competition, Korea Telecom (KT), the monopoly provider of telecommunications services, was gradually privatized while the MIC carefully managed the introduction of competition. In order to facilitate broadband build-out, MIC offered financial support, preferential tax treatment and directly underwrote loans to service providers. In order to facilitate demand, Korea implemented a series of programs including making computer literacy part of Korea's ultra-competitive university entrance exams, expanding computer use in schools, providing assistance to purchase computers and educating housewives who tended to control household finances.[26]

In April 1999, Hanaro, a competitive provider, began offering broadband services as a free addition to its basic telephone subscription which amounted to $40 with free installation.[27] Within 18 months, Hanaro gained more than a million subscribers. KT responded accordingly so that its broadband subscriber base increased from 12,903 in 1999 to 3.9 million in 2001. Competitors ran into financial difficulties and KT reestablished its market dominance. In response, the government designated KT as the dominant service provider in broadband, making it subject to stricter regulations in terms of service and pricing.[28]

JAPAN. In 1999, when DSL was first introduced, Japan was one of the most expensive countries for Internet access. By 2002, Japan had the lowest prices for DSL in the world as well as a booming market for Fiber to the Home with transmission speeds of 100 mbps.[29] This transformation was the result of a specific national policy. The Ministry of Posts and Telecommunications (MPT) was transformed from a "regulatory" authority to a "policy" institution capable of developing and implementing a broad national policy. MPT established an "IT Strategy Headquarters" within the Cabinet Office. It produced the "e-Japan strategy" that stipulated a specific timeline to create a market environment providing low cost, fast Internet access.[30]

25 Izumi Aizu, A Comparative Study of Broadband in Asia: Deployment and Policy, Asia Network Research, May 21, 2002.

26 Kenji Kushida and Seung-Youn Oh, The Political Economies of Broadband Development in Korea and Japan, June 2, 2006, p. 21.

27 Hanaro, a start up firm, was formed in 1997 after the MIC announced that it would license exactly one competitor into the local telephony market. However, Hanaro was not able to compete effectively in the local telephony market because KT offered high quality services at competitive prices. Hanaro then focused on the high speed broadband market.

MPT developed a selective policy of deregulation and re-regulation paying special attention not only to competition but also to the need to build a broadband infrastructure. The incumbent former monopoly provider, Nippon Telegraph and Telephone (NTT), was gradually privatized. MPT compartmentalized the telecommunications sector, orchestrated competitors and used extensive licensing authority over matters such as pricing to micromanage competition.[31] NTT was ordered to lease its unused fiber optic infrastructure at low prices and provide access to its local loop. However, NTT was not left with a situation in which low prices undercut its incentive to build infrastructure: Tax incentives and other subsidies filled the gap and supported investments in high capacity broadband networks.[32]

In 2002, Softbank entered the DSL market through its Yahoo!BB subsidiary by offering DSL at just $22 per month. This was the lowest price in the world at that time. Later, Yahoo!BB bundled free IP telephony with its DSL.[33] Other providers soon reduced their prices with a resulting increase in DSL adoption by the Japanese.

MPT was not satisfied with the mere provision of DSL services: it explicitly stimulated investment in Fiber to the Home (FTTH) by using tax incentives and low interest loans from the Development Bank of Japan and a semi-public organization (Telecommunications Advancement Organization) to help subsidize interest payments. In 2005, there were 4.64 million FTTH subscribers in Japan up from only 70,000 FTTH subscribers in 2001.

MPT's approach to wireless broadband illustrates its policy of managed competition which focused especially on the vital need to ensure that there was enough capital to build the needed infrastructure. MPT issued only three 3G licenses: one to the NTT's wireless subsidiary DoCoMo, one to J-Phone (a subsidiary of Vodafone) and KDDI. This policy of consolidation was implemented in order to ensure that firms would have enough capital to deploy infrastructure. By 2003, Japan had three separate 3G networks. By May 2000, 11 million of Japan's 51 million wireless users subscribed to wireless Internet services, growing to 74 million out of 86 million subscribers by February 2005.[34]

28 Kushida and Seung-Youn Oh, p. 22.

29 Kenji Kushida and Seung-Youn Oh.

30 Kenji Kushida and Seung-Youn Oh, p. 25.

31 Kenji Kushida and Seung-Youn Oh, p. 12.

32 Robert Atkinson and Philip Weiser, A "Third Way" on Network Neutrality, The Information Technology and Innovation Foundation, May 30, 2006.

33 Kenji Kushida and Seung-Youn Oh, p. 27.

34 Kenji Kushida, Japan's Telecommunications Regime Shift: Understanding Japan's Potential Resurgence, Brie Working Paper 170, November 30, 2005.

A National High Speed Broadband Policy for the U.S.

The CWA believes that the goal of telecommunications policy should be to connect everyone at much higher speeds — the more people connected to a network, the greater the value of the network itself and the services it enables. Unfortunately, unfettered market competition focuses too narrowly on "effective demand" thereby leaving millions on the wrong side of the digital divide. Instead, CWA supports a telecommunications policy that involves appropriate government action to ensure that all residents participate equally in the benefits promised by the information revolution.

Almost every other developed country has established a cohesive and comprehensive national strategy to stimulate the deployment of high speed broadband by establishing specific goals and policies. While U.S. policy makers have issued rhetorical calls for greater broadband, there has been no organized or systematic broadband plan. This policy vacuum threatens the ability of the U.S. to maintain its leadership in high-technology and applications.

CWA supports the following public policy framework that would stimulate the creation of universal high speed broadband networks.

Goals to Guide Public Policy. The CWA has adopted five basic goals to guide the formulation of telecommunications policies.

- **SPEED AND UNIVERSALITY MATTER FOR INTERNET ACCESS.** It is important to realize that Internet access alone is not enough. Truly high speed, universal networks are needed to obtain the full benefits of the information and technology revolution including further technological innovation, job growth, telemedicine, distance learning, rural economic development, public safety and e-government.

- **A NATIONAL HIGH SPEED INTERNET FOR ALL POLICY IS CRITICAL.** The U.S. should not only adopt policies for universal access but should also set specific timetables to ensure that an infrastructure with adequate capacity is actually deployed. A reasonable initial national goal would be an infrastructure with enough capacity for 10 mbps download and 1 mbps upload speeds by 2010. This national goal would be increased periodically to reflect changes in technological progress and the public's need for greater capacity. In order to measure progress in reaching these goals, government should require the public reporting of deployment, actual speeds and price.

- **THE U.S. DEFINITION OF "HIGH SPEED" IS TOO SLOW.** The Federal Communications Commission (FCC) defines "high speed" as just 200 kbps in one direction. This inadequate measure undermines any realistic assessment concerning the actual deployment and adoption of "high speed" Internet. Instead, government should immediately set "high speed" at 2 mbps downstream and 1 mbps upstream.

- **THE U.S. MUST PRESERVE AN OPEN INTERNET.** High speed, high capacity networks will eliminate bandwidth scarcity and will promote an open Internet. Consumers are entitled to an open Internet allowing them to go where they want, when they want. Nothing should be done to degrade or block access to any websites. Reserving proprietary video bandwidth is essential to finance the build-out of high speed networks.

➤ **CONSUMER AND WORKER PROTECTIONS MUST BE SAFEGUARDED.** All residential and business customers should be protected by basic consumer and service quality protections no matter where they live, which carrier they choose or what technology is used to provide their services. Telecommunications services should meet the highest standards of quality, reliability, and safety. Quality service depends primarily on sufficient investment in telecommunications infrastructure and adequate staffing provided by trained, well-compensated career employees. Public policies should support the growth of good, career jobs as a key to quality service.

SPECIFIC POLICIES. There are a number of policy options that can be taken to address the gaps in the U.S. broadband telecommunications market in relation to both providers and consumers.

ESTABLISH A HIGH SPEED BROADBAND MAP OF AMERICA — A RELIABLE DATA BASE TO IDENTIFY GAPS IN AVAILABILITY, SPEED AND PRICE. There is no comprehensive and reliable database of the availability, penetration, speed or price of broadband services in the United States. This gap is surprising since Congress directed the FCC to "determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion" in Section 706 of the Telecommunications Act of 1996. Congress also required the FCC to take "immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market."[35]

Unfortunately, the FCC has failed to implement adequately this Congressional mandate in a number of ways. For example, the FCC decided to define "high speed" as 200 kbps in one direction and "advanced services" as 200 kbps in both download and upload directions. Such speeds are quite inadequate for such important applications as high quality video communications.

The FCC also does not provide data that can be used to determine the extent of broadband deployment throughout the U.S. with any degree of accuracy. Indeed, the FCC states that its data is not meant to measure broadband deployment even though this was mandated by Congress.

The FCC collects data on the number of providers in a given zip code who report serving at least one subscriber in that zip code. This measurement is not very useful. The GAO stated that "based on our analysis it appears that these [zip code] data may not provide a highly accurate depiction of deployment of broadband infrastructures for residential service in some areas."[36] After correcting for shortcomings in the FCC data, the GAO found that 9% of respondents had no service at all as opposed to just 1% according to the FCC.

This situation is untenable. The U.S. needs a reliable database in order to focus on the gaps in broadband penetration as well as to be able to accurately report on available speeds and prices. The following recommendations would begin to address this concern.

Develop A High Speed Broadband Map of America. This map would provide an infrastructure assessment of broadband availability throughout the U.S. A national effort would be funded by federal government grants to states and local communities to work with pri-

35 Public Law 104-104 Section 706, Advanced Telecommunications Incentives."

36 GAO, Broadband Report, p. 3.

vate sector companies across the country to develop the map. The ConnectKentucky program provides a model for such an effort.[37] ConnectKentucky, a non-profit organization, in collaboration with the Kentucky Infrastructure Authority, the Commonwealth Office of Technology and private sector companies produced a comprehensive GIS-based county-by-county inventory of existing broadband infrastructure and service availability, a first in the nation. The map identifies the specific communities where additional efforts are required to stimulate broadband investment and allows for the coordination of investment decisions of state and local governments with economic development organizations and private sector companies. The creation of the ConnectKentucky map was a joint effort of the state and local government, local communities and private sector providers.

Require the FCC to Develop a More Realistic and Usable Definition of High Speed and Provide Better Data on Deployment and Price. The FCC should redefine high speed as 2 mbps down and 1 mbps up which at least would have some relevance to the speed needed by actual applications. The FCC should also obtain data on price. The FCC should also dramatically improve its reporting requirements in order to determine accurately the extent of broadband deployment to all Americans. For instance, the FCC could ask providers to report the actual number of subscribers in a given zip code at the more specific "zip plus 4" geographic level and better integrate this information with census data.[38]

REQUIRE PUBLIC REPORTING OF ACTUAL BROADBAND SPEEDS & RELIABILITY. Currently, consumers do not know exactly what speed they are getting when they subscribe to broadband. In many cases, the actual speeds are quite different from the advertised speeds. The FCC, or if created, the Office of Telecommunications, should develop a standard that consumers can use to evaluate the speed and reliability of the broadband services provided in the market. This would enable consumers to become better informed and allow markets to function more efficiently. The EPA-estimated mileage standards represent a similar effort to better inform customers.

CREATE A CONNECTAMERICA PROGRAM — A PRIVATE-PUBLIC PARTNERSHIP TO PROMOTE DEPLOYMENT AND DEMAND AT THE LOCAL COMMUNITY LEVEL. The goal of providing universal, affordable access to high speed broadband networks requires the joint, even coordinated, efforts of both the public and private sectors.

Create Public-Private Partnerships in Each State. The federal government should actively support the creation of such partnerships in each state. ConnectKentucky can serve as a model for the joint effort of state and local governments, communities, universities, labor and private sector companies. The program supports statewide technology planning, alliance building, broadband expansion, public policy and advocacy. The goal is to ensure that every resident, business and community has broadband access by the end of 2007. In just two years, Kentucky's residential broadband availability rate grew by 17 percentage points to 77%; its home broadband penetration rate grew by 8 percentage points to 30%; and its home computer rate grew by 12 percentage points to 70%.

Enable Communities & Businesses to Identify and Implement Broadband Deployment and Demand Strategies. Once gaps in availability have been identified in the mapping project described above the focus shifts to implementation. The ConnectKentucky program

37 For more information about ConnectKentucky go to http//www.conectkentucky.org/

38 S. Derek Turner, Broadband Reality Check II: The Truth Behind America's Digital Divide, Free Press, August 2006.

created community leadership teams which developed a Community Implementation Plan. The plan identifies community needs through surveys and focus groups; identifies gaps in existing versus needed infrastructure; establishes a financial model to address gaps; completes the documentation needed to apply for federal funds; quantifies demand and communicates demand opportunities to private sector firms; and encourages broadband adoption.[39]

STIMULATE INVESTMENT. CWA recommends that federal and state governments institute a number of specific policies that would stimulate the investment needed for the development of high capacity broadband networks throughout the country. However, such policies should not amount to a blank check without appropriate measures for accountability. Consequently, eligibility for these programs should be based on a reasonable schedule for build out and speeds offered. If timelines are not met then penalties should be assessed and future funding put at risk.

Tax Incentives. Congress could provide tax incentives to companies investing in broadband in underserved areas.[40] These tax incentives would reduce the cost of making the investments and spur faster deployment of higher speed networks. Companies would only qualify for these incentives if they provided broadband services with at least 10 mbps down and 1 mbps up in underserved areas.

Such tax incentives could take the form of credits or the expensing of a portion of the capital investment. Underserved areas could be defined as those communities in an empowerment zone or enterprise community defined by federal law; any census tract with high poverty levels or low median income levels; or areas with relatively low broadband penetration levels. Other countries have used tax incentives successfully to stimulate faster deployment of advanced telecommunications infrastructures. For example, the Japanese government allowed NTT to rapidly write-off the cost of its new fiber broadband networks. The Korean government followed a similar policy.[41]

Universal Service Fund Reform. A ubiquitous network is necessary for education, public health & safety, access to governmental, educational, and informational services and basic economic activity. No individual or community should be left behind. Yet, what might be beneficial for society as a whole might not be profitable for individual companies. Private firms might not invest in areas where profit expectations are low such as high-cost rural areas, schools & libraries or rural health care providers. Congress created the Universal Service Fund (USF) in order to address these issues. However, the USF has a number of problems that should be addressed to ensure that it adequately supports universal broadband services. CWA recommends the following five actions to address these issues.[42]

- *Include Broadband in the Definition of Services Allowed to Receive Universal Service Fund Support.* The Telecommunications Act of 1996 states that access to advanced telecommunications and information services should be provided in all regions of the

39 ConnectKentucky at http//www.conectkentucky.org/.

40 An example of this approach is provided by S. 1147 that was introduced in 2005 by a bi-partisan group of Senators including Rockefeller, Snowe, Burns, Bunning, Schumer, Baucus and Cantwell provided such tax incentives for companies making broadband investments in underserved rural and urban areas.

41 Atkinson and Weiser, A "Third Way" on Network Neutrality.

42 See Appendix Two for an explanation of the four programs within the USF.

nation and to schools, libraries and health care providers.[43] In addition, the Act explicitly allows the FCC to incorporate new services "taking into account advances in telecommunications services."[44] However, the FCC has refused to expand the definition of covered services to include broadband even though the E-Rate program directly supports advanced services to schools and libraries and the High Cost program implicitly supports the build out of high capacity broadband networks.[45] For example, many rural carriers obtaining money through the High Cost program are replacing copper with fiber and deploying DSL. These monies are actually stimulating the deployment of broadband in rural areas — just what Congress initially intended. Congress and the FCC should explicitly allow existing carriers to utilize USF funds for broadband purposes.[46]

- *Ensure a Broader, More Stable and Equitable USF Funding Structure.* The USF is undergoing significant strains as its funding base declines while funding demands increase. The USF operates by collecting mandatory payments from all providers of interstate and international telecommunications in order to subsidize local services and providers. Those payments are based on a percentage of the revenue that companies derive from providing interstate and international services. Unfortunately, the USF funding base is contracting just as the needs for USF monies are increasing. The fees are not fully assessed on such growing services as broadband Internet connections or a significant portion of most wireless calls.[47] Consequently, the USF fee has increased from 5.9% in the first quarter of 2000 to 10.9% in the first quarter of 2006.[48] This lack of a broader funding base is not only inequitable as it favors some competitors over others but it is also unstable. The current contribution scheme should be abandoned. Instead, every provider should be assessed a USF fee based on numbers (phone numbers), connections (high-speed, non-circuit switched connections such as DSL and cable modems) and capacity (dedicated business connections). This approach would eliminate arbitrary regulatory exemptions from contribution obligations, protect the fiscal stability of the USF, and ensure fully equitable and competitively neutral contribution obligations for all competitors regardless of technology or market.[49]

43 47 U.S.C. 254(b).

44 47 U.S.C. 254 (c) (1).

45 The FCC lists the following functions or services as eligible for universal service support: voice grade access to the public switched network; local usage; dual tone multi-frequency signaling (e.g. Touchtone); single party service; access to emergency services, including in some instances access to 911 and enhanced 911 services; operator services; inter-exchange services; directory assistance; and toll limitation services for qualifying low income consumers. See FCC 97-157 Report and Order in CC Docket 96-45, May 8, 1997.

46 H.R. 5072 introduced by Representatives Terry and Boucher states that access to telecommunications and advanced telecommunications and information services should be made available throughout the United States at reasonably comparable rates and defines universal service to explicitly include broadband services.

47 The FCC recently made some "interim" modifications to its USF contribution methodology. Specifically, the FCC required providers of interconnected VoIP services to contribute to the USF based on actual calculations of their interstate revenues or "safe harbor" estimates. Universal Service Contribution Methodology, Report and Order and Further Notice of Proposed Rulemaking, WC Docket No. 06-122, June 21, 2006.

48 Rosenberg, Edwin, Lilia Perez-Chavolla and Jing Liu, Commission Primer: Universal Service, The National Regulatory Research Institute, May 2006, p. 8.

49 CC Docket No. 01-92, Comments of SBC Communications Inc., May 23, 2005.

- *Ensure The Equitable and Efficient Distribution of USF Monies.* The USF High Cost program was intended to ensure that rural consumers in "high cost" areas obtain the benefits of universal service. However, current FCC rules base support on whether a carrier is defined as "rural" or "non-rural" rather than on the customers it serves. Consequently, such "non-rural" carriers as AT&T, Verizon and BellSouth serve twice as many rural customers as the "rural" carriers but obtain just one-sixth of the amount of USF funds. Consequently, the USF provides little or no support to most rural areas and customers.[50] The FCC should abandon the arbitrary rural and non-rural distinctions and instead adopt a more unified approach designed to provide all carriers, regardless of size, with sufficient support to meet the real-world universal needs in high cost areas and to address concerns about the affordability, not just comparability, of service prices.[51] In this way, USF monies would be targeted not to the carriers but to the rural populations that should be served.

- *Require USF Recipients to Provide Broadband.* Currently, there is little oversight of carriers' use of their USF funds. Instead, carriers should have to submit a broadband upgrade plan before and after receiving funding. These plans would have to meet the national goals previously outlined of providing high capacity broadband with speeds of at least 10 mbps down and 2 up by 2010. This goal would increase over time. Carriers that do not meet the deadlines would be subject to penalties including the reimbursement of USF monies already obtained. There could be a special exception for low density areas where speed requirements could be lower because of technological limitations.

- *Protect & Stabilize the E-Rate Program.* The E-Rate program is one of the signal successes of broadband deployment in the U.S. It provides discounts ranging from 20-90% for the provision of telecommunications services and Internet access to schools and libraries. Before the E-Rate program, only 3% of the nation's classrooms and 27% of the libraries were connected — today 93% of classrooms and 95% of libraries are connected.[52] However, schools and libraries still have considerable technology gaps and a continuing need for E-rate assistance. Each year, applications for E-rate funds far exceed the amount available for disbursement. This program must be preserved since it is under constant attack.

Subsidies for Emergency Services. It should be a top priority for the federal government to provide subsidies for emergency services. Local governments do not have the ability or capacity to fund a regional much less national program to create integrated networks to effectively link police and fire departments, emergency services, infrastructure, airports, seaports, and power/water treatment plants. A recent survey of 183 cities by the United States Conference of Mayors found that 80% of the cities need more federal funding to achieve full communications interoperability among first responders. The average length of time required to achieve full interoperability was four years.[53] Unfortunately, disasters and crises will not wait for this time period.

50 CC Docket No. 96-45 and WC Docket No. 05-337, Comments of AT&T Inc., March 27, 2006, pp 5-7.

51 For one specific proposal that would accomplish these goals see CC Docket No. 96-45 and WC Docket No. 05-337, Comments of AT&T Inc., March 27, 2006.

52 American Library Association and National Education Association.

53 TR Daily, Cities Say They Need More Federal Resources to Achieve Public Safety Interoperability, July 26 2006.

Leveraging Public Money. Efforts should be made to include the provision of high speed broadband in publicly funded health care, education, or job training programs. Housing advocates led by One Economy have demonstrated how to leverage public money to stimulate broadband deployment in publicly subsidized housing. As of February 2005, 31 states have issued executive orders or adopted housing finance policies to encourage the inclusion of in-home, high speed Internet access in affordable housing. For example, the state of Texas requires that all new homes financed under its tax credit program must be built with high speed Internet infrastructure and strongly encourages the provision of broadband service at no cost to the residents of these homes. In 2003, California began encouraging developers to build affordable housing with high speed Internet. By the end of the year, nearly half a billion dollars worth of affordable housing was equipped with such capabilities. In 2004, California gave incentives to developers to provide high speed Internet service at no cost to their residents.[54]

ENSURE AFFORDABLE ACCESS. Increased deployment that creates economies of scope and scale and increased competition should result in reduced broadband prices. However, that alone may not be enough to ensure that low income consumers would be able to afford high speed broadband. Without broadband access, low income individuals and families would not be able to fully benefit from technological advances and improvements in their quality of life.

Reform the Universal Service Fund Low Income Program. The Low Income Programs of the Universal Service Fund be expanded to include support for broadband connection and monthly charges for low income consumers. The Low Income Program provides funding to local phone companies that enable them to offer low income consumers discounts for installation and monthly access for telephone service. LinkUp provides discounts of up to $30 for installation while Lifeline provides discounts of up to $10 per month for basic telephone service. However, access to broadband is becoming just as important as access to narrowband. The USF should be reformed in order to recognize this fact.

STIMULATE DEMAND. Governments could adopt policies to overcome barriers that consumers may face in gaining access to high speed broadband networks such as cost, geography, and disabilities. After all, the value of the entire network to each subscriber depends on the ability to reach other subscribers. Thus, the value of the network increases as additional subscribers are added. In addition, demand obviously influences providers' deployment decisions. Potential providers will seek to deploy broadband infrastructure in markets where demand for their service will be sufficient to yield substantial revenue and profits.

The Government Should Aggregate Demand. One reason that many areas are underserved or un-served is that providers are not aware of a sufficient market to warrant the required investment to provide high speed broadband services. In these instances, efforts should be made to identify existing and potential demand and "aggregate" the total to make the case for private sector and/or public sector investment. Demand aggregation is especially important in rural areas but also for underserved urban areas. Governments can aggregate demand by requiring their administrative units to utilize high speed broadband; becoming "anchor" tenants in buildings or developments; and adjusting their own program eligibility criteria to enable the proliferation of high speed broadband. There are a number of examples of demand aggregation. At a national level, the United Kingdom has established a Broadband Aggregation Project. The government has allocated more than 1 billion pounds

to increase broadband connectivity in the public sector including plans to deliver 2 mbps and 8 mbps respectively to all primary and secondary schools; 256 kbps to all general practitioner practices and at least 2 mbps to all hospitals and other health authorities. The project will set up 9 regional aggregation bodies and a national aggregation body to aggregate public sector demand and take it to the market.[55] At a state and regional level, Kentucky and Massachusetts have instituted programs that have maximized the purchase of broadband services by working with local hospitals, schools, home businesses, small businesses and residents to demonstrate the full extent of demand to encourage private sector investment.[56]

Leave No Child Offline — Supplying Computers as Gateways to the Internet. Broadband services cannot be utilized, much less accessed, without a computer. Yet, approximately 34% of U.S. households do not own a computer.[57] Price is a factor since even the most basic computers cost approximately $300 to $500. This is a significant sum for many low income families who would then have to pay monthly fees for broadband access. This barrier to broadband deployment could be addressed in a number of ways. ConnectKentucky has implemented a joint public-private program called Leave No Child Offline. Through this program, surplus government computers are refurbished and distributed to the homes of eighth graders who otherwise would not have a computer at home. Private sector firms provide software, security programs and printers.[58]

The government also could directly subsidize the purchase of computers by low income families. Congress recently provided a precedent when it decided to subsidize the cost of set-top box converters for high-definition television sets for consumers. The government could also provide tax incentives. Sweden became the country with the most computers per household by providing tax relief to businesses for the purchase of computers that they then offered to their staff to buy tax free and keep at home. The condition was that everybody with a permanent position, regardless of job title, would be included in the offer, not only those employees needing a computer at home. In just one year, the proportion of employees with access to computers rose from 48% to 67%.[59]

Demonstration Projects. Congress should reauthorize funding to promote the innovative uses of network technologies in the public and non-profit sectors through matching grants for model projects. From 1994 to 2004, the Technologies Opportunity Program (TOP) accomplished these goals. Over the ten-year period, TOP made 610 matching grants to state, local and tribal governments, health care providers, schools, libraries, police departments, and community-based non-profit organizations. The projects demonstrated how community-based organizations and public entities could utilize technology and the Internet to improve services and empower citizens — setting the stage to expand the suc-

55 Commission of the European Communities, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of Regions, Connecting Europe at High Speed, National Broadband Policies, May 26, 2004.

56 GAO Broadband Report pp., 27-28.

57 GAO Broadband Report p. 11.

58 For each computer refurbished, Microsoft provides Windows XP and Office 2003 while CA, Inc. provides a software security suite. Lexmark International provides a new ink jet printer for every family that receives a computer. For more information see connectkentucky.org.

59 Swedish Ministry of Industry, Employment and Communications, An Information Society for All — A publication about Swedish IT policy.

cessful initiatives through both supply-side and demand-driven policies. Specific examples of TOP funded projects are included in Appendix III.[60]

Consumer Education and Content. Consumers should also be educated in terms of the beneficial uses of high speed Internet. Conversely, content should be molded to fit the needs of consumers. For example, One Economy has developed a self-help-oriented website in multiple languages.[61] The Beehive provides resources and interactive tools focused on health, jobs, money, education, and family. The content is aimed at a variety of literacy levels. As one example of its content, users can learn about the availability of free health insurance for children through federal and state programs, then determine their eligibility, and connect to their local office to sign up, all through the Beehive's health section.

In June 2006, One Economy announced plans to create a Public Internet Channel produced by a network of organizations to serve the public interest, especially the poor. The web portal will provide national and local information and programming in the areas of safety/emergency services, economic livelihood, health, education, and public affairs. All content will be available in English and Spanish, with the potential for other languages.

Finally, One Economy creates Digital Communities to assist low-income people to connect to information and services that help them build power and improve their lives and standard of living.

PROTECT AN OPEN INTERNET. Government policies should enable the widest possible dissemination of information from a multiplicity of sources over the Internet as the foundation of a democratic society. Moreover, since the value of any network increases as more content is transmitted to more people over its paths, unrestricted Internet access is good economics — stimulating consumer demand for more bandwidth and reducing supplier costs through economies of scale.

Because the greatest threat to an open Internet is bandwidth scarcity and unequal deployment of high-speed networks, building and maintaining universal high speed networks must be the first priority in protecting and strengthening an open Internet. Since private capital will largely finance the high-capacity network build-out, network providers must be assured a return on their investment. That return comes from value-added services and, in current business models, primarily from video. Policymakers, therefore, should refrain from imposing open-network requirements on network providers' offering of video and other private network services. Such policies would dampen investment in job-creating high-speed networks and other specialized services such as voice telephony, video streaming, medical monitoring that operates more effectively with quality of service and other managed network upgrades.[62]

60 For more information see http://www.ntia.doc.gov/otiahome/top/index.html.

61 See One Economy, www.theBeehive.org.

62 For a useful analysis, see Robert D. Atkinson and Phillip J. Weiser, "A 'Third' Way on Network Neutrality, May 20, 2006. Available at http://www.innovationpolicy.org/pdf/netneutrality.pdf. Atkinson and Weiser recommend that the FCC establish a minimum unrestricted bandwidth requirement that must be met by Internet access providers in order to call their service "broadband" or "high speed."

At the same time, policymakers should ensure that the capacity used for "last-mile" Internet access in high speed networks is open and unrestricted. Public policy must ensure that all network, content, and applications providers honor consumers' right to access the content, run the applications, and attach the equipment of their choice to high speed networks.[63] Policymakers should adopt the following policies to protect an open Internet:

Public Disclosure. All broadband providers should be required to inform consumers of their Internet access speed, price, and usage metrics, and to report to the FCC pricing, average speed, and the amount of latency (delay) of actual Internet access service to ensure truth-in-advertising. This information should be publicly available.

Protect the Public Internet. All broadband Internet access providers should be required to provide open, unrestricted Internet access. At the same time, network providers should be entitled to provide video and other private network services on a proprietary basis.

"Anti-trust" Protection Against Discriminatory Behavior. To protect against abuse of market power, the FCC (or another agency such as the FTC) should have the authority to adjudicate on an expedited basis complaints alleging discrimination by broadband providers.

Cable (or Video) A La Carte. All video providers should be required to provide consumers the option of purchasing content on an individual channel or self-selected tiering basis.

ESTABLISH OVERSIGHT, ACCOUNTABILITY AND REPORTING. Government regulatory bodies should not only monitor the development and progress of such policies but also their enforcement in relation to deadlines, penalties and the protection of consumer rights.

ENSURE HIGH QUALITY SERVICES & JOBS. Government should adopt the following policies to ensure that job growth in the telecommunications sector translates into middle-class, career, and union jobs and high quality service delivered to consumers.

Support stable employment for communications workers. Government policies should require prevailing wages and benefits on government communications contracts including municipal broadband.

Enforce strong service standards and consumer protections to ensure competition is based on quality and not by cutting staff, network investment, or corporate standards.

Ensure a level regulatory playing field. With the convergence of voice, video, and data network platforms, policymakers must ensure that competition takes place based on service and technology, not reduced labor costs or through regulatory arbitrage. For example, all providers should be subject to the same high level of service quality standards and consumer protections. In this way, all consumers would be protected regardless of their provider, their place of residence or the technology used to deliver their services. In addition, no provider would be able to obtain a competitive advantage by offering substandard services.

CREATE AN OFFICE OF TELECOMMUNICATIONS. The ability of the U.S. to develop a coherent and consistent national telecommunications policy is hampered by bureaucratic fragmentation. Currently, responsibility for telecommunications is divided between the Federal

63 The FCC affirmed these principles for broadband network operators in a September 2005 Policy Statement. In the Matter of Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, CC Docket No. 02-33, Sept. 23, 2005 (rel). Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-151A1.pdf.

Communications Commission (FCC), the Federal Trade Commission (FTC), the Department of Commerce and the Department of Agriculture. The activities of these agencies are not coordinated and sometimes are at cross purposes. The promotion of rural broadband development is split between the FCC which administers the Universal Service Fund and the Department of Agriculture's Rural Utilities Service. Meanwhile, the FCC and the Department of Commerce (the National Telecommunications and Information Administration) both are supposed to collect information and function as advocates for high speed broadband deployment and the formulation of spectrum policy. Thus, the FCC is placed in the uncomfortable position of both regulator and advocate.

CWA recommends the creation of an Office of Telecommunications to be located in the White House. This Office would replace the current system of bureaucratic fragmentation and dysfunction. The Office of Telecommunications would be empowered to develop, coordinate and administer a national telecommunications policy, establish a standardized and consistent information base, and act as an advocate for the universal deployment of a high capacity broadband network.

Many other countries have recognized the critical importance of high capacity broadband deployment and have created secretarial level departments or ministries. For example, national telecommunications ministries were critical for the successful deployment of high capacity broadband throughout Korea and Japan. These ministries created, implemented and coordinated a national high speed broadband policy.

STATE BROADBAND POLICIES. States should also adopt universal broadband policies. A number of states have already functioned as laboratories for innovative policies to accelerate deployment of universal, affordable high speed networks. These policies were developed to stimulate economic development, e-government, more effective delivery of education, health care, and other public services, and encourage citizen participation in community and government affairs.

In many ways, states have developed more comprehensive and effective broadband policies than the federal government.[64]

- ***State Broadband Authorities/Agencies.*** Several states have established independent agencies tasked with various aspects of broadband deployment. Activities of the agencies include grant making, evaluation of deployment and obstacles, data collection, and policy recommendation.

- ***Tax Credits.*** Several states have adopted tax programs designed to spur deployment by offering credits for installation of equipment or network investment. The credits are applied to either corporate or property taxes. Some states have linked broadband access to eligibility for the Low Income Housing Tax Credit, which is used by developers to finance affordable housing.

- ***Statewide Networks.*** Many states have some form of large broadband network, usually dedicated to educational purposes or for connecting government agencies. Some states allow access to the networks by non-profit organizations.

64 For more information see The State Broadband Index, by the Analysis Group for TechNet http://www.michigan.gov/documents/State_Broadband_Index_71282_7.pdf. A National of Laboratories: Broadband Policy Experiments in the States, Alliance for Public Technology http://www.apt.org/publications/reports-studies/broadbandreport_final.pdf.

- ***Demand Aggregation Programs.*** States have created programs to encourage communities to attract broadband deployment by bringing together local institutions, including government. In some cases, the state has acted as the anchor tenant.

- ***Public/Private Partnerships.*** Similar to demand aggregation programs, these models bring together government, industry, community institutions and others to accelerate deployment. The programs often focus on data collection, community implementation surveys, and bringing together providers with potential customers in underserved areas. Some include direct relationships in which the state contracts for the deployment of broadband in exchange for offering use of the network.

- ***State Demonstration Projects.*** Some states have adopted grant programs to fund innovative programs to provide public or community-based services utilizing high speed technologies, modeled after the federal E-rate and Technology Opportunity Program.

However, states still could do much more. The CWA recommends that states adopt the following proposals:

- ***Establish a broadband strategy and formal plan.*** States should assess their broadband status through a map or catalog of existing infrastructure.

- ***Adopt financial incentives for broadband deployment*** through tax credits, loans, and direct subsidies, with particular focus on underserved communities. State Universal Service Funds should require carriers that receive support make broadband available to all residents within three years at specified speeds, increasing over time.

- ***Provide financial support as well as encourage the development of broadband applications*** that improve government services or support next-generation technologies. States could play an important role in driving consumer demand for broadband by offering e-learning applications, health services and other e-government initiatives.

CONCLUSION: IT IS TIME FOR ACTION

Millions of people in the United States are unable to take advantage of the benefits of the telecommunications revolution because they do not have access to affordable, high quality Internet services. This failure not only hurts our relative economic position in the world and the ability of individuals to participate in civic life but also adversely affects public health and safety. How many lives are placed at risk because health care professionals and patients do not have the option of utilizing telemedicine or because first responders do not have access to high capacity broadband networks but are dependent on old and inefficient technologies?

We should not have to endure such risks or wasted lives. It is time for the government to protect the public interest, to "promote the general welfare." It is time for federal government to adopt a national policy to ensure universal access to affordable high speed Internet.

APPENDIX ONE:
Summary of CWA's Specific Policy Options

DEVELOP A HIGH SPEED BROADBAND MAP OF AMERICA — a Reliable Data Base on Availability, Speed and Price

- Develop A High Speed Broadband Map of America
- Require the FCC to Develop a More Realistic Definition of High Speed Broadband and Provide Better Data

REQUIRE PUBLIC REPORTING OF ACTUAL BROADBAND SPEEDS & RELIABILITY

CREATE A CONNECTAMERICA PROGRAM — A Public Private Partnership to Promote Deployment and Demand at the State and Local Community Levels

- Create Public Private Partnerships in Each State
- Enable Communities & Businesses to Identify and Implement Broadband Deployment and Demand Strategies

STIMULATE INVESTMENT

- Tax Incentives
- Universal Service Fund Reform
  - Include Broadband in the Definition of Services Allowed to Receive USF Support
  - Ensure a Broader, More Stable and Equitable Funding Structure
  - Ensure the Equitable and Efficient Distribution of USF Monies
  - Require USF Recipients to Provide Broadband
  - Protect and Stabilize the E-Rate Program
- Subsidies for Emergency Services/First Responders
- Leveraging Public Money

ENSURE AFFORDABLE ACCESS

- Reform the USF Low Income Program to include Broadband.

STIMULATE DEMAND

- The Government Should Aggregate Demand
- Leave No Child Offline — Computers as Internet Gateways

- Demonstration Projects
- Consumer Education and Content

PROTECT AN OPEN INTERNET

- Public Disclosure
- Protect the Public Internet
- Anti-Trust Enforcement of Discriminatory Behavior
- Cable (or video) A La Carte

ESTABLISH OVERSIGHT, ACCOUNTABILITY AND REPORTING

ENSURE HIGH QUALITY JOBS AND SERVICES

- Support Stable Employment for Communications Workers
- Enforce Strong Service Standards and Consumer Protections
- Ensure a Level Regulatory Playing Field

CREATE AN OFFICE OF TELECOMMUNICATIONS

STATE BROADBAND POLICIES

- Establish a Broadband Strategy and Formal Plan
- Public Private Partnerships
- Broadband Authorities and Agencies
- Investment Incentives for Deployment
- Demand Aggregation Programs
- Encourage the Development of Broadband Applications
- Demonstration Projects

APPENDIX TWO: The Universal Service Fund

Congress explicitly recognized the importance of promoting universal access to telecommunications when it created the Universal Service Fund (USF] as part of the Telecommunications Act of 1996. The USF consists of four programs that expended $31.6 billion from 2000 through 2005.

The High Cost Program makes payments to eligible local telephone companies that serve customers in rural or remote areas where the cost of providing service is higher than a statewide average. Currently, over 1,700 eligible telecommunications carriers receive High Cost support.[65] The program allows these carriers to recover investment costs for areas that would otherwise be uneconomic to serve. The program expended $17.8 billion or 56% of total USF monies from 2000 to 2005.

The Schools and Libraries or E-Rate Program reimburses providers for giving discounts to schools and libraries for the purchase and installation of advanced telecommunications services including high speed Internet access. Before the E-Rate came into being, only 3 percent of the nation's classrooms were connected to the Internet. Today, 93 percent of classrooms are connected — and statistics show that disparities in Internet access between rural, urban, and suburban schools and high and low-poverty districts have been dramatically reduced. It is estimated that 82 percent of public schools and 61 percent of public libraries receive E-Rate funds.[66] The program expended $9.7 billion or 31% of total USF monies from 2000 to 2005.

The Low Income Program provides funding to local phone companies that enable them to offer low-income consumers discounts of up to $30 for installation and $10 per month for basic telephone service. In 2004, the Lifeline program supported discounted monthly service for almost 7 million access lines while the Link Up program provided discounts for the installation of 1.7 million lines.[67] The program expended $4.1 billion or 13% of total USF monies from 2000 to 2005.

The Rural Health Care Program serves the same function for nonprofit health care providers in rural areas. However, less than $50 million a year has been expended on this program.

65 Universal Service Administrative Company, available at http://lifelinesupport.org/hc/about/default.aspx.

66 National Education Association, The E-Rate, available at http://www.nea.org/technology/erate.html.

67 Rosenberg, Edwin, Lilia Perez-Chavolla and Jing Liu, Commission Primer: Universal Service, The National Regulatory Research Institute, May 2006, p. 16.

APPENDIX THREE: Examples of Technologies Opportunity Program (Top) Demonstration Projects

From 1994 to 2004, TOP promoted innovative uses of network technologies in the public and non-profit sectors through matching grants for model projects. TOP made 610 matching grants to state, local and tribal governments, health care providers, schools, libraries, police departments, and community-based non-profit organizations. The projects demonstrated how community-based organizations and public entities could utilize technology and the Internet to improve services and empower citizens — setting the stage to expand the successful initiatives through both supply-side and demand-driven policies.

Community Technology Centers

- The Appalachian Center for Economic Networks set up five community technology centers in public schools that were used to connect local people with jobs, and to connect local businesses with web-savvy students who designed web pages and assisted the local firms with online purchasing, inventory, and market research.
- Houston's Technology for All's JobTech Project created a scalable and replicable model for creating jobs with livable wages in low-income communities.
- Cleveland Housing Network's Bringing Information Technology Home uses the Internet to build capacity for successful home ownership and financial strength among low-income families, bringing the equipment, technology, and skills to low-income households.
- Washington D.C.'s Community Preservation and Development Corporation's EdgeNet Project places networked computers directly into the homes of its 800-unit residences, providing a broadband connection to allow residents to participate in community governance and access to community-based services. Residents learn computer use in the computer lab, young people are trained in digital music production in the music studio, and elderly residents can get health services remotely connected to health providers over a broadband connection.
- North Carolina Central University's Intergeneration Project uses a digital network in five public housing communities so school-aged youth, their parents, and their grandparents will have access to, and be tutored in the use of applications software, Internet browsing and e-mail.

Health Care

- The University of Kansas Medical Center's Tele-KidCare project utilizes PC-based technology to link physicians with children visiting the school nurse office in eight schools.
- Duke University in Durham, N.C., produced a web-based database of primarily Medicaid patient information to assist with preventive health services.
- The University of Vermont used a two-way interactive video telemedicine system to connect trauma center specialty surgeons with rural ambulance personnel and doctors.
- Khmer Health Advocates in West Hartford, Conn., created a telemedicine network to address health issues faced by Cambodian Americans who were trauma and torture victims in their homelands.
- The Hawaii Area Health Education Center expanded the state's digital network to 25 rural learning centers to allow nurses to carry out telehealth home consultations via videoconferencing.

Rural Economic Development

- Minnesota Rural Partners is designed to aggregate demand for telecommunications infrastructure in the state's rural communities, and provides a web portal that links small rural businesses with potential partners and advisors.
- Montana's District Export Council is also an online virtual business incubator, providing small business owners with training to locate partners, business leads, marketing, and access to banking, accounting, order fulfillment, freight forwarding and other services.
- The Jubilee Project in Tennessee provides business owners with state-of-the-art laptop computers, and created a collaborative online toolkit.
- North Dakota State University gave farmers and ranchers broadband access to compete in the agricultural marketplace.
- The Cheyenne River Sioux Tribe used distance education to train the unemployed for entry-level health care positions at a new senior assisted-living facility.

Rural Quality of Life

- Community Partners in Amherst, Mass., equipped outreach workers with PCs and Wi-FI Internet access to streamline receipt of health care benefits for rural residents.
- Sevier River Water Users Association in Utah created a real-time river basin monitoring and control system for water management.
- North Carolina Rural Economic Development Center established e-government in rural counties and 55 municipal governments.

Libraries

- The Queens Borough Public Library used video teleconferencing to provide math and science education to 15,000 children in 33 library-sponsored latchkey programs.
- The New York Public Library created an online interactive community resource to connect entrepreneurs and small business assistance organizations with one another.

The Communications Workers of America represents 700,000 workers employed in telecommunications, broadcasting, cable TV, journalism, publishing, electronics, general manufacturing, airlines, government service, health care, education and other fields.

Comments and questions about *Speed Matters* should be directed to Dr. Kenneth R. Peres at kperes@cwa-union.org.

Speed Matters — 5 Key Principles

The United States — the country that invented the Internet — has fallen from 1st to 16th in high-speed Internet penetration. To assure economic growth, we must reverse that trend.

➤ Speed and universality matter for Internet access.

High-tech innovation, job growth, telemedicine, distance learning, rural development, public safety, and e-government require truly high-speed, universal networks.

➤ U.S "high-speed" definition is too slow.

FCC defines "high-speed" as 200 kilobits per second (kbps) downstream. Government policies should immediately set "high-speed" definition at 2 megabits per second (mbps) downstream, 1 upstream.

➤ U.S. needs a national High-Speed Internet for All policy.

The U.S. must adopt policies for universal access and set deployment timetables: 10 mbps down, 1 mbps up by 2010; with new benchmarks set for succeeding years.

➤ Open Internet.

High-speed, high-capacity networks will eliminate bandwidth scarcity and will promote an open Internet. Consumers are entitled to an open Internet allowing them to go where they want when they want. Nothing should be done to degrade or block access to any websites. Reserving proprietary video bandwidth is essential to finance the build-out of high-speed networks.

➤ Consumer and worker protections.

Public policies should support growth of good, career jobs as a key to providing quality service. Government should require public reporting of deployment, actual speed, and price.

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