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DIGITAL DIVIDE POLICY BOOK

DIGITAL DIVIDE POLICY BOOK

**GENE SPERLING
ASSISTANT TO THE PRESIDENT FOR ECONOMIC POLICY**

BACKGROUND ON THE DIGITAL DIVIDE AND EAST PALO ALTO, CALIFORNIA

APRIL 17, 2000

THE DIGITAL DIVIDE: Access to computers and the Internet and the ability to use this technology effectively are becoming increasingly important for full participation in America's economic, political and social life. Unfortunately, unequal access to technology and high-tech skills by income, educational level, race, and geography could deepen and reinforce the divisions that exist within American society.

The Gap Between High and Low Income Americans is Increasing 80 percent of households with an income of \$75,000 or above have computers, compared to 16 percent of households earning \$10,000 - \$15,000 (Dept. of Commerce, "Falling Through The Net," July 1999).

Better Educated Americans More Likely to Be Connected 69 percent of households with a bachelor's degree or higher have computers, compared to 16 percent of those households that have not completed high (Dept. of Commerce, "Falling Through The Net," July 1999).

Whites More Likely to be Connected than African-Americans and Hispanics. 47 percent of white households have computers, compared to 23 percent of African-American households and 26 percent of Hispanic households (Dept. of Commerce, "Falling Through The Net," July 1999).

SILICON VALLEY: In the past 20 years, Silicon Valley has played a leading role in fostering the digital revolution that is sweeping the globe. This revolution has led to the productivity gains that have helped create the longest economic expansion in U.S. history. The Silicon Valley has profited handsomely from the innovation of its residents; the region has become one of the most prosperous communities in our nation.

- Silicon Valley has created more than 275,000 new jobs since 1992 (CA Employment Development Dept, 1999).
- Median family income has soared to \$87,000 per year – the third highest in the country (Dept of HUD, 2000).
- The median price of a house in the Silicon Valley is \$410,000, more than twice the median price in rest of the country (California Real Estate Association, 1999).

EAST PALO ALTO: East Palo Alto has missed out on much of this prosperity. While there has been progress and the city is working to attract employers, East Palo Alto continues to struggle with a relatively high poverty rate, the largest high school dropout rate in the Bay Area, and the lowest property values in San Mateo county (Association of Bay Area Governments, Projections, 1998).

Demographics: With a population that is 53 percent Hispanic, 36 percent African-American, 12 percent white, and 8 percent Asian and Pacific Islander, East Palo Alto celebrates its diversity (Claritas, 1999). The Hispanic population has grown rapidly in the last 10 years with Latinos comprising 64 percent of the school-age children (California Dept. of Education, 1999).

Economic Vitality: The City is engaged in an ambitious redevelopment initiative. Nevertheless, there is only one large employer in the community, a situation that narrows the tax base and obliges many residents to make long commutes to work each day. There is no bank, major supermarket, and other key service-oriented businesses in the city (City of East Palo Alto, 1999).

Poverty: Over 80 percent of K-8 students are eligible for free or reduced-price lunches (California Dept. of Education, 1999).

Education: There is only one computer for every 28 students in East Palo Alto schools, as compared to the 1-to-9 ratio for the entire state. Only 60 percent of residents have a high school diploma or its equivalent (California Dept. of Education, 1999; City of East Palo Alto, 1999).

**THE PRESIDENT'S NEW MARKETS TRIP:
FROM DIGITAL DIVIDE TO DIGITAL OPPORTUNITY**
Highlighting Technology's Economic Opportunity in Shiprock
April 17, 2000

TODAY, PRESIDENT CLINTON WILL VISIT SHIPROCK, NEW MEXICO TO HIGHLIGHT HOW ACCESS TO TECHNOLOGY CAN LEAD TO ECONOMIC OPPORTUNITY. President Clinton will visit Shiprock, NM where he will speak to the Navajo Nation at the local Boys and Girls Club, which is also a PowerUP site. The President will focus on access to technology as a vehicle for education and economic development to bring employment opportunities to Native Americans. He will also emphasize how public and private sector investments can create digital opportunity in isolated communities. The President will then participate in an Internet video conference at the Diné Tribal College with students from remote schools within the Navajo Nation. Building on his successful New Markets trips of 1999, the President will highlight the importance of mobilizing the high-tech industry to encourage the participation of all Americans in the digital economy.

NATIVE AMERICANS HAVE NOT SHARED IN THE NATION'S DIGITAL REVOLUTION.

While the number of Americans accessing the Internet has grown rapidly in recent years, there remains a digital divide between information "haves" and "have nots." Native Americans rank far below the national average in their access to telephones, computers, and the Internet, and thus unable to access the full range of information resources that are quickly becoming essential for success in the new economy. For example:

- Lack of Telephone Service Only 22.5 percent of Navajo Nation households have home telephone service as compared to the national average of 94 percent (American Indian Report, March 2000).
- Lack of Education The Navajo Nation high school drop-out rate averages at 20 percent for 9th graders. Only one quarter of the Navajo adult population has graduated from high school (Navajo Nation, 1999).

THE PRESIDENT WILL BE JOINED BY HIGH-TECH AND COMMUNITY LEADERS. The President will be joined by Jeff Arnold, CEO, Healtheon/ WebMD Corporation; Bruce Brooks, Director of Community Affairs, Microsoft; Michael Chasen, President and Co-Founder, Blackboard, Inc.; Rev. Jesse Jackson, CEO and Founder, Rainbow/PUSH Coalition; Yusef Jackson, Co-Chairman, One Net Now; Yvonne Jackson, Senior Vice President, Compaq Computer Corporation; Robert Johnson, CEO, BET Holdings, Inc.; Dr. John Koehler, President and CEO, Tachyon, Inc.; Susan Masten, Chairman and President of the National Congress of American Indians; Steven Rohleder, Managing Partner, Andersen Consulting; Robert Rutherford, President, Native American Systems; Karen Smith, Executive Director, TechCorps; Raul Yzaguirre, President, National Council of La Raza; and Rae Grad, CEO of PowerUP.

PRESIDENT CLINTON AND HIGH-TECH LEADERS WILL ANNOUNCE KEY TECHNOLOGY INITIATIVES TO BRING ECONOMIC OPPORTUNITY TO NATIVE AMERICANS:

- FCC Chairman William Kennard Will Announce Proposals to Increase Telephone Access for Native American Communities for \$1 Per Month Through the Lifeline Program
- Microsoft Will Announces a \$2.75 Million in New Grants to the American Indian Tribal College Program
- IBM, the W.K. Kellogg Foundation and the University of Michigan Will Invest \$1 Million in Partnership with Tribal Colleges to Develop a Virtual Library for Tribal Colleges
- Compaq, in Partnership with TechCorps, Will Announce a \$500,000 Commitment to Serve Native American and Other Schools Through Online Mentoring
- The Corporation For National Service Will Announce \$1 Million for the Navajo Leader Corps
- Andersen Consulting Will Help Native American Small Business to Use E-Commerce
- Tachyon, Inc. Will Provide 500 Navajo Nation Students with Satellite Internet Access
- An Over \$100,000 Commitment by Native American Systems to Increase Internet Access in Indian Country
- The Native American Digital Divide Taskforce Will Launch with \$100,000 From America Online
- Blackboard Inc., Will Commit to Providing Enhanced Educational Tools to Native American Tribal Colleges
- Healtheon/WebMD Will Announce Internet Access to Healthcare Information for Indian Country

A COMPLETE LIST OF PRESIDENT CLINTON'S ANNOUNCEMENTS OF PUBLIC AND PRIVATE SECTORS COMMITMENTS TO BRING DIGITAL OPPORTUNITY NATIVE AMERICANS

- FCC Chairman William Kennard Will Announce Proposals to Provide Phone Service for \$1 Through the Lifeline Program. The Federal Communications Commission (FCC) Chairman, William Kennard, has proposed increasing funding under the Lifeline program so that every member of a federally recognized Indian tribe who is income eligible can have basic phone service for as little as \$1 per month. The FCC has also proposed an increase in federal universal service funding to companies willing to serve Native American reservations by removing the cap on the funding available to carriers that purchase exchanges on reservations and changing the practice of averaging the cost of serving high-cost reservations with low-cost areas when calculating support amounts. These critical steps to expand the Lifeline program will greatly improve Native American communities' access to information and technology resources.
- Microsoft Will Announce \$2.75 Million in New Grants to the American Indian Tribal College Program, Including Diné College. Microsoft will provide eight American Indian Tribal Colleges with technology and training through its American Indian Tribal College Program, part of a continuing relationship with the American Indian Science and Technology Education Consortium. Microsoft will provide these tribal colleges with \$2.5 million in software and \$250,000 in technical assistance to ensure an increase in technical skills among students at tribal colleges. In addition, the program will include the tools necessary for the institutions to achieve Microsoft Certified Training Facility status.
- IBM, the W.K. Kellogg Foundation and the University of Michigan Will Invest \$1 Million in Partnership Tribal Colleges to Develop a Virtual Library For Tribal Colleges. The President will announce a unique \$1 million partnership between IBM, the W.K. Kellogg Foundation, the University of Michigan and several tribal colleges to create a "virtual library." The virtual library homepage will link into a major national database that will catalog electronic books, magazines, journals and Internet documents from around the world. The virtual library will have a reference section, a database section, and local exhibitions for the 32 tribal colleges across the country. There will also be a technical support system which will answer student, faculty and community members' questions interactively.
- Compaq, in Partnership with TechCorps, Will Announce a \$500,000 Commitment to Serve Native American and Other Schools Through Online Mentoring. The President will announce a \$500,000 commitment by Compaq Computer Corporation to partner with TechCorps to develop, pilot and support the nationwide launch of Techs4Schools, an online mentoring program that uses the Internet to join teachers with volunteer high-tech experts to advance the level of technological knowledge and support in our schools. Four Navajo Nation schools participated in the pilot of Techs4Schools, and following today's launch, Techs4Schools will be available to *all* Navajo Nation Schools and other K-12 schools nationwide.
- The Corporation for National Service Will Announce A \$1 Million AmeriCorps Grant For the Navajo Leader Corps. The President will announce a \$1 million AmeriCorps grant for the Navajo Leader Corps. The grant will support 50 Navajo AmeriCorps members in renovating 165 Head Start Centers and BIA schools across the Navajo Nation. The renovations will include wiring the facilities for Internet access.
- A \$100,000 Commitment from Andersen Consulting to Support Small Business In Indian Country. The President will announce that Andersen Consulting will pledge \$100,000 to mentor and provide technical assistance to Native American tribes, tribal businesses, and other Native-owned businesses. This assistance will support their efforts to expand e-commerce. Andersen and the Department of Housing and Urban Development will coordinate this effort. This support will be in the form of professional mentoring, technical advising, computer equipment, and other services.

- Tachyon, Inc. Will Provide Tribal Colleges with Satellite Internet Access. President Clinton will announce a major commitment by Tachyon, Inc. to assist 500 students by bringing Internet access to Diné Tribal College and a remote school. The Tachyon Corporation will provide high-speed, two-way, satellite-delivered Internet access to link two sites of Diné Tribal College and the Lake Valley School, a Bureau of Indian Affairs school. This assistance from Tachyon will build upon a \$10.3 million Department of Labor Youth Opportunity Grant received by the Navajo Nation and Diné College to help fund eight technology centers in each of Diné College's locations.
- An Over \$100,000 Commitment by Native American Systems to Increase Internet Access in Indian Country. The President will announce a more than \$100,000 commitment by Native American Systems (NAS) to provide satellite connections to the Red Rock Day School, a Bureau of Indian Affairs school on the Navajo Nation in Red Valley, AZ. NAS will donate and install a satellite dish, a network router, and 12 complete computer workstations, including Compaq iPAQ computers and monitors for the 244 children attend the Red Rock Day School. NAS is also contributing an additional 30 network routers which will be distributed to similarly isolated Bureau of Indian Affairs schools on reservations across the country. The President and CEO of NAS is Robert P. Rutherford, a member of the Choctaw Tribe.
- The Native American Digital Divide Taskforce Will Launch with \$100,000 from America Online. The National Congress of American Indians (NCAI) will announce the creation of the Native American Digital Divide Taskforce. This Taskforce, with the support and cooperation of the Department of Commerce, bring together a core group of tribal leaders, tribal businesses, academics, government officials, and private businesses to examine issues of access to technology; economic development and workforce training; education; and the creation of culturally and socially relevant Internet resources. America Online will pledge \$100,000 to support for this effort, which is intended to empower Native communities through increased information and access to advanced telecommunications and information technologies.
- Blackboard Inc., Commits to Providing Enhanced Educational Tools to Native American Tribal Colleges. The President will announce a pledge of software, training and educational content to Native American Tribal Colleges. Blackboard, Inc., is Internet education company that powers online teaching and learning platforms, servicing more than 2.1 million people worldwide. Through this pledge, tribal colleges will be able to develop courses for students in remote areas in need of distance learning opportunities. It will also ensure access for tribal college students and faculty to millions of online course currently available through the Blackboard platform.
- Healtheon/WebMD Announces Internet Access to Healthcare Information for Indian Country. Healtheon/WebMD has agreed to provide free subscriptions for *WebMD Practice* to the doctors at the Indian Health Services facility in Shiprock, NM. *WebMD Practice* is an Internet portal that provides doctors and other healthcare providers with a full spectrum of services and information to help them provide quality healthcare more effectively and efficiently. In addition, Healtheon/WebMD will install an Internet-connected kiosk equipped with printers in the waiting room of the Indian Health Services facility. This kiosk will allow visitors to search for and print out healthcare information from the WebMD portal.
- USDA-Rural Development Announces Safe and Clean Water Funds for Indian Country. The Department of Agriculture will announce \$3 million in grants from its American Indian Safe and Clean Water Set-Aside fund to serve six tribal communities in five states (AZ, ME, MN, OR, SD). Additionally, USDA is committing \$2.2 million in low interest loans and \$300,000 in grants to the projects. Five tribes and one non-profit utility district have developed these projects to provide good quality drinking water or improved wastewater disposal.
- HUD Announces 10 Neighborhood Network Centers Targeted in Indian Country. As part of its overall expansion of Neighborhood Network Centers, HUD commits to helping 10 Indian Housing Authorities to create Neighborhood Network Community Learning Centers, and to locating donations or other sources of funding for equipment and networking.

- HUD Launches Native eDGE – the Native American Economic Development Access Center. The Department of Housing and Urban Development and its Office of Native American Programs (ONAP) will announce the creation of a Native American Economic Development Access Center, accessible via website and toll-free number. This Access Center, called Native eDGE (economic Development Guidance and Empowerment) will, for the first time, electronically link resources from over 12 Federal agencies with Native Americans, lending institutions, non-profits, foundations, and private businesses so they can collaborate to achieve sustainable economic development in Indian Country. The Access Center will include a publications clearinghouse to distribute printed materials on demand, and will provide technical assistance by economic development specialists.
- The Department of Education Proposes the Challenging Online Coursework Initiative. The President will announce that his FY2001 budget includes \$10 million to fund the Challenging Online Coursework Initiative for competitive grants to spur innovative research and development efforts focused on web-based Advance Placement (AP), second language, and other challenging coursework. Grants of up to three years would be provided to partnerships for research, development and evaluation of technologies such as online simulations and other web-based instruction that can help provide high-quality learning experiences for all students no matter where their school is located. This initiative will be particularly valuable for remote Native American schools.
- The Small Business Administration and Treasury Propose BusinessLINC in Indian Country. Under Vice President Gore's leadership, the Small Business Administration (SBA) and Treasury have launched a national initiative called BusinessLINC. As part of his FY2001 budget, the President has proposed \$1.25 million to expand BusinessLINC to Indian Country. During the remainder of this year, Treasury and SBA will hold at least two working sessions that will help explore how BusinessLINC in Indian Country might best proceed with particular attention to high-tech opportunities. These sessions will bring together tribal leaders, high-technology firms. These working sessions would explore how the high-tech industry could expand its activities into Indian Country.

**PRESIDENT CLINTON'S TRIP TO BRING
DIGITAL OPPORTUNITY TO ALL AMERICANS**

BACKGROUND ON INDIAN COUNTRY: THE NAVAJO NATION

APRIL 17, 2000

ECONOMIC CHALLENGES FACING NATIVE AMERICANS

In the United States today, there are more than 2.4 million Native Americans that belong to more than 550 tribes. Almost everywhere, they face serious economic challenges:

- Half the total Native American workforce is unemployed – 50 percent in 1997 (Bureau of Indian Affairs 1997).
- Nearly one-third of Native Americans live in poverty, compared to 13 percent of the total U.S. population (Census Bureau, 1995).
- Thirty-eight percent of Indian children aged 6 to 11 live below the poverty level, more than twice the 18 percent rate for the U.S. population as a whole. (Indian Health Service, 1997)

BACKGROUND ON THE NAVAJO NATION AND SHIPROCK, NEW MEXICO

With a population of about 235,000 and covering an area of 16.2 million acres, the Navajo Nation is the largest Indian reservation in the United States.

Shiprock, NM, population 9,095, is the community on the reservation that President Clinton will visit. It lies in the northeastern corner of the Navajo Nation, not far from the point where New Mexico, Colorado, Utah and Arizona meet. The town gets its name from a 1,700 foot geological monument rising impressively from the surrounding plains. The Navajo face most of the economic challenges confronting Indian reservations across the United States, especially in building an Information Age economy.

- The Navajo Nation's unemployment rate was 58 percent in 1997 (Bureau of Indian Affairs, 1997).
- With 38.8 percent of the Navajo Nation younger than age 16, the local economy will have to create 3,500 jobs per year in order to keep an already high unemployment rate from climbing further (Bureau of Indian Affairs, 1997).
- Only 22.5 percent of Navajo homes have telephone service compared to 94.1 percent of all households in the United States (Dept. of Commerce, 1999; American Indian Report, March, 2000).
- The few telephone lines that exist are often antiquated and therefore not well suited to transmitting the large volumes of data that flow along the Internet.
- Among the few Navajo towns that have Internet service, even fewer have more than one Internet Service Provider and thus do not receive the low prices made possible by competition.

THE CLINTON-GORE ADMINISTRATION RECORD TO HELP CLOSE THE DIGITAL DIVIDE

April 17, 2000

President Clinton and Vice President Gore Have a Strong Record of Working to Bridge the Digital Divide / Ensuring That Every Child is Technologically Literate. In 1994, President Clinton and Vice President Gore set the goal of connecting every classroom and library to the Internet. In 1996, President Clinton unveiled his Technology Literacy Challenge -- and has made a major commitment of resources to connect every classroom to the Internet, expand access to modern, multimedia computers; make high-quality educational software an integral part of the curriculum; and enable teachers to effectively integrate technology into their instruction

President Clinton Succeeded in Increasing Educational Technology Funding by Over 3,000 Percent -- From \$23 Million in FY94 to \$766 million in FY2000. This includes:

- \$425 million for the Technology Literacy Challenge Fund, first launched by President Clinton and Vice President Gore in 1996, which helps states and local communities meet all four "pillars" of the President's educational technology initiative (computers, Internet access, teacher training, educational software).
- \$197 million for partnerships between local school districts and the private sector to develop innovative approaches to using technology in the classroom, including the Administration's Technology Innovation Challenge Grants launched in 1995.
- \$75 million for the first stage in the Administration's effort to train all new teachers to use technology, computers and the Internet in the classroom.
- \$32.5 million for the new Clinton-Gore Administration's Community Technology Center Initiative.

President Clinton and Vice President Gore Also Fought for the \$2.25 billion "E-rate" to Connect Schools and Libraries to the Internet.

- The e-rate is providing 20 percent -- 90 percent discounts to connect schools and libraries to the Internet, with the deepest discounts going to the poorest schools that need it most.
- By the end of 2000, the e-rate will have funded \$6.25 billion of telecommunications infrastructure and services to schools and libraries. In 1999, 82 percent of public schools (over 78,000) and 51 percent of public libraries received public funding.

Major progress has been made in reaching the goals of the President's Educational Technology Initiative.

- The number of classrooms connected to the Internet has increased from 3 percent in 1994 to 63 percent in 1999 (Fall 1999 data, Dept of Education, National Center for Education Statistics, "Internet Access in U.S. Public Schools and Classrooms," February 2000).
- The number of schools connected to the Internet has increased from 35 percent in 1994 to 95 percent in 1999 (Fall 1999 data, Dept of Education, National Center for Education Statistics, "Internet Access in U.S. Public Schools and Classrooms," February 2000).
- Grants supported by the Department of Education are training 400,000 new teachers to use technology effectively in the classroom.

President Clinton and Vice President Gore are Building on Their Past Achievements Through a Number of New and Expanded Proposals this Year. Earlier this year, the President and Vice President announced specific proposals in their FY2001 budget to help create digital opportunity for more Americans, including:

- \$2 billion over 10 years in tax incentives to encourage private sector donation of computers, sponsorship of community technology centers, and technology training for workers.
- \$150 million to help train all new teachers entering the workforce to use technology effectively.
- \$100 million to create 1,000 Community Technology Centers in low-income urban and rural neighborhoods.
- \$50 million for a public/private partnership to expand home access to computers and the Internet for low-income families.
- \$45 million to promote innovative applications of information and communications technology for under-served communities.
- \$25 million to accelerate private sector deployment of broadband networks in underserved urban and rural communities.
- \$10 million to prepare Native Americans for careers in Information Technology and other technical fields.

In addition, President Clinton and Vice-President Gore have worked to:

- **Expand access to technology for people with disabilities.** President Clinton and Vice President Gore have been strong supporters of efforts to make technology more accessible for people with disabilities. Recent actions by the Federal Communications Commission will help ensure that telecommunications equipment, such as cellular phones, is designed to be accessible for people with disabilities.
- **Expand access to technology in under-served communities.** In addition to the Department of Education's Community Technology Center program, which provides computer access and educational services to communities around the country, the Department of Housing and Urban Development has created approximately 500 Neighborhood Network learning centers that bring state of the art technology to publicly-assisted housing across America. HUD's Neighborhood Networks are innovative private/public partnerships that establish computer-based multi-service centers to help people in publicly-assisted housing learn critical computer skills and prepare for 21st Century jobs.
- **Ensure that the Administration makes closing the Digital Divide a top priority.** In December, 1999, President Clinton directed members of his Cabinet (Secretaries of Commerce, Education, Health and Human Services, Housing and Urban Development, and Labor) to take specific steps to close the Digital Divide, including:
 - ✓ Continuing to measure the nature and extent of the digital divide by examining the importance of income, education, race, gender, geography and age to Americans' access to Information Age tools;
 - ✓ Expanding the network of Community Technology Centers to provide access to technology for those American who can't afford it;
 - ✓ Promoting applications of the Internet that will empower low-income families, such as the ability to start their own business; and
 - ✓ Upgrading the IT skills of workers in low-income communities.

THE IMPORTANCE OF BRIDGING THE DIGITAL DIVIDE AND CREATING DIGITAL OPPORTUNITY FOR ALL AMERICANS

April 17, 2000

- Access to computers and the Internet and the ability to effectively use this technology are becoming increasingly important for full participation in America's economic, political, and social life. In recent years, access to computers and the Internet has exploded. Unfortunately, there is strong evidence of a "digital divide" -- a gap between those individual and communities that have access to these Information Age tools and those who don't.

Better-educated Americans are more likely to be connected.

- 69 percent of households with a bachelor's degree or higher have computers, compared to 16 percent of those households that have not completed high school (Dept. of Commerce, "Falling Through The Net," July 1999).
- 45 percent of households with a bachelor's degree or more have Internet access in the home, compared to 14 percent with no only a high school diploma or GED (Dept. of Commerce, "Falling Through The Net," July 1999).

The divide between high and low-income Americans is significant.

- 80 percent of households with an income of \$75,000 or above have computers, compared to 16 percent of households earning \$10,000 - \$15,000 (Dept. of Commerce, "Falling Through The Net," July 1999).
- 60 percent of households with incomes of \$75,000 or above have Internet access, compared to 12 percent earning \$20,000 - \$25,000 (Dept. of Commerce, "Falling Through The Net," July 1999).

Whites are more likely to be connected than African-Americans and Hispanics.

- 47 percent of white households have computers, compared to 23 percent of African-American and 26 percent of Hispanic households (Dept. of Commerce, "Falling Through The Net," July 1999).
- 53 percent of white, two-parent households with children earning more than \$35,000 have Internet access in the home, compared to 31 percent of African-American and Hispanic households (Dept. of Commerce, "Falling Through The Net," July 1999).
- However, there is virtually no gap in computer ownership between white and African- American households earning more than \$75,000. (Dept. of Commerce, "Falling Through The Net," July 1999).

Wealthier schools are more likely to be connected to the Internet than poorer schools

- In wealthy schools (less than 11 percent of students eligible for free or reduced-price school lunch), 74 percent of classrooms are connected to the Internet, compared to 39 percent for the poorest schools (71 percent or more of students eligible for free or reduced-price school lunch) (Fall 1999 data, Dept of Education, National Center for Education Statistics, "Internet Access in U.S. Public Schools and Classrooms," February 2000).

People with disabilities are less likely to have access to technology.

- 11 percent of people aged 15 and above with a disability have access to the Internet at home, compared to 31 percent of people without disabilities (Current Population Survey, 1998 Computer and Internet Use Supplement, as cited in H. Stephen Kaye, Computer and Internet Use Among People with Disabilities, Disability Statistics Center, March 2000).

DIGITAL DIVIDE POLICY BOOK

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Clinton Presidential Records Digital Records Marker

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Q. Some have argued that there is no digital divide -- and that minorities are getting connected in increasing numbers? What's your response to that?

- First of all, we've never defined the digital divide as being solely a divide along ethnic or racial lines -- it's also a gap by income, education level, disability, and geography.
- Second -- it's not only access to hardware -- we need to train teachers to use technology effectively in the classroom, encourage more women and minorities to pursue high-tech careers, and encourage the development of applications of information technology -- such as compelling educational software that can get children excited about learning.
- Finally - the 1998 Census data that we have suggests that the differences between blacks and whites have narrowed at the upper income levels (above \$75,000) - but not at lower income levels. For example, 33 percent of white households with incomes of \$15,000 - \$35,000 have computers -- compared to 19 percent of black households.

[Note: argument that there is no "racial" divide is based on projections from market research companies.]

Q. Isn't this going to happen anyway - given rapidly falling prices of hardware and Internet access?

- We'd like it to happen faster. There was nothing inevitable about getting schools connected to the Internet - we catalyzed that with activities like NetDay and worked to ensure that poor schools are not left behind with the e-rate.
- Again, it's not just access to hardware -- we need to train teachers to use technology effectively in the classroom, encourage more women and minorities to pursue high-tech careers, and encourage the development of applications of information technology -- such as compelling educational software that can get children excited about learning.

Q. Isn't Administration's proposal corporate welfare?

- No -- we are providing tax incentives for them to take steps that are in the public interest -- such as donate computers to schools, libraries, and community technology centers.

THE IMPORTANCE OF BRIDGING THE DIGITAL DIVIDE AND CREATING DIGITAL OPPORTUNITY FOR ALL AMERICANS

April 17, 2000

- Access to computers and the Internet and the ability to effectively use this technology are becoming increasingly important for full participation in America's economic, political, and social life. In recent years, access to computers and the Internet has exploded. Unfortunately, there is strong evidence of a "digital divide" -- a gap between those individual and communities that have access to these Information Age tools and those who don't.
- Ensuring that more Americans have high-tech skills is important, since jobs in the IT sector pay almost 80 percent more than the private sector average. (Dept. of Commerce, Emerging Digital Economy II, June 1999).

Better-educated Americans are more likely to be connected.

- 69 percent of households with a bachelor's degree or higher have computers, compared to 16 percent of those households that have not completed high school. (Dept. of Commerce, "Falling Through The Net," July 1999).
- 45 percent of households with a bachelor's degree or more have Internet access in the home, compared to 4 percent with no high school education. (Dept. of Commerce, "Falling Through The Net," July 1999).

The divide between high and low-income Americans is significant.

- 80 percent of households with an income of \$75,000 or above have computers, compared to 16 percent of households earning \$10,000 - \$15,000. (Dept. of Commerce, "Falling Through The Net," July 1999).
- 60 percent of households with incomes of \$75,000 or above have Internet access, compared to 12 percent earning \$20,000 - \$25,000. (Dept. of Commerce, "Falling Through The Net," July 1999).

Whites are more likely to be connected than African-Americans and Hispanics.

- 47 percent of white households have computers, compared to 23 percent of African-American and 26 percent of Hispanic households. (Dept. of Commerce, "Falling Through The Net," July 1999).
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- In wealthy schools (less than 11 percent of students eligible for free or reduced-price school lunch), 74 percent of classrooms are connected to the Internet, compared to 39 percent for the poorest schools (71 percent or more of students eligible for free or reduced-price school lunch). (Fall 1999 data, Dept of Education, National Center for Education Statistics, "Internet Access in U.S. Public Schools and Classrooms," February 2000).

People with disabilities are less likely to have access to technology.

- 11 percent of people aged 15 and above with a disability have access to the Internet at home, compared to 31 percent of people without disabilities. (Current Population Survey, 1998 Computer and Internet Use Supplement, as cited in H. Stephen Kaye, Computer and Internet Use Among People with Disabilities, Disability Statistics Center, March 2000).

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Divider Title: _____

THE CLINTON-GORE AGENDA FOR CREATING DIGITAL OPPORTUNITY

Private sector competition and rapid technological progress are powerful forces for bridging the digital divide and for making Information Age tools available for more and more Americans. The information technology industry is able to double the amount of computing power available at a given price every 12-18 months, and is now selling low-cost computers and "information appliances" – such as specialized Internet access devices. Some companies are even offering free, advertiser-supported Internet access. By working with the private sector and community-based organizations, the Administration can accelerate the trend of expanded access.

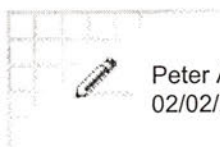
But access to technology is only the first step. We also need to give more people the skills they need to use technology, promote content and applications of technology that will help empower under-served communities, and ensure that our teachers can use technology effectively in the classroom. Below is a brief description of the initiatives that President Clinton and Vice President Gore are proposing to help accomplish these goals:

1. **\$2 billion over 10 years in tax incentives to encourage private sector donation of computers, sponsorship of community technology centers, and technology training for workers:** President Clinton's budget includes \$2 billion in tax incentives to encourage companies to donate computers to schools, libraries and community technology centers, to sponsor schools, libraries, and community technology centers in designated Empowerment Zones, and to provide basic computer training, workplace literacy, or other basic education for their employees.
 - **Encouraging companies to donate computers.** The President proposes to extend and expand an enhanced tax deduction to provide companies with an incentive to donate computers to schools, libraries and computer technology centers. This enhanced deduction allows companies to deduct more than the cost of their donation. Under current law, this enhanced deduction applies to donations of computers to schools only and expires after the year 2000. The President's proposal would extend this provision through June 30, 2004 and would expand it to donations to public libraries or community technology centers in Empowerment Zones, Enterprise Communities, and high-poverty areas.
 - **Promoting corporate sponsorship of schools, libraries and community technology centers.** The President proposes tax relief to encourage companies to sponsor schools and community technology centers in Empowerment Zones and Enterprise Communities and targeted low-income areas. The President's proposal would allocate credits for \$16 million in corporate sponsorship to each of the 31 existing Empowerment Zones and 10 proposed new Empowerment Zones and \$4 million in corporate sponsorship for each of the more than 80 Enterprise Communities. In total, the President's proposal would help support up to nearly \$1 billion in annual sponsorships to help improve schools and community technology centers.
 - **Supporting technology training for workers.** The President's proposal would provide targeted tax relief to encourage companies to provide basic computer training, workplace literacy, or other basic education for employees that lack the basic skills to succeed in the modern workplace. Companies would be allowed to take a 20 percent tax credit for up to \$5,250 in annual expenses per employee. Eligible employees generally would not have received a high school degree or its equivalent.
2. **\$150 million to help train all new teachers entering the workforce use technology effectively in the classroom:** Under the leadership of President Clinton and Vice President Gore, the United States has made enormous progress in connecting schools to the Internet, and increasing the number of modern computers in the classroom. However, access to computers and the Internet will not help students achieve high academic standards unless teachers are as comfortable with a computer as they are with a chalkboard. President Clinton's budget calls for \$150 million in Department of Education grants -- double the last year's investment of \$75 million -- to ensure that all new teachers entering the workforce are technologically literate and can integrate technology into the curriculum. The need for this investment is clear. According to the National Center for Education Statistics, only 20 percent of teachers report that they are "very well prepared" to integrate technology into classroom. And over the next 10 years, K-12 schools will need to hire 2 million new teachers to fill the vacancies left by retiring teachers and to accommodate increasing student populations.

3. **\$100 million to create up to 1,000 Community Technology Centers in low-income urban and rural communities:** The President's budget more than triples the Department of Education's support for Community Technology Centers - from \$32.5 million in FY2000 to \$100 million in FY2001. This initiative, championed by Congresswoman Maxine Waters was initially funded at \$10 million in fiscal year 1999. The goal of the initiative is to help close the "digital divide" by providing computers and Information Age tools to children and adults that are not able to afford them at home. These community technology centers will help empower hundreds of thousands of low-income children and adults in a variety of ways. Children will be able to improve their performance in school by having access to high-quality educational software after school and prepare for the high-tech workplace of the 21st century by getting certified with an information technology skill. Adults will be able to use computers and the Internet to take a self-paced adult literacy course; get access to America's Job Bank to see what jobs are available; learn to type up a resume and cover letter using word processing software; learn to start up their own "micro-enterprise" or Web-based business, or acquire new training. A study sponsored by the National Science Foundation confirms that Community Technology Centers are helping to bridge the digital divide. Of the users surveyed: 62 percent had incomes of less than \$15,000; 65 percent took computer classes to improve their job skills; and 41 percent got homework help or tutoring at the center.
4. **\$50 million for a public/private partnership to expand home access to computers and the Internet for low-income families:** The President's budget includes a new \$50 million Department of Commerce pilot program to expand access to computers and the Internet for low-income families, and to give these families the skills they need to use these new Information Age tools effectively. This new program will provide competitive grants to public-private partnerships at the local level. Potential partners might include: local school districts seeking to expand parental involvement in education; high-tech companies willing to provide discounts on computers and access; libraries offering training on "information literacy"; employers seeking to upgrade the skills of their workforce using distance learning, and government agencies at all levels seeking to save taxpayer dollars through the electronic delivery of government services. The Administration will continue to work with the private sector and non-profit organizations on the most effective way to design this program.
5. **\$45 million to promote innovative applications of information technology for under-served communities:** President Clinton's budget will increase the investment in the Department of Commerce's highly-successful Technology Opportunities Program (TOP) to \$45 million -- triple the current level of \$15 million. This program encourages innovative applications of information technology that help empower low-income communities -- public health information systems that raise childhood immunization rates in inner-cities, tele-mentoring for at-risk youth, and electronic networks that strengthen local communities by fostering communication and collaboration.
6. **\$25 million to accelerate private sector deployment of high-speed networks in under-served urban and rural communities:** High-speed Internet access is becoming as important to the economic vitality of a community as roads and bridges are today. The President will propose a new \$25 million program at the Department of Commerce and the Department of Agriculture to accelerate private sector deployment of broadband networks in under-served urban and rural communities -- using grants and loan guarantees. The potential payoff from these kinds of investments is enormous. One company, for example, has helped people move from "welfare-to-work" by connecting their community with the high-speed networks needed to support telecommuting. This solves some of the biggest barriers associated with welfare-to-work -- lack of childcare and transportation.
7. **\$10 million to prepare Native Americans for careers in information technology and other technical fields:** The National Science Foundation will support efforts by tribal colleges to increase the number of Native Americans who are prepared to pursue careers in information technology and other technical fields. The ability to use technology is becoming increasingly important in the workplace, and jobs in the rapidly growing information technology sector pay almost 80 percent more than the average private sector wage.

CLINTON ADMINISTRATION INITIATIVES TO HELP BRIDGE DIGITAL DIVIDE

Program	Department	FY 2000	FY2001	CHANGE
Tax incentives to encourage private sector donation of computers, sponsorship of community technology centers, and technology training for workers. Specifically, this funding encourages companies to: • donate computers to schools, libraries and community technology centers • sponsor schools, libraries, and community technology centers in designated Empowerment Zones, • provide basic computer training, workplace literacy, or other basic education for their employees.			\$2 billion (tax incentives over 10 years)	
Funding to help train all new teachers entering the workforce to use technology effectively.	Education	\$75 million	\$150 million	\$75 million
Funding to create 1,000 Community Technology Centers in low-income urban and rural neighborhoods.	Education	\$32.5 million	\$100 million	\$67.5 million
Funding for a public/private partnership to expand home access to computers and the Internet for low-income families.	Commerce	0	\$50 million	\$50 million
Funding to promote innovative applications of information and communications technology for under-served communities.	Commerce	\$15 million	\$45 million	\$30 million
Funding to accelerate private sector deployment of broadband networks in under-served urban and rural communities.	Commerce / USDA	0	\$25 million	\$25 million
Funding to prepare Native Americans for careers in Information Technology and other technical fields.	NSF	0	\$10 million	\$10 million



Peter A. Weber
02/02/2000 09:17:58 AM

Record Type: Record

To: Thomas A. Kalil/OPD/EOP@EOP
cc: Wayne Upshaw/OMB/EOP@EOP
Subject: Technology Table

Below is the table that you requested.

Program	FY 2000 Enacted	FY 2001 Budget
Technology Literacy Challenge Fund	425	450
Next Generation (TICG & Star in FY 2000)	196.8	170
R*TECs	10	10
Community Based Tech. Centers	32.5	100
Technology Leadership Activities	2	2
Ready to Learn Digital Television	16	16
Preparing Tomorrow's Teachers	75	150
Telecom. Program for Prof. Dev.	8.5	5
TOTAL	765.8	903

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Divider Title: _____

April 9, 2000

MEMORANDUM TO GENE SPERLING

FROM: TOM KALIL

SUBJECT: THE ADMINISTRATION'S HIGH-TECH ACCOMPLISHMENTS

1. Why information and communications technology has been a priority for the Administration

- The IT industry is **driving U.S. economic growth**. In the last three years, IT has accounted for almost 1/3 of U.S. economic growth. Declining prices in the IT industry have lowered inflation by almost a full percentage point - and have helped the U.S. economy maintain this terrific combination of rapid growth, low unemployment, low inflation, and higher productivity.
- Second, the **IT industry is generating high-wage, high-skill jobs**. Wages in the IT sector are almost 80 percent higher than the private sector average.
- Third, **information technology is changing the way all companies do business**. IT now accounts for 1/2 of business investment. Companies are using IT to tailor their products and services to the needs of individual customers, forge closer relationships with their suppliers, and deliver just-in-time training to their employees. Customers can name a price they are willing to pay for a hotel or airline reservation - and force companies to compete for their business. Business-to-business e-commerce in the U.S. alone could reach \$1.3 trillion by the year 2003 - some estimates are even higher.
- Fourth, **the Internet is becoming a new communications medium in addition to a commercial marketplace**. It is different from radio, TV and print medium because it allows individuals to be producers as well as consumers of information, and it allows "many to many" interaction as opposed to the "one-to-many" communication of the broadcast medium. This has allowed for the formation of tens of thousands of "communities of interest" -- such as caregivers for people with Alzheimers disease. And unlike the traditional telecommunications network, which only allowed new services like call waiting and voice mail to be introduced by a few industry players -- the Internet has created an open platform for innovation.
- Fifth, **we are just at the beginning of the Information Revolution**. Although 275 million people are connected to the Internet, half of the world's population has never made a phone call. And there is every reason to believe that the incredible improvements in our ability to store, process and move information will continue for at least another 20 years. For example, the government is funding long-term research that could allow us to make transistors out of individual molecules -- and store trillions of bits of information in a square centimeter.

- **These technologies have the potential to deliver social as well as economic benefits.** Using distance learning, working adults can acquire new skills at a time, place and pace that is convenient for them. Telemedicine can improve the quality of health care in under-served rural communities. Technologies such as speech recognition and text-to-speech can allow people with disabilities participate in the workforce, and lead more independent lives. And IT can make help government at all levels more open, responsive and efficient.
- **Personal interest of the Vice President** -- long-standing interest and support for the "information superhighway" long before anyone outside of the research community was taking it seriously.

2. Actions the President and Vice President have taken to strengthen America's high-tech competitiveness and promote e-commerce and the Internet

- The Administration has **opened up foreign markets for high-tech goods and services and cracked down on foreign piracy.** The Administration has negotiated a number of important trade agreements, including:
 - The Information Technology Agreement (ITA), which will eventually eliminate tariffs on \$600 billion worth of goods: 95 percent of the world production of semiconductors, computers, telecom equipment, and other high-tech products.
 - The World Trade Organization's Basic Telecommunications Agreement, which will promote competition and privatization in a global telecommunications services market worth \$1 trillion.
 - Strong intellectual property protection as part of the GATT, NAFTA, and bilateral agreements.
- President Clinton and Vice President Gore have **liberalized export controls on computers and telecommunications equipment.** These decisions have increased U.S. high-tech exports while maintaining controls on those items that are truly important for U.S. national security.
- Administration pushed for **longer-extension of the R&E credit** - and got 5 year extension as part of the final tax package.
- Administration also succeeded in getting **patent reform** passed -- which will be good for inventors, entrepreneurs, and innovation.
- President Clinton and Vice President Gore fought for the **first comprehensive telecommunications reform legislation in over 60 years** -- the Telecommunications Act of 1996. This Act is designed to promote competition in the telecommunications industry -- which will lead to lower prices, more customer choice, and faster deployment of an advanced telecommunications infrastructure.
- Although it is taking longer than any of us would like -- **competition is beginning to emerge.** Using the pro-competition provisions of the Act, new carriers have entered the

market for voice and high-speed data and Internet access – attracting over \$30 billion in capital investment. **The U.S. has much lower prices for advanced telecommunications services than virtually any other country – giving American companies a tremendous competitive advantage.**

- The Administration has also **transferred large blocks of spectrum from government to private sector use – creating new digital wireless industries.** More than 80 million Americans now subscribe to wireless services – up from 16 million in 1993, and many Americans can choose from 4 or more wireless telecommunications companies.
- **The President and the Vice President have announced a framework for global electronic commerce that relies on market forces and private sector leadership whenever possible.** Since the framework was unveiled in 1997, we've made significant progress in implementing it, including:
 - A new export control regime that will allow U.S. companies to export **encryption** of unlimited bit-length, following a one-time technical review. Controls on export to terrorist nations and foreign governments would remain.
 - International agreements with other heads of state that adopt the Administration's market-led approach to e-commerce
 - **A three-year moratorium on Internet access taxes** and taxes that discriminate against e-commerce - to avoid thousands of different state and local jurisdictions each taxing the Internet in a different way
 - Passage of legislation that requires government agencies to recognize digital signatures for online transactions (note: this is legislation passed in 1998 - not the Bliley bill that the Administration opposed this year)
 - A growth in the number of e-commerce companies that have agreed to protect the **privacy of their consumers through meaningful self-regulation**, and targeted legislation to protect children's privacy online.
 - The transfer of the technical management of the Internet to an international non-profit organization
 - A temporary agreement to make cyberspace a duty-free zone
 - Ratification of the intellectual property treaties the Administration negotiated in Geneva
- **The Administration has worked to increase investment in long-term research that is beyond the 3-5 year time horizons of corporations.** Government-supported research, particularly in our nation's leading research universities, has played a critical role in the development of information technology. For example:
 - Government investment in the ARPANET beginning in 1969 led to today's Internet.

- The first graphical Web browser, Mosaic, was developed by Marc Andreessen at an NSF-sponsored supercomputer center
- Many of the Internet search engines are outgrowths of the Digital Library Initiative - jointly supported by NSF, DARPA and NASA
- The President and the Vice President have been champions of research initiatives such as the **Next Generation Internet** and "**Information Technology for the 21st Century.**" The IT initiative is based on the recommendations of the President's Information Technology Advisory Committee, which is composed of leading academic researchers and industry executives from companies such as Sun, IBM, 3Com, Intel and Microsoft. Although the results of these research initiatives are impossible to predict -- it could lead to computers that use DNA, an Internet that can connect billions of devices as opposed to just millions of computers, and computers that can more accurately predict tornadoes and hurricanes.
- As part of the FY2001 budget -- President Clinton has proposed an almost \$3 billion increase in R&D - including a major increase in the National Science Foundation budget and a new initiative in nanotechnology.

3. Connecting our children to the future:

- President and Vice President have set a national goal of **ensuring that every child is technologically literate.**
- That means that children will understand the mechanics of using computers and the Internet, but also be able to use it to improve their performance in all academic subjects -- and be able to acquire and synthesize information from multiple sources.
- In addition to preparing children for the high-tech workplace of the 21st century, it's an opportunity to change the way teachers teach and students learn. Teachers can communicate more frequently with parents, keep up with the latest developments in their field, and exchange lesson plans with their colleagues. Students can conduct research using primary source material, learn the principles of genetics by breeding virtual fruit flies, and learn astronomy by using a professional telescope located 3,000 miles from their classroom.
- Our educational technology strategy has four "pillars"
 - Connecting every classroom and library to the Internet by the year 2000.
 - Technology training for teachers
 - Modern computers in the classroom
 - High-quality educational software/content
- As a result of the Clinton-Gore educational technology initiative:

- The number of classrooms connected to the Internet has increased from 4 percent in 1994 to 63 percent in 1999.
- The "e-rate", part of the Telecommunications Act of 1996, is providing \$2.25 billion in 20% - 90% discounts to connect schools and libraries to the Internet, with the deepest discounts going to the poorest schools that need it most. **Our total investment in educational technology at the federal level (including the e-rate) has increased from \$23 million in 1993 to over \$3 billion today.**
- Grants supported by the Department of Education are training 400,000 new teachers to use technology effectively in the classroom.

4. From "digital divide" to "digital opportunity":

- Currently, urban households with more than \$75,000 and higher are twenty times more likely to have access to the Internet than rural households at the lowest income levels, and more than nine times as likely to have a computer at home.
- In addition to ensuring that all schools and libraries are connected to the Internet, President Clinton and Vice President Gore have also taken other steps to bridge the digital divide, including:
 - Increased investment in Community Technology Centers: The President's FY2001 budget calls for \$100 million to support Community Technology Centers in low-income urban and rural neighborhoods, up from \$32.5 million in FY2000.
 - Supporting innovative applications of information technology for low-income families through the Department of Commerce. Examples include the use of telemedicine for prenatal care, telementoring for at-risk youth, a national computer network for local food banks, and distance learning for people who have lost their jobs.

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Divider Title: _____

FROM DIGITAL DIVIDE TO DIGITAL OPPORTUNITY

A NATIONAL CALL TO ACTION

Access to information technology and the Internet and the ability to use this technology effectively are becoming increasingly important to full participation in America's economic, political and social life. While computer and Internet access has exploded in recent years, America faces a "digital divide"—a gap between those who have access to Information Age tools and the skills to use them and those who don't.

America has an important choice to make: we can allow unequal access to deepen existing divisions along the lines of race, income, education level, geography, and disability -- or we can use technology as a powerful tool to help make the American dream a reality for more people. To help create digital opportunity for more Americans, we must create strong partnerships between government, industry, and the rich mosaic of America's civil society -- including educators, labor unions, librarians, civil rights leaders, faith-based organizations, foundations, volunteers, and community-based organizations.

As companies, non-profit organizations and individuals, we are committed to taking concrete steps to meet two critical national goals: (1) Ensuring Access To 21st Century Learning Tools For Every Child In Every School; and (2) Expanding Digital Opportunity For Every American Family And Community. We pledge to support these two goals.

GOAL ONE: 21ST CENTURY LEARNING TOOLS FOR EVERY CHILD IN EVERY SCHOOL

For children to succeed, they need to master basic skills at an early age. A critical element of this is the need for information and technological literacy. To help achieve these aims, we must focus on a comprehensive approach to integrating technology into teaching and learning while recognizing that -- as powerful as technology is -- it is no substitute for an inspiring teacher or a loving parent. Together, we must:

1. Connect every classroom to the Internet
2. Ensure that all students have modern multi-media computer access, ideally at a ratio of 1 computer for every 4-5 students
3. Ensure that teachers are technologically literate and can integrate technology into the curriculum
4. Make available high quality educational software and online learning resources

GOAL TWO: DIGITAL OPPORTUNITY FOR EVERY AMERICAN FAMILY AND COMMUNITY To ensure that no family or community is left behind, we must:

1. Set the long-term goal of making home access to the Internet universal
2. Bring technology to every community -- urban, rural, and Native American -- through Community Technology Centers and high-speed networks
3. Give adults the skills they need to use information technology and compete for jobs in the IT sector
4. Motivate and inspire more people to appreciate the value of "getting connected"

**A NATIONAL CALL TO ACTION FOR
DIGITAL OPPORTUNITY**

**YES, WE SUPPORT THE CALL TO ACTION AND ARE COMMITTED
TO TAKING CONCRETE STEPS TOWARD MEETING THE TWO
NATIONAL GOALS FOR DIGITAL OPPORTUNITY.**

COMPANY/ORGANIZATION NAME:

PRESIDENT/CEO: _____

ADDRESS: _____

PHONE: _____ **FAX:** _____

E-MAIL: _____

PLEASE RETURN THIS FORM BY MARCH 24th TO:

Jackson Dunn, Office of Public Liaison

E-mail: jackson_dunn@who.eop.gov

Phone: 202-456-2930

Fax: 202-456-6218

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Divider Title: _____



By Ekaterina O. Walsh, Ph.D.

With Michael E. Gazala

Christine Ham

APRIL 11, 2000

The Truth About The Digital Divide

While Asian- and Hispanic-Americans lead in online use, African-Americans lag behind. Income disparities carve up a digital divide, and it won't close as long as they remain. Once online, the divide disappears -- ethnic groups don't behave differently on the Net.

INCOME DIVIDES CONSUMERS INTO DIGITAL HAVES AND HAVE-NOTS

The "digital divide" -- the gap between the Internet haves and have-nots -- is grabbing headlines, with much of the coverage suggesting that members of ethnic minorities lag behind online. Forrester's research confirms that a digital divide exists, but not all minorities show up on the wrong side of it. Our January 2000 representative mail survey of more than 80,000 US households reveals that:

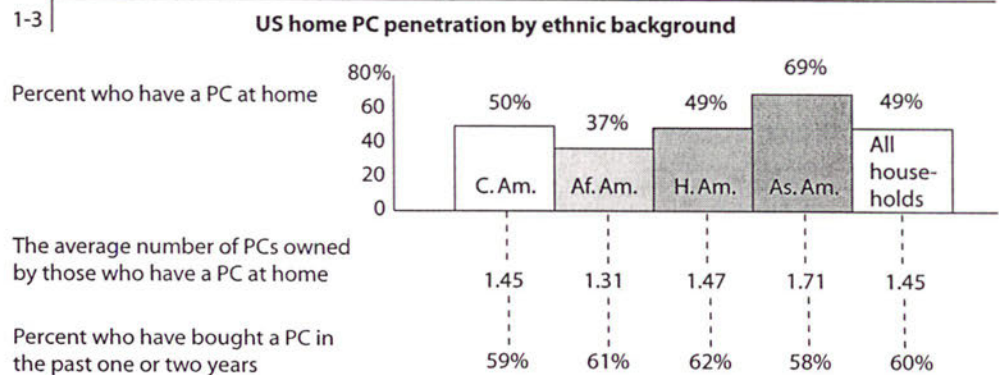
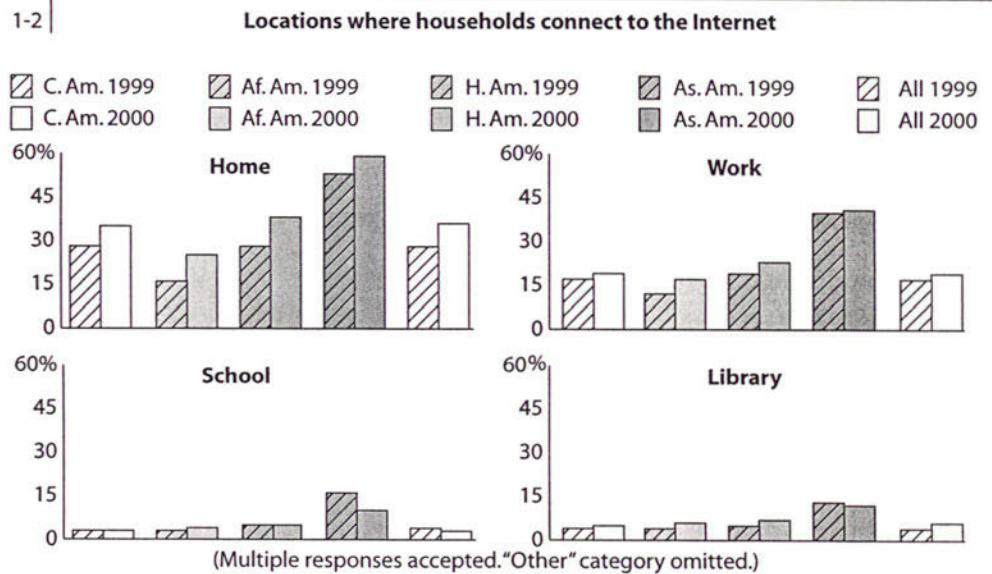
- **Asian- and Hispanic-Americans lead in online access.** Internet penetration among Asian-American households already matches that of mass consumer technologies like cable TV, while Hispanic-American households are 9% more likely than Caucasian ones to be online. Despite being the fastest-growing online group last year, African-American households still lag behind all other groups in Internet adoption (see Figure 1-1).
- **At-home Internet access grows for all ethnic groups.** In 1999, connectivity to the Net from home increased by at least 11% for all ethnic groups. Again, Asian- and Hispanic-American households lead (see Figure 1-2). Because African-Americans are least likely to own a PC, they are also least likely to connect from home (see Figure 1-3). Focusing solely on PC owners, we find no differences in quality of access: Across the board, about 60% purchased their computers in 1998 or 1999, virtually all home PCs feature modems, and most users dial in at 56 Kbps.

Figure 1 Internet And PC Penetration Among Ethnic Groups

1-1

US online penetration by ethnic background			
	Percent online in January 2000	Percent online in January 1999	1999 growth rate
Caucasian-American (C. Am.)	43%	34%	27%
African-American (Af. Am.)	33%	23%	44%
Hispanic-American (H. Am.)	47%	36%	33%
Asian-American (As. Am.)	69%	64%	8%
All households	43%	35%	23%

Ethnic groups are ordered by number of US households (most to least)



Source: Forrester Research, Inc.

- **Income drives Internet access . . .** Although a combination of factors determines consumer likelihood to be online, income is the strongest predictor -- across ethnic groups, online penetration rises as income rises. Other drivers of Internet use include age, education, and technology optimism (see Figure 2). Ethnic background alone does not explain the existence of a digital divide: Once statistical analyses take into account the impact of income, age, education, and technology optimism, ethnic background does *not* materially influence online adoption (see the March 3, 1999 Forrester Brief "The Digital Melting Pot").
- **. . . therefore, African-Americans' online usage lags behind.** More than one in four African-American households lives on less than \$15,000 per year, compared with only 7% of Asian-, 14% of Hispanic-, and 17% of Caucasian-American households that do so. As long as income remains a critical driver of online adoption and household incomes differ markedly across ethnic groups, the US will be stuck with a digital divide.

THE DIGITAL DIVIDE CLOSES ONLINE

Once online, the digital divide virtually disappears. Regardless of ethnicity, consumers use the Internet for the same reasons and to do the same things (see Figure 3-1):

- **Communicate.** A shared motivation -- cheap and quick communication -- compels almost all consumers to go online. Sending email is the most popular online activity for all consumers, and more than two-thirds of respondents in each ethnic group say that it prompted them to get wired. Furthermore, ethnic background appears to have little impact on the uptake of newer online communication technologies like chat and instant messaging.
- **Access information.** Online consumers of all ethnic groups mine the Internet for information on everything from the weather to nutrition guides. Only minor differences exist in the *types* of information that interest various ethnic groups: African-Americans, for example, are more likely to seek health and job information, while more Asian-Americans use search engines and browse newspapers and magazines.
- **Have fun.** The quest for entertainment consistently influences how consumers of all ethnic backgrounds use the Internet. Again, only minor differences exist in the types of entertainment they seek -- African-Americans are more likely to play games online and Asian-Americans are more likely to download music.

Figure 2 Ethnic Background Does Not Materially Influence Internet Adoption**Factors influencing Internet adoption**

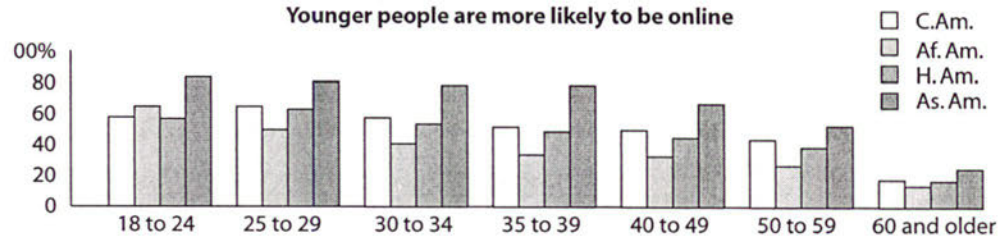
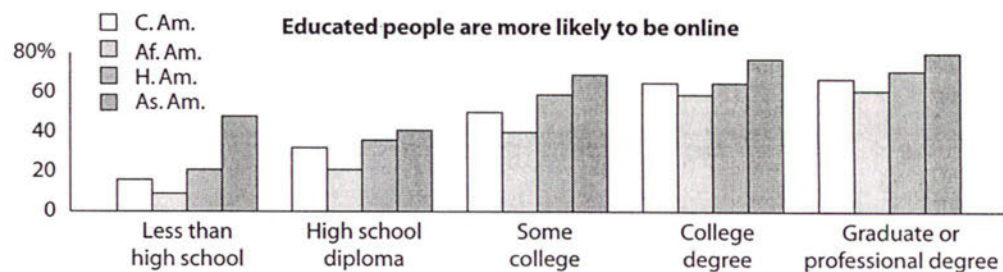
Median annual household income	\$40,000	\$31,000	\$40,000	\$65,000	
Median age	47	44	40	36	
College educated*	29%	24%	26%	60%	
Technology optimists	51%	61%	58%	76%	

□ C. Am.
 □ Af. Am.
 □ H. Am.
 □ As. Am.

*The college-educated category includes those who have either a college, graduate, or professional degree

Income is the main driver of Internet adoption

	C. Am.	Af. Am.	H. Am.	As. Am.
Less than \$15,000	11%	7%	13%	35%
\$15,000 to \$24,999	25%	19%	35%	56%
\$25,000 to \$34,999	37%	36%	40%	71%
\$35,000 to \$49,999	48%	44%	50%	75%
\$50,000 to \$69,999	59%	51%	62%	74%
\$70,000 to \$99,999	64%	55%	68%	69%
\$100,000 or more	68%	65%	72%	79%

Younger people are more likely to be online**Educated people are more likely to be online****Technology optimists are more likely to be online**

Percent of technology optimists online	58%	39%	57%	75%
Percent of technology pessimists online	28%	22%	33%	51%

□ C. Am.
 □ Af. Am.
 □ H. Am.
 □ As. Am.

Source: Forrester Research, Inc.

- **Shop.** At first glance, the data shows deeper eCommerce penetration among Asian-Americans -- they are 30% more likely than any other ethnic group to buy online. But examination of specific online purchases by ethnic group reveals that all consumers progress almost in lock step through a retail adoption cycle -- buying convenience items the most, researched products second, and replenishment goods the least (see Figure 3-2).

HOW TO REACH ETHNIC GROUPS ONLINE

Our findings about various ethnic groups' online use have two implications for companies targeting ethnic groups on the Internet:

- 1) **Ethnic flavor alone does not lure visitors.** The immaterial impact of ethnic background on online behaviors highlights the need for sites to offer more than a generic ethnic label to attract visitors. Online users are not only Asian-, African-, Hispanic-, Polish-, or Irish-Americans -- each of them also has specific individual interests, ranging from arts and gardening to hunting and fishing, that are stronger drivers of surfing behavior.
- 2) **Ethnic sites should specialize.** The era of the broad-based portal is coming to an end -- Forrester expects that only three will remain by 2004 (see the December 1999 Forrester Report "The Parting Of The Portal Seas"). Niche sites hold the best chance of survival, and this trend applies to ethnic sites, too. With their clear differentiation, batanga.com -- which specializes in alternative Hispanic music for 16- to 28-year-olds -- and minorityinterest.com -- promising to connect minority users with minority-owned businesses -- have an edge amid the clamor of broad-based ethnic portals.

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Divider Title: _____

January 16, 2000

MEMORANDUM FOR GENE SPERLING

FROM: TOM KALIL

RE: BACKGROUND BRIEFING ON THE INTERNET

This memo is an effort to distill for you some information on Internet and high-tech to prepare you for your dinner on January 20th. It includes information on:

- I. Glossary of terms (there are at least 13,000 computer and Internet-related terms – this just covers a few).
- II. Big picture Qs and As (how does the Internet work, why is it important, etc.)
- III. Internet-related policy Qs and As
- IV. Industry and expert opinion about the future of the Internet
- V. Factoids
- VI. Points that you may wish to make

There may be a few additional Qs and As that I need to provide to you.

After you've had a chance to read this – please let me know what else you need – both short-term and long-term.

Glossary of terms

Attention economy: The argument that in today's economy – what is scarce is people's attention.

B2B: Abbreviation for “business-to-business” electronic commerce. Although it does not get as much press, it is rapidly becoming much larger and more important than its retail counterpart – **B2C** – or business-to-consumer.

Bandwidth: The measure of a network's ability to transmit information – measured in “bits per second.”

Bit: The smallest element of computer storage – it is either a “0” or a “1.” Short for “binary digit.”

Broadband: A network capable of transmitting more information, as opposed to a narrowband connection. The most likely (near-term) ways to access the Internet at broadband speeds are a cable modem (provided by upgraded, 2-way cable systems), and DSL (digital subscriber line – provided by local telecommunications companies). Other possibilities include wireless, satellite, and fiber-to-the home.

28-56 kilobits per second	Dial-up connection – how most people use the Internet. Good for text, some graphics, AM quality radio.
500 kilobits – 2 megabits/second	Broadband connection for homes. CD-quality audio, can start to handle video.
45 megabits/second	Connection that a large business might have
1 gigabit/second and above	Next Generation Internet and Internet2 – can handle HDTV

Browser: The software used to explore the World Wide Web. Marc Andreessen developed the first graphical Web browser in 1993.

Byte: 8 bits – the amount of memory required to store a letter or a number.

Community of Interest: The Internet makes it easier to form “communities” that are based on shared interests as opposed to solely geography. Whether the ties that are formed by chatting and exchanging e-mail messages are strong enough to be called a community is hotly debated by social scientists. Web sites try to combine community, content, and commerce. A consumer might go to a parenting Web site, learn about what baby stroller is best by reading reviews from other users of the Web site, and then order the best one online.

Convergence: Somewhat fuzzy notion. Usually means that a number of services (Internet, television, radio, telephone) can or will be delivered over one network – because all of these services are digital.

Digital: Information represented as 0s or 1s – could be a phone conversation, an e-mail message, software, music, video, graphics, an electronic document, etc. An advantage of digital information is that it can be copied and stored almost perfectly an unlimited number of times.

Disintermediation: Idea that the “middle-man” will be cut out and buyers and sellers will interact directly. Although this is happening – you also have the emergence of new intermediaries – that provide services like comparison-shopping.

Domain name: The Internet address of an organization – such as “whitehouse.gov” or “amazon.com.”

Dot.com: Generic name for Internet start-ups.

E-business: Concept initially promoted by IBM – but now widely accepted by industry. The notion is that the Internet and information technology will transform not only the way a company buys and sells (e-commerce) – but all aspects of its business operations.

Extranet: A network that allows a firm to be linked securely (using encryption) to suppliers, customers, and other partners.

Information appliance: Not all of the devices that are connected to the Internet will be computers. “Information appliance” is a generic term used to describe lower-cost or specialized devices that might be connected to the network. An example is “WebTV” – now owned by Microsoft – which sells for \$100 - \$200.

Intranet: An internal network that a company or an organization uses to share information or handle internal business processes.

IP – or Internet Protocol: The single most important technical standard of the Internet. This standard breaks data into chunks called “packets” – and provides the information needed to move the data from point A to point B. You will often see this combined with another important Internet standard called Transmission Control Protocol (TCP/IP).

Killer app: The use or application of a new technology that spurs wide adoption of a new technology. The killer application of the personal computer was the Lotus spreadsheet – the first killer app of the Internet was e-mail.

Knowledge Management: New business fad – based on the observation that the information and expertise of its employees is one of the most valuable assets a company has. An example of a KM application is an “expertise map” that allows employees to find out “who knows what” within a firm.

Metcalf’s Law: Observation by Bob Metcalfe (developer of an important networking technology called Ethernet) that the value of a network increases with the square of the number

of people who are connected to it. If you have the only fax machine in town – it is not very useful. Economists refer to this as the “network effect.”

Moore’s Law: Observation by Gordon Moore (founder of Intel) in 1965 – that the number of transistors on a computer chip has been doubling – every 12-18 months. This prediction has proved to be true – and explains why computers have gotten better, faster and cheaper year after year.

Portal: A company like Yahoo that seeks to become the first place that consumers go to use the Internet. Portals are providing an increasingly wide range of services – such as a directory of web sites, search engines, free-email, personalized news, personal calendar, etc.

Router: Networking equipment used to transmit data. Cisco dominates this market.

Server: A computer that is used by an organization to support the activities of multiple individuals. For example, a “Web server” is a computer that might allow millions of people to download information or purchase something online. A **client** is a computer or software program used by an individual.

Ubiquitous computing: Also called pervasive computing. The notion that computing will not just be on your desk-top – but everywhere.

World Wide Web: An Internet application developed by Tim Berners-Lee at the European Laboratory for Particle Physics in 1989. It allows people and organizations to publish information on the Internet – and anyone with access to the World Wide Web to download that information. This is the application that really caused the Internet to take off because it gave “point and click” access to information.

I. Big Picture Qs and As

Q. How does the Internet work?

- At the heart of the Internet is a set of standards for moving data from point A to point B.
- The most important of these is the Internet Protocol. This breaks data (such as an e-mail message) into chunks called packets.
- Think of an Internet packet like a postcard. The postcard contains both a message and an address. Specialized computers (called routers) act like the post office – they look at the (destination) address on the packet and figure out where to forward it to.
- The Internet is a “network of networks.” If I subscribe to MCI and you subscribe to AOL, we can be sure that our Internet Service Providers have some mechanism for exchanging traffic, either directly or indirectly.
- What makes the Internet useful is a whole series of applications software and standards that build on the basic service that the Internet provides (moving data from point A to B.) These include:
 - E-mail;
 - World Wide Web;
 - Chat and instant messaging;
 - Internet news groups (postings by people around the world on a particular subject)
 - Real-time audio and video;
 - Phone calls over the Internet

And many, many, others.

Q. What’s different and special about the Internet as compared to broadcast (radio, television) and telecommunications networks? Why do people call it the biggest change in human communications since the printing press?

- It allows for individuals to be both producers as well as consumers of information, as opposed to broadcast technology. *New Yorker* press critic A.J. Liebling once remarked that "Freedom of the press is guaranteed only to those who own one." The Internet allows anyone with access the equivalent of a printing press – although no guarantee that anyone will pay attention.
- It allows “many to many” communication (e.g. a group of people participating on a Internet newsgroup or mailing list), as opposed to the “one to many” communication of broadcast television and the “one to one” communication of the telephone. This makes it easier to form communities based on shared interests as opposed to geography. There are over 100,000 public Internet mailing lists and newsgroups, and many more private ones.

- The most important standards are in the public domain and are not owned by anyone company. This promotes competition and consumer choice.
- Anyone can develop a new application or service for the Internet, and if it is popular, it will spread like wildfire. This accounts for the extraordinarily rapid rate of innovation on the Internet. Compare this to the telecommunications network, where essentially only a few phone companies can introduce new services (e.g. call waiting, voice mail, caller ID, etc.)

Q. Why does the U.S. have a commanding lead in the Internet industry?

- The Internet happened in the U.S. before it happened in the rest of the world – which gave U.S. companies a “time to market” advantage.
- The U.S. has world-class research universities – a great source of new ideas and talent. Many successful Internet and computer companies are a direct outgrowth of university research.
- The U.S. has lower telecommunications costs (no per minute charges for local service and a competitive long-distance market).
- U.S. economy and culture promote and encourage entrepreneurship (willingness to take risk, tolerance of failure, well-developed venture capital markets, huge financial rewards from stock options and equity – which is called “upside” in Silicon Valley).

Q. Why do some analysts believe that there is an “Internet bubble?”

- In past waves of technological innovation (railroads, computers, hard drives, biotechnology), investors fund lots of “me too” companies going after the same market. Inevitably, there is a period of consolidation and shake-out, and companies either go under or are acquired. A few companies do very well, but many more do not. Of the 1,200 technology-related IPOs since 1980, 5 percent have created 86 percent of the wealth.
- A recent analysis of 133 leading Internet stocks tried to calculate the possible size of the Internet bubble. The analysis assumed 5 years of hyper-growth, after which these stocks would be evaluated more like traditional high-tech companies, with an average P/E ratio.
- The June 1999 market capitalization of these companies was over \$400 billion! Even assuming that these companies grow at 50 to 65 percent per year – the size of the bubble could be \$130 billion - \$260 billion.

- Middle America could wind up holding much of the bag – since the “smart money” (venture capitalists, institutional investors) may have sold its stock, or bought it at a fraction of its current price.

Q. Why has the Internet and high-tech in general been a priority for the Administration?

- **The IT industry is driving U.S. economic growth.** In the last three years, IT has accounted for almost 1/3 of U.S. economic growth. Declining prices in the IT industry have lowered inflation by almost a full percentage point - and have helped the U.S. economy maintain this terrific combination of rapid growth, low unemployment, low inflation, and higher productivity.
- **The IT industry is generating high-wage, high-skill jobs.** Wages in the IT sector are almost 80 percent higher than the private sector average.
- **Information technology is changing the way all companies do business.** IT now accounts for 1/2 of business investment. Companies are using IT to tailor their products and services to the needs of individual customers, forge closer relationships with their suppliers, and deliver just-in-time training to their employees. Customers can name a price they are willing to pay for a hotel or airline reservation - and force companies to compete for their business. Business-to-business e-commerce in the U.S. alone could reach \$1.4 trillion by the year 2003.
- **The Internet is becoming a new communications medium in addition to a commercial marketplace.**
- **We are just at the beginning of the Information Revolution.** Although 200 million people are connected to the Internet, half of the world's population has never made a phone call. Only 1.4 million American households have broadband Internet access. And there is every reason to believe that the incredible improvements in our ability to store, process and move information will continue for at least another 20 years. For example, the nanotechnology initiative will support long-term research that could allow us to make transistors out of individual molecules -- and store the equivalent of the Library of Congress on a chip the size of a sugar cube.
- **These technologies have the potential to deliver social as well as economic benefits.** Using distance learning, working adults can acquire new skills at a time, place and pace that is convenient for them. Telemedicine can improve the quality of health care in under-served rural communities. Technologies such as speech recognition and text-to-speech can allow people with disabilities participate in the workforce, and lead more independent lives. And IT can make help government at all levels more open, responsive and efficient.
- **Personal interest of the Vice President** -- long-standing interest and support for the "information superhighway" long before anyone outside of the research community was taking it seriously.

III. Internet-related and high-tech Qs and As

Q: What are the Administration's views on having legal protections for privacy on the Internet?

The President and Vice President are committed to making sure that Americans have effective privacy and other consumer protections when they go online. Unless individuals have confidence in how they will be treated online, the full potential of the Internet will never be realized.

The issue we all face is how to obtain the protections, so that they are developed in Internet time and well-suited to the new medium. Our judgment has been that we should support self-regulatory privacy efforts, and the results this year have been encouraging. In early 1998, only about 15% of the significant commercial web sites had a privacy policy. In a study done this spring, that figure had risen to 67% -- remarkable progress in one year, and due in large measure to the work of Secretary of Commerce Daley, Federal Trade Commission Chairman Pitofsky, and others to encourage the private sector to put good practices in place.

These steps are encouraging, but we need to keep a close eye on how privacy protections develop on the Internet. For instance, only 10% of the commercial sites that were in the spring survey had all of the key privacy protections -- notice, choice, access, security, and enforcement. We have to do better.

Q: But aren't legal protections needed for privacy, at least in some circumstances?

Yes. There are certain sorts of especially sensitive information, where we have seen abuses and where we should protect privacy as a matter of law. For example:

- *Children online.* Last year the President supported and signed the Children's Online Privacy Protection Act of 1998. Before that law was passed, we saw abusive practices by some web sites, which essentially used very young children as informants about their parents. Under the new law, sites aimed at children under the age of 13 must get verifiable parental consent before they gather and use personal information received from the children.

Medical privacy. Every American has a right to know that his or her medical records are protected at all times from falling into the wrong hands. And yet, as more and more of our medical records are stored electronically, the threats to our privacy have greatly increased. Recently, the President announced comprehensive proposed regulations for the protection of medical records. The President and Vice President have also called upon Congress to pass additional legislation that would fill gaps in our current authority, such as to cover all paper records and all employers.

- *Financial privacy.* The new financial modernization law, passed by Congress last week, will provide protections that go well beyond existing law, such as clear notice of how institutions share financial data, the right to block sharing or sale outside a financial

institution's corporate family, and new and significant enforcement provisions. When the President put forward his financial privacy plan this May, the financial modernization bills that Congress was drafting contained almost none of these protections. So, the new law reflects a real improvement over the status quo. But we will not rest. We will continue to press for even greater protections -- especially for effective choice about whether personal financial information can be shared with affiliates.

Q. Should the Internet remain tax-free?

The President and Vice President supported the Internet Tax Freedom Act, which established a 3 year moratorium on new taxes on Internet access and electronic commerce, and also created a Congressional Advisory Commission to look at the long-term issues raised by e-commerce.

We don't want to prejudge the work of the Commission, but the Administration is committed to finding a solution to this issue that will allow the Internet and e-commerce to flourish, but without stripping states and localities of the revenue they need to educate our children and fight crime.

[Note: We are tentatively thinking about supporting a permanent (or at least 5 year) moratorium on Internet access taxes and multiple or discriminatory taxes, and a "standstill" on any changes in the definition of nexus while states and localities develop and adopt a uniform law on sales and use taxes.]

Q. What kind of protection does the government offer from Internet fraud?

The government offers the same consumer protections against fraud online as it does offline. The Federal Trade Commission Act gives the Federal Trade Commission (FTC) the tools it needs to act in the interest of all consumers to prevent deceptive and unfair acts or practices. The FTC Act prohibits unfair or deceptive advertising in any medium. In fact, the FTC is aggressively prosecuting fraudulent practices and misleading ads in the online marketplace under existing consumer protection laws. The FTC has brought over 100 enforcement actions ranging from garden variety pyramid schemes and miracle cure health care products to technologically sophisticated scams.

Q. Are you concerned about the "digital divide"? What are you doing about it?

Yes, the Administration is very concerned - information technology should bring us together - not result in further polarization of our society.

To address the digital divide, the President and Vice President have worked to:

- Connect every classroom to the Internet, and provide our children with modern computers, technology-savvy teachers, and high-quality educational software;
- Increase support for Community Technology Centers in low-income neighborhoods.

- We will be announcing additional “digital divide” issues in the President’s FY2001 budget, and the President will be leading a “New Markets” tour that will focus on the digital divide in the spring.
- Market forces and technology will also help bridge the digital divide -- because computers are continuing to get faster and cheaper every year.

Q. Do we need to rewrite the Telecom Act to encourage residential broadband deployment?

No. We think that the Telecom Act is beginning to work. Cable companies, phone companies, new entrants, satellite companies, etc. are all competing with one another. Competition will lead to lower prices, more customer choice, and faster deployment of the technology. For example, cable companies report that they will be able to reach over half of U.S. households by the end of 2000.

IV. Industry and expert views about the future of the Internet and information technology

1. Internet is inherently unpredictable – we will continue to be surprised by its uses.
2. Continued rapid growth in:
 - Number of people connected to the Internet (now at 200 million – could be 1 billion by 2005)
 - Volume of e-commerce (especially business-to-business)
 - Quantity of information accessible on the Web
3. Continued declines in the cost of storing, processing, and transmitting information.
4. Wider variety of things connected to the Internet – not just computers but Web-phones (combination digital cell-phone, personal organizer, Web device), information appliances, household appliances, sensors, etc. More goods become “intelligent” (the refrigerator that knows when it needs to be fixed, and sends a message to the manufacturer.)
5. Greater penetration of broadband networks to home – less frustrating to download information, ability to support multimedia applications like video and CD-quality, always on “Internet.”
6. More and more voice traffic migrates to the Internet.
7. Greater use of encryption because of recent changes in government policy, and expiration of some key patents.
8. Transformation of different sectors of the economy that adopt it – and emergence of new business models and business processes. Examples:
 - Mass customization – companies allow you to tell them exactly what kind of good or service that you want – and don’t manufacture and ship it until you request it.
 - Real-time auctions or “name your price” increasingly replaces fixed pricing.
 - Real-estate: Customers enter price-range, number of rooms, importance of school performance, crime rate, etc. and get back a list of homes on the market that meet their requirements. Customers can also take a 3-D tour of the house before visiting.
 - Health: More informed decisions by consumers because of access to consumer health information. An “electronic patient record” under the control of the patient. Reduced

administrative costs because of electronic connections between consumers, physicians, hospitals, HMOs, employers, Medicare/Medicaid, labs, etc.

9. Examples of emerging computer and Internet technologies:

- Intelligent agents that can perform simple tasks like find me the cheapest airline ticket to Ann Arbor, page me if the departure time changes, etc.
- Speech recognition (eliminate the need for a keyboard)
- Natural language understanding (computers that can disambiguate between multiple sense of the same word through context – very hard, may not happen)
- Video-on-demand – every video can be downloaded and played back – no more trips to the video-store (been predicted for a long time).
- Much better tools for collaboration and for supporting distributed teams.
- Multicast – selective broadcast of information – could lead to an infinite number of video-channels
- Authentication – ability to prove that you are who you say you are using digital signatures or some other technology

10. Possible downsides

- Erosion of privacy – tracking of people’s “mouse-clicks” on the Internet
- Digital divide
- Cyber-terrorism or collapse of system (equivalent of brown-outs or black-outs)
- People increasingly disconnected from reality
- Access to inappropriate material, cyber-stalking
- Fraud and other cyber-crimes
- Economic disruption (fewer retail dollars spent on “Main Street”)
- Control of Internet by a few major companies

VI. Facts about the Internet, Information Technology, and electronic commerce

1. 201 million people online – worldwide

- As of September 1999, there were 201 million people online.

2. 109.9 million people online in the U.S.

- As of September 1999, there were 109.9 million people online in the United States.

3. 1 billion people could be online as soon as 2005

4. One-third of U.S. economic growth accounted for by IT industry

- Between 1995 and 1998, the IT industry (computer and communications hardware, software, and services) accounted for 35 percent of the nation's real economic growth.

5. Jobs in IT industry pay almost 80 percent more than average private sector wages

- In 1997, jobs in IT industries paid 78 percent more than the average private sector wage - \$52,920 compared to \$29,787.

6. As of December 1999 -- there are 9.5 million sites on the World Wide Web, up from 50 in early 1993

7. The number of computers connected to the Internet has increased from 1.3 million in 1993 to 56.2 million in July 1999

- The number of computers connected to the Internet has increased from 1.3 million in January 1993 to 56.2 million in July 1999.

8. U.S. e-commerce is projected to grow to \$1.4 trillion by 2003

- By one estimate -- U.S. business-to-business e-commerce is projected to increase from \$43 billion in 1998 to \$1.4 trillion. Some estimates are even higher.

9. Information technology has reduced inflation by almost a full percentage point

- In 1996 and 1997, falling prices in the IT sector brought down overall inflation by 0.7 percent points, helping us control inflation and keep interest rates low in a period of historically low unemployment.

10. **17 million American households will shop online in 1999**
 - 17 million American households will shop online by year end, with total retail sales of \$20.2 billion.
11. **In 1998, Americans sent or received 3.4 trillion e-mail messages**
 - In 1998, Americans sent or received 3.4 trillion e-mail messages, compared to 107 billion pieces of first class mail.
12. **Percentage of classrooms in public schools connected to the Internet has increased from 3 percent in 1994 to 51 percent in 1998**
 - The percentage of classrooms in public schools connected with the Internet has increased from 3 percent in 1994 to 51 percent in 1998. This percentage will continue to grow as more schools take advantage of the "e-rate." The percentage of public schools with Internet access has increased from 35 percent to 89 percent during the same period.
13. **In 1997, the United States had more than 6 times as much venture capital flowing into information technology and communications companies as the European Union and Japan combined**

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April 8, 2000

MEMORANDUM FOR GENE SPERLING

FROM: TOM KALIL

RE: BACKGROUND ON BROADBAND

Definition

- There is no one universally accepted definition of broadband - but generally it refers to a network capable of sending and receiving data at much higher speeds than today's "narrowband" connections.
- Network speeds (or bandwidth) is measured in "bits per second." Today, most people connect to the Internet using an ordinary phone line and a modem with a bandwidth of 28 to 56 kilobits per second. A broadband connection to the Internet might provide speeds of hundreds of kilobits per second or even megabits (millions of bits) per second.
- Large businesses have been able to purchase broadband connections to the Internet for a while. It has only been within the last few years that cable companies and telecommunications companies have started to market broadband services to the home at a price that is affordable for more consumers.

Importance of broadband

Broadband is important for a number of reasons:

- Broadband networks can support a wider range of applications -- such as video-conferencing, video streaming, CD-quality audio, 3-D graphics, and lightning-fast download of software programs and computer files. Trying to do these applications over a "narrowband" connection to the Internet is painful or impossible. Video is likely to be jerky or the size of a postage stamp. Downloading a large picture is like watching paint dry -- a phenomena known as the "World Wide Wait."
- Broadband can be "always on." That means that people are more likely to use the Internet than if they have to spend the time to dial-up to their Internet Service Provider. It also means that more devices in the home can be connected to the Internet (e.g. burglar alarms, refrigerators that can alert their manufacturer when they are in need of maintenance, etc.)
- Broadband is important for business. If broadband is either not available or prohibitively expensive in a particular region of the country, businesses will find it difficult to compete. Businesses need higher speed connections to connect to their customers and suppliers.
- Widespread deployment could have broader social benefits as well -- supporting applications such as telemedicine, distance learning, and telecommuting.

Price and level of access

- Generally, broadband access to the Internet costs at least \$40 - \$50/month, compared to narrowband access to the Internet, which costs roughly \$20/month, and be even cheaper for customers that are willing to make a multi-year commitment to a single Internet Service provider. There can also be one-time equipment and installation charges.
- The FCC estimates that of the 105 million households in the U.S.:
 - 50 million households can purchase broadband from at least one provider (typically a cable company or a local phone company)
 - Tens of millions of households have a choice of two providers
 - A few million households have a choice of 3 or more
- As of the end of 1999 - an estimated 1-2 million households had actually purchased broadband Internet access.
- Estimates of how quickly for broadband access will increase vary widely. I have seen estimates of 16.6 to 28.6 million high-speed Internet access subscribers by 2004.

Different kinds of broadband

Market research firms that DSL and cable modems will be the dominant broadband technology over the next 3-4 years, but that satellite and wireless could play a significant role as well.

1. Digital subscriber line (DSL)

- Typically deployed by the local phone companies (SBC, Bell Atlantic) - and the competitive local exchange carriers (CLECs) that compete against them by leasing parts of their network.
- Major advantage is that it uses the existing copper phone lines that are now used to carry voice traffic.
- Major disadvantage is that not all phone lines are capable of handling DSL. For example, a phone line that is longer than 12,000 - 18,000 feet from the residence to the "central office" (the place where telecommunications companies locate their equipment). Note that this is particularly a problem for rural areas.
- Note that local phone companies have been able to charge their business customers much more for high-speed Internet access (hundreds or even thousands of dollar per month). To be able to maintain these price differentials -- they have marketed a service to residential customers that is "asymmetric." That means that residential consumers can download a lot of information, but their ability to send information is limited. Phone companies would argue

that most residential customers have this usage pattern. Their critics argue that the phone companies are marketing this service to protect their profit margins from their business customers.

2. Cable modem

- Uses the cable network to deliver high-speed Internet access -- which is a combination of fiber and coaxial cable.
- Advantage is that cable networks pass most American households -- and that by 2001 -- up to 71 million households will be passed by cable systems that are "two-way capable." Cable companies had to upgrade their networks to support high-speed Internet access.
- Disadvantage of cable modems is that the bandwidth of cable networks for Internet access is shared between subscribers. The more subscribers you have, the less bandwidth each customer has.

3. Wireless and satellite

- There are a variety of wireless and satellite alternatives as well. They are not expected to penetrate the market as quickly as DSL and cable modems, although they could be important in some rural markets.
- Hughes offers a service called DirecPC. It uses a satellite link to provide broadband downstream -- but customers have to use a regular phone line for upstream communication. There are other satellite companies that are beginning to market 2-way broadband satellite service.
- MCI and Sprint are beginning to do trials of a wireless service called MMDS (Multichannel Multipoint Distribution System). MMDS is a fixed service -- as opposed a mobile service like cell phones. It uses a tower -- and has a maximum range of 35 miles in all directions.

4. Fiber-to-the-home

- The ultimate in broadband would be running optical fiber all the way to the home, or at least to the curb. There are not many companies deploying fiber-to-the-home systems at this point because of the expense.

Public policy issues

1. Promoting competition for broadband services using the Telecommunications Act of 1996

- Passage of the Telecommunications Act of 1996 helped to spur competition in the market for broadband services because it imposed certain requirements on the local phone companies like Bell Atlantic, SBC, and US West known as ILECs (incumbent local exchange carriers). ILECs are required under the act to allow their competitors to:

- Lease parts of their network (known as unbundling);
- Interconnect with their network (interconnection);
- Locate equipment in their central offices (colocation).
- All of this spurred the development of competitive local exchange carriers (CLECs) -- who are able to provide high-speed Internet access without building out a whole new network. Covad is an example of a CLEC. Some of these companies literally would not exist were it not for the Telecommunications Act of 1996.
- The Administration has been a supporter of the Telecommunications Act and its continued enforcement.

2. Deregulation of ILECs

- The central bargain of the Telecommunications Act of 1996 is that ILECs would be allowed to enter the long distance market after they took steps to open up their own (local) market.
- So far, only one ILEC (Bell Atlantic) and has received permission from the FCC to provide long distance in one state (New York). Even this is not going smoothly, because Bell Atlantic is finding it difficult to transfer customers from Bell Atlantic to AT&T and other phone companies that are trying to enter the local market.
- Because Internet traffic crosses long-distance boundaries, the ILECs can't be Internet Service Providers without teaming up with another ISP for the long-distance portion of the Internet traffic.
- ILECs are arguing before the Hill that they should be allowed to provide Internet access, and that the restrictions on their ability to provide long-distance service should not apply to the Internet.
- Long-distance companies and CLECs have argued that if ILECs are allowed to provide Internet service before opening up their local market -- they will have no incentive to open up their market in the future. The Administration has generally found the argument of the long-distance companies and CLECs to be more persuasive.

3. Open access to cable networks

- Under the Telecommunications Act of 1996, cable companies don't have the same obligations to open up their network as the local phone companies do. They were regulated as cable companies as opposed to "common carriers."
- For several years, some Internet Service Providers (including AOL) argued that cable companies should have to open up their networks -- so that customers could have a choice of

ISPs. Their argument was that cable companies would monopolize the Internet -- and fundamentally change its open nature.

- They were not successful at the federal level in convincing the FCC, the Administration, or the Congress that this was a good idea. They did convince some cities to impose "open access" requirements on cable systems - and these are currently in the courts.
- The Administration took the view that customer choice of Internet Service Providers was a good goal, but that the market was likely to lead to this outcome because of competition between cable modem, DSL and wireless technology. The FCC was also opposed to imposing new regulations on cable companies before there was any real evidence of a problem (cable monopolies over high-speed Internet access) - given that there were so few subscribers of high-speed Internet access. The FCC did say that they would continue to monitor developments in the marketplace. There was also a concern that new regulations imposed on cable companies would increase uncertainty and deter investment in upgrading cable systems.
- This issue has quieted down in recent months for several reasons:
 - AOL and Time Warner merged. AOL stopped lobbying for "open access" legislation, although they said that they would open the Time Warner cable network to other Internet Service Providers.
 - AT&T (which purchased the TCI cable system) said that they would make arrangements to provide access to third-party Internet Service Providers in 2002. [TCI had an exclusive arrangement with a high-speed Internet access company called @Home. AT&T inherited this exclusive arrangement when they bought TCI -- but this contract will expire in 2002.]
- Consumer and public interest groups continue to express concerns -- and note that the AT&T and AOL flip-flops demonstrate the importance of not making policy on the basis of corporate interests.

Significant Research Conclusions

As cable, telephone, wireless and satellite all race to provide broadband access to data-hungry homes and small businesses, confusion and controversy have erupted over the capabilities, costs, and implementation schedules of various delivery schemes.¹ Following are the significant research conclusions that we will develop further in the main body of this report.

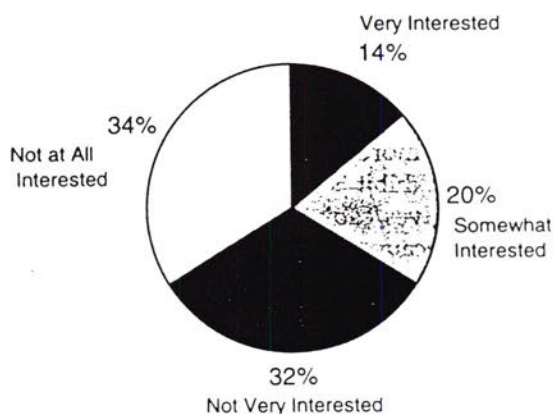
Broadband Data Demand Is Explosive; Market Is Supply Constrained for Next 24 Months

Over the next 24 months, the rollout of all broadband platforms will be "supply constrained" because of provisioning and addressability limits. This will make the next two years a land grab — already underway — for the best broadband customers. Demand is there: A survey of online consumers conducted for this report shows that a third are interested in high-speed service (see Exhibit 1), and interest increases rapidly with familiarity (see Exhibit 2).

Cable and DSL Advantaged in Residential Market Over Wireless

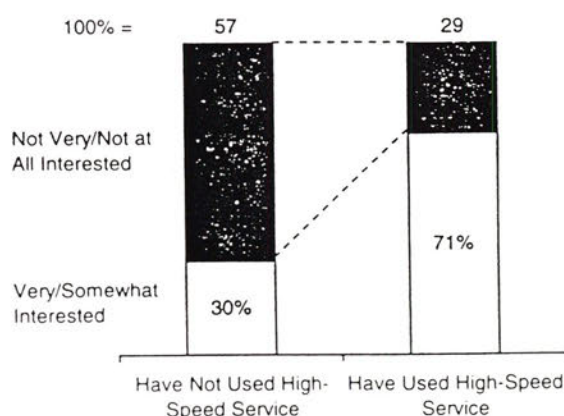
The first broadband battle has already begun as providers race to sign up high-value customers. Together, cable and DSL have an early start and the potential for bundled multiproduct broadband offerings that are expected to leave satellite and wireless behind, as shown in Exhibit 3. Cable is likely to stay ahead thanks to its early start, technical advantages, and its control of data displays on televisions in non-PC households.

Exhibit 1 Level of Consumer Interest in High-Speed Internet Access



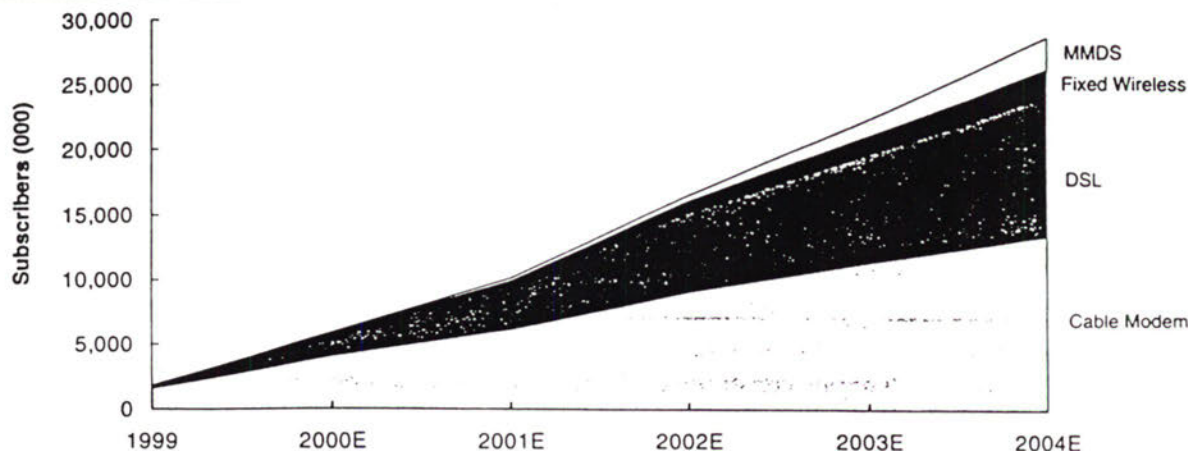
Source: Primary market research.

Exhibit 2 High Speed Familiarity Increases Interest



Source: Primary market research.

¹ Throughout this report, "broadband" refers to the full potential of a pathway to the home or small business, while "video," "high-speed data" and "phone" refer to specific products offered over the broadband pathway. In addition, unless otherwise stated, "DSL" refers to services sold by ILECs and "cable" to services sold by MSOs, including AT&T.

Exhibit 3**Residential Subscribers by Service**

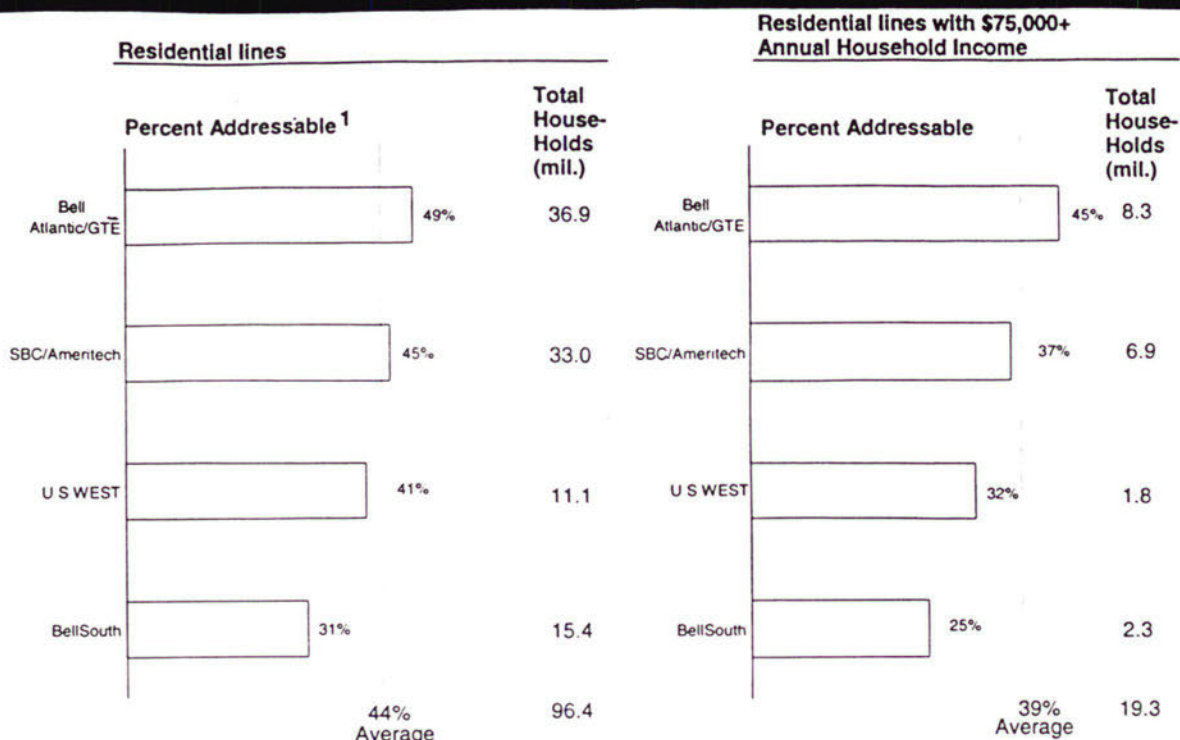
Source: Bernstein/McKinsey analysis.

DSL Hurt by "Upgrades" Over Last 20 Years

Legacy plant issues (loop lengths, the presence of non-compatible electronics) currently constrain DSL addressability to an estimated 44% of residential access lines, as seen in Exhibit 4. Efficiency-oriented upgrades to telephone plant make those systems far less tolerant of DSL than short-runs of old copper plant. Digital loop carrier equipment used in upgrades and new subdivisions far from the central office will need to be replaced. Variations in RBOC strategies will reflect the fact that, on average, some companies (like Bell Atlantic) have copper rich plant and short runs between the home and central office, while others (like BellSouth and U S WEST) have either more fiber, longer loops or both. Repair and upgrade of the national telephone plant for nonvideo DSL are expected to take some \$9.5 billion in incremental capital expenditures (SBC has already committed \$4 billion), with the option for later upgrades to carry video over DSL costing another \$10 billion.

DSL Disadvantaged in Areas with Best Customers

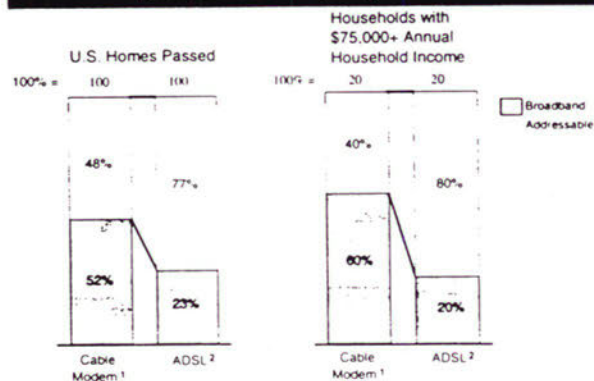
Long copper runs and non-DSL compatible line electronics have resulted in affluent customers being significantly more addressable by cable modem than DSL given upgrades to date, as Exhibit 5 shows. Not only is that bad for the phone companies because it gives cable a head start for the high-speed business, it is also a problem because high speed seems to be a distinctive product, making it a credible wedge for cable to sell a broader bundle. While most potential high-speed data customers surveyed said they would rather buy high-speed data service from the ILEC, as shown in Exhibit 6, problems the ILECs face in reaching those customers give cable a chance to get into consumers' homes to provide high-speed data and then try to convert them to cable telephone service, which won't be far behind in many markets.

Exhibit 4**Current DSL Addressability Less Than 50% of All Households**

¹ Addressable defined as within 12,000 feet of central office and not served by DLC.

Note: Based on typical distance restriction for ADSL; exact distance cut-off varies by carrier, but typically between 10,000 and 12,000 feet.

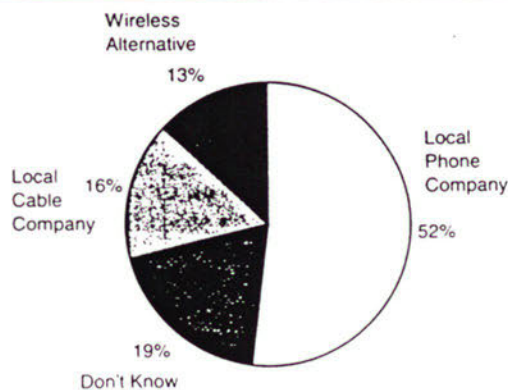
Source: U.S. Census Bureau and McKinsey/Bernstein analysis.

Exhibit 5 Broadband Availability Higher for Cable Than DSL — Year-End 1999 (million households)


¹ Passed by upgraded two-way plant as of year-end 1999.

² Served via upgraded CO; loop length less than 12,000 feet; not served by DLC.

Source: U.S. Census Bureau, ILEC and MSO upgrade reports, and Bernstein/McKinsey analysis.

Exhibit 6 Phone Company Preferred High-Speed Data Provider


Source: Primary market research.

Cable Data EBITDA Higher But Wholesale Strategy Makes DSL Margins Better

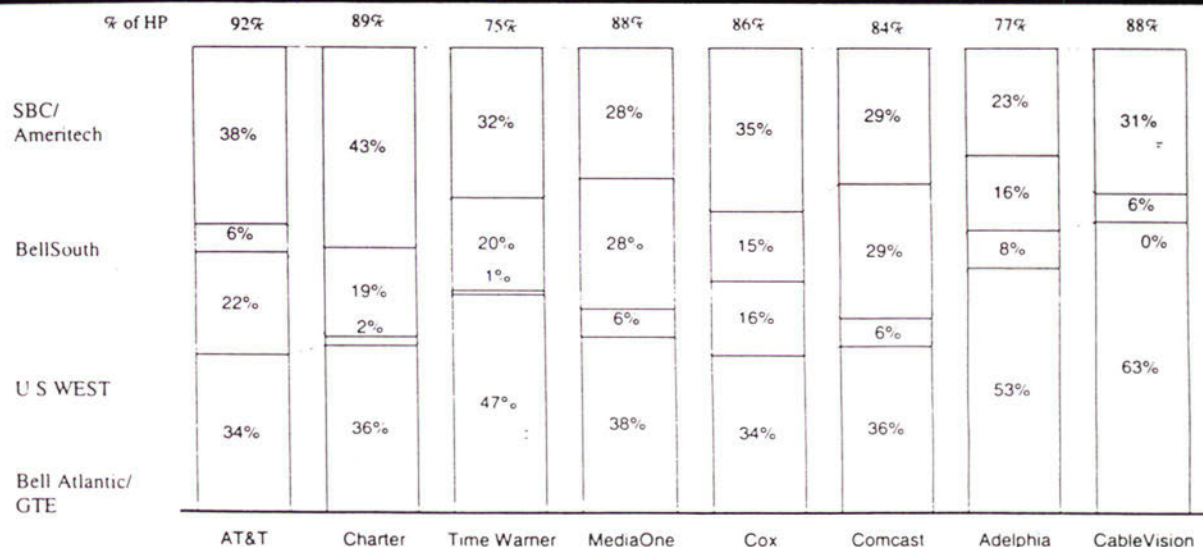
Cable data is expected to deliver some \$2.4 billion in EBITDA on \$5.6 billion in revenues in five years versus DSL's \$2.0 billion in EBITDA on \$4 billion in revenues.¹ The ILEC strategy of wholesale DSL service to companies like AOL reduces revenues, but shifts significant costs for content, hardware, and customer service to the retailer, while also driving penetration. Overall, the impact of residential data is more significant on cable's revenue stream, which is only about a third that of the ILECs; ILECs will benefit from the growing revenue trend as they sprint from their tiny current base toward a close second place. On a cash-cost basis, DSL margins are in the 45-50% range for data, while cable data is in the low 40% range. Results vary greatly by company depending on geographic locations, current state of plant, and aggressiveness of competitors. Exhibits 7 and 8 provide a study of the competitive overlaps of ILEC and major cable companies.

Cable Is Scalable for Data But Heavy Penetration Will Cost More Than Expected

While cable has the advantage in deployment speed, the engineering and economics of its upstream path will require more capital than generally anticipated to handle mass loads of customers. In most cable systems, upstream signals must travel over frequencies lower than 45 MHz (because of "on" channel requirement for Channel 2), out of a total system capacity of at least 750 MHz. Thus, while cable is easily scalable in the downstream direction, if more than 20-25% of homes use cable data for current Web applications, additional return path investment will be required. This could require an additional \$3 billion cumulative capital investment by cable by 2003 (assuming 80% of homes are upgraded, and an average 20% penetration by 2003). Still more upstream capacity will be necessary at a cost of approximately \$50 per home passed or more if cable must meet a serious move by ILECs into upstream-hogging video applications. AT&T is already experimenting with 50 home nodes instead of 500, so that at 25% penetration of data, only 12 households are sharing the 20 Mbps of upstream capacity — giving each about the same average throughput as a T1-speed DSL line.

Exhibit 7

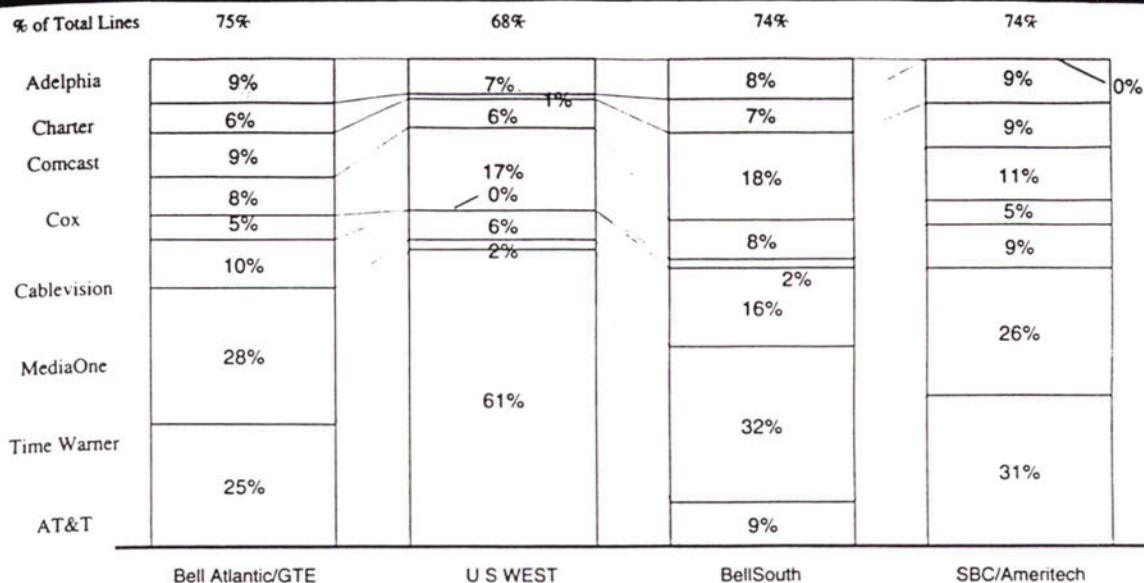
Degree of Consumer Overlap Between MSOs and ILECs (percent of overlapping homes)



Source: Bernstein/McKinsey estimates.

¹ Based on Bernstein assumption that average residential high-speed data pricing moves from \$40 per month in 1999 to \$29 in 2004, and average small business high-speed data pricing moves from \$65 per month in 1999 to \$43 in 2004. For additional details, see the following chapter: "The Economics of Broadband Data."

Exhibit 8

Degree of Consumer Overlap Between ILECs and MSOs
(percent of overlapping lines)

Source: Bernstein/McKinsey estimates.

MMDS and Fixed Wireless
Unlikely to Be Significant in the
Near Term

By all accounts, wireless will not be a factor in the residential broadband market until at least 2002 (see Exhibit 3). AT&T is expected to use Fixed Wireless in markets without cable deals — about 50% of the U.S.— and provide medium-speed data as part of a telephone bundle, while industry groups spearheaded by Sprint, MCI WorldCom, and Cisco will be attempting to develop industry standards and improved technology for MMDS customer premise equipment and network infrastructure. Recent developments such as the FCC's approval of two-way service, Sprint and MCI WorldCom's recent investments, and the development of new signal processing and RF technology have significantly brightened the outlook for the "wireless cable" industry, but both it and, to a larger degree, Fixed Wireless have significant downstream speed limitations and upstream scaling problems. Neither is likely to offer substantial competition to DSL and cable in the near term. Instead, both will primarily address residential customers in markets and areas where advantageous climates and topographies permit "filling in" holes that cable and DSL find less economical to serve. Fixed Wireless will find its footing more as a low-priced voice play, with medium-speed data a low-cost add-on.

Combination Platforms, New
Consumer Equipment, and
Overbuilders Provide Longer-
Term Residential Competition

With widespread adoption of two-way broadband satellite (Ka-band) and digital television (DTV) still at least five years away, combinations of satellite or DTV with other return routes and high-density storage in the home could provide a path for ILECs and others to leapfrog cable's head start in broadband delivery within the next two years. However, these complementary strategies are likely to suffer from operational complexities, particularly in the back office and service areas, and are likely to pose very difficult economic problems for partners trying to decide whose offering takes the deep discounts necessary to compete with cable's bundled services. High-density storage at the television set threatens cable and broadcast programmers by technically permitting the replacement of network-sold

commercials with those sold by other distributors. Overbuilds appear to be gaining momentum and pose a threat to DSL and cable where they are deployed.

Free Set-Top Boxes Could Give Cable Larger Edge; AOL Can Help

Acquiring broadband customers once the early adopter/latent demand phase ends will be costly. Having a multiservice-capable box in the home could enable efficient cross-selling of additional services. Over the next five years, e-commerce and media revenues are likely to subsidize the rollout of cable broadband set-top devices, with cable operators providing widespread "free" boxes with e-commerce and some Web applications built in, and allowing cable easily to upsell to phone or high-speed data. Such availability of set-top boxes would undercut RBOC broadband efforts by providing cable with a marketing and delivery vehicle that combines television, PC, and phone capabilities. Video-oriented DSL offerings (VDSL) at that time will be limited by insufficient bandwidth and still-too-long access lines to reach a critical mass of homes. If cable can significantly subsidize digital boxes, cable could win over early DSL subscribers with a free, "all services" set-top product offer (or, at a minimum, compete with telephone for television-based e-commerce business in DSL households). This is consistent with AOL's contention that it can provide a significant boost to conversion from slow-speed dial-up service to any high-speed service by easily upselling AOL subscribers to broadband.

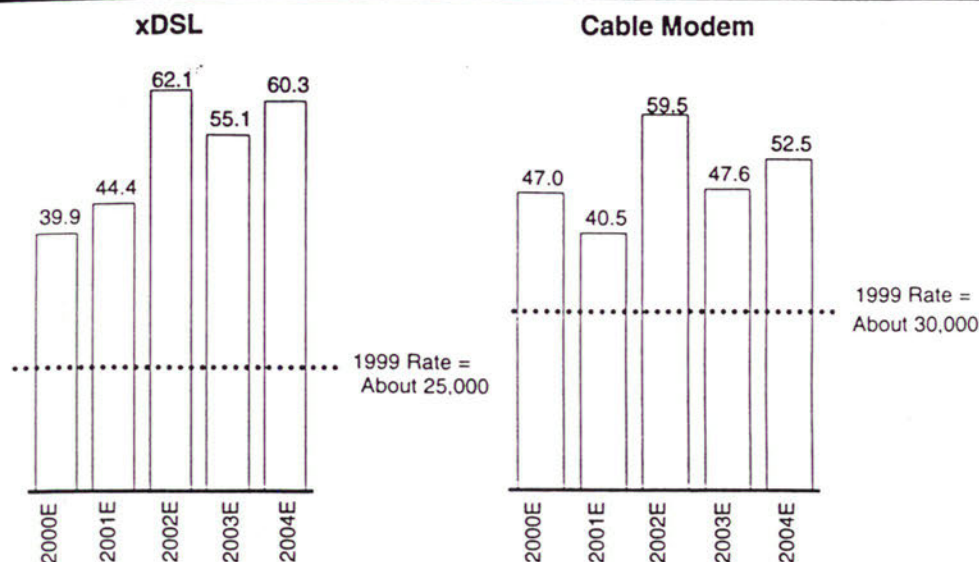
Self Provisioning Could Be Key for Residential Winner

Forecast provisioning capabilities of DSL and cable modems lag expected demand, with DSL lagging significantly, as shown in Exhibit 9. To meet the demand — and the company business plans — it is crucial that a large number of subscribers utilize "self-provisioning," or install-it-yourself. We estimate that within five years fully 60% of residential high-speed cable and DSL services will be installed in the home by the consumer through the inclusion of equipment in new PCs, or "take home" programs that involve in-store or over-phone training and support. Having one platform materially exceed the other on self-provisioning will affect rollout and competitive positioning. To date, progress has been slow and field evidence suggests both cable and DSL will typically require multiple truck rolls for some time. If DSL's self-provisioning problems can be overcome, AOL could leverage its existing subscriber base to the great advantage of DSL.

Seismic Shifts: AOL Merger with Time Warner

As we go to press, the strategic merger of AOL and Time Warner has just been announced. The deal represents just the kind of shift in the broadband landscape that puts the access battle into a broader perspective. Assuming that the merger is consummated, the resulting company will have extensive consumer content assets and access connections to Time Warner's nearly 20 million cable households — 85% of which are upgraded for two-way service. Obviously, this raises a large potential challenge for other companies active in either content or access, and may drive similar strategic counter moves. Above all else, AOL's decision is the strongest evidence to date that cable offers the broadest set of broadband assets available today. With AOL now aligned more closely with cable, DSL faces the challenge of competing in many markets without the benefit of AOL as a *de facto* exclusive resale partner. Thus, the AOL-Time Warner deal indicates not only that cable is the advantaged platform today (as we observe elsewhere), but also that it is likely to remain advantaged *vis-à-vis* DSL and other platforms in the future.

Exhibit 9

Rate of Provisioning Required to Meet Demand Forecast
(000 provisioned units per week)

Source: Interviews, corporate reports and Bernstein/McKinsey analysis.

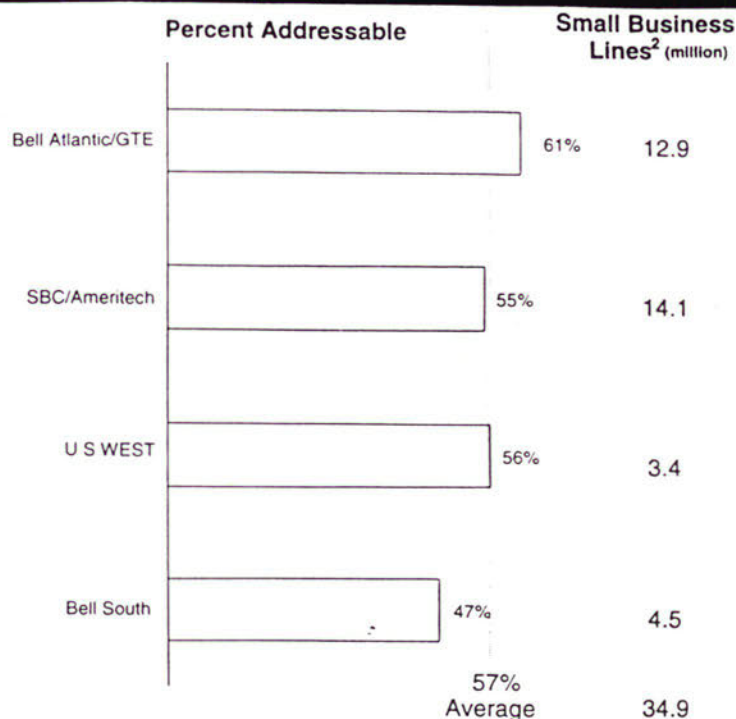
Telephony Market Shares Threatened

Voice services will emerge as a critical component of the broadband story. For incumbents such as the ILECs and AT&T, broadband is as much about securing legacy voice revenue streams as it is about new opportunities in data. The cable telephony outlook has remained frustratingly unclear to date, as MSO JVs with AT&T remain elusive and technology continues to be developed. We believe, however, that a major push by MSOs into telephony is inevitable by the end of next year, as IP trials make rapid progress and AT&T pursues a multifaceted strategy that will include wireless and unbundled network elements (UNE) in addition to cable. In particular, long distance entry for Bell Atlantic and other RBOCs will ratchet up the pressure on AT&T to roll out cable telephony as part of a broadband bundle. On the ILEC side, as regulators methodically improve the ability of DLECs, CLECs, and IXC to access ILEC networks, we expect increased competition for local services. In particular, voice-over-DSL (VoDSL) will be an important opportunity for DSL attackers to add significant revenues for little incremental cost, especially in the small-business market where DSL-based data service is rapidly taking hold and voice revenues are attractive. In response, ILECs will accelerate DSL deployments to preempt cable and telco attackers. Even savvy cable companies may elect to resell DSL to establish a data foothold in difficult-to-upgrade markets.

DSL Platform Advantaged in Small Business Market

In the small business market, DSL has the most potential to serve as the major distribution platform for broadband services. DSL currently is able to reach nearly 60% of small businesses (see Exhibit 10). The shared nature of the cable data service is particularly unsuited to the kinds of high-duty-cycle applications that small businesses will require in the future. However, DSL competition will become intense as regulatory developments and improvements in OSS interfaces make it increasingly easy for DLECs, CLECs (some even cable owned), and IXCs to access DSL-qualified unbundled

loops. Although high-speed data will serve as the entry application, as VoDSL technology comes online, DSL data providers will be able to attack the local voice market with very low incremental costs. MMDS may begin playing a more significant role in some small business markets in 2002 and beyond.

Exhibit 10
**DSL Addresses More Than 50% of All Small Business Lines
(Percent Currently Addressable¹, Million Small Businesses)**


¹ Addressable defined as within 12,000 feet of the central office and not served by DLC.

² Businesses with less than 100 employees (about 7.5 million firms).

Note: Based on typical distance restriction for ADSL; exact distance cut-off varies by carrier, but typically between 10,000 and 12,000 feet.

Source: Bell Atlantic, U S WEST, literature reviews and McKinsey/Bernstein analysis.

**Unlimited Mandated Access
Major Risk Factor for Cable
Value**

Judicial, legislative, and regulatory initiatives by RBOCs and ISPs (including AOL) to gain access to cable lines are seen as recognition of cable's strength, particularly in relation to the television set. Should unlimited mandated access come to pass instead of business agreements between data and cable companies, then cable's basic business proposition would be called into question. Cable is relying on a combination of video, data, and phone services to restore top line growth. Cannibalization of any, or all, through transmission of competitive streaming video, IP phone, and data products would significantly undermine returns.

Progress on the Presidential Directives

On July 1, 1997, President Clinton issued the first of two directives designed to implement the strategy laid out in *A Framework for Global Electronic Commerce*. Under this directive, the President assigned thirteen specific tasks to various cabinet agencies. Last year, with the release of the Working Group's *First Annual Report*, the President assigned responsibility for five new initiatives to implement the Administration's strategic vision for electronic commerce. Progress on both sets of directives are outlined below:

A. 1998 Presidential Directives

1. High Speed Internet Access

The Secretary of Commerce, in appropriate consultation with the Federal Communications Commission, shall encourage the deployment of advanced telecommunications capabilities for all Americans while preserving the vibrant and competitive free market that exists for the Internet and other interactive computer services. These agencies shall work with the Office of the United States Trade Representative to help ensure the elimination of foreign trade barriers to the deployment of advanced telecommunications capabilities.

Access to high speed Internet services – what has come to be called “broadband” access – is critical in order to realize the full benefits of the Internet. Widespread deployment of broadband services ultimately will allow people to send video, audio, text and images with virtually no delay and at an affordable price. People

thousands of miles apart will be able to share virtual-reality experiences and work together on business, education or medical projects. A single service company or a single hookup could provide real-time high-fidelity music, videoconferencing, telephone, television and radio programs. Broadband networks also will promote new entertainment options, such as movies-on-demand, and enable more sophisticated approaches to distance learning, telemedicine and home health care, e-commerce, and community networking.

Our emerging digital economy thus increasingly demands broadband networks, which in turn create jobs and demand for networking equipment, appliances, and software. Deployment of these networks is important for our nation's economic prosperity and advancement of Americans' standard of living.

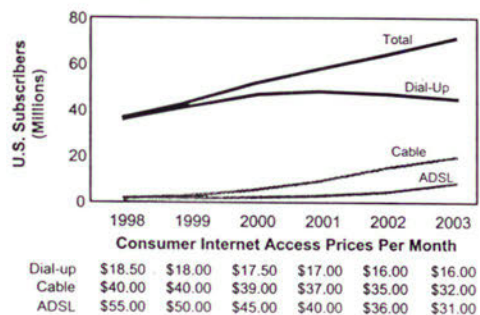
The Administration has long championed competition as the basic means of achieving widespread deployment of broadband services. The Telecommunications Act of 1996 reflects that approach, providing for accelerating deployment of advanced telecommunications networks by opening all telecommunications markets to competition. In addition, the Act requires the Federal Communications Commission (FCC) to ensure that in all regions of the nation, Americans have “access to advanced telecommunications and information services,” and to “encourage the deployment on a reasonable and timely basis of advanced telecommunications capabilities to all Americans.” (18)

Over the past year, the Administration has identified, advocated, and adopted policies that are: (1) accelerating the deployment of broadband networks to homes, businesses, and non-profit institutions; (2) fostering a competitive market for broadband networks and services that is resulting in greater customer choice, more affordable prices, and continuous innovation, and is reducing the need for government regulation; (3) promoting the availability of broadband networks to all Americans by encouraging faster deployment to areas that otherwise would be underserved; and (4) maximizing the economic and social benefits associated with broadband networks by promoting broadband applications.

and audio is creating the demand for broadband networks.

The Telecom Act established a framework that has spurred investment in broadband networks and services by all industry segments, using a variety of technologies. Companies have invested tens of billions of dollars in a broadband backbone and long-haul infrastructure. AT&T has built more than 40,000 route miles of fiber and is investing billions to boost its capacity and improve its network. (19) MCI quadrupled the speed of its Internet backbone in 1996 and doubled that capacity in 1997. (20) Competitive local exchange carriers have invested heavily (\$15-\$20 billion) in fiber rings and broadband technologies such as ATM, and frame relay to boost capacity. (21) Incumbent local exchange carriers have responded by increasing their investment in broadband facilities.

Consumer Internet Access Penetration



Source: Forrester Research, Inc.

The Administration's pro-competitive market driven approach to broadband deployment is producing the desired results. The Telecommunications Act of 1996 opened up monopoly telecom markets and allowed for the emergence of new competitive players. As competition emerges between telephone companies and cable companies, between wireline and wireless providers, companies are investing in and building out high speed, broadband networks of the future. Competition among equipment suppliers and service providers is driving the innovation that is extending the reach of these technologies, lowering their prices, and making them easier to install and use. Increased use of the Internet and other electronic networks to transmit data, video,

There also has been considerable investment in providing broadband connections to end-users. The majority of large businesses and many medium-sized businesses already can obtain access to broadband communications via one of the many technologies—from wireline to terrestrial wireless to satellite—capable of carrying broadband communications. The Federal Communications Commission (FCC) concluded in February 1999 that, as a whole, large and medium residential broadband markets are at an earlier stage of development. The availability of and investment in broadband technology—cable, digital subscriber lines (xDSL), and other technologies that are potentially capable of delivering small office/home office (SOHO) and residential broadband—have been increasing during recent years. The first regular, sustained commercial offerings of broadband for residential customers occurred in 1996. The FCC estimates that in February 1999 there were at least 375,000 customers subscribing to broadband, which represents a residential penetration of four percent. (22) As shown in Table 1, only a limited number of existing broadband technologies—primarily cable and xDSL—are currently capable of

cost-effectively delivering broadband over the last mile to the SOHO/residential markets. But, taken together, these two technologies today are capable of delivering broadband to a large share of U.S. homes.

millions of homes by the end of this year. The FCC Cable Services Bureau's October 1999 report on *Broadband Today* cited predictions that 78 million Americans would have access to broadband technology by 2008. (28)

Table 1: Characteristics of Competing Broadband Access Technologies

Technology	Fixed Cost to Prepare Network	Variable Costs to Deploy	Speed (Mbps)	Coverage	Reliability	Time Frame for Deployment
XDSL	Negligible	\$350 - \$700 per user	0.5—27	~ 70 -75 percent of lines	High	Today
Cable Modem	~\$500/home passed; ~30 Bil. Total	~\$250 per user	10—30 (shared)	~30 percent of U.S. Homes	Medium	Today
LMDS	~1 Mil. Per cell for antenna	~ 500 per user	10	Terrestrial line of sight limits	Low—rain LOS are issues	2—5 years
Satellite	~ \$10 Bil. (global)	\$1000's per user for receivers	< 1	Global	Medium - atmospheric issues	~ 5 years
Fiber to Home	Very High - \$1000's per home	\$500 - \$1,000 per user	No real limit	Terrestrial lines	High	> 5 years

Notes: LOS=line of sight.

Source: Primarily Uterberg 1999. Also Solomon, Smith Barney, 1999.

Data reveal considerable investment in deployment of cable and xDSL to residential users. Currently, there are over 91 millions homes in the United States passed by cable, (23) and cable that can support two-way cable modem transmissions passes about 12 million homes. (24) The industry has spent or announced plans to spend \$9 billion to upgrade the cable infrastructure to state-of-the-art systems. (25) One estimate is that 63 percent (26) of all cable systems will be broadband-ready by 2001.

Analysts estimate that 70 to 75 percent of U.S. homes and businesses can be reached with xDSL given the current state of the technology. (27) Local exchange carriers have announced aggressive programs for deploying xDSL to tens of

The Administration has advocated policies to ensure that all competitors can enter these markets and that new competitors have access to facilities that are necessary for competition to flourish. At the same time, the Administration has supported policies that would eliminate regulation that could inhibit the deployment of new facilities or disadvantage any particular market participant or technology. Thus, the Administration supported the continuing unbundling of network elements that were critical for the provision of broadband services by new entrants, but recognized that the presence of alternative sources of supply and the rise of effective competition should lead to the elimination of such regulatory requirements. Similarly, the Administration supported "wholesale" discounts by incumbent telephone

companies of broadband services allowing Internet Service Providers to broaden the market for high speed services. The FCC recently has required incumbent telecommunications companies to allow new entrants to have access to the "spectrum" required for the provision of broadband data services in the wires that they control to the home.

Considerable attention has been focused on the question of "open access" to broadband delivery over cable. At the heart of this issue is consumer choice and competition at all levels of the marketplace. We believe that competition should be encouraged in all markets and support the principle that customers should have choice in both their content and their Internet access provider. Our Administration has long recognized the importance of the open characteristics of the Internet. Anyone with a laptop computer and a modem can publish on the Internet, making it much easier for people to be producers as well as consumers of information. The Internet allows people to engage in "many-to-many" communication as opposed to solely "one-to-many" communication. This has created an explosion in the number of communities that are based on shared interests as opposed to geography. Moreover, the decentralized nature of the Internet accelerates innovation and entrepreneurship. Anyone with a good idea for a new application can post it on the Internet, where it can spread like wildfire. We must maintain what is special, valuable and unique about the Internet, even as it evolves to support broadband applications. The Administration hopes that the continued promotion of pro-competitive policies and market forces will achieve these goals.

The Telecommunications Act of 1996 is also helping to bring broadband networks and services to our communities through the E-rate program. More than a million classrooms and libraries are wired and connected to the Internet. Many of those schools and libraries have broadband connections. Schools and libraries are

providing an important source of access to computers and the Internet for members of the community, as well as generating demand for advanced telecom services.

Ensuring that broadband networks reach underserved communities is an important goal of the Administration. In September 1999, the National Telecommunication and Information Administration (NTIA) co-sponsored a conference on economic development, and examined efforts to bring advanced networks and the concomitant economic benefits, such as jobs and services, to underserved communities, including inner cities as well as rural areas. Currently, the NTIA and the Department of Agriculture's Rural Utilities Service (RUS) are conducting an assessment of deployment of advanced telecommunications services, with particular emphasis on rural America compared to more densely populated areas. This assessment was initiated at the request of ten United States Senators from states with significant rural populations and areas. The report will be completed by early 2000.

RUS is one example of a program that has facilitated significant deployment of advanced telecommunications in rural areas. In 1993, President Clinton signed legislation which mandated that RUS-financed infrastructure be capable of supporting data rates of one million bits per second. Since then, the deployment of fiber optic cable has doubled so that fiber represents nearly one of every ten miles of plant in RUS financed systems. From then through 1998, RUS has financed over \$1 billion in fiber optic facilities and \$725 million in digital switching systems and enhanced feature software. In fiscal year 1999, RUS added nearly half a billion dollars of rural infrastructure financing. To facilitate the flow of investment to rural America, RUS has streamlined procedures to reduce loan processing and fund advance times.

The Department of Commerce, and the FCC are working with USTR to ensure that broadband access is deployed in foreign

countries so that both the United States and foreign countries can realize the full benefits of multi-media applications. Competition and market-based principles will pave the way for people across the globe to tap the full potential of broadband services. The principles of the WTO, as discussed in a later section, establish the underlying infrastructure upon which broadband applications can be accessed on a global basis. Encouragement of rapid development of high capacity international undersea cables, wireline facilities, satellite systems, and terrestrial wireless infrastructure are necessary to support the widest range of broadband offerings around the world.

2. Consumer Protection

The Secretary of Commerce, in consultation with the Federal Trade Commission and other relevant agencies, shall foster appropriate consumer confidence in electronic commerce by working to ensure effective consumer protection online. This shall include exploring opportunities for global cooperation to enforce consumer protection laws and facilitating partnerships between industry and consumer advocates to develop redress mechanisms for online consumers. These agencies shall work with the Office of the United States Trade Representative to help avoid the creation of foreign trade barriers while protecting the interests of consumers.

"We must give consumers the same protection in our virtual mall they now get at the shopping mall."

President Clinton,
November 1998

The electronic marketplace offers consumers unprecedented choice and twenty-four hour accessibility and convenience. It gives established marketers and new entrepreneurs low-cost access to a virtually unlimited customer base. With these

benefits, however, also comes the challenge of ensuring that the virtual marketplace is a safe and secure place to purchase goods, services, and digitized information. Consumers must be confident that the goods and services offered online are fairly represented and the merchants with whom they are dealing — many of whom may be located in another part of the world — deliver their goods in a timely manner and are not engaged in illegal business practices such as fraud or deception. Consumer confidence also requires that consumers have access to fair and effective redress if they are not satisfied with some aspect of the transaction. U.S. Government policymakers and law enforcement officials are working to ensure consumer confidence in the virtual marketplace by enforcing existing legal protections and encouraging private sector leadership

Last spring, Secretary of Commerce William M. Daley challenged industry to work with consumer representatives to develop effective consumer protection practices, including codes of conduct for business-to-consumer electronic commerce and alternative, easy-to-use mechanisms for consumer dispute resolution, redress and enforcement. This approach recognizes that as e-commerce expands to encompass more international business-to-consumer transactions, alternative, easy-to-use mechanisms for consumer dispute resolution, redress and enforcement can help to ensure strong and effective consumer protection in the online environment and obviate the need for immediate resolution of the difficult issues surrounding jurisdiction and choice of law.

The Administration is pleased to see a number of significant responses to this challenge. In June of this year, the Better Business Bureau's online division, BBBOnLine, announced a project to develop a *Code of OnLine Business Practices* (www.bbb.org). BBBOnLine is working with industry, consumer representatives and government to develop a code to provide online merchants with guidelines to implement

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WARREN'S CABLE REGULATION MONITOR

March 13, 2000, Monday

SECTION: THIS WEEK'S NEWS

LENGTH: 610 words

HEADLINE: OPEN ACCESS RIVALS DEBATE NEXT MOVES IN BROADBAND BATTLE

BODY:

Proponents and opponents of opening high-speed cable lines to rival ISPs kicked off Legg Mason telecom investors conference Thurs. with spirited debate over whether federal govt. should intervene in emerging broadband market. While FCC and NCTA officials vigorously defended Commission's current hands-off approach, OpenNet Co-Dir. Gregory Simon provoked biggest reaction by predicting that such other major cable operators as Comcast, Cox and Charter will likely follow lead of AT&T and proposed AOL-Time Warner union in promising to offer multiple ISPs to high-speed online subscribers. Once AOL and AT&T actually open their lines to other ISPs, he said, "they'll start pressure for everybody else to open" as well.

Simon, who's spending much of his time lobbying Md. and Montgomery Co. policymakers for open-access regulations, said he's also looking for AOL Time Warner to carry other ISPs by end of year. He sees combined entity moving relatively quickly to end its exclusive contracts with Road Runner, slated to expire at end of next year, because of AOL's strong desire to place its new broadband service on cable systems. If AT&T tries to block that move through its pending acquisition of MediaOne Group, co-owner of Road Runner with Time Warner, "then they're begging for trouble from the Justice Dept.," he said.

Comment by Simon came amid fresh speculation that Justice Dept. might make AT&T divest its stake in either Excite@Home or Road Runner in exchange for approval of MediaOne purchase. Excite@Home and Road Runner are by far leading cable high-speed services, controlling more than 1.7 million of estimated 2 million cable-modem subscribers in U.S. and Canada. In written statement, AT&T reiterated its intent to "honor its current contract with Excite@Home, including its exclusivity provisions." While AT&T said it "remains open to any discussions" with rival ISPs "regarding possible commercial relationships" once Excite@Home exclusive deals start expiring in 2002, it stressed that it "does anticipate a long-term relationship with Excite@Home."

With both sides awaiting key decision in Portland case by U.S. Appeals Court, San Francisco, FCC Cable Bureau Chief Deborah Lathen disputed contention by open-access proponents that broadband market needs regulation. "We have not seen any signs of a market failure that would justify regulation at this point," she said, citing open-access pledges by 2 biggest MSOs and emergence of DSL, wireless cable and satellite systems as high-speed rivals to cable. "We see competition flourishing and thriving." In light of AT&T and AOL-Time Warner moves, Lathen said she thinks "we'll see parties put more meat on the bone."

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David Olson, dir., cable communications and franchise management for Portland, predicted "a tremendous number of local govts." will mandate open-access provisions for their cable franchises if U.S. Appeals Court, as he

expects, upholds Portland ruling: "It's simply going to happen because it's the obvious thing to do, it's the right thing to do." He said communities are taking action because of FCC's unwillingness to set market rules. "Because of federal inaction," he said, "the battle is being left to be fought hand-to-hand, city hall to city hall."

Daniel Brenner, NCTA senior vp-law & regulatory policy, said open-access regulatory attempts continue to flounder in Canada more than year after rules were mandated there. Citing surge in DSL rollouts in recent months, he argued that cable-modem deployments have proven to be spur to competition. He also contended that companies like GTE are calling for open-access regulations to slow down cable-modem rollouts.

LANGUAGE: ENGLISH

LOAD-DATE: March 14, 2000

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Divider Title: _____

Talking Points for Year 3 Roll Out of E-rate

Background

- In its first two years, the **E-Rate** has funded over **\$4 Billion** of services and infrastructure to bring modern telecommunications to schools and libraries throughout the country.
- Schools in rural and poor neighborhoods, those neighborhoods most likely to be on the wrong side of the Digital Divide, receive priority funding.
- **78% of public schools** (over 68,000) received E-Rate funding.
- **Over 72,000 schools** (public and private) received E-Rate funding.
- **As of 1999, 63% of school instructional classrooms** have connections to the Internet – a tremendous increase from **1994** when only **3%** of classrooms were connected.
- **51% of public libraries** in the nation have received E-Rate funding.
- After two years of the **E-Rate**, libraries have increased their **connections to the Internet by 48%**.

Year 3 Applications

- In the third year of the E-Rate, over **\$4.7 billion** in discounts was requested.
- Nearly **\$3.3 billion or 70%** of the funds requested are for **internal connections**.
- Approximately **\$1.1 billion or 23%** seek **telecommunications services** discounts.
- Approximately **\$360 million or 7%** seek **Internet access** discounts.
- **Urban** schools and libraries account for **\$3.43 billion or 73%** of the total discounts requested.
- **Rural** schools and libraries submitted applications for **\$1.28 billion or 27%** of the total discounts requested.
- The nation's **poorest schools and libraries** – those which have from 75 to 100% of their children eligible for the federal free and reduced lunch program – account **for 23.5% or \$1.1 billion of all discount requests**.

- By contrast, the nation's **wealthiest schools and libraries** – those which have less than 20% of their students eligible free and reduced lunches – account for **9.1% or \$431 million of all discount requests**.

Year 3 Funding

- We expect that the program will be **funded to the annual cap** for Year 3.
- We plan to **fully fund** all priority one service requests – **telecommunications and Internet access** – this year. Approximately **\$1.43 billion** in funding will go to support **priority one services**.
- USAC expects to be able to **fully fund at least the 90% bracket for internal connections** this year. If we can only fund this bracket:
 - Without including consortia applications, over **5100 urban** public schools, nearly **2800 rural** public schools, **160** public libraries and nearly **500 private schools** will be eligible to receive internal connections discounts.
 - About **36% or \$266 million of rural** school and library funding requests for **internal connections** will be granted.
 - **Urban** schools and libraries will receive **nearly 23% or over \$586 million** of requested **internal connections** funding.
 - A number of **large urban consortia** requests, which account for **39%** of all internal connections requests in the 90% bracket, will be eligible for funding, including:
 - \$105.9 million from the New York City Board of Education
 - \$32.9 million from Memphis City School District, Tennessee
 - \$27.8 million from Highland Park Schools, Michigan
 - \$23.9 million from the New York State Office of Technology
 - \$18.4 million from Muskegon Heights Schools, Michigan
 - \$13.8 million from Boston Public Schools, Massachusetts
 - \$13.2 million from Covert Public Schools, Michigan
 - \$12.9 million from Atlanta Public Schools, Georgia
 - \$12.7 million from Philadelphia Public Schools, Pennsylvania
 - \$12.5 million from San Juan, Puerto Rico
 - \$12.5 million from Compton Unified School District, California
 - \$12.0 million from San Antonio Independent Schools, Texas
 - \$10.4 million for New York State Office of Children and Family Services
 - \$10.1 million for WEB DuBois Charter School, Fresno, California
 - \$8.8 million from Miami-Dade County Public Schools, Florida

- \$8.3 million from Roosevelt Elementary Schools, Phoenix, Arizona
- \$8.2 million from Paterson School District, New Jersey

Three **large rural** applications, which account for only **5%** of all internal connections in the 90% bracket, will be eligible for funding:

- \$22.6 from the Puerto Rico Department of Education
 - \$11 million from Lee County Public Schools, Marianna, Arkansas
 - \$10.1 million from Jasper County Schools, Ridgeland, South Carolina
- **If USAC determines that they can fund down to the 80%-89% bracket for internal connections, these numbers increase dramatically:**
 - **Rural** school and library applications seeking **another 27% or \$200 million** would be eligible for internal connections funding. This means that a **total of 63%** of rural school and library internal connections applications, representing **\$466 million** in requested funding, would be eligible for funding.
 - **Urban** school and library applications representing an **additional 47% or \$1.2 billion** would be eligible for internal connections funding. This means that a **total of 70%** of urban school and library applications, seeking **\$1.7 billion** in internal connections monies, would be eligible for funding.

Year 3 Process

- USAC plans to again issue funding commitment letters in waves. This year there will be anywhere from **7 to 9 waves** depending on when the funding cap announcement is made. USAC aims to send out the **final wave by late May**.
- USAC plans to utilize a standard process each week for sending out funding commitment letters:
 - **Mondays:** the funding commitment **letters will be prepared**.
 - **Tuesdays:** **notification** of funding commitments will be sent **to Congress**.
 - **Fridays:** letters to applicants will be **mailed** and posted to the SLD **website**.
- The announcement date will be _____.
- The announcement will be made by _____ in _____.



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Stats *in Brief*

Internet Access in U.S. Public Schools and Classrooms:
1994-99

NCES 2000-086

Stats in Brief present information on education topics of current interest.

Stats *in Brief*

INTERNET ACCESS IN U.S. PUBLIC SCHOOLS AND CLASSROOMS: 1994–99

February 2000

In 1994, the White House's National Information Infrastructure (NII) initiative challenged the nation's schools and classrooms to connect to the Internet by the year 2000. In that year, the U.S. Department of Education commissioned the National Center for Education Statistics (NCES) to track the rate at which public schools and classrooms were meeting this goal. Since 1994, NCES has surveyed nationally representative samples of approximately 1,000 public schools in the fall of each academic year on Internet access and, since 1996, on the types of Internet connections used.

How much progress have public schools made connecting to the Internet?

The most recent survey of Internet access indicates that public schools in the United States have nearly reached the goal of connecting every school to the Internet. The percentage of public schools connected to the Internet has increased each year, from 35 percent in 1994 to 95 percent in 1999 (table 1).

In earlier years, access to the Internet varied by school characteristics. In some previous surveys, for example, secondary schools, schools with lower concentrations of students in poverty (as measured by eligibility for free or reduced-price lunches), and suburban schools were more likely to have Internet access than other schools. By 1999, these differences had disappeared; all schools, regardless of level, poverty concentration, and metropolitan status, were equally likely to have Internet access.

How much progress have public schools made in connecting classrooms?

In 1994, 3 percent of all U.S. public school instructional rooms¹ were connected to the Internet, by 1999, 63 percent were connected. Classroom connectivity is expected to continue to grow due to the allocation of funds through the Education rate (E-rate) program, which was established to make services and technologies in telecommunications available to schools and libraries at discounted rates based upon

the income level of the students in their community and whether their location is urban or rural. The poorest applicants receive the largest discounts (90 percent) and rural communities receive up to a 10 percent additional discount. As of November 22, 1999, \$1.9 billion² has been committed to E-rate programs throughout the nation.

Differences by school characteristics remain regarding Internet access in instructional rooms (table 1). For example, 39 percent of instructional rooms had Internet access in schools with high concentrations of poverty (71 percent or more students eligible for free or reduced-price lunches), compared with 62 to 74 percent of instructional rooms in schools with lower concentrations of poverty. The percentage of instructional rooms with Internet access in public schools with high concentrations of poverty did not increase between 1998 and 1999, while there were increases in the percentage of connected instructional rooms in schools with lower concentrations of poverty.

What is the ratio of students per computer?

According to the President's Committee of Advisors on Science and Technology (1997, 21), 4 to 5 students per computer is the ratio "that many experts consider to represent a reasonable level for the effective use of computers within the schools." In 1999, the ratio of students per instructional computer in public schools was approximately 6, the same as 1998 (not shown). Overall, within types of schools, ratios of students to instructional computer stayed the same or decreased slightly between 1998 and 1999.

The ratio of students per instructional computer *with Internet access* decreased from 12 to 9 from 1998 to 1999, although differences remain across schools with different characteristics (table 1). For example, medium-sized and large schools had more students per computer with Internet access than small schools, 9 and 10 students compared to 6 students. Schools located in cities had more students per computer with Internet access (11) than schools in rural areas (7). The largest differences occurred in schools with

¹ Instructional rooms include classrooms, computer and other labs, library/media centers, and any other rooms used for instructional purposes.

² The "Year 2 Funding Commitment Data" was found at the Schools and Library Division (SLD) of the Universal Service Administration Company website, <http://www.sl.universalservice.org/apply/fcyear2/national.asp>.

Table 1.—Percent of public schools with Internet access, percent of instructional rooms with Internet access in public schools, and ratio of students per instructional computer with Internet access, by school characteristics: Selected years 1994 to 1999

School characteristics	Percent of public schools with Internet access				Percent of instructional rooms with Internet access in public schools				Students per instructional computer with Internet access	
	1994	1996	1998	1999	1994	1996	1998	1999	1998	1999
All public schools	35	65	89	95	3	14	51	63	12	9
Instructional level ¹										
Elementary	30	61	88	94	3	13	51	62	13	11
Secondary	49	77	94	98	4	16	52	67	10	7
Size of enrollment										
Less than 300	30	57	87	96	3	15	54	71	9	6
300 to 999	35	66	89	94	3	13	53	64	12	9
1,000 or more	58	80	95	96	3	16	45	58	13	10
Metropolitan status										
City	40	64	92	93	4	12	47	52	14	11
Urban fringe	38	75	85	96	4	16	50	67	12	9
Town	29	61	90	94	3	14	55	72	12	8
Rural	35	60	92	96	3	14	57	71	9	7
Geographic region										
Northeast	34	70	90	94	3	10	39	56	13	9
Southeast	29	62	92	98	2	10	51	60	12	10
Central	34	66	90	93	3	19	61	70	10	7
West	42	62	86	95	5	15	51	68	14	10
Percent of students eligible for free or reduced-price school lunch										
Less than 11 percent	40	78	87	94	4	18	62	74	10	7
11 to 30 percent	39	72	94	96	4	² 18	53	71	11	8
31 to 49 percent	33	62	94	98	2	² 12	61	68	11	9
50 to 70 percent	31	53	88	96	4	² 12	40	62	16	10
71 percent or more	19	53	80	90	2	² 5	39	39	17	16

¹ Data for combined schools are included in the totals and in analyses by other school characteristics but are not shown separately.

² Revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Advanced Telecommunications in U.S. Public Schools, K–12*, NCES 95–731; *Advanced Telecommunications in U.S. Elementary and Secondary Public Schools, Fall 1996*, NCES 97–944; *Internet Access in Public Schools and Classrooms, 1994–98*, NCES 1999–017; and Fast Response Survey System, “Survey on Internet Access in U.S. Public Schools, Fall 1999,” FRSS 75, 1999.

varying concentrations of poverty. Schools with the highest concentration of poverty had 16 students per instructional computer with Internet access, compared to 7 among schools with the lowest concentration of poverty.

How are public schools connecting to the Internet?

Over the years, changes have occurred in the type of network connections used by public schools and the speed at which they are able to connect. In 1996, dial-up network connections were used by almost three-quarters of public schools (not shown). By 1999, more schools were using faster dedicated-line network connections. Sixty-three percent of the nation's public schools were connected to the Internet by dedicated lines, 14 percent used dial-up connections, and 23 percent of schools used other connection types, which included ISDN, wireless connections, and cable modems (table 2). Secondary schools (77 percent) and schools with the lowest concentration of poverty (72 percent) were more likely to connect to the Internet using dedicated lines than elementary schools (60 percent) and schools with the highest concentration of poverty (50 percent).

How are public schools funding advanced telecommunications?

Measuring funding is difficult as schools receive support for advanced telecommunications programs from a myriad of sources. Because of the complexity of this issue, measuring actual funding amounts was considered beyond the scope of this survey. However, the survey did list several potential sources of support and asked whether the school received hardware, software, or funding from the sources. About 9 out of 10 public schools reported receiving support from their school district, and 72 percent from state or federal government programs (figure 1). About a third of schools reported receiving support from parents and parent organizations, and about the same percentage received support from businesses. Fifteen percent of schools received support from teachers or students while 5 percent received support from other programs or individuals (not shown). School administrators were also asked to indicate the primary source of support. Schools most frequently cited the school district (58 percent), followed by state and federal programs (32 percent). This primary support was related to the school's poverty concentration: for example, state and fed-

Table 2.—Percentage of public schools that use the following types of connections when connecting to the Internet, by school characteristics: Fall 1999

School characteristics	Types of network connections to the Internet		
	Dedicated line ¹	Dial-up connection	Other connection types ²
All public schools	63	14	23
Instructional level ³			
Elementary	60	15	25
Secondary	77	6	17
Size of enrollment			
Less than 300	64	21	15
300 to 999	63	12	26
1,000 or more	67	10	23
Metropolitan status			
City	62	15	23
Urban fringe	62	10	27
Town	64	13	24
Rural	66	18	16
Geographic region			
Northeast	60	16	24
Southeast	53	18	29
Central	68	14	19
West	70	9	21
Percent of students eligible for free or reduced-price school lunch			
Less than 11 percent	72	7	21
11 to 30 percent	65	10	24
31 to 49 percent	65	11	24
50 to 70 percent	63	21	17
71 percent or more	50	23	26

¹ Dedicated-line connections include T1/DS1, fractionalized T1, 56Kb, T3/DS3, and fractionalized T3 lines.

² Other connection types include ISDN, cable modem, wireless connections, and other types of network connections.

³ Data for combined schools are included in the totals and in analyses by other school characteristics but are not shown separately.

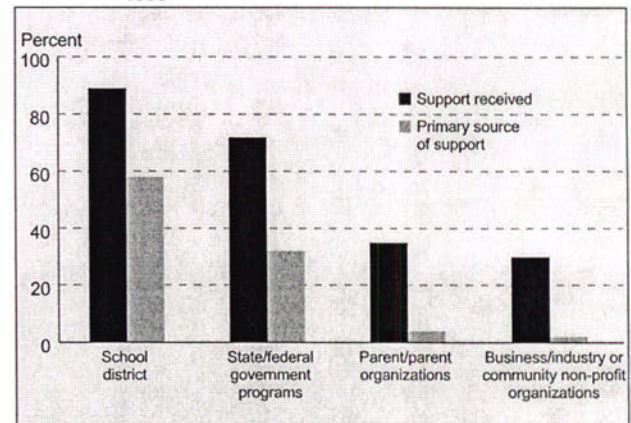
SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Internet Access in U.S. Public Schools, Fall 1999," FRSS75, 1999.

eral government programs were cited as the primary source by 48 percent of schools with the highest concentration of poverty compared to the 14 percent of schools with the lowest concentrations of poverty; the school district was the primary source for 43 percent of highest poverty schools compared to 78 percent of schools with the lowest poverty (not shown).

Related Information

This survey is part of an overall effort of NCES to track the access and use of technology in schools and classrooms. More information from the series of public school surveys on advanced telecommunications and Internet access (1995,

Figure 1.—Percent of public schools that received hardware, software, or funding for advanced telecommunications from the following programs, organizations, or individuals and the primary source of support: Fall 1999



NOTE: Data were also collected for schools receiving hardware, software, or funding from teachers or students, and other sources.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Internet Access in U.S. Public Schools, Fall 1999," FRSS 75, 1999.

1996, 1997, 1998, and 1999, see references) can be obtained from the U.S. Department of Education. In addition to collecting information from public schools, NCES surveyed private schools about advanced telecommunications in 1995 and 1998 (1997 and 2000, see references). NCES has also collected information on teacher training in advanced telecommunications; a report on this topic is scheduled to be released in summer 2000.

References

- President's Committee of Advisors on Science and Technology, Panel on Educational Technology. 1997. Report to the President on the Use of Technology to Strengthen K-12 Education in the United States. Available online: <http://www.whitehouse.gov/WH/EOP/OSTP/NSTC/PCAST/k-12ed.html>.
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Stats in Brief present information on education topics of current interest. All estimates shown are based on samples and are subject to sampling variability. All differences are statistically significant at the 0.05 level. In the design, conduct, and data processing of NCES surveys, efforts are made to minimize the effects of nonsampling errors, such as item nonresponse, measurement error, data processing error, or other systematic error.

This **Stats in Brief** was prepared by Catrina Williams. To obtain standard errors or definitions of terms for this Issue Brief, or to obtain additional information about the Fast Response Survey System or the FRSS telecommunications surveys, contact Edith McArthur at NCES, 202-219-1442. To order additional copies of this Issue Brief or other NCES publications, call 1-800-424-1616. NCES publications are available on the Internet at <http://www.NCES.ed.gov/pubsearch>.

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April 9, 2000

MEMORANDUM FOR GENE SPERLING

FROM: TOM KALIL

RE: BACKGROUND ON "3G" AND WIRELESS DATA

What is 3G?

"3G" refers to the 3rd generation of wireless technology.

- The **first generation** was analog cellular phones.
- The **second generation** is digital cellular phones that have limited bandwidth for data - usually 14.4 kilobits/second. (The current Sprint PCS service is an example of 2G.)
- The **third generation** will allow broadband wireless - up to 2 megabits/second in a fixed environment and 384 kilobits/second in a mobile environment.

Currently, no one is providing 3G service -- the most likely scenario is that telecommunications companies will deploy an evolutionary "2.5G" service that is faster than 2G to see if there is really a market demand for high-speed wireless data.

What are the applications of wireless data?

- Two-way, mobile e-mail. Many executives I know now send and receive e-mails during meetings.
- Putting a "micro-browser" in a smart cell phone to download information. People might get alerts on news stories, stock quotes, traffic delays, changes in airline flight times, etc. that are of particular interest to them.
- Mobile commerce. Allows for spontaneous purchases. For example, one of Amazon's customers reported buying a CD during a concert she enjoyed.
- Voice recognition. One of the limitations of a mobile handheld device is the lack of a keyboard. Companies are developing the technology to navigate the Web and perform transactions using voice recognition and text-to-speech.
- Electronic wallet. People in Finland can buy a Coke by beaming electronic payment at a vending machine.
- Location-based information services. Someone walking around a new city might want directions to the nearest Chinese restaurant still accepting reservations.

- Wireless modem. Business users want to be able to take their lap-top or PDA anywhere, and be connected to their information and files as if they were in the office.
- "Dick Tracy" watch. With enough bandwidth, mobile video-conferencing is possible, although it's not clear what the demand for the service would be.

Standards battles

The standards battles between the U.S. and Europe are a confusing "alphabet soup."

- For 2G, the EU picked one standard, called GSM. The U.S. -- in comparison, allowed multiple standards to compete in the U.S. market -- including TDMA, CDMA, and GSM. (Qualcomm developed CDMA technology).
- For 3G -- the Europeans tried to convince the ITU (International Telecommunications Union) to harmonize on Wideband-CDMA (W-CDMA) as the single standard for 3G. The Europeans picked a technology that would make it easier to evolve from the technology that they are currently using (GSM). Qualcomm and the U.S. industry pushed for another another variant of CDMA called cdma2000.
- The U.S. Government was concerned that the Europeans were using standards as a means of (a) keeping U.S. technology out of the European market; and (b) giving European wireless companies an advantage by making the European technology the "de facto" global standard.
- In November 1999, the U.S. was successful in getting the ITU to embrace multiple standards, as opposed to picking one.
- The U.S. is also trying to convince European governments to allow telecommunications companies that obtain licenses to provide 3G services using multiple technologies, as opposed to just W-CDMA. Europe has agreed to this, but it's not clear that European telecom companies will in fact use technologies other than W-CDMA.

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Radio Comm. Report

March 27, 2000, Monday

SECTION: Pg. 22

LENGTH: 1585 words

HEADLINE: Setting the record straight: The U.S. is Europe's equal on wireless technology

BYLINE: David L. Aaron

BODY:

One press article after another has asserted that the European Union's single standards regime for wireless services has given Europe an enormous "lead" over the United States. These stories, however, do not present a complete picture regarding the global leadership of the U.S. wireless industry—a leadership advanced through innovation, increased wireless usage and market-driven standards.

Innovation

U.S. wireless firms are undeniably responsible for some of the most significant technical innovations in this field, including extensive contributions to the development of third-generation standards for wireless communications. U.S.-developed technology is at the heart of three of the five technical standards for 3G endorsed in November by the International Telecommunication Union, a treaty organization of the United Nations that is coordinating the worldwide process to establish global 3G wireless standards through a project dubbed "IMT-2000." These innovations are a direct result of the free competition that U.S. policy promotes.

Code Division Multiple Access technology, a product of the freely competitive U.S. marketplace, was the first-to-market second-generation wireless technology to introduce high-speed data capability, coming on line in mid-1999. Comparable speeds on Global System for Mobile communications networks, the only second-generation technology licensed in Europe, will not be introduced for at least several more months. In addition, Qualcomm Inc., the developer of CDMA, continues to be a technology leader, recently announcing a product that enables data rates from a moving vehicle more than 10 times faster than the parameters specified for 3G, years before 3G systems have even been built. U.S. and European industry groups are co-developing high-speed data applications that will serve as their stepping stones to 3G.

Moreover, U.S. firms are competing head-to-head with European firms for wireless contracts. Motorola Inc. is the world's second-largest supplier of GSM handsets, and Motorola, Lucent Technologies Inc. and Nortel Networks all have significant sales of GSM systems. In addition, U.S. firms have developed the simplified browsers and servers that wireless carriers in the United States, Europe and elsewhere are embracing for the up-and-coming wireless Internet. Thus, even as Europe attempts to achieve its longstanding objective in terms of 3G technology hegemony, U.S. manufacturers are innovating across all standards, are competing for each and every contract and are by no means

slouches or followers.

Growing usage

Finland, coincidentally home to mobile phone leader Nokia, is typically cited as the most "wireless" country in the world. However, Finland is actually a bit of an anomaly, with wireless penetration double that of most developed markets. The U.S. average penetration level of 30 percent is comparable to the European average. In fact, overall U.S. penetration exceeds penetration in three out of four of Europe's largest cellular markets-the United Kingdom, France and Italy. And in most major U.S. cities, wireless penetration has reached 50 percent. The high cost and mediocre quality of European basic telephone service relative to the United States makes wireless service more attractive to European consumers than wireless service is to Americans. In the United States, most local phone service is provided on a flat-rate basis, with the result that Americans seldom consider the cost of a local phone call. In Europe, on the other hand, local phone service is metered, meaning that each local call and each minute costs the user incrementally. In Finland, for example, most local calls cost approximately 8 cents per minute during business hours. At the average U.S. rate of home usage of 1,200 local minutes per month, that would amount to \$96 per month for local telephone service-well over three times the average American monthly residential local phone bill! So why not use your mobile phone?

Secondly, greater wireless usage should by no means be equated with greater technological prowess. Short messaging service and wireless e-mail, often touted as examples of European leadership, are neither highly sophisticated nor high-speed services. They do fill an unquestionable communications void, since Internet connectivity is so low in Europe that sending an e-mail to a mobile phone is often the only way to be sure that it reaches the intended recipient. The oft-cited example of paying for sodas from vending machines via wireless phones, incidentally independent of the Internet, is not a highly marketable application. Interestingly, the biggest users of these services are the technologically savvy users in the 16-26 age bracket.

Standards

It is true that European technology is predominant in today's global wireless market-but let's be clear about the fundamental reason behind this. It is because the Europeans imposed, by law, a single European standard for second-generation (digital) wireless systems, GSM, which replaced a hodgepodge of incompatible first-generation analog wireless telephony systems. Although the initial purpose was to ensure cross-border compatibility within Europe, this policy has long since served purely protectionist purposes. After developing GSM in the closed home market, the Europeans took GSM on a global road show. This was so effective that there are only a handful of countries around the world to this day where GSM and CDMA operators compete head-to-head. Clearly, European industrial policy strategists intent on perpetuating the EU's standards success into the next wireless generation have one aim-promoting European industrial hegemony in European and global markets. Thus, it was the EU's protectionist standards regime, not the comparative virtues of GSM technology or the needs of consumers, which propelled GSM to the top. The true test of technological superiority would be if all technologies were allowed to compete on a level playing field and operators were given the opportunity to select their preferred technology based on commercial considerations.

U.S. policy favors neither a single standard nor multiple standards. The United States favors market-driven, rather than government-imposed, standards, deferring to the market and open private standards-setting procedures to determine the appropriate mix and variety of standardization. This market-driven standards policy has supported U.S. leadership in virtually every sector of the high technology revolution sweeping the world. This policy drove the initial commercialization of CDMA technology, which the Europeans subsequently recognized as superior by adopting it as the basis for their next-generation wireless standard. This is what Secretary of Commerce Daley and other U.S. Cabinet officials have aggressively advocated with the European Commission over the last year and half.

Japan and competition

So how competitive will U.S. companies be as 3G technology is rolled out in global markets? Japan provides a good example, since years ago, the Japanese market was generally viewed as closed to foreign standards. The Japanese eventually learned that this exclusionary practice was highly risky, when they were notably unsuccessful in exporting Japanese wireless technology. U.S. wireless technologies have been allowed to compete freely in Japan throughout most of the 1990s. Challenges from competitors launching CDMA technology in mid-1998 prompted NTT DoCoMo, the world's largest cellular operator, to accelerate the roll out of its "i-Mode" wireless Internet service. As a result, Japan actually has the most commercial experience to date with high-speed wireless data and wireless Internet-i-Mode has proven highly popular with consumers since being introduced early in 1999, with more than 3 million subscribers in just 9 months. Japan has already approved two standards for 3G services, and in 2001, NTT plans to launch the world's first 3G network. Both Lucent and Motorola will supply equipment for NTT's network. Also of note is NTT's announcement that it will establish a research and development base in California to strengthen its Internet technology and to promote 3G services in the United States.

In conclusion, global leadership in wireless technology has been shared between the United States and Europe for the past two decades and will likely continue to be shared for years to come. Each country brings important contributions to the table. However, it is essential that all players have a seat at the table as we develop and begin to use the next-generation wireless technology. In this new era, being a leader in cellular technology will not necessarily assure leadership in delivering IP-based systems for next-generation networks. Such leadership will stem from survival in a highly competitive market environment. Perhaps the most positive outcome of the 3G debate, albeit via an arduous path, has been the ensuing dialogue and significant technical harmonization which makes it possible for all current operators to evolve their existing networks to the next generation. Hopefully, the global wireless industry will finally embrace the premise that free market principles grow the market for everyone's benefit.

David L. Aaron is undersecretary of commerce for International Trade. He is the head of the International Trade Administration and is responsible for formulating and providing leadership for U.S. trade policy.

UPSIDE today:

So Where is the Wireless Web?

by Dee McVicker
February 11, 2000

Wireless data is hot. You can't open a magazine without reading about microbrowsers on cell phones or turn on a television without seeing an advertisement for the Internet-in-your-pocket.

Japan is blasting away, with all jets driving, toward the new wireless Internet. As far back as October 19, 1998, NTT Mobile Communications Network Inc. (NTT DoCoMo, Tokyo), Japan's leading mobile operator, piloted a cellular network that joined together the cell phone and motion video.

Expected to launch commercially in March 2001, the network and others like it will give birth to a new wireless-communications era. For NTT DoCoMo's 3 million "i-mode" cell-phone subscribers (roughly 10 percent of the company's total customer base), for example, it will mean wireless high-speed Internet news, banking, video streaming, travel reservations, Web radio, and a slew of other services.

But here in the U.S., matters are not proceeding at the same headlong rate. Most wireless carriers are still smarting from their enormous (and painfully recent) investments in upgrading their network to support digital services (PCS). There is also some concern that the data market will bloom slowly -- a prediction that may become a self-fulfilling prophecy.

The long and short of it is that next-generation cellular data services will happen on this continent, but it will be at least a three-to-six-year engagement before they do.

Data That Grabs You

Few cellular operators can ignore the importance of data. In major cities, up to eight wireless-network operators now compete for business. Data transmission represents a new source of revenue extraction from their customer base. Even though data currently represents less than 2 percent of wireless traffic, according to Datacomm Research, a cursory look at the 40 percent growth of messaging in Europe during 1999 (to a whopping billion messages sent per month, according to The Yankee Group) indicates that wireless data services have profit potential.

Most observers expect that wireless data services will evolve in much the same way the landline Internet grew. E-mail and other text messaging services will come first. "I think in the North American market, what hasn't had any widespread adoption yet is messaging. Whether it's done through e-mail and browsers or through SMS, I think that is going to be an initial step that will get people used to wireless data devices," says Larry Paulson, president of Product Line Management for Nokia (NOK) CDMA handsets, Dallas, Texas.

Eventually, the goal is "third generation," or 3G, devices (digital cell phones were the second generation) that will deliver data rates of up to 2 Mbps. Just for comparison, current cellular-network transfer rates plod along at 9.6 Kbps or 14.4 Kbps, at best, which is OK for e-mail and some of the new Internet services being lauded by cell-phone carriers. Phone.com's (PHCM) Wireless Application Protocol (WAP) microbrowser is helping squeeze the Web into these pipes, but that's a stopgap measure.

In the long term, 3G will bring about full mobile multimedia -- video streaming and audio streaming, plus location-based services that will be able to notify a traveler there's a concert in which he'll be interested in the city he's visiting, for example.

Every Call Is a Winding Road

Any and all of these nifty data services will require investment in hardware and software upgrades. How much, when, and how fast will depend on the operator's existing transmission equipment. Network operations are currently divided into three technology families, code division multiple access (CDMA), time division multiple access (TDMA), and global system for mobile communication (GSM).

Each is facing a multigenerational path to higher data rates: a two-and-a-half generation (2.5G) modification followed by a third-generation (3G) modification. TDMA and GSM operators can take the 2.5G step with Ericsson's general packet radio service (GPRS), which will give them up to 115 Kbps, and then step up to 3G with enhanced data rates for global evolution (EDGE), which will bump them up to 384 Kbps and even, in some cases, 2 Mbps. CDMA operators can step into 2.5G with Qualcomm's cdma2000 1X, for up to 307 Kbps, and then step up to 3G with cdma2000 3X, which will give them up to 2 Mbps. 2-Mbps Wideband-CDMA (W-CDMA) is also a 3G option for GSM and CDMA operators.

Part of what is making it hard for U.S. wireless operators such as GTE Wireless (GTE) to immediately commit to 3G is their reluctance to give up a cash cow. "If we gave you 800-kilobit packet-data service as a user, we could fit 100 voice calls into that same bandwidth," explains Keith Radousky, vice president of engineering for BellSouth Cellular Corp. (BLS), Atlanta, Ga., which is also deploying 2.5G modifications as a soft step into 3G. Voice currently makes up the majority of operator income. "So there's a question of opportunity loss," he adds.

Japan's NTT DoCoMo doesn't have the same concern, one reason why it's not hesitating to jump into 3G. Japanese and European operators running out of bandwidth can license new spectrum for 3G; U.S. operators cannot.

The marriage between high-speed data and voice is a longer shot for U.S. network operators, because the operators already occupy the 2GHz band that other countries are now licensing for 3G. Moreover, U.S. PCS operators are running voice over this band -- very profitably, thank you -- so operators are already vested in existing infrastructure.

Taking Baby Steps

Some believe that the world of high-speed wireless data will come quickly and to a broad range of customers. Of the operators we spoke to, AT&T Wireless (T) is the farthest up on the high-speed staircase. AT&T runs a TDMA network, and it will start major deployment of EDGE in 2003, which will net it the transfer rates necessary for quality video and advanced high-speed data.

AT&T will test GPRS (TDMA's 2.5G step) internally in order to get its operations ready for EDGE. AT&T Wireless Services tracking stock, to be offered in May 2000, is expected to round up \$10 billion in capital, which will no doubt help pay for that lead. The company disclosed plans to spend \$3.5 to \$4 billion this year to boost capacity and improve service quality.

AT&T Wireless has relatively aggressive plans. It's betting that although data services will appeal initially to power users, third-party companies that want to provide advanced services (stock quotes, retail services, and the like) to a broader range of consumers will

help jump-start adoption.

"3G will be primarily a horizontal offering," predicts Rod Nelson, senior vice president and chief technology officer for AT&T Wireless. "The early adopters will be businesses that want to give their mobile workers access to their corporate data. Pure consumer offerings based on portals, music, audio, and video applications will emerge at nearly the same time."

But many carriers are skeptical. GTE Wireless's Randy Crouse, assistant vice president of Technology Planning and Implementation for the Irving, Texas-based operator, doesn't share AT&T's blue-sky vision. He says he's heard all the talk about "people running up and down the street with streaming video cameras at 2 megabits, but it's just not clear yet how that will shake out." Not surprisingly, GTE Wireless is taking the more conservative, 2.5G approach with its 6.9 million subscribers.

"Two-and-a-half generation is going to provide the proving ground. If there's more take-up of 2.5G, if they deliver the kind of usage and subscriber growth that people are hoping for, it will help make the business case for 3G. But there are a lot of steps along the way before we get serious about 3G," points out Mark Lowenstein, senior vice president of Global Wireless Practice with The Yankee Group, Boston, Mass.

To these uncertainties add the hidden costs of converting even to 2.5G. Operators have to turn their voice business model into a data business model, with all the billing and logistical nightmares that follow -- the business equivalent of a Buddhist converting to Catholicism.

"All the back-end support, all the financial reporting, all the marketing, all the distribution, billing -- all those things are voice-centric," comments BellSouth Cellular's Keith Radousky. What operators are doing now is starting to move "from voice to data. It really is the first step to becoming a data company."

Silver Lining

Happily for access providers, moving to a data-oriented infrastructure offers them benefits, too. For example, 2.5G will bring operating efficiencies to operators so they can offer more access time to data subscribers. That's going to be a big step in the matrimony of the Internet and cell phones, because it gets operators past that hurdle they're now facing with high-overhead, session-based access.

The operator with the most to gain from 2.5G is Sprint PCS (PCS), a company investing mightily in making its name synonymous with the term wireless Web. John Yuzdepski, vice president of Product Management and Development for Sprint PCS, Kansas City, Mo., says upgrading to 2.5G will essentially bridge the gap between what was good for voice -- that is, session-based traffic -- and what is more ideal for IP.

He explains, "When you pick up the handset and dial a number, you open a circuit between yourself and me. We're using up the same amount of bandwidth whether we're talking right now or not."

That may be OK for checking e-mail twice a day but becomes a problem when cell-phone users start cruising the Web as they do at home on landlines. Hence, Sprint PCS's 2.5G upgrade to cdma2000 1X.

"It allows us to create more capacity. It allows us to move to new billing paradigms. It allows us to move to more of a store-and-forward system, as well as optimizing the network. So the really big impact is on the network side, and on the user experience," says Yuzdepski.

More important, cdma2000 1X will also give Sprint PCS double the voice capacity -- the next best thing to new spectrum.

So, despite the current hype surrounding Internet-anything, cellular carriers' move to high-speed data services will more likely be a slow march than a quick sprint.

"I think we're going to go in small steps," says Radousky. "We have a very specific plan for our delivery of data services, and it doesn't involve the industry coming out with this huge 384-type service right out of the chute."

Battle of the Standards

Battles over technology standards are commonplace, but it's not every catfight that manages to get the governments of several countries involved.

Ericsson (ERICY) and Qualcomm (QCOM) develop the majority of transmission technology for network operators' base stations as well as the technology for their respective cell phones to pick up transmissions from those base stations.

San Diego, Calif.-based Qualcomm, with 1999 revenues of \$3.9 billion, is the digital-cellular-network phenom whose CDMA technology all but owns the digital market in the U.S.

Stockholm, Sweden-based Ericsson, with reported 1999 revenues of \$22 billion, connects over 40 percent of the world's mobile callers, as the maker of TDMA, GSM, and CDMA base stations and cell phones.

The trouble started during the debate of the International Telecommunication Union (ITU) on its International Mobile Telecommunications 2000 (IMT-2000) initiative, intended to bring about third-generation (3G) cellular audio, video, and high-speed Internet applications.

Ericsson and Qualcomm proposed different CDMA variants. Qualcomm's proposal was a better alternative for the majority of U.S. CDMA operators migrating to high-speed data, and Ericsson's proposal was a better alternative for its customer base in Japan and Europe, which accounts for more than half of Ericsson's revenue.

The quarrel became so heated that it prompted governments to get involved in what was quickly escalating into trade tensions between Europe and the United States. At the heart of the debate were CDMA intellectual-property rights.

A December 1998 letter signed by U.S. Secretary of State Madeleine Albright and Federal Communications Commission Chairman William E. Kennard urged the European Commission, Brussels, Belgium, not to impose unnecessary 3G obstacles or "barriers to trade."

Finally, the ITU stepped in and announced that it would disqualify all CDMA proposals from its IMT-2000 initiative if the two companies didn't hold their fire.

Eventually, Qualcomm and Ericsson resolved their differences, coincidentally right around the time one of the strangest unions in recent history took place. Ericsson purchased Qualcomm's terrestrial-infrastructure business in May 1999.

Not long after, in November 1999, the ITU recommended transmission specifications for all countries and CDMA, TDMA, and FDMA technologies on the evolutionary path toward 3G, including two "harmonized" CDMA standards from Qualcomm and Ericsson.

The set of IMT-2000 specifications will fit the 3G wireless migration path of the Americas as well as the new-spectrum licenses of Asia and Europe, although it hardly fits anyone's definition of one single global standard.

Smart Phones

For every step up the high-speed migration path, phone manufacturers Nokia, Motorola (MOT), and Ericsson plan to come out with progressively more feature-rich phones, starting in early 2001.

Subscribers will need to upgrade or replace phones to get more-advanced features. But according to Nokia which makes TDMA and CDMA phones for the worldwide market, the current life expectancy of a mobile phone is just two years -- upgrades which have about the same life span as the carriers' upgrade steps to 3G.

There could be a premium market for multimode phones as well, because the ITU's global standards are not globally compatible with each other after all. U.S. cell-phone users traveling abroad will need either a multimode phone or some sort of adapter for their phones to work with some other countries' cellular networks.

Smart Chips

The complexity of these phones will require smarter and better chips, and lots of them. In December of 1999, Qualcomm agreed to sell its handset business to Kyocera, so it wouldn't have to "wrap the plastic" around what it expects will generate enough volume to keep its profits on the rise: chipsets.

Qualcomm is working on next-generation chipsets that will have global positioning for push-type, location-specific messaging and voice-recognition capability for hands-free user interaction. It unveiled a 3G handset prototype in October that offered voice command for all major functions plus a video display for when 3G comes about.

Motorola is also working toward smarter phones. "As you've seen from the PC world, mobile chipset technology will be very fast," says Dr. Valy Lev, corporate vice president and director of 3G, Advanced Technology and Software Operations for Motorola's Personal Communications Sector, Libertyville, Ill.

The math for these companies is simple: Carriers will continue to subsidize phone sales. Datacomm Research, a research firm in Chesterfield, Mo., predicts that 330 million smart phones will be sold per year by 2003.

There's also room for PDAs, specifically Palm Pilots, of which there are now 5 million worldwide. Before it announced its spin-off from 3Com Corp. (COMS), Palm announced a partnership with Sony (SNE) to develop audiovisual applications based on its platform.

It also began licensing its Palm OS to cell-phone manufacturers Qualcomm, Motorola, and Nokia as well as Handspring, a handheld-device manufacturer. Datacom Research predicts that 36 million PDAs will be sold in 2003.

Dee McVicker of Gilbert, Ariz. is a freelance writer specializing in broadcasting, information technology and telecommunications.

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April 9, 2000

MEMORANDUM TO GENE SPERLING

FROM: TOM KALIL

SUBJECT: INTERNET TAXATION ISSUES

Background on Commission

- The Advisory Commission on Electronic Commerce had its last in-person meeting on March 20-21 in Dallas, Texas. A final meeting, by teleconference, was held on Thursday, March 30.
- Unfortunately, members of the business community and state and local representatives were not able to agree on a consensus position that garnered the necessary two-thirds vote.
- At the Dallas meeting, the business proposal received 11 of 19 votes, 2 short of the required two-thirds for recommendations to be submitted to Congress. State and local representatives objected to the business proposal on a number of grounds.
 - First, the proposal would create a number of "nexus carve-outs" or further tax collection exemptions. For example, the proposal would allow a company to have an affiliate in a state, take product returns in a state and do repair and warranty services in a state -- without having to collect that state's sales tax.
 - Second, under the proposal, sales of digitized goods *and their functional equivalents* would be exempt from tax for 5 years. Thus, under the proposal, downloaded software, music and books would be exempt from sales tax, *as well as "physical" books, music CDs and software diskettes, whether purchased on-line or in person.*
 - Third, the business proposal includes significant restrictions on the imposition of state income tax.
- Governor Leavitt and other state and local representatives were willing to agree to some provisions of the business proposal, but thought that on the whole the business proposal went much too far. The Administration agreed, and unfortunately, even after extensive negotiations, we could not find a compromise on the more extreme elements of the plan.
- After the failure of negotiations on a consensus package, the Administration determined that rather than vote on individual items in isolation, the Administration would present its comprehensive position at the beginning of the Commission. We continue to argue for:
 - A permanent ban on Internet access taxes;

- Continued moratorium on multiple and discriminatory taxes on e-commerce (haven't specified how long);
- Simplification of state and local sales taxes over the next two years;
- Revisiting the issue of the application of the sales taxes to sales over the Internet after states and localities have completed their simplification;
- Simplification of state and local taxes on telecommunications;
- A permanent ban on customs duties on electronic transmissions.

Background on Hill action and Administration response

- Republicans have been blasting the Administration for abstaining on votes and being "allied" with the pro-tax forces (state and local government, "brick and mortar" merchants).
- McCain and Hastert are reportedly considering a five-year extension of the moratorium in the Internet Tax Freedom Act, which is currently scheduled to expire in 2001.
- The impact of this would be largely symbolic -- since ITFA only prohibits Internet access taxes and "multiple and discriminatory" taxes on e-commerce.
- There is really only one overlap between ITFA and the issue of state and local sales tax. ITFA defines "discriminatory tax" to include any tax that a state requires an out-of-state seller to collect solely because the seller's web sites can be accessed from the taxing jurisdiction.
- However, the press and the politicians don't seem to know that it is *Quill* that is preventing states and localities from imposing a "duty to collect" on remote sellers, not the ITFA, or they aren't making this clear.
- In a *WSJ* article today -- Hastert is clearly trying to trump Gephardt by calling for a longer moratorium. Hastert is calling for 5-year extension of the current moratorium - which is set to expire in 2001. Gephardt called for a permanent ban on Internet access taxes and a 2-year extension of the "multiple and discriminatory" ban.
- Of course, any legislation that started out as a simple extension of ITFA could acquire some of the nexus carve-outs that the business commissioners advocated in the report.
- Cox and Wyden are calling for a permanent moratorium on Internet access taxes and multiple and discriminatory taxes.

- NGA would prefer that nothing happen legislatively this year - or that if there is an extension of the ITFA, that it be linked to Congressional authorization of the state and local simplification process.

Next steps

- Treasury has produced an options memo. There may be a value in having us weigh in early with support for a limited package. The Senate Commerce Committee is expected to hold hearings next week, and could mark up the bill immediately.

Background on Internet Tax Freedom Act

- Length of moratorium is 3 years from date of enactment - until October 21, 2001.
- Moratorium covers:
 - All new state and local taxes on **Internet access**
 - Any state and local taxes that **discriminate** against e-commerce. "Discriminatory tax" includes any tax that a state requires an out-of-state seller to collect solely because the seller's web sites can be accessed from the taxing jurisdiction.
 - Any **multiple** state and local taxation.
- Advisory Commission on Electronic Commerce has 19 members. Administration has 3 votes. Two-thirds agreement is required for any finding or recommendation to be in the report.

Q. What did the Administration think about the outcome of the Advisory Commission?

- We were disappointed that the Commission was unable to reach a real consensus on the issues. There was a strong effort to do so, and the Administration worked up until the last hour of the last day in an effort to forge a consensus.

Q. What is the Administration's position on Internet taxes?

- We want to allow the Internet and electronic commerce to flourish, but we don't want to deprive states and local governments of the revenue they need to fight crime and educate our children.
- We believe that the most appropriate course of action would be the following:
 - A permanent ban on Internet access taxes;
 - A continued moratorium on multiple and discriminatory taxes on e-commerce;
 - Simplification of state and local sales taxes over the next two years; and
 - Permanent ban on customs duties on electronic transmissions (e.g. software downloaded over Internet)
 - Revisiting the issue of the application of the sales taxes to sales over the Internet after states and localities have completed their simplification.

Q. What is the Administration's position on phasing out or repealing the 3 percent telecom excise tax?

Phase out of this tax is a worthy policy objective and should be considered, but must be weighed against other worthy objectives including other proposed tax reductions. It must also not be allowed to threaten the important priorities of maintaining fiscal discipline, paying down the national debt, extending the solvency of Medicare and Social Security, and maintaining core government functions such as health care and education.

[Note: Eliminating the telecom excise tax would cost \$52 billion over 10 years.]

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Cyber-security base memo
March 9, 2000

Talking points

- President takes the issue of cyber-security very seriously -- our digital economy must be built on a strong and secure foundation.
- That's why the President:
 - Proposed a \$2 billion budget for "critical infrastructure protection" in FY2001 - a 16 percent increase from FY2000
 - Convened a White House summit in mid-February on cyber-security in mid-February in the wake of the "denial of service" attacks that blocked many high-profile Web sites.
- The Administration believes that:
 - We need to address cyber-security through a public-private partnership
 - We need to make computer networks more secure and resilient, while protecting privacy and civil liberties.

Background

- Under PDD-63 - the NSC has led a long process to develop a National Plan for Information Systems Protection -- which was released on January 2000.
- This plan was developed on the theory that our IT infrastructure makes us particularly vulnerable to cyber-attack. The most vital sectors of our economy -- power generation, banking and finance, transportation and emergency services - are all increasingly dependent on Internet and telecommunications systems.
- Elements of the FY2001 budget proposal include:
 - Increased support for R&D -- including a new \$50 million Institute for Information Infrastructure Protection;
 - A cyber "burglar alarm" to warn against attacks on federal government systems
 - Analyzing the vulnerabilities of federal agencies
 - Establishing a Partnership for Critical Infrastructure Security with the private sector
 - Working to recruit and retain experts in security in the federal agencies

- The cyber-security summit in mid-February was called in part because of the "denial of service" attacks on high-profile Web sites. A "denial of service" attack is the functional equivalent of flooding someone's telephone with telephone calls. The private sector agreed to do a better job of sharing information on cyber-attacks, vulnerabilities, and "best practices." The President was very careful to say that this was a wake-up call -- not an "electronic Pearl Harbor."
- It's important to know that *USA today* ran a front-page story on March 9th alleging that the government (National Infrastructure Protection Center) did not act quickly enough to spread information about the denial of service attacks.

Upcoming events

- Podesta is supposed to report to the President by April 1 on agency efforts to respond to "denial of service" attacks.
- Administration is reviewing proposals by the Justice Department to strengthen law enforcement. For example - DOJ would like to be able to obtain a single court order for electronic communications that cut across multiple jurisdictions. The Administration does not have a position on these issues yet -- we need to make sure that privacy is protected. Peter Swire is leading an inter-agency process on this.

Q. Is cyber-security a government responsibility?

- This has to be an area of shared responsibility with the private sector -- they own and operate the telecommunications and Internet infrastructure.
- There are some important things that the government can do:
 - Protect our own systems
 - Enforce the law
 - Conduct R&D
 - Encourage sharing of information within the private sector
- But we clearly the private sector has a major responsibility here.

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Divider Title: _____

April 9, 2000

MEMORANDUM TO GENE SPERLING

FROM: TOM KALIL

SUBJECT: INTERNET PRIVACY BASE MEMO

Talking points

- The Administration is committed to making sure that Americans have effective privacy and other consumer protections when they go online. Unless individuals have confidence in how their personal information will be treated online, the full potential of the Internet will never be realized.
- The issue we all face is how to obtain the protections, so that they are developed in Internet time and well-suited to the new medium. Our judgment has been that we should support self-regulatory privacy efforts on the Internet -- although there are some areas that are so sensitive that we have supported legislation (children's privacy, medical records, financial).
- We've made some real progress. In early 1998, only about 15% of the significant commercial web sites had a privacy policy. In a study in the spring of 1999, that figure had risen to 66% -- remarkable progress in one year, and due in large measure to the work of the Administration to encourage the private sector to put good practices in place.
- But as the President said in a speech before the Aspen Institute in March 2000, the private sector needs to do more. The same 1999 survey found that only 10 percent of the commercial sites had all of the key privacy protections.

General Background

- As part of our e-commerce initiative, Administration began to challenge the private sector to adopt a self-regulatory approach to Internet privacy.
- As a result, companies began to adopt privacy policies, and to sign up for organizations like TRUSTe and BBBOnline. These organizations provide a company with a "seal" -- and also offer a mechanism for handling consumer complaints and dispute resolution. In early 1998, only about 15% of the significant commercial web sites had a privacy policy. In a study in the spring of 1999, that figure had risen to 66%. More than 2,500 companies have joined a "privacy seal" organization, or have applications pending.
- In his speech at the Aspen Institute on March 3rd, the President challenged the private sector to improve the quality of their privacy policies. Ideally, privacy policies should address the following so-called "fair information principles":

- **Notice** about what information is collected and how it will be used;
 - **Choice** about whether personal information will be shared with third parties;
 - **Access** to the information that the site has collected, including the right to check it for inaccuracies; and
 - **Security** of the information during its transmission and storage.
- The Administration is also engaged in negotiations with the European Union on privacy that have been led by David Aaron. The basic agreement would create a "safe harbor" on privacy. U.S. companies doing business in Europe could sign up to these principles -- which would be deemed to provide "adequate" privacy protection under the standards of the EU Directive on Data Protection. The U.S. and the European Commission reached an agreement on March 14th -- but it has not yet been ratified by the Member States. The agreement also does not cover the financial sector -- since the EU is waiting to see what the U.S. will do in the area of financial privacy.
 - Some consumer and privacy groups do not believe that self-regulation goes far enough -- and believe that the Congress should support legislation. However, there is no consensus on the Hill about what that legislation should look like -- so they are not likely to do anything this year.

Areas where the Administration has supported legislation or regulation

Children online. In 1998, the President supported and signed the Children's Online Privacy Protection Act of 1998. Before that law was passed, we saw abusive practices by some web sites, which essentially used very young children as informants about their parents. Under the new law, sites aimed at children under the age of 13 must get verifiable parental consent before they gather and use personal information received from the children.

Medical privacy. Every American has a right to know that his or her medical records are protected at all times from falling into the wrong hands. And yet, as more and more of our medical records are stored electronically, the threats to our privacy have greatly increased. Congress failed to act, so the Administration proposed regulations for the protection of Medical records under HIPAA.

Financial privacy. The new financial modernization law, passed by Congress last year, provides protections that go well beyond existing law, such as clear notice of how institutions share financial data, the right to block sharing or sale outside a financial institution's corporate family, and new and significant enforcement provisions. The Administration is continuing to press for even greater protections.

DoubleClick controversy

- DoubleClick is a leading provider of Internet-based advertising. DoubleClick tracks the individual Internet users at the Web sites by putting something called a "cookie" file in the user's computer. As a user visits Web sites that utilize DoubleClick technology - DoubleClick is able to gain information on the user's viewing activities and ad responses.
- DoubleClick originally represented that the information of all of the Internet users targeted by its ads would be anonymous.
- Then DoubleClick acquired Abacus Direct -- which has 88 million buyer profiles compiled from 2 billion catalog purchasing agreements. DoubleClick then said that it would combine the "personally identifiable information" it had from Abacus with the information it was collecting from Web sites that are part of the DoubleClick Network.
- This announcement was very controversial -- and led to several lawsuits and investigations. On March 2nd, the CEO of DoubleClick reversed himself, saying: "It is clear from these discussions that I made a mistake by planning to merge names with anonymous user activity across Web sites in the absence of government and industry privacy standards. We commit today, that until there is agreement between government and industry on privacy standards, we will not link personally identifiable information to anonymous user activity across Web sites."
- On March 8th, DoubleClick announced that they were making Bob Abrams (former New York AG) the head of their privacy board.

Upcoming events

- FTC is doing another survey of privacy policies -- will be used to evaluate the progress of self-regulation.
- Commerce and FTC are in discussions with the Internet advertisers (including Double Click) to see if an effective self-regulatory regime can be developed.