



June 19, 1996

## **Wireless Communications System Improves Education In America's Classrooms**

New schools are taking shape in America--wireless schools--where teachers are spending more time teaching, students are spending more time learning, and classroom behavior is improving thanks to the greatest productivity tool of the 20th Century--the wireless phone

In September 1994, Southwestern Bell Mobile Systems installed the first-ever wireless communications system for the classroom -- ClassLink<sup>SM</sup> -- at Richardson West Junior High School in Richardson, Texas, a Dallas suburb. Since then, the concept has become a wireless industry initiative through the efforts of the CTIA (Cellular Telecommunications Industry Association) Foundation for Wireless Telecommunications.

Southwestern Bell has launched 11 ClassLink schools in the U.S., more than any other wireless service provider. The most recent addition was JFK High School in Chicago on Tuesday of last week. Southwestern Bell plans to launch another seven schools during the fall of this year.

ClassLink dramatically reduces the time teachers spend coordinating educational activities, leaving more time for teaching. Similarly, it eliminates many unproductive hours spent coordinating activities of custodial, nursing and administrative staff by linking these groups to teachers and to each other.

ClassLink operates as an extension to any existing office phone system including a PBX, Centrex or key system. It uses cellular frequencies at very low power to communicate with the office telephone system. With a ClassLink pocket phone, a teacher or school employee travels freely throughout the school's campus placing and receiving calls. When the teacher leaves the ClassLink school environment, the pocket phone then operates as a regular cellular hand-held phone using the external cellular network.

Research conducted with teachers, students, parents, and students who no longer attend a wireless school, confirms that ClassLink has made significant contributions to the education process. Key findings indicate that wireless communications:

- ✓ enhances the learning environment by improving communication, access to information and bolstering discipline.
- ✓ brings parents, teachers and students closer together
- ✓ lessens feelings of isolation.
- ✓ provides a safer environment.
- ✓ adds 15 1/2 days of teaching time each school year through more productive use of time

Curriculum enhancement has been another benefit from the ClassLink wireless system. Students now take "electronic field trips" using wireless speaker phones to discuss government with an elected official or get input from graphic designers on how to produce a magazine. In addition, ClassLink gives students and teachers access to the Internet via wireless modems connected to the phones and computers. Students also can access remote data bases or browse the Library of Congress from their classrooms.

**Peter F. Harter**  
**Public Policy Counsel**  
**Netscape Communications Corporation**  
**Mountain View, California**

**4 June 1996**

**Peter F. Harter is Public Policy Counsel for Netscape Communications Corporation in Mountain View, California. Peter is responsible for Internet law and policy issues and strategy. Since joining Netscape in the Fall of 1995, Peter has dealt with a variety of issues including the Communications Decency Act of the 1996 Telecommunications Act and Securities Litigation Reform. Currently, Peter is involved with reforming U.S. export controls laws on encryption technology, copyright issues, and FCC proceedings on universal service and Internet voice services and software products.**

**Prior to joining Netscape Peter was executive director and general counsel for The National Public Telecomputing Network (NPTN) of Cleveland, Ohio. While at NPTN Peter assisted in the expansion of community computer network systems into ten countries handling over 400,000 users. In March of 1995 Peter garnered interest from others in industry to start forming a legal analog to the Internet Engineering Task Force (IETF): the Internet Law and Policy Forum (ILPF). Today the ILPF has organized into an ad hoc body of over twenty companies focusing their efforts on developing open draft legal standards for a variety of Internet law issues. Peter graduated from Villanova Law School (J.D.) in 1993 and from Lehigh University (B.A. Rhetoric and Government) in 1990.**

**FEDERAL-STATE JOINT BOARD ON UNIVERSAL SERVICE**

Statement of Peter F. Harter  
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19 June 1996

**SUMMARY**

Universal access to the Internet's rich information and communications resources for schools, libraries, hospitals, and related public and educational institutions is an important national goal under the Telecommunications Act of 1996. Netscape Communications Corporation ("Netscape") of Mountain View, California, and The National Public Telecomputing Network ("NPTN") of Cleveland, Ohio, have been private industry and non-profit community leaders in helping to ensure that the Internet's promise of "equal information opportunity" for all Americans becomes a reality. The difficult job of this Joint Board is to find a way of achieving the Act's objectives without compromising the decentralized, non-regulated, non-governmental and competitive model of Internet administration that has produced the recent geometric growth of this unique and revolutionary medium.

There are three main obstacles that the Joint Board faces. *First*, the Act's definition of "telecommunications" – the linchpin for which providers contribute to universal service and can receive support subsidies, as well as which specific services should be provided to schools at a discount – very clearly does not extend to Internet access services or ISPs/OSPs. *Second*, the technology of the Internet is changing so rapidly that it would be counterproductive for the Joint Board to identify specific technologies, or even functionalities, for Internet access for K-12 schools; today's leading-edge technologies will be obsolete next year (or next month) given the frenetic pace of Internet change. Some of the RBOC proposals that the Joint Board define T1 or 56Kbps services as best for schools are simply short-sighted. *Third*, no matter what the Joint Board does, "access" to the Internet is meaningless without a substantial amount of non-telecommunications investment, in modems, computers, inside wiring, software and, perhaps most importantly, the training necessary for our young Americans to achieve "informational literacy" in a global economy.

Netscape and NPTN approach the issues of schools and libraries from similar perspectives. Both organizations are intimately involved in Internet matters, but neither is a provider of Internet access or either telecommunications services.[1] What they share is the principle that marketplace competition is highly compatible with empowering communities and educational institutions in the electronic world of the Internet. The Commission's first objective -- before even addressing whether to make a special definition of universal services for K-12 schools -- should be to rationalize the universal service support in order to allow telecommunications services to be provided at fully competitive rates. Since the Internet "rides on top of" telecommunications services, the best way to make sure Internet access is affordable and widely available geographically is to ensure that telecommunications services are priced efficiently and competitively.

Instead of immersing itself in the details of network administration and information technology selection, the Joint Board should take a more "top level" view of universal Internet access for educational institutions. This high-level approach leaves more of the implementation of information access to the market, and the institutions themselves, allowing the educational community to leverage federal dollars to create a self-sustaining mechanism for meeting the tremendous challenge of wiring American schools.

- The Joint Board should encourage the FCC to use its more liberal authority under Sections 706, 707 and 708 of the Act to directly subsidize small businesses and non-profit organizations providing Internet access and services -- "information services" under the Act -- to schools.
- Rather than deciding at a national level how to connect schools to the Internet, the Joint Board should allow those decisions to be made on a decentralized basis by the institutions and people themselves, to maximize flexibility and increase competition
- The Joint Board should create a system by which K-12 Internet access is part of a more comprehensive local "community online," so that citizens and other local government and private organizations can share information and reintegrate citizens into the social, economic and cultural life of their towns and cities.
- Universal service efforts depend upon the core Internet value of open, non-proprietary, interoperable standards because they enable the use of the resources that are available and lower the barrier to entry.

NPTN has proposed that the Joint Board create a "seed money" program for local community computer networks as a way of enhancing advanced information service access for schools, libraries and hospitals. Under this approach, the Commission would not subsidize specific services or technologies for Internet access, but rather fund the initial operations of local voluntary organizations that set-up local computer networks -- like University computer networks -- to which *all* local institutions would be connected. The local NPOs would be responsible for

ensuring full Internet access, locally-created content, public access kiosks, subsidized or free access to students, seniors, and others who lack the means to own or access a computer with a network connection, and raising public and private funds to support network operations and educational computer hardware. In short, this model lets the federal universal service money earmarked for K-12 schools be leveraged, so that the 15% or so of the access expenses can form a long-term, decentralized vehicle for raising and administering the other 85% of the money necessary to put schools and students on the Internet. (Whether it's voluntary programs like California's recent "NetDay" or local school tax expenditures, these non-telecommunications costs are the far larger element of "wiring" American schools.)

As the former Executive Director & General Counsel of NPTN, I witnessed first-hand how a little bit of start-up capital (between \$20,000 and \$50,000 depending on the size of the community) can create a robust information "Free-Net," of which there are now almost 200 local and rural NPTN affiliates worldwide. It would be a tragedy if the Joint Board takes a narrow view and looks only to subsidize identifiable data services for schools. Not only will technology overtake the Board's decision before the ink is dry, but more decentralized decisions on access methods (cable, T1, dial-up, etc.) are more consistent with American values and better for competition. Each local community should have the ability to decide, for itself, the best way to get all its schools, and thus all its students, on the Internet.

No one entity has the ability to control network operation or information flow on the Internet or locally. In the ten years of community computing many different efforts have created networked computing capacity for schools, libraries, hospitals, and rural areas. No one model fits every circumstance. In fact, many veterans of community computing argue over strategy, engaging in a heated competition of ideas in Internet discussion groups online and in practice when operating a system. This grass roots dynamic of pride and ownership is critical to the success of universal service initiatives. Without the enthusiasm and imagination of local volunteers and leadership, unique problems stand less chance of being resolved and deployment of advanced communications services will likely take longer.

The Joint Board has an historic opportunity here. It has been likened to the decisions to set aside land in New York City for Central Park and to create a system of "land grant" public universities in the Midwest. But to take advantage of this opportunity, the Joint Board must think big, think long-term, and work within -- not in conflict with -- the existing model of decentralized, non-governmental Internet administration and competition. The Internet has grown and flourished precisely because the government has had a "hands off" attitude. The Internet community can extend that growth to the schools and libraries of America if the federal government puts a little bit of money on the table, with some strings attached, and then stands out of the way. Given my background in Internet issues, I guarantee you that leaving these decisions to local community networks provides the flexibility, diversity and competitive market incentives to bring the global

information resources of the World Wide Web and the rest of the Internet to every school child in America.

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[1] NPTN does provide limited dial up modem access to its server for users located in the greater Cleveland area. However, most users access NPTN's server and its information and communication resources via the Internet. NPTN relies upon an Internet service provider (ISP) for its Internet connection and services and on the local telephone company, Ameritech, for its telecommunications needs.

**Edward D. Young, III**  
Vice President - External Affairs  
and  
Associate General Counsel

Edward D. Young, III is the Vice President - External Affairs and Associate General Counsel for Bell Atlantic. He is the responsible Bell Atlantic officer for federal regulatory matters and public policy issues. He is actively involved in significant operating and strategic decisions at Bell Atlantic and plays an important role in the technical development and management of the company. Also, once Congress passes the new federal telecommunications bill, he will lead the effort to ensure that the new law will allow Bell Atlantic to offer a full range of telecommunications services to its customers free from unnecessary costs and regulations.

Prior to his current position, Mr. Young was Vice President, General Counsel, & Secretary of Bell Atlantic- N.J. Since joining Bell Atlantic at its divestiture from AT&T in 1984, he has been a leader in reforming telecommunications regulation to permit customer choice, and not regulation, to decide how new technologies are introduced. For example, in 1992, he was instrumental in getting the New Jersey legislature to overhaul its telecommunications laws—the first successful regulatory reform effort since 1919.

Mr. Young speaks and writes frequently about telecommunications issues and has testified before Congress and state legislatures. Copies of his most recent speeches can be found on the Internet at <http://www.ba.com/speeches/>. He has taught Administrative Law at Seton Hall University School of Law. Also, he is frequently consulted by other countries seeking to change their telecommunications laws and is listed in the International Who's Who of Professionals.

Mr. Young has a law degree from Harvard Law School and graduated with honors from Amherst College.

Mr. Young has diverse interests and talents. He learned to program computers at age 16 and built his first computer by hand at age 21. He was named a Mark DeWolfe Howe Scholar by Harvard Law School, a John Woodruff Simpson Scholar in Law by Amherst College, and a Walter Reed Army Medical Center Fellow in Radiation Physics. Also, he has won the Lincoln Lowell Russell Prize in Music, an U.S. Army Engineering Fair Award for advances in particle physics, and the Amherst College Computer Center Prize.

Mr. Young serves on the Board of Directors for the U.S. Telephone Association and the U.S. Technical Training Institute.

Born in 1956 in Roswell, New Mexico, Mr. Young is married to the Rev. Gina Tillman-Young, who is also an attorney. They have seven children, four of whom were delivered at home by Mr. Young. The Young's reside on a farm by the Chesapeake Bay in Deale, Maryland.

Mr. Young's e-mail address is [edward.d.young@bell-atl.com](mailto:edward.d.young@bell-atl.com).

**Remarks of Edward D. Young**  
**on Productive Learning Environments and Telecommunications Technology**  
**Before the Joint Board**  
**June 19, 1996**

Bell Atlantic has been in the forefront of exploring the impact of advanced telecommunications technology on educational achievement. Bell Atlantic's participation in the public school - private partnership in Union City taught us two lessons:

First, a properly equipped and connected classroom can accelerate the pace of learning by providing opportunities for browsing and research through the Internet, use of age-appropriate word processors, multimedia materials, and electronic mail, and participation in electronically mediated audio and video group meetings. Good teachers in such environments generally cause students to compose relevant questions and obtain answers via targeted research using these technologies. The kind of learning skills this practice reinforces moves beyond the mechanical and technical skills that sometimes pass for "computer training". These are skills that will stand them in good stead as they continue lifelong learning, by developing a child's research, critical thinking and assessment skills, while enhancing self-esteem.

Second, access to technology in the classroom is by itself insufficient to make a big difference in children's achievement. Community involvement is a vital ingredient.

The national costs for equipping K-12 classrooms with the above telecommunications-mediated functionalities were estimated in the National Information Infrastructure Advisory Council's Kickstart Initiative. For a "partial classroom" model, the startup cost was \$1.7 billion and the recurring cost was \$1 billion per year for the "outside the school connections". These figures do not include inside wiring, which would add \$5 billion and \$400 million to the startup and recurring costs. We believe the Kickstart estimates are reliable.

First, I would like to address the issue of discounts in the form of "purchasing power". Bell Atlantic supports an approach to helping all schools take advantage of telecommunications in the learning process that we call "purchasing power". It meets the requirements of the Act as a discount first, by identifying the national price for telecommunications services schools might need; second, by having the FCC and Joint Board select a national discount level; and third, by remitting directly to the schools either a check or credit voucher as a discount. The discount, i.e. "purchasing power", received will take into account the size and location (urban, suburban, or rural) of the school, and income level of the neighborhoods served.

This plan provides the cash or credits each school can use directly with any telecommunications provider to purchase any telecommunications service commercially available that makes sense to the school. It allows for aggregation of demand if the school wants to, and encourages the marketplace to work to the schools' advantage. The purchasing power" approach is especially helpful to the poorest of schools -- and is the best way to achieve the "affordable" criterion in the Act. It does not alter tariffs in any jurisdiction, and does not upset existing state regulatory arrangements that benefit schools.

The second issue of concern is to assure that rural schools are not disadvantaged. Rural schools sometimes face an unusually high cost in connecting to the Internet because their leased circuits require high interoffice mileages if there is no Internet or interexchange carrier point of presence (POP) nearby. Bell Atlantic supports reimbursing schools in remote rural areas for such interoffice mileage charges to the nearest interexchange POP directly from the universal service education fund.

**PRESENTATION**

**BY**

**EDWARD D. YOUNG, III**

**VICE PRESIDENT - EXTERNAL AFFAIRS  
AND ASSOCIATE GENERAL COUNSEL**

**BELL ATLANTIC**

**TO**

**THE FEDERAL-STATE JOINT BOARD**

**ON**

**UNIVERSAL SERVICE**

**JUNE 19, 1996**

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

**In the Matter of** )  
 )  
**Federal-State Joint Board on** ) **CC Docket No. 96-45**  
**Universal Service** )  
 )

**Comments of Edward D. Young, III  
Vice President-External Affairs and Associate General Counsel  
Bell Atlantic**

**June 19, 1996**

My name is Edward Young and I am Vice President and Associate General Counsel for Bell Atlantic. It is a pleasure to be here today to discuss Bell Atlantic's approach to implementing the Snowe-Rockefeller provisions of the 1996 Telecom Act.

*Union City, N.J. -- "Universal Service in the 21st Century"*

Bell Atlantic has been in the forefront of exploring the impact of advanced telecommunications technology on educational achievement. In an effort to understand how advanced technology affects educational achievement, Bell Atlantic conducted a remarkable trial. We supplied all the seventh grade students, teachers, and their families in the Christopher Columbus School in Union City, New Jersey with 486-based computers.

Bell Atlantic chose the Christopher Columbus School for two reasons. First, the students in Union City are typical of the so-called "information have-nots". The families of nearly 4600 children receive state or federal assistance. Almost 80% of the students receive free or reduced price lunches, a figure that is three times the national average. Also, Union City is the most densely populated city in the United States, with a population density of 42,000 people per square mile.

Second, the State of New Jersey placed the school system in Union City on probation. Out of 52 areas that the state investigated, Union City was found to be failing in 40. The school district had five years in which to improve its performance or be taken over by the state.

We thought Union City would be a good test case of our new universal service concept of the 21st century. To paraphrase a familiar lyric: "If we could make it there, we could make it anywhere."

The results of the three year experiment have been impressive. Each year, the state of New Jersey gives an Early Warning battery of academic progress tests to all students in the state. In the first year of the trial, the percentage of Christopher Columbus students that passed all three sections of the test exceeded that of the other schools in Union City and that of all of the other “special needs” districts. In the second year, the percent that passed exceed the *statewide* average. Absenteeism by students and teachers is very low, the drop-out rate is almost non-existent, and students write extensively.

We have gained valuable experience from this trial:

First, a properly equipped and connected classroom can stimulate the learning process by providing opportunities to browse the rich online libraries on the Internet, to use age-appropriate multimedia materials, and participate in networked audio and video meetings. Good teachers can take advantage of such environments to get students to write more, to organize their research, and to feel more comfortable expressing their own points of view. This media rich environment promotes the development of skills beyond the mere mechanical and technical skills that sometimes pass for “computer training”. These are skills that will stand them in good stead as they continue lifelong learning.

Second, technology in the classroom is by itself insufficient to make a big difference in children’s achievement. Community involvement is also a vital ingredient. In Union City, Congressman Menendez and Mayor Walters were early champions. The Superintendent, Thomas Highton saw that involving the entire community in the project would lead to its success. Teachers, initially suspicious, were offered good training in multimedia and became strong advocates in getting the community to respect the accomplishments of their students.

Third, networked computers in the homes of students and teachers encouraged parents to influence the child's motivation to learn. Teachers assigned projects to the students, who used networked materials to research answers. Students submitted their completed assignments by Email. Because the parents were trained on how to use Email, they quickly became active correspondents with teachers and principals. This widespread collaboration was an essential part of the success.

### **Getting Started**

I do not advocate repeating the level of support we contributed to Union City as a universal service plan. Putting a personal computer and high speed connections in every home would be far too costly an undertaking. A big step towards a universal service concept for education is getting the classrooms connected. According to the National Information Infrastructure Advisory Council's *Kickstart Initiative*, the national costs for connecting K-12 classrooms is \$1.7 billion, with recurring costs of \$1 billion per year for the "outside the school connections." These figures do not include inside wiring, which would add \$5 billion and \$400 million to the startup and recurring costs.

To fund this effort, we support a "purchasing power" approach that enables the schools and libraries to obtain services using a formula that ensures that certain schools are not disadvantaged. Under this approach, the Joint Board would first identify the national price for telecommunications services to which schools should have access. Next, the Joint Board should decide how much of a discount the schools should receive. The amount of this discount would then be sent directly to the schools either as a check or as a credit voucher. The discount, i.e. "purchasing power", received should take into account the size and location of the school, and income level of the neighborhood. A surcharge would then be collected by all telecommunications carriers to generate the revenues necessary to fund these services

The plan thus provides cash or credits that a school could use with any telecommunications provider to purchase any telecommunications service commercially available. The schools may aggregate demand if they wish to further enhance their purchasing power. The plan would not alter existing tariffs or change existing state regulatory arrangements that benefit schools.

Also, the Joint Board should ensure that the funding process does not disadvantage rural schools. Rural schools sometimes face unusually high costs in connecting to the Internet because of the distance of the leased circuits from the nearest facility. The fund should reimburse schools in remote rural areas for such interoffice mileage charges.

We encourage the Joint Board to refrain from adopting a uniform technical model for all schools. There is a broad range of applications and needs in the educational community. Schools need the flexibility to integrate multimedia technology into their curricula consistent with their overall educational philosophy.

Bell Atlantic is proud to be a part of this historic effort and I thank you for the opportunity to provide these comments for the record in this proceeding.

## Appendix A

### **Bell Atlantic's Education Partnerships and Initiatives**

Bell Atlantic has made investments and direct and in-kind contributions worth more than \$50 million to K-12 schools over the last few years. Our projects are responsive to community and state-level requests for assistance in improving learning opportunities. Some projects benefit all teachers and students in our local service areas, and some are more focused on areas of special need.

### **Bell Atlantic Regionally**

Bell Atlantic has funded five projects to connect schools to the Internet. These projects -- World School in West Virginia, The Union City Multimedia Interactive Trial, The Blacksburg Interactive Village in Blacksburg Va, Project CANDLE which funds digitization of Library of Congress holdings and connects schools to Internet and teacher training, and Access America which provides formalized Internet use training (many teachers are taking advantage) and free community Kiosks for accessing Internet. These projects are notable for targeting economically and ethnically diverse areas. In December 1995, Bell Atlantic committed to replicate the highly acclaimed Union City project in a needy school and neighborhood in Maryland.

Early in 1994, Bell Atlantic committed to connect all public K-12 schools in its serving territory to video on demand and Internet when the school's neighborhood becomes served by the Full Service Network. As well, educational programming will be provided without charge to those schools to the extent Bell Atlantic has rights to do so. This initiative is called the Basic Education Connection, and is to be funded by Bell Atlantic shareowners.

Project Candle consists of two parts. The first is a Bell Atlantic Foundation grant of \$1.5 million to the Library of Congress' National Digital Library. The funds will be used to advance the Library's aggressive digitization project -- converting unique, exciting holdings into digital versions that can be shared with all school children over the Internet. The second part is a Bell Atlantic project to help equip, connect (over ISDN), and provide teacher training five or six schools which are committed to including Internet materials in their curriculum delivery plans. The schools have been selected in NJ, PA, DC, VA, and DE and implementation has started. Training will be provided jointly by Bell Atlantic and the Library of Congress to school.

Bell Atlantic Foundation made a \$25,000 grant to Access America to help with installation and running of; "free" kiosks for Internet access, Internet and computer literacy training (a high proportion of enrollees are k-12 teachers). An additional grant was made by Bell Atlantic to expand on-line guidance for teachers who are planning infusion of multimedia and video learning tools in their curriculum delivery. Access America is a consortium of more than 50 public access TV stations using Internet to share community programming ideas, experiences, and community training curriculum (script writing, production, camera and audio operations, directors workshops). Ten of the member stations are participating in these projects.

In 1995, the Bell Atlantic Foundation made a grant of \$144,000 to a coalition of 30 school systems, universities and state education agencies to support project MANTLE. The project provides distance learning training for teachers. It is modeled after the highly successful Union City experience in Christopher Columbus Middle School. Curriculum materials developed will be shared throughout the Bell Atlantic region and updated by MANTLE (Mid-Atlantic Network for Teaching Learning Enterprises)..

The Bell Atlantic Foundation made a \$98,000 grant to Earthwatch for its classroom teacher training project. The grant made it possible to include teachers from New Jersey, Delaware, DC, and DoD overseas schools in Earthwatch field projects and subsequent on-line curriculum development and inter-classroom sharing. The Earthwatch-guided, classroom-teacher developed science curriculum elements are very popular with school children.

### **West Virginia**

The World School program is a joint Bell Atlantic/state government project which has interconnected all 890 public school. As well, all 790 schools in Bell Atlantic's serving territory are being connected to Internet (typically 5 or more classrooms per school). Bell Atlantic is donating routers, software, teacher training and mid-level carrier fees until the end of 1997. To date, more than 120 schools are equipped and the teachers trained. A Bell Atlantic contribution of approximately \$1.5 million reflected activity as of 9/94. An additional 80 schools have been equipped and trained since then.

### **New Jersey**

In June, Bell Atlantic announced that it will continue funding the Union City Project for another two years. That includes extending the project to Emerson High School, where the original student participants moved on completion of their highly successful academic year at Christopher Columbus. About 90% of the students from Christopher Columbus passed each of New Jersey's Early Warning Tests (mathematics, reading, writing) -- a dramatic turnaround from the disastrous performance a few years ago. The multimedia trial supplies home and school computers, software, and network connections (ISDN). At Christopher Columbus middle school, Bell Atlantic donated 160 home computers and ISDN lines for teachers and students and a further 44 networked PCS at the school. At Emerson, the arrangements are similar, except that more multimedia software is being made available.

"Opportunity New Jersey" Grants totaling \$86,000 were made to 11 school districts to help communities pursue K-12 learning technology improvements.

### **Maryland**

In September 1994, Bell Atlantic bid on and won a contract from the state to build a distance learning network. The contract requires the company to equip every public high school, community college, and public university in the state with a distance learning classroom as Bell Atlantic upgrades its systems to fiber (about 270 sites). The \$50,000 cost for each of these classrooms is borne by Bell Atlantic. Each school is eligible for a reduced rate two-way video

service (\$1365 a month, with the price reverting to \$2730 after 3 years). The service is capable of carrying 4 channels of broadcast quality, including "upstream" video and audio. Schools may accept or decline the service. The services are an option for the schools, acceptance is not mandatory. The price of \$1365 for 4 channels of switched two-way broadcast quality video and audio service is a bargain -- even more so for rural schools. The \$50k donation of equipment per school removes the major stumbling block for most schools to try 2-way distance learning. The value of the donation is \$13 million.

In December 1995, Bell Atlantic announced its commitment to replicate the Christopher Columbus School multimedia arrangement in a "needy school and community" in partnership with the State of Maryland. This is a major investment and as in New Jersey, multimedia learning opportunities in the students' school and home will be placed at the disposal of the teachers and parents. Similar equipment, connections and software as used in Union City will be donated. And just as important, the valuable lessons of the Christopher Columbus multimedia trial will be shared with the local community selected. The commitment is unrelated to regulatory issues in Maryland.

### **Virginia**

In 1994, Bell Atlantic announced a total of \$1 million in direct grants to K-12 schools undertaking distance learning projects. In 1995, an additional \$1 million of grants was announced to K-12 schools seeking grants for distance learning projects.

In the Blacksburg area a network investment of approximately \$7 million was made over the few years prior to formalization of the Blacksburg Electronic Village. The investment was warranted based on economic developments. Since the announcement of the Blacksburg Electronic Village, a further \$700,000 to \$1,000,000 network investment (LANs to apartment buildings, business districts, and the like) has been made directly supporting demand for digital communications.

### **Pennsylvania**

Bell Atlantic provided \$500,000 in funding to the Free Library of Philadelphia for the technology phase of the Free Library's Changing Lives Campaign. The campaign will equip the Free Library and its 53 branches with state-of-the-art information technology to be a leader in connecting people with information. The Library will become the information superhighway's most accessible on-ramp in every community.

Bell Atlantic made a \$500,000 Pledge toward the Philadelphia School District's Children Achieving program to incorporate technology throughout the learning process. Bell Atlantic is working jointly with the School District to promote state-of-the-art technology to provide access to enormously expanded education resources for students in the classroom and beyond. Our financial commitment, as well as our technical support, helped the School District secure an large award from the U.S. Department of Education.

Bell Atlantic provided K-12 public, private and parochial schools an opportunity to compete for

grants that would bring advanced telecommunications technology to their classrooms. The competition emphasizes our commitment to make state-of-the-art telecommunications technology a standard in the schools. Ten schools in urban and rural areas were awarded a total of \$312,000.

\$200,000 in Bell Atlantic support was given to improve K-12 education in Allegheny County (western Pennsylvania) through advanced technology. Our funding will provide model distance learning classrooms in several of the resource-poor school districts. The project will allow access to the same advanced, high quality, challenging curriculum as students from affluent districts.

A Bell Atlantic grant of \$100,000 to establish the State Education Association's Greensburg-Salem Learning Lab will demonstrate for all Pennsylvania educators the use of learning technology in schools. This state-of-the-art telecommunications facility provides teachers with the resources necessary to create effective learning environments.

Bell Atlantic granted \$75,000 in funding to establish the Bell Atlantic Distance Learning Center at Lancaster-Lebanon Intermediate Unit. This regional training facility is used to demonstrate distance learning technology and solutions for a wide variety of audiences. It upgrades the quality of education for students throughout Lancaster and the Lebanon school districts.

A Bell Atlantic grant of \$25,000 was made the Altoona Area School District's Center for Advanced Technology helped establish an advanced technology center. The center's curriculum and state-of-the-art telecommunications equipment enhance students' skills and prepare them for the highly technological world.

### **Delaware**

Bell Atlantic has committed to bring fiber optics to the doorstep of every high school, college, medical center and government building by 1998 as part of an overall plan for infrastructure upgrades under the price caps plan agreed to by the PSC. The investment in educational and government upgraded connections represent about \$20 million.

Bell Atlantic of Delaware and the State of Delaware are harnessing the under-construction statewide fiber optic network to make better learning opportunities for K-12 students and teachers. In 1995, 2 school districts used 2-way video distance learning for courses such as algebra, Spanish, philosophy and staff development programs. A tariff for distance learning has been filed and more schools have asked to be linked for 1996. Bell Atlantic successfully bid on connecting all public schools to Internet -- that will be done quickly using Switched Multi-Megabit Digital Service (SMDS). Based on education market demand Bell Atlantic is also planning a market trial of networked multimedia applications. Networked multimedia was the *technical* cornerstone for the highly successful results in Union City NJ.

The Bell Atlantic Foundation made a 1995 grant of \$100,000 to the Delaware Office of Telecommunications Management to provide Internet and technology training for all Delaware K-12 teachers, librarians and technology coordinators.

### **William L. Smith**

Bill is a native of Asheville, North Carolina. He graduated with honors from North Carolina State University in 1979 and began his career with Southern Bell. Bill received his Professional Engineering license in 1983. He held various positions in North Carolina until 1986, at which time he represented Southern Bell in the Technology Internship Program at Bellcore in New Jersey. Bill worked with fiber optics and broadband system researchers while at Bellcore, and returned to the BellSouth Science and Technology organization in Atlanta in 1987 where he developed broadband system plans for BellSouth. Bill was an active participant in national and international telecommunications standards bodies. Bill returned to North Carolina in 1991 as Operations Manager for the Major Account Center and Special Services Center, and later as District Engineer for the Charlotte area. In June of 1993, Bill was named to direct BellSouth's participation in the implementation of the North Carolina Information Highway. Effective January 1, 1995, Bill became Vice President of the Broadband Business Unit (now named Advanced Networking Division) of BellSouth Business Systems. In this role, he is responsible for BellSouth's efforts in broadband data, video, and multimedia business services. Bill has been involved in a variety of health care related telecommunications initiatives, and participated in the Council on Competitiveness Health Care Committee in 1995 and 1996.

**Universal Service and Rural Health Care**  
**William L. Smith**  
**V.P. - Advanced Networking Division**  
**June 19, 1996**

BellSouth has supported a variety of health care applications for advanced telecommunications services, many of which are intended to improve rural access to both general and specialized care. Most of the projects have involved some form of supplementary funding in the form of research grants or direct government appropriations. In addition, most of these projects have included a combination of urban and rural facilities, with a combined cost structure designed to "average" the two. As we move into a much more competitive environment, the ability to average costs associated with urban and rural facilities will no longer exist. Any viable competitor will pursue locations where actual costs are below average costs, leaving only the high cost sites for the carriers of last resort. In some cases, pricing based on the actual cost to serve a rural facility will be cost prohibitive, therefore limiting access to one of the populations with the largest need for improved access to health care.

In developing these plans there is not a single model to follow. Some of the more basic health care applications can be provided by fairly low cost technologies such as ISDN, while other applications require much more sophisticated and costly systems. For purposes of this discussion, we believe that data rates of T-1 (1.544 Mb/s) should be considered as the general platform for rural health care access, and the telecommunications should support basic data, image, and video applications. Some of the projects that BellSouth has supported include more sophisticated systems such as fiber optic transport and ATM switching, but these systems go beyond the need for remote access to basic care.

In trying to determine the total differential costs associated with serving rural facilities, the result is highly dependent on the type of services provided and the assumptions regarding the definition of a rural care facility. Our analysis is based on the above assumption regarding T-1 access as the standard, as well as the assumption that every rural hospital, clinic, and physician's office would need to have access to these services. Based on this criteria, we believe the cost differential between urban and rural areas to be approximately 30-50%.

# News Release

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## BELLSOUTH EXECUTIVE URGES CAREFUL CONSIDERATION OF TELEMEDICINE COSTS FOR RURAL HEALTH CARE

WASHINGTON -- The benefits of telemedicine -- the ability to use telecommunications to link doctors and patients across long distances -- should not be overlooked as we enter a more competitive environment, a BellSouth executive told a federal-state panel today.

William L. Smith, BellSouth vice president - advanced networking division, told the panel of regulators that "Any viable competitor will pursue locations where actual costs are below average costs, leaving only high-cost sites for the carriers of last resort."

Under current pricing rules, BellSouth averages costs associated with urban and rural health facilities.

The Federal State Joint Board of federal and state telecommunications regulators heard testimony on preserving universal service in the face of blossoming competition in the telecommunications business.

Smith told the commissioners that BellSouth believes that the basic platform for rural health care access to the benefits of telemedicine should support transmission of basic data and images, as well as other video applications. In the telephone industry, this sort of access is provided by a circuit designated as a T-1 which transmits at 1.544 Megabits per second, a speed that can transmit full-motion video like that seen on a home TV set.

"As we move into a much more competitive environment, the ability to average costs associated with urban and rural facilities will no longer exist," Smith explained.

BellSouth believes that every rural hospital, clinic and physicians office would need to have access to a T-1 circuit for all residents to be able to benefit from the efficiencies of telemedicine.

Timely and accurate provision of vital health care information to the appropriate care giver is becoming more and more important in the delivery of cost-effective medical treatment. With telemedicine, facilitated by advanced telecommunications technologies, doctors can have virtually instantaneous access to their most qualified colleagues to share diagnostic and consultative information on a patient, no matter where the patient or the medical specialist is located.

BellSouth helped develop a more timely and cost effective way for Trident Regional Health System in Charleston, S.C., to transfer radiology images between its Trident and Summerville sites. Radiologists at one location and physicians at the other can jointly study the images. And the images - which used to take up to an hour to reach their destination - now arrive in seconds.

The Medical College of Georgia in Augusta has implemented an interactive video system that will allow specialists to examine patients at rural Dodge County Hospital in Eastman, Ga. The specialist can see the patient and hear what the physician in Eastman hears through a stethoscope, and can also study patient X-rays. The Medical College is also linked to seven correctional facilities so examinations can be conducted without the inmates having to leave the penal facility.

In North Carolina, BellSouth has been a sponsor of the VISTAnet project since 1991 using advanced switching on a broadband network. The project is being used to develop improved treatment plans for cancer. The network provides high resolution images (of malignant tumors) and radiation dose patterns that enable specialists to optimize radiation treatment plans (by exploring thousands of possibilities) in real time, a process that otherwise takes several days.

Also, BellSouth has partnered with the University of Alabama at Birmingham (UAB) to develop a new pathology image system that uses high-speed telephone lines to visually connect tissue samples of patients at outlying hospitals with pathologists at UAB Medical Center. With the UAB-BellSouth Anatomic TelePathology Applications Research Project, remote robotics and medicine are combined to allow personnel at outlying hospitals to examine suspect tissue on a slide that can be concurrently viewed by pathologists at UAB.

BellSouth is a \$17.9 billion communications services company. It provides telecommunications, wireless communications, directory advertising and publishing, and information services to more than 25 million customers in 17 countries worldwide.

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