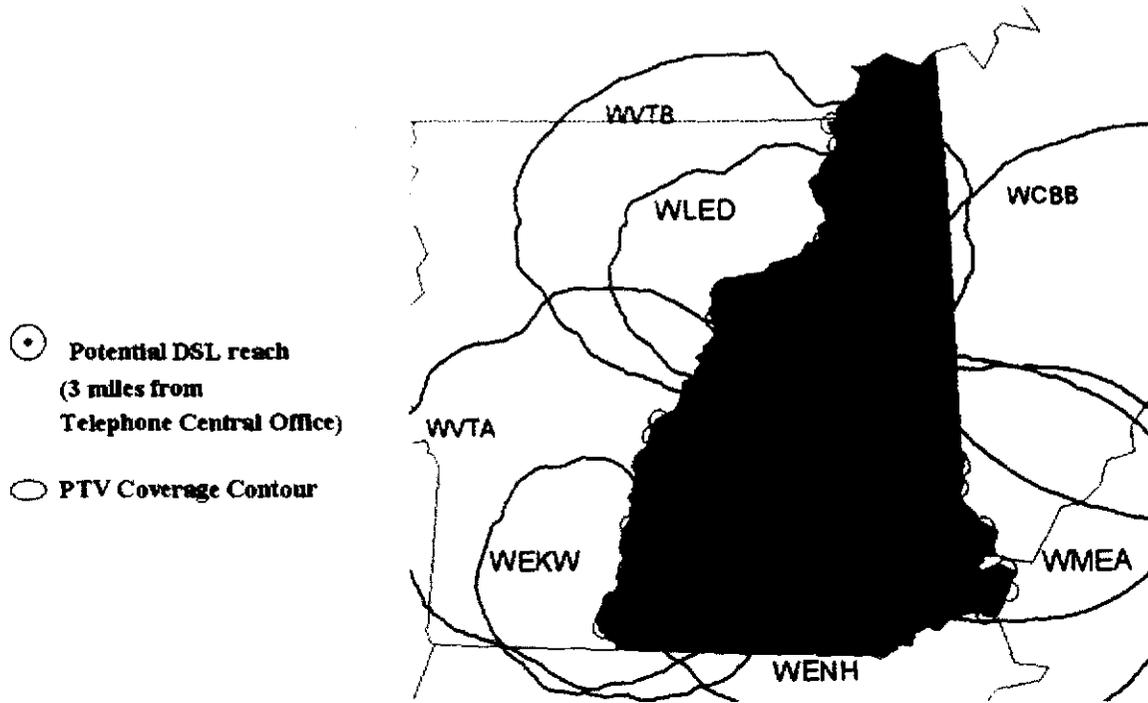


APPENDIX A

Public Television Coverage Maps (Based on NTSC Coverage⁶⁴)

⁶⁴ Except where otherwise noted.

Public Television for Broadband in New Hampshire PTV vs DSL



Public Television in Georgia PTV vs DSL

- ⊙ Potential DSL reach
(3 miles from
Telephone Central Office)
- PTV Coverage Contour
- Population Density



Public Television in Kentucky PTV vs DSL

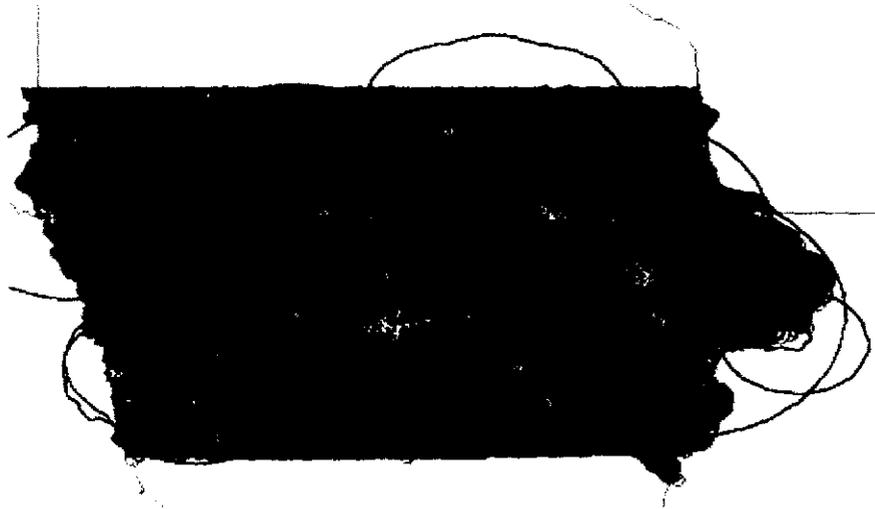
- Potential DSL reach
(3 miles from
Telephone Central Office)
- PTV Coverage Contour
- Population Density



Public Television for Broadband in Iowa

PTV vs DSL

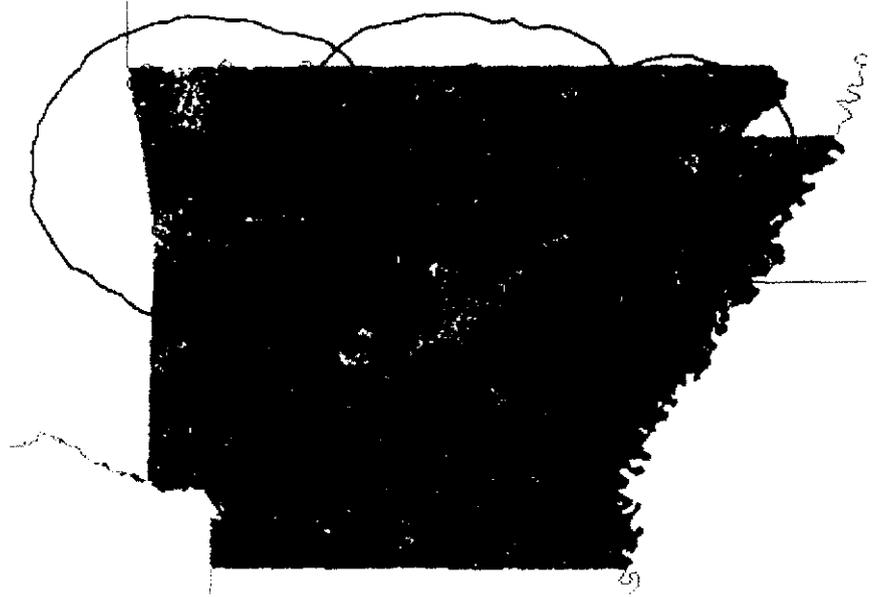
- ⊙ Potential DSL reach
(3 miles from
Telephone Central Office)
- PTV Coverage Contour
- Population Density



Public Television in Arkansas

PTV vs DSL

- Potential DSL reach
(3 miles from
Telephone Central Office)
- PTV Coverage Contour
- Population Density



Public Television for Broadband in Idaho

PTV vs DSL

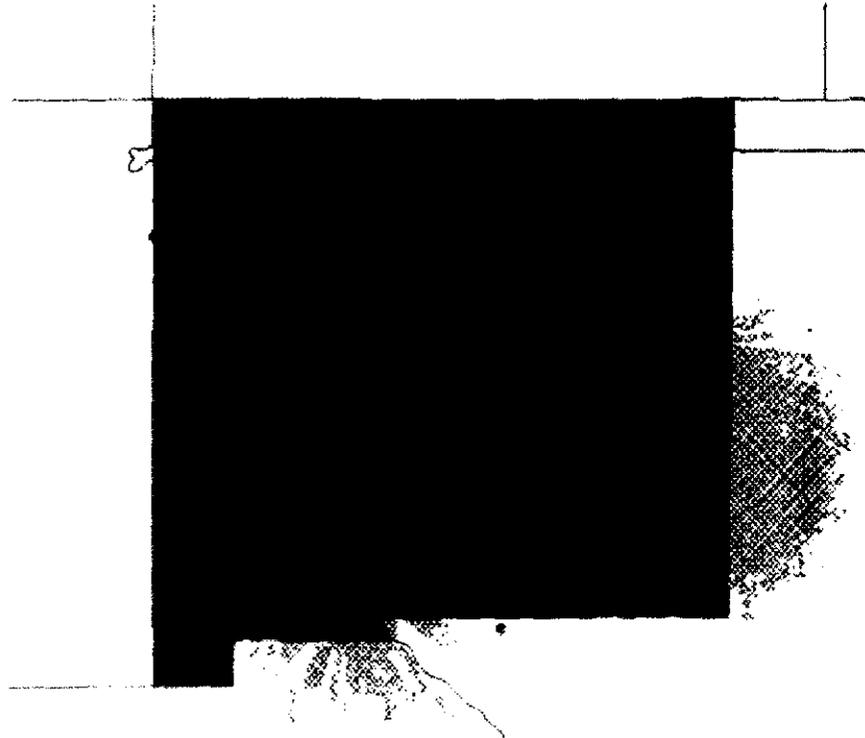
- ⊙ Potential DSL reach
(3 miles from
Telephone Central Office)
- PTV Coverage Contour
- Population Density



Public Television for Broadband in New Mexico

PTV vs DSL

- Potential DSL reach
(3 miles from
Telephone Central
Office)
- # PTV Digital Coverage
- PTV Translator Coverage



APPENDIX B

The following are some additional examples of how Public Television stations distributes valuable educational services to rural communities throughout America.

- The Arkansas Educational Telecommunications Network (AETN) satellite network offers distance learning, on-line, and various other educational services throughout the state. AETN's interactive educational services include preschool, secondary, and graduate courses and programs, as well as continuing adult education courses, designed, among other things, to enhance educational curricula, provide college credit hours, and provide teacher training. Through its on-line services, AETN provides curriculum resources, interactive databases, local and national topic-specific discussion groups, and technology resources information to the citizens of Arkansas.
- The South Carolina Educational Television Network (SC ETV) launched a digital satellite network in 1993 which, using digital compression, provides up to 32 channels of programming simultaneously. The satellite transmissions are linked with an extensive terrestrial network of broadcast transmitters, ITFS stations, cable television distribution facilities, and microwave links. These facilities have enabled SC ETV to provide video and audio programming and live interactive teleconferences to locations throughout the state of South Carolina, and users in other states as well, on an extremely cost-effective basis. Some of the services SC ETV provides to the citizens of South Carolina and other states include: instructional television to its public schools, development courses for teachers, college credit courses, medical education courses, adult literary courses, early childhood instructional programming and professional development seminars, law enforcement in-service training courses, legal continuing education courses, and on-line services.
- The Iowa Communications Network (ICN) employs a state-wide fiber optic network capable of transporting interactive, two-way audio and video, data and voice services. The ICN facilitates the sharing of Iowa's outstanding educational resources among communities and school districts, large and small, and reaches at least one educational institution in each of Iowa's 99 counties. The ICN provides interactive connections that permit the served facilities to share educational resources, analog and digital transport capabilities, and affordable access to the Internet. Medical facilities use the ICN for diagnostic and consultative services and to provide education and training to their medical staff. Schools use the interactive distance learning classrooms to share instructional programming and to connect with experts, universities, state agencies, and other facilities that offer rich information resources. The high speed Internet connections offered by the ICN bring world resources to each learner through his/her desktop computer.

- The NHPTV Knowledge Network, the educational arm of New Hampshire Public Television, operates a comprehensive educational service to all of the K-12 schools in New Hampshire. The purpose of the service is to provide quality instructional television and professional development resources to New Hampshire's educational community. Using its five-transmitter, statewide broadcast network as the delivery vehicle, NHPTV broadcasts instructional programming, and using its satellite receive capabilities, NHPTV sponsors satellite videoconferences so that educators and students can participate in live, interactive, satellite-delivered programs.
- Mississippi Authority for Educational Television (MAET) provides over-the-air educational television to all of Mississippi's elementary and secondary schools, community and junior colleges and four year colleges. In addition to over-the-air television-receive capabilities in virtually every school, many sites have satellite-receive facilities. Also, the Mississippi Fibernet 2000 Network now links several high schools, Mississippi ETV, the Mississippi Department of Education, two universities, the Waterways Experiment Station, and NASA Stennis with two way interactive capabilities.
- Kentucky started its KET Star Channels in 1989 to address a critical shortage of courses in math, science, humanities and foreign language courses in Kentucky public schools. Every public school, vocational school, state park, community college and university in Kentucky has been equipped with a satellite dish. The Star Channel system utilizes a variety of technologies including computers, telephone lines and the Internet to provide interactivity between instructors and students.

In addition to the efforts of individual stations, many stations have created regional consortia to address local and regional needs on an integrated basis. These include the following.

- A broad consortium of educational organizations throughout Nebraska established NEB*SAT in 1990 to distribute educational programming by satellite, broadcast, and microwave facilities. The network has since been expanded by use of fiber optic and coaxial cable facilities. The fiber optic service, developed in cooperation with local telephone companies, has permitted NEB*SAT to establish a regional network of elementary, secondary and post-secondary schools throughout the state of Nebraska to provide interactive instructional services in math, science, foreign languages, and other subject areas to K-12 classrooms.
- A partnership between four public television stations in Kansas, Missouri and Illinois, and local school boards, Chalkwaves (www.chalkwaves.org) provides both instructional programming and a related online collection of "standards based"

curricular resources (including lesson plans, indices and “teachable moments”) to students and teachers in Missouri, Kansas and Illinois.

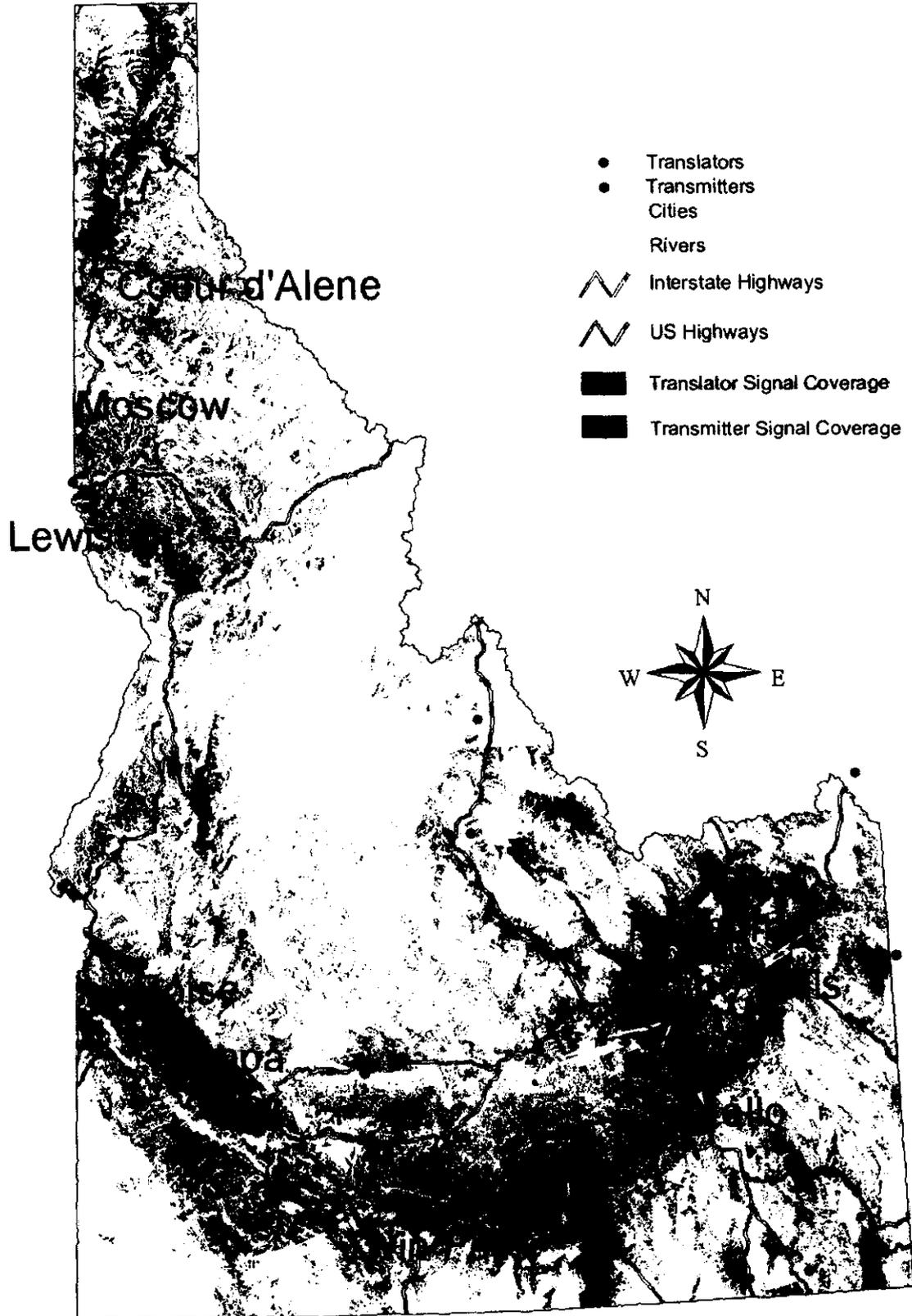
- The Native American Public Broadcasting Consortium, partners the Nebraska Educational Telecommunications Commission and several Native American tribes by inter-linking schools and other facilities, providing educational and social services, and increasing access to educational, governmental, and other resources.

A number of public television stations have voiced an interest using their ancillary and supplementary digital spectrum to provide Internet access and other broadband services. Local schools and libraries in particular would be the likely beneficiaries.

- For instance, WHRO in Norfolk, Virginia has launched “WHROlink,” a new service that would allow the station to serve as the Internet service provider for its community’s schools and libraries. WHRO also intends to provide support staff and training seminars for teachers at the station’s on-site computer labs.
- To enhance its World Wide Web presence, KMOS in Warrensburg, Missouri plans on creating online searchable resource guides for teachers, providing video streaming of previews of the station’s local programming and providing Internet access to teachers in rural school districts.
- And KENW in Portales, New Mexico plans on using its datacasting capabilities to provide teacher guides, as well as other data related to its instructional television programming, to public schools, as well as providing Internet access to rural public schools in its community of license.

APPENDIX C

Relative Coverage of Public Television Transmitters vs. Translators in Idaho



APPENDIX D

**Before the
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
Washington, DC**

) **Filed Dec. 14, 2001**
)

In the Matter of

Request for Comments on the Deployment
of Broadband Networks and
Advanced Telecommunications

)
)
)
)
)

Docket No. 011109273-1273-01

COMMENTS OF THE ASSOCIATION OF PUBLIC TELEVISION STATIONS

The Association of Public Television Stations (“APTS”)¹ submits these comments in response to NTIA’s Request for Comments in the above-captioned proceeding.² NTIA solicited comments as part of its ongoing effort to obtain more information about broadband issues in order to develop a domestic telecommunications policy and to continue NTIA’s support for removing obstacles to broadband deployment.³ Among other things, NTIA has requested comment on how “broadband services” should be defined, including (1) what criteria should be used to determine whether a facility or services has sufficient transmission capacity to be classified as “broadband”; (2) how the definition should evolve over time; and (3) the policy implications of how the term is defined.⁴

¹ APTS is a nonprofit organization whose members comprise nearly all of the nation’s 354 noncommercial educational television stations. APTS represents public television stations in legislative and policy matters before the Commission, Congress, and the Executive Branch, as well as engaging in planning and research activities on behalf of its members.

² 66 Fed. Reg. 57941 (November 19, 2001).

³ Id.

⁴ Id.

APTS files these comments to highlight public television stations' contribution and commitment to the deployment of high-speed educational services to schools and other end users in rural and other underserved areas in America. Public television stations can provide, particularly to rural Americans, high-speed educational services through digital broadcast technology that can serve the same function as full, two-way interactive broadband services. Digital technology can also be used to expand and upgrade critical public safety services throughout the country. APTS urges NTIA to recognize the public benefits of these "broadband-like" services as it establishes the definition and criteria for broadband services going forward.

A. Public Television Can Provide High-Speed Broadband-Like Educational and Public Safety Services for Schools, and Other Users in Rural Areas

As part of its statutory mission, public television is committed to serving unserved and underserved audiences. With the advent of digital technology, public television's goal is not only to increase the number and variety of its educational offerings, but also to maximize its ability to offer high-speed "broadband-like" services to these underserved consumers. These services can be provided through an "asymmetric" network that utilizes the high-speed data delivery capability of DTV for downstream services and leverages an existing network infrastructure, such as telephone dial-up access, for the "return path." As the Administration develops its policies related to broadband telecommunications services, APTS requests that it recognize the importance of educational high-speed services, and the value of each public television transmitter and translator, in ensuring that all Americans have access to such services.

Public television stations are currently at the forefront in providing unique and valuable educational services to homes, schools, libraries, and other essential public service organizations in America. Public stations provide multimedia educational offerings through their television signals, interactive web sites, print materials, and community outreach programs. With the transition to digital operations, public television will play a pivotal and cost effective role in providing “broadband-like” access and educational services for rural and other underserved areas and audiences. For instance:

- Through the Utah Education Network, a partnership with the Utah Department of Education, public television station KUED, Salt Lake City, helps to distribute curriculum materials to teachers in the state more effectively. Its web site, www.uen.org, is a comprehensive educational resource for grade school through adult learners featuring an online library service, access to lesson plans and teaching materials, the ability for teachers to create their own Web page portal, a catalog of distance learning opportunities and other resources.
- Public television station KNME, Albuquerque, New Mexico, is partnering with regional colleges and universities to create high-end interactive teaching packets to help high school teachers in the Four Corners region (Utah, Colorado, New Mexico and Arizona) meet curriculum standards. The project supports more than 48,000 students, 86 percent of whom are Navajo, in 100 schools in 11 school districts.

With digital broadcast technology, these types of educational services can be delivered to schools and homes on a near universal basis. Public stations have dedicated a portion of their digital bandwidth to providing access for all Americans to educational services. In exchange for federal support of its digital build-out, public television stations will commit 4.5 megabits per second of their DTV bitstream (one-quarter of their digital channel capacity on average) to the delivery of formal educational services. This is the equivalent of three T-1 lines downstream to every school in America, a service that is worth \$2.4 billion annually. This level of digital capacity will deliver data at rates 80 times faster than 56K dial-up modems and 15 times faster than digital subscriber line (DSL) connections.

A digitized public television system will make a significant contribution to the deployment of high-speed services to Americans in rural areas and other underserved populations. If fully converted, public television stations' transmitters and translators could provide digital video, audio, and data services over-the-air to 99 percent of our nation's citizens. In fact, a digitized public television system would have the ability to reach a far greater number of Americans than other current "last mile" services, such as cable modems and DSL connections. By illustration, attached are maps that show the potential coverage by public television versus the potential DSL reach in terms of the "last mile" delivery of services in Georgia, New Hampshire, Iowa and South Carolina (Appendix A). Using a fully converted digital system, public television will be able to provide powerful and cost-effective nearly universal last mile "broadband-like" services to meet the public's needs.⁵

For example, a teacher in a remote community may use dial-up Internet access through a rural telephone company to access rich media web content delivered over-the-air by the teacher's local public television transmitter or translator. This material would be received by an antenna, stored on a server located at the school equipped with a DTV tuner, and downloaded on-demand to personal computers throughout the school. Educational content stored on the server could be refreshed daily at data rates that may never be available through DSL or cable modems for many rural citizens.

APTS demonstrated this model at its September 5, 2001 "Ed Tech & Ice Cream" event on Capitol Hill. APTS used WETA, Washington, D.C. and Nebraska ETV content distributed over the DTV bitstream from the model DTV station in Washington, DC. This content, which

⁵ Last year, NTIA and RUS found that the deployment of advanced telecommunications services in urban and rural areas was not proceeding at a comparable rate, with residents in rural areas generally being the last to receive service. "Advanced Telecommunications In Rural America: The Challenge of Bringing Broadband Service to All

was “ordered” over a telephone Internet connection, was received on a PC connected to an antenna on the roof of the Rayburn Building. This “live” prototype of public television educational content distribution architecture demonstrated public television stations’ ability to send multimedia educational material over-the-air to teachers and schools through a digital television signal. This technology will revolutionize public television stations’ role in helping schools and teachers—especially those in rural areas—to access rich educational content quickly and efficiently.

Some public television stations are already deploying similar “asymmetric” networks. For example, New Jersey Network has a program called *New Jersey Workplace Literacy Program*. This program helps address New Jersey’s adult literacy problem through a groundbreaking partnership with the New Jersey Department of Labor and other agencies. NJN is using a variety of technologies, including its digital television signal to deliver workforce training materials to welfare recipients, dislocated workers and other job seekers to sites in New Jersey. And public television station KCPT in Kansas City, Missouri has developed a multimedia children’s literacy initiative, using digital television and the interactive features of Internet technologies to enhance the traditional “read aloud” experience targeted to ages four to seven years old. KCPT’s “Read Aloud with Wally Amos” initiative allows children to direct their own learning experience by selecting options from hearing, reading and watching an illustrated story told in English, Spanish or American Sign Language.

In addition, because of the universal coverage of public television transmitters and translators, reaching 99 percent of all American households, a fully digitized public television system could offer significant new public safety advantages. For example, on November 15,

Americans,” U.S. Department of Commerce, National Telecommunications and Information Administration, and

2001, Kentucky Educational Television (KET), in partnership with the local branch of the National Oceanic and Atmospheric Administration (NOAA), debuted a new service to representatives from the state police, emergency management agency and weather service. KET commissioned the development of software that allows it to use its digital broadcast capacity to immediately send emergency storm alerts, weather information, criminal profiles and updates, and other time-sensitive materials instantaneously to computers around the state. Transmission of this data over the digital broadcast signal decreases alert time and information lags from minutes to seconds, and is not subject to hacking. Use of the digital broadcast infrastructure can also bypass the congestion of wireline and cellular networks that can plague communications in emergency situations, as was recently demonstrated on September 11th. Generous funding from the Kentucky state legislature enables KET to complete their digital conversion of 16 transmitters by May of 2003, thereby ensuring this service is available to virtually all residents of the state. Public television's digital facilities can be used to provide this vital public safety service nation-wide.

Through its digital broadcast facilities, public television stations are therefore committed to providing valuable educational services over an asymmetric broadband-like infrastructure. This commitment will bring educational opportunities to all Americans, particularly those living in rural areas. In addition, these asymmetric broadband-like services also have the potential to bring a new generation of public safety services to America in this time of national crisis.

B. The Administration Should Define “Broadband” So As to Include High-Speed Asymmetric Data Services that Provide Educational and Public Safety Services to All Americans

U.S. Department of Agriculture, Rural Utilities Service (“NTIA/RUS Report”) (April, 2000) p. 17.

The term “broadband” has been a loosely used term of art that has encompassed a variety of services delivered at a number of data-rates. For instance, Section 706 of the 1996 Telecommunications Act defines “advanced telecommunications capability” to mean a “high-speed, switched, broadband telecommunications capability” in any media that “enables users to originate and receive high-quality voice, data, graphics and video telecommunications using any technology.”⁶ Interpreting this language, the Federal Communications Commission (“FCC”) concluded in 1999 that “broadband” was to be defined as “having the capability of supporting, in both the provider-to-consumer (downstream) and the consumer-to-provider (upstream) directions, a speed... in excess of 200 kilobits per second (kbps) in the last mile.”⁷ The FCC has noted that because DTV signals by themselves are not two-way, nor are they “switched,” such signals do not constitute “broadband” services.⁸ Nevertheless, the FCC recognized that if two separate one-way technologies capable of delivering data rates at 200 kbps or greater to the last mile were used in concert, the result would be a broadband service.⁹ The FCC has also recognized that as technology evolves, the concept of “broadband” would also have to evolve.¹⁰

⁶ Telecommunications Act of 1996, Title VII, §706(c), P.L. 104-104, 110 Stat. 153 (Feb. 8, 1996) (codified at 47 U.S.C.S. § 157, note).

⁷ Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Report, 14 FCC Rcd 2398, 2406, FCC 99-5, ¶20 (rel. Feb. 2, 1999) (“First Broadband Report”). The Commission reasoned that 200 kbps was enough to provide the most popular forms of broadband (e.g. to change web pages as fast as one can flip through the pages of a book and to transmit full-motion video) and was intended by Congress to be faster than ISDN service, which operated at a data rate of 128 kbps and was widely available at the time the 1996 Act was enacted. *Id.*

⁸ First Broadband Report, 14 FCC Rcd 2398, 2406, ¶ 21 and n. 15.

⁹ *Id.* at 14 FCC Rcd 2398, 1406, ¶22.

¹⁰ *Id.* at 14 FCC Rcd 2398, 2408, ¶25 (allowing for the possibility that the Commission could require two-way data rates of more than 200 kbps in the future).

In 2000, the FCC retained its definition of “broadband” but clarified that because the term had become so “common and imprecise” as to include a broader range of services, it was necessary to divide broadband services into two narrower sub-categories: “advanced services” and “high-speed services.”¹¹ “Advanced services” refer to two-way data delivery services capable of data rates of 200 kbps or greater in both directions, while “high-speed services” refer to services that deliver 200 kbps in at least one direction.¹²

APTS strongly supported the FCC’s retention of its distinction between “advanced services” and “high-speed services” within the definition of the term “broadband.” In April of last year, the U.S. Department of Commerce and the U.S. Department of Agriculture adopted the FCC definition of “broadband” while recognizing the importance of asymmetrical data-delivery systems. It stated:

We have adopted the Federal Communications Commission’s ... definition of *broadband*: the capability of supporting at least 200 kilobits/second in the consumer’s connection to the network (“last mile”), both from the provider to the consumer (downstream) and from the consumer to the provider (upstream). Because most consumers use the Internet to receive data, broadband service offerings are generally asymmetrical (*i.e.*, the downstream link operates at a higher rate than the upstream link).¹³

APTS urges the Administration to continue to recognize the distinction between advanced services and high-speed services within the definition of “broadband” and to include within the

¹¹ Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Second Report, 15 FCC Rcd 20913, FCC 00-290, ¶11 (rel. Aug. 21, 2000) (“Second Broadband Report”).

¹² Id. In August of this year, the Commission proposed retaining this distinction for the reasons stated above as it prepares its third report on the deployment of advanced telecommunications. Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps To Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Third Notice of Inquiry, FCC 01-223, CC Docket No. 98-146, ¶ 5 (rel. August 10, 2001).

¹³ NTIA/RUS Report, pp. 5-6.

definition of “broadband” the one-way delivery of high-speed services using digital broadcast technology.

As demonstrated above, public television can bring a “broadband-like” experience to all Americans, particularly those living in rural areas, through digital television, and in conjunction with other technologies. It is essential that neither the Administration nor the FCC unnecessarily constrain the definition of “broadband” in ways that could delay the deployment of these educational and public safety services.

Conclusion

As the Administration develops its policies related to broadband telecommunications services, APTS requests that it keep in mind the value of educational and public safety high-speed services that public television stations offer. Through Administration policies that recognize the value of each public television transmitter, public television has the ability to help the Administration to ensure that all Americans have access to broadband telecommunications capability.

Respectfully Submitted,

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December 14, 2001

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC**

In the Matter of)
)
Inquiry Concerning the Deployment of)
Advanced Telecommunications)
Capability to All Americans in a Reasonable)
And Timely Fashion, and Possible Steps)
To Accelerate Such Deployment)
Pursuant to Section 706 of the)
Telecommunications Act of 1996)

Filed Sept. 24, 2001

CC Docket No. 98-146

To: The Commission

**COMMENTS OF THE ASSOCIATION OF AMERICA'S PUBLIC TELEVISION
STATIONS**

The Association of America's Public Television Stations ("APTS")¹ submits these comments in response to the Commission's Third Notice of Inquiry ("Notice") in the above-captioned proceeding. In its Notice, the Commission requests information on the telecommunications marketplace in order to determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely manner, consistent with the goals of section 706 of the Telecommunications Act of 1996. APTS files these comments to highlight for the Commission public television stations' contribution and commitment to deployment of high-speed educational services to schools and other end users in rural and other underserved areas in America. APTS also wishes to illustrate to the Commission that in many cases these high-speed services

¹ APTS is a nonprofit organization whose members comprise nearly all of the nation's 354 noncommercial educational television stations. APTS represents public television stations in legislative and policy matters

are a satisfactory solution to the public's "last mile" needs, and the Commission should not focus solely on advanced telecommunications services as the solution to "last mile" delivery.

In its Notice, the Commission addresses the question of whether deployment of advanced telecommunications services is occurring in a reasonable and timely manner. Despite its preliminary conclusion that the pace and scope of deployment is on track, the Commission recognizes that certain groups of consumers may be particularly vulnerable to not receiving such services if the Commission relies upon the market place alone. As the Notice indicates, "These particularly vulnerable consumers, included low-income consumers, consumers living in sparsely populated areas, consumers living in inner cities, minority consumers, consumers living on tribal lands, consumers living in U.S. territories, persons with disabilities, elementary and secondary schools (especially instructional classrooms), and rural health care facilities."²

The Commission proposed to retain the definitions used in its First and Second Reports, including the definition of "advanced services" as having the capability of supporting, in both the provider-to-customer (downstream) and the customer-to-provider (upstream) directions, a bandwidth in excess of 200 kilobits per second in the last mile of service, as well as the definition of "high-speed" services as those services with over 200 kbps capability in at least one direction. The Commission's Notice states its intent to examine the breadth and timing of the deployment of both advanced services and high-speed services, in particular in relation to these potentially vulnerable consumers noted above. As stated by the Commission, "(W)e propose to continue to examine both the

before the Commission, Congress, and the Executive Branch, as well as engaging in planning and research activities on behalf of its members.

relatively narrow class of ‘advanced services’ . . . and the broader class of ‘high-speed’ services, which include advanced services.”³

APTS supports the Commission’s continued inquiry into the scope and timing of deployment of advanced telecommunications services. Further, APTS is gratified that the Commission recognizes the importance of ensuring the continued growth of not only advanced services but also high-speed services, as defined by the Commission. As part of its statutory mission, public television is committed to serving unserved and underserved audiences, indeed the very groups of vulnerable consumers addressed by the Commission in its Second Report. Through the advent of digital conversion, public television’s goal is not only to increase the number and variety of its educational offerings, but also to maximize its ability to offer high-speed services to these consumers. As the Commission develops its policies related to advanced telecommunications services, APTS requests that the Commission recognize these important educational high-speed services and the value of each public television transmitter and translator in ensuring that all Americans have access to such services.

Public television stations currently are at the forefront in providing unique and valuable educational services to homes, schools, libraries, and other essential public service organizations in America. Public stations provide multimedia educational offerings through their television signals, interactive web sites, print materials, and community outreach programs, as shown by the following examples:

- WETA, Washington, D.C. offers the multimedia effort *Reading Rockets*, which disseminates research-based information on how to help young readers. This program provides expert advice, practical tips and other resources for parents,

² Notice, at n. 4, citing *Second Report*, 15 FCC Rcd at 20996-03.

³ Notice at paragraph 5.

teachers, students and policy-makers through television specials, an interactive Web site, live teleconferences and bilingual print materials.

- Through the Utah Education Network, a partnership with the Utah Department of Education, public television station KUED, Salt Lake City, helps to distribute curriculum materials to teachers in the state more effectively. Its web site, www.uen.org, is a comprehensive educational resource for grade school through adult learners featuring an online library service, access to lesson plans and teaching materials, ability for teachers to create their own Web page portal, a catalog of distance learning opportunities and other resources.
- Public television station KNME, Albuquerque, New Mexico, is partnering with regional colleges and universities to create high-end interactive teaching packets to help high school teachers in the Four Corners region (Utah, Colorado, New Mexico and Arizona) meet curriculum standards. The project supports more than 48,000 students, 86 percent of whom are Navajo, in 100 schools in 11 school districts.

With the transition to digital operations, public television will play a pivotal and cost effective role in providing educational services and broadband access for rural and other underserved areas and audiences. Public stations are committed to developing new and essential educational content and services and have dedicated a portion of their digital bandwidth to providing universal access for all Americans to educational services. Through the APTS Board of Trustees, public television stations have officially adopted a policy of committing 4.5 megabits per second on a daily average of public stations' DTV bitstream (one-quarter of their digital channel capacity on average) to formal educational services. This is the equivalent of three T-1 lines downstream to every school in America, which is worth \$2.4 billion annually. This level of digital capacity will deliver data at rates 80 times faster than 56K dial-up modems and 15 times faster than digital subscriber line (DSL) connections. This commitment of DTV bandwidth will play a vital role in helping schools achieve their educational goals.

Through this commitment, a digitized public television system will make a significant contribution to the deployment of high-speed services to Americans in rural areas and other underserved populations. If fully converted, public television stations' transmitters and translators can provide digital video, audio, and data services over-the-air to 99 percent of our nation's citizens at the rate of 19.4 megabits per second. In fact, a digitized public television system would have the ability to reach a far greater number of Americans than other current "last mile" services, such as cable modems and DSL connections. By illustration, attached are two maps that show, respectively, the potential coverage by public television versus the potential DSL reach in terms of the "last mile" delivery of services in Georgia and New Hampshire. Thus, using a fully converted digital system, public television will be able to provide powerful and cost-effective nearly universal "last mile" services to meet the public's needs.⁴

This bandwidth and reach will effectively leverage facilities that have been developed over the years to ensure the goals of universal services policies. For example, a teacher in a remote community may use dial up Internet access through a rural telephone company to access rich media web content delivered over-the-air by the teacher's local public television transmitter or translator. This material would be downloaded on-demand to a PC with a tuner card and a UHF antenna at data rates that may never be available through DSL or cable modems for many rural citizens.

⁴ *Advanced Telecommunications in Rural America*, April, 2000, a report by the National Telecommunications and Information Administration (NTIA) and Rural Utilities Service (RUS) on the status of broadband deployment in rural versus non-rural areas in the United States, found that rural areas are currently lagging far behind urban areas in broadband availability. The report found that only two technologies, cable modem and digital subscriber line (DSL), are being deployed at a high rate, but the deployment is occurring primarily in urban markets for economic and technical reasons. The report urges support for alternative broadband technologies.

APTS demonstrated this model at its September 5, 2001 “Ed-tech & Ice Cream” event on Capitol Hill. APTS used WETA, Washington, D.C. and Nebraska ETV content distributed over the DTV bitstream from the model DTV station in Washington, DC, which was received on a PC connected to an antenna on the roof of the Rayburn Building. With the assistance of Triveni Digital, this “live” prototype of public television educational content distribution architecture demonstrated public television stations’ ability to send multimedia educational material over the air to teachers and schools through a digital television signal. This technology will revolutionize public television stations’ role in helping schools and teachers—especially those in rural areas—to access rich educational content quickly and efficiently.

Some public television stations currently are deploying such “asymmetric” networks. For example, New Jersey Network has a program called *New Jersey Workplace Literacy Program*. This program helps address New Jersey’s adult literacy problem through a groundbreaking partnership with the New Jersey Department of Labor and other agencies in which NJN is using a variety of technologies, including its digital television signal to deliver work force training materials to welfare recipients, dislocated workers and other job seekers to sites in New Jersey. Public television station KCPT in Kansas City, Missouri has developed a multimedia children’s literacy initiative, using interactive features of digital television and Internet technologies to enhance the traditional read aloud experience targeted to ages four to seven years old. KCPT’s interactive television pilot allows children to direct their own learning experience by selecting options from hearing, reading and watching an illustrated story told in English, Spanish or American Sign Language.

Conclusion

As the Commission develops its policies related to advanced telecommunications services, as well as digital television, APTS requests that the Commission keep in mind the valuable educational high-speed services of public television stations. Through Commission policies that recognize the value of each public television transmitter and translator, public television has the ability to help the Commission “to ensure that all Americans have access to advanced telecommunications capability.”⁵

Respectfully Submitted,

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⁵ Second Report, paragraph 7.