

ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION DOCKET FILE COPY ORIGINAL
Washington, D.C. 20554

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

COMMENTS OF RICHARD W. RILEY
SECRETARY OF EDUCATION

Statement of Principle

This is no time to think short term. Our elementary and secondary schools and libraries must have access to telecommunications services to provide quality education to our children, now and in the future. Access to telecommunications brings the resources of the best libraries, museums, universities, and research into local classrooms and libraries, no matter where they are located. It expands access to education for those living in rural or impoverished areas. Because a quality education is essential to each citizen for participation in the changing economy, and essential to our country's democratic way of life, the Clinton Administration has set a goal of having *every classroom and library in the Nation connected to the Internet by the year 2000.*

The connection between telecommunications access and student performance is compelling. Telecommunications technologies are helping students to master basic skills such as writing, and to learn advanced skills for college and the workplace. I have seen how these technologies are providing access to courses that would otherwise be unavailable -- from rural areas in North Carolina to the suburbs of Illinois, and from the neighborhoods of San Francisco to small towns in Kentucky. Universal service and affordable connections for schools and libraries, then, have long-term implications for educational quality

024

Unfortunately, there is a huge gap between need and availability. Today, few classrooms and libraries are connected. The costs of initial connections, charges for ongoing service, and a lack of necessary infrastructure in school and library buildings are barriers to more widespread educational use.

Nevertheless, reaching every school and library by the year 2000 is an achievable goal. Classroom access to the Internet tripled in just one year, from 3 percent in 1994 to nine percent in 1995.¹ Moreover, a range of technologies, from telephone lines to coaxial cable to wireless networks and direct broadcast satellite, can be deployed to connect our students, teachers, library users, and librarians to the vast resources of the information superhighway.

The Telecommunications Act of 1996 provides an opportunity to improve education over the long term, by expanding the concept of universal service to include schools and libraries, and through provisions that call for affordable services. The recommendations of the Joint Board will set in place policies that will affect affordability and access not just for this generation of children but for many years to come. The FCC and state regulators should, therefore, make sure that telecommunications services are available in the schools and libraries that are least able to afford them. This will mean discounts in some cases, and free services in others. I look forward to working with the Joint Board in the months ahead as it develops its recommendations for schools and libraries.

The Benefits of Telecommunications Access in Schools and Libraries

A decade of research on the use of telecommunications in classroom settings demonstrates that these tools contribute to increased educational achievement, support teachers' work, create new kinds of learning opportunities, and improve the administration of schools.

¹National Center for Education Statistics, *Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, 1995*, Washington, D.C.: February, 1996.

- Writings produced by students for transmission to other students over a network tend to be of higher quality than those produced for in-class use only.²
- One- and two-way distance learning has expanded access to the core curriculum. Students in remote schools that could previously afford only bare bones course listings can watch live transmissions or videotaped recordings of classes being offered in other areas. In many cases the instruction they experience is superior to that available in conventional classrooms because the distance learning courses are designed for broad distribution and can attract exceptional teachers and content experts. The academic achievement of students in these courses is comparable to in-class learners.³
- Students can solve real-world problems with telecommunications. For example, students at an elementary school in Texas measured levels of carbon dioxide in their school's classrooms that were higher than normal. They used access to a computer network to consult with an environmental scientist on their experiment, and later distributed the results of the experiment to other schools via the network. Their project resulted in action by the school board to fix the school's ventilation system, and students in other schools conducted the same experiment.
- Learners with disabilities benefit from access to telecommunications networks. Hearing-impaired students, for example, can relate with distant peers through telecommunications despite their disability.⁴ Through speak-text, visually impaired students have more

²Margaret Riel, "The Impact of Computers in Classrooms," *Journal of Research on Computing in Education*, Vol. 22 No. 2 (1989), p. 180-89

³Moore, M.G., and Thompson, M.M., *The Effects of Distance Learning: A Summary of the Literature*, Southeastern Ohio Telecommunications Consortium, 1990. Kitchen, W., *Education and Telecommunications: Partners in Progress*, testimony before the Senate Committee on Labor and Human Resources, March 11, 1987

⁴Riel, M., "AT&T Learning Circles," presentation at the Symposium in Technology and Social Interaction Technology and Media Conference, 1992

equitable access to information.

- Teachers use telecommunications networks to break down the isolation of the classroom. By bouncing ideas off peers and sharing experiences and resources with like-minded colleagues across the country, teachers gain in enthusiasm, confidence, and competence.⁵
- The State of Texas realized substantial efficiencies when it moved to a network-based system for communicating with school districts across the state

Examples from public libraries also indicate significant benefits from the use of telecommunications.

- In Clinton, Iowa, library users can locate more than 1,500 job listings throughout the state via an electronic bulletin board. California, North Carolina and numerous other states offer access to job listings through libraries.
- In Maryland, residents can obtain online travel advisories and job listings at their homes, schools and businesses via the federally-funded Sailor project which provides statewide access to the Internet via libraries.
- In Louisiana, every parish library system has at least one computer connected to LANET (Louisiana Wide Area Network), making it possible for citizens anywhere in the state to access library materials held in other locations
- In Oregon and Washington, citizens use PORTALS, a multi state library consortium, to make more than 13,000 accesses per week to government information, including U.S. Census Bureau and Department of Education reports.

⁵Ringstaff et al., *Trading Places: When Teachers Utilize Student Expertise in Technology-Intensive Classrooms*. Cupertino, CA: Apple Computer, 1991.

The Definition of Services Essential to Education

Schools and libraries are beginning to use more advanced applications of telecommunications, such as broadband connections. For example, Guilford County, North Carolina has connected all of its classrooms with fiber optics to enable them to use broadcast-quality distance learning. While the evidence of benefits is not as complete for newer applications, the existing evidence suggests that they are powerful tools for learning. Therefore, it is important that the Joint Board have a broad definition of services. Schools and libraries need access not to the most basic telecommunications services, but to advanced ones as well. The Joint Board should consider the services now being used by the most advanced schools and libraries when it defines the services to be eligible for discounts.

Access is Limited

Many private sector firms have increasingly used information technology to stay competitive in the world marketplace. However, schools and libraries currently use telecommunications services much less than other types of organizations. Most of these institutions have telephone lines for administrative use only. In 1993, only 12 percent of classrooms had telephone lines.⁶ In fact, school and library access to telecommunications today is much like the nation's access to telephones before the passage of the 1934 Communications Act. Clearly, schools and libraries have much to gain from greater access to telecommunications.

The National Center for Education Statistics completed a representative sample survey of public schools in 1995, indicating that access to advanced telecommunications in today's schools is

⁶National Education Association, *National Education Association Communications Survey: Report of Findings*, Washington, D.C., June, 1993

growing quickly, yet it is both limited and unevenly distributed⁷ (A copy of this survey is attached)

- Fifty percent of schools have access to the Internet in at least one point in the building, up from 35 percent one year earlier. This point of connection might be an administrative office, a library, or a computer laboratory
- Nine percent of classrooms have an Internet connection, up from 3 percent one year earlier.
- Only 31 percent of schools with large proportions of students from poor families have access to the Internet, while 62 percent of schools with relatively few students from poor families have access somewhere in the building. Only half as many classrooms in low-income areas (5 percent) have connections compared to other areas, which have 8 to 10 percent of classrooms connected.

Evidence from surveys show that access to telecommunications in libraries and homes are also limited.

- The 1994 National Commission on Libraries and Information Science national sample survey of U.S. public libraries showed that 20.9 percent of public libraries are connected to the Internet⁸

⁷National Center for Education Statistics, *Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, 1995*, Washington, D C., February, 1996.

⁸McClure, Charles R., Bertot, John Carlo, Zweizig, and Douglas, L., *Public Libraries and the Internet: Study Results, Policy Issues and Recommendations, Final Report*, Washington, DC: National Commission on Libraries and Information Science, June 1994.

- The American Library Association found in a 1995 survey that only 23 percent of public libraries serving populations of 100,000 or more offer public access to the Internet.⁹
- A 1995 study by the U.S. Department of Commerce found that Americans living in rural areas and central cities are least likely to possess computers and modems. This study also found that fewer than one in three U.S. households own a computer and only 10 percent own a modem required for online access, indicating that 90 percent would benefit from having access through their local libraries.¹⁰

Cost is a Key Barrier to Increased Access

Recent surveys indicate that the cost of telecommunications connections and services is a formidable barrier to use in schools and libraries.

- The 1995 National Center for Education Statistics survey indicated that funding is the greatest barrier to the use of advanced telecommunications. Fifty-five percent of all public schools listed a lack of funding specifically allocated to telecommunications as “a major barrier.” The second largest barrier was a lack of telecommunications access points, such as telephone jacks, in school buildings -- a problem also related to cost.
- In a 1996 survey of members, the National Association of Secondary School Principals discovered that fully one hundred percent listed funding as an obstacle to developing and implementing a technology plan. One principal noted, “funding, funding, funding! We have the vision and the plan -- we need money and resources to implement our vision.”¹¹

⁹American Library Association, *Libraries Today*, Chicago: 1995.

¹⁰U.S. Department of Commerce, *Falling Through the Net: A Survey of the "Have Nots" in Rural and Urban America*. Washington, DC: July 1995.

¹¹National Association of Secondary School Principals, *Survey Summary*, presentation to the Goals 2000 Technology Work Group, 1996.

- A survey of 30 district superintendents conducted by the American Association of School Administrators in 1996 also listed money as the chief barrier to implementing technology use.¹²
- The 1994 National Commission on Libraries and Information Science national sample survey of U.S. public libraries found that several factors affect public library involvement with the Internet, in particular, the key factors are the cost of an Internet connection, closely followed by adequate time for library staff to develop expertise in using the Internet.¹³

Therefore, telecommunications rates will need to take into account schools' and libraries' ability to pay for these services. An additional concern of school administrators is the uncertainty of future telecommunications costs. Many worry that as usage in their schools grows, costs will rise sharply. A pricing structure that enables schools to predict future costs successfully will be most successful in expanding access.

The Technology Literacy Challenge

While telecommunications connections are a necessary step for schools, they are by no means sufficient to give students the skills they need for work and life in the rapidly-approaching new century. In order to make all children technologically literate by the dawn of the 21st Century, President Clinton has challenged the private sector, schools, teachers, parents, students,

¹²American Association of School Administrators, *Report on Responses to Goals 2000 Technology Survey*, presentation to the Goals 2000 Technology Work Group, 1996.

¹³McClure, Charles R., Bertot, John Carlo, Zweizig, and Douglas, L. *Public Libraries and the Internet: Study Results, Policy Issues and Recommendations, Final Report*, Washington, DC: National Commission on Libraries and Information Science, June 1994.

community groups, state and local governments, and the federal government to accomplish four goals

- ▶ Provide all teachers with the training and support they need to help students learn through computers and the information superhighway;
- ▶ Develop effective and engaging software and on-line learning resources as an integral part of the school curriculum;
- ▶ Provide access to modern computers for all teachers and students;
- ▶ Connect every school and classroom in America to the information superhighway.

The \$2 billion, five year Technology Literacy Challenge Fund, proposed in the President's 1997 budget, will catalyze and leverage State and local efforts -- including work with the private sector -- so that schools provide children across America with a greater opportunity to learn the skills they need to succeed in school, on the job, and in the community

In order to receive funds, states are asked to come forward with a statewide strategy to meet this four-part national mission, but they are given maximum flexibility to accomplish these objectives. The initiative is designed to support many efforts already underway in states and communities across the country.

The goal of connections, and the larger objective of technological literacy for all students, are of great concern to Americans. Eighty percent of Americans feel that teaching students computer skills is "absolutely essential"¹⁴. Governors, state legislatures and local communities have major technology initiatives underway

¹⁴Public Agenda Foundation, *Assignment Incomplete: The Unfinished Business of Education Reform*, New York, 1995

Conclusion

A remarkable opportunity lies before the FCC and the Joint Board. Through your actions, it is possible that our children and grandchildren will have available at their fingertips the best quality information in the world. Meeting the goal of connecting every classroom and library to the information highway will require a partnership between the FCC and state regulatory authorities. It will also require a commitment from school and library boards, telecommunications providers, teachers, librarians, administrators, and parents. Providing a quality education is our common responsibility and is absolutely necessary to bring us together as Americans and to prepare our students to compete in the international marketplace of skills, jobs, and commerce. If we invest in education today -- all of our schools and libraries -- we invest in the economic future of the nation.



UNITED STATES DEPARTMENT OF EDUCATION
THE SECRETARY

Statement of
Richard W. Riley
U.S. Secretary of Education
before the
Federal Communications Commission
April 12, 1996

My main message to you as you consider the many ramifications of this new telecommunications law is that this is no time to think short term.

If we want to jump-start American education into the future, and that is something we just have to do for our economic future, we should accept some short-term costs in order to gain the long-term benefits that come with this telecommunications revolution.

And by that I mean simply this -- every effort should be made to give our nation's schools and libraries free access to the new telecommunications world that is now emerging or access at substantially discounted rates.

While this may cause some eye brows to get raised, I believe that in the long-term it will strategically position America to reap the economic benefits of this new knowledge based economy. For it is my very strong belief that three things of great importance will occur if we are willing to accept the short-term costs associated with this proposal.

First, we will very rapidly give a generation of young people the skills they need to enter this new knowledge based economy. In one bold stroke we will lift the level of the American work force. This is something that every business leader in America has been asking us to do for over a decade. Why not make this our national mission?

This afternoon I will be giving awards to some of the best tech prep and voc-ed schools in the nation. They are on the cutting edge of reform. I assure you these schools are tuned into what business want in its workforce.

But these schools are more the exception rather than the rule. It is time to stop being satisfied with little success stories and move to a national perspective. It is ultimately a question of scale.

If we want a national work force that is skillful and prepared for this new global economy we have to have a much bolder vision of how we move America forward. I believe you have the power to make this happen by putting America's schools and libraries at the head of the line.

Second, by accepting the concept of "free access" or access at very low rates you will fundamentally change the very nature of American education by increasing the pace of reform.

For over a decade now we have working to raise the level of American education. It is hard work and we are turning the corner. I see progress everywhere I go. But, over all, the pace of reform is too slow to satisfy me. If we want to "fast forward" American education, and drive American education into the 21st century this is the way to go.

Third, by putting America's schools and libraries on line quickly you will create a much more sophisticated market for telecommunications services in the years to come. The customer base for services will be broader and deeper, and the entire telecommunications industry will be all the better for it.

The Telecommunications Act of 1996, then, in my opinion, provides us with a unique window of opportunity not only to jump ahead economically but to radically speed up the pace of our efforts to improve American education. Access to telecommunications can bring the resources of the best libraries, museums, universities, and research into local classrooms and libraries, no matter where they are located.

The recommendations of the Joint Board have the potential to be history making if you are bold enough and strong enough to have such a vision.

President Clinton and Vice-President Gore have been strong and tireless

proponents for making our nation's schools and libraries full participants in the ongoing telecommunications revolution. This is why the Clinton Administration has set a goal of having *every classroom and library in the Nation connected to the Internet by the year 2000*.

The connection between telecommunications access and student performance are, in my opinion, compelling. Telecommunications technologies are helping students to master basic skills such as reading and writing, and to learn advanced skills for college and the workplace.

I have seen this progress first hand. It is simply astonishing what young people can do once they make the connection between computers and learning. Universal service and affordable connections for schools and libraries, then, have long-term implications for educational quality and equality. Both are important national objectives.

Unfortunately, there is a huge gap between need and availability. Today, few classrooms and libraries are connected. The costs of initial connections, charges for ongoing service, and a lack of necessary infrastructure in school and library buildings are barriers to more widespread educational use.

Nevertheless, reaching every school and library by the year 2000 is an achievable goal. Classroom access to the Internet tripled in just one year, from 3 percent in 1994 to nine percent in 1995.¹

The goal of connections, and the larger objective of technological literacy for all students -- are of great concern to the American people. They simply want to it happen, and they have the good common sense to recognize that our country will be all the better for it if we make this our national mission.

Meeting the goal of connecting every classroom and library to the information highway will require a unique partnership between the FCC and state

¹National Center for Education Statistics, *Advanced Telecommunications in U.S. Public Elementary and Secondary Schools*, 1995, February, 1996.

regulatory authorities. It will also require a commitment from school and library boards, telecommunications providers, teachers, librarians, administrators, and parents.

But it can happen and it should happen. The key is to avoid the trap of short-term thinking. I want to suggest to you that a remarkable opportunity lies before the FCC and the Joint Board.

I urge you to seize this opportunity, to recognize the historical moment, and take the bold stroke of making sure that all the children of America have at their fingertips the best quality information in the world.

In closing I want the young people of America to speak for themselves. I want now to introduce a four minute videotape made by the students in the Olympia, Washington public schools, the home state of Commissioner Nelson.

Thank you.

NATIONAL CENTER FOR EDUCATION STATISTICS

E.D. TABS

February 1996

**Advanced
Telecommunications in
U.S. Public Elementary
and Secondary Schools,
1995**


Fast Response Survey System

NATIONAL CENTER FOR EDUCATION STATISTICS

E.D. TABS

February 1996

**Advanced
Telecommunications in
U.S. Public Elementary
and Secondary Schools,
1995**



Sheila Heaviside
Elizabeth Farris
Westat, Inc.

Gerald Malitz
National Center for Education Statistics

Judi Carpenter
Project Officer
National Center for Education Statistics

U.S. Department of Education
Richard W. Riley
Secretary

Office of Educational Research and Improvement
Sharon P. Robinson
Assistant Secretary

National Center for Education Statistics
Jeanne E. Griffith
Acting Commissioner

Paul Planchon
Associate Commissioner

National Center for Education Statistics
"The purpose of the Center shall be to collect, and analyze, and disseminate statistics and other data related to education in the United States and in other nations."—
Section 406(b) of the General Education Provisions Act, as amended (20 U.S. C. 1221e-1).

February 1996

Contact:
Judi Carpenter
(202) 219-1333

Table of Contents

Section	Page
Introduction	1
Selected Findings	3
Tables	6
1 Number and percent of responding public schools in the study sample and estimated number and percent of public schools the sample represents, by school characteristics: 1995	6
2 Percent of public schools having access to selected telecommunication capabilities and the specific location of telecommunications within the school, by capability: 1995	7
3 Percent of public schools having access to various types of computer networks in fall 1994 and fall 1995: 1995	8
4 Percent of public schools having access to the Internet and the percent of all instructional rooms across the country with Internet access in fall 1994 and fall 1995, by school characteristics: 1995	9
5 Percent of public schools having access to the Internet by the number and mean number of instructional rooms with Internet access, by school characteristics: 1995	10
6 Mean number of computers in public schools and the percent of all computers in public schools across the country with Internet access, by school characteristics: 1995	11
7 Percent of public schools having access to the Internet by the number and mean number of computers with Internet access, by school characteristics: 1995	12
8 Percent of public schools having access to the Internet, by various types of Internet capabilities and for whom in the school community the capability is available: 1995	13
9 Percent of public schools having access to the Internet, by the extent of wide area network use by members of the school community and by school characteristics: 1995	14
10 Percent of public schools having access to the Internet, by type of wide area network connection and by school characteristics: 1995	15
11 Percent of public schools having access to the Internet, by type of network administrator and by school characteristics: 1995	16
12 Percent of public schools reporting the extent of the formal role that various groups have in developing the school's advanced telecommunications activities: 1995	17

13	Percent of public schools that do not currently have access to the Internet and their plans to obtain access to the Internet, by school characteristics: 1995.....	18
14	Percent of all public schools indicating the extent to which various factors are barriers to either the acquisition or the use of advanced telecommunications: 1995.....	19
15	Percent of public schools currently having access to the Internet by the extent to which various factors are barriers to upgrading or maximizing the use of their advanced telecommunication capabilities: 1995	20
16	Percent of public schools that do not currently have access to the Internet by the extent to which various factors are barriers to their acquisition of advanced telecommunication capabilities: 1995 ..	21
Appendix A: Standard Error Tables		23
2a	Standard error of the percent of public schools having access to selected telecommunication capabilities and the specific location of telecommunications within the school, by capability: 1995	25
3a	Standard error of the percent of public schools having access to various types of computer networks in fall 1994 and fall 1995: 1995 ..	26
4a	Standard error of the percent of public schools having access to the Internet and the percent of all instructional rooms across the country with Internet access in fall 1994 and fall 1995, by school characteristics: 1995.....	27
5a	Standard error of the percent of public schools having access to the Internet by the number and mean number of instructional rooms with Internet access, by school characteristics: 1995	28
6a	Standard error of the mean number of computers in public schools and the percent of all computers in public schools across the country with Internet access, by school characteristics: 1995	29
7a	Standard error of the percent of public schools having access to the Internet by the number and mean number of computers with Internet access, by school characteristics: 1995.....	30
8a	Standard error of the percent of public schools having access to the Internet, by various types of Internet capabilities and for whom in the school community the capability is available: 1995.....	31
9a	Standard error of the percent of public schools having access to the Internet, by the extent of wide area network use by members of the school community and by school characteristics: 1995	32
10a	Standard error of the percent of public schools having access to the Internet, by type of wide area network connection and by school characteristics: 1995.....	33

11a	Standard error of the percent of public schools having access to the Internet, by type of network administrator and by school characteristics: 1995.....	34
12a	Standard error of the percent of public schools reporting the extent of the formal role that various groups have in developing the school's advanced telecommunications activities, by various groups: 1995	35
13a	Standard error of the percent of public schools that do not currently have access to the Internet and their plans to obtain access to the Internet, by school characteristics: 1995.....	36
14a	Standard error of the percent of all public schools indicating the extent to which various factors are barriers to either the acquisition or the use of advanced telecommunications: 1995.....	37
15a	Standard error of the percent of public schools currently having access to the Internet by the extent to which various factors are barriers to upgrading or maximizing the use of of their advanced telecommunication capabilities: 1995.....	38
16a	Standard error of the percent of public schools that do not currently have access to the Internet, by the extent to which various factors are barriers to their acquisition of advanced telecommunication capabilities: 1995	39
Appendix B: Reference Tables		41
5b1	Percent of public schools having access to the Internet by the number and mean number of instructional rooms connected to the Internet, by school characteristics: 1994.....	43
5b2	Standard error of the percent of public schools having access to the Internet by the number and mean number of instructional rooms connected to the Internet, by school characteristics: 1994	44
8b1	Percent of public schools having access to the Internet, by various types of Internet capabilities and for whom in the school community the capability is available: 1994.....	45
8b2	Standard error of the percent of public schools having access to the Internet, by various types of Internet capabilities and for whom in the school community the capability is available: 1994.....	46
10b1	Percent of public schools having access to any wide area network, by type of connection and by school characteristics: 1994	47
10b2	Standard error of the percent of public schools having access to any wide area network, by type of connection and by school characteristics: 1994.....	48

12b1	Percent of public schools having access to any wide area network by the extent of the formal role in developing the school's telecommunications program, by various groups: 1994.....	49
12b2	Standard error of the percent of public schools having access to any wide area network by the extent of the formal role in developing the school's telecommunications program, by various groups: 1994.	50
Appendix C:	Glossary of Terms	51
Appendix D:	Survey Methodology and Data Reliability	55
Appendix E:	Background Information	59
Appendix F:	References	61
Appendix G:	Survey Form	63

Introduction

The National Information Infrastructure (NII), set forth by the President, encourages an acceleration of the goal to connect all of the Nation's school classrooms, as well as libraries, hospitals, and law enforcement agencies, to the "Information Superhighway."

In response to this federal goal, the U.S. Department of Education commissioned a survey to obtain current data to compare with baseline data obtained in 1994 on the status of advanced telecommunications in public elementary and secondary schools. The survey requested information regarding the types of advanced telecommunications equipment and services that are currently available in public schools and the specific locations of the equipment; current computer networking capabilities in public schools; the number of schools that have plans to connect to wide area networks; the sources of their plans and of the schools' budgetary decisions for telecommunications technology; and the various barriers that limit schools' acquisition or use of advanced telecommunications.

This E.D. TABS report contains tabular summaries based on data collected from the *Survey of Advanced Telecommunications in U.S. Public Schools, K-12*, conducted for the National Center for Education Statistics (NCES). E.D. TABS are a collection of tables whose sole purpose is to make data or tables available to the general and research public quickly. E.D. TABS are not intended to present analyses of the data from the survey. The tabular summaries present the actual data collected, and only selected findings are highlighted in this report.

The tables in this report present data for public schools overall and for schools by instructional level (elementary, secondary), size of enrollment (less than 300, 300-999, 1,000 or more), metropolitan status (city, urban fringe, town, rural), geographic region of the country (northeast, southeast, central, west), percent minority enrollment (less than 6 percent, 6 to 20 percent, 21 to 49 percent, 50 percent or more), and the percent of students eligible for the federally funded free or reduced price lunch program (less than 11 percent, 11 to 30 percent, 31 to 70 percent, 71 percent or more). The statistics in all tables are based on national estimates (see table 1). Any statement of comparison made in this report has been tested for statistical significance through chi-square tests or *t*-tests adjusted for multiple comparisons using the Bonferroni adjustment and are significant at the .05 level or better.

The survey was conducted by Westat, Inc., a research firm in Rockville, Maryland, through the NCES Fast Response Survey System (FRSS). FRSS was designed to provide data quickly on policy-related issues regarding emerging educational developments.

The data from this survey provide valuable information that federal agencies will use to determine the magnitude of the tasks and activities required to help our Nation's public schools obtain and use telecommunications technology. Additional, indepth reports containing detailed analyses of the findings from the survey are forthcoming.

Selected Findings

The *Survey of Advanced Telecommunications in U.S. Public Schools, K-12*, requested current information regarding the availability and use of telecommunications and, in particular, access to the Internet, plans to obtain Internet access, use of the Internet, and barriers to the acquisition or use of advanced telecommunications. The data were gathered from a nationally representative sample of 917 public elementary and secondary schools in fall 1995. Some comparisons are made with data collected from a similarly nationally representative sample of schools during fall 1994.

- Fifty percent of U.S. public schools now have access to the Internet (table 3). This percentage is up from 35 percent just 1 year ago.
- Secondary schools, large schools, and those with low rates of student poverty are the most likely to be connected to the information superhighway. While 65 percent of secondary schools have Internet access, 46 percent of elementary schools can access the Internet (table 4). Only 39 percent of schools with fewer than 300 students have Internet access. However, the percentages increase to 52 percent for schools with enrollments of 300 to 999 and to 69 percent in schools with 1,000 or more students. Schools in which less than 11 percent of the student body are poor, as measured by eligibility for the federally funded free or reduced-price lunch program, were twice as likely to be on the information superhighway as those in which 71 percent or more of the students qualified for this program.
- Seventy-four percent of the schools that do not currently have access to the Internet plan to obtain access in the future (table 13).
- Funding and inadequate telecommunications access points in the building were the most frequently cited barriers to acquiring or using advanced telecommunications in public schools. Fifty-five percent of schools indicated funds not specifically allocated for telecommunications was a major barrier, and 54 percent ranked too few access points in the building as a major barrier (table 14).
- Although half of the Nation's public schools already have access to the Internet somewhere in the building and three-fourths of those without access have plans to connect, only 9 percent of all instructional rooms (classrooms, labs, and library media centers) are currently on the Internet (tables 4 and 13). This is a three-fold increase compared with fall 1994, when only 3 percent of all instructional rooms had access to the Internet.
- Public schools report an average of 72 computers including those used for both administrative and instructional purposes (table 6). However, only 14 percent of all computers in public schools across the country have Internet access. Schools with Internet access report an average of 12 computers connected to the Internet.
- Eighty-five percent of public schools have access to some kind of computer network; 77 percent have a local area network and 61 percent can have wide area network access (table 2).

- In addition to the 50 percent of schools that are on the Internet, 11 percent have access to some other wide area network that does not connect to the Internet, and 23 percent have only a local area network (table 3).
- Public schools now are as likely to report having a computer with a modem as they are to have cable television (76 percent for both; table 2). Seventy-one percent have access to broadcast television in their schools. Fewer schools have closed-circuit television (28 percent), one-way video with two-way audio or computer link (13 percent), and two-way video and audio (7 percent).
- Only 35 percent of public schools with a computer with access to a wide area network report having this capability in a classroom (table 2). Wide area network access is generally found in library media centers (68 percent) and to a lesser extent in computer labs (41 percent). The types of telecommunications most often located in classrooms are broadcast and cable television. Although 91 percent of schools with closed-circuit television report having it in the classroom, only 28 percent of schools have this capability.
- Schools indicate that the school district (63 percent) and teachers and other staff (38 percent) are the two groups most likely to play a large formal role in developing the school's telecommunications program (table 12). While only 7 percent indicate that parents play a large role, 31 percent cite parents as a group playing a moderately active role. This is up from 1994, when only 4 percent of public schools indicated that parents played a large role, with 17 percent reporting they played a moderate role (reference table 12b1).

For the 50 percent of public schools having Internet access:

- Schools with Internet access indicated that an average of 5 instructional rooms accessed the Internet. (table 5). To better understand this, 7 percent of schools on the Internet reported that no instructional rooms were connected (including computer labs, library or media centers, and classrooms), 47 percent had 1 instructional room on the Internet, 24 percent had 2-3 rooms, 4 percent reported 4 rooms, and 19 percent of schools could connect to the Internet in 5 or more instructional rooms in the school (table 5). In 1994, only 8 percent of schools with Internet reported access in 5 or more instructional rooms (reference table 5b1).
- On average, high poverty schools report fewer instructional rooms with Internet access than those with low levels of poverty. Schools in which 71 percent or more of the students are eligible for the federally funded free or reduced-price lunch program report Internet access an average of 2.8 instructional rooms, compared with 5.3 percent for schools in which less than 11 percent of their students were eligible for the federal lunch program (table 5).
- In fall 1994, 97 percent of schools with wide area networks connected to these networks by modem; only 3 to 4 percent used higher speed T1, 56Kb, or SLIP/PPP (reference 10b). By fall 1995, fewer schools with Internet access were relying on modems and the use of faster transmission connections had increased markedly. Most schools still connect to wide area networks by modem (81 percent; table 10). Twenty-three percent now report having a SLIP or PPP connection, 10 percent connect by a 56Kb, with 7 percent for T1 and 3 percent for ISDN.
- Of the schools with Internet access, 93 percent have e-mail, 83 percent can access resource location services, 80 percent have World Wide Web access, and 73 percent