Many in the United States have argued that universal access to broadband networking is important to support commerce, healthcare, government, research, and education. The nation’s college and university leaders have taken this into their own hands, by installing and operating “big broadband” networks (with capacities of at least 100 Mbps) that link classrooms, laboratories, residence halls, and all other facilities of their campuses to each other and to the commercial Internet. Many institutions have taken this a step further by linking to one another through regional, national, and now international big broadband connections, sharing a powerful, global platform for research and education. On these private networks they have “lived in the future,” demonstrating on a daily basis what can be achieved with 24x7 big broadband capacity on networks open to innovation.

This rosy picture is only a part of the story, however. Few Americans have access to big broadband in their homes, workplaces, or other off-campus venues and so cannot participate as critical activities migrate from physical to virtual—much less enjoy the many new services that rely on big broadband capabilities. For higher education, this means missed opportunities and increased costs in both education and research, since the majority of students, faculty, and collaborators spend much of their time away from campus networks. EDUCAUSE has long argued that universal access to big broadband should be a national goal and that the federal government should adopt active, not just passive, policies to achieve it. In 2005, for example, EDUCAUSE outlined five principles that are key to this approach and shared with policy-makers, EDUCAUSE members, and partner associations articles and brochures that showed the power of big broadband and how it could actually be used in an average household.

Our voice has been joined by many others in recent years, leading to a national consensus that universal access to broadband is critical for both the continued well-being and also the global leadership status of the United States. It is high time for a new discussion—not “Why do we need big broadband?” but “How can we make it happen?” In 2007, networking and policy experts in the EDUCAUSE community took on the challenge, working with John Windhausen Jr., a noted telecommunications expert, to propose principles and concrete steps for achieving this goal. The result is the EDUCAUSE white paper A Blueprint for Big Broadband.

—Mark Luker, Vice President, EDUCAUSE

By John Windhausen Jr.

Universities have historically played a special role in the creation and advancement of the Internet—and continue today to push the boundaries of the Internet. The first nodes of the U.S. Defense Department’s ARPANET were at four universities in 1969. The first million-user scaled-up demonstration of a national IP-based network was deployed among U.S. universities in the late 1980s, thanks to the investment by the National Science Foundation in NSFnet and regional networks. A university student, supported by federal funds, developed the Mosaic web browser, later to become Netscape. A few years later, two university graduate students founded Google.

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The following article is drawn from A Blueprint for Big Broadband, an EDUCAUSE white paper released in January 2008. The full white paper is located on the EDUCAUSE website: <http://www.educause.edu/library/pdf/EPO0801.pdf>.
Reaching these millions of Americans for e-learning and for a host of emerging applications in education, health care, national security, and other areas requires a national commitment to a truly broadband Internet.

Today, researchers at U.S. universities are experimenting with advanced Internet protocols that deliver speeds ten thousand times faster than speeds typically available at the home. They are developing and deploying advanced Internet applications that have the potential to transform research, education, health care, entertainment, and business. We see the future on our campuses. In turn, we feel obligated to urge the nation’s policymakers to help extend these services beyond the campus, to society at large.

EDUCAUSE and its affiliate Internet2 are the primary higher education organizations whose goal is to promote widely available and affordable broadband connectivity. EDUCAUSE represents the chief technology officers of more than 2,200 colleges and universities across the United States. Since its founding in 1998, EDUCAUSE has consistently advocated that advanced network capabilities on campuses should also be made available to all Americans so that the entire nation may benefit from Internet-based access to education, health care, and public safety. More than two-thirds of the students in U.S. colleges and universities live off-campus, as do students in primary, secondary, and continuing education programs. Reaching these millions of Americans for e-learning and for a host of emerging applications in education, health care, national security, and other areas requires a national commitment to a truly broadband Internet.

In 2005, as the U.S. Congress considered rewriting the telecommunications law, EDUCAUSE urged Congress to adopt legislation incorporating the following five principles:

- The United States should adopt as a national goal a broadband Internet that is secure, affordable, and available to all, supporting two-way gigabit-per-second speeds and beyond.
- All components of the public broadband Internet must remain open to all persons, all applications, and all lawful content. All components must interconnect and interoperate using freely available, international standards.
- Telecommunications policy must ensure a level playing field for competing technologies so that market forces can drive continued innovation and affordable access.
- State and local governments must have the right to build and deploy their own public broadband networks to enable full participation of all citizens in Internet-based higher education, workforce development, and telemedicine.
- The federal government must renew its leading role in funding academic research and development in future Internet technologies and applications in order for America to enjoy the full benefits of the broadband revolution and to remain competitive in the global marketplace.

In May 2007, the EDUCAUSE Network Policy Council reiterated its support for a national broadband policy and urged policymakers to adopt the following four broadband policy goals:

1. A National Policy to Create a Universal Broadband Network
   A broadband network that meets America’s needs of today and tomorrow requires many important technical and operational features, including the following:

   - Open, secure, reliable, and scalable infrastructure that continues to be based on freely available, interoperable, technical standards
   - Access prices that are reasonable, nondiscriminatory, and universally available on a nationwide basis
   - Bandwidth to every home at a minimum of 100 megabits per second (in both upstream and downstream directions) that is easily scalable to gigabits
   - Network access that is standardized for the delivery of essential residential and business public services, including police, fire, health, civil defense, and national disaster

2. Government Policies, at All Levels, That Promote Innovation and Competition in Network Applications and Services While Preserving the Essential Services of the Universal Telephone Network
   America must maximize incentives and rewards for innovation within competitive markets while delivering the universality and the affordability of broadband services that were a hallmark of the regulated telephone era. The explosive growth of today’s Internet would not
have occurred without the actions, by Congress and government agencies, that created a federal policy environment encouraging and rewarding entrepreneurial business initiatives. This entrepreneurial freedom for the Internet was possible because the universal telephone network, a result of decades of federal and state regulation, provided a stable underlying telecommunications infrastructure that met many necessary social objectives for communications services on which everyone was dependent. We must maintain the balance of encouraging innovation while preserving essential services. America’s global competitive advantage is at stake.

3. Expansion of Federal R&D Programs in Network Technology, Including Support for Technology Transfer to the Private Sector
A continuation of the federal government’s leading role in sponsoring and funding network and computational research, now collectively known as cyberinfrastructure, is an essential component of an overall plan for restoration of U.S. leadership in networking. This effort—much of it conducted within the university community through basic research, prototyping, and proof-of-concept deployment activities—is a vital part of the R&D “food chain” that leads to commercial products and services and their substantial economic benefits. While the benefits of advanced cyberinfrastructure are already visible in such “big science” fields as physics, astronomy, seismology, and genomics, the potential of technology to infuse and transform many academic fields and other areas such as education and health care has hardly been realized. To achieve its promise as a powerful instrument for educational achievement, and many other social and economic goals, the Internet must continue to be closely linked to communications and computing research endeavors.

4. Federal Legislation to Preserve Open, Non-discriminatory Access to Network Applications and Content
The Internet has grown far beyond its original roots in telephony, and America has richly benefited from its development in an open-access environment. As the telecommunications industry has become less regulated, consumers are no longer guaranteed that their traffic will be carried on a nondiscriminatory basis. The impending digital conversion of broadcast television and the ongoing convergence of most communications services onto a broadband Internet infrastructure have created new challenges for public policy. Congress is already considering legislation, under the banner of “net neutrality” that would ensure nondiscriminatory access to Internet applications and content, thus maintaining the openness that has characterized the Internet since its earliest days.

The Need for a Big Broadband Plan
The United States is facing a growing crisis in broadband connectivity. Very few of the nation’s businesses and homes have the type of high-speed broadband connection that they need to participate fully in the international economy and society. Current U.S. broadband networks are under stress because of the increasing demand for greater content, especially video. In contrast, the countries of eastern Asia and northern Europe have more widely deployed broadband networks, generally provide faster Internet access, and offer service at much lower prices than the United States. The shortage of broadband connectivity in the United States threatens economic growth, limits opportunities for health care and telemedicine, constrains educational opportunities for students, retards Internet-based innovation, and limits the nation’s potential to compete in the twenty-first century.

Although many have written about the importance of broadband services and the need for the United States to adopt a national broadband policy, few have taken the next step: proposing a specific broadband action plan. With A Blueprint for Big Broadband, EDUCAUSE offers the outlines of a comprehensive broadband policy and recommends specific steps that will enable policymakers to bring the nation’s broadband market into the twenty-first century. The proposal is forward-looking; it avoids wrangling over old regulations and technologies and, instead, addresses the needs of the future.
The proposal is aggressive but realistic, and most important, the proposed steps are necessary if the United States is to restore its world leadership in the increasingly Internet-based economy.

Over the past several years, U.S. policymakers have relied on deregulating the telecommunications industry and funding underfunded broadband programs as the primary tools to promote broadband deployment and adoption. But this laissez-faire approach is insufficient. The U.S. broadband ranking among other nations has fallen sharply since the beginning of this decade. At the same time, there is considerable evidence that American consumers will be demanding greater broadband capacity in the very near future (especially with the advent of high-definition video over the Internet).

It is increasingly clear that America needs a national broadband plan to promote big broadband connectivity. Many, if not all, of the nations ahead of the United States in broadband connectivity adopted broadband plans several years ago. Many U.S. states have taken aggressive steps to promote broadband technologies as well, but their focus has been primarily on low-speed broadband—not the kind of big broadband that will be necessary for the future. The United States needs to learn from these experiences and develop a set of policies that will propel its Internet capabilities into the twenty-first century.

The United States can no longer let market forces alone determine the optimum level of broadband deployment. As Gartner Consulting and Robert Atkinson have explained, the private sector is primarily motivated by short-term profits and cannot take into account the positive externalities of widely available broadband networks. The private sector cannot be faulted for being cautious; the dot-com bust at the beginning of this decade left a battleground littered with bankrupt companies. But something bigger is at stake than the profit-and-loss statements of the telecommunications industry. Broadband services are no longer an exciting option, an enhancement of the existing telecommunications system. Broadband services have become an essential component of the national infrastructure. Widely deployed broadband pipes available at affordable prices and open to any lawful content are increasingly essential to the full participation of the United States in the twenty-first-century economy.

America thus needs to focus on big broadband—very high-capacity networks that are capable of delivering a minimum of 100 megabits per second (Mbps) of transmission speed to every home, business, and public institution. This goal is both realistic and necessary. Japan has already deployed high-capacity fiber networks to the home, advertising speeds of almost 100 Mbps. France and South Korea are making 45 Mbps capabilities available to their citizens today. At present, the United States lags behind these countries; to catch up, it will need to do more than build, by 2010, the same quality of networks that others are deploying today. If America is to restore its leadership position in broadband capabilities, we must leap-frog the competition. We must design our broadband policy in order to “skate to where the puck is going to be.”

Building big broadband networks is not just a matter of international competition; it is also economically efficient. Because of the limited dollars available, it is more economically efficient to invest these resources into networks with unlimited potential (such as fiber-optic cable) than to invest in the deployment of a multitude of interim technologies whose bandwidth could be overwhelmed by Internet traffic in a few years. American policy should thus focus on future-proof networks—networks employing technologies that are scalable and adaptable to future growth in demand. Several existing technologies are limited by physics and geography and will be obsolete in three to five years. U.S. resources will be better spent on technologies that have a long shelf life.

Some states are admirably developing programs to fill the gaps in small broadband deployment and availability. Certain municipalities are building fiber networks on a case-by-case basis, but many more municipalities have been bogged down on wireless networks that will not satisfy consumers’ hunger for much greater capacity.

No agency of government in the United States is addressing the need for big broadband. Only the federal government can fill the void with a comprehensive policy to promote big broadband.

What should the U.S. big broadband policy be? The following presents suggested principles and an action plan.

**Principles for Enhancing U.S. Big Broadband Connectivity**

1. **Universal**
   All communities, institutions, residences, businesses, nonprofits, educational and health care institutions, and individuals should have equitable and
affordable access to big broadband services and to the widest possible range of content and service providers.

2. Deployment and Subscription
Big broadband policies should focus on both deployment and subscription. We must enhance the investment in building the network and also efforts to ensure that big broadband service is affordable so that all consumers are able to subscribe.

3. Public and Private Sectors
Both the public and the private sector can and must play significant roles in the nation’s broadband deployment. Local governments have shown that they can build broadband networks even where the private sector will not. State governments have demonstrated that they are in the best position to know where resources may be most needed and efficiently used. State and local governments can promote economic development, education, health services, public safety—goals that may not be reflected in corporate boardrooms. At the same time, building broadband networks can be expensive and beyond the financial resources of many governments acting alone. Thus, big broadband policies should also include measures to encourage the private sector to build broadband networks with supervision, guidance, and funding from the public sector.

4. Federal–State Cooperation
Federal, state, and local governments should work together, across traditional jurisdictional lines if necessary, to achieve the shared goals. The United States is a large country, with many different geographic, income, economic, and density zones. There is no one-size-fits-all solution. Different broadband technologies may be required for different regions. Any federal government program must be designed with flexibility to allow state and local governments to target federal dollars to the best location.

5. Big Broadband
U.S. broadband policy should focus on the future. Cable modem, DSL, and wireless technologies are unlikely to meet our future needs. The United States needs to set its sights toward the 100 Mbps speeds that are commonplace in Japan and increasingly the focus of European countries.

An Eight-Step Action Plan to Promote Big Broadband Connectivity

1. Leadership, Vision, and Goals
To achieve results, U.S. leaders must set forth a vision of the future. Foreign and state governments have announced the need for broadband with major addresses
A reasonable starting point is to seek to provide every home, business, and public institution with a minimum of a 100 Mbps connection by the year 2012.

to their electorates. Their plans include specific goals as well as processes and timelines to meet those goals. U.S. policymakers should do the same. Simply making the announcement in a public manner can motivate the industry and other government leaders to follow suit. These goals must be realistic and achievable, but they must also be aggressive if the United States is to catch up to and surpass international competitors. A reasonable starting point is to seek to provide every home, business, and public institution with a minimum of a 100 Mbps connection by the year 2012.

2. Organization
Once the goals are set, achieving them will require hard work from a dedicated set of professionals who understand the needs of consumers and the industry. Almost every country and state that has initiated a broadband plan has created a new organization focused on implementation. The United States should do the same. One suggestion is to create a Broadband Council of government officials, co-chaired by the secretary of commerce and the chairman of the Federal Communications Commission (FCC), which would also include a variety of senior officials from federal, state, and local government agencies. The Broadband Council would implement the big broadband policies and programs. For instance, the council would award funding from the Universal Broadband Fund (described below) and set the rules of openness.

In addition, the Broadband Council would receive input from a Broadband Advisory Committee consisting of a variety of public, nonprofit, and consumer representatives. The Broadband Advisory Committee would receive and analyze information from the general public and provide advice and recommendations to the council. The committee would have its own professional staff and would conduct research on broadband solutions and technologies. For instance, one important component of information would be detailed mapping of the availability of broadband facilities. The FCC’s reporting methods also need to be upgraded to provide more granular information that can help locate the areas where broadband does not exist.

3. Tax Incentives
There is some concern that the current investment climate does not provide sufficient rewards for providers to make significant investments in broadband networks. Verizon, the provider that has invested most heavily in fiber to the home through its FiOS (Fiber Optic Service) project, still faces skepticism from some Wall Street analysts. Although Verizon's rollout of its fiber-to-the-home network is commendable, the company's plans call for the network to pass only one-half of the homes in its service area, most of them high-income residential areas on the east and west coasts. It will be difficult to persuade Verizon and other local companies to increase their investment without some additional investment incentives to attract capital.

In 1986, Congress passed legislation providing tax incentives for the accelerated deployment of next-generation communications infrastructure. Consequently, the country’s long-distance networks were rapidly upgraded. Providing similar incentives for the deployment of next-generation broadband networks would have a similar effect today—allowing the United States to close the gap with global competitors.

The following summarizes some of the tax incentive programs that have been discussed:

a. Expensing of broadband equipment: Accelerating the depreciation of broadband equipment could dramatically stimulate investment in broadband infrastructure by removing the disincentive of an unrealistically long depreciation cycle. According to the Information Technology Industry Council (ITI), telecom service providers are the largest capital investors in the world; thus depreciation changes should significantly increase capital expenditures in broadband infrastructure.

b. Tax break for fiber investment: A broadband tax credit would also stimulate investment in broadband infrastructure by reducing the cost of deployment. Such a tax credit could be focused on “middle mile” or backbone pipes that are not built with UBF funds (see below). According to one estimate cited by ITI, a one-year credit would generate $2–4 billion in broadband investment, and a five-year credit would generate $10–20 billion in broadband investment.
c. **Internet tax moratorium:** The Internet prospers today as the result of unshackled innovation and technological growth unfettered by government taxation or regulation. Although policies up to this point have temporarily put a hold on government interference, passing a permanent ban on Internet taxation would send a signal that the Internet is open for further growth and development. The ban on Internet taxes, which was recently extended for seven years, should be made permanent.14

d. **New home tax credits:** Local governments should be encouraged to adopt building codes requiring the deployment and installation of next-generation broadband facilities in new home developments. New communities are constantly being developed and houses built and renovated. These events provide an opportunity for local governments to accelerate the deployment of next-generation broadband networks by adopting new development and building requirements that will ensure these homeowners can connect at twenty-first-century access speeds.15

4. **A New Universal Broadband Fund**

To be truly effective, the national broadband policy must incorporate a program to provide direct funding from the government to subsidize local big broadband connections. Such funding has proven to be successful in Canada, the United Kingdom, and Japan, as well as almost every state that has adopted a broadband policy. Just as rural electrification, rural telephone service, and the national highway system in the early twentieth century required U.S. government subsidies, the federal government should consider providing subsidies to promote the nationwide deployment of big broadband capability.

The funding should be considered a necessary investment in the future—an investment that will pay for itself over time in several ways. First, the costs of operating these networks once they are constructed will be much smaller than the costs of operating the existing copper and coaxial networks, so there will be considerable cost savings to the network owner.16 Furthermore, fiber networks are easily scalable upward, meaning that the one-time investment in fiber facilities will last well into the future. In other words, there will be less of a need for other government subsidies in the future to support older copper networks. Finally, and perhaps most important, several studies demonstrate that an advanced infrastructure generates more jobs, greater business investment, and higher tax revenues.17 Thus, the economic benefits of an advanced infrastructure will prove that the investment today will bring about enormous long-term benefits.

Where should this new fund be housed? Perhaps none of the existing programs are appropriate:
The existing federal Universal Service Fund (USF) is not a suitable vehicle for providing broadband funding. The existing $7 billion USF is extraordinarily complex. It consists of four separate programs, each with its own rules. The high-cost fund, which is the largest component of the USF, provides funding for ongoing (recurring and capital) costs of operating narrowband networks (i.e., for voice telephony) and may only secondarily be used for broadband services. In contrast, the cost of deploying broadband consists primarily of one-time costs of deployment, and the cost of maintaining a broadband network is lower than maintaining a narrowband network. As a result, folding a broadband subsidy program into the existing federal USF is not ideal, since the two programs are not compatible.

The Rural Utilities Service (RUS) Broadband Loan and Grant Program does not provide the best model for meeting the nation’s broadband needs. The RUS program, though specifically designed for broadband deployment, provides the majority of its assistance through loans to those entities that can demonstrate the financial strength to repay the loan. Although it is understandable that the federal government would want some assurances that the loans will be repaid, the net effect is that most loans are awarded to entities that already have significant financial resources. Very few, if any, loans can be awarded to the highest-cost areas that need broadband the most. Furthermore, both the loan and the grant programs provide funding for low-speed broadband, not the high-speed big broadband that America needs. Finally, the RUS program operates without the oversight and involvement of many parties—such as consumer organizations, nonprofit organizations, and state and local governments—that should have an integral role in determining the success of the nation’s broadband program.

For these reasons, the United States should consider creating a brand-new fund using a public-private partnership focused only on broadband deployment. For purposes of discussion, the proposed fund is called the Universal Broadband Fund (UBF). The UBF would be funded by the federal government, either through general appropriations or from selling broadband bonds.

Funds would be distributed from the UBF to the states based on a variety of factors as long as the states contributed an equal amount of support (i.e., a match). The states would award the combined federal and state funding to private- or public-sector entities to cover up to two-thirds of the deployment costs on a community-by-community basis. The recipient of any funding must agree to comply with the open network principles (discussed further below).

How much funding should be provided? One way to estimate the amount of funding needed is to use Verizon’s costs of deploying its FiOS FTTH network as a guide. Verizon has told investment analysts that the network costs $817 per home passed and has estimated that it will pass 18 million homes with its FiOS service by 2010. With approximately 115 million households, there will be approximately 97 million homes remaining. The costs of “wiring” the remaining homes is probably higher than Verizon’s current costs because Verizon is likely choosing to wire homes that are lower cost than average (though the increased cost of serving these areas may decline over time, just as the provider’s costs of deploying FiOS networks have declined over time). Assuming that it will cost approximately $1,000 to pass each home and that there will be approximately 97 million homes remaining, the total amount of funding necessary to provide fiber connectivity to each home in the United States would come to approximately $97 billion.

The federal government need not provide the entire amount of funding. The United States should consider adopting the type of matching-grant program used by several provinces in Canada, whereby the federal government, the state/province, and the network builder/owner each contributes one-third of the funding for each broadband construction project. The federal government could, for instance, contribute $8 billion per year for four years (a total of $32 billion) to fund one-third of the costs of building a big Internet connection is useful only if you can use it. A superfast connection that can connect only to the websites chosen by the ISP would not serve the consumer or the nation’s economic or national security goals.
broadband network capable of providing a minimum of 100 Mbps service.

Although there are a variety of methods for distributing these funds, one proposal follows:

a. The program would be distributed by the Department of Commerce, under guidelines provided by the Broadband Council.
b. Available funds would be apportioned to each state based on a formula developed by the Broadband Council. The formula would include an evaluation of the population, household income, the costs of deploying local broadband connections in that state, and other considerations.
c. The funding for each state would not be released until the state makes available an equivalent amount of funding on a dollar-for-dollar basis (i.e., matching program).
d. Each state would determine which entity will build the local big broadband network on a market-by-market basis in each local community. The network builder could be a commercial for-profit entity, a nonprofit entity, or a state or local government agency. The guidelines for distributing the funds should mandate that the state require the network builder to provide at least one-third of the funding for each project.
e. The network builder would own the local network but would be required, as a condition of receiving the federal/state funds, to ensure that the network is open to all lawful content and applications and that its prices are affordable. In addition, government policymakers would determine whether or not the network owner should be required to make a certain amount of capacity available on a wholesale basis to competitive retail service providers.

5. Openness
A big broadband Internet connection is useful only if you can use it. A superfast connection that can connect only to the websites chosen by the ISP—or a connection that does not provide access to distance learning, telemedicine, or the next creative application—would not serve the consumer or the nation’s economic or national security goals. At present, however, there is no legal requirement to provide consumers with access to the Internet services they desire, and there is no rule preventing operators of broadband networks from blocking or preferring Internet applications they choose. Some network operators have considered imposing extra charges to carry the traffic of certain entities or providing “enhanced” carriage for entities that can afford to pay for it. The result of these practices, if implemented, could lead to enhanced Internet access for entertainment but not for education.

The United States should adopt a simple provision ensuring that consumers can reach the services of their choice and that network owners cannot impede
or degrade any lawful service or application. The provision should be enforceable through a streamlined complaint process that ensures the rapid decisions that Internet-based services require. Penalties should be imposed for particularly egregious or anticompetitive conduct.19 The requirement should ensure that consumers can obtain access to the services and applications they desire and that new entrants and entrepreneurs are able to “innovate without permission.”

In addition, the United States should undertake an inquiry to determine whether owners and operators of broadband networks should make their facilities available for interconnection and resale by competitors on an unbundled basis. The European experience demonstrates that unbundling and interconnection creates a competitive dynamic that provides lower prices for consumers and can enhance broadband deployment and penetration. On the other hand, network owners allege that network sharing inhibits their incentive to invest. If these private network operators receive two-thirds of the funding they need to cover deployment costs, however, that would appear to address the investment incentive. Competitors often offer innovative services by adding to the network their own electronics that benefit consumers. At the same time, network owners must be assured that they are not subsidizing their competitors by being required to offer below-cost rates.


States and municipalities have demonstrated a keen interest in promoting broadband deployment. Unfortunately, at least fourteen states have passed laws that either prohibit or limit municipalities from providing telecommunications services. These laws take various forms:

- Minnesota requires municipalities to obtain a 65 percent supermajority vote before building a broadband network.
- Texas prohibits municipalities and municipal electric utilities from providing certificated telecommunications services either directly or indirectly through public-private partnerships.
- Nevada flatly prohibits municipalities and counties of certain sizes from providing telecommunications services.

Several municipalities have demonstrated that they can build sophisticated big broadband networks to serve their consumers. Furthermore, several reports document the economic benefits of broadband capability. Sweden and other countries in Europe are also deploying fiber. Given the shortage of available broadband capacity in the United States, it seems unwise for states to thwart the efforts of municipalities to deploy greater broadband.

Senator Frank Lautenberg and seven cosponsors have introduced legislation in the Senate (S. 1853), and Representative Rick Boucher and four cosponsors have introduced a bill in the House (H.R. 3281), to expressly permit municipalities to offer broadband service. The Senate bill has been approved by the Senate Commerce Committee and is awaiting action on the Senate floor. These bills would remove the legal uncertainties surrounding municipal broadband plans and would also make it clear that the private sector cannot use the state political process to block cities that want to build their own networks.

7. Enhancing Consumer Education Concerning the Benefits and Availability of Broadband Services

To take advantage of all that broadband has to offer, consumers need to have better information concerning the availability of services, the technical requirements for accessing these services (computer skills, etc.), and the benefits that broadband connectivity can provide to their lives. Many consumers are unaware of the e-government services, online instruction, telehealth, and other applications that could benefit them. Some state governments, including Kentucky, North Carolina, and others, have already taken steps to address this need. The federal government should support these efforts through offering funds, mapping broadband facilities, and enhancing the information of available federal e-government services.

8. Broadband Technology Research

The United States must increase the resources it devotes to basic research on

Given the shortage of available broadband capacity in the United States, it seems unwise for states to thwart the efforts of municipalities to deploy greater broadband.
Unlike previous international challenges, the race to deploy big broadband does not involve a space program or a military-industrial complex that consumers may read about but seldom see.

S. 1493, the Advanced Information and Communications Technology Research Act. The bill would establish a telecommunications program within the National Science Foundation (NSF) to focus research on the development of affordable advanced communications services. It would authorize $40 million in fiscal year 2008, increasing in $5 million increments to reach $60 million in FY 2012. The bill would also establish a Federal Advanced Information and Communications Technology Board within the NSF to advise the program on appropriate research topics. Finally, the bill would accelerate efforts initiated almost four years ago to promote spectrum-sharing technologies. It would require the National Telecommunications and Information Administration (NTIA) and the FCC to initiate, within a year, a pilot program that would make a small portion of spectrum available for shared use between federal and nonfederal government users.

Conclusion

The United States faces a challenge unlike any other in its history. The nation’s economic and social future depends on answering the growing demand for very high-speed broadband connectivity, a capability termed “big broadband.” Unlike previous international challenges, the race to deploy big broadband does not involve a space program or a military-industrial complex that consumers may read about but seldom see. The race to deploy big broadband is local. Big broadband connectivity affects the Internet experience of each and every home and business in America. The evidence is clear: America’s broadband resources are lacking. Failure to take on the challenge could lead to a decline in global competitiveness and an inability to educate students and provide needed telemedicine services. The country’s lackluster broadband performance results directly from its failure to adopt a comprehensive national broadband policy, with specific goals and significant public funding.

A Blueprint for Big Broadband proposes a solution that draws on the successful efforts of U.S. state and local governments and also those of other countries: the creation of a new Universal Broadband Fund to subsidize open, big broadband networks to every home and business by 2012. An investment of $8 billion per year will pay enormous dividends in cheaper network management and overall economic, educational, and social growth. We urge policymakers to adopt this plan as soon as possible to restore our nation’s leadership position in high technology and to prepare for the twenty-first century.

Notes

1. UCLA, Stanford, the University of California at Santa Barbara, and the University of Utah
4. A summary of the U.S. international rankings is contained in section III of the white paper.
5. The white paper was introduced by FCC Commissioner Michael J. Copps at the Congressional Internet Caucus Advisory Committee’s State of the Net Conference in January 2008: <http://www.netcaucus.org/conference/2008/preconference.shtml>.
6. The term “big broadband” is used in this article to distinguish it from “low-speed broadband” or “small broadband”—often used to measure the U.S. broadband capabilities. For purposes of this article, “low-speed broadband” or “small broadband” will typically refer to broadband services between the FCC standard (over 200 kbps) and 10 Mbps. Services typically falling within this definition include almost all wireless, DSL, and cable modem technologies. “Big broadband” refers to services faster than 100 Mbps, services that are increasingly available in Japan and are in consideration in several other countries.
7. A summary of the steps taken by other countries to promote broadband is contained in section VII of the white paper.

8. A summary of the steps taken by selected states to promote broadband is contained in section VI of the white paper.


11. The 109th Congress passed H.R. 6111, the Tax Relief and Health Care Act of 2006, which included a retroactive extension of the R&D tax credit from January 1, 2006, through December 31, 2007. Also included is language to strengthen the credit with a new credit formula called the Alternative Simplified Credit, effective January 1, 2007, through December 31, 2007.


13. Ibid.


15. One Economy (http://wwwone-economy.com), a nonprofit organization, has championed the need for tax credits to promote broadband connectivity in new housing developments for low-income residents. It claims to have changed the tax policies in forty-two states.

16. As discussed below, FiOS will save Verizon $4.9 billion through 2010 in reduced operating expenses from not having to maintain the old copper network.

17. Using a method that considers the correlation between penetration (or “density”) of an advanced communications technology and GDP per capita, California’s One Gigabit or Bust initiative estimated that pervasive broadband speeds could yield a $376 billion increase in the incremental gross state product (GSP) and 2 million additional jobs. See “A $376 Billion Opportunity for California,” in CENIC and Gartner, One Gigabit or Bust Initiative.


19. The language agreed to by AT&T in its merger agreement with BellSouth provides a useful model for this provision: “AT&T/BellSouth also commits that it will maintain a neutral network and neutral routing in its wireline broadband Internet access service. This commitment shall be satisfied by AT&T/BellSouth’s agreement not to provide or sell to Internet content or application providers, including those affiliated with AT&T/BellSouth, any service that privileges, degrades or prioritizes any packet transmitted over AT&T/BellSouth’s wireline broadband Internet access service based on its source, ownership, or destination.” (Ex parte letter from AT&T in WC Docket No. 06-74, December 28, 2006, p. 8)

20. See section V of the white paper.