



Universal BROADBAND

Targeting Investments to Deliver
Broadband Services to All Americans

BY BLAIR LEVIN



A project of the Aspen Institute Communications and Society Program
and the John S. and James L. Knight Foundation.

Universal Broadband

Targeting Investments to Deliver Broadband Services to All Americans

A White Paper on the Universal Service Recommendations
of the Knight Commission on the Information Needs of
Communities in a Democracy

written by
Blair Levin



THE ASPEN INSTITUTE
Communications and Society Program
2010

The Aspen Institute and the John S. and James L. Knight Foundation invite you to join the public dialogue around the Knight Commission's recommendations at www.knightcomm.org or by using Twitter hashtag #knightcomm.

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The Aspen Institute
One Dupont Circle, NW
Suite 700
Washington, DC 20036

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ISBN: 0-89843-531-5

Individuals are encouraged to cite this paper and its contents.
In doing so, please include the following attribution:

The Aspen Institute Communications and Society Program, *Universal Broadband:
Targeting Investments to Deliver Broadband Services to All Americans*,
Washington, D.C.: The Aspen Institute, September 2010.

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Cover background graphic was created in part at www.wordle.net.



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Contents

FROM REPORT TO ACTION.....	v
EXECUTIVE SUMMARY	vii
 UNIVERSAL BROADBAND:	
TARGETING INVESTMENTS TO DELIVER BROADBAND SERVICES	
TO ALL AMERICANS, <i>Blair Levin</i>	
The Knight Commission Recommendation	11
The Current Universal Service System	11
The Plan for Universal Broadband	13
Specific Actions.....	13
Who Should Do What	32
Conclusion	34
 APPENDIX	
About the Author.....	37
About the Communications and Society Program	39

From Report to Action

Implementing the Recommendations of the Knight Commission on the Information Needs of Communities in a Democracy

In October 2009, the Knight Commission on the Information Needs of Communities in a Democracy released its report, *Informing Communities: Sustaining Democracy in the Digital Age*, with 15 recommendations to better meet community information needs.

Immediately following the release of *Informing Communities*, the Aspen Institute Communications and Society Program and the John S. and James L. Knight Foundation partnered to explore ways to implement the Commission's recommendations.

As a result, the Aspen Institute commissioned a series of white papers with the purpose of moving the Knight Commission recommendations from report into action. The topics of the commissioned papers include:

- Universal Broadband
- Civic Engagement
- Government Transparency
- Online Hubs
- Digital and Media Literacy
- Local Journalism
- Public Media
- Assessing the Information Health of Communities

The following paper is one of those white papers.

This paper is written from the perspective of the author individually. The ideas and proposals herein are those of the author, and do not necessarily represent the views of the Aspen Institute, the John S. and James L. Knight Foundation, the members of the Knight Commission on the Information Needs of Communities in a Democracy, or any other institution. Unless attributed to a particular person, none of the comments or ideas contained in this report should be taken as embodying the views or carrying the endorsement of any person other than the author.

Executive Summary

The Knight Commission recognized that for there to be healthy news communities, all Americans need access to diverse sources of news and information. In the future, that means that all Americans will need access to broadband networks, and public policy should encourage broadband adoption. Yet current government programs to assure communication networks are available to all Americans will neither ensure that such networks are available nor encourage adoption.

This paper proposes a number of steps to achieve these goals. First, the paper outlines the steps necessary to make basic broadband available to all Americans, regardless of location. As an initial matter, the paper proposes setting a target of assuring that all Americans have access to a network capable of delivering 4 Mbps actual download speed and 1 Mbps actual upload speed. To do so requires a fund of approximately \$10 billion over 10 years. This money can be obtained by repurposing existing money from the Universal Service Fund, which is no longer efficiently serving the goal of connecting Americans to the universal communications medium.

One step that could be taken is reducing or freezing funds currently utilized for eligible telecommunications carriers (ETCs), Interstate Access Support and Interstate Common Line Support. Once the funds are identified, the government needs to determine a mechanism to distribute funds. The paper proposes that the funds be distributed through a transparent, market-based approach; that funds be provided only to areas where, without such funding, there is no private sector case to provide broadband; and that funds are provided to one provider per area. The criteria should be company and technology agnostic, and the recipients should be accountable for achieving universal broadband access in the relevant geographic areas. As the government rolls out the funding, it should do so in a manner that solves the least expensive access problems first. Ultimately, it will be too expensive to provide service to the last .2 percent of homes, so those homes should be served by satellite broadband.

To further assure deployment and operation of broadband networks everywhere, the government should create a broadband mobility fund to assure coverage in areas for which mobile costs are significantly greater (generally due to geographic issues such as mountainous terrain), provide middle mile support where operating costs are significantly greater due to the high cost of middle mile transit, and remove barriers to government funding of broadband networks.

The second major policy initiative would be to support the adoption of broadband by low-income Americans and other non-adopter communities. Numerous surveys show that low-income Americans adopt broadband at less than half the rate of wealthier Americans. Cost is the biggest factor, but it is not the only factor. Digital literacy and relevance also loom large as factors affecting adoption.

The paper makes a number of recommendations to increase adoption. The government should expand, and eventually transform, the current Lifeline and Link-Up programs from subsidizing voice services to making broadband affordable to low-income individuals. Government agencies and non-profits should form partnerships to address relevance barriers with targeted programs. Similarly, governments and non-profits should address digital literacy through a Digital Literacy Corps and an Online Digital Literacy Portal. The government should convene a working group to address adoption by persons with disabilities, a key non-adopter community. The government should also experiment, through a competition, to try new techniques to drive adoption.

In addition, the paper suggests that to drive both deployment and adoption, the country needs to improve broadband-related funding to community anchor institutions. This can be done by facilitating demand aggregation for public sector broadband facilities, such as health care facilities, and by enabling partnerships that focus on serving the needs of institutions that require more complex networks. The paper also recommends a number of steps to improve the use of broadband for economic development efforts.

UNIVERSAL BROADBAND:
TARGETING INVESTMENTS TO DELIVER
BROADBAND SERVICES TO ALL AMERICANS

Blair Levin

Universal Broadband

Targeting Investments to Deliver Broadband Services to All Americans

“Set ambitious standards for nationwide broadband availability and adopt public policies for encouraging consumer demand for broadband services.”

— Recommendation 8, *Informing Communities:
Sustaining Democracy in the Digital Age*

The Knight Commission Recommendation

The Knight Commission proposed that all Americans should have access to high-speed Internet services wherever and whenever they need it. This includes mobile access everywhere and affordable home service that provides access to an Internet service capable of receiving and transmitting high-definition programming comparable to that received over multichannel video services. As the Commission notes, however, current government policies, even the \$7.2 billion provided through the American Recovery Act and Reinvestment Act of 2009, will not be sufficient to ensure that all people in the United States have access to and can enjoy the benefits of universal digital citizenship. To remedy this gap, the Commission endorsed the use of government funds to spur deployment of broadband where networks do not exist and to develop applications and services that will make broadband more attractive to non-adopters.

This paper proposes a plan for achieving the goals set out by the Commission, primarily through the restructuring of the current federal Universal Service Fund. Over time, that fund, which currently outlays over \$8 billion per year, might be sufficient to achieve the Commission’s goals. As currently structured, however, it will not do so, as it neither efficiently targets the funds for universal deployment and adoption of broadband, nor does it incorporate an ability to experiment with ways to improve the return on the money it spends. The plan discussed below relies primarily on private investment to drive towards the Commission goals but seeks to target government investments in ways that will stimulate additional private funds to complete the job of connecting all America.

The Current Universal Service System

Universal service has been a national objective since the enactment of the Communications Act of 1934. The policy, now realized primarily through an assessment on interstate and international “end user” telecommunications charges, has been successful in achieving nationwide access and adoption of voice

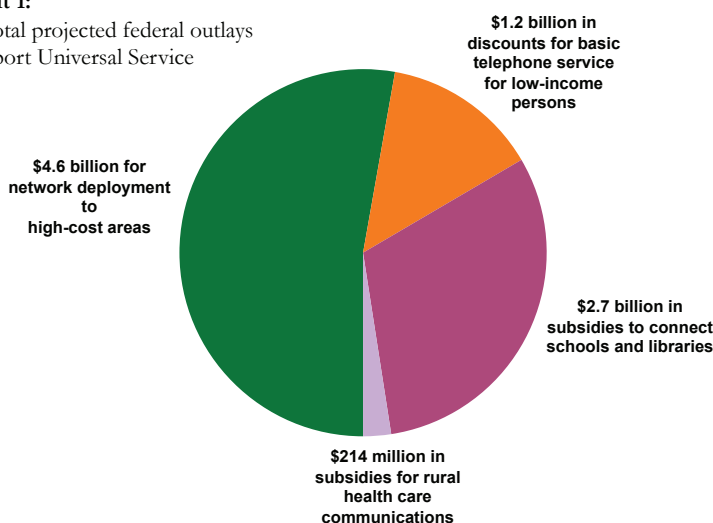
communications services. It is not yet designed, however, to achieve a similar end for broadband.

In 2010, the federal fund is projected to make total outlays of \$8.7 billion in the following categories:

- \$4.6 billion to support deployment of networks to high-cost areas, where population density or other factors would cause the price of services to consumers to be at a level that would not reasonably compare to urban areas (this is in addition to the 21 states that have similar high-cost funds that distribute a total of over \$1.5 billion)
- \$1.2 billion to provide discounts to make basic telephone service available and affordable to low-income consumers (in addition, 33 states have similar programs)
- \$2.7 billion to subsidize telecommunications services, Internet access and internal connections to enable schools and libraries to connect to the Internet (in addition, nine states have similar programs)
- \$214 million to subsidize rates for rural health care providers for communications services (in addition, at least 27 states support such services)

Exhibit 1:

2010 total projected federal outlays
to support Universal Service



Source: Federal Communications Commission

The Plan for Universal Broadband

The existing funding mechanisms target three particular gaps: first, the high cost of network deployment and operation in rural areas; second, low-income Americans unable to afford the cost of connectivity; and third, schools, libraries and health care facilities unable to afford connectivity.

These gaps must be addressed, but reform of each current mechanism is necessary to achieve the goals set out by the Knight Commission. Such reforms include targeting the funds to current gaps instead of previous gaps, targeting new deployment gaps, enabling institutions to collaborate more effectively and utilizing competitive mechanisms for distribution. In addition, there are new areas for which funding would be appropriate, such as addressing digital literacy, and new opportunities for specific, immediate economic development.

Funding could come from four areas:

1. existing funding
2. existing funding plus an increase in the assessment on the existing revenue base (known as the contribution factor)
3. funding from a new revenue base
4. funding from a congressional appropriation

Making better use of existing funding should be the first priority in any reform effort. The universal service contribution factor—an assessment on interstate and international charges that usually appears as a surcharge on consumers' phone bills—is already at about 15 percent (having risen dramatically in the last decade). Further increases would create both political and policy problems. Creating a new funding base, while probably inevitable in the long run, would add both political and policy complexity to the task of reforming universal service. Further, it is not necessary to achieve the goals of the Knight Commission. Funding from Congress for any large or permanent program is highly unlikely at this time and should, at most, only be considered for short-term, targeted actions. Moreover, there are significant funds in the current system that are not effectively serving public policy goals and should be repurposed to achieve the current communications imperatives for our country.

Specific Actions

A. Make Basic Broadband Available to All Americans, Regardless of Location

In order to design a plan to bring broadband to all Americans, one must make two initial determinations. First, one must determine the basic level of broadband service that deserves public support. Second, one must determine the gap between what the private sector would be willing to pay to deploy and operate the necessary networks and the amount it would actually cost to deploy and operate those networks.

As to the first determination, an appropriate target would be 4 Mbps of actual download speed and 1 Mbps of actual upload speed (hereafter called the Availability Target). This represents a speed comparable to what the typical broadband subscriber in the United States receives today. It would enable the uses that are common today, including a variety of educational, health care, news and information, communications (such as Voice over Internet Protocol and e-mail) and entertainment uses, such as over-the-top video. It is likely that the speed requirements for the most common applications will grow over time, but it is also possible that compression technology or shifts in customer usage patterns will slow the growth of bandwidth needs. Thus, for purposes of this paper, actions will be designed to support the 4 down/1 up actual offering, but the Federal Communications Commission (FCC) should review and reset the target for universal service support every four years. While the nation should aspire to, and will achieve, far higher speeds for most of the country, the speeds supported in this plan will assure that all citizens can participate in essential community functions. Any types of networks that facilitate such functions and require public investment should be able to receive support.

Country	“Universal” availability target (download)	Type of speed	Date
United States	4 Mbps	Actual	2020
Rep. of Korea	1 Mbps (99%)	Actual	2008
Finland	1 Mbps	Actual	2009
Australia	0.5 Mbps	Unspecified	2010
Denmark	.5 Mbps	Unspecified	2010
Ireland	1 Mbps	Unspecified	2010
France	0.5 Mbps	Unspecified	2010
Germany	1 Mbps	Unspecified	2010
United Kingdom	2 Mbps	Unspecified	2012
Australia	12 Mbps	Unspecified	2018

Critics may suggest that the 4/1 offering is not sufficiently ambitious. This is a debate worth having as the goals represent a policy judgment in which reasonable minds can differ. It should be remembered, however, that this is not a broadband goal for most of the country but rather a minimum technical requirement for being able to receive public support for the build-out and operation of private networks in markets where market forces will not otherwise provide broadband networks.

Second, this goal, in fact, is one of the highest universal targets anywhere in the world.

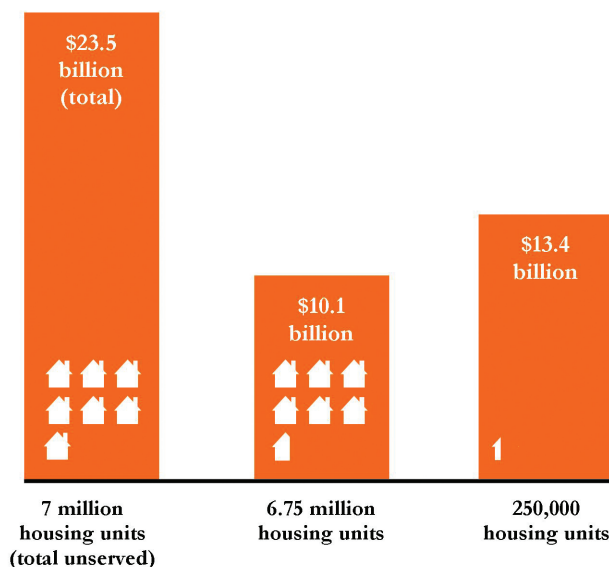
Third, the goal will have to be reevaluated in terms of actual use by most Americans, but more ambitious goals in terms of network speeds, at this time,


would cause such an increase in the assessment on the current system that it could backfire in terms of driving America's use of broadband. For example, the FCC calculates that going from 4 Mbps to 6 Mbps would increase the investment gap by more than 100 percent, but it is not clear that the benefits to the currently unserved would be material. Above all, the real ambition ought to be demonstrated in how the public uses the network. That is obviously related to speed, but speed is only one component of how we should think about America's ambition to use broadband to drive economic growth and improve society. While this target should be reevaluated every five years, the current 4/1 target should be the initial goal.

With that goal in mind, the most recent FCC study concludes that there are 7-million housing units (about 5 percent of all American housing units) without access to a terrestrial broadband infrastructure capable of meeting the Availability Target. The FCC further concluded that the cost of building and operating networks to reach these homes would be about \$32.4 billion dollars (which represents both capital expenditures and operating expenditures over 10 years). The expected revenue from these homes would be about \$8.9 billion, leaving an investment gap of \$23.5 billion over a 10-year period. The majority of this gap is caused by just 250,000 homes, which by themselves account for \$13.4 billion. Those homes, which are less than .2 percent of all housing units, could be served by satellite broadband. As such, this plan will focus on connecting 97 percent of the currently unserved. To meet this gap requires approximately \$10 billion over a 10-year period.

Exhibit 2: The Broadband Investment Gap

Number of U.S. homes without access to terrestrial broadband and projected 10-year investment gap to connect them to terrestrial broadband. Majority of gap (\$13.4 billion) is caused by final 250,000 homes.



 1 house = 1 million homes

Source: Federal Communications Commission

1. Repurpose existing funds for broadband

There are a number of problems with the current Universal Service Fund. Among these are that the fund is targeted to support analog voice requirements, rather than data networks; that the fund does not target unserved areas but rather funds particular kinds of companies; that the fund provides incentives for inefficient build outs; that there is no accountability for actually using the funds for their intended purposes; and that the support programs are not coordinated to leverage the funds to maximize broader policy objectives.

It is beyond the scope of this paper to outline all the policy steps necessary to reform the Universal Service Fund. It is, however, appropriate to focus on those reforms that would directly achieve the recommendations of the Knight Commission. In this regard, it is noteworthy that there are a number of current disbursements from the Universal Service Fund that do not effectively provide broadband universal service. These can and should be repurposed to fund networks that meet the Availability Target in unserved areas. Potential savings from these current disbursements include:

- Verizon and Sprint have already agreed to a reduction in funds provided under the programs that support competitive eligible telecommunications carriers (ETCs), pursuant to merger conditions, but the FCC has not yet acted to reduce these payments. Doing so will result in about \$4 billion in savings over 10 years.
- Interstate Access Support (IAS) payments were supposed to be reevaluated in 2005 but never were. The funds for this program, which supports legacy voice services, could be retargeted for broadband, creating approximately \$4 billion in savings over 10 years.
- Freezing Interstate Common Line Support (ICLS) would limit the growth of the existing high-cost fund and result in savings of about \$1.8 billion over 10 years. To accomplish this, the FCC would have to require that rate-of-return carriers move to incentive regulation. Rate-of-return regulation was designed for a monopoly provider of voice services. It does not work well in today's market, when companies have ways to monetize their investment beyond simply selling voice services. Requiring a change to incentive regulation would be consistent with current market structures, as broadband services are more competitive than voice services were when rate-of-return rules were adopted. This would also be consistent with existing FCC policy, which recognizes that rate-of-return regulation does not provide sufficient incentives for developing innovations in the way the firms do business.
- Phasing out remaining legacy high-cost support for competitive ETCs would yield up to an additional \$5.8 billion over the coming decade. This program, while well intentioned, has not led to incremental universaliza-

tion of voice services and has not helped to drive new broadband services. Rather, the program has created situations where, in some areas, the ETC program supports more than a dozen competitive ETCs for voice services. What’s more, in many instances, companies receive support for multiple handsets on a single family plan.

Together these actions would result in between \$15 and 16 billion in savings from the existing High-Cost program. This number should be sufficient to fill the investment gap, though some funds would be needed for some of the programs other than the high-cost fund, as discussed further below.

Closing the Broadband Investment Gap

Universal Service Fund disbursements that can be retargeted to universal broadband

Implement merger conditions for eligible telecommunications carriers (Verizon, Sprint)	\$4 billion
Phase out Interstate Access Support (IAS) subsidy	\$4 billion
Freeze Interstate Common Line Support (ICLS)	\$1.8 billion
Phase out remaining legacy High-Cost support for competitive eligible telecommunications carriers (ETCs)	\$5.8 billion
<hr/>	
Total saved over 10-year period	\$15.6 billion

In addition, it is important that the FCC adopt a long-term framework for intercarrier compensation reform that creates a glide path to eliminate per-minute charges while providing carriers an opportunity for adequate cost recovery. In addition, the FCC must establish interim solutions to address access charge arbitrage. While the policy goal here is not directly related to achieving universal broadband access (and therefore this paper will not go into detail on the subject), the economics are linked; many recipients of current High-Cost funds are also net recipients for the current intercarrier compensation system. Changing both systems at the same time without understanding the impact on current communica-

tions providers could result in loss of service in some areas. It is likely that several billion dollars of the savings from the High-Cost fund will have to be put into a fund for revenue replacement resulting from intercarrier compensation reform.

Similarly, as the FCC moves the goal of universal service from supporting voice to supporting broadband, it will have to redefine the obligations of carriers of last resort. Like intercarrier compensation, it is beyond the scope of this paper to delve into those issues, but the terms will have to be redefined for the proposed reforms to assure that broadband is offered everywhere.

2. Create a distribution mechanism for broadband connectivity

None of the existing universal service funds are directly targeted at supporting the shortfall in capital expenditures or operating expenditures that would keep a private entity from being willing to invest in building and operating a broadband network in a rural area. The FCC should create such a Connect America Fund according to the following principles:

- The fund should only provide support in geographic areas where, without such funding, there is no private-sector business case to provide broadband.
- The geographic areas to be funded should be based on neutral geographic areas rather than areas associated with specific industry segments (such as geographies defined by wire centers).
- There should be only one subsidized provider of broadband per geographic area. (This is a significant change from current policy. While there are negative consequences of not having multiple providers, adding a second wired network would add more than \$50 billion to the investment gap. Funding for just one additional wireless network would add about \$10 billion. Adding assessments on the current fund to pay for additional support would significantly reduce the affordability of broadband for millions of Americans.)
- The criteria for being eligible for support should be company and technology agnostic, as long as the recipient is able to provide the service that meets the specifications of the FCC.
- Recipients of the funds should be accountable for their use, subject to enforceable time lines for achieving universal broadband access, and subject to other broadband provider of last resort obligations.

In addition, the funds should be distributed according to criteria that are transparent and, where feasible, subject to market mechanisms. The most attractive of these utilizes a reverse auction in which the government specifies the broadband characteristics it seeks in the unserved area (such as the Availability Target) and asks firms to bid for the right to meet those objectives. This technique has the advantage of avoiding a government beauty contest in which the government

chooses on the basis of subjective criteria, a technique that history suggests is time consuming and difficult—as it is hard to compare one project with another. It also has the advantage of having the market set the appropriate level of subsidy, rather than having the government guess at the appropriate level, which history also suggests is difficult to do and which creates incentives on the part of private parties to create a record that would increase the level of subsidy required. There are difficulties in utilizing reverse auctions, such as defining the geographic area and the broadband characteristics, but those problems exist no matter what technique the FCC chooses. Reverse auctions also need to be designed to take into account the different business strategies firms may employ (such as differences in building in options to upgrade) to assure the greatest long-term return for the public.

In addition, as the FCC rolls out the fund, it should do so in a manner in which it solves the least expensive access problems first. For example, once the broadband mapping is completed in February 2011, the FCC should determine the geographic units where there is no broadband availability. It should then hold a reverse auction in which providers bid down to the amount they need to build and operate a broadband network in that area. Only a percentage of the geographic areas would be funded in the first auction, but the competitive dynamic would cause providers to compete with other providers from around the country for subsidies. This mechanism would therefore ensure that the cost to the government of providing service in that area reflects market costs and that the provider who will serve the area at the lowest cost will receive the subsidy. In doing so, the government should target funding capital expenditure shortfalls, rather than ongoing operating expenditure shortfalls, which are the bulk of the shortfalls and which also drive the greatest immediate job creation.

In addition, as the government is largely funding capital expenditures, it should do so in an efficient manner. As universal service funds represent a secure revenue stream, the government should award the funds in a lump sum by capitalizing the universal service revenues, rather than awarding smaller sums every year. This would encourage a faster deployment by the companies.

3. Create a Broadband Mobility Fund

Unlike wireline voice networks, wireless voice networks did not require explicit government subsidies to build out networks to nearly all Americans. Even today's advanced wireless networks, generally referred to as 3G networks, already cover 98 percent of the country's population. Some areas, however, are not covered due to the particular characteristics of building wireless networks. For example, 3G networks cover a mere 71 percent of West Virginia's population due to the mountainous terrain that characterizes so much of the state. This lack of coverage is even more significant because the foundations of the 3G networks will also serve as the foundations of the 4G networks being built out across America. Assuring a nationwide 3G build out would also lower the price of building out a nationwide

public safety network. As such, the FCC should create a Broadband Mobility Fund to provide sufficient funding (which a preliminary estimate suggests would be approximately \$300 million) to bring all states to a minimum level of 3G (or better) mobile service availability.

4. Examine middle mile costs and pricing, and provide funding, where appropriate, for middle mile support

Numerous studies have demonstrated that the cost of middle mile transport (which refers generally to the transport and transmission of data communications from the central office, cable head end or wireless switching station to an Internet point of presence or gateway) and the cost of second mile (transport from the remote terminal, cable node or base transceiver station to the central office, head end or mobile switching station) often make it uneconomical for business to offer broadband in rural areas. For the most part, this does not appear to be a deployment gap—approximately 95 percent of telecom central offices and nearly all cable nodes are served by fiber. Rather, it appears that the pricing for these services often makes it difficult for ISPs to offer an affordable service. Low density and demand in rural areas, coupled with the volume dependent middle mile cost structure, means that rural broadband operators do not benefit from the same economies of scale that service providers in denser areas enjoy. But in some cases, the high costs may also be caused by the FCC’s policies regarding the rates, terms and conditions of providing access to these services, generally referred to as special access services.

In light of this, the FCC should conduct an examination of middle mile and second mile costs and pricing and determine the extent to which it should help subsidize such costs as part of the Connect America Fund and to what extent it should reform its rules regarding special access.

5. Improve access to, and lower access costs of, rights of ways

Broadband networks, whether wired or wireless, rely on cables and conduits attached to public roads, bridges, poles and tunnels. Securing rights to this infrastructure can be a time-consuming process that discourages private investment. Government, through permitting, zoning and other practices, affects the costs and ease of access to such rights of way. Governments should do a number of things to improve the business case for deploying and upgrading broadband networks. The FCC should establish low, uniform rates for pole attachments; reform the process for resolving rights-of-way disputes; and, working with state and local governments, should improve the collection and dissemination of information about public rights of way. The Department of Transportation should attach conditions to federal financing of projects to facilitate the placement of conduits. Congress should adopt “dig once” legislation to enable conduit placement along all federally funded projects and the executive branch should develop a master contract to expedite the placement of wireless towers on federal government property and buildings.

6. Remove barriers to government funding of broadband networks

It is unusual for local governments to build and operate their own broadband networks. But some, after being frustrated by unsuccessful efforts to work with established carriers to meet local needs, have done so. This is similar to how, in the early part of the 20th century, public and cooperative-owned power utilities were created to fill the gap resulting from investor-owned power companies focusing on more profitable urban areas. And just as before, local governments seek to meet what they think are the needs of their constituents by investing in their own efforts.

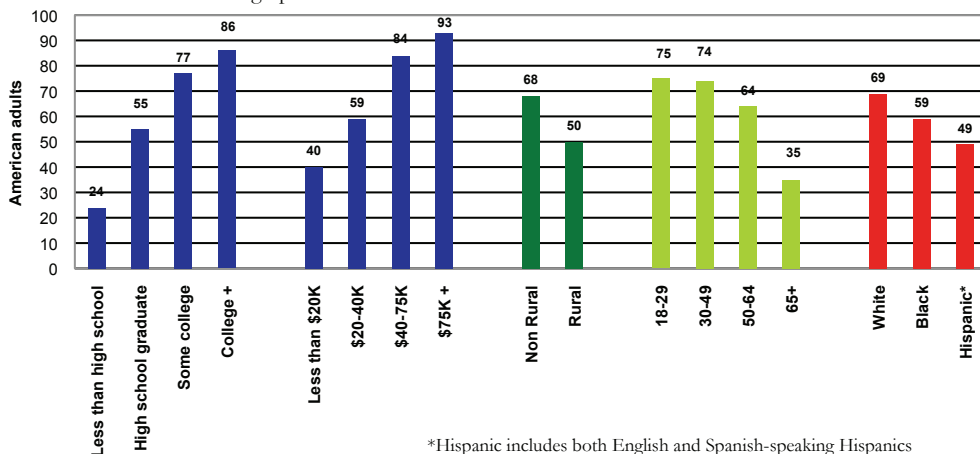
These efforts carry significant financial risks and may discourage private sector investment. But those risks and the impact on investment in a particular area are best left to those in the local area to determine. In the absence of sufficient private investment in networks, local governments should have the right to build networks that serve their constituents as they deem appropriate. A number of states, however, have passed laws that make such municipal efforts illegal or, in other cases, extremely difficult. Congress should clarify the current federal law to make it clear that local governments should have the right to engage in local deployment efforts.

B. Support the Adoption of Broadband by Low-Income Americans and Other Current Non-Adopter Communities

Forty percent of adults in households where the income is less than \$20,000 per year have broadband at home compared to 93 percent where the household income is greater than \$75,000. The FCC's recent study of non-adopters confirmed what other studies have suggested—that cost is the single largest reason, cited by over one-third of the respondents, non-adopters do not adopt. To achieve universal adoption of broadband, there will have to be government support for low-income persons, as there has been with telephone service.

Exhibit 3:

Broadband Adoption by American Adults by
Socio-Economic and Demographic Factors



*Hispanic includes both English and Spanish-speaking Hispanics

Source: Federal Communications Commission, *Connecting America: The National Broadband Plan*

But money is not the only issue. Eighty percent of the households with incomes of less than \$20,000 subscribe to premium television services whose monthly fees are comparable to, and often exceed, the cost of broadband. This might surprise some who view broadband as more essential than premium television, but it should come as no surprise for a variety of reasons.

First, while television brings value to the individual, broadband's value depends to a significant degree on how many people in one's social circle are also using it and how they are using it. Second, there is a large gap between the tools necessary to watch television and those necessary to use the Internet. Television requires very little. Broadband requires device literacy and a basic understanding of how

Exhibit 4:

Demographic and socio-economic overview of non-adopters by selected barriers
(% of those facing barrier, by demographic)

	Cost	Digital Literacy	Relevance	Lack of Availability
Male	40	45	43	49
Female	60	55	57	51
Parents with minor children at home	32	17	15	33
Those who report they have a disability	41	46	37	21
18-29	24	6	10	18
30-49	29	22	21	30
50-64	26	28	22	35
65+	19	44	44	16
White (not Hispanic)	54	65	71	78
Black (not Hispanic)	16	13	9	11
Hispanic (English or Spanish speaking)	27	16	14	5
Less than high school	34	29	27	10
High school graduate	42	51	47	38
Some college	14	12	15	33
College+	9	8	11	20
Under \$20K	38	24	24	22
\$20-30K	15	15	14	15
\$30-40K	10	10	7	10
\$40-50K	7	9	10	7
\$50-75K	5	8	11	5
\$75-100K	3	4	2	3
Over \$100K	2	2	3	2
Don't know/refused	21	28	30	21
Urban	37	28	24	8
Suburban	38	44	47	42
Rural	21	26	25	46

Source: Federal Communications Commission survey, October-November 2009

to find and locate trustworthy, substantive content; how to safely interact online; and how to protect personal information. Moreover, using the Internet requires its users to be literate. Fourteen percent of the adult population in the United States, or 30 million people, read at below basic literacy levels, while another 63 million read at just the basic level. Literacy levels do not interfere with television usage, but without sufficient content geared towards those with lower reading levels, the utility of the Internet for those Americans drops dramatically. In short, there is no digital literacy without basic literacy. But in the future, given the adoption of broadband among young people, it is likely that the path to basic literacy will pass through the desire to be literate on broadband.

The FCC's data confirm how these factors play into the decision not to adopt. Twenty-two percent of non-adopters cite digital literacy-related factors as their primary reason for non-adoption, while 19 percent of non-adopters cite lack of relevant online content.

What this means is that any program to achieve universal broadband must address a variety of factors beyond those required to achieve universal telephony or universal broadcast adoption. While cost is a primary factor, there must be programs to address the variety of factors that affect adoption. The Knight Commission Report recognized this need and recommends integrating "digital and media literacy as critical elements for education at all levels through collaboration among federal, state and local education officials." That recommendation will be considered in a separate paper on digital and media literacy by Renee Hobbs, but this paper will also explore those issues in the context of current or expanded universal service policies.

Among the specific steps the FCC and other parts of the government should take to increase adoption are the following:

- 1. Expand and eventually transform the current Lifeline and Link-Up programs from subsidizing voice services to making broadband affordable to low-income individuals**

In the mid-1980s, the FCC created Lifeline Assistance and Link-Up America to ensure that low-income Americans could afford local telephone service. Lifeline subsidizes the cost of the service by directly paying service providers on behalf of a qualified consumer. Link-Up provides a one-time discount on the initial installation of telephone service.

Over time, these programs should be transformed to provide support for broadband connectivity. As an initial matter, the FCC and the states, many of which provide similar assistance, should require service providers to permit Lifeline customers to apply the subsidy payment to any service or package that includes basic voice service, including packages with broadband that meet the standards

established by the FCC. As Voice over Internet Protocol is often less expensive than traditional voice services, this would enable low-income Americans to enjoy the benefits of bundling already enjoyed by wealthier Americans and, in doing so, would make broadband more affordable. Further, the FCC should expand service provider eligibility to include any broadband provider selected by the consumer so long as it meets the standard set by the FCC.

Less than 30 percent of households eligible for Lifeline participate, with the difficult enrollment process cited as one of the main reasons for limited participation. To address this issue, the FCC should integrate the Lifeline and Link-Up efforts with state and local government e-government efforts, including coordination with other low-income support programs to streamline enrollment for benefits. As evidenced by the experience of the state of Florida, an automatic enrollment process for low-income assistance programs will likely lead to increased enrollment in the Lifeline and Link-Up programs.

In addition, the FCC needs to run pilot projects to develop the design elements of the long-term program. These pilots should determine which parameters can most efficiently improve low-income adoption by studying the different effects of different levels of service subsidy, device subsidy, installation subsidy, minimum payment requirements, and alternative strategies such as integrating the subsidy programs with various educational opportunities, including job training or digital literacy training.

2. Address relevance barriers for specific groups through targeted partnerships

Certain demographic groups have below-average adoption rates. For example, the adoption rate for Americans over age 65 is 35 percent, for those who speak Spanish as their primary language the adoption rate is about 20 percent, and for persons with disabilities the adoption rate is 42 percent.

It is likely that the path to adoption for members of these groups is quite different. For each, the most effective strategy is likely to be focused on the specific barriers to adoption they face. For example, for seniors, the barriers are more likely to be related to learning how to use the technology; for Hispanics, language related; and for those with disabilities, equipment related. As there are many private and non-profit entities with an interest in increasing the adoption rates of these and other discrete groups, the right approach is likely to be targeted partnerships that understand both the needs of and the distribution channels relied on by the persons in these groups.

These partnerships are already developing. For example a number of private entities, including leading Internet Service Providers (ISPs), and software and applications companies have joined together with leading non-profit groups for seniors to form The Project to Get Older Americans onLine (Project GOAL), which will work with seniors to encourage greater broadband adoption and use. All public entities, particularly those whose mission is to service the targeted

groups, should encourage such efforts. For example, the FCC should work with the National Institute on Aging to conduct a survey of older Americans to identify barriers they face to adoption and should work with the Department of Health and Human Services and the Social Security Administration to develop online materials to improve health care and customer service for Social Security.

3. Address digital literacy through a Digital Literacy Corps and an Online Digital Literacy Portal

As previously noted, Renee Hobbs' paper detailing action steps for implementing the Knight Commission recommendations will explicitly address how to incorporate digital literacy into the curriculum throughout educational institutions in the United States. This is clearly an important long-term effort.

In addition to that effort, there are two efforts that overlap with traditional universal service efforts that should be utilized to further digital literacy and therefore, universal adoption. First, Congress should consider funding the creation of a Digital Literacy Corps. There are many examples of in-person, digital training provided in local communities through community-based resources. The lessons of these programs, in addition to those of AmeriCorps, Senior Corps, and Learn and Serve America, should be used to create a model that builds national scale and operational capabilities (such as recruitment and training) to support locally based efforts. The Digital Literacy Corps should both target and recruit from population segments that are non-adopting populations. The training Corps members receive will not only benefit the community through greater adoption but will also provide the Corps members jobs and professional skills that would enhance future career prospects.

Second, every American should have access to free, age-appropriate content that teaches digital skills. Utilizing libraries, many of which have connectivity because of support from the E-rate program, such a program would serve as a gateway for those who first need to develop digital skills before purchasing broadband for the home. This Online Digital Literacy Portal, which should be launched through the collaborative effort of the FCC, the Department of Education, and the National Telecommunications and Information Administration (NTIA), should offer high-quality online lessons that users can access and complete at their own pace. This is similar to the successful effort that produced online safety programs available through OnGuardOnline.gov. It is also similar to the collaborative models that the Department of Housing and Urban Development and institutions of higher education have developed to utilize educational resources to revitalize communities. The portal's programs should be constantly evaluated and improved and can serve as a valuable resource for similar efforts to integrate digital literacy into the classroom.

4. Convene a working group to address adoption by persons with disabilities

Broadband creates great opportunities for persons with disabilities to enjoy new access to information, entertainment, goods and services, as well as jobs. For these opportunities to be realized, however, hardware, software, services and digital content must be accessible and assistive technologies must be affordable. While there are examples of improvements, such as closed captioning of certain Internet delivered video offerings, our country is still far from where we need to be in terms of assuring that persons with disabilities have effective access to broadband. A significant percentage of those persons without broadband service describe themselves as having a disability, suggesting disability still serves as a barrier to adoption.

The federal government must be a leader in making itself a model of accessibility. To do so, the Chief Technology Officer should convene an executive branch working group that would, among other efforts, ensure that the federal government complies with Section 508 of the Rehabilitation Act. Section 508 requires federal agencies to develop and utilize accessible electronic technologies unless doing so would cause an undue burden. The working group should also coordinate policies across all federal agencies to facilitate funding of more efficient assistive technologies and publish a report on the state of broadband accessibility in the United States. As part of these efforts, the FCC should establish an Accessibility and Innovation Forum that would convene manufacturers, service providers, applications developers and others to share best practices and demonstrate new products, applications and assistive technologies. The forum should have a web presence that would enable an ongoing dialogue between consumers and providers to continually drive innovation and problem solving for the needs of specific disability communities.

5. Create a fund to stimulate competition to improve adoption efforts

Adoption policy should utilize competitive mechanisms to innovate new, measurable techniques. The FCC should use some part of the savings realized with the changes to the current High-Cost program, discussed above, to create a competition for increasing adoption in identified areas. For example, the FCC could set aside \$100 million to be provided to the provider in five areas who guarantees the greatest increase in adoption. This would take the form of a reverse auction in which a number of areas, far greater than five, are identified as eligible for the program. The winners of the grants will be those who guarantee the greatest increase in users for the least amount of money. Through such a market-based program, the country will learn which tactics are the most cost-effective for increasing broadband adoption.

Either as part of that effort, or as a separate competition, the FCC should encourage local governments to experiment in delivering services to low-adoption communities. There is some anecdotal evidence suggesting that, eventually, governments will find it cheaper to pay non-adopters to adopt, as it allows the

elimination of duplicative means of providing certain services. The FCC should encourage experimentation as it could be useful to all local governments, as well as to adoption efforts.

6. Monitor affordability

A goal of the Knight Commission, and an essential foundation for a universal access policy, is that broadband be affordable. Affordability is a difficult metric as it is subject to subjective judgments about what price point is “affordable” and because the price point must also be considered with the value created. For example, broadband at \$40 a month when offered with a premium video package offered at \$80 might not be affordable, but more expensive broadband offered at \$60 might be more affordable if a person were to be able to satisfy their video needs through Internet-delivered video that only costs an incremental \$30 a month. Broadband for a fixed-income, older American at \$50 a month might not seem affordable, but if there were health care applications that could save significant amounts of time, travel and money, broadband at \$100 a month might seem like the deal of the century.

While the task involves complexity, it is nonetheless critical that the government collect and analyze relevant information so as to be able to determine whether affordability is becoming less of a problem or more of a problem. At a minimum, the FCC and the U.S. Bureau of Labor Statistics should collect data on actual availability, penetration, prices, churn, and bundles offered by broadband service providers to consumers and businesses and should publish the data and analyses of these data, except where the publication would reveal competitively sensitive or copyrighted material. The information collected should include information related to switching barriers, such as early termination fees and contract lengths.

Further, the data collection effort should be mindful of significant developments in the market that could affect affordability. The FCC’s National Broadband Plan pointed to two major efforts over the next several years that could affect the market structure for broadband services. First, based on current deployment announcements, it appears that 75 percent of the population may have access to only one service provider (cable companies with DOCSIS 3.0 enabled infrastructure) that can offer very high download speeds. Second, the development of 4G wireless networks will enable wireless, with the added functionality of mobile, to compete on a performance basis more effectively with current fixed providers of low-end DSL. The first development might negatively affect affordability, depending on consumer need for higher performance, while the second development might improve affordability, by forcing low-end providers to either lower rates or improve their offerings (thereby providing more competition to the high-end cable offerings). The FCC should monitor the impact of such developments by, for example, analyzing the impact on prices of emerging 4G offerings and analyzing the different pricing strategies where cable faces a high-end competitor (such as where it faces a Verizon FiOS offering) and where it faces a lower-quality DSL offering.

C. Improve Funding to Anchor Institutions

The primary way to judge the success of a universal service program will be through its adoption in the mass market. As the Knight Commission correctly notes, however, part of doing so requires “public policies encouraging consumer demand for broadband services.” While entertainment is a primary driver of demand, and one that the government need not be involved in stimulating, there are other demand drivers that the government is directly involved in, such as applications that improve education, health care, public safety, job training and government performance generally.

To drive demand, the government itself has to have appropriate levels of broadband connectivity, and those would require institutional levels far beyond those available in the mass market. Connecting public anchor institutions such as schools, libraries, health care facilities and government buildings to such higher levels of connectivity would help drive demand and would lay the physical and economic groundwork for further upgrades in the mass market. To a significant extent the government has started doing this with the E-rate and Rural Health programs that were established in the 1996 Telecommunications Reform Act. As connectivity needs increase along with the opportunities for new services to be made available over broadband, these programs’ needs increase. These funds have traditionally been capped, which provides a valuable check on potential inefficiencies. The FCC should consider increasing these caps in light of new needs, but at the same time the FCC should consider imposing new caps on all the USF programs to ensure some discipline on expenditures.

To ensure that the public sector has access to the appropriate levels of connectivity, a number of steps should be taken:

1. Remove barriers to government funding of broadband networks

As noted above (section A.5), in the absence of local private sector deployments, local governments should have the right to build out networks to their constituents. Congress should make it clear that states should not be able to deprive local governments of that right. Similarly, local governments should be able to fund the build out or upgrade of existing networks to public sector anchor institutions. State laws should not put up barriers to such public investment.

2. Facilitate demand aggregation for public sector broadband facilities, including health care facilities

Various government policies, including those of grant-making agencies, frequently drive institutions to use dedicated, single-purpose networks that are not available for broader community use, limiting the effectiveness of embedded broadband networks. The problem is particularly acute in rural areas where limited broadband is available. Because broadband networks—particularly fiber optic

networks—have large economies of scale, bulk purchasing agreements can drive down the per megabit cost of access by a significant amount. At least 30 states have networks that enable various public institutions to aggregate demand to reduce costs. Various federal and state policies limit the benefits of such sharing, however, by precluding or limiting networks that serve one category of institution from serving other institutions and the community as a whole. For example, rather than maintain current policies that prohibit sharing, as it currently does, the FCC's E-rate and Rural Health programs should encourage the shared use of state and local networks by schools, libraries and health care providers when such networks provide the most cost efficient choice for meeting broadband needs. Further, the FCC should consider funding a competition to develop a set of demonstration projects and best practices for aggregating demand.

3. Facilitate partnerships to enable more effective purchasing and design of complex connectivity needs

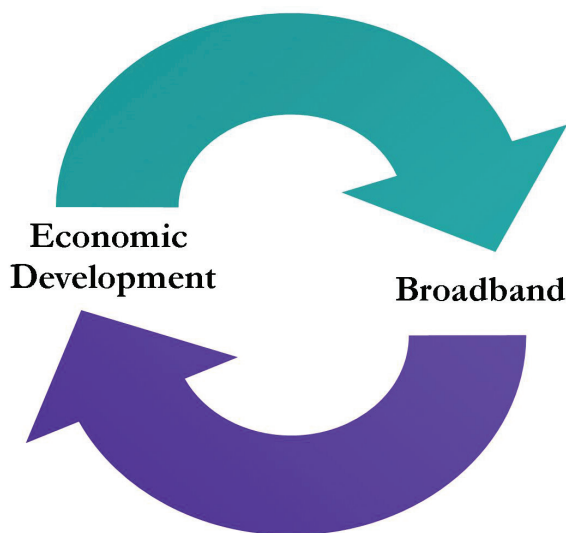
In addition to making sure that E-rate and Rural Health money is used effectively, governments should encourage the development of non-profit partnerships with the mission and capability of serving the broadband needs of public institutions. This model is based on the highly successful non-profits that have served the connectivity needs of research institutions. Expanding this model to other public institutions would have many benefits. Many community institutions lack the experience and resources necessary to maximize their utilization of broadband. Collaboration with others, including experts, on network design and how best to utilize applications to meet public needs, could result in lower costs and far more efficient and effective utilization.

A starting point would be to establish state coordinators and a consortium of anchor institutions. The coordinator would help on a variety of fronts, such as negotiating bulk equipment and connectivity purchase agreements. An additional lever would be to create flexibility in the E-rate and Rural Health funding rules to encourage joint grant applications, where educational and health facilities can combine forces to improve their broadband operations at a lower cost.

D. Create a Fund to Stimulate Competition to Improve Using Broadband for Economic Development Efforts

As noted above, government has historically provided subsidies for three recognized gaps: last mile deployment in high-cost areas, service for low-income persons, and connectivity for schools, libraries and rural health clinics. There is one new area for which USF funding should be considered, at least on an experimental basis: economic development.

There is significant anecdotal evidence that communities have been able to attract new businesses due to broadband connectivity and that other communities



have lost out on new opportunities due to not having broadband connectivity. Certainly local economic developers should view broadband as an essential component of local infrastructure development and should incorporate it into local economic development strategies.

But economic development efforts that depend on infrastructure often offer a chicken-and-egg dilemma: the development will not come without the infrastructure, but without the development it will be difficult to pay for the infrastructure. With water, power, roads and other infrastructure projects, there are a variety of long-standing techniques, such as various government bond mechanisms, that help close the gap—enabling financing for the infrastructure with sufficient certainty that the potential new employers can commit to the location. Broadband is a different kind of infrastructure, but communities would benefit from a spirit of experimentation to determine ways in which broadband can be used in specific cases to drive job creation and regional economic development. To accomplish that the government should do the following:

- 1. Provide support for state and regional economic development efforts to map broadband availability suitable for institutional purposes**

There are numerous federal government programs that support state and local economic development efforts. For example, the Department of Housing and Urban Development runs Empowerment Zones, Enterprise Community and Renewal Community programs, while the Department of Agriculture and the

Department of Commerce run a number of programs related to economic development. All should integrate broadband infrastructure and technological assessments into their programs. To make this job easier, the Economic Development Administration should create an online information center that gives regional planners access to information about broadband infrastructure and potential grants to assist with infrastructure. The center could also serve a match-making function by enabling communities to see what the needs of surrounding communities are so they can band together to aggregate needs and help stimulate greater private sector interest in deploying new or upgraded networks. As this effort would likely provide new incentives to drive deployment in areas that are unserved or underserved, it would also have the effect of increasing overall deployment and adoption in the United States.

2. Create a fund (Race to the Broadband Technology Opportunities Program), to be distributed on a competitive basis, to serve as a stimulus to broadband deployment or upgrades where such deployment would have a significant, immediate economic development impact

To further determine how broadband can be used to drive economic development, the FCC should take some funds—for example, \$100 million—from the restructuring of the current High-Cost program to create a competitive program for sustainable economic development. The fund would combine the best of the Department of Education’s Race to the Top Program with lessons learned from NTIA’s BTOP program. The money would be awarded on a competitive basis, with grant applicants providing information on how many jobs the grant would create and the grants being awarded on the basis of the most jobs created per grant. The competition, similar in structure to the Race to the Top program developed by the Department of Education, would be to provide a financial incentive to develop creative ways to utilize broadband to drive economic development. As with all such experiments, there are a number of questions about program design but the availability of such funds is likely to spark new community efforts.

E. Utilize Incentives for Creating Model Communities for Ultra-High Levels of Broadband Connectivity to Provide a Test-Bed for Next Generation Broadband

While the Knight Commission recommendation aims to assure universal adoption, and the primary focus is on meeting the most basic broadband needs, the Commission understood that success is not just base-level connectivity.

There is also a need to have networks that allow for the development and testing of ultra-high speed applications here in the United States. Not only is this important for long-term economic leadership, the development of such applications will have ripple effects throughout the entire broadband ecosystem. This will improve the business case for the deployment of faster networks not just in wealthier communities but also throughout the country. Such high-speed test beds are also

essential for driving the market to meet the ambitious goals that the Knight Commission recommended. To help drive the market for broadband networks to increasing speeds, the government should take the following steps:

1. Provide ultra-high speed connectivity to military bases

American military bases are communities that house, train, educate, and support tens of thousands of service personnel and their families. They are ideal communities for ultra-high speed broadband services due to their scale and the variety of services they need to offer their residents, including advanced medical applications, all kinds of education and training offerings, and advanced video communications. The facilities, as heavy users of energy, are also ideal settings for deploying new smart-grid applications. Many bases have high-speed networks for national security operations, so the cost of expanding the networks to all facilities on the base likely would be less than upgrading other kinds of communities to ultra-high speed networks.

To explore this idea, the Department of Defense should, in consultation with the Office of Science and Technology Policy, form a task force to make recommendations on installation selection, network configurations, and an initial list of next generation applications to be utilized through these networks. Particular attention should be paid to bases where the surrounding areas are lacking in broadband, so that the investment can help improve the economics of reaching those underserved communities. The task force should assure, of course, nothing in these plans compromises the level of force readiness.

2. Provide support for private efforts to create ultra-high speed communities through targeted actions similar to those used for economic development zones

There will be private efforts to deploy ultra-high speed networks to communities to accelerate the development of applications that can utilize such speeds. In other circumstances, the United States has utilized various tools to stimulate investment in targeted areas, such as tax incentives or regulatory relief to enter enterprise zones. Policies should use these kinds of levers to help develop a critical mass of such ultra-high speed communities through tax and regulatory incentives for making and maintaining such investments.

Who Should Do What

In this paper, we have recommended a number of different actions by various stakeholders. In this section of the paper, we summarize what each of the different stakeholders should do.

The Federal Communications Commission

The Federal Communications Commission is responsible for the bulk of the recommendations in this paper. It needs to reform the existing universal service program by transitioning it to a more efficient, broadband-focused program, including transitioning both the High-Cost fund and the Lifeline-Link-Up funds to address broadband rather than voice services. It also needs to create special funds for support of mobility and extraordinary middle mile costs. It needs to reevaluate the caps on support for schools and rural health facilities and the lack of caps on other universal service programs. Also, it needs to reform the rules regarding rights of way and work with others to provide better information about such access. The FCC also has to monitor affordability of broadband.

The Executive Branch

The executive branch can play a key role in forming partnerships with non-profits to develop targeted programs to drive adoption in low adoption communities. It should develop both the Digital Literacy Corps, as part of the community service initiative, and the Digital Online Portal, in conjunction with the non-profit and educational community. The executive branch can also play a role in improving access to rights of way to federally funded projects and federal buildings. The Bureau of Labor Statistics should assist the FCC in collecting data on broadband affordability. The Defense Department should take the lead in bringing ultra-high speed connectivity to military bases. The Economic Development Administration should create an online information center for regional planners and assist the FCC in establishing a broadband economic development competition. The Chief Technology Officer should oversee the executive branch initiative on assuring broadband access to persons with disabilities. NTIA should assist the FCC in developing the Race to the BTOP program.

Congress

Congress does not need to fund significant new programs but may need to approve small amounts for improvements to libraries as part of the Digital Online Portal initiative and for the Digital Literacy Corps. Congress should pass “dig once” legislation and may be called upon to pass targeted legislation assuring that the FCC has authority to take the steps necessary to transition the current universal service and intercarrier compensation framework to support broadband services instead of voice services.

State Governments

State governments need to remove the barriers to municipalities, work with others to help ease and lower the cost of access to rights of way, and work with local partners to assure that state facilities are part of efforts to aggregate broadband demand for community anchor institutions.

Local Governments

Local governments need to reform access to rights of way to provide more transparency and efficiency for private companies seeking to deploy or upgrade networks. Local governments will also play a key role in working with local groups to develop targeted programs for low-adopter communities. Local governments should also work with local partners to assure that local government facilities are part of efforts to aggregate broadband demand for community anchor institutions.

Non-Profits

The non-profit sector has a key role to play in funding some of the experiments that need to be done in terms of transitioning programs for low-income persons from voice to broadband. The sector also should fund specific operational non-profits to address specific target groups, such as seniors. The sector can also play a key bridge-building role in bringing together a number of community anchor institutions to drive more efficient and higher levels of connectivity in every community.

Telecommunications Companies

The private sector should assist the government in reforming rights of way by providing input into the kind of information that would most assist in deploying or upgrading networks. It can also assist in supporting the transition of low-income programs to supporting broadband.

Conclusion

Americans have benefited from government policies designed to assure that the communications and electronic media platforms of their time, telephone and broadcast networks respectively, were universally available and affordable. As we move into an era in which broadband networks become the dominant means of transmitting all manner of voice, video and data communications, a similar commitment to universal availability and affordability is just as important, if not more so. This paper sets out the actions needed to provide that universality by making basic broadband available to all Americans, regardless of location; supporting the provision of broadband to low-income Americans and other current non-adopter communities; and improving funding to anchor institutions. In addition, to fulfill the recommendations of the Knight Commission, it would also be beneficial to create a fund to stimulate competition to improve using broadband for economic development efforts and to utilize incentives for creating model communities for ultra-high levels of broadband connectivity to provide a test-bed for next-generation broadband applications.

APPENDIX



About the Author

Blair Levin became Communications & Society Fellow with the Aspen Institute Communications and Society Program on May 10, 2010, following his departure from the Federal Communications Commission, where he served as the Executive Director of the Omnibus Broadband Initiative. In his role at the Federal Communications Commission, Mr. Levin oversaw the development of a National Broadband Plan, a project mandated by Congress in the America Recovery and Reinvestment Act. Mr. Levin rejoined the Commission in June 2009 after eight years as an analyst at Legg Mason and Stifel Nicolaus. As *Barron's* magazine noted, Levin “has always been on top of developing trends and policy shifts in media and telecommunications...and has proved visionary in getting out in front of many of today’s headline making events.”

Previously, Mr. Levin served as Chief of Staff to FCC Chairman Reed Hundt from December 1993 through October 1997. Mr. Levin oversaw, among other matters, the implementation of the historic 1996 Telecommunications Reform Act, the first spectrum auctions, the development of digital television standards, and the Commission’s Internet initiative.

Prior to his position with the FCC, Mr. Levin was a partner in the North Carolina law firm of Parker, Poe, Adams and Bernstein, where he represented new communications ventures, as well as numerous local governments on public financing issues. He is a summa cum laude graduate of Yale College and Yale Law School.

The Aspen Institute

Communications and Society Program

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The Communications and Society Program is an active venue for global leaders and experts to exchange new insights on the societal impact of digital technology and network communications. The Program also creates a multi-disciplinary space in the communications policy-making world where veteran and emerging decision-makers can explore new concepts, find personal growth, and develop new networks for the betterment of society.

The Program's projects fall into one or more of three categories: communications and media policy, digital technologies and democratic values, and network technology and social change. Ongoing activities of the Communications and Society Program include annual roundtables on journalism and society (e.g., journalism and national security), communications policy in a converged world (e.g., the future of international digital economy), the impact of advances in information technology (e.g., "when push comes to pull"), and serving the information needs of communities. For the past three years, the Program has taken a deeper look at community information needs through the work of the Knight Commission on the Information Needs of Communities in a Democracy, a project of the Aspen Institute and the John S. and James L. Knight Foundation. The Program also convenes the Aspen Institute Forum on Communications and Society, in which chief executive-level leaders of business, government and the non-profit sector examine issues relating to the changing media and technology environment.

Most conferences utilize the signature Aspen Institute seminar format: approximately 25 leaders from a variety of disciplines and perspectives engaged in roundtable dialogue, moderated with the objective of driving the agenda to specific conclusions and recommendations.

Conference reports and other materials are distributed to key policymakers and opinion leaders within the United States and around the world. They are also available to the public at large through the World Wide Web, www.aspeninstitute.org/c&s.

The Program's Executive Director is Charles M. Firestone, who has served in that capacity since 1989, and has also served as Executive Vice President of the Aspen Institute for three years. He is a communications attorney and law professor, formerly director of the UCLA Communications Law Program, first president of the Los Angeles Board of Telecommunications Commissioners, and an appellate attorney for the U.S. Federal Communications Commission.