AVAILABILITY

CHAPTER 8

EVERYONE IN THE UNITED STATES TODAY should have access to broadband services supporting a basic set of applications that include sending and receiving e-mail, downloading Web pages, photos and video, and using simple video conferencing.[1]

Ensuring all people have access to broadband requires the Federal Communications Commission (FCC) to set a national broadband availability target to guide public funding. An initial universalization target of 4 Mbps of *actual* download speed and 1 Mbps of *actual* upload speed, with an acceptable quality of service for interactive applications, would ensure universal access.[2]

This represents a speed comparable to what the typical broadband subscriber receives today, and what many consumers are likely to use in the future, given past growth rates.[3] While the nation aspires to higher speeds as described in Chapter 2, it should direct public investment toward meeting this initial target.

A universalization target of 4 Mbps download and 1 Mbps upload is aggressive. It is one of the highest universalization targets of any country in the world. Many nations, such as South Korea and Finland, have already adopted short-term download targets around 1 Mbps (see Exhibit 8-A). Over time, these targets, both in the United States and abroad, will continue to rise.

It is possible the speed requirements for the most common applications will grow faster than they have historically. But it is also possible compression technology or shifts in customer usage patterns will slow the growth of bandwidth needs. To account for this uncertainty, the FCC should review and reset this target for public investment every four years.[5]

RECOMMENDATIONS

The FCC should conduct a comprehensive reform of universal service and intercarrier compensation in three stages to close the broadband availability gap.

Stage One: Lay the foundation for reform (2010–2011)

- The FCC should improve Universal Service Fund (USF) performance and accountability.
- The FCC should create the Connect America Fund (CAF).
- The FCC should create the Mobility Fund.
- The FCC should design new USF funds in a tax-efficient manner to minimize the size of the gap.

BOX 8-1:

National Broadband Availability Target

Every household and business location in America should have access to affordable broadband service with the following characteristics:

- *Actual* download speeds of at least 4 Mbps and *actual* upload speeds of at least 1 Mbps
- An acceptable quality of service for the most common interactive applications

The FCC should review and reset this target every four years.

Exhibit 8-A: Universalization Goals in Selected Countries[4]

Country	"Universal" availability target (download)	Type of speed	Date
United States	4 Mbps	Actual	2020
South Korea	1 Mbps (99%)	Actual	2008
Finland	1 Mbps	Actual	2009
Australia	0.5 Mbps	Unspecified	2010
Denmark	0.5 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

- Throughout the USF reform process, the FCC should solicit input from Tribal governments on USF matters that impact Tribal lands.
- The FCC should take action to shift up to $15.5 billion over the next decade from the current High-Cost program to broadband through common-sense reforms.
- The FCC should adopt a framework for long-term intercarrier compensation (ICC) reform that creates a glide path to eliminate per-minute charges while providing carriers an opportunity for adequate cost recovery, and establish interim solutions to address arbitrage.
- The FCC should examine middle-mile costs and pricing.

Stage Two: Accelerate reform (2012–2016)

- The FCC should begin making disbursements from the CAF.
- The FCC should broaden the universal service contribution base.
- The FCC should begin a staged transition of reducing per-minute rates for intercarrier compensation.

Stage Three: Complete the transition (2017–2020)

- The FCC should manage the total size of the USF to remain close to its current size (in 2010 dollars) in order to minimize the burden of increasing universal service contributions on consumers.
- The FCC should eliminate the legacy High-Cost program, with all federal government funding to support broadband availability provided through the CAF.
- The FCC should continue reducing ICC rates by phasing out per-minute rates for the origination and termination of telecommunications traffic.

Accelerating broadband deployment

- To accelerate broadband deployment, Congress should consider providing optional public funding to the Connect America Fund, such as a few billion dollars per year over a two to three year period.

Congress should consider providing other grants, loans and loan guarantees

- Congress should consider expanding combination grant-loan programs.
- Congress should consider expanding the Community Connect program.
- Congress should consider establishing a Tribal Broadband Fund to support sustainable broadband deployment and adoption on Tribal lands, and all federal agencies that upgrade connectivity on Tribal lands should coordinate such upgrades with Tribal governments and the Tribal Broadband Fund grant-making process.

Government should facilitate Tribal, state, regional, and local broadband initiatives

- Congress should make clear that state, regional and local governments can build broadband networks.
- Federal and state policies should facilitate demand aggregation and use of state, regional and local networks when that is the most cost-efficient solution for anchor institutions to meet their connectivity needs.
- Congress should consider amending the Communications Act to provide discretion to the FCC to allow anchor institutions on Tribal lands to share broadband network capacity that is funded by the E-rate or the Rural Health Care program with other community institutions designated by Tribal governments.
- The federal government and state governments should develop an institutional framework that will help America's anchor institutions obtain broadband connectivity, training, applications and services.

8.1 THE BROADBAND AVAILABILITY GAP

Setting a target clarifies where the United States should focus its resources to universalize broadband. At present, there are 14 million people living in seven million housing units[6] that do not have access to terrestrial broadband infrastructure capable of meeting the National Broadband Availability Target.[7]

This broadband availability gap is greatest in areas with low population density.[8] Because service providers in these areas cannot earn enough revenue to cover the costs of deploying and operating broadband networks, including expected returns on capital, there is no business case to offer broadband services in these areas. As a result, it is unlikely that private investment alone will fill the broadband availability gap. The question, then, is how much public support will be required to fill the gap.

An FCC analysis finds that the level of additional funding required is approximately $24 billion (present value in 2010 dollars) as described in Exhibit 8-B.[9]

Exhibit 8-B presents the broadband availability gap in greater detail. Initial capital expenditures ("initial capex") are the incremental investments required to *deploy* networks that can deliver the targeted level of service to everyone in the United States; this covers new networks and upgrades of existing networks. "Ongoing costs" are the incremental costs that must be incurred to *operate* those networks. They include the cost of replacing old or outdated equipment, access to middle-mile transport and other continuing costs such as customer service, marketing and network operations.

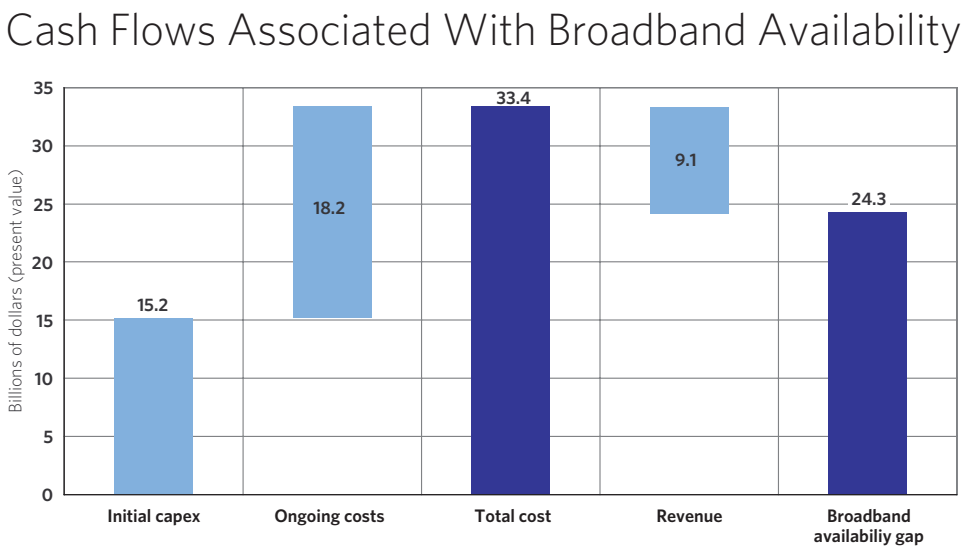
"Revenue" includes all incremental revenue generated as a result of deploying the networks that meet the National Broadband Availability Target, whether the revenue comes from the sale of voice, data or, in limited cases, multichannel video services.

Adding initial capex and continuing costs and subtracting revenue yields a gap of approximately $24 billion.[11]

This estimate is based on a number of key assumptions:

- First, the gap was calculated based on the economics of terrestrial technologies only, although a variety of technologies and architectures were considered. While satellite is capable of delivering speeds that meet the National Broadband Availability Target,[12] satellite capacity can meet only a small portion of broadband demand in unserved areas for the foreseeable future.[13] Satellite has the advantage of being both ubiquitous and having a geographically independent cost structure, making it particularly well suited to serve high-cost, low-density areas. However, while satellite can serve *any* given household, satellite capacity does not appear sufficient to serve *every* unserved household. In addition, the exact role of satellite-based broadband and its impact on the total cost of universalizing access to broadband depends on the specific disbursement mechanism used to close the broadband availability gap.
- Second, this calculation assumes that, whenever possible, a market-based mechanism will be used to select which providers receive support (as discussed in Section 8.3), and that there is competitive interest in receiving a subsidy to extend broadband to an unserved area. But it is impossible to know precisely how and whether this will occur until the details of the distribution mechanism are defined.
- Third, the estimated gap does not assume that currently announced fourth-generation (4G) wireless buildouts will provide service that meets the target without investments incremental to the planned commercial builds. Fourth-generation technology holds great promise and will likely play a large role in closing the broadband availability gap if speed and consumer satisfaction are comparable to traditional wired service, such as that provided over Digital Subscriber Line (DSL) or cable modem. If buildouts occur as announced, about five million of the seven million unserved housing units will have 4G coverage.[14] However, in order to provide actual download speeds of 4 Mbps or more, it may be necessary for providers to make investments that are incremental to their planned commercial builds. The FCC will revisit this issue as this new technology is implemented.
- Fourth, the estimated gap does not include any amounts necessary to support companies that currently receive universal service support for voice and already offer broadband that meets the National Broadband Availability Target. Some federal USF amounts indirectly support broadband, and going forward will do so directly. Nor do the estimates take into account the impact on existing recipients of support if other providers receive support to build out broadband in an area where the current provider has a carrier of last resort obligation.
- Fifth, there are a number of recommendations throughout this plan that may lower the cost of entering or operating in currently unserved areas, or that could increase or decrease potential revenues. The calculation does not include the impact of any of these recommendations. To the extent

Exhibit 8-B:
The Present Value (in 2010 Dollars) of the Broadband Availability Gap is $24 Billion[10]



these recommendations are implemented, they may change the overall gap. The analysis also does not take into account any available federal, state, regional, Tribal, local or other funding sources that could help close the gap.

The support needs of different geographic areas are distinct and depend on many factors, including the existing network infrastructure and household density. In some areas, subsidizing all or part of the initial capex will allow a service provider to have a sustainable business. Elsewhere, subsidizing initial capex will not be enough; service providers will need support for continuing costs. Support for one-time deployment or upgrades will likely be enough to provide broadband to 46% of the seven million unserved housing units. Closing the gap for the remaining 54% of housing units will probably require support for both one-time and recurring costs.

Moreover, serving the 250,000 housing units with the highest gaps accounts for $14 billion of the broadband availability gap. As Exhibit 8-C depicts, this represents less than two-tenths of 1% of all housing units in the United States. The average amount of funding per housing unit to close the gap for these units with terrestrial broadband is $56,000.[15]

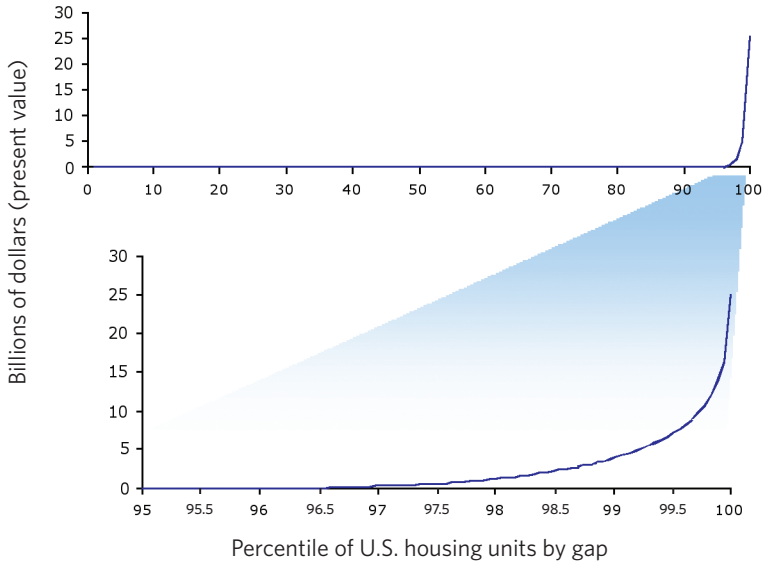
8.2 CLOSING THE BROADBAND AVAILABILITY GAP

Closing the broadband availability gap requires financial support from federal, state and local governments. This section will discuss the current state of government support for infrastructure deployment and will make recommendations for targeting this support more directly to close the availability gap.

The federal government spends nearly $10 billion annually on grants, loans and other subsidy programs that support communications connectivity; in 2010, the American Recovery and Reinvestment Act (Recovery Act) provided an additional $7.2 billion in one-time funding (see shaded rows Exhibit 8-D). Historically, much of this funding has supported voice service in certain areas of the country, but more recently it also has been used to modernize networks to deliver broadband as well. While this funding has improved broadband infrastructure in the U.S., federal efforts have not been coordinated to meet the universal broadband goals of Congress.

Nearly half of the funding appropriated in 2010 to support greater connectivity comes from the Recovery Act, which Congress passed in February 2009. Congress appropriated $7.2 billion to create the Broadband Telecommunications

Exhibit 8-C: The Most Expensive Unserved Housing Units Represent a Disproportionate Share of the Total Gap[16]



Opportunities Program (BTOP) at the U.S. Department of Commerce and the Broadband Initiatives Program (BIP) at the U.S. Department of Agriculture. BTOP "makes available grants for deploying broadband infrastructure in unserved and underserved areas in the United States, enhancing broadband capabilities at public computer centers, and promoting sustainable broadband adoption projects."[19] BIP "extend[s] loans, grants and loan/grant combinations to facilitate broadband deployment in rural areas."[20]

Awards under BTOP and BIP are ongoing, and many projects should help meet the goal of providing universal broadband access. For instance, the ION Rural Broadband Initiative will add middle-mile connectivity for 70 rural communities in upstate New York, and Project Connect South Dakota will provide a cash infusion to add 140 miles of backhaul service and 219 miles of middle-mile connections to an existing fiber optic network.[21]

Through the Broadband Data Improvement Act mapping process, the FCC may be able to improve its estimate of the gap. But it is impossible to know with precision how much the BTOP and BIP programs will contribute to closing the gap before all of the funds are awarded.

In any event, BTOP and BIP alone will not be sufficient to close the broadband availability gap. Other government support is required to complete the task of connecting the nation to ensure that broadband reaches the highest-cost areas of the country. Closing the broadband availability gap and connecting the nation will require a substantial commitment by states and the federal government alike. This commitment must include initial support to cover the capital costs of building new networks in areas that are unserved today, as well as ongoing support for the operation of newly built networks in areas where revenues will be insufficient to cover ongoing costs.

Exhibit 8-D:
Existing Sources of Federal Support for Communications Connectivity[17]

Agency	Program	Description	Annual funding amount
Federal Communications Commission	Universal Service Fund	Provides funding for companies serving high-cost areas, low-income consumers, rural health care providers, and schools and libraries.	$8.7 billion (FY2010)
National Telecommunications and Information Administration	Broadband Technology Opportunities Program	Grant program to promote deployment and adoption of broadband throughout the country, particularly in unserved and underserved areas. Priority in the second Notice of Funding Availability (NOFA) will be given to middle-mile broadband infrastructure projects that offer new or substantially upgraded connections to community anchor institutions, especially community colleges.	$4.7 billion (one-time ARRA)—includes at least $2.5 billion for infrastructure, $250 million for adoption, and $200 million for public computing centers.
Rural Utilities Service	Broadband Initiatives Program	Loan, loan guarantee and grant program to increase broadband penetration and adoption, primarily in rural areas. Priority in the second NOFA will be given to last-mile projects, and middle-mile projects involving current RUS program participants.	$2.5 billion (one-time ARRA)—includes at least $2.2 billion for infrastructure.
Rural Utilities Service	Telephone Loans and Loan Guarantees Program	Provides long-term, direct and guaranteed loans to qualified organizations, often telephone companies, to support investment in broadband-capable telephone networks.	$685 million
Rural Utilities Service	Rural Broadband Access Loans and Loan Guarantees Program	Provides loans and loan guarantees to eligible applicants—including telephone companies, municipalities, non-profits and Tribes—to deploy broadband in rural communities.	$298 million
Institute of Museum and Library Services	Library Services and Technology Act Grants	Provides funds for a wide range of library services including installation of fiber and wireless networks.	$164 million
Multiple agencies	Other programs[18]	Multiple purposes	$49 million
Total			$17.1 billion

8.3 UNIVERSAL SERVICE

Universal service has been a national objective since the Communications Act of 1934, in which Congress stated its intention to "make available, so far as possible, to all the people of the United States... a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges."[22]

The current federal universal service programs were created in the aftermath of the Telecommunications Act of 1996 at a time when only 23% of Americans had dial-up Internet access at home, and virtually no one had broadband.[23] While the federal USF and earlier programs have played a critical role in the universalization of voice service in the last century, the current USF was not designed to support broadband directly, other than for schools, libraries and rural health care providers.[24]

In 2010, the federal USF is projected to make total outlays of $8.7 billion through four programs (see Exhibit 8-E).[25] The High-Cost program, which subsidizes telecommunications services in areas where costs would otherwise be prohibitively high, will spend $4.6 billion. E-rate, which supports voice and broadband connectivity for schools and libraries, will spend $2.7 billion.[26] The Low Income program, which subsidizes the cost of telephone service for low-income people, will spend $1.2 billion, and the Rural Health Care program, which supports connectivity for health care providers, will spend $214 million.

At least 21 states have high-cost funds that collectively distribute over $1.5 billion.[28] Thirty-three states have a state low-income program, nine states have a state subsidy program for schools and libraries, and at least 27 states support state telehealth networks.[29] A number of states have established specific programs to fund broadband deployment.[30] Some states provide tax credits for investment in broadband infrastructure.[31]

The remainder of this section will discuss how the current federal High-Cost program should be modernized to shift from supporting legacy telephone networks to directly supporting high-capacity broadband networks. The federal Low Income program provides critical support to low-income households and will be discussed in Chapter 9. The Rural Health Care and E-Rate programs provide important support for broadband to critical institutions like schools, libraries and health care facilities, and will be addressed in Chapters 10 and 11.

Accelerating the pace of investment in broadband networks in high-cost areas will also require consideration of related policy issues that affect the revenue streams of existing carriers. The ICC system provides a positive revenue stream for certain carriers, which in turn affects their ability to upgrade their networks during the transition from voice telephone service to broadband service. In rural America USF and ICC represent a significant portion of revenues for some of the smallest carriers—i.e., 60% or more of their regulated revenues.[32] The rules governing special access services also affect the economics of deployment and investment, as middle-mile transmission often represents a significant cost for carriers that need to transport their traffic a significant distance to the Internet backbone. For that reason, the FCC needs to consider the middle mile in any discussion of government support to high-cost areas.[33]

USF and ICC regulations were designed for a telecommunications industry that provided voice service over circuit-switched networks. State and federal ratemaking created implicit subsidies at both the state and federal levels and were designed to

Exhibit 8-E:
The Federal Universal Service Fund[27]

Program	Description	FY 2010 disbursements (projected)
High Cost	Ensures that consumers in all regions of the nation have access to and pay rates for telecommunications services that are reasonably comparable to those in urban areas.	$4.6 billion
Low Income (Lifeline and Link-Up)	Provides discounts that make basic, local telephone service affordable for low-income consumers.	$1.2 billion
Schools and Libraries (E-rate)	Subsidizes telecommunications services, Internet access and internal connections to enable schools and libraries to connect to the Internet.	$2.7 billion
Rural Health Care	Provides reduced rates to rural health care providers for telecommunications and Internet access services and, on a pilot basis, support for infrastructure.	$214 million
Total		**$8.7 billion**

shift costs from rural to urban areas, from residential to business customers, and from local to long distance service.

Unfortunately, the current regulatory framework will not close the broadband availability gap. A comprehensive reform program is required to shift from primarily supporting voice communications to supporting a broadband platform that enables many applications, including voice. This reform must be staged over time to realign these systems to support broadband and minimize regulatory uncertainty for investment.

The goal of reform is to provide everyone with affordable voice and broadband. The reforms must be achieved over time to manage the impact on consumers, who ultimately pay for universal service. The FCC should target areas that are currently unserved, while taking care to ensure that consumers continue to enjoy broadband and voice services that are available today. Given that USF is a finite resource, the FCC should work to maximize the number of households that can be served quickly, focusing first on those areas that require lower amounts of subsidy to achieve that goal, and over time addressing those areas that are the hardest to serve, recognizing that the subsidy required may decline in the future as technology advances and costs decline. Ongoing support should be provided where necessary.

Sudden changes in USF and ICC could have unintended consequences that slow progress. Success will come from a clear road map for reform, including guidance about the timing and pace of changes to existing regulations, so that the private sector can react and plan appropriately.

Stage One of this comprehensive reform program starts with building the institutional foundation for reform, identifying funding that can be shifted immediately to jumpstart broadband deployment in unserved areas, creating the framework for a new Connect America Fund and a Mobility Fund, establishing a long-term vision for ICC, and examining middle-mile costs and pricing (see Chapter 4). In Stage Two, the FCC will begin disbursements from the CAF and Mobility Fund, while implementing the first step in reducing intercarrier compensation rates and reforming USF contribution methodology. Stage Three completes the transformation of the legacy High-Cost program, ends support for voice-only networks and completes reforms on ICC.

Before going into the details of this plan, it is important to consider the unique characteristics of each system in more detail.

The High-Cost Program

The High-Cost program ensures that consumers in all parts of the country have access to voice service and pay rates for that service that are reasonably comparable to service in urban areas. The program currently provides funding to three groups of eligible telecommunications carriers (ETCs) (see Box 8-2). In 2009, approximately $2 billion went to 814 rate-of-return carriers, $1 billion to 17 price-cap carriers and $1.3 billion to 212 competitive eligible telecommunications carriers (competitive ETCs).[34]

The current High-Cost program is not designed to universalize broadband. While some companies receiving High-Cost support have deployed broadband-capable infrastructure to serve most of their customers,[35] others have not. Carriers receiving High-Cost support are not required to provide any households in their service area with some minimal level of broadband service, much less provide such service to *all* households in their service area.

In addition, the High-Cost program only supports certain components of a network, such as local loops and switching equipment, but not other components necessary for broadband, like middle-mile infrastructure that transports voice and data traffic to an Internet point of presence. As a result, the amount of support provided is not appropriately sized for the provision of broadband in high-cost areas.

Because broadband is not a supported service, today there is no mechanism to ensure that support is targeted toward extending broadband service to unserved homes. Today, roughly half of the unserved housing units are located in the territories of the largest price-cap carriers, which include AT&T, Verizon and Qwest, while about 15% are located in the territories of mid-sized price-cap companies such as CenturyLink, Windstream and Frontier.[36] While current funding supports phone service to lines served by price-cap carriers, the amounts do not provide an incentive for the costly upgrades that may be required to deliver broadband to these customers.[37]

In addition, current oversight of the specific uses of High-Cost support is limited. While some states require both incumbents

BOX 8-2:

High-Cost Program Recipients

Rate-of-Return Carriers—Incumbent telephone companies that are given the opportunity to earn an 11.25% rate of return on their interstate services.

Price-Cap Carriers—Incumbent telephone companies that may only raise interstate rates on the basis of a formula that considers expense growth and a productivity growth factor.

Competitive ETCs—Competitive wireline and wireless providers that are certified by a state utility regulator or the FCC to receive funds from the High-Cost program based on the level of support provided to the incumbent in a given area.

and competitive ETCs to report on their use of funding for network infrastructure projects,[38] many states do not.[39] There is no uniform framework at the federal level to track the progress of any infrastructure deployment, broadband-capable or not, that is subsidized through the use of federal funds.

While the High-Cost program has made a material difference in enabling households in many high-cost areas of America to have access to affordable voice service, it will not do the same for broadband without reform of the current system.

Intercarrier Compensation

ICC is a system of regulated payments in which carriers compensate each other for the origination, transport and termination of telecommunications traffic. For example, when a family in Philadelphia calls Grandma in Florida, the family's carrier usually pays Grandma's carrier a per-minute charge, which may be a few cents a minute, for terminating the call. Estimates indicate that this system results in up to $14 billion in transfers between carriers every year.[40]

The current per-minute ICC system was never designed to promote deployment of broadband networks. Rather, ICC was implemented before the advent of the Internet when there were separate local and long distance phone companies. Local companies incurred a traffic-sensitive cost to "switch" or connect a call from the long distance company to the carrier's customer. The per-minute rates charged to the long distance carrier were set above cost and provided an implicit subsidy for local carriers to keep residential rates low and promote universal telephone service.[41] ICC has not been reformed to reflect fundamental, ongoing shifts in technology and consumer behavior, and it continues to include above-cost rates. The current ICC system is not sustainable in an all-broadband Internet Protocol (IP) world where payments for the exchange of IP traffic are not based on per-minute charges, but instead are typically based on charges for the amount of bandwidth consumed per month.

The current ICC system also has fundamental problems that create inefficient incentives. First, terminating rates are not uniform despite the uniformity of the function of terminating a call, which leads to unproductive economic activity. Rates vary from zero to 35.9 cents per minute,[42] depending on the jurisdiction of the call, the type of traffic[43] and the regulatory status of the terminating carrier.[44] Rate differences lead to arbitrage opportunities such as phantom traffic, in which traffic is masked to avoid paying the terminating carrier intercarrier compensation entirely, and/or redirected to make it appear that the call should be subject to a lower rate.[45] Such behavior leads to disputes and underpayment to the terminating carrier.

Most ICC rates are above incremental cost, which creates opportunities for access stimulation, in which carriers artificially inflate the amount of minutes subject to ICC payments. For example, companies have established "free" conference calling services, which provide free services to consumers while the carrier and conference call company share the ICC revenues paid by interexchange carriers.[46] Because the arbitrage opportunity exists, investment is directed to free conference calling and similar schemes for adult entertainment that ultimately cost consumers money, [47] rather than to other, more productive endeavors.

Broadband providers have begun migrating to more efficient IP interconnection and compensation arrangements for the transport and termination of IP traffic. Because providers' rates are above cost, the current system creates disincentives to migrate to all IP-based networks. For example, to retain ICC revenues, carriers may require an interconnecting carrier to convert Voice over Internet Protocol (VoIP) calls to time-division multiplexing in order to collect intercarrier compensation revenue. While this may be in the short-term interest of a carrier seeking to retain ICC revenues, it actually hinders the transformation of America's networks to broadband.[48]

ICC may be stalling the development of the broadband ecosystem in other ways as well. For example, there are allegations that regulatory uncertainty about whether or what intercarrier compensation payments are required for VoIP traffic,[49] as well as a lack of uniform rates, may be hindering investment and the introduction of new IP-based services and products.[50]

Moreover, fewer terminating minutes ultimately mean a smaller revenue base for intercarrier compensation. According to FCC data, for example, total minutes of use of incumbent carriers decreased from 567 billion minutes in 2000 to 316 billion minutes in 2008, a drop of 56%.[51] Price-cap carriers have no means of increasing per-minute rates to offset these declines. Even rate-of-return carriers, who are permitted to increase per-minute rates so they have the opportunity to earn their authorized rate of return, acknowledge that the current system is "not sustainable" and could lead to a "death spiral" as higher rates to offset declining minutes exacerbate arbitrage and non-payment.[52] As the small carriers recognize, revenues are also decreasing due to arbitrage and disputes over payment for VoIP traffic.[53]

The continued decline in revenues and free cash flows at unpredictable levels could hamper carriers' ability to implement network upgrade investments or other capital improvements. Any consideration of how government should provide supplemental funding to companies to close the broadband availability gap should recognize that ICC revenue is an important part of the picture for some providers.

Special Access Policies

High-capacity dedicated circuits are critical inputs in the provision of fixed and mobile broadband services in rural America. Special access circuits connect wireless towers to the core network,[54] provide fiber optic connectivity to hospitals and health centers,[55] and are sometimes the critical broadband link that traverses up to 200 miles between a small town and the nearest Internet point of presence.[56] The law requires that the rates, terms and conditions for these circuits be just and reasonable.[57]

The rates that firms pay for these critical middle- and second-mile connections have an impact on the business case for the provision of broadband in high-cost areas. Small local exchange carriers, wireless firms and small cable companies typically purchase these connections from other providers. It may well be the case that the cost of providing these circuits is so high that there is no private sector business case to offer broadband in some areas, even if the rates, terms and conditions are just and reasonable.

High-Cost funds today are generally distributed on the basis of loop and switching costs and not the cost of middle-mile transport of voice traffic. Because data traffic is aggregated on backhaul facilities, per-customer middle-mile costs will increase significantly as consumers and businesses use their broadband connections more.[58]

It is not clear whether the high costs of middle-mile connectivity in rural areas are due solely to long distances and low population density,[59] or also reflect excessively high special access prices as some parties have alleged.[60] The FCC is currently examining its analytic framework for regulating special access services generally (see Chapter 4). Because of the link between middle- and second-mile costs and special access policies, the FCC's review of its special access policies should be completed in concert with other aspects of this reform plan.

Comprehensive Reform

As federal and state regulators have recognized, the federal USF must be modernized to support the advanced broadband networks and services of the future—and must be modernized quickly, in a way that will accelerate the availability of broadband to all Americans.[61] Closing the broadband availability gap requires comprehensive reform of the USF High-Cost program, as well as consideration of ICC and an examination of special access costs and pricing. These actions should be consistent with a set of guiding principles:

- *Support broadband deployment directly.* The federal government should, over time, end all financial support for networks that only provide "Plain Old Telephone Service" (POTS) and should provide financial support, where necessary and in an economically efficient manner, for broadband platforms that enable many applications, including voice.[62]
- *Maximize broadband availability.* USF resources are finite, and policymakers need to weigh tradeoffs in allocating those resources so that the nation "gets the most bang for its buck." The objective should be to maximize the number of households that are served by broadband meeting the National Broadband Availability Target.[63]
- *No flash cuts.* New rules should be phased in over a reasonable time period. Policymakers must give service providers and investors time to adjust to a new regulatory regime.[64]
- *Reform requires federal and state coordination.* The FCC should seek input from state commissions on how to harmonize federal and state efforts to promote broadband availability.[65]

These guiding principles will inform a long-term plan for reform that will unfold over a decade (see Exhibit 8-F). This plan balances the need to direct more capital to broadband networks, particularly in high-cost areas, while recognizing the significant role that the private sector plays in broadband deployment.

One variable that will impact the pace of broadband availability is the time it will take to implement various reforms. The proposed reforms on the timeline presented could enable the buildout of broadband infrastructure to more than 99% of American households by 2020. Any acceleration of this path would require more funding from Congress, deeper cuts in the existing USF program or higher USF assessments, which ultimately are borne by consumers. While this plan makes the best use of the assets the country currently has to advance the availability of broadband, a more aggressive path is available if Congress so chooses.

Before discussing the reforms in Stage One to advance broadband availability, we address administrative reforms to improve the management and oversight of USF.

RECOMMENDATION 8.1: The FCC should improve Universal Service Fund (USF) performance and accountability.

The Universal Service Administrative Company (USAC), a not-for-profit subsidiary of the National Exchange Carrier Association (NECA), serves as the day-to-day administrator of USF, working under FCC direction. As part of its overall effort to make the FCC more open and transparent, data-driven and a model of excellence in government, the FCC is reviewing its oversight of the funds it administers to determine whether changes are necessary to improve efficiency and effectiveness. USF is part of that review and includes oversight and management of USAC and all of the universal service programs. While there is no doubt that federal universal service programs have been successful in preserving and advancing universal service, it is vital to ensure that these public funds are administered appropriately.

To provide stronger management and oversight of the program, the FCC already has begun to implement a number of changes:

- The FCC has moved oversight of the audit program to the Office of Managing Director and has directed USAC to revise its audit approach.
- The FCC has implemented a new Improper Payments Information Act (IPIA) assessment program that is tailored to cover all four USF disbursement programs, measure the accuracy of payments, evaluate the eligibility of applicants, test information obtained by participants, and ensure a reasonable cost while meeting IPIA requirements.
- The FCC has implemented a new compliance audit program for all four USF disbursement mechanisms and contributors. This audit program takes into account such factors as program risk elements and size of disbursements. This audit program is also conducted at a reasonable cost in relation to program disbursements and reduces unnecessary burdens on beneficiaries.

These new assessment and audit programs will reduce the cost of USF-related audits going forward and will be more efficient. These changes will also help deter fraud, waste and abuse and identify levels of improper payments.

As the FCC reforms its USF support and disbursement mechanisms after the release of the National Broadband Plan, it should also ensure that any future enhancements to the USF program have accountability and oversight provisions built in from the outset. The FCC should also examine its Memorandum of Understanding with USAC to ensure that it reflects programmatic changes and evaluate whether any modifications to its existing relationship with USAC are necessary.[66]

Across the four USF programs, there is a lack of adequate data to make critical policy decisions regarding how to better utilize funding to promote universal service objectives. For instance, recipients of USF funding currently are not required to report the extent to which they use the funding they receive to extend broadband-capable networks. As the FCC moves forward on the reforms in the plan, it should enhance its data collection and reporting to ensure that the nation's funds are being used effectively to advance defined programmatic goals.

Stage One: Laying the Foundation for Reform (2010–2011)

The FCC should create a Connect America Fund to address the broadband availability gap in unserved areas and provide any ongoing support necessary to sustain service in areas that already have broadband because of previous support from federal USF. The FCC should create a fast-track program in CAF for providers to receive targeted funding for new broadband construction in unserved areas. In addition, the FCC should create a Mobility Fund to provide one-time support for deployment of

Exhibit 8-F: Roadmap for USF/ICC Reform

Roadmap for USF/ICF Reform

	Stage One (2010-2011)	Stage Two (2012-2016)	Stage Three (2017-2020)
Universal service	Create Connect America Fund and Mobility Fund Adopt rules to eliminate Interstate Access Support and re-target funding levels to broadband Adopt rules to move rate-of-return carriers to incentive regulation Begin implementation of Sprint/Verizon Wireless merger commitments to reduce their competitive ETC funding to zero Adopt rules to phase out other competitive ETC support to zero over five years	Begin disbursements from new Connect America Fund and Mobility Fund Implement reformed contribution methodology Phase out all remaining competitive ETC support	Eliminate legacy High-Cost programs
Intercarrier compensation	Adopt framework for long-term intercarrier compensation reform, while implementing interim measures to curb arbitrage	Begin reductions in ICC rates	Phase out per-minute rates

3G networks (used for both voice and data) to bring all states to a minimum level of 3G availability which will improve the business case for investment in the rollout of 4G in harder to serve areas.

In Stage One, a series of actions will identify initial funds to be shifted from the current High-Cost program to the CAF and Mobility Funds. The FCC also should establish a glide path to long-term ICC reform, while taking interim steps to address phantom traffic and access stimulation to provide the industry a greater degree of revenue stability and predictability. Because middle- and second-mile connectivity is a key cost component for broadband service providers in high-cost areas, the FCC should also examine the rates for high-capacity circuits to ensure they are just and reasonable.

Throughout the USF reform process, the FCC should solicit input from Tribal governments on USF matters that impact Tribal lands.[67]

RECOMMENDATION 8.2: The FCC should create the Connect America Fund (CAF).

The FCC's long range goal should be to replace all of the legacy High-Cost programs with a new program that preserves the connectivity that Americans have today and advances universal broadband in the 21st century. CAF will enable all U.S. households to access a network that is capable of providing both high-quality voice-grade service and broadband that satisfies the National Broadband Availability Target. There are many issues that will need to be addressed in order to fully transition the legacy programs into the new fund. The FCC should create an expedited process[68], however, to fund broadband infrastructure buildout in unserved areas with the USF savings identified below.

As a general roadmap, CAF should adhere to the following principles:

- *CAF should only provide funding in geographic areas where there is no private sector business case to provide broadband and high-quality voice-grade service.*[69] CAF support levels should be based on what is necessary to induce a private firm to serve an area. Support should be based on the net gap (*i.e.*, forward looking costs less revenues).[70] Those costs would include both capital expenditures and any ongoing costs, including middle-mile costs, required to provide high-speed broadband service that meets the National Broadband Availability Target.[71] Revenues should include all revenues earned from broadband-capable network infrastructure, including voice, data and video revenues,[72] and take into account the impact of other regulatory reforms that may impact revenue flows, such as ICC, and funding from other sources, such as Recovery Act grants.[73] The FCC should evaluate eligibility and define support levels on the basis of neutral geographic units such as U.S. Census-based geographic areas, not the geographic units associated with any particular industry segment.[74]

  In targeting funding to the areas where there is no private sector business case to offer broadband service, the FCC should consider the role of state high-cost funds in supporting universal service and other Tribal, state, regional and local initiatives to support broadband. A number of states have established state-level programs through their respective public utility commissions to subsidize broadband connections, while other states have implemented other forms of grants and loans to support broadband investment.[75] As the country shifts its efforts to universalize both broadband and voice, the FCC should encourage states to provide funding to support broadband and to modify any laws that might limit such support.[76]
- *There should be at most one subsidized provider of broadband per geographic area.*[77] Areas with extremely low population density are typically unprofitable for even a single operator to serve and often face a significant broadband availability gap. Subsidizing duplicate, competing networks in such areas where there is no sustainable business case would impose significant burdens on the USF and, ultimately, on the consumers who contribute to the USF.
- *The eligibility criteria for obtaining support from CAF should be company- and technology-agnostic so long as the service provided meets the specifications set by the FCC.* Support should be available to both incumbent and competitive telephone companies (whether classified today as "rural" or "non-rural"), fixed and mobile wireless providers, satellite providers and other broadband providers, consistent with statutory requirements.[78] Any broadband provider that can meet or exceed the specifications set by the FCC should be eligible to receive support.
- *The FCC should identify ways to drive funding to efficient levels, including market-based mechanisms where appropriate, to determine the firms that will receive CAF support and the amount of support they will receive.*[79] If enough carriers compete for support in a given area and the mechanism is properly designed, the market should help identify the provider that will serve the area at the lowest cost.
- *Recipients of CAF support must be accountable for its use and subject to enforceable timelines for achieving universal access.* USF requires ongoing adjustment and re-evaluation to focus on performance-based outcomes.The recipients of funding should be subject to a broadband provider-of-last-resort obligation.[80] The FCC should establish timelines for extending broadband to unserved areas. It should define operational requirements and make verification of broadband availability a condition for funding.[81] The subsidized providers, should be subject to specific service quality and

reporting requirements, including obligations to report on service availability and pricing. Recipients of funding should offer service at rates reasonably comparable to urban rates.[82] The FCC should exercise all its relevant enforcement powers if recipients of support fail to meet FCC specifications.

RECOMMENDATION 8.3: The FCC should create the Mobility Fund.

As discussed in Chapter 3, both broadband and access to mobility are now essential needs, and America should have healthy fixed and mobile broadband ecosystems. Based on past experience with mobile wireless, it is not clear that government intervention will be necessary to enable a robust mobile broadband ecosystem in most parts of the country. According to American Roamer, 3G wireless networks, used for both voice and data, cover 98% of the population in the United States—more people than are passed by terrestrial broadband.[83]

However, some states have materially lower 3G deployment than the national average. For example, 77% of Alaska's population is covered by 3G networks, and a mere 71% of West Virginia's population is covered by 3G networks.[84]

This lack of coverage is even more significant if one considers that 3G infrastructure will be used in many cases to enable the rollout of 4G networks. U.S. companies will soon embark on 4G buildouts, expecting to reach at least 94% of the U.S. population by 2013.[85] The 4G footprint is likely to mirror closely the 3G footprint, because providers will use their existing infrastructure as much as possible. But how much this build will ultimately cost, and exactly which parts of the country it will cover, or not cover, remains unclear.

Timely, limited government intervention to expand the availability of 3G networks would help states with 3G buildout below the national standard to catch up with the rest of the nation and improve the business case for 4G rollout in harder-to-serve areas. In addition, expanding 3G coverage would benefit public safety users to the extent that public safety agencies use commercial services. It would benefit public safety by establishing more cell sites that could be used for a 4G public-private broadband network, serving commercial as well as public safety users.

The FCC should create a Mobility Fund to provide one-time support for deployment of 3G networks, to bring all states to a minimum level of 3G (or better) mobile service availability.[86] The FCC should select an efficient method, such as a market-based mechanism, for supporting mobility in targeted areas.

RECOMMENDATION 8.4: The FCC should design new USF funds in a tax-efficient manner to minimize the size of the gap.[87]

In certain circumstances, the Department of Treasury's Internal Revenue Service treats governmental payments to private parties for the purpose of making capital investments to advance public purposes as contributions to capital under section 118 of the U.S. Internal Revenue Code. Such treatment allows recipients to exclude the payments from income, but reduces depreciation deductions in future years. The Department of Treasury recently issued a ruling that BTOP grants to corporations that are restricted solely to the acquisition of capital assets to be used to expand the business and that meet a five-part test would be excluded from income as a nonshareholder contribution to capital under section 118(a).[88] Ultimately, the impact of taxes incurred may depend on the specific details of how the support is distributed, as well as the profitability of the service providers that receive support.

RECOMMENDATION 8.5: Throughout the USF reform process, the FCC should solicit input from Tribal governments on USF matters that impact Tribal lands.

In recognition of Tribal sovereignty, the FCC should solicit input from Tribal governments on any proposed changes to USF that would impact Tribal lands. Tribal governments should play an integral role in the process for designating carriers who may receive support to serve Tribal lands.[91] The ETC designation process should require consultation with the relevant Tribal government after a carrier files an ETC application to serve a Tribal land. It should also require that an ETC file a plan with both the FCC (or state, in those cases where a carrier is seeking ETC designation from a state) and the Tribe on proposed plans to serve the area.

BOX 8-3:

Tribal Input

The United States currently recognizes 564 American Indian Tribes and Alaska Native Villages (Tribes).[89] Tribes are inherently sovereign governments that enjoy a special relationship with the U.S. predicated on the principle of government-to-government interaction. This government-to-government relationship warrants a tailored approach that takes into consideration the unique characteristics of Tribal lands in extending the benefits of broadband to everyone.

Any approach to increasing broadband availability and adoption should recognize Tribal sovereignty, autonomy and independence, the importance of consultation with Tribal leaders, the critical role of Tribal anchor institutions, and the community-oriented nature of demand aggregation on Tribal lands.[90]

RECOMMENDATION 8.6: The FCC should take action to shift up to $15.5 billion over the next decade from the current High-Cost program to broadband through common-sense reforms.[92]

In Stage One, the FCC should identify near-term opportunities to shift funding from existing programs to advance the universalization of broadband. These targeted changes are designed to create a pathway to a more efficient and targeted funding mechanism for government support for broadband investment, while creating greater certainty and stability for private sector investment.

While these shifts could move as much as $15.5 billion (present value in 2010 dollars) into new broadband programs, they are not risk-free. Shifting identified funds to support broadband could have transitional impacts that will need to be carefully considered. To the extent the FCC does not realize the full amount of savings described below, it will need to identify additional opportunities for savings in Stage Two in order to achieve the National Broadband Availability Target, unless Congress chooses to provide additional public funding for broadband to mitigate some of hese risks.

First, the FCC should issue an order to implement the voluntary commitments of Sprint and Verizon Wireless to reduce the High-Cost funding they receive as competitive ETCs to zero over a five-year period as a condition of earlier merger decisions.[93] Sprint and Verizon Wireless received roughly $530 million in annual competitive ETC funding at the time of their respective transactions with Clearwire and Alltel in 2008. Their recaptured competitive ETC funding should be used to implement the recommendations set forth in this plan. This represents up to $3.9 billion (present value in 2010 dollars) over a decade.

Second, the FCC should require rate-of-return carriers to move to incentive regulation. As USF migrates from supporting voice telephone service to supporting broadband platforms that can support voice as well as other applications, and as recipients of support increasingly face competition in some portion of their service areas,[94] how USF compensates carriers needs to change as well.

Rate-of-return regulation was implemented in the 1960s, when there was a single provider of voice services in a given geographic area that had a legal obligation to serve all customers in the area and when the network only provided voice service. Rate-of-return regulation was not designed to promote efficiency or innovation; indeed, when the FCC adopted price-cap regulation in 1990, it recognized that "rate of return does not provide sufficient incentives for broad innovations in the way firms do business."[95]. In an increasingly competitive marketplace with unsubsidized competitors operating in a portion of incumbents' territories, permitting carriers to be made whole through USF support lessens their incentives to become more efficient and offer innovative new services to retain and attract consumers.

Conversion to price-cap regulation would be revenue neutral in the initial year of implementation, assuming that amounts per line for access replacement funding known as Interstate Common Line Support (ICLS) would be frozen (consistent with existing FCC precedent).[96] Over time, however, freezing ICLS would limit growth in the legacy High-Cost program on an interim basis, while the FCC develops a new methodology for providing appropriate levels of CAF support to sustain service in areas that already have broadband.[97] This step could yield up to $1.8 billion (present value in 2010 dollars) in savings over a decade.

The amount of interim savings achieved by freezing ICLS support during the CAF transition is dependent on the timing of the conversion to price caps and carrier behavior before the conversion. There is some chance that rate-of-return carriers could accelerate their investment before conversion to price caps to lock in higher support per line. Depending on the details of implementation, such a spike in investment activity could result in further broadband deployment that would narrow the broadband availability gap, but could increase the overall size of the fund.

Third, the FCC should redirect access replacement funding known as Interstate Access Support (IAS) toward broadband deployment.[98] Incumbent carriers received roughly $457 million in IAS in 2009.[99] When the FCC created IAS in 2000, it said it would revisit this funding mechanism in five years "to ensure that such funding is sufficient, yet not excessive."[100] That re-examination never occurred. Now, in order to advance the deployment of broadband platforms that can deliver high-quality voice service as well as other applications and services, the FCC should take immediate steps to eliminate this legacy program and re-target its dollars toward broadband. This could yield up to $4 billion (present value in 2010 dollars) in savings over a decade.

Freezing ICLS and refocusing IAS could have distributional consequences for existing recipients; individual companies would not necessarily receive the same amount of funding from the CAF as they might otherwise receive under the legacy programs. As the FCC considers this policy shift, it should take into account the impact of potential changes in free cash flows on providers' ability to continue to provide voice service and on future broadband network deployment strategies.

Fourth, the FCC should phase out the remaining legacy High-Cost support for competitive ETCs.[101] In 2008, the FCC adopted on an interim basis an overall competitive ETC cap of approximately $1.4 billion, pending comprehensive USF

reform.[102] As the FCC reforms USF to support broadband, it is time to eliminate ongoing competitive ETC support for voice service in the legacy High-Cost program.

In some areas today, the USF supports more than a dozen competitive ETCs that provide voice service,[103] and in many instances, companies receive support for multiple handsets on a single family plan. Given the national imperative to advance broadband, subsidizing this many competitive ETCs for voice service is clearly inefficient.[104] The FCC should establish a schedule to reduce competitive ETC support to zero over five years, which will be completed in Stage Two. In order to accelerate the phase-down of legacy support, the FCC could immediately adopt a rule that any wireless family plan should be treated as a single line for purposes of universal service funding.[105] As competitive ETC support levels are reduced, this funding should be redirected toward broadband. This could yield up to $5.8 billion (present value in 2010 dollars) in savings over a decade.

Depending on the details and timing of implementation, these actions collectively will free up to $15.5 billion (present value in 2010 dollars) in funding from the legacy High-Cost program between now and 2020. In addition to funding the CAF, the savings identified should be used to implement a number of USF and ICC recommendations in this plan. Approximately $4 billion (present value in 2010 dollars) will go to a combination of activities including the new Mobility Fund, potential revenue replacement resulting from intercarrier compensation reform, expanding USF support for health care institutions up to the existing cap, enabling E-rate funding to maintain its purchasing power over time, and conducting pilots for a broadband Lifeline program. The remaining amount, up to $11.5 billion (present value in 2010 dollars), can be expressly targeted to supporting broadband through the CAF so that no one is left behind.

RECOMMENDATION 8.7: The FCC should adopt a framework for long-term intercarrier compensation (ICC) reform that creates a glide path to eliminate per-minute charges while providing carriers an opportunity for adequate cost recovery, and establish interim solutions to address arbitrage.

During Stage One, the FCC should establish a framework for phased reform of ICC to eliminate current distortions that are created by recovering fixed network costs through per-minute rates for the origination and termination of traffic. The FCC also should provide carriers the opportunity for adequate cost recovery.

The first step of the staged reform should move carriers' intrastate terminating switched access rates to interstate terminating switched access rate levels in equal increments over a period of two to four years.[106] The FCC has authority to establish a new methodology for ICC, but Congress could make explicit the FCC's authority to reform intrastate intercarrier rates by amending the Communications Act in order to reduce litigation and expedite reform. Following the intrastate rate reductions, the framework should set forth a glide path to phase out per-minute charges by 2020.

To offset the impact of decreasing ICC revenues, the FCC should permit gradual increases in the subscriber line charges (SLC) and consider deregulating the SLC in areas where states have deregulated local rates.[107]

The FCC should also encourage states to complete rebalancing of local rates to offset the impact of lost access revenues. Even with SLC increases and rate rebalancing, some carriers may also need support from the reformed Universal Service Fund to ensure adequate cost recovery. When calculating support levels under the new CAF, the FCC could impute residential local rates that meet an established benchmark.[108] Doing so would encourage carriers and states to "rebalance" rates to move away from artificially low $8–$12 residential rates that represent old implicit subsidies to levels that are more consistent with costs.[109]

As part of comprehensive ICC reform, the FCC should adopt interim rules to reduce ICC arbitrage. The FCC should, for example, prohibit carriers from eliminating information necessary for a terminating carrier to bill an originating carrier for a call. Similarly, the FCC should adopt rules to reduce access stimulation and to curtail business models that make a profit by artificially inflating the number of terminating minutes. The FCC also should address the treatment of VoIP traffic for purposes of ICC.

RECOMMENDATION 8.8: The FCC should examine middle-mile costs and pricing.

As discussed above, the cost of second- and middle-mile connectivity has a direct impact on the cost of providing broadband service in unserved areas of the country. As a result, there is a direct link between whether the FCC's policies regarding the rates, terms and conditions of special access services are effective and the funding demands that will be placed on the new CAF. It may be the case that the cost of providing these circuits in areas supported by CAF is so high that there is no private sector business case to offer broadband services, even if the rates, terms and conditions are just and reasonable. An examination of middle-mile costs and pricing should occur in concert with the comprehensive USF/ICC reform program.

Stage Two: Accelerating Reform (2012–2016)

In Stage Two, the FCC will need to take further steps and answer a number of questions in order to accelerate reform of the High-Cost program and ICC. Some have proposed other ways that current High-Cost funding could be shifted towards broadband without having a deleterious effect on existing network deployment or operations.[110] The FCC should examine the

potential costs and benefits of additional ways to shift funding from the legacy High-Cost program to the CAF.

Implementation decisions in Stage Two will impact the speed with which broadband service is available throughout the United States and the overall cost of filling the broadband availability gap. Two critical issues will be to determine what ongoing support is necessary to sustain areas that already meet the National Broadband Availability Target due to current USF subsidies, and how rights and responsibilities should be modified when the incumbent is not the broadband provider-of-last-resort for a particular geographic area.[111]

During this phase, the FCC will begin distributing support from CAF, with an initial focus on extending broadband to unserved areas. Intrastate rates for ICC will be lowered over several years to interstate levels, and competitive ETC support will be phased out. The FCC should also stabilize USF for the future by expanding the USF contribution base.

RECOMMENDATION 8.9: The FCC should begin making disbursements from the CAF.

Once the FCC completes rulemakings to establish the parameters of the new CAF, it should begin to distribute CAF funding to discrete geographic areas that contain unserved households. The FCC potentially could focus first on those states that have a higher absolute number or percentage of unserved housing units per capita, or those states that provide matching funds for broadband construction.

RECOMMENDATION 8.10: The FCC should broaden the universal service contribution base.

Today, federal universal service funding comes from assessments on interstate and international end-user revenues from telecommunications services and interconnected VoIP services. Service providers typically pass the cost of these assessments on to their customers.

The revenue base for universal service contributions—telecommunications services—has remained flat over the last decade, even though total revenues reported to the FCC by communications firms grew from $335 billion in 2000 to more than $430 billion in 2008.[112] Broadband-related revenues are projected to grow steadily over time.[113]

Service providers are increasingly offering packages that "bundle" voice and broadband and deliver them over the same infrastructure. Assessing only telecommunications services revenues provides incentives for companies to characterize their offerings as "information services" to reduce contributions to the fund.

There is an emerging consensus that the current contribution base should be broadened, though with differing views on how to proceed. Some parties urge the FCC to expand the contribution base to include broadband revenues,[114] while others urge the FCC to assess broadband connections through a hybrid numbers- and connections-based approach.[115] Some parties suggest that the FCC should explore some method of assessing entities that use large amounts of bandwidth.[116] Some suggest that broadband should not be assessed because that would lessen broadband adoption, or that residential broadband should be exempted.[117]

As the FCC establishes the CAF, it also should adopt revised contribution methodology rules to ensure that USF remains sustainable over time. Whichever path the FCC ultimately takes, it should take steps to minimize opportunities for arbitrage as new products and services are developed and remove the need to continuously update regulation to catch up with technology and the market.

RECOMMENDATION 8.11: The FCC should begin a staged transition of reducing per-minute rates for intercarrier compensation.

The comprehensive ICC reforms adopted in Stage One should be implemented in Stage Two. The FCC should begin by reducing intrastate rates to interstate rate levels in equal increments over a period of time. The FCC should also implement interim solutions to address arbitrage, which will help offset revenue losses from the reduction in intrastate rates.

The FCC should continue the staged reduction of per-minute rates adopted as part of the comprehensive ICC reform. After reducing intrastate rates, the FCC could, for example, reduce interstate rates to reciprocal compensation rate levels for those carriers whose interstate rates exceed their reciprocal compensation rates, and reduce originating access rates in equal increments. Doing so would transition all ICC terminating rates to a uniform rate per carrier, which is an important step to eliminate inefficient economic behavior. The rate reduction in a staged approach will give carriers adequate time to prepare and make adjustments to offset the lost revenues.

Stage Three: Completing the Transition (2017–2020)

In Stage Three, the FCC should complete the transition with an emphasis on measurement and adjustment. To the extent there remain a small number of households that still do not have service meeting the National Broadband Availability Target, the FCC should consider alternative approaches to extend service to those areas.

RECOMMENDATION 8.12: The FCC should manage the total size of the USF to remain close to its current size (in 2010 dollars) in order to minimize the burden of increasing universal service contributions on consumers.

Unrestrained growth of the USF, regardless of reason, could jeopardize public support for the goals of universal service.[118]

The USF has grown from approximately $4.5 billion in 2000 to a projected $8.7 billion in 2010.[119] Portions of the USF are already capped, and with the implementation of the interim competitive ETC cap for the High-Cost program in 2008, the only significant parts of the fund that remains uncapped are the Low Income program and a part of the High-Cost program that provides access replacement funding (ICLS) to small, rate-of-return carriers.

The FCC's Low Income program has grown significantly in the last year,[120] in large part due to the efforts of companies to create targeted offerings for Lifeline recipients. Since Low Income support comes from an uncapped fund for which eligibility is determined by need, future demand for Low Income support will likely depend on many factors, including the state of the economy, the efficacy of outreach efforts, the level of subsidy provided, the price elasticity of demand among low-income households, the number and type of eligible service offerings and the evolution of consumer demand.

The FCC needs to proceed with measured steps to assure that as it advances the nation's broadband goals, it does not increase the USF contribution factor, which is already at a public historic high. Unless Congress chooses to provide additional public funding to accelerate broadband deployment, the FCC should aim to keep the overall size of the fund close to its current size (in 2010 dollars), while recognizing that the uncapped parts of USF may continue to grow due to factors outside the scope of this plan.[121] As the FCC implements the recommendations of the plan, it should evaluate innovative strategies to leverage the reach of existing governmental support programs and evaluate whether to adjust the relative proportion of supply-side versus demand-side subsidies over time.

RECOMMENDATION 8.13: The FCC should eliminate the legacy High-Cost program, with all federal government funding to support broadband availability provided through the CAF.

By 2020, the "old" High-Cost program will cease operations, and service providers will only receive support for deployment and provision of supported services (i.e., broadband that offers high-quality voice) through the CAF.

The FCC should set a deadline for recipients of USF to offer supported services. As noted above, based on current terrestrial technology, providing broadband to the 250,000 housing units with the highest gaps accounts for approximately $14 billion of the total investment gap, which represents an average cost of $56,000 per housing unit to serve the last two-tenths of 1% of all housing units.

The FCC should consider alternative approaches, such as satellite broadband, for addressing the most costly areas of the country to minimize the contribution burden on consumers across America. The FCC could consider means-tested consumer subsidies for satellite service. Another approach would be to provide a limited waiver of the requirement to offer broadband to providers that demonstrate that it is economically or technically infeasible to upgrade a line to offer broadband service,[122] while ensuring that consumers are able to continue to receive the high-quality voice service that they enjoy today.

RECOMMENDATION 8.14: The FCC should continue reducing ICC rates by phasing out per-minute rates for the origination and termination of telecommunications traffic.

The elimination of per-minute above-cost charges should encourage carriers to negotiate alternative compensation arrangements for the transport and termination of voice and data traffic. Given that there may be market power for terminating traffic, the FCC should carefully monitor compensation arrangements for IP traffic as the industry transitions away from per-minute rates, particularly in areas where there is little or no competition, to ensure that such arrangements do not harm the public interest.[123]

In summary, this roadmap for comprehensive universal service and ICC reform over the next decade represents a critical first step to ensure that all people in the United States have access to affordable broadband. To begin turning this roadmap into reality, the FCC will embark on a series of rulemakings to seek public comment and adopt rules to implement this reform. Although these proceedings will need to make specific decisions on implementation details, this plan sets forth a clear vision for the end state we seek to achieve as a nation—preserving the connectivity that Americans have today and advancing universal broadband in the 21st century.

Achieving this vision will not happen automatically. Indeed, significant changes to the existing regulatory structure will need to be made, including adjustments to existing USF support mechanisms to redirect funding away from supporting single-purpose voice telephone networks and toward supporting integrated, multifunctional broadband platforms in a more efficient manner. Additional capital must be directed toward broadband infrastructure. The plan sets forth a pathway to shift up to $15.5 billion (present value in 2010 dollars) over the next decade from the existing USF High-Cost program to broadband, with up to $11.5 billion specifically focused on broadband deployment in unserved areas. By implementing this plan as written, broadband will be available to more than 99% of the people in the United States by 2020.

This plan is not without risk. The baseline estimates that form the foundation for this plan are subject to a number of assumptions, most notably relating to the timing and outcome of regulatory proceedings.[124] The timing of some shifts such as implementation of the voluntary commitments from Sprint

and Verizon Wireless to give up their competitive ETC funding is known, while the timing of other changes that could yield savings is not.

The FCC's ability to shift funds from existing programs to broadband assumes that shifting the identified money from voice service to broadband will not negatively impact company operations or future deployment strategies.

The gap estimates assume that the FCC implements an effective market-based mechanism to determine who should receive support and the level of that support, and that the market-based mechanism is designed in a way to target support first to those areas that require only support for new construction. The estimates also assume that the market mechanism will fund the areas requiring the least amount of support first, thus connecting the most housing units as quickly as possible. In some areas of the country, however, the number of interested parties may be insufficient to implement a market-based mechanism, and the FCC therefore may need to use an alternative approach to drive subsidies to efficient levels.

The plan does not estimate the amount of support that may be necessary to sustain broadband service in those areas where it already is available. The estimates focus on the investment gap to make broadband capable of delivering high-quality voice universally available in unserved areas. While the FCC will initially target CAF funding toward unserved areas, the objective over time is to develop a mechanism that supports the provision of affordable broadband and voice in all areas, both served and unserved, where governmental funding is necessary. The amount of support ultimately required for those areas that currently are served through the receipt of universal service subsidies will depend on many factors, including the evolution of market demand, the precise distribution mechanism selected, and the achievement of efficiencies in an IP-based network. To the extent an incumbent rate-of-return company is not the designated broadband provider-of-last-resort for its entire territory, for instance, the FCC would need to determine how changing support levels would impact service to consumers and how to address the costs of past network investments.

The fact that many questions remain to be answered should not stop the nation from starting down the road to universal broadband. There will be ample opportunity to adjust in the years ahead.

Accelerating Broadband Deployment

Active management of the entire USF program by the FCC as described in this plan is the best way to mitigate these risks going forward. To speed deployment, provide the FCC greater flexibility, and ensure significant capital available for broadband, Congress should act.

RECOMMENDATION 8.15: To accelerate broadband deployment, Congress should consider providing optional public funding to the Connect America Fund, such as a few billion dollars per year over a two to three year period.

If Congress were to provide such funding in a timely manner, it would enable the FCC to achieve more quickly the objectives set forth in the plan for universal broadband, without having to obtain such funding through the current USF contribution mechanism. Since consumers and businesses bear both the USF contribution burden and the general tax burden, additional public funding would draw money for deployment from the same parties that contribute today, but potentially with less relative impact on vulnerable populations that may have lower broadband adoption rates than the general population.[125] Additional funding would allow the country to achieve the National Broadband Availability Target faster and ease the glide path for implementing other reforms in this plan by removing regulatory uncertainty over USF and ICC revenue streams potentially available for further broadband deployment. In addition, in the event additional funding becomes available, whether through new government funding or careful management of existing funds, that funding could be used to build upon lessons learned from successful Lifeline broadband pilots and expand innovations in the E-rate and other programs to support community institutions (see Chapters 9 and 11).

Although the plan sets forth a vision to achieve universal broadband, no one can accurately foresee every potential market dynamic between now and 2020, nor would it be possible for the plan to accurately predict how private sector investment may occur in the future. The precise timing to achieve universal availability will depend on multiple variables, many of which are beyond the control of regulators. Technology, markets and the industry can and will change. One thing that we can reliably predict is that the world in 2020 will be different than what we envision today. But the fact that the FCC may need to make mid-course corrections along the way does not change the overarching national policy imperative—the need for a connected, high-performance America. For the nation to achieve this goal, the steps outlined in this plan must be taken promptly.

8.4 OTHER GOVERNMENT ACTIONS TO PROMOTE AVAILABILITY

Other Federal Financing

Congress should also consider measures to provide greater flexibility to the Rural Utilities Service (RUS) and other agencies in order to provide additional financing solutions to advance broadband availability.

RECOMMENDATION 8.16: Congress should consider expanding combination grant-loan programs.

Most existing funding mechanisms for telecommunications infrastructure, such as those run by RUS, are designed to provide funds via loans, loan guarantees or grants. Recovery Act funding and RUS's Farm Bill Broadband Program and Distance Learning Program have allowed some combinations. To optimize use of taxpayer dollars, more funding should be directed to such combinations. By allowing agencies like RUS to structure funding as combinations of loans, grants and guarantees,[126] they can select the most efficient use of taxpayer dollars while simultaneously providing service providers a one-stop financing solution.

RECOMMENDATION 8.17: Congress should consider expanding the Community Connect program.

The Community Connect program, administered by RUS, is intended to provide funding for broadband to communities that are otherwise unserved. The program had $13.4 million in funding available in 2009,[127] while demand for program funding runs into the hundreds of millions of dollars, principally from communities that are too small to attract interest from private capital. To meet the needs of such communities, Congress should consider expanding the Community Connect program (both in size and in the scope of its eligibility criteria) to be more inclusive in serving such communities.

RECOMMENDATION 8.18: Congress should consider establishing a Tribal Broadband Fund to support sustainable broadband deployment and adoption in Tribal lands, and all federal agencies that upgrade connectivity on Tribal lands should coordinate such upgrades with Tribal governments and the Tribal Broadband Fund grant-making process.

Tribal lands face unique connectivity challenges (see Box 8-4). Grants from a new Tribal Broadband Fund would be used for a variety of purposes, including bringing high-capacity connectivity to Tribal headquarters or other anchor institutions, deployment planning, infrastructure buildout, feasibility studies, technical assistance, business plan development and implementation, digital literacy, and outreach.[128] In addition, a portion of the fund should be allocated to provide small, targeted grants on an expedited basis for Internet access and adoption programs.[129] The fund should be administered by NTIA in consultation with the FCC and the Bureau of Indian Affairs.

In order to provide state-of-the-art services to Tribal communities and promote the deployment of high-capacity infrastructure on Tribal lands, Congress should consider providing ongoing public funding for federal facilities serving Tribal lands in order to upgrade and maintain their broadband infrastructure. Telecommunications infrastructure at federal facilities located on Tribal lands frequently has limited broadband capacity.[130]

Consistent with Recommendation 6.8, which encourages government entities to actively seek out and leverage "dig once" coordination opportunities, all federal agencies that upgrade network connectivity on Tribal lands should coordinate such upgrades with Tribal governments and the Tribal Broadband Fund grant-making process to exploit opportunities for joint trenching, laying of conduit or construction of additional fiber optic facilities.[131]

BOX 8-4:

Broadband on Tribal Lands

Available data, which are sparse, suggest that less than 10% of residents on Tribal lands have broadband available.[132] The Government Accountability Office noted in 2006 that "the rate of Internet subscribership [on Tribal lands] is unknown because no federal survey has been designed to capture this information for Tribal lands."[133] But, as the FCC has previously observed, "[b]y virtually any measure, communities on Tribal lands have historically had less access to telecommunications services than any other segment of the population."[134]

Many Tribal communities face significant obstacles to the deployment of broadband infrastructure, including high buildout costs, limited financial resources that deter investment by commercial providers and a shortage of technically trained members who can undertake deployment and adoption planning.[135] Current funding programs administered by NTIA and RUS do not specifically target funding for projects on Tribal lands and are insufficient to address all of these challenges.[136] Tribes need substantially greater financial support than is presently available to them, and accelerating Tribal broadband deployment will require increased funding.[137]

Tribal, State, Regional and Local Broadband Initiatives

In addition to Tribal, federal, and state efforts to support broadband deployment, local governments and regions often organize themselves to support deployment in their communities. According to recent market research, as of October 2009, there were 57 fiber-to-the-premises (FTTP) municipal deployments, either in operation or actively being built, in 85 towns and cities in the United States. These deployments collectively serve 3.4% of the FTTP subscribers in North America.[138]

Not all government-sponsored networks serve consumers directly. Several government-sponsored entities, such as NOANet in the Pacific Northwest and OneCommunity in Ohio, are major providers of backhaul capacity in areas that benefit community institutions and local broadband service providers. Their networks are often "constructed" by patching together and opening up to wider use fiber and other connections that might originally have been built for single-purpose institutional needs, such as the needs of government offices and local transportation. By offering up that existing capacity to wider use, including the service provider community, these efforts can benefit an entire community, not just one institution.[139]

While it is difficult to measure the impact of many local efforts, these efforts should be encouraged when they make sense. However, 18 states have passed laws to restrict or explicitly prohibit municipalities from offering broadband services. Some states, like Nebraska, have outright bans on municipalities offering any wholesale or retail broadband service. Other states, such as South Carolina and Louisiana, set conditions that make municipal broadband both harder to deploy and more costly for consumers.[140] In addition, restrictions on the use of institutional networks can substantially impede the ability of local and regional authorities to utilize that infrastructure to benefit the broadband needs of the community as a whole. Restricting these networks in some cases restricts the country's ability to close the broadband availability gap, and should be revisited.

RECOMMENDATION 8.19: Congress should make clear that Tribal, state, regional and local governments can build broadband networks.

Local entities typically decide to offer services when no providers exist that meet local needs. These local entities do so only after trying to work with established carriers to meet local needs.[141] This experience is similar to how some municipalities responded in the early part of the 20th century, when investor-owned electric utilities left rural America in the dark while they electrified more lucrative urban centers. Public and cooperatively owned power utilities were created to fill the void. More than 2,800 public and co-op operators still provide electricity to 27% of Americans today.[142] Many of these same rural areas now face similar challenges attracting private investment to connect civic institutions, businesses and residences to high-speed data networks. In some areas, local officials have decided that publicly–owned communications services are the best way to meet their residents' needs (see Box 8-5).

Municipal broadband has risks. Municipally financed service may discourage investment by private companies. Before embarking on any type of broadband buildout, whether wired or wireless, towns and cities should try to attract private sector broadband investment. But in the absence of that investment, they should have the right to move forward and build networks that serve their constituents as they deem appropriate.

RECOMMENDATION 8.20: Federal and state policies should facilitate demand aggregation and use of state, regional and local networks when that is the most cost-efficient solution for anchor institutions to meet their connectivity needs.

Government policy often limits the ability of schools, hospitals and other community institutions to serve as community broadband anchors. FCC universal service policies and the policies of other grant-making agencies frequently drive institutions to use dedicated, single-purpose networks that are not available for broader community use, resulting in a situation in which "[c]ommunity residents working in healthcare or education often have unlimited access to the Internet while other rural residents are left with no access."[143] These restrictions make it difficult to expand and share broadband with other community institutions in the most cost-effective way.

This problem is especially acute in rural areas and Tribal lands where broadband may only be available and affordable to residents and small businesses in a community if the fiber optic infrastructure in that town is shared not only by commercial users but also by the local hospital, government office

BOX 8-5:

Community Broadband in Rural America

Bristol, Va., provides a good example of the potential of community broadband in rural America. This small town, which also operates the local electric utility, initially deployed a fiber optic network to connect its government, electric utility and school buildings. Local businesses and residents expressed interest in connecting to this high-speed network, so Bristol made plans to build a fiber-to-the-premises network. After overcoming a series of state legislative barriers and legal challenges by incumbent providers offering slower services, Bristol launched a FTTP service. Today 62% of Bristol's residents and businesses subscribe to the service despite competition from the incumbent telephone company and cable.

and school system.[144] Because broadband networks—particularly fiber optic networks—demonstrate large economies of scale, bulk purchasing arrangements for forms of connectivity like second-mile and middle-mile access can drive down the per-megabit cost of such access considerably. As a result, policy restrictions that impede the ability of school networks funded by E-rate to share capacity with hospitals funded by the Rural Health Care program, or the public safety system which may be funded by state and other federal sources, drive up the cost of connectivity for those institutions and for others in the community.[145]

At least 30 states have established state networks operated by public agencies or the private sector to aggregate demand among schools, universities, libraries, and state and local government agencies to reduce costs.[146] Better collaboration among government agencies could reduce the potential for waste of federal resources and maximize available federal funding for broadband-related community development projects. Federal and state policy should not preclude or limit networks that serve one category of institution from serving other institutions and the community as a whole.[147] The FCC should explore creative solutions to help schools, libraries and health care providers reduce their broadband-related costs by aggregating demand with other community institutions so that they can purchase the maximum amount of broadband with their USF dollars. For instance, the FCC should remove barriers to the shared use of state, regional, Tribal, and local networks by schools, libraries and health care providers when such networks provide the most cost-efficient choice for meeting broadband needs.[148]

Because community anchor institutions are large—if not the largest—potential consumers of broadband in even the smallest of towns, adopting these recommendations will not only expand broadband options for the institutions themselves but also will improve availability in the community as a whole.

RECOMMENDATION 8.21: Congress should consider amending the Communications Act to provide discretion to the FCC to allow anchor institutions on Tribal lands to share broadband network capacity that is funded by the E-rate or the Rural Health Care program with other community institutions designated by Tribal governments.

In recognition of the unique challenges facing Tribal communities, Congress should consider amending the Communications Act to provide discretion to the FCC to define circumstances in which schools, libraries and health care providers that receive funding from the E-rate or Rural Health Care program may share broadband network capacity that is funded by the E-rate or the Rural Health Care program with other community institutions designated by Tribal governments.[149]

RECOMMENDATION 8.22: The federal government and state governments should develop an institutional framework that will help America's anchor institutions obtain broadband connectivity, training, applications and services.

Earlier in this chapter, the plan proposes a path to ensure that homes in high-cost areas have access to broadband, largely by reforming the High-Cost program and intercarrier compensation. In other chapters, the plan proposes reforms to USF to improve connectivity to schools, libraries and health care providers. Government should take additional steps to enable these and other community institutions to better utilize their connectivity to provide a better quality of life for all people.

One approach to ensure connectivity for facilities that serve public purposes is to give a non-profit institution the mission and capability to focus on serving the broadband needs of public institutions, including health clinics, community colleges, schools, community centers, libraries, museums, and other public access points. In the past, the connectivity needs of research institutions have been met by non-profit research and education (R&E) networks such as Internet2 and National LambdaRail. R&E networks played a central role in the development and growth of the Internet itself through ARPANET and later NSFNET. Today, similar R&E networks provide high-speed (10 Mbps-1 Gbps) connectivity to 66,000 community anchor institutions.[150] But more can be done—it is estimated that only one-third of anchor institutions have access to an R&E network today.[151] This model should be expanded to other community institutions.

A group of R&E networks, including Internet2 and the National LambdaRail, with the support of the National Association of Telecommunications Officers and Advisors and the Schools, Health and Libraries Broadband Coalition, have proposed that the federal government and state governments create a non-profit coordinating entity, the "Unified Community Anchor Network," that would support and assist anchor institutions in obtaining and utilizing broadband connectivity.[152] Expanding the R&E network model to other anchor institutions would offer tremendous benefits. Many community institutions lack the institutional resources to undertake the many tasks necessary to maximize their utilization of broadband. Facilitating collaboration on network design and how best to utilize applications to meet public needs could result in lower costs and a far more efficient and effective utilization of broadband by these institutions.

Working with the R&E and non-profit community, the federal government and state governments should facilitate the development of an institutional framework that will help anchor institutions obtain broadband connectivity, training, applications and services. One method of implementation

would be to establish federal and state coordinators and consortia of anchor institutions. These coordinators would help secure connectivity and would also provide hands-on experience and capacity in the building and running of networks.[153] A coordinating entity also could have a national procurement role in negotiating bulk equipment and connectivity purchase agreements, acting as a sophisticated buyer, which would then be available to community institutions.[154] There also could be a platform for interconnected networks to share resources and applications and provide training opportunities. Coordinating and building common resources and capacity in this manner at the national and state levels would lower the overall costs of building and running anchor institutional networks.

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1 Here, "access" refers only to the capability of the last-mile network. Service providers may, for any number of reasons, make only lower-speed services available to customers—in other words, the speeds or products to which consumers have access may not fully reflect network capabilities. Because access networks are the most capital-intensive elements of the broadband infrastructure, it is reasonable to expect that providers will meet demand for higher speeds once the access network is capable of supporting such speeds.

2 For purposes of the plan, "actual speed" refers to the data throughput delivered between the network interface unit (NIU) located at the end-user's premises and the service provider Internet gateway that is the shortest administrative distance from that NIU. In the future, the technical definition of "actual speed" should be crafted by the FCC, with input from consumer groups, industry and other technical experts as is proposed in Chapter 4. The technical definition should include precisely defined metrics to promote clarity and shared understanding among stakeholders. For example, "actual download speeds of at least 4 Mbps" may require certain achievable download speeds over a given time period. Acceptable quality of service should be defined by the FCC. *See supra* Chapter 4 (Transparency Section).

3 In the first half of 2009, the median actual speed for those that subscribe to broadband in the United States was 3 Mbps download speed. comScore, Inc., Jan.–June 2009 Consumer Usage database (sampling 200,000 machines for user Web surfing habits) (on file with the Commission) (comScore database). Given past annual growth rates in subscribed speed of approximately 20–25% per year, we expect the median to exceed 4 Mbps by the end of 2010. *Cf.* Akamai, The State of the Internet, 3rd Quarter, 2009, at 10 (2010) (finding median download speeds to be 3.9 Mbps in the third quarter of 2009), *available at* http://www.akamai.com/dl/whitepapers/Akamai_State_Internet_Q3_2009.pdf?curl=/dl/whitepapers/Akamai_State_Internet_Q3_2009.pdf&solcheck=1& (registration required); *see also* Omnibus Broadband Initiative, Broadband Performance (forthcoming) (discussing past growth rates).

4 Countries use different incentive policies for "universalizing" speeds. For instance, Canada awards funding for rural build-out above 1.5 Mbps actual speeds, while Finland has mandated that incumbent providers deliver a minimum of 0.5–1.0 Mbps actual download speeds (varying by time of day) to all citizens. Gov't of Australia, Dep't of Broadband, Commc'ns & the Digital Econ., Australian Broadband Guarantee—Frequently Asked Questions, http://www.dbcde.gov.au/__data/assets/pdf_file/0017/114281/ABG_FAQ-lowres.pdf (last visited Mar. 7, 2010) (particularly "speeds of at least 512 kbps download and 128 kbps upload, at least 3 GB monthly download limits, and a price of no more than $2500 (including GST) over a three year period, including all connection and equipment cost"); Gov't of Australia—Prime Minister of Australia, *New National Broadband Network* (press release), Apr. 7, 2009, http://www.pm.gov.au/node/5233 (last visited Mar. 7, 2010) (specifically "[c]onnect 90 percent of all Australian homes, schools and workplaces with broadband services with speeds up to 100 megabits per second—100 times faster than those currently used by many households and businesses; Connect all other premises in Australia with next generation wireless and satellite technologies that will be deliver broadband speeds of 12 megabits per second"); Danish Gov't, IT and Telecommunications Policy Report 2009, at 6 (2009) (English translation) ("The Government's target is for all Danes to have broadband access by the end of 2010 at the latest"), *available at* http://en.itst.dk/the-governments-it-and-telecommunications-policy/it-and-telecommunications-policy-reports/filarkiv/IT_and_Telecommunications_Policy_Report_2009.pdf; Danish Gov't, Annual Broadband Mapping 2009, at 6 (2009) (Danish) (referencing the measurement threshold for broadband as 512 kbit/s set in bilateral agreement between service providers and the government), *available at* http://www.itst.dk/statistik/Telestatistik/Bredbandstatistik/bredbandskortlegning-1/bredbandskortlegning-2009/Bredbandskortlegning%202009.pdf; Ministry of Transp. & Commc'ns, Gov't of Finland, Making Broadband Available to Everyone 2–4 (2008) (English Version) (particularly "[t]he report proposes that the public sector introduce business subsidies to enterprises that upgrade the public telecommunications network into a condition that makes available to most all citizens by 2015 an optical fiber or cable network supporting 100 Mbit connections. Prior to this goal, the speed of the broadband connection included in the universal service obligation must be raised to an average of 1 Mbit/s by the end of 2010 at the latest" with 100 Mbps target set to be delivered within 2 kilometers of all households), *available* at http://www.lvm.fi/c/document_library/get_file?folderId=57092&name=DLFE-4311.pdf; Éric Besson, Secrétariat D'état Chargé De La Prospective, Gov't of France, De L'évaluation Des Politiques Publiques Et Du Développement De L'économie Numérique, Plan de développement de l'économie numérique 4 (2008) (French), *available at* http://lesrapports.ladocumentationfrancaise.fr/BRP/084000664/0000.pdf; *see also* European Comm'n, Progress Report on the Single European Electronic Communications Market 2008, 14th report 4 (English) ("The Plan announced the launch of a call for tenders in the first half of 2009, for designating the provider that would ensure that service (a minimum of 512 kb/s) at an affordable price (35 euros/month) to all."), *available at* http://ec.europa.eu/information_society/policy/ecomm/doc/implementation_enforcement/annualreports/14threport/fr.pdf; Ministry of Econ. & tech., Gov't of Germany, The Federal Government's Broadband Strategy 8 (2009) ("Gaps in broadband penetration are to be eliminated and capable broadband access made available nationwide by the end of 2010. . . . [Capable broadband connections] are currently defined as having transmission rates of at least 1MBit/s"; "A total of 75 percent of households are to have Internet access with transmission rates of at least 50MB/sec by 2014."), *available at* http://www.bmwi.de/English/Navigation/Service/publications,did=294718.html; Gov't of Ireland, Dep't of Commc'ns, Energy, and Natural Resources, NBS Frequently Asked Questions, http://www.dcenr.gov.ie/Communications/Communications+Development/NBS+FAQs (last visited Mar. 7, 2010) (referencing Plan of December 23, 2008, particularly "3, the [National Broadband Scheme] Service Provider, will extend its network to provide mobile wireless broadband services into the NBS area. The mobile broadband service (I-HSPA) will have a minimum download speed of 1.2Mbps and a minimum upload speed of 200kpbs with a contention ratio of 36:1. In recognition of the fact that some areas will be very costly and difficult to reach, in a very limited number of cases, 3 will make available a satellite product of 1Mbps download and 128kbps upload. This will cover up to a maximum of 8% of fixed residences and businesses in the NBS coverage area. . . . An uncharged monthly data cap of 15GB (12GB download and 3GB upload) will apply for the wireless product while 11GB (10GB download and 1GB upload) will be available for satellite users"); Ministry Of Internal Aff. & Commc'ns, Gov't Of Japan, Digital Divide Elimination Strategy 1 (2008) (Japanese, staff translation) (calling for elimination of all areas not served by broadband by 2010, and ultra high speed broadband coverage for 90% of households by 2010), *available at* http://www.soumu.go.jp/menu_news/s-news/2008/pdf/080624_3_bt2.pdf. Also, note the inclusion of targets for fixed and mobile class infrastructures. *See* IT Strategy Headquarters, Gov't of Japan, i-Japan Strategy 2015, at 26 (2009) (English translation) ("The following measures will be carried out by 2015 . . . further advances in ultra-high-speed broadband infrastructure will be made (in the Gbps class for fixed and in excess of 100 Mbps [class] for mobile) to allow everyone to easily obtain and exchange information safe[l]y and securely from anywhere at anytime."), *available at* http://www.kantei.go.jp/foreign/policy/it/i-JapanStrategy2015_full.pdf; Letter from Young Kyu Noh, Minister Counselor of Broad. & ICT, Embassy of the Republic of Korea, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 09-47, 09-51, 09-137 (Feb. 3, 2010) Attach. at 3, 6 (The 1.5–2M[bps] class high-speed network was completely established in 2008 with a goal of minimum 50Mbps to 95% of households by 2013; also shows that Korea served 99% of population with 1Mbps service by 2008.); Korean Commc'ns Comm'n, *Korean Internet Speeds to Be Ten Times Faster by 2012* (press release) (Mar. 28, 2009) (noting that 1Gbps is not an established download minimum for a percentage of the population at this time), *available at* http://eng.kcc.go.kr/user.do?mode=view&page=E04010000&dc=E04010000&boardId=1058&cp=1&searchKey=ALL&searchVal=broadband+&boardSeq=15621; Ministry of Enter., Energy and Commc'ns, Gov't of Swed., Broadband Strategy for Sweden 15 (2009) (particularly "In 2020 . . . 90 per cent of all households and businesses have access to broadband at a minimum speed of 100 Mbps. . . . In 2015 . . . 40 per cent of all households and businesses have access broadband at a minimum speed of 100 Mbps"), *available at* http://www.sweden.gov.se/content/1/c6/13/49/80/112394be.pdf; Dep't for Culture, Media and Sports , Gov't of the

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U.K., Digital Britain 12 (2009) (particularly "[t]o ensure all can access and benefit from the network of today, we confirm our intention to deliver the Universal Service Broadband Commitment at 2Mbps by 2012"), *available at* http://www.culture.gov.uk/images/publications/digitalbritain-finalreport-jun09.pdf.

5 Section 254(c) (1)requires the FCC to establish periodically the definition of universal service that is supported by federal USF.

6 Housing units are distinct from households. "A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters." In contrast, "A household includes all the persons who occupy a housing unit. . . . The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements." There are 130.1 million housing units and 118.0 million households in the United States. U.S. Census Bureau, Households, Persons Per Household, and Households with Individuals Under 18 Years, 2000, http://quickfacts.census.gov/qfd/meta/long_71061.htm (last visited Mar. 7, 2010); Omnibus Broadband Initiative, The Broadband Availability Gap (forthcoming) (OBI, The Broadband Availability Gap).

7 *See* OBI, The Broadband Availability Gap. Seven million housing units without access to 4 Mbps service are outside the cable footprint and are more than approximately 11,000–12,000 feet from the nearest DSLAM location. An FCC estimate shows that 12 million people in six million housing units do not have access to terrestrial broadband capable of 768 kbps actual download speeds; those 6 million housing units without access to any always-on service are more than approximately 16,000 feet from the nearest DSLAM.

8 *See* OBI, The Broadband Availability Gap.

9 The analysis depends on a variety of data sources. *See* OBI, The Broadband Availability Gap. Where the quality of data is limited, broadband-gap calculations will be affected. For example, there are 12 wire centers in Alaska that show no population within their boundaries, and an additional 18 wire centers that have no paved public-use roads (i.e., no roads other than 4WD or forest-service roads). All 30 of these wirecenters were excluded from wired broadband-gap calculations; however, all areas with population were covered by the wireless calculations. In addition, due to insufficient demographic and infrastructure data for Puerto Rico and the U.S. Virgin Islands in the Caribbean and Guam, American Samoa, and the Northern Marianas in the Pacific to calculate baseline availability, the broadband availability gap for these territories is not included.

10 The estimate includes capital expenditure and 20 years of operating expenditure and revenue. All calculations use an annual discount rate of 11.25%. The calculation of the broadband availability gap does not include the cost of spectrum. Recent 700 MHz auctions in the A, B, C and E blocks had mean prices between $0.74 and $2.65 per MHz-POP, including a top price for a market of over $9.00 per MHz-POP; median prices for these same auctions were between $0.20 and $0.42 per MHz-POP. At $1.00 per MHz-POP, well above the median price of recent auctions, the cost of 40 megahertz of spectrum for serving 14 million unserved people would be $0.56 billion. See OBI, The Broadband Availability Gap for more detail about the financial model and how it functions.

11 Numbers may not add to 100% due to rounding.

12 For more information about satellite broadband, see OBI, The Broadband Availability Gap.

13 Northern Sky Research, How Much HTS Capacity is Enough?, http://www.talksatellite.com/Americas-A781.htm (last visited Mar. 6, 2010).

14 *See* OBI, The Broadband Availability Gap; American Roamer, Verizon Wireless 3G Coverage Area (2009); Robert C. Atkinson & Ivy E. Schultz, Columbia Inst. for Tele-Information, Broadband In America: Where It Is And Where It Is Going (According To Broadband Service Providers) 40 (2009) (Atkinson & Schultz, Broadband in America).

15 *See* OBI, The Broadband Availability Gap.

16 *See* OBI, The Broadband Availability Gap.

17 "Annual funding amount" refers to fiscal year 2008 funding for all programs except BTOP and BIP, which were one-time programs funded by the American Recovery and Reinvestment Act of 2009, and for the Universal Service Fund, which uses FY 2010 projected total outlays to ensure consistency with the rest of the document. The estimate of $2.5 billion under BTOP for infrastructure includes the $119 million in grants already awarded, plus the $2.35 billion announced in the January 2010 NOFA. GAO, Broadband Deployment Plan Should Include Performance Goals and Measures to Guide Federal Investment 13–14, GAO-09-494 (2009) (chart is modified from figure in this source), *available at* http://www.gao.gov/new.items/d09494.pdf; Broadband USA, The Portal To Apply for Broadband Funding under the American Recovery and Reinvestment Act of 2009, http://www.broadbandusa.gov (last visited Mar. 7, 2010); NTIA, *Commerce Department's NTIA and USDA's RUS Announce Availability of $4.8 Billion in Recovery Act Funding to Bring Broadband to More Americans* (press release), http://www.ntia.doc.gov/press/2010/BTOP_BIP_NOFAII_100115.html (last visited Mar. 7, 2010); The White House, *Vice President Biden Kicks Off $7.2 Billion Recovery Act Broadband Program* (press release), http://www.whitehouse.gov/the-press-office/vice-president-biden-kicks-72-billion-recovery-act-broadband-program (last visited Feb. 20, 2010); NTIA, Broadband Technology Opportunities Program Key Revisions in Second Notice of Funds Availability, http://www.ntia.doc.gov/press/2010/BTOP_NOFAII_FACTSHEET_100115.pdf (last visited Mar. 7, 2010).

18 "Other programs" include the Rural Utilities Service's Distance Learning and Telemedicine Loans and Grants Program and Community Connect Grant Program, the Appalachian Regional Commission's Telecommunications Initiative, the Economic Development Administration's program for Economic Development Facilities and Public Works, and the Delta Regional Authority's program for Delta Area Economic Development.

19 Notice of Funds Availability for Broadband Initiatives Program and Broadband Technology Opportunities Program, 74 Fed. Reg. 33, 104 (July 9, 2009).

20 Notice of Funds Availability for Broadband Initiatives Program and Broadband Technology Opportunities Program, 74 Fed. Reg. 33, 104 (July 9, 2009).

21 NTIA, ION Upstate New York Rural Broadband Initiative Grant Award, http://www.ntia.doc.gov/broadbandgrants/BTOPAward_IONHoldCoLLC_121709.pdf (last visited Feb. 20, 2010); NTIA, Project Connect South Dakota Grant Award, http://www.ntia.doc.gov/broadbandgrants/BTOPAward_SDakotaNetwork_121709.pdf (last visited Feb. 20, 2010).

22 47 U.S.C. § 151.

23 J.M. Bauer et al., *Whither Broadband Policy* (30th Annual Telecomms. Policy Research Conf. Paper, 2002), *available at* http://tprc.org/papers/2002/72/Broadband_v1.pdf.

24 The FCC has relied on the statutory language in section 254(h) to support internet access for schools, libraries and health care providers.

25 Universal Serv. Admin. Co., Universal Service Fund, http://www.usac.org/about/universal-service/ (last visited Mar. 7, 2010). The estimated annual projected outlay for the federal USF can be found in the FY 2010 Federal budget. Office of Mgmt. & Budget, Exec. Office of the President, Budget of the United States Government, Fiscal Year 2010, at 1220 (2010), *available at* http://www.whitehouse.gov/omb/budget/fy2010/assets/oia.pdf.

26 While the E-rate program is capped by FCC regulation at $2.25 billion annually, unused funds from prior funding years may be rolled over to the future, enabling the FCC to disburse more than the annual cap in a given year. In addition, in a given year, the FCC may disburse more than the cap when invoices for funding commitments from prior years are presented for payment.

27 Universal Serv. Admin. Co., Universal Service Fund, http://www.usac.org/about/universal-service/ (last visited Mar. 7, 2010). FCC total outlay estimates for FY 2010 submitted to OMB on December 15, 2009 based on Universal Service Administrative Company projections. *See* USAC, Federal Universal Service Support Mechanisms Fund Size Projections for Second Quarter 2010, at 2 (2010), *available at* http://www.universalservice.org/about/governance/fcc-filings/2010/Q2/2Q2010%20Quarterly%20Demand%20Filing.pdf.

28 Peter Bluhm, et al. *State High Cost Funds: Purposes, Design, and Evaluation* 60 (Nat'l Regulatory Res. Inst. (NRRI), Working Paper No. 10-04, 2010), *available at* http://www.nrri.org/pubs/telecommunications/NRRI_state_high_cost_funds_jan10-04.pdf. (Bluhm et al., *State High Cost Funds*); Public Utility Commission of Texas, Texas Universal Service Fund, http://puc.state.tx.us/ocp.telephone/choice/txunivserv.cfm (more recent data for Texas) (last visited Feb. 20, 2010).

29 *See* Jing Liu & Edwin Rosenberg, *State Universal Service Funding Mechanisms: Results of the NRRI's 2005–2006 Survey* 43, 54 (NRRI, Working Paper

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No. 06-09, 2006), *available at* http://nrri.org/pubs/telecommunications/06-09.pdf (Liu & Rosenberg, *State Universal Service Funding Mechanisms*); Alliance for Pub. Tech. & Commc'ns Workers of Am., State Broadband Initiatives 3 (2009), *available at* http://www.apt.org/publications/reports-studies/state_broadband_initiatives.pdf.

30 Not all of these programs are administered by the state public utility commission. Bluhm et al. *State High Cost Funds* at 32. Examples of funding programs to support the build-out of advanced networks in unserved and underserved areas include the California Advanced Services Fund, ConnectME Authority, Illinois Technology Revolving Loan Program, Idaho Rural Broadband Investment Program (IRBIP), Louisiana Delta Development Initiative, and Massachusetts Broadband Initiative. *See* Alliance for Pub. Tech. & Commc'ns Workers of Am., State Broadband Initiatives 3, 47–49 (2009), *available at* http://www.apt.org/publications/reports-studies/state_broadband_initiatives.pdf.

31 Alliance for Pub. Tech. & Commc'ns Workers of Am., State Broadband Initiatives 3, 44–56 (2009), *available at* http://www.apt.org/publications/reports-studies/state_broadband_initiatives.pdf.

32 Although several commenters submitted estimates into the record, not all commenters specified whether figures represented a percentage of total revenues or regulated revenues. *See* Western Telecommunications Alliance Comments in re NBP PN #19 (*Comment Sought on the Role of the Universal Service Fund and Intercarrier Compensation in the National Broadband Plan*, GN Docket No. 09-47, 09-51, 09-137, Public Notice, 24 FCC Rcd 13757 (WCB 2009) (*NBP PN #19*)), filed Dec. 7, 2009, at 25, 27 (stating that for small rural LECs, high cost represents 30–40% of regulated revenues, while intercarrier compensation represents 30–40% of regulated revenues); Organization for the Promotion and Advancement of Small Telecommunications Companies Comments in re NBP PN #19, filed Dec. 7, 2009, at 25 (stating that intercarrier compensation revenues together with high-cost USF support comprise approximately 60% of rate of return incumbent LECs' net telephone company operating revenue); Rural High Cost Carriers Comments in re NBP PN #19, filed Dec. 7, 2009, at 11 (noting that federal universal service support and intercarrier compensation account for between 40–62% of revenues for many rural carriers); Texas Statewide Telephone Company Comments in re NBP PN #19, filed Dec. 7, 2009, at 13 (intercarrier compensation revenues and high-cost support accounts for over 60% of rural LECs' revenue stream).

33 Certain competitive aspects of special access will be addressed in Chapter 4 on a pro-competition framework for the high capacity circuit wholesale market.

34 Figures based on USAC preliminary 2009 disbursement data.

35 *See, e.g.*, National Exchange Carrier Association (NECA) Comments in re NBP PN #19, filed Dec. 7, 2009, at 5 (RLECs added gross investment of $1.2 billion in 2006–07, $1.6 billion in 2007–08, and $2.1 billion in 2008–09/10; "the vast majority of these investments in network upgrades are for fiber deployment and state-of-the-art softswitches"); Western Telecommunications Association Comments in re National Broadband Plan NOI, filed June 9, 2009, at 24–25 (USF support has permitted RLECs to install and operate digital switches and soft switches, and deploy and extend fiber optic and DSL facilities deeper into their networks).

36 *See* OBI, The Broadband Availability Gap. Estimate does not take into account Frontier's proposed acquisition of Verizon lines.

37 Funding levels for the larger carriers are based on a forward looking cost model that was designed to estimate the cost of providing circuit-switched voice service; it was never intended to address the investment necessary to extend broadband to unserved areas. In contrast, smaller carriers typically receive funding under formulas that allow them to recoup their actual costs of extending broadband to unserved areas, including the costs of deploying fiber and, for some companies, soft switches.

38 *See, e.g.*, AT&T Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, at 10 (describing Alabama and Mississippi requirements to report on use of high cost funds; AT&T reported its plans to spend funding on deployment of loop fiber and next generation digital loop carrier).

39 Liu & Rosenberg, *State Universal Service Funding Mechanisms* at 43 & tbl. 26. For instance, in Maine, applicants seeking competitive ETC designation must file a plan describing with specificity, for the first two years, proposed improvements or upgrades to the applicant's network throughout the designated service area, projected start and completion date for each improvement, estimated amount of investment for each project that is funded by high cost support, specific geographic areas where improvements will be made, and the estimated population that will be served as a result of the improvements; only competitive ETCs are required to report annually on investments made with high cost support. Standards for Designating and Certifying Eligible Telecommunications Carriers Qualified to Receive Federal Universal Service Funding, 65-407-206 Me. Code R. § 3, § 6, *available at* www.maine.gov/sos/cec/rules/65/407/407c206.doc.

40 Jonathan E. Nuechterlein & Philip J. Weiser, Digital Crossroads: American Telecommunications Policy in the Internet Age 292 (2007). As noted above, ICC represents a significant revenue flow for many small carriers. *See* National Exchange Carrier Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 27 (representing that, in 2005, an average 29% of its incumbent carriers' revenues came from intercarrier compensation, and some carriers received up to 49% of revenues from intercarrier compensation); Fred Williams and Associates Comments in re NBP PN #19, filed Dec. 7, 2009, at Attach. 1–2; Letter from Genevieve Morelli, Counsel for XO et al., to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 09-47, 09-51, 09-137, WC Docket No. 05-337, CC Docket No. 01-92 (Dec. 9, 2009) Attach. at 1; Independent Telephone & Telecommunications Alliance Comments in re NBP PN #19, filed Dec. 7, 2009, at 6 ("A survey of ITTA members revealed that approximately 12% of member carrier revenues are obtained via ICC"); Alaska Telephone Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 6.

41 *See Economic Implications and Interrelationships Arising from Policies and Practices Relating to Customer Information, Jurisdictional Separations and Rate Structures*, Docket No. 20003, First Report, 61 FCC 2d 766, 796–97, paras. 81–82 (1976); Gerald W. Brock, The Second Information Revolution 188 (2003).

42 *See* Letter from Brian J. Benison, AT&T, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51, WC Docket Nos. 07-135, 05-337, 99-68, CC Docket Nos. 01-92, 96-45 (Jan. 6, 2010) Attach. at 2; *see also* FCC, Universal Service Monitors Report 2009, at tbl. 7.10 (2009), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-295442A1.pdf (showing that interstate per-minute charges range up to 5.71 cents per minute).

43 The FCC has set the rate for ISP-bound traffic at $0.0007 per minute. *See Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, Intercarrier Compensation for ISP-Bound Traffic, Order on Remand and Report and Order*, CC Docket Nos. 99-68, 96-98, Order on Remand and Report and Order, 16 FCC Rcd 9151 (2001), *remanded* WorldCom Inc. v. FCC, 288 F.3d 429 (D.C. Cir. 2002); *High Cost Universal Service Reform; Federal-State Joint Board on Universal Service; Lifeline and Link Up; Universal Service Contribution Methodology; Numbering Resource Optimization; Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; Developing a Unified Intercarrier Compensation Regime; Intercarrier Compensation for ISP-Bound Traffic; IP-Enabled Services*, CC Docket Nos. 96-45, 99-200, 96-98, 01-92, 99-68, WC Docket Nos. 05-337, 03-109, 06-122, 04-36, Order on Remand and Report and Order and Further Notice of Proposed Rulemaking, 24 FCC Rcd 6475 (2008), *aff'd,* Core Commc'ns Inc. v. FCC, No. 86-1365 (D.C. Cir. slip op. Jan. 12, 2010). Other forms of ICC include LEC-CMRS traffic.

44 Rates differ depending on if the terminating carrier is a rate-of-return carrier, price-cap carrier, competitive carrier or mobile wireless provider.

45 PAETEC Communications et al. Comments in re NBP PN #19, filed Dec. 7, 2009, at 18 ("The Joint Commenters have invested substantial amounts to ensure proper billing . . . . These investments and the systems used to bill intercarrier compensation would be substantially simpler if Joint Commenters did not have to track and classify traffic based on artificial regulatory constructs"); US Telecom Comments in re NBP PN #19, filed Dec. 7, 2009, at 7; CenturyLink Comments in re NBP PN #19, filed Dec. 7, 2009, at 38 (citing Central Telephone Company of Virginia et al. v. Sprint Communications Company of Virginia, Inc. and Sprint Communications Company LP, Case No. 3:09-cv-00720 (E.D. Va.) (filed Nov. 16, 2009); CenturyTel of Chatham LLC et al. v. Sprint Communications Company LP, Case No. 3:09-cv-01951 (W.D. La.) (filed Nov. 23, 2009)).

46 *See, e.g.*, *Establishing Just and Reasonable Rates for*

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Local Exchange Carriers, WC Docket No. 07-135, Notice of Proposed Rulemaking, 22 FCC Rcd 17989 (2007) (*Access Stimulation NPRM*) (seeking comment on how to address access stimulation concerns); *Establishing Just and Reasonable Rates for Local Exchange Carriers; Call Blocking by Carriers*, WC Docket No. 07-135, Declaratory Ruling, 22 FCC Rcd 11629 (2007) (prohibiting self-help call blocking to address access stimulation concerns); *Qwest Commc'ns Corp. v. Farmers and Merchants Mut. Tel. Co.*, File No. EB-07-MD-001, Second Order on Reconsideration, 24 FCC Rcd 14801 (2009) Attach. (Second Petition for Reconsideration and Petition for Stay pending) (resolving dispute regarding payment of access charges in alleged access stimulation situation).

47 AT&T Comments in re Access Stimulation NPRM, filed Dec. 17, 2007, Attach. (Decl. of Adam Panagia) at para. 11; *see also* Letter from Brian J. Benison, AT&T, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 07-135 (Nov. 20, 2009) Attach. at 4–6; Letter from Donna Epps, Verizon, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 07-135 (June 4, 2008) at 2-3.

48 *See* Cablevision Comments in re NBP PN #25 (*Comment Sought on Transition from Circuit-Switched Network to All-IP Network*, GN Docket No. 09-47, 09-51, 09-137, Public Notice, 24 FCC Rcd 14272 (WCB 2009) (*NBP PN #25*)), filed Dec. 22, 2009, at 2 ("[A]s incumbent local exchange carriers . . . upgrade their legacy networks to IP, they refuse to provide IP interconnection to their competitors on reasonable terms or at all. As a result, each IP voice call initiated on a competing carriers' network must be reduced to TDM, transmitted over an electrical DS-0 or similar connection, and routed to an ILEC customer over the legacy hierarchical circuit-switched network, with all of its associated costs, inefficiencies, and limitations."); Global Crossing Comments in re NBP PN #19, filed Dec. 7, 2009, at 6; Sprint Nextel Comments in re NBP PN #25, filed Dec. 22, 2009, at 10; PAETEC Comments in re NBP PN #25, filed Dec. 22, 2009, at 7-10.

49 *See* Verizon Comments in re NBP PN #19, filed Dec. 7, 2009, at 18 ("Ongoing uncertainty regarding the compensation due to—and from—providers for IP traffic serves as a disincentive to further investment in the very next-generation services that consumers seek most").

50 *See* Verizon Comments in re NBP PN #19, filed Dec. 7, 2009, at 17; AT&T Comments in re NBP PN #25, filed Dec. 22, 2009, at 12; Global Crossing Comments in re NBP PN #19, filed Dec. 7, 2009, at 5.

51 *See* FCC, Universal Service Monitoring Report 2009, at tbl. 8.1 (2009), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-295442A1.pdf; *see also* AT&T Comments in re NBP PN #25, filed Dec. 21, 2009, at 10.

52 Organization for the Promotion and Advancement of Small Telecommunications Companies Comments in re NBP PN #19, filed Dec. 7, 2009, at 23-24.

53 Further, the FCC has not addressed whether VoIP traffic is subject to ICC charges, and, if so, what type of charges apply. Commenters in the record argue that the uncertainty regarding the treatment of VoIP traffic has resulted in significant disputes and costly litigation regarding the payment of intercarrier compensation for such traffic. CenturyLink Comments in re NBP PN #19, filed Dec. 7, 2009, at 38 (*citing Central Telephone Company of Virginia, et al v. Sprint Communications Company of Virginia, Inc and Sprint Communications Company LP*, Case No. 3:09-cv-00720 (E.D. Va.) (filed Nov. 16, 2009); *CenturyTel of Chatham LLC, et al v. Sprint Communications Company LP*, Case No. 3:09-cv-01951 (W.D. La.) (filed Nov. 23, 2009)).

54 Wired special access circuits connect wireless towers to the rest of the network. Sprint estimates that one third of its total operating costs of a cell site are devoted to *second and middle*-mile connectivity. Sprint Comments in re NBP PN #11, (*Comments sought in Impact of Middle and Second Mile Access on Broadband Availability and Development-NBP Public Notice #11*, GN Docket Nos. 09-47, 09-51, 09-13, Public Notice 24 FCC Rcd 12470 (WCB 2009) NBP PN #11), filed Nov. 19, 2010, at 2.

55 *See, e.g.*, Comments of Contact Communications, Inc. and wwyoming.com in re NBP PN #11, filed Nov. 3, 2009, at 4-6 (providing connectivity options and costs for served middle mile circuits in Wyoming of up to 231 miles); Letter from Thomas Jones, Counsel, tw telecom inc., to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 09-47, 09-51, 09-137 (Dec. 22, 2009).

56 *See, e.g.*, Comments of Contact Communications, Inc. and Wyoming.com in re NBP PN #11, filed Nov. 3, 2009, at 4-6 (providing connectivity options and costs for several middle-mile circuits in Wyoming of up to 231 miles); National Exchange Carrier Association Comments in re NBP PN #11, filed Nov. 4, 2009; Wireless Internet Service Provider Association Comments in re NBP PN #11, filed Nov. 4, 2009.

57 47 U.S.C. § 201(b).

58 National Telecommunications Cooperative Association Comments in re NBP PN #11, filed Nov. 20, 2009, at 5-13 (asserting that total middle-mile cost will rise as Internet demand increases, and small rural providers have per Mbps middle-mile costs higher than the larger providers).

59 Per-megabit costs can vary significantly for small rural providers. The National Exchange Carrier Association reports that the price its members pay for a 45 Mbps DS3 connection ranges from $50–$375 per month. National Exchange Carrier Association Comments in re NBP PN# 11, filed Nov. 4, 2009, at 4.

60 *See generally* Peter Bluhm & Robert Loube, *Competitive Issues in Special Access Markets* (NRRI, Working Paper No. 09-02, rev. ed. 2009), *available at* http://nrri.org/pubs/telecommunications/NRRI_spcl_access_mkts_jan09-02.pdf; XO Comments in re NBP PN #11, filed Nov. 4, 2009, at 15–27; Letter from Thomas Jones, Counsel, tw telecom inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51 (Oct. 14, 2009) Attach.; Letter from Thomas Jones, Counsel, tw telecom inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51 (Dec. 22, 2009) (regarding price, terms, and conditions of high-capacity Ethernet transport); Sprint Comments in re NBP PN # 11, filed Nov. 4, 2009, at 13–45; Wireless Internet Service Provider Association Comments in re NBP PN # 11, filed Nov. 4, 2009, at 25–28 (recommending fiber access policy), *But cf.* Verizon Comments in re NBP PN# 11, filed Nov. 4, 2009, at 4–5, 42 (noting that while "cost and availability of middle- and second-mile facilities—generally together with other factors—have hindered the deployment of broadband in some instances" to the point that broadband in those locations "would be too expensive for most," but asserting that "it is the distance such facilities must be deployed and the relatively small base of customers" that results in high costs); Letter from Jeffrey S. Lanning, Director, Federal Regulatory Affairs, CenturyLink, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51, WC Docket No. 05-25 (Nov. 4, 2009) at Attach. (noting that special access circuits "typically are sunk cost investments with considerable risk"); AT&T Comments in re NBP PN #11, filed Nov. 4, 2009, at 3–5, 9–13 (noting per-mile rates for special access second and middle-mile connections "typically vary little from urban to rural areas").

61 *High-Cost Universal Service Support; Federal-State Joint Board on Universal Service*, WC Docket No. 05-337, CC Docket No. 96-45, Recommended Decision, 22 FCC Rcd 20477, 20490–92, paras. 55–62 (JB 2007).

62 *See* National Exchange Carrier Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 8 (as mechanisms are put in place to support broadband services, funding for existing voice-based programs can be phased down).

63 *See, e.g.*, Letter from Mike Lovett, Executive Vice President and Chief Operating Officer, Charter, to Chairman Julius Genachoski, FCC, GN Docket Nos. 09-51, 09-47, 09-137, 09-919, 07-52, WC Docket No. 09-154, 05-337, RM-11584 (Feb. 24, 2010) at 8 (urging FCC to pinpoint support to unserved areas and prioritize applications that will deliver broadband to the greatest number of now unserved households per public dollar invested); Qwest Comments in re NBP PN #19, filed Dec. 7, 2009, at 4 (in early years of program, target unserved households where it is less costly to provide broadband service, in order to maximize the number of unserved households in every year).

64 *See, e.g.*, Organization for the Promotion and Advancement of Small Telecommunications Companies Comments in re NBP PN #19, filed Dec. 7, 2009, at 10 (seven year transition period); TDS Telecommunications Corp. Comments in re NBP PN #19, filed Dec. 7, 2009, at 6–7 (supports OPASTCO proposal); Independent Telephone and Telecommunications Alliance Comments in re NBP PN #19, filed Dec. 7, 2009, at 16 (five to seven year transition); Free Press Comments in re National Broadband Plan NOI, filed June 8, 2009, at 29, 255 (ten years).

65 Pennsylvania Public Utility Commission Comments in re NBP PN #25, filed Dec. 22, 2009, at 5–6 (stating that the FCC should seek input on how to reconcile national efforts with successful state programs).

66 For the purposes of the Plan, we define "Tribal lands" as any federally recognized Tribe's reservation, pueblo and colony, including former reservations in Oklahoma, Alaska Native regions established pursuant to the

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Alaska Native Claims Settlement Act (85 Stat. 688), and Indian allotments. The term "Tribe" means any American Indian or Alaska Native Tribe, Band, Nation, Pueblo, Village or Community which is acknowledged by the Federal government to have a government-to-government relationship with the United States and is eligible for the programs and services established by the United States. See Statement of Policy on Establishing a Government-to-Government Relationship with Indian Tribes, 16 FCC Rcd 4078, 4080 (2000). Thus, "Tribal lands" includes American Indian Reservations and Trust Lands, Tribal Jurisdiction Statistical Areas, Tribal Designated Statistical Areas, and Alaska Native Village Statistical Areas, as well as the communities situated on such lands. This would also include the lands of Native entities receiving Federal acknowledgement or recognition in the future. While Native Hawaiians are not currently members of federally-recognized Tribes, they are intended to be covered by the recommendations of this Plan, as appropriate.

67 *See, e.g.* CenturyLink et al. Comments in re NBP PN #19, filed Dec. 7, 2009, at 3–4 (urging FCC to create expedited process to target additional support for broadband deployment in unserved areas pending resolution of longer term USF reform issues for areas that already have broadband and voice services).

68 The Memorandum of Understanding is posted on the FCC's website. *See* Memorandum of Understanding between the Federal Communications Commission and the Universal Service Administrative Company (Sept. 9, 2008), http://www.fcc.gov/omd/usac-mou.pdf.

69 *See, e.g.*, National Telecommunications Cooperative Association Reply in re NBP NOI, filed July 21, 2009, at 23–24 (target funding to "Market Failure Areas," defined as areas that lack the population base or economic foundation to justify build-out and ongoing maintenance without external monetary support); Nebraska Public Service Commission Comments in re NBP PN #19, filed Dec. 7, 2009, at 7–8 (need to target funding to "out of town" areas); National Cable & Telecommunications Association Comments in re NBP PN # 19, filed Dec. 7, 2009, at 2–3.

70 *See, e.g.*, National Association of State Utility Consumers Advocates Comments in re NBP PN #19, filed Dec. 7, 2009, at 13; Rural Cellular Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 14; Comcast Comments in re NBP PN #19, filed Dec. 7, 2009, at 2–3.

71 *See, e.g.*, AT&T Comments in re NBP PN #19, filed Dec. 7, 2009, at 13; Organization for the Promotion and Advancement of Small Telecommunications Companies Comments in re NBP PN #19, filed Dec. 7, 2009, at 10, 16; TDS Telecommunications Corp. Comments in re NBP PN # 19, filed Dec. 7, 2009, at 6; Western Telecommunications Alliance Comments in re NBP PN #19, filed Dec. 7, 2009, at 20–21; Pioneer Comments in re NBP PN #19, filed Dec. 7, 2009, at 2.

72 *See, e.g.*, Comcast Comments in re NBP PN #19, filed Dec. 7, 2009, at 3–4; New Jersey Rate Division of Counsel Comments in re NBP PN #19, filed Dec. 7, 2009, at 7–8; Letter from Ben Scott, Free Press to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51 (Jan. 19, 2010) (need for high cost should be based on forward-looking infrastructure and total revenue earning potential); *see also* Sprint Comments in re *National Cable and Telecommunications Association Petition for Rulemaking To Reduce Universal Service High-Cost Support Provided To Carriers In Areas Where There Is Extensive Unsubsidized Facilities-based Voice Competition*, WC Docket No. 05-337, GN Docket No. 09-51, RM-11584, filed Jan. 7, 2010, at 7 (FCC must recognize that USF recipients derive revenues from broadband and video services delivered over common network); National Cable & Telecommunications Association Petition for Rulemaking, Reducing Universal Service Support in Geographic Areas That Are Experiencing Unsupported Facilities-Based Competition (filed Nov. 5, 2009) (when considering need for ongoing support, FCC should consider whether ILEC costs, including costs attributable to provider of last resort obligations imposed under state law, cannot be recovered through the regulated and unregulated services provided over the network).

73 *See, e.g.*, Florida Public Service Commission Comments in re NBP PN #19, filed Dec. 15, 2009, at 5 (carriers should not be able to double dip from different federal agencies for the same project); US Cellular Comments in re NBP PN #19, filed Dec. 7, 2009, at 15; Centurylink Comments in re NBP PN #19, filed Dec. 7, 2009, at 27.

74 *See, e.g.*, US Cellular Comments in re NBP PN #19, filed Dec. 7, 2009, at 15–17; USA Coalition Comments in re NBP PN #19, filed Dec. 7, 2009, at 11.

75 Liu & Rosenberg, *State Universal Service Funding Mechanisms* at 70, 76; Alliance for Pub. Tech. & Commc'ns Workers of Am., State Broadband Initiatives 3, 47–49 (2009), *available at* http://www.apt.org/publications/reports-studies/state_broadband_initiatives.pdf..

76 *See* California Public Utility Commission Comments in re NBP PN #19, filed Dec. 7, 2009, at 4–5 (arguing that states that generate matching funding should get supplemental funding; states that do not should only get base level funding). In 2007, the Federal-State Joint Board on Universal Service recommended that the FCC adopt policies to encourage states to provide matching funds for the new Broadband Fund that it proposed be established. *Comprehensive Reform Recommended Decision*, 22 FCC Rcd at 20489, para. 50.

77 *See, e.g.*, Letter from Ken Pfister, Vice Pres.–Strategic Pol'y, Great Plains Communications, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51 (Dec. 8, 2009) Attach. at 6 (arguing that the United States cannot afford to support more than one network; support should be targeted to where the market will not work); California Public Utility Commission Comments in re NBP PN #19, filed Dec. 7, 2009, at 6 (arguing that USF should provide support to only one provider in a given geographic area); Qwest Communications International Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, at 3 (arguing that only a single provider of broadband, regardless of technology, should receive support); Maine Public Utility Commission and Vermont Public Service Board Comments in re NBP PN #19, filed Dec. 7, 2009, at 4; Charter Communications, Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, at 5; *see also Comprehensive Reform Recommended Decision*, 22 FCC Rcd at 20481–82, para. 15 (recommending that Broadband Fund provide funding for "only one provider in any geographic area").

78 *See, e.g.*, National Cable and Telecommunications Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 7; American Cable Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 32 (supporting the creation of a new support mechanism that is "competitively and technologically neutral").

79 *See, e.g.*, Maine Public Utilities Commission and Vermont Public Service Board Comments in re NBP PN #19, filed Dec. 7, 2009, at 4 (arguing that the Commission should award support for broadband deployment through cost model, Request for Proposal or reverse auctions); Qwest Communications International Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, at 3, 21 (recommending competitive bidding for one-time grant to cover cost of deploying and providing broadband in previously unserved area for finite time period, such as ten years); AT&T Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, at 11 & App. A at 11 (suggesting competitive project-based funding approach); AdHoc Telecommunications Users Committee Comments in re NBP PN #19, filed Dec. 7, 2009, at 10.

80 *See* National Association of State Utility Consumer Advocates Comments in re NBP PN #19, filed Dec. 7, 2009, at 22 (condition receipt of funding on acceptance of broadband carrier of last resort for the area where funding is accepted).

81 *See, e.g.*, American Cable Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 39 (arguing that funding should be provided with strict terms and conditions, including time limits for construction, reporting requirements, and annual audits); Kansas State Representative Tom Sloan and Mary Galligan Comments in re NBP PN #28 (*Comment Sought on Addressing Challenges to Broadband Deployment Financing—NBP Public Notice #28*, GN Docket No. 09-47, 09-51, 09-137, Public Notice, 24 FCC Rcd 14610 (WCB 2009) (*NBP PN #28*)), filed Jan. 8, 2010, at 1 (arguing that companies that receive financial support must be held accountable for actually signing up customers for broadband service, not simply installing infrastructure); Organization for the Promotion and Advancement of Small Telecommunications Companies Comments in re NBP PN #19, filed Dec. 7, 2009, at 10.

82 *See, e.g.*, Cox Communications, Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, at 10 ("[M]onopoly providers subject to COLR obligations should be required to meet service quality standards and reporting and oversight obligations to guarantee that they provide reasonable service in areas where customers have no competitive choice."); AT&T Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, App. A at 19 (arguing that recipients should provide supported services at rates, terms and conditions reasonably comparable to those offered in urban areas); Qwest Communications International Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, at 4 (arguing that winner bidders

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of subsidies to deploy broadband to unserved areas should be limited to charging no more than 125% of the state-wide average for comparable broadband service); OPASTCO Comments in re NBP PN #19, filed Dec. 7, 2009, at 21 (arguing that ETCs should be required to serve all customers at minimum broadband speeds and maximum rates).

83 Data from American Roamer shows geographic coverage by technology. The actual service quality of data connections experienced by end-users will differ due to a large number of factors, such as location and mobility. Further, the underlying coverage maps do not include information on what level of service (*i.e.*, the quality of the signal and the speed of broadband service) provided; nor is coverage defined by providers in the same way. Thus, coverage as described here does not correspond to a specific minimum signal quality or user experience. *See* American Roamer Advanced Services database (accessed Aug. 2009) (aggregating service coverage boundaries provided by mobile network operators) (on file with the Commission) (American Roamer database). Population is based on projected census blocks figures from Geolytics. *See* Geolytics Block Estimates and BlockEstimates Professional databases (2009) (accessed Nov. 2009) (projecting census populations by year to 2014 by census block) (on file with the Commission) (Geolytics databases). *See generally* OBI.

84 *See* American Roamer database; Geolytics databases. *See generally* OBI, The Broadband Availability Gap.

85 Atkinson & Schultz, Broadband in America at 7.

86 *See* Maine Public Utility Commission and Vermont Public Service Board Comments in re NBP PN #19, filed Dec. 7, 2009, at 3 (arguing the Commission should establish Mobility Fund to expand wireless mobile voice services in unserved areas). In 2007, the Federal-State Joint Board on Universal Service recommended that the FCC create a new Mobility Fund "tasked primarily with disseminating wireless voice services to unserved areas" with funding targeted to capital spending for new construction. *Comprehensive Reform Recommended Decision*, 22 FCC Rcd at 20482, 20486, paras. 16, 36.

87 *See, e.g.*, United States Telecom Association Comments in re NBP PN #28, filed Jan. 8, 2010, at 9; Windstream Communications, Inc. Comments in re NBP PN #28, filed Jan. 8, 2010, at 5.

88 *See* Letter from William J. Wilkins, Chief Counsel, U.S. Department of Treasury, to Cameron K. Kerry, General Counsel, U.S. Department of Commerce (Mar.4, 2010). The five factors outlined in the Treasury ruling are: (1) the contribution must become a permanent part of the transferee's working capital structure; (2) the contribution may not be compensation, such as a direct payment for a specific, quantifiable service; (3) the contribution must be bargained for; (4) the contributed asset foreseeably must result in a benefit to the transferee commensurate with its value; and (5) the contributed asset must ordinarily, if not always, be employed in or contribute to the production of additional income.

89 For the definition of "Tribal lands" as used in this Plan, see Chapter 3 note 80, *supra*.

90 *See* Traci L. Morris & Sacha D. Meinrath, Native Public Media & Open Technology Initiative, New America Foundation, New Media, Technology and Internet Use in Indian Country: Quantitative and Qualitative Analyses 36–37 (2009) (Morris & Meinrath, New Media, Technology and Internet Use in Indian Country); Letter from Mark Pruner, Pres., Native Am. Broadband Ass'n, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 09-47, 09-51, 09-137 (Dec. 17, 2009) Attach. at 2–3.

91 Letter from Loris Ann Taylor, Exec. Dir., Native Public Media et al., to Marlene H. Dortch, Secretary, FCC, GN Docket Nos 09-47, 09-51, 09-137 (Dec. 24, 2009) (Joint Native Filers Dec. 24, 2009 *Ex Parte*) at 12.

92 *Cf. Comprehensive Reform Recommended Decision*, 22 FCC Rcd at 20484, paras. 26–27 (recommending overall cap on the High Cost fund and a transition in which existing funding mechanisms would be reduced, and all, or a significant share, of savings transferred to proposed new funds for broadband and mobility).

93 Verizon Wireless agreed to a five-year phase-out of its competitive ETC High-Cost support for any properties that it retained after mandated divestitures. *Applications of Cellco Partnership d/b/a Verizon Wireless and Atlantis Holdings LLC for Consent to Transfer Control of Licenses, Authorizations, and Spectrum Manager and De Facto Transfer Leasing Arrangements and Petition for Declaratory Ruling that the Transaction is Consistent with Section 310(b)(4) of the Communications Act*, WT Docket No. 08-95, File Nos. 0003463892 et al., ITC-T/C-20080613-00270 et al., ISP-PDR-20080613-00012, Memorandum Opinion and Order and Declaratory Ruling, 23 FCC Rcd 17444, 17529–17532, paras. 192–197 (2008). Similarly, Sprint agreed to a five-year phase-out of its competitive ETC high-cost support as part of its transaction with Clearwire. *Applications of Sprint Nextel Corporation and Clearwire Corporation For Consent to Transfer Control of Licenses, Leases and Authorizations*, WT Docket No. 08-94, File Nos. 0003462540 et al., Memorandum Opinion and Order and Declaratory Ruling, 23 FCC Rcd 17570, 17612, para. 108 (2008).

94 Nat'l Telecomm. Coop. Ass'n, 2009 Broadband/Internet Availability Survey Report 3, 9 (2009) (89% of those surveyed face competition from at least one broadband provider in some portion of their service area; 47% face broadband competitors serving customers throughout their area).

95 *Policy and Rules Concerning Rates for Dominant Carriers*, CC Docket No. 87-313, Second Report and Order, 5 FCC Rcd 6786, 6790, para. 32 (1990), *aff'd, Nat'l Rural Telecom Ass'n v. FCC*, 988 F.2d 174 (D.C. Cir. 1993).

96 A number of the mid-sized telephone companies already have elected to convert to price cap regulation, with their ICLS support per line frozen; the proposed rule change would have no impact on those companies. *See Windstream Petition for Conversion to Price Cap Regulation and for Limited Waiver Relief*, WC Docket No. 07-171, Order, 23 FCC Rcd 5294 (2008); *Petition of Puerto Rico Telephone Company, Inc. for Election of Price Cap Regulation and Limited Waiver of Pricing and Universal Service Rules; Consolidated Communications Petition for Conversion to Price Cap Regulation and for Limited Waiver Relief; Frontier Petition for Limited Waiver Relief upon Conversion of Global Valley Networks, Inc., to Price Cap Regulation*, WC Docket Nos. 07-292, 07-291, 08-18, Order, 23 FCC Rcd 7353 (2008); *Petition of Centurylink for Conversion to Price Cap Regulation and for Limited Waiver Relief*, WC Docket No. 08-191, Order, 24 FCC Rcd 4677 (2009).

97 The Alliance of Rural CMRS Carriers has proposed that the FCC adopt an interim cap for incumbent telephone company support per line at either March 2010 or March 2008 levels, with estimated savings of $1.8 billion between 2010 and 2012 repurposed toward broadband programs, pending comprehensive USF reform. *See* Letter from David LaFuria, Counsel for Alliance for Rural CMRS Carriers, to Marlene H. Dortch, Secretary, FCC, CC Docket No. 96-45, WC Docket No. 05-337, GN Docket Nos. 09-47, 09-51, 09-137 (Mar. 3, 2010).

98 *See* National Telecommunications Cooperative Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 4 (suggesting that carriers receive future funding for broadband through Interstate Access Support and Interstate Common Line Support).

99 Figures based on preliminary USAC 2009 disbursement data. *See* Universal Serv. Admin. Co., Disbursement Data (High Cost), http://www.usac.org/hc/tools/disbursements/default.aspx (last visited Mar. 7, 2010) (providing disbursement data for all the high-cost programs).

100 *Access Charge Reform; Price Cap Performance Review for Local Exchange Carriers; Low-Volume Long Distance Users; Federal-State Joint Board on Universal Service*, CC Docket Nos. 96-262, 94-1, 99-249, 96-45, Sixth Report and Order, Report and Order, and Eleventh Report and Order, 15 FCC Rcd 12962 (2000), *aff'd in part, rev'd in part, and remanded in part, Texas Office of Public Util. Counsel et al. v. FCC*, 265 F.3d 313 (5th Cir. 2001); *on remand, Access Charge Reform; Price Cap Performance Review for LECs; Low-Volume Long Distance Users; Federal-State Joint Board on Universal Service*, CC Docket Nos. 96-262, 94-1, 99-249, 96-45, Order on Remand, 18 FCC Rcd 14976 (2003). Interstate Access Support was created in 2000 as a first step in removing implicit support from the FCC's interstate access charge regime.

101 Competitive ETC support per line is based on the incumbent telephone company's support per line. 47 C.F.R. § 54.307. As a consequence, the support a competitive ETC receives is not based on either its costs or the costs of the most efficient technology to support customers in a given area.

102 *High-Cost Universal Service Support; Federal-State Joint Board on Universal Service*, WC Docket No. 05-337, CC Docket No. 96-45, Order, 23 FCC Rcd 8834 (2008), (2008), *aff'd, Rural Cellular Ass'n v. FCC*, 588 F.3d 1095 (D.C. Cir. 2009).

103 *See* Letter from Michael J. Copps, Acting Chairman, FCC, to the Honorable Henry J. Waxman, Chairman, Committee on Energy and Commerce, U.S. House of Representatives, Part 4 (May 4, 2009), *available at* http://energycommerce.house.gov/index.php?option=com_content&view=article&id=1644.

104 In 2007, the Federal-State Joint Board on Universal

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Service concluded, "We no longer believe it is in the public interest to use federal universal service support to subsidize competition and build duplicative networks in high cost areas." *Comprehensive Reform Recommended Decision*, 24 FCC Rcd at 6482, para. 12.

105 *See* Letter from Melissa Newman, Vice Pres., Fed. Relations, Qwest Communications International, Inc., to Marlene H. Dortch, Secretary, FCC, CC Docket No. 96-45 (Feb. 4, 2010) (proposing that universal service support be limited to one handset per wireless family plan and suggesting that could yield savings of up to $463 million annually).

106 *See, e.g.*, Broadview Networks et al. Comments in re NBP PN #19, filed Dec. 7, 2009, at 4–7; CenturyLink Comments in re NBP PN #19, filed Dec. 7, 2009, at 40; AT&T Inc. Comments in re NBP PN # 19, filed Dec. 7, 2009, App. A at 28–29; Verizon Comments in re NBP PN #19, filed Dec. 7, 2009 at 19–20.

107 *See, e.g.*, AT&T Comments in re NBP PN #19, filed Dec. 7, 2009, App. A at 28–29.

108 *See* AT&T Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, App. A at 28–29; CenturyLink Comments in re NBP PN #19, Dec. 7, 2009, at 40.

109 For example, 8 percent of local residential rates are $12 or less (excluding the SLC). *See* Letter from Mary L. Henze, Asst. Vice Pres., Fed. Reg., AT&T Inc., to Marlene H. Dortch, Secretary, FCC (Nov. 24, 2009) at 12.

110 *See* Free Press Comments in re NBP PN#30 (*Reply Comments Sought in Support of National Broadband Plan—NBP Public Notice #30*, GN Docket No. 09-47, 09-51, 09-137, Public Notice, 25 FCC Rcd 241 (WCB 2010) (*NBP PN #30*)), filed Jan. 30, 2010, at 9–11 (suggesting the FCC could phase down over five years support for any lines receiving $20/month or less).

111 *See* American Cable Association in re NBP PN #19, filed Dec. 7, 2009, at 40 (providers should not be able to draw from both broadband and high cost support mechanism for the same area).

112 FCC, Universal Service Monitoring Report 2009, tbls. 1.1, 1.2 (2009), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-295442A1.pdf. According to USAC's most recent filing, the revenue base for second quarter 2010 is $16.6 billion, more than a $600 million drop from first quarter 2010. *See* USAC, Federal Universal Service Contribution base Projections for Second Quarter 2010, at 7 (2010), *available at* http://www.universalservice.org/about/governance/fcc-filings/2010/Q2/2Q2010%20Quarterly%20Contribution%20Base%20Filing.pdf.

113 According to the Telecommunications Industry Association (TIA), overall telecommunications revenues in the United States are projected to grow from $990 billion in 2010 to $1.133 billion in 2012, led by double digit growth in web conferencing, broadband, and support services. Broadband Internet access revenues alone are projected to grow from $39 billion in 2010 to $49 billion in 2012. TIA also projects that wireless data revenue will expand at a 24.6% compound annual growth rate between 2009 and 2012. Telecomm. Indus. Ass'n, TIA's 2009 ICT Market Review and Forecast 1–11 (2009).

114 *See, e.g.*, National Telecommunications Cooperative Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 2–3 (asking the Commission to expand contributions to all broadband providers and to assess contributions based on telecommunications and broadband revenues); TracFone Wireless Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, at 4 (arguing that all providers of services which derive revenues from services which use telecommunications should be required to contribute to the support of universal service); Broadview Networks, Inc. et al. Comments in re NBP PN #19, filed Dec. 7, 2009, at 11 (arguing that all information service revenues, including all broadband service provider revenues, should be included for contribution purposes); American Association of Paging Carriers Comments in re NBP PN #19, filed Dec. 7, 2009, at 5–6 (arguing that all revenues from high speed Internet access should be subject to direct assessment); National Association of State Utility Consumer Advocates Comments in re NBP PN #19, filed Dec. 7, 2009, at 7–8; Nebraska Public Service Commission Comments in re NBP PN #19, filed Dec. 7, 2009, at 6; Rural Cellular Comments in re NBP PN #19, filed Dec. 7, 2009, at 8–10; Vermont Public Service Board and Vermont Department of Public Service Comments in re National Broadband Plan NOI, filed June 8, 2009, at 7.

115 *See, e.g.*, AT&T Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, at 4, 6 (suggesting that if the Commission assessed $1.01 per month on both telephone numbers and residential broadband connections, the inclusion of mass market residential broadband connections in the contribution base would raise an additional $957 million per year); United States Telecom Association Comments in re NBP PN#19, filed Dec. 7, 2009, at 9–10; Western Telecommunications Alliance Comments in re NBP PN #19, filed Dec. 7, 2009, at 9.

116 *See, e.g.*, AT&T Inc. Comments in re NBP PN #19, filed Dec. 7, 2009, at 4; Rural High Cost Carriers Comments in re NBP PN #19, filed Dec. 7, 2009, at 13–14; Rural Independent Competitive Alliance Comments in re NBP PN #19, filed Dec. 7, 2009, at 10; National Telecommunications Cooperative Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 13.

117 *See, e.g.*, National Cable & Telecommunications Association Comments in re NBP PN #19, filed Dec. 7, 2009, at 5; Access Humboldt et al. Comments in re NBP PN #19, filed Dec. 7, 2009, at 14–15 (filed as Rural/Urban Commenters).

118 *See Comprehensive Reform Recommended Decision*, 22 FCC Rcd at 20484, para. 25.

119 USAC, Universal Service Fund, http://www.usac.org/about/universal-service/ (last visited Feb. 20, 2010). The estimated annual projected outlay for the federal USF can be found in the FY 2010 Federal budget. Office Of Mgmt. & Budget, Exec. Office Of The President, Budget Of The United States Government, Fiscal Year 2010, at 1220 (2010), *available at* http://www.whitehouse.gov/omb/budget/fy2010/assets/oia.pdf. Total outlays for 2000 based the sum of disbursements for all four programs as reported in the FCC's Trends in Telephone Service report and USAC administrative expenses reported in USAC's 2000 annual report. FCC, Trends in Telephone Service, tbls 19.3, 19.10, 19.13, 19.15 (2008), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-284932A1.pdf; Universal Service Administrative Company, 2000 Annual Report 5 (2000), *available at* http://www.usac.org/about/governance/annual-reports/2000/default.asp.

120 Low Income Support total outlays were $930 million in FY 2009, and in annual projections to OMB submitted in December 2009, projected to be $1.2 billion in FY 2010. Based on USAC's most recent quarterly filing, total outlays for the Low Income programs are forecast to be approximately $1.4 billion in calendar year 2010. USAC, Federal Universal Service Support Mechanisms Fund Size Projections for Second Quarter 2010, at 15–17 (2010), *available at* http://www.universalservice.org/about/governance/fcc-filings/2010/Q2/2Q2010%20Quarterly%20Demand%20Filing.pdf.

121 A number of commenters suggest that the FCC should work within the existing budget of the current Universal Service Fund. *See, e.g.*, Florida Public Service Commission Comments in re NBP PN # 19, filed Dec. 15, 2009, at 3, 6–7 (opposing further growth in fund); Verizon and Verizon Wireless Comments in re NBP PN #19, filed Dec. 7, 2009, at 4–5 (noting that E-rate and rural health care programs are capped and urging FCC to set an overall cap for high cost funding); Benton Comments in re NBP PN #19, filed Dec. 7, 2009, at 6 (arguing that the size of the fund should remain the same but the FCC should redirect money to support broadband); New Jersey Division of Rate Counsel Comments in re NBP PN #19, filed Dec. 7, 2009, at 5, 7 (arguing to cap the high-cost fund and transition support to a Mobility Fund, a Broadband Fund and a Provider of Last Resort Fund, such that combined total of the three stays within cap).

122 *See* Universal Service Reform Act of 2009, H.R. __, 111th Cong. (discussion draft), *available at* http://www.boucher.house.gov/images/usf%20discussion%20draft.pdf. The discussion draft legislation to reform the universal services provisions of the Communications Act of 1934 would exempt a provider from having to serve all households in the service territory if the cost per line of deploying such service is at least three times the national average cost of providing broadband for all wire centers.

123 *See* U.S. Department of Justice *Ex Parte* Submission, filed Jan. 4, 2010, at 28 (recommending that "the Commission monitor carefully those areas in which only a single provider offers—or even two providers offer—broadband service" and cautioning that price regulation may be appropriate only "to protect consumers from the exercise of monopoly power" and must be careful to avoid stifling "incentives to invest in infrastructure deployment").

124 One factor that impacts the sensitivity of estimates is the amount of ICC revenue replacement that may ultimately be provided to carriers during implementation of long-term ICC reform. The need for explicit revenue replacement from the CAF depends in part on the rate benchmark

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ultimately selected and the extent to which costs are recovered from end-user customers. The estimates also do not include potential cost savings that would result from implementing other parts of the plan, such as lower pole and rights-of-way costs or spectrum reforms.

125 Because the current USF contribution methodology assesses telecommunications revenues, the burden of funding universal service may ultimately fall more heavily on households that do not subscribe to broadband services, which on average may be lower income, older and more likely rural. In contrast, the federal income tax system is more progressive so that lower-income households pay a lower marginal rate than upper-income households.

126 U.S. Metronets, LC Comments in re NBP PN #28, filed Mar. 3, 2010,at 4; Letter from Thomas Cohen, Kelley Drye & Warren LLP, counsel for Hiawatha Broadband Communications, Inc., to Marlene H. Dortch, Secretary, FCC (Nov. 25, 2009) at 1; *id.* Attach. at 1 (Hiawatha Broadband Communications Inc. White Paper); *see also* Letter from Thomas Cohen, Kelley Drye & Warren LLP, counsel for Hiawatha Broadband Communications, Inc., to Marlene H. Dortch, Secretary, FCC (Nov. 5, 2009) at 1; *id.* Attach. at 1–3 (Barriers to Broadband Rural Deployment—Challenges and Solutions).

127 U.S. Dep't of Agric., *Agriculture Secretary Vilsack Seeks Applicants for Broadband Grants in Rural Areas* (press release), Apr. 28, 2009, *available at* http://www.usda.gov/wps/portal?contentidonly=true&contentid=2009/04/0135.xml; *see also* GAO, Telecommunications: Broadband Deployment Plan Should Include Performance Goals and Measures to Guide Federal Investment 13, GAO-09-494 (2009).

128 *See* Joint Native Filers Dec. 24, 2009 *Ex Parte* at 24–25. The Joint Native Filers estimate such a fund would require at least $310 million to effectively support deployment and adoption objectives. The New America Foundation's Open Technology Initiative (OTI) proposes an allocation of $1.2 billion to $4.6 billion for broadband deployment on Tribal lands. *See* Letter from Matthew F. Wood, Associate Director, Media Access Project, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 09-47, 09-51, 09-137, CG Docket No. 09-158, CC Docket No. 98-170 (Jan. 20, 2010) at 2.

129 *See* Joint Native Filers Dec. 24, 2009 *Ex Parte* at 25. The Joint Native Filers recommend an allocation of at least $30 million for funding small grants. *See id.* at 24.

130 *See, e.g.*, Morris & Meinrath, New Media, Technology and Internet Use in Indian Country at 52, *available at* http://www.nativepublicmedia.org/images/stories/documents/npm-nafnew-media-study-2009.pdf. Such entities include the Bureau of Indian Affairs, the Indian Health Service, and the Bureau of Indian Education. The connectivity at these locations is typically limited to T1 lines. *See generally id.* App. II.

131 *See* California Association of Tribal Governments *Ex Parte* in re National Broadband Plan NOI, filed Dec. 18, 2009, at 12, 14 (filed by William Micklin); Joint Native Filers Dec. 24, 2009 *Ex Parte* at 9–10. This is consistent with the recommendation in Chapter 14 that Federal contracting power via Networx be made available to connect communities.

132 *See* Native Public Media et al. Comments in re NBP PN #5 (*Comment Sought on Broadband Deployment and Adoption on Tribal Lands—NBP Public Notice #5*, GN Docket No. 09-47, 09-51,09-137, Public Notice, 24 FCC Rcd 12010 (CGB 2009) (*NBP PN #5*)), filed Nov. 9, 2009, at 2–3 (noting that "broadband penetration [on Tribal lands] may be as low as five percent (5%)"); Joint Native Filers Dec. 24, 2009 *Ex Parte* at 1 ("Broadband deployment on Tribal Lands is at less than a 10 percent penetration rate . . . ."); California Association of Tribal Governments *Ex Parte* in re National Broadband Plan NOI, filed Dec. 18, 2009, at 2 (filed by William Micklin) (stating that "broadband deployment in Indian Country is at less than a 10 percent penetration rate"); Native Public Media et al. Comments in re NBP PN #1 (*Comment Sought on Defining Broadband—NBP PN #1*, GN Docket Nos. 09-47, 09-51, 09-137, Public Notice, 24 FCC Rcd 10897 (WCB 2009) (*NBP PN #1*)), filed Aug. 31, 2009, at 3 ("There are no solid data on broadband deployment on Tribal lands, but it is estimated that Tribal penetration hovers somewhere around five percent (5%).").

133 GAO, Challenges to Assessing and Improving Telecommunications for Native Americans on Tribal Lands 10, GAO-06-189 (2006).

134 *Extending Wireless Telecommunications Services to Tribal Lands*, WT Docket No. 99-266, Report and Order and Further Notice of Rule Making, 15 FCC Rcd 11794, 11798 (2000); *see also* General Communication, Inc. Comments in re NBP PN #5, filed Nov. 9, 2009, at 6; California Association of Tribal Governments Comments in re NBP PN #18 (*Comment Sought on Relationship Between Broadband and Economic Development—NBP PN #18*, GN Docket No. 09-47, 09-51, 09-137, Public Notice, 24 FCC Rcd 13736 (WCB 2009) (*NBP PN #18*)), filed Dec. 3, 2009, at 2; Letter from James M. Smith, Counsel, Davis Wright Tremaine LLP on behalf of Kodiak Kenai Cable Company, LLC, to Marlene Dortch, Secretary, FCC, GN Docket Nos. 09-47, 09-51, 09-137 (Dec. 18, 2009) at 9.

135 *See* Joint Native Filers Dec. 24, 2009 *Ex Parte* at 25–26.

136 *See* Joint Native Filers Dec. 24, 2009 *Ex Parte* at 25–26.

137 *See, e.g.*, Alaska Telephone Association Reply in re NBP PN #5, filed Dec. 9, 2009, at 2; General Communication, Inc. Comments in re NBP PN #5, filed Nov. 9, 2009, at 16; Nemont Telephone Cooperative Comments in re NBP PN #5, filed Nov. 9, 2009, at 12–13.

138 Fiber-to-the-Home Council, Municipal Fiber to the Home Deployments 2009 (2009), *available at* http://www.ftthcouncil.org/sites/default/files/Municipal%20FTTH%20Systems%20October%202009%20Final%20Oct09_1.pdf.

139 *See, e.g.*, Commenters Supporting Anchor Institution Networks Reply in re NBP PN #30, filed Jan. 27, 2010, at 2–3; Comments of Nat'l Ass'n of Telecomm. Officers & Advisors, in re NBP PN #12, filed Oct. 28, 2009, at Ex. 2, 3 (providing case studies on many such local and regional networks).

140 Baller Herbst Law Group, State Restrictions on Community Broadband Services or Other Public Communications Initiatives (2004), *available at* http://www.baller.com/pdfs/Barriers2004.pdf.

141 *See* National Association of Telecommunications Officers and Advisors et al. Comments in re NBP PN #7 (*Comment Sought on the Contribution of Federal, State, Tribal, and Local Government to Broadband—NBP Public Notice #7*, GN Docket Nos. 09-47, 09-51, 09-137, Public Notice, 24 FCC Rcd 12110 (WCB 2009) (*NBP PN #7*)), filed Nov. 6, 2009, at 12, 17–20, 37–42.

142 U.S. Energy Information Administration, Electric Power Industry Overview 2007, fig. 5, http://www.eia.doe.gov/cneaf/electricity/page/prim2/toc2.html (Number of Ultimate Customers Served by U.S. Electric Utilities by Class of Ownership, 2007).

143 Comments of Health Network Group Organized by Internet2 in re NBP PN #17, (*Comment Sought on Health Care Delivery Elements of National Broadband Plan—NBP Public Notice #17*, GN Docket Nos. 09-47, 09-51, 09-137, WC Docket No. 02-60, Public Notice, 24 FCC Rcd 13728 (WCB 2009) (*NBP PN #17*)), files Dec. 2, 2006, at 6; *see also* EDUCAUSE et al. Comments in re National Broadband Plan NOI, filed June 8, 2009, Attach. at 6 (recommending that state-led grants for institutional networks "should be done in a way that private sector companies can build upon them to extend connectivity to households in the future").

144 For example, a group of participants in the FCC's Rural Health Care Pilot program have noted that the current program results in "the creation of independent special purpose networks that are usually not expected to interoperate." As a result, "[t]hese networks are often developed using the minimum bandwidth capabilities to meet the identified application" and in a manner that "does not encourage the aggregation of services" and "does not consider the community needs such as economic development." Health Network Group Organized by Internet2 Comments in re NBP PN #17 filed Dec. 2, 2009, at 4–5.

145 U.S. R&E Networks and HIMSS Reply in re NBP PN #30, filed Jan. 27, 2010, at 43 (noting that state laws that limit networks to single purposes "thereby forc[e] the creation of more networks than are necessary," and noting that as a result, "[t]hese laws undermine the benefits from, and the efficiencies of, having one network, used by all community anchors who wish to be a part of it").

146 *See* Liu & Rosenberg, *State Universal Service Funding Mechanisms* at 43, 54; Alliance for Public Technology and Communications Workers of America, State Broadband Initiatives 3 (2009), *available at* http://www.apt.org/publications/reports-studies/state_broadband_initiatives.pdf.

147 U.S. R&E Networks and HIMSS Reply in re NBP PN #30, filed Jan. 27, 2010, at 6, 43–45 ("With regard to community anchors, inclusion, rather than exclusion, should be the rule of the day.").

148 American Library Association Comments in re NBP PN #15 (*Comment Sought on Broadband Needs in Education, Including Changes to E-Rate Program to Improve Broadband Deployment—NBP Public Notice #15*, GN Docket No. 09-47, 09-51, 09-137, Public Notice, 24 FCC Rcd 13560 (WCB 2009) (*NBP PN #15*)), filed Nov. 20,

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2009, at 14 (noting that "current complexities associated with filing consortia applications can be overwhelming for even the most seasoned E-rate applicant" and that "[m]any consortia leaders are no longer willing to risk filing on behalf of member entities" as a result).

149 Native Public Media et al. Comments in re: NBP PN #5, filed Nov. 9, 2009, at 18; Morris & Meinrath, New Media, Technology and Internet Use in Indian Country at 42; Joint Native Filers Dec. 24, 2009 *Ex Parte* at 13.

150 U.S. R&E Networks and HIMSS Reply in re NBP PN #30, filed Jan. 27, 2010, at 16-18.

151 Letter from John Windhausen, Jr., Coordinator, Schools, Health and Libraries Broadband Coalition, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51, filed Mar. 5, 2010, at 2. Attach. (citing over 210,000 community anchor institutions).

152 *See generally* Commenters Supporting Anchor Institution Networks Reply in re NBP PN #30, filed Jan. 27, 2010.

153 U.S. R&E Networks and HIMSS Reply in re NBP PN #30, filed Jan. 27, 2010, at 35–36.

154 Commenters Supporting Anchor Institution Networks Reply in re NBP PN #30, filed Jan. 27, 2010, at 3.